RO 2711

December 3, 2002

Mr. Barney Chan
Alameda County Health Care Services Agenc Environmental Health
Alameda, California 94502

Re: Groundwater Monitoring and System Progress Report
Third Quarter 2002

Former Exxon Service Station 3055 35th Avenue Oakland, California Cambria Project #130-0105



Dear Mr. Chan:

On behalf of Mr. Lynn Worthington of Golden Empire Properties, Cambria Environmental Technology, Inc. (Cambria) has prepared this groundwater monitoring and system progress report for the above-referenced site. Presented in the report are the third quarter 2002 activities and the anticipated fourth quarter 2002 activities.

If you have any questions or comments regarding this report, please call me at (510) 450-1983.

Sincerely,

Cambria Environmental Technology, Inc.

" Schul

Ron Scheele, RG Senior Geologist

Attachments: Groundwater Monitoring and System Progress Report, Third Quarter 2002

cc: Mr. Lynn Worthington, Golden Empire Properties, Inc. 5942 MacArthur Boulevard, Suite B, Oakland, CA 94605 Mr. Robert Cave, BAAQMD, Permit Services Division, 939 Ellis Street, San Francisco, CA 94109

Oakland, CA San Ramon, CA Sonoma, CA

Cambria Environmental Technology, Inc.

1144 65th Street Suite B Oakland, CA 94608 Tel (510) 420-0700 Fax (510) 420-9170

### GROUNDWATER MONITORING AND SYSTEM PROGRESS REPORT

### **THIRD QUARTER 2002**

Former Exxon Service Station 3055 35th Avenue Oakland, California Cambria Project #130-0105

December 3, 2002



Prepared for:

Mr. Lynn Worthington Golden Empire Properties, Inc. 5942 MacArthur Boulevard, Suite B Oakland, CA 94605

Prepared by:

Cambria Environmental Technology, Inc. 6262 Hollis Street Emeryville, California 94608 No. 6842

No. 6842

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### GROUNDWATER MONITORING AND SYSTEM PROGRESS REPORT

### **THIRD QUARTER 2002**

Former Exxon Service Station 3055 35th Avenue Oakland, California Cambria Project #130-0105

December 3, 2002



### INTRODUCTION

On behalf of Mr. Lynn Worthington of Golden Empire Properties, Cambria Environmental Technology, Inc. (Cambria) has prepared this groundwater monitoring and system progress report for the above-referenced site (see Figure 1). Presented in the report are the third quarter 2002 groundwater monitoring and corrective action activities and the anticipated fourth quarter 2002 activities.

### **THIRD QUARTER 2002 ACTIVITIES**

### **Monitoring Activities**

*Field Activities:* On September 26, 2002, Cambria conducted quarterly monitoring activities. Cambria gauged and inspected for separate-phase hydrocarbons (SPH) in monitoring wells MW-1, MW-2, MW-3 and MW-4 (Figure 1). Groundwater samples were collected from all scheduled wells not containing SPH. Field data sheets are presented in Appendix A.

Sample Analyses: Groundwater samples were analyzed for total petroleum hydrocarbons as gasoline (TPHg) and total petroleum hydrocarbons as diesel (TPHd) by modified EPA Method 8015, and benzene, toluene, ethylbenzene and xylenes (BTEX) and methyl tertiary butyl ether (MTBE) by EPA Method 8021B. The groundwater analytical results are summarized in Table 1. The laboratory analytical report is presented as Appendix B.

### **Monitoring Results**

Groundwater Flow Direction: Depth-to-water measurements were collected during Cambria's September 26, 2002 site visit (Figure 1). The groundwater gradient was affected by a two phase extraction (TPE) remediation system in which down-well stingers are used to extract groundwater from wells MW-1, MW-2, MW-3, MW-4, RW-5, RW-6, and RW-12. Since 1994, the primary groundwater flow direction has been towards the northwest with a change towards the southwest usually occurring during the fourth and/or second quarters. Groundwater monitoring data is presented in Table 1.



Hydrocarbon Distribution in Groundwater: Hydrocarbon concentrations have decreased in well MW-2 and increased in wells MW-1, MW-3, and MW-4 as compared with the previous sampling event. No SPH were detected in any of the wells. The increase of concentrations in wells MW-1, MW-3, and MW-4 is likely due to varying TPE system operations and reopening MW-4 after it had been closed for almost a month. Since the start of TPE remediation (June 2000), all monitoring wells exhibit a decreasing hydrocarbon concentration trend (See Appendix D for individual well concentration trend graphs). The maximum TPHg, TPHd, and benzene concentrations were detected in well MW-3 at 50,000, 130,000, and 3,900 micrograms per liter ( $\mu$ g/L), respectively. MTBE concentrations were below laboratory detection limits in all sampled wells. Analytical results are summarized in Table 1. See Appendix E for confirmation of groundwater data submittal to the State's "Geotracker Database".

### **Corrective Action Activities**

System Design and Modifications Prior to August 6, 2002, the TPE remediation system consisted of a trailer mounted all-electric catalytic oxidizer, a 300-cfm positive-displacement (PD) blower, a 150-gallon moisture knockout with automatic float controls, a 1 horsepower centrifugal transfer pump, and two 1,000-lb carbon vessels connected in series. On August 6, 2002, the existing extraction equipment was replaced with a new integrated all electric catalytic oxidizer and a 20-hp liquid-ring pump. The system modification will reduce the system noise generated by the previous PD blower that had resulted in several complaints from the nearby neighbors. A new hour meter was also installed as part of the new equipment. Fourteen wells are connected to the remediation system (RW-5 through RW-14, and MW-1 through MW-4) via a 4-inch diameter PVC trunk line. One-inch diameter stingers are inserted into each well to allow the simultaneous extraction of soil vapor and groundwater from the well.

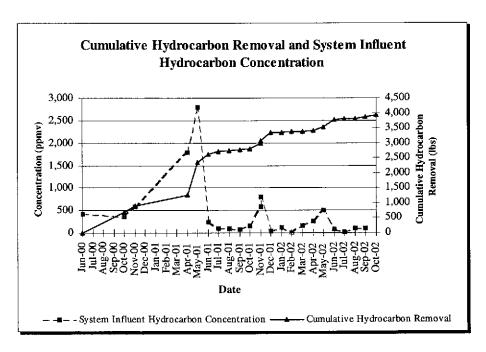
Remediation System Operations and Maintenance Activities: During the third quarter, Cambria performed TPE system operation and maintenance activities approximately 3 times per month. During operation and maintenance activities, individual well flow, vacuum, and hydrocarbon concentration

Oakland, California December 3, 2002

measurements were collected from all remediation system wells and from the catalytic oxidizer/blower (See Tables 2, 3, and 4). During site visits, system operation parameters were also recorded in specialized field forms for future system optimization and agency inspection. As per the Bay Area Air Quality Management (BAAOMD) permit, a catalytic oxidizer operating temperature greater than 600 degrees Fahrenheit was maintained and system operation parameters were continuously measured using a chart recorder. System influent and effluent vapor samples were collected and submitted for laboratory analysis on a monthly basis. Groundwater treatment system influent and effluent samples were collected on a monthly basis. Table 2 summarizes soil vapor extraction system operations and analytical results. Table 3 summarizes groundwater extraction system parameters and analytical results. Table 4 summarizes the individual extraction well parameters. The system analytical laboratory reports are included as Attachment C.



Remediation System Performance: From July 2 through October 2, the TPE system operated continuously without shutdowns, for a total of 2,367 hours. To maximize site cleanup select remediation wells were opened and closed, and well stinger depths were adjusted to account for seasonal changes in the groundwater table (see Table 4). System influent and effluent vapor samples were collected and submitted for laboratory analysis on July 2, August 6, and September 10, 2002. System influent vapor concentrations increased during the quarter and ranged from 26 to 103 parts per million by volume (ppmv). Hydrocarbon removal rates increased during the quarter and ranged from 0.7 to 5.0 lbs/day. System effluent vapor concentrations were below laboratory detection limits indicating that the catalytic oxidizer was achieving proper destruction efficiency and was operating within permit requirements. To date, a total of 3,921 pounds of hydrocarbons have been destroyed



Groundwater Monitoring and System Progress Report, Third Quarter 2002

Former Exxon Service Station
Oakland, California

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by vapor extraction (see inserted graph above and Table 2). Please note that all previous flow rate measurements were converted from actual cubic feet per minute (acfm) to standard cubic feet per minute (scfm) to account for air volume affects when the measurements were collected. Flow rate measurements in scfm will provide a more accurate calculation of hydrocarbon removal rates and total mass removed.

From July 2 to October 2, 2002, approximately 38,428 gallons of groundwater was extracted and treated onsite using granular activated carbon. The groundwater extraction rate ranged from 0.3 to 0.6 gallons per minute. The groundwater extraction rates were lower than the previous quarters to due seasonally lower groundwater table. Groundwater treatment system influent and effluent samples were collected on July 2, August 6, and September 10, 2002. System effluent groundwater concentrations for TPHg and BTEX were below laboratory detection limits indicating that no hydrocarbons were discharged to the sanitary sewer system and that the groundwater extraction portion of the TPE system was operating within permit requirements. Groundwater extraction and treatment have removed a total of 1.584 pounds of hydrocarbons to date.



### **ANTICIPATED FOURTH QUARTER 2002 ACTIVITIES**

### **Monitoring Activities**

Cambria will gauge the site wells, check the wells for SPH, and collect groundwater samples from all wells not containing SPH. Groundwater samples will be analyzed for TPHg and TPHd by Modified EPA Method 8015 and BTEX and MTBE by EPA Method 8021B. Cambria will prepare a groundwater monitoring report summarizing the monitoring activities and results. Cambria will submit groundwater monitoring and analytical data to the State's Geotracker database.

### **Corrective Action Activities:**

Cambria will continue to perform TPE operation and maintenance activities twice per month during the fourth quarter of 2002. The depth of extraction stingers will be adjusted in an effort to maximize hydrocarbon removal and TPE operations may vary between select wells to optimize site cleanup. System influent and effluent vapor and groundwater samples will be collected on a monthly basis, and system operation and performance will be evaluated and optimized. Records will be kept for a period of two years for possible future BAAQMD inspection.

### **ATTACHMENTS**

Figure 1 – Groundwater Elevation and Analytical Summary Map

Table 1 - Groundwater Elevations and Analytical Data

Table 2 - TPE System Performance and Analytical Results - Soil Vapor Extraction

Table 3 – TPE System Performance and Analytical Results - Groundwater Extraction

Table 4 - TPE Well Parameters



Appendix A – Groundwater Monitoring Field Data Sheets

Appendix B - Analytical Results for Quarterly Groundwater Sampling

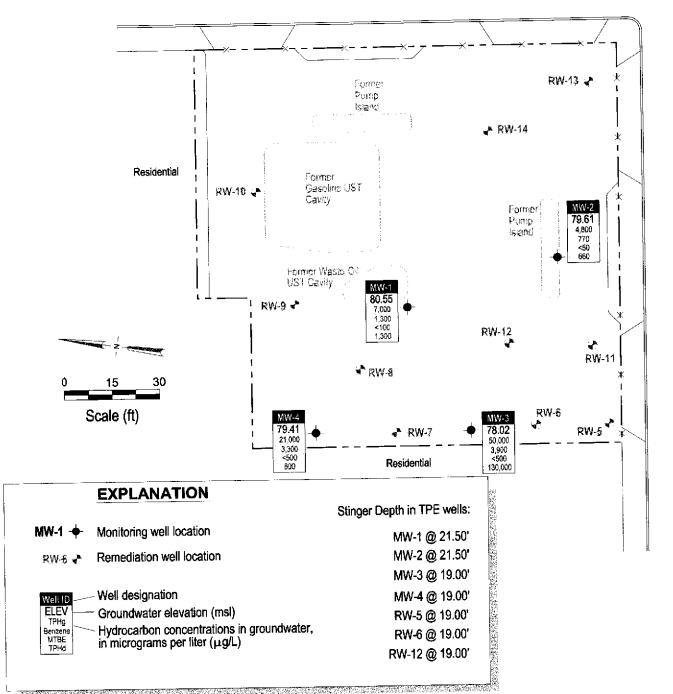
Appendix C – Analytical Results for TPE System Operation

Appendix D - TPHg and Benzene Concentration Trend Graphs

Appendix E – Electronic Delivery Confirmations

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### SCHOOL STREET



**Former Exxon Station** 

Note: Groundwater elevations are affected by TPE remediation system.

3055 35th Avenue Oakland, California

HINSB-2004/OAK-002/FIGURES/3QM02-MP.DWG



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Groundwater Elevation and Analytical Summary Map

September 26, 2002

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FIGURE

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Table 1. Groundwater Elevations and Analytical Data - Former Exxon Service Station, 3055 35th Avenue, Oakland, California

Well ID	Date	GW	SPH	GW	TPHg	TPHd	TPHmo	Benzene	Toluene	Ethylbenzene	Xylenes	MTBE	DO
(TOC)		Depth (ft)	(ft)	Elev. (ft)	<-		Concent	trations in par	ts per billion	(μg/L)		<b>,</b>	(mg/L)
MW-1	05/25/94	16.79	Sheen	84.06	120,000	25,000	<50,000	22,000	17,000	2,800	16,000		
100.85	07/19/94	20.77		80.08									
	08/18/94	21.04	Sheen	79.81	925,000	ada bar adi		16,500	6,200	1,000	9,400		
	11/11/94	15.80		85.05	57,000			14,000	4,400	1,400	6,400		
	02/27/95	15.53		85.32	45,000			2,900	2,500	760	4,100		
	05/23/95	15.29		85.56	22,000			9,900	990	7 <del>9</del> 0	2,000		
	08/22/95	20.90		79.95	23,000			6,900	340	1,200	1,900		
	11/29/95	22.19		78.66	37,000			9,900	530	1,600	2,900		
	02/21/96	11.69	-	89.16	33,000	4,300		10,000	480	1,000	1,800	3,300	
	05/21/96	14.62	-	86.23	36,000	8,500		8,500	1,400	1,300	2,800	1,900	
	08/22/96	22.30	_	78.55	41,000	6,200		8,600	1,300	1,500	2,900	<200	8.0
	11/27/96	17.24	Sheen	83.61	38,000	6,100		9,600	950	1,600	3,100	<400	5.6
	03/20/97	16.65		84.20	33,000	10,000		6,100	560	970	2,200	<400	8.5
	06/25/97	19.77		81.08	31,000	7,400 <sup>a</sup>		7,400	440	890	1,800	<400	3.7
	09/17/97	20.12		80.73	32,000 <sup>d</sup>	3,500°		9,100	550	1,000	2,000	<1,000	2.1
	12/22/97	12.95		87.90	$26,000^{d}$	5,800°		7,900	370	920	1,500	<790	0.7
	03/18/98	12.34	Sheen	88.51	30,000 <sup>d</sup>	4,200 <sup>e,f</sup>		7,800	820	840	2,000	<1,100	1.3
	07/14/98	17.34		83.51	41,000 <sup>d</sup>	8,900 <sup>e,f</sup>		8,200	1,100	1,200	3,000	<200	1.8
	09/30/98	19.90		80.95	37,000	3,300		11,000	950	1,200	2,800	<20	2.0
	12/08/98	15.62		85.23	22,000	3,700		3,000	1,200	730	3,100	<900	
	03/29/99	11.98		88.87	36,000 <sup>d</sup>	6,800°		12,000	750	1,300	2,400	950	0.50
	06/29/99	20.77		80.08	28,000 <sup>d</sup>	3,500°		7,300	420	810	1,700	<1,300	0.10
	09/28/99	19.68		81.17	13,000 <sup>d</sup>	3,600 e,f		3,200	130	320	1,100	<210	0.55
	12/10/99	17.02		83.83	25,000 <sup>d</sup>	2,900 •1		5,400	130	620	1,400	<1,000	1.03
	03/23/00	12.76		88.09	21,000 <sup>d</sup>	3,300 <sup>f</sup>		4,700	140	470	1,100	<350	
	09/07/00	19.45		81.40	40,000 <sup>d.g</sup>	12,000°-8		3,700	1,400	910	4,900	<50	0.17
	12/05/00	18.60		82.25	26,000°	3,400°		7,900	150	580	810	<300	0.35
	03/07/01	16.19		84.66	13,000	2,400		2,700	43	69	300	<100	0.49
	06/ <b>06</b> /01	18.47		82.38	19,000	4,000		4,500	130	270	430	<400	0.39
	08/30/01	21.70		79.15	8,800°	1,400 <sup>d</sup>		2,100	45	91	240	<130	0.27

Table 1. Groundwater Elevations and Analytical Data - Former Exxon Service Station, 3055 35th Avenue, Oakland, California

Well ID	Date	GW	SPH	GW	TPHg	TPHd	TPHmo	Benzene	Toluene	Ethylbenzene	Xylenes	MTBE	DO
(TOC)		Depth (ft)	(ft)	Elev. (ft)	<		Concent	rations in par	ts per billion	(µg/L)	>	<b>&gt;</b>	(mg/L)
					4	-6				44	500	70	0.50
	12/07/01	26.55		74.30	8,700 <sup>d</sup>	1,900 <sup>c,f</sup>		1,300	160	38	730	<20	0.59
	03/11/02	17.13	-	83.72	9,400 <sup>d</sup>	1,400°		2,100	200	74	470	<20	0.39
	06/10/02	24.10	-	76.75	$4,200^{d}$	900°,k		830	170	110	460	<100	
	09/26/02	20.30		80.55	7,000 <sup>4</sup>	1,300°, <sup>çk</sup>		<b>1,300</b> →	190 +-	200 -	760 	<100	0.70
	05.05.01	15.65		04.25	÷		<5,000	9,900	7,400	960	4,600		
MW-2	05/25/94	15.65		84.35	61,000	6,900	·	·					
100.00	07/19/94	19.81		80.19	40.000			10.750		1,850	9,600		
	08/18/94	20.37		79.63	88,000			10,750	10,500				
	11/11/94	15.52		84.48	54,000		*^-	5,900	6,700	1,300	7,500		
	02/27/95	14.46	Sheen	85.54	44,000			5,100	5,300	930	6,400		
	05/23/95	14.17		85.83	33,000			8,200	5,600	900	6,600		
	08/22/95	19.80		80.20	38,000			6,400	5,000	1,100	5,600		
	11/29/95	21.05		78.95	46,000			7,100	5,300	1,300	6,000		
	02/21/96	10.53		89.47	59,000			8,000	6,000	1,800	8,900	4,500	
	05/21/96	13.47		86.53	51,000	3,400		8,200	5,200	1,300	6,600	2,400	
	08/22/96	19.12		80.88	37,000	5,700		5,100	3,500	960	4,500	<200	3.0
	11/27/96	16.61	Sheen	83.39	54,000	10,000		9,800	7,000	1,800	7,900	<2,000	3.1
	03/20/97	15.39		84.61	27,000	6,100		3,700	2,300	580	2,800	<400	8.1
	06/25/97	18.62		81.38	42,000	7,800 <sup>b</sup>		7,400	3,800	1,200	5,700	<200	0.9
	09/17/97	19.05	Sheen	80.95	41,000 <sup>d</sup>	8,900°		5,200	3,400	1,300	5,900	<700	1.2
	12/22/97	14.09		85.91	47,000 <sup>d</sup>	6,100°		8,500	4,600	1,800	8,400	<1,200	1.2
	03/18/98	10.83	Sheen	89.17	58,000 <sup>d</sup>	7,000 <sup>e,f</sup>		9,300	6,100	1,800	8,200	<1,100	1.1
	07/14/98	16.07		83.93	$42,000^{d}$	5,300 <sup>e,f</sup>		6,000	3,000	1,000	4,800	<200	1.5
	09/30/98	18.71		81.29	22,000	2,400	***	3,600	1,300	720	3,200	<30	1.8
	12/08/98	14.80	***	85.20	32,000	3,100		9,200	680	1,100	2,300	<2,000	
	03/29/99	11.81		88.19	28,000 <sup>d</sup>	7,500 <sup>c,f</sup>		4,400	1,600	950	4,100	410	1.86
	06/29/99	19.54		80.46	28,000 <sup>d</sup>	3,300°	***	3,500	1,100	690	3,100	<1,000	0.41
	09/28/99	18.61	***	81.39	15,000 <sup>d</sup>	3,400°.f		1,200	540	230	2,300	<36	1.18
	12/10/99	16.53		83.47	17,000 <sup>d</sup>	2,500°.f		1,300	780	420	2,700	<40	0.17
	03/23/00	13.56		86.44	25,000 <sup>d</sup>	3,100 <sup>i</sup>	••-	1,900	1,100	660	3,700	<500	
	09/07/00	18.25		81.75	62,000 <sup>d,g</sup>	32,000°-8		5,300	2,300	1,500	8,400	<100	0.39

Table 1. Groundwater Elevations and Analytical Data - Former Exxon Service Station, 3055 35th Avenue, Oakland, California

Well ID	Date	GW	SPH	GW	TPHg	TPHd	TPHmo	Benzene	Toluene	Ethylbenzene	Xylenes	MTBE	DO
(TOC)		Depth (ft)	(ft)	Elev. (ft)	<-		Concent	rations in par	ts per billion	(μg/L)	>		(mg/L
	12/05/00	17.45		82.55	60,000 <sup>d,g</sup>	87,000°.ℓ,g		5,100	2,200	1,600	9,000	<200	0.31
	03/07/01	15.68		84.32	34,000	3,900		1,200	770	620	4,300	<200	0.44
	06/06/01	17.51		82.49	110,000	48,000		14,000	9,000	1,900	12,000	<950	0.24
	08/30/01	21.00		79.00	43,000 <sup>a,h</sup>	15,000 <sup>d,h</sup>		3,100	720	980	5,500	<200	***
	12/07/01	24.45		75.55	4,100 <sup>d</sup>	750 <sup>€,Γ</sup>		510	88	8.2	580	<20	0.47
	03/11/02	16.95		83.05	4,700 <sup>d</sup>	590°		1,200	150	30	310	<50	0.24
	06/10/02	18.59		81.41	14,000 <sup>d</sup>	2,000°		2,600	710	150	2,000	<800	
	09/26/02	20.39		79.61	4,800 <sup>d</sup>	660°		770	200	140	740	<50	0.29
						_		****	-			_	
MW-3	05/25/94	13.93	Sheen	82.94	56,000	14,000	<50,000	14,000	14,000	1,300	11,000		
96.87	07/19/94	17.04		79.83									
	08/18/94	17.75		79.12	116,000			28,300	26,000	2,400	15,000		
	11/11/94	17.80		79.07	89,000			1,600	1,900	1,900	14,000		
	02/27/95	11.86	Sheen	85.01	250,000			22,000	26,000	7,800	21,000		
	05/23/95	11.60	Sheen	85.27	310,000			18,000	17,000	4,500	2,800		
	08/22/95	17.10		79.77	74,000			14,000	13,000	1,900	11,000		
	11/29/95	16.34		80.53	220,000			25,000	25,000	3,500	19,000		
	02/21/96	7.92		88.95	60,000			10,000	7,800	1,500	8,800	3,400	
	05/21/96	10.86	Sheen	86.01	69,000	13,000		17,000	9,400	1,700	9,400	2,600	
	08/22/96	16.50		80.37	94,000	16,000		17,000	15,000	2,100	12,000	330	2.0
	11/27/96	13.47	Sheen	83.40	82,000	24,000		14,000	13,000	2,400	13,000	<1,000	2.4
	03/20/97	12.86		84.01	56,000	11,000		9,900	6,900	1,300	8,000	3,500	9.0
	06/25/97	15.98		80.89	49,000	7,700 <sup>b</sup>		9,700	7,100	1,300	7,000	220	5.8
	09/17/97	16.34	Sheen	80.53	78,000 <sup>d</sup>	15,000°		11,000	9,900	1,800	10,000	<1,200	0.7
	12/22/97	10.71	Sheen	86.16	49,000 <sup>d</sup>	14,000 <sup>e</sup>		7,300	5,300	1,400	7,500	<1,100	3.1
	03/18/98	8.41	Sheen	88.46	120,000 <sup>d</sup>	20,000°,f		21,000	19,000	2,600	15,000	<1,600	1.6
	07/14/98	13.51		83.36	94,000 <sup>d,g</sup>	65,000 <sup>c,f,g</sup>		18,000	14,000	1,900	11,000	<1,400	1.8
	09/30/98	16.14		80.73	91,000	9,800		17,000	13,000	2,100	12,000	<1300	2.0
	12/08/98	11.20		85.67	51,000	4,200		8,000	6,800	1,400	7,500	<1,100	
	03/29/99	7.95		88.92	39,000 <sup>d</sup>	4,600°	_	8,900	4,400	940	4,500	810	0.50
	06/29/99	16.98	•••	79.89	71.000 <sup>d</sup>	6,900°		12,000	7,300	1,400	8,400	<1,700	0.19

Table 1. Groundwater Elevations and Analytical Data - Former Exxon Service Station, 3055 35th Avenue, Oakland, California

Well ID	Date	GW	SPH	GW	TPHg	TPHd	TPHmo	Benzene	Toluene	Ethylbenzene	Xylenes	MTBE	DO
(TOC)		Depth (ft)	(ft)	Elev. (ft)	<		Concent	rations in par	ts per billion	(μg/L)	······	>	(mg/L)
	09/28/99	15.99		80.88	60,000 <sup>d</sup>	7,800°		9,400	9,200	1,000	9,900	200	0.53
	12/10/99	13.31		83.56	53,000 <sup>d</sup>	5,300°.f		8,000	6,400	1,100	8,100	<200	0.48
	03/23/00	8.98		87.89	77,000 <sup>d,g</sup>	11.000 <sup>g j</sup>		10,000	9,400	1,600	11,000	<430	
	09/07/00	15.61		81.26	100.000 <sup>d.g</sup>	19,000°f.g		17,000	12,000	1,600	11,000	<500	
	12/05/00	14.80		82.07	110,000 <sup>d.g</sup>	17,000 <sup>e.g</sup>		17,000	11,000	1,900	12,000	<750	0.37
	03/07/01	14.27		82.60	60,000	13,000		7,000	4,600	900	7,100	<350	0.49
	06/06/01	14.88		81.99	43,000	12,000		3,000	1,000	770	5,200	<400	1.71
	08/30/01	12.43		84.44	95.000 <sup>a,h</sup>	190,000 <sup>d,h</sup>		6,900	10,000	2,700	15,000	<250	0.24
	12/07/01	24.65		72.22	25,000 <sup>d</sup>	3.900°.f		2,500	1,700	64	2,200	<200	0.19
	03/11/02	14.69		82.18	30,000 <sup>d</sup>	2,800 <sup>f.e.k</sup>		5,000	2,400	190	1,800	<1,300	0.30
	06/10/02	22.94	and a second	73.93	9,000 <sup>d</sup>	990°k		1,800	1,300	96	1,000	<300	
	09/26/02	18.85		78.02	50,000 <sup>d,g</sup>	130,000° a		3,900	5.400	820	6,600	<500	0.19
	47,23,02	20102			1	,		· 13	j	4	2.		
MW-4	03/20/97	13.75		83.59	47,000	3,100		11,000	4,500	1,100	5,200	3,400	8.4
97.34	06/25/97	16.15		81.19	61,000	5,800 <sup>b</sup>		16,000	6,100	1,500	5,900	780°	1.4
	09/17/97	17.10		80.24	60.000 <sup>d</sup>	4,400°		17,000	4,900	1,500	5,700	<1,500	1.5
	12/22/97	9.21		88.13	43,000 <sup>d</sup>	3,100°		13,000	3,900	1,100	4,200	<960	3.7
	03/18/98	9.54		87.80	58,000 <sup>d</sup>	5,500°.f		14,000	4,700	1,400	5,700	<1,200	0.8
	07/14/98	14.15		83.19	73,000 <sup>d</sup>	2,900 <sup>e,f</sup>		22,000	7,000	1,800	7,300	<200	1.0
•	09/30/98	16.84		80.50	39,000	2,100		12,000	2,700	1,000	3,400	510	1.1
	12/08/98	13.45		83.89	27,000	1,600		8,900	1,600	730	2,300	<1,500	
	03/29/99	9.10		88.24	48,000 <sup>d</sup>	2,400 <sup>e.f,h</sup>		15,000	3,000	1,300	5,000	1,300	1.32
	06/29/99*												
	09/28/99	16.58		80.76	24,000 <sup>d</sup>	3,200 <sup>e,f</sup>		7,500	1,200	190	2,200	210	14.29
	12/10/99	13.99		83.35	47,000 <sup>d</sup>	3,100 <sup>c, (</sup>		12,000	1,800	1,000	4,400	<100	0.62
	03/23/00	10.22		87.12	40,000 <sup>d</sup>	3,100 <sup>c,f</sup>		11,000	1,600	910	3,100	690	
	09/07/00	16.40		80.94	43,000 <sup>d</sup>	5,900°		10,000	1,100	1,100	3,400	<450	1.04
	12/05/00	15.55		81.79	69,000 <sup>d,g</sup>	2,600 <sup>e,g</sup>		16,000	1,300	1,300	3,400	<200	0.35
	03/20/01	14.03		83.31	46,000			13,000	1,000	900	2,800	<350	0.39
	06/06/01	15.49		81.85	75,000	5,400		22,000	1,800	1,900	6,400	<1.200	2.22
	08/30/01	18.00		79.34	43,000°	3,200 <sup>d</sup>		6,400	630	510	2,600	<200	0.32
	12/07/01	23.45		73.89	32,000 <sup>d,g</sup>	11,000 <sup>c,f,g</sup>		4,500	740	310	2,300	<200	0.21
	03/11/02	14.95		82.39	15,000 <sup>d</sup>	1,600°,fk		3,700	500	92	790	<500	0.30
	06/10/02	22.30		75.04	9,400 <sup>d</sup>	3,400°	+-	1,400	50	<5.0	690	<200	
	09/26/02	17.93		79.41	21,000 <sup>d</sup>	800°		3,300	1,300	450	2,900	<500	0.24
								1_					

Table 1. Groundwater Elevations and Analytical Data - Former Exxon Service Station, 3055 35th Avenue, Oakland, California

Well ID	Date	GW	SPH	GW	TPHg	TPHd	ТРНто	Benzene	Toluene	Ethylbenzene	Xylenes	MTBE	DO
(TOC)		Depth (ft)	(ft)	Elev. (ft)	<		Concent	trations in par	ts per billion	(μg/L)	>		(mg/L)
m: n: r	07/14/00				-E0	<50		<0.5	<0.5	<0.5	<0.5	<5.0	
Trip Blank	07/14/98				<50								
	09/30/98		***		<50	<50		< 0.5	< 0.5	<0.5	<0.5	<5.0	
	12/08/98				<50			< 0.5	< 0.5	<0.5	<0.5	<5.0	
	03/29/99				<50			< 0.5	< 0.5	<0.5	<0.5	<5.0	
	06/29/99			h+	<50			< 0.5	<0.5	< 0.5	<0.5	<5.0	
	03/23/00				<50			< 0.5	<0.5	<0.5	< 0.5	<5.0	
	09/07/00				<50			<0.5	1.1	<0.5	1.1	<5.0	

#### Abbreviations:

TOC = Top of casing elevation relative to an aribitrary datum

GW = Groundwater

SPH = Separate-phase hydrocarbons

--- = not observed/not analyzed

TPHg = Total petroleum hydrocarbons as gasoline by modified EPA Method 8015

TPHd = Total petroleum hydrocarbons as diesel by modified EPA Method 8015

TPHmo = Total petroleum hydrocarbons as motor oil by modified EPA Method 8015

Benzene, Ethylbenzene, Toluene, and Xylenes by EPA Method 8020

MTBE = Methyl Tertiary Butyl Ether by EPA Method 8020

DO = Dissolved oxygen

µg/L = Micrograms per liter, equivalent to parts per billion in water

mg/L = Milligrams per liter, equivalent to parts per million in water

#### Notes:

a = Result has an atypical pattern for diesel analysis

b = Result appears to be a lighter hydrocarbon than diesel

c = There is a >40% difference between primary and confirmation analysis

d = Unmodified or weakly modified gasoline is significant

e = Gasoline range compounds are significant

f = Diesel range compounds are significant; no recognizable pattern

g = lighter than water immiscible sheen is present

h = one to a few isolated peaks present

i = medium boiling point pattern does not match diesel (stoddard solvent)

j = aged diesel is significant

k = oil range compounds are significant

TOC Elevation of Well MW-4 surveyed relative to an arbitrary site datum by David Hop,

Licensed Surveyor on April 19, 1997

# = abnormally high reading due to added hydrogen peroxide

<sup>\* =</sup> Well inaccessible during site visit

Table 2. TPE System Performance and Analytical Results - Soil Vapor Extraction - Golden Empire Properties (Worthington), 3055 35th Street, Oakland, California TPHg Gasoline System Effluent HC Emission System Influent System System Hour Meter System System Rate 2 Removal Rate 2 Destruction Cumulative HC Conc. 1 HC Conc. 1 Readings Uptime Inlet Vacuum Flow Rate Date Removal<sup>3</sup> (lbs/day) (lbs/day) Efficiency ("Hg) (scim) (ppmv) (ppmv) (hrs) (per interval) Temp. (lbs) TPHg (%) (degree F) TPHg TPHg Benz TPHg Benz (%) 0 6/24/2000 0 420 22 0.24 23.6 1.24 0.012 95 446 175 9/28/2000 454 20% 789 10.1 < 0.28 < 0.004 684 88 360 <10 <0.15 10/12/2000 696 72% 950 --< 0.18 <0.002 918 <0.15 10.5 83% 820 \_\_ 55 590 <10 11/9/2000 1251 945 ---1/23/2001 1313 3% -----945 --3/28/2001 0 0.010 98 1261 39.2 0.74 194 101% 908 6.0 68 1.800 34 0.52 4/5/2001 + < 0.001 2355 < 0.15 25.8 < 0.09 863 100% 1000 14 29 2.800 <10 5/3/2001 \* 2625 < 0.003 820 6.5 79 240 <10 <0.15 6.1 < 0.25 6/4/2001 1114 33% 72 2705 10.0 73 92 26 0.34 2.1 < 0.61 < 0.007 47% 804 7/2/2001 1429 2722 92 <10 < 0.15 3.2 < 0.35 < 0.005 900 8.0 110 1621 100% 7/10/2001 2.3 < 0.21 < 0.003 2740 110 <10 < 0.15 940 5.0 65 8/2/2001 1759 25% 0.52 2.2 < 0.92 < 0.013 58 2793 34 2301 63% 854 12.0 84 81 9/7/2001 <0.52 < 0.015 2808 0.31 8.3 161 160 <10 10/3/2001 2470 27% 854 9.0 <0.009 95 2995 0.43 13.1 <0.69 8.5 69 590 31 11/6/2001 3015 67% 955

Table 2. TPE System Performance and Analytical Results - Soil Vapor Extraction - Golden Empire Properties (Worthington), 3055 35th Street, Oakland, California System Influent System Effluent HC Emission **TPHg** Gasoline Hour Meter System System System System HC Conc. 1 HC Conc. 1 Removal Rate 2 Rate 2 Destruction Cumulative Readings Uptime Inlet Vacuum Flow Rate Date Removal 3 (per interval) ("Hg) (ppmv) (lbs/day) (lbs/day) Efficiency Temp. (scfm) (ppmv) (hrs) TPHg TPHg TPHg Benz (lbs) TPHg Benz (%) (%) (degree F) < 0.15 11.9 < 0.15 < 0.002 \* 3087 46 810 <10 11/14/2001 3184 88% 860 10.0 < 0.15 0.5 <0.11 < 0.001 3349 <10 12/6/2001 3710 96% 806 11.0 33 50 \* 120 <10 < 0.15 1.0 < 0.09 < 0.001 3366 4472 99% 841 10.5 27 1/7/2002 < 0.16 < 0.002 \* 3386 51 <5 <10 < 0.15 0.1 2/4/2002 4938 69% 817 10.5 170 <10 < 0.15 0.9 < 0.05 < 0.001 3388 665 10.5 17 3/5/2002 5396 66% \* < 0.13 < 0.002 3413 670 39 260 <10 < 0.15 3.3 6068 100% 12.5 4/2/2002 < 0.002 \* 3524 < 0.15 8.1 < 0.16 100% 667 10.0 50 500 <10 5/6/2002 6886 < 0.16 < 0.002 3767 < 0.15 1.2 6/5/2002 7608 100% 751 8.5 51 73 <10 3799 26 <15 < 0.15 0.5 < 0.27 < 0.002 7/2/2002 8253 100% 736 9.0 56 97 < 0.003 3815 8/6/2002 7 100% 739 13.0 79 <10 < 0.15 2.5 < 0.25 \* 3869 9/10/2002 528 62% 723 11.5 92 103 <10 < 0.15 3.0 < 0.30 <0.004 3921 10/2/2002 938 78% 828 8.5 89 --

I I dole at 11 is placing a series and state to an a series and a contract to be a series of a series	I	Table 2. TPE System Performance and Analytical Results -	Soil Vapor Extraction	- Golden Empire Properties (Worthington), 3055 35th Street, Oakland, California
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Date	Hour Meter Readings	System Uptime	System Inlet	System Vacuum	System Flow Rate	System Influent HC Conc. 1	System Effluent HC Conc. 1	HC Removal Rate <sup>2</sup>	Еп	nission Rate <sup>2</sup>	TPHg Destruction	Gasoline Cumulative
	(hrs)			(scfm)	(ppmv)	(ppmv)	(lbs/day)		s/day)	Efficiency	Removal <sup>3</sup> (lbs)	
		(%)	(degree F)	ĺ		TPHg	TPHg Benz	TPHg	TPHg	Benz	(%)	

#### Notes and Abbreviations:

TPHg = Total petroleum hydrocarbons as gasoline

Benz = Benzene

HC Conc. = Hydrocarbon Concentrations

ppmv = Parts per million by volume. Analytical lab results converted from micrograms per liter (µg/l) to ppmv assumes the molecular weight of gasoline to be equal to that of hexane at 1 atmosphere of pressure and 20 degrees Celsius.

8/6/02 TPE system upgrade. Previous system hour meter = 9089

<sup>&</sup>lt;sup>1</sup> TPHg and benzene concentrations based on lab results by Modified EPA Methods 8015 and 8020.

<sup>&</sup>lt;sup>2</sup> The hydrocarbon removal/emission rate is based on the Bay Area Air Quality Management's District's (BAAQMD) Procedures for Soil Vapor Extraction where Rate = concentration (ppmv) x flow rate (scfm) x 1 lb-mole/386x10<sup>6</sup>ft<sup>3</sup> x molecular weight (86 lb/lb-mole for TPHg, 78 lb/lb-mole for benzene) x 1440 min/day.

<sup>&</sup>lt;sup>3</sup> Gasoline Cumulative Removal = The previous removal rates multiplied by the interval days of operation plus the previous total removal amount. The total TPHg removal is based on lab analytical results.

As per BAAQMD permit conditions, system destruction efficiency need not be calculated for effluent TPHg concentrations less than 10 ppmv

<sup>&</sup>quot;The TPE system was modified on August 6, 2002, and the PD blower was replaced with a liquid-ring blower. The hour meter was also replaced.

In addition, all previous flow rate measurements were converted from acfm to sofm adjusting the Hydrocarbon Removal Rates and Gasoline Cumulative Removal.

Table 3. TPE System Performance and Analytical Results - Groundwater Extraction - Golden Empire Properties (Worthington), 3055 35th Street, Oakland, CA

Date	Hour Meter	Water Meter	Total Groundwater	System Flow Rate			_				HCs Removed	Total HCs
	Readings (hrs)	Readings (gallons)	Extracted (gallons)	Per Period (gpm)	Sample ID	TPHg (µg/L)	Benzene (µg/L)	Toluene (µg/L)	Ethylbenzene (µg/L)	Total Xylenes (μg/L)	Per Period (lbs)	Removed (lbs)
10/20/00	878	0	0	NC	Inf Eff		<0.5 <0.5	<0.5 <0.5	<0.5 <0.5	<0.5 <0.5		
10/30/00	1004		50	NC	Inf Eff		170 <0.5	140 <0.5	16 <0.5	200 <0.5		
11/9/00	1,251		50	NC	Inf Eff	760 <50	120 <0.5	86 <0.5	4.2 <0.5	84 <0.5	NC	NC
12/15/00	1,267	760a	50	NC								
1/23/01	1,313	3,790	3,080	1.1	In Mid Eff	3,000 <50 <50	440 <0.5 <0.5	360 <0.5 <0.5	57 <0.5 <0.5	350 <0.5 <0.5	0.019	0.019
3/28/01	0	3,970	3,210	NC	Replacement C	atox System S	Startup		<del></del>		0.005	0.024
4/13/01	378	17,366	16,606	0.6	IN EF-1	360 <50	45 <0.5	39 <0.5	5.1 <0.5	43 <0.5	0.335	0.359
6/4/01	1,114	36,058	35,298	0.4	IN Mid EF	54 <50 <50	<0.5 <0.5 <0.5	0.69 <0.5 <0.5	<0.5 <0.5 <0.5	3.1 <0.5 <0.5	0.056	0.415

Table 3. TPE System Performance and Analytical Results - Groundwater Extraction - Golden Empire Properties (Worthington), 3055 35th Street, Oakland, CA

Date	Hour Meter Readings (hrs)	Water Meter Readings (gallons)	Total Groundwater Extracted (gallons)	System Flow Rate Per Period (gpm)	Sample ID	TPHg (µg/L)	Benzene (µg/L)	Toluene (μg/L)	Ethylbenzene (µg/L)	Total Xylenes (µg/L)	HCs Removed Per Period (lbs)	Total HCs Removed (lbs)
7/2/01	1,429	39,433	38,673	0.2	IN Mid EF	<50 <50 <50	2.5 <0.5 <0.5	1 <0.5 <0.5	<0.5 <0.5 <0.5	5 <0.5 <0.5	0.002	0.417
9/7/01	2,301	48,566	47,806	0.2	INF EFF-1 EFF-2	4,600 <50 	24 <0.5 	57 <0.5	15 <0.5 	140 <0.5 	0.004	0.421
11/16/01	3,184	61,892	61,132	0.3	INF EFF-1 EFF-2	1100 <50 	57 <0.5 	42 <0.5 	6.5 <0.5 	110 <0.5 	0.512	0.932
12/6/01	3,710	80,094	79,334	0.6	INF EFF-1 EFF-2	410 <50	31 <0.5	14 <0.5 	3.2 <0.5 	48 <0.5 	0.167	1.099
1/7/02	4,472	132,337	131,577	1.1	INF EFF-1 EFF-2	120 <50 	17 <0.5 	7.7 <0.5 	1.5 <0.5 	13 <0.5 	0.179	1.278
2/4/02	4,938	164,774	164,014	1.2	INF EFF-1 EFF-2	140 <50 	18 <0.5 	5.1 <0.5 	0.86 <0.5	12 <0.5 	0.032	1.310

Table 3. TPE System Performance and Analytical Results - Groundwater Extraction - Golden Empire Properties (Worthington), 3055 35th Street, Oakland, CA

Date	Hour Meter Readings (hrs)	Water Meter Readings (gallons)	Total Groundwater Extracted (gallons)	System Flow Rate Per Period (gpm)	Sample ID	TPHg (µg/L)	Benzene (µg/L)	Toluene (µg/L)	Ethylbenzene (µg/L)	Total Xylenes (μg/L)	HCs Removed Per Period (lbs)	Total HCs Removed (lbs)
3/5/02	5,396	208,997	208,237	1.6	INF EFF-1 EFF-2	170 <50 	22 <0.5	12 <0.5 	1.8 <0.5 	24 <0.5 	0.052	1.362
4/2/02	6,068	263,563	262,803	1.4	INF EFF-1 EFF-2	160 <50	15 <0.5 	17 <0.5 	3.3 <0.5 	20 <0.5 	0.077	1.439
5/6/02	6,886	306,765	306,005	0.9	INF EFF-1 EFF-2	100 <50	3.5 <0.5 	1.7 <0.5 	1.0 <0.5	4.0 <0.5 	0.058	1.497
6/5/02	7,608	340,020	339,260	0.8	INF EFF-1 EFF-2	<50 <50 	2.8 <0.5 	1.4 <0.5	<0.5 <0.5	2.5 <0.5 	0.028	1.525
7/2/02	8,253	361,717	360,957	0.6	INF EFF-1 EFF-2	<50 <50	1.5 <0.5 	<0.5 <0.5 	<0.5 <0.5 	0.94 <0.5 	0.009	1.534
8/6/2002*	7	383,750	382,990	0.4	INF EFF-1 EFF-2	<50 <50 	1.8 <0.5	0.92 <0.5 	<0.5 <0.5 	2.0 <0.5 	0.009	1.543
9/10/02	528	392,405	391,645	0.3	INF EFF-1 EFF-2	570 <50 	15 <0.5 	17 <0.5 	2.9 <0.5 	30 <0.5 	0.004	1.547

Table 3. TPE System Performance and Analytical Results - Groundwater Extraction - Golden Empire Properties (Worthington), 3055 35th Street, Oakland, CA

Date	Hour Meter Readings (hrs)	Water Meter Readings (gallons)	Total Groundwater Extracted (gallons)	System Flow Rate Per Period (gpm)	Sample ID	TPHg (µg/L)	Benzene (μg/L)	Toluene (µg/L)	Ethylbenzene (µg/L)	Total Xylenes (μg/L)	HCs Removed Per Period (lbs)	Total HCs Removed (lbs)
10/2/02							44.90				0.037	1.584
		1/200		Sewer	Effluent Disch	narge Limits: (μg/L)	5.0	5.0	5.0	5.0		

#### Notes:

TPHg = Total Petroleum Hydrocarbons as Gasoline

BTEX = Benzene, Toluene, Ethylbenzene, Total Xylenes

MTBE = Methyl tertiary butyl ether

 $\mu g/L = micrograms per liter$ 

a = Malfunctioning totalizer replaced 12/15/00 (initial reading at 760 gallons)

\* = TPE system upgrade. Previous system hour meter = 9089

ND = non detect

<n = below noted practical laboratory quantitation limits

Inf = Influent Sample

Eff = Effluent Sample

NC = Not calculated, insufficient data

Table 4. TPE Well Parameters - Former Exxon Service Station, 3055 35th Avenue, Oakland, California

Well ID	Date	Well Status (open/closed)	System/Stinger Vacuum (inches of H <sub>2</sub> O)	Well Annulus Vacuum (inches of H <sub>2</sub> O)	Flow Rate (cfm)	Hydrocarbon Vapor Concentration (ppmv)	Stinger Depth (ft below TOC)
MW-1	11/6/01	open	80		*		28
	11/12/01	open	125	-	*		28
	11/14/01	open	85	-	*	<u>.</u>	28
	11/21/01	open	95		*		28
	12/6/01	open	115		*		28
	12/19/01	open	110	-	*		25
	1/17/02	open	130		*		25
	2/4/02	open	105		*		28
	2/14/02	closed		-	*		-
	3/5/02	closed	+=	-	*	<b></b>	
	3/11/02	closed			*		-
	3/25/02	open	130		*		21
	4/2/02	open	130		*		21
	4/5/02	open	135	50	*		21
	4/19/02	open	130	49	*		22
	5/6/02	open	100	42	*		22
	5/21/02	open	105	49	*	-	23.5
	6/19/02	open	90	42	*		24
	6/28/02	open	95	47	*		25
	7/10/02	open	97	41	*		25
	7/26/02	closed			*	~-	<b></b>
	8/6/02	open		_	*		21.5
	8/26/02	open	95	47	*		21.5
	9/16/02	open	105		*		21.5
	9/20/02	open	85	40	*		21.5
	10/2/02	open	75	22	*		21.5

Table 4. TPE Well Parameters - Former Exxon Service Station, 3055 35th Avenue, Oakland, California

Well ID	Date	Well Status (open/closed)	System/Stinger Vacuum (inches of H <sub>2</sub> O)	Well Annulus Vacuum (inches of H <sub>2</sub> O)	Flow Rate (cfm)	Hydrocarbon Vapor Concentration (ppmv)	Stinger Depth (ft below TOC)
		• •	,				
MW-2	11/6/01	open	80		*	**	27
	11/12/01	open	125		*	-	27
	11/14/01	open	85	<del></del>	*	-	27
	11/21/01	open	95		*	<del></del>	27
	12/6/01	open	115	-	*		28
	12/19/01	closed			*		
	1/17/02	closed		<del></del>	*		
	2/4/02	open	105		*		28
	2/14/02	closed		_	*		~~
	3/5/02	closed			*	**	
	3/11/02	closed			*		
	3/25/02	open	130	w=	*		21
	4/2/02	open	130		*		21
	4/5/02	open	135	70	*		21
	4/19/02	open	130	55	*		22
	5/6/02	closed	_	<del></del>	*		
	5/21/02	closed	••		*		
	6/19/02	closed			*		**
	6/28/02	open	95	52	*		22
	7/10/02	open	97	51	*	-	22
	7/26/02	open	92	19	*		25.5
	8/6/02	open			*		21.5
	8/26/02	open	95	35	*		21.5
	9/16/02	open	105		*	<del></del>	21.5
	9/20/02	open	85	30	*		21.5
	10/2/02	open	75	72	*		21.5

Table 4. TPE Well Parameters - Former Exxon Service Station, 3055 35th Avenue, Oakland, California

Well ID	Date	Well Status (open/closed)	System/Stinger Vacuum (inches of H <sub>2</sub> O)	Well Annulus Vacuum (inches of H <sub>2</sub> O)	Flow Rate (cfm)	Hydrocarbon Vapor Concentration (ppmv)	Stinger Depth (ft below TOC)
-							25
MW-3	11/6/01	open	80		*		25
	11/12/01	open	125		*		25
	11/14/01	open	85		*	<b>**</b>	25
	11/21/01	open	95		*		25
	12/6/01	open	115	••	*		25
	12/19/01	open	110		*		25
	1/17/02	open	130		*	**	25
	2/4/02	open	105		*	-	25
	2/14/02	closed		••	*		
	3/5/02	closed			*	-	••
	3/11/02	closed			*	<b>+</b> -	
	3/25/02	closed		, -	*		
	4/2/02	closed	~*		*		
	4/5/02	closed	**	-	*		
	4/19/02	closed			*		-
	5/6/02	open	100	28	*		20
	5/21/02	open	105	7	*		22
	6/19/02	open	90	10	*	**	24
	6/28/02	open	95	11	*		24
	7/10/02	open	97	6	*		23
	7/26/02	open	92	7	*		23
	8/6/02	open	_	-	*		19
	8/26/02	open	95	44	*		19
	9/16/02	open	105	-	*		19
	9/20/02	open	85	50	*		19
	10/2/02	open	75	29	*		19

Table 4. TPE Well Parameters - Former Exxon Service Station, 3055 35th Avenue, Oakland, California

Well ID	Date	Well Status (open/closed)	System/Stinger Vacuum (inches of H <sub>2</sub> O)	Well Annulus Vacuum (inches of H <sub>2</sub> O)	Flow Rate (cfm)	Hydrocarbon Vapor Concentration (ppmv)	Stinger Depth (ft below TOC)
							24
MW-4	11/6/01	open	80		*	-	25
	11/12/01	open	125		*	••	25
	11/14/01	open	85	**	*		25
	11/21/01	open	95		*		25
	12/6/01	open	115	-	*	-	25
	12/19/01	open	110	-	*		25
	1/17/02	open	130		*		25
	2/4/02	open	105		*		25
	2/14/02	closed	**	-	*		
	3/5/02	closed			*		
	3/11/02	closed		-	*	••	-
	3/25/02	closed			*		
	4/2/02	closed		-	*		-
	4/5/02	closed			*		
	4/19/02	closed	-		*		-
	5/6/02	open	100	26	*	<del></del>	20
	5/21/02	open	105	31	*		21
	6/19/02	open	90	26	*		21
	6/28/02	closed	_		*	-	
	7/10/02	closed	**		*	-	
	7/26/02	open	92	14	*	-	24.5
	8/6/02	open		***	*		19
	8/26/02	ореп	95	39	*		19
	9/16/02	open	105		*		19
	9/20/02	open	85	35	*		19
	10/2/02	open	75	34	*		19

Table 4. TPE Well Parameters - Former Exxon Service Station, 3055 35th Avenue, Oakland, California

Well ID	Date	Well Status (open/closed)	System/Stinger Vacuum (inches of H <sub>2</sub> O)	Well Annulus Vacuum (inches of H <sub>2</sub> O)	Flow Rate (cfm)	Hydrocarbon Vapor Concentration (ppmv)	Stinger Depth (ft below TOC
RW-5	5/24/00		80		*		11.64
KW-3	10/6/00		100				11.04
				-	*	4320	
	11/29/00	open	>100 54	-		4320 650	<b></b>
	3/29/01	open		-	*		
	4/14/01	open	100				 15
	4/26/01	open	85		*		15
	5/3/01	open	80		*		15
	5/23/01	open	10		*		15
	6/4/01	open	50		Ť		
	6/21/01	open	65		<b>*</b>		15
	7/2/01	open	55				15
	7/16/01	open	45		*		16
	8/2/01	open	35	**	*		••
	8/10/01	open	20		*		_
	8/15/01	open	20		*		-
	8/27/01	open	65		*	**	
	9/7/01	closed			*		
	9/14/01	closed			*		
	10/3/01	closed			*		••
	10/8/01	closed	_		*		
	10/22/01	closed	-	A.F.	*	-	
	10/29/01	closed			*		-
	11/6/01	closed	-		*	-	
	11/12/01	closed			*	••	
	11/14/01	closed		-	*		
	11/21/01	closed			*	-	•-
	12/6/01	closed	-	-	*	**	
	12/19/01	open	110		*	-	20
	1/17/02	open	130	-	*	-	20
	2/4/02	closed			*		-
	2/14/02	closed		_	*		••
	3/5/02	closed			*		**
	3/11/02	closed			*		
	3/25/02	open	130		*	-	16
	4/2/02	open	130		*		16
	4/5/02	open	135	90	*	_	16
	4/19/02	open	130	72	*		18
	5/6/02	open	100	43	*	••	18
	5/21/02	open	105	55	*		19
	6/19/02	open	90	33	*		19.5
	6/28/02	open	95	48	*		20
	7/10/02	_		<b>4</b> 0	*		
	7/26/02				*		
	8/6/02				*	-	19
			 95	 27	*		19
	8/26/02				*		19
	9/16/02		105		*** ***	_	19
	9/20/02 10/2/02		85 75	22 32	<b>.</b>		19

Table 4. TPE Well Parameters - Former Exxon Service Station, 3055 35th Avenue, Oakland, California

Well ID	Date	Well Status (open/closed)	System/Stinger Vacuum (inches of H <sub>2</sub> O)	Well Annulus Vacuum (inches of H₂O)	Flow Rate (cfm)	Hydrocarbon Vapor Concentration (ppmv)	Stinger Depth (ft below TOC
RW-6	5/24/00		80		*		11.78
KW-0	10/6/00				*		
			 >100		 34	260	
	11/29/00 3/29/01	open	54		*	2050	
		open	100		*	2030	20
	4/14/01 4/26/01	open closed			*		20 
			-	<del></del>	*	_	<u></u>
	5/3/01	closed closed		••	*		 
	5/23/01		-	<del></del>	*		15
	6/4/01	open	50		*		15
	6/21/01	open	65		*		15
	7/2/01	open	55 45	_		-	16
	7/16/01	open	45		<b>*</b>		
	8/2/01	open	35	-	*	-	
	8/10/01	open	20		T.	-	_
	8/15/01	open	20	<del></del>	т·		<del></del>
	8/27/01	open	65		*		
	9/7/01	closed		-	**		
	9/14/01	closed		••			-
	10/3/01	closed		-	*	<del></del>	
	10/8/01	closed	••		*		
	10/22/01	closed	••		*		**
	10/29/01	closed	-		*	_	**
	11/6/01	closed	-		*		
	11/12/01	closed			*	-	
	11/14/01	closed	-		*		
	11/21/01	closed			*	-	
	12/6/01	closed	-		*		-
	12/19/01	closed			*		
	1/17/02	closed		••	*		
	2/4/02	closed	<b>*</b> -		*		
	2/14/02	closed			*		
	3/5/02	closed			*		
	3/11/02	open	130		*		16
	3/25/02	open	130		*		16
	4/2/02	open	12		*		16
	4/5/02	open	135	85	*	**	16
	4/19/02	open	130	75	*		18
	5/6/02	closed		•-	*	••	
	5/21/02	closed			*		
	6/19/02	closed			*		
	6/28/02	closed			*		
	7/10/02		97	54	*		20
	7/26/02		92	39	*		20
	8/6/02				*		19
	8/26/02		95	34	*		19
	9/16/02		105		*		19
	9/20/02		85	45	¥c		19
	10/2/02		75	30	*	<del></del>	19

Table 4. TPE Well Parameters - Former Exxon Service Station, 3055 35th Avenue, Oakland, California

Well ID	Date	Well Status (open/closed)	System/Stinger Vacuum (inches of H <sub>2</sub> O)	Well Annulus Vacuum (inches of H <sub>2</sub> O)	Flow Rate (cfm)	Hydrocarbon Vapor Concentration (ppmv)	Stinger Depth (ft below TOC)
RW-7	5/24/00		80		*		12.5
K W-/	10/6/00				*		12.3
			 >100	<del></del>	*	0	
	11/29/00	open	54		*	52	<del></del>
	3/29/01	open	100	<b></b>	*	J2 	20
	4/14/01	open	85		*		15
	4/26/01	open		-	*		15
	5/3/01	open	80	_	*		15
	5/23/01	open	10		*		
	6/4/01	open	50	<b></b>		-	15
	6/21/01	open	65	<del></del>		4-	15
	7/2/01	open	55		*	••	15
	7/16/01	open	45		*	-	16
	8/2/01	ореп	35		*		
	8/10/01	open	20	**	*		
	8/15/01	open	20	==	*	**	-
	8/27/01	open	65		*		•
	9/7/01	closed	••		*		-
	9/14/01	closed			*		
	10/3/01	closed	**	==	*	**	_
	10/8/01	closed			*		••
	10/22/01	closed			*		
	10/29/01	closed			*	**	
	11/6/01	closed			*		
	11/12/01	closed	**		*		
	11/14/01	closed			*		
	11/21/01	closed			*		
	12/6/01	closed	<u></u>		*	_	
	12/19/01	closed	<del></del>	<del></del>	*	+-	
	1/17/02	closed	<b></b>		*		
	2/4/02	closed	**		*		
	2/14/02	closed			*		
	3/5/02	closed		<b></b>	*		
				-	*		
	3/11/02	closed			sk	•-	
	3/25/02	closed			** **		
	4/2/02	closed	<del>4-</del>	+•	T-		
	4/5/02	closed			*		•
	4/19/02	closed					-
	5/6/02	closed			*		
	5/21/02	closed	**		*		
	6/19/02	closed			*		
	6/28/02	closed			*		<del></del>
	7/10/02	closed	-	**	*	-	
	7/26/02	closed			*		**
	8/6/02	closed	<del>-</del>		*	_	
	8/26/02	closed	-		*		<b></b>
	9/16/02	closed			*	***	
	9/20/02	closed			*		
	10/2/02	closed			*		-

Table 4. TPE Well Parameters - Former Exxon Service Station, 3055 35th Avenue, Oakland, California

Well ID	Date	Well Status (open/closed)	System/Stinger Vacuum (inches of H <sub>2</sub> O)	Well Annulus Vacuum (inches of H <sub>2</sub> O)	Flow Rate (cfm)	Hydrocarbon Vapor Concentration (ppmv)	Stinger Depth (ft below TOC
RW-8	5/24/00				<b>≱</b> e		_
KW-0					*		_
	10/6/00	<b></b>	- 100		*	44	•
	11/29/00	open	>100		*	60	
	3/29/01	open	54		* *		-
	4/14/01	open	100		*		20
	4/26/01	open	85		*		15
	5/3/01	open	80		*	-	15
	5/23/01	open	10		*		15
	6/4/01	open	50		*		15
	6/21/01	open	65		*		••
	7/2/01	open	55	44	*		
	7/16/01	open	45		*	-	
	8/2/01	open	35		*	-	
	8/10/01	open	20		*		
	8/15/01	open	20	-	*	-	
	8/27/01	open	65		*	••	
	9/7/01	closed		_	*		
	9/14/01	closed			*		
	10/3/01	closed			*		-
	10/8/01	closed		<del></del>	*		
	10/22/01	closed			##		_
	10/29/01	closed		<u></u>	*		
	11/6/01	closed		••	*		
	11/12/01	closed			*		_
	11/14/01	closed		**	*		
	11/21/01	closed			*		
	12/6/01	closed			*		
	12/19/01	closed		<del></del>	*		
	1/17/02	closed		<del></del>	*		
			-		**		
	2/4/02	closed		**	-" -		
	2/14/02	closed				<del></del>	•-
	3/5/02	closed			T.		 10
	3/11/02	open				-	18
	3/25/02	closed			*		<b></b>
	4/2/02	closed			*		
	4/5/02	closed			*		
	4/19/02	closed			*		
	5/6/02	closed		**	*		
	5/21/02	closed			*		
	6/19/02	closed			<b>e</b> c		-
	6/28/02	closed			* *		**
	7/10/02	closed			*		
	7/26/02	closed			*		
	8/6/02	closed			*		
	8/26/02	closed			*	_	
	9/16/02		-		*		
	9/20/02				*	_	
	10/2/02			÷÷	*		

Table 4. TPE Well Parameters - Former Exxon Service Station, 3055 35th Avenue, Oakland, California

Well ID	Date	Well Status (open/closed)	System/Stinger Vacuum (inches of H <sub>2</sub> O)	Well Annulus Vacuum (inches of $H_2O$ )	Flow Rate (cfm)	Hydrocarbon Vapor Concentration (ppmv)	Stinger Depth (ft below TOC)
DIVO	5/24/00				*		12.5
RW-9					*		12.3
	10/6/00		> 100	<del></del>	*	 43	_
	11/29/00	<del>-</del>	>100		*	90	<del></del>
	3/29/01	open	54	-	*	<del></del>	-
	4/14/01	open	100	-	*		••
	4/26/01	open	85	**			
	5/3/01	open	80	an.	*		<b></b>
	5/23/01	open	10		<b>*</b>		•-
	6/4/01	open	50		*	••	
	6/21/01	open	65	<del></del>	* *	-	
	7/2/01	open	55				
	7/16/01	open	45		*	_	
	8/2/01	open	35	**	*		
	8/10/01	open	20		*	-	
	8/15/01	open	20		*		
	8/27/01	open	65	-	*		**
	9/7/01	closed		-	*		
	9/14/01	closed			*		-
	10/3/01	closed		=	*		
	10/8/01	closed			*		
	10/22/01	closed			*		
	10/29/01	closed			*		
	11/6/01	closed	**		*	-	**
	11/12/01	closed	••		*		
	11/14/01	closed			*		
	11/21/01	closed			*		
	12/6/01	closed			*		
	12/19/01	closed			*		-
	1/17/02	closed		**	*		
	2/4/02	closed			*		
	2/14/02	open	125	<del></del>	*	••	20
	3/5/02	open	115		*		20
	3/11/02	closed	_		*	_	
	3/25/02	closed	<u></u>		*		
	4/2/02	closed			*	<del></del>	
	4/5/02	closed	***		*		<del></del>
	4/19/02	closed			*		
	5/6/02	ореп	100	38	*		20
	5/21/02	=	105	56	*		20
		open	90	47	*		20
	6/19/02	open		47 	*	72	_
	6/28/02	closed		 	**		<del>-</del>
	7/10/02	closed			**		 
	7/26/02	closed			ak:		19
	8/6/02	open		 1.5	T		19
	8/26/02	open	95	15	*		
	9/16/02	closed			**		
	9/20/02	closed			**		

Table 4. TPE Well Parameters - Former Exxon Service Station, 3055 35th Avenue, Oakland, California

Well ID	Date	Well Status (open/closed)	System/Stinger Vacuum (inches of H <sub>2</sub> O)	Well Annulus Vacuum (inches of H <sub>2</sub> O)	Flow Rate (cfm)	Hydrocarbon Vapor Concentration (ppmv)	Stinger Depth (ft below TOC)
					de.		
RW-10	5/24/00	-	-	-	*		-
	10/6/00				*		_
	11/29/00	-	>100	<del></del>	*	>10,000	-
	3/29/01	open	54	-	*	850	_
	4/14/01	open	100		*		
	4/26/01	open	85		*	-	
	5/3/01	open	80		*	-	**
	5/23/01	open	10	-	*		
	6/4/01	open	50		*	••	
	6/21/01	open	65		*		
	7/2/01	open	55		*		
	7/16/01	open	45		*		
	8/2/01	open	35		*	-	
	8/10/01	open	20		*	-	
	8/15/01	open	20		*	_	
	8/27/01	open	65		*		
	9/7/01	closed			*		
	9/14/01	closed			*		
	10/3/01	closed			*		
	10/8/01	closed	<del></del>	+-	*	**	_
	10/22/01	closed			*		-
	10/29/01	closed			*		_
	11/6/01	closed		_	*		
	11/12/01	closed			*		
	11/14/01	closed			*		44
			<del></del>		*		
	11/21/01	closed	<b></b>		*	 	
	12/6/01	closed					-
	12/19/01	closed			**		-
	1/17/02	closed	_		·	-	
	2/4/02	closed	••	<b>₩</b>	*	•-	20
	2/14/02	open	125		*		20
	3/5/02	open	115	-		<del></del>	20
	3/11/02	open			*		20
	3/25/02	closed			*		
	4/2/02	closed			*		-
	4/5/02	closed	••		*		
	4/19/02	closed	40		*		
	5/6/02	open	100	31	*		20
	5/21/02	open	105	70	*		20
	6/19/02	open	90	56	*		20
	6/28/02	closed			*		••
	7/10/02	closed			*		
	7/26/02				*	-	
	8/6/02		<del></del>	<del>=</del>	*	<del></del>	19
	8/26/02	-			*	+*	
	9/16/02				*		
	9/20/02				*		-
	10/2/02			<b></b>	*		

Table 4. TPE Well Parameters - Former Exxon Service Station, 3055 35th Avenue, Oakland, California

Well ID	Date	Well Status (open/closed)	System/Stinger Vacuum (inches of H <sub>2</sub> O)	Well Annulus Vacuum (inches of H <sub>2</sub> O)	Flow Rate (cfm)	Hydrocarbon Vapor Concentration (ppmv)	Stinger Depth (ft below TOC
RW-11	5/24/00		80		*		11.65
K W-11	10/6/00			 	*	-	
	11/29/00		>100		*	2280	
					*	784	
	3/29/01	open	54	_	*		
	4/14/01	open	100		•		15
	4/26/01	open	85	-	*		
	5/3/01	open	80		*		15
	5/23/01	open	10		*		15
	6/4/01	open	50		*		20
	6/21/01	open	65		*	-	15
	7/2/01	open	55		*		15
	7/16/01	open	45		*		16
	8/2/01	open	35	••	*		-
	8/10/01	open	20		*		
	8/15/01	open	20	-daw	*		
	8/27/01	open	65	<b>*</b> *	*		-
	9/7/01	closed			*		
	9/14/01	closed			*		
	10/3/01	closed			*	-	
	10/8/01	closed			*		
	10/22/01	closed			*	-	
	10/29/01	closed			*		
	11/6/01	closed			*		
	11/12/01	closed	**		*		
	11/14/01	closed	_		*		
	11/21/01	closed		**	*		
	12/6/01	closed		-+	*		
	12/19/01	closed	**	_	*		<del></del>
	1/17/02	closed			*		
	2/4/02	closed			*		
				<b></b>	**		_
	2/14/02	closed			*		
	3/5/02	closed		<del></del>	*	<del></del>	18
	3/11/02	open					
	3/25/02	closed					••
	4/2/02	closed			· ·	-	
	4/5/02	closed	<del></del>		40.	-	
	4/19/02	closed	-		*	<del></del>	
	5/6/02	closed			*		
	5/21/02	closed	-		**	-	
	6/19/02	closed			*	**	
	6/28/02	closed			*		
	7/10/02	closed			*		
	7/26/02	closed			*		
	8/6/02	closed			*		<b>~-</b>
	8/26/02	closed			*		
	9/16/02	closed			*		
	9/20/02	closed	••	**	*		**
	10/2/02	closed			*		

Table 4. TPE Well Parameters - Former Exxon Service Station, 3055 35th Avenue, Oakland, California

Well ID	Date	Well Status (open/closed)	System/Stinger Vacuum (inches of H <sub>2</sub> O)	Well Annulus Vacuum (inches of H <sub>2</sub> O)	Flow Rate (cfm)	Hydrocarbon Vapor Concentration (ppmv)	Stinger Depth (ft below TOC)
	<b>5</b> 10.110.0				44	- "	
RW-12	5/24/00	_			*		
	10/6/00	-		<del></del>	*		••
	11/29/00	open	>100		÷	24	<del></del>
	3/29/01	open	54			72	4.
	4/14/01	open	100		•		
	4/26/01	open	85		*		15
	5/3/01	open	80				15
	5/23/01	open	10	-	*		15
	6/4/01	open	50		*		15
	6/21/01	open	65		*		15
	7/2/01	open	55		*		15
	7/16/01	open	45		*	# <b>-</b>	16
	8/2/01	open	35	-	*		
	8/10/01	open	20		•		
	8/15/01	open	20		*		
	8/27/01	open	65		*		-
	9/7/01	closed			*		
	9/14/01	closed	**		*		
	10/3/01	closed			*		
	10/8/01	closed	••		*		-
	10/22/01	closed			*	_	••
	10/29/01	closed			**		
	11/6/01	closed			*	-	
	11/12/01	closed	_		*	_	
	11/14/01	closed			*		
	11/21/01	closed			*		
	12/6/01	closed	_		*		
	12/19/01	closed			*		
	1/17/02	closed			*		
	2/4/02	closed		_	*		
	2/14/02	closed			*		_
	3/5/02	closed	<b>u</b> -	<del></del>	*		-
	3/11/02	closed			*		_
	3/25/02	open	130		*		16
	4/2/02	open	130	<del></del>	*	••	16
	4/5/02	open	135	97	*		16
	4/19/02	open	130	75	*		18
	5/6/02	closed			*		<u></u>
	5/21/02		<del></del>		*		
	6/19/02		<del></del>		*	<del></del>	
	6/28/02		95	16	*	-	20
	7/10/02		93 97	5	*		20
	7/26/02		92	5	*		20
	8/6/02		<del>9</del> 2		*		19
			 95	6	*		19
	8/26/02				жic		19
	9/16/02		105	4	Na.	<del></del>	19
	9/20/02 10/2/02	•	85 75	6 4	*		19

Table 4. TPE Well Parameters - Former Exxon Service Station, 3055 35th Avenue, Oakland, California

Well ID	Date	Well Status (open/closed)	System/Stinger Vacuum (inches of H <sub>2</sub> O)	Well Annulus Vacuum (inches of H <sub>2</sub> O)	Flow Rate (cfm)	Hydrocarbon Vapor Concentration (ppmv)	Stinger Depth (ft below TOC
RW-13	5/24/00		80		*		12.59
KW-13	10/6/00				*		12.07
	11/29/00		>100		*	77	
	3/29/01		54		*	124	
	4/14/01	open	100	-	*		
	4/26/01	open	85		*	 	
	5/3/01	open	80		*	_	_
		open	10	_	*		-
	5/23/01	open			**		_
	6/4/01	open	50		±		-
	6/21/01	open	65				-
	7/2/01	open	55	-	*		
	7/16/01	open	45		*		
	8/2/01	open	35		*		
	8/10/01	open	20		skc		
	8/15/01	open	20	-	*		-
	8/27/01	open	65		*		-
	9/7/01	closed	-		*		-
	9/14/01	closed		•••	*		
	10/3/01	closed			*		
	10/8/01	closed	-		*		
	10/22/01	closed	-		*		
	10/29/01	closed	_		*	_	
	11/6/01	closed	-		*		
	11/12/01	closed			*		
	11/14/01	closed	_		*	_	
	11/21/01	closed			*		
	12/6/01	closed			*	_	••
	12/19/01	closed		■4-	*		
	1/17/02	closed			*		
	2/4/02	closed	••		*		
	2/14/02		125	<del></del>	*	_	20
	3/5/02	open	115		*		20
	3/11/02	open		**	*		16
		open		<b></b>	**		_
	3/25/02	closed		<del></del>	**		_
	4/2/02						
	4/5/02				. ·	<del></del>	
	4/19/02				*		_
	5/6/02				*		
	5/21/02		**		*		
	6/19/02				*	**	
	6/28/02				*	-	
	7/10/02	closed			*		
	7/26/02		••	<del>ue</del>	*		••
	8/6/02	closed		-	*		
	8/26/02	closed			*		
	9/16/02	closed			*		
	9/20/02				*		
	10/2/02			==	*		_

Table 4. TPE Well Parameters - Former Exxon Service Station, 3055 35th Avenue, Oakland, California

Well ID	Date	Well Status (open/closed)	System/Stinger Vacuum (inches of H <sub>2</sub> O)	Well Annulus Vacuum (inches of H <sub>2</sub> O)	Flow Rate (cfm)	Hydrocarbon Vapor Concentration (ppmv)	Stinger Depth (ft below TOC)
RW-14	# 10 A 100		80		*		12.33
	5/24/00				 		12.55
	10/6/00		100		*	 5830	
	11/29/00		>100	-	*	120	
	3/29/01	open	54		*		<b></b>
	4/14/01	open	100	**			
	4/26/01	open	85		*		
	5/3/01	open	80	<del></del>	· ·		<del>-</del>
	5/23/01	open	10		*		<del>-</del>
	6/4/01	open	50	-	*		-
	6/21/01	open	65		*		_
	7/2/01	open	55		*		_
	7/16/01	open	45		*		<del></del>
	8/2/01	open	35		*		
	8/10/01	open	20		*	-	
	8/15/01	open	20	<del></del>	*		••
	8/27/01	open	65		*		•-
	9/7/01	closed			*		
	9/14/01	closed		-	*		-
	10/3/01	closed			*		
	10/8/01	closed	**		*		
	10/22/01	closed			*	•-	-
	10/29/01	closed			*	••	
	11/6/01	closed			*		
	11/12/01	closed	_		*		~~
	11/14/01	closed			*		
	11/21/01	closed	_		*		
	12/6/01	closed			*		
	12/19/01	closed			*		
	1/17/02	closed			*	<b></b>	
	2/4/02				*		
	2/14/02		125		*		20
	3/5/02		115		*		20
	3/11/02	closed			*		
	3/25/02	closed			*		
					*		
	4/2/02				*		<del></del>
	4/5/02		-		*		75
	4/19/02				*	_	
	5/6/02		-				
	5/21/02		<del></del>	••	*		
	6/19/02				*	 	
	6/28/02				ste		
	7/10/02				**		
	7/26/02		-		-T-		-
	8/6/02		-		<b>*</b>		
	8/26/02				*	-	
	9/16/02			**	* .		
	9/20/02				*	-	
	10/2/02	closed		-	*		••

Table 4. TPE Well Parameters - Former Exxon Service Station, 3055 35th Avenue, Oakland, California

				<u> </u>	Hydrocarbon		
			System/Stinger	Well Annulus		Vapor	
		Well Status	Vacuum	Vacuum	Flow Rate	Concentration	Stinger Depth
Well ID	Date	(open/closed)	(inches of H <sub>2</sub> O)	(inches of H <sub>2</sub> O)	(cfm)	(ppmv)	(ft below TOC)

#### Notes:

<sup>\*</sup> = Parameter could not be accurately measured due to the presence of water or water vapor.

<sup>-- =</sup> Data not available or not collected



### **APPENDIX A**

Groundwater Monitoring Field Data Sheets

Project Name: Worthington	Cambria Mgr: RAS	Well ID: MW-1
Project Number: 130-0105	Date:09/26 /02	Well Yield:
Site Address:	Sampling Method:	Well Diameter: 4" pvc
3055 35 <sup>th</sup> St Oakland, Ca	Disposable bailer	Technician(s): SG
Initial Depth to Water: 20.30	Total Well Depth:	Water Column Height:
Volume/ft: 065	1 Casing Volume:	3 Casing Volumes:
Purging Device: NO PURGE	Did Well Dewater?:	Total Gallons Purged:
Start Purge Time:	Stop Purge Time:	Total Time:

 1 Casing Volume = Water column height x Volume/ ft.
 Well Diam.
 Volume/ft (gallons)

 2"
 0.16

 4"
 0.65

 6"
 1.47

L	Time	Casing Volume	Temp.	pН	Cond.	Comments
						NO PURGE
l						DO= 0.70 mg/L
ŀ						
ŀ						

Sample ID	Date	Time	Container Type	Preservative	Analytes	Analytic Method
MW-1	09/26/02	12:15	4VOAs	HCL	TPHg BTEX MTBE	8260
			1 Amber		TPHd	

D:\TEMPLATE\FORMS\FIELD\WELLSAMP.WPD NSM 5/31/94

Project Name: Worthington	Cambria Mgr: RAS	Well ID: MW-2
Project Number: 130-0105	Date:09/26 /02	Well Yield:
Site Address:	Sampling Method:	Well Diameter: 4" pvc
3055 35 <sup>th</sup> St Oakland, Ca	Disposable bailer	Technician(s): SG
Initial Depth to Water: 20.39	Total Well Depth:	Water Column Height:
Volume/ft: 065	1 Casing Volume:	3 Casing Volumes:
Purging Device: NO PURGE	Did Well Dewater?:	Total Gallons Purged:
Start Purge Time:	Stop Purge Time:	Total Time:

Well Diam. 1 Casing Volume = Water column height x Volume/ ft.

Volume/ft (gallons) 0.16 0.65 1.47

Time	Casing Volume	Temp.	pН	Cond.	Comments
	,	• • • • •			NO PURGE
					DO= 0.29 mg/L

Date	Time	Container Type	Preservative	Analytes	Analytic Method
09/26/02	12:30	4VOAs	HCL	TPHg BTEX MTBE	8260
		1 Amber		TPHd	
			09/26/02 12:30 4VOAs	7ype 09/26/02 12:30 4VOAs HCL	Type         Type           09/26/02 /2:30         4VOAs         HCL         TPHg BTEX MTBE

D:\TEMPLATE\FORMS\FIELD\WELLSAMP.WPD NSM 5/31/94

Project Name: Worthington	Cambria Mgr: RAS	Well ID: MW-3
Project Number: 130-0105	Date:09/26 /02	Well Yield:
Site Address:	Sampling Method:	Well Diameter: 4" pvc
3055 35 <sup>th</sup> St Oakland, Ca	Disposable bailer	Technician(s): SG
Initial Depth to Water: 18.85	Total Well Depth:	Water Column Height:
Volume/ft: 065	1 Casing Volume:	3 Casing Volumes:
Purging Device: NO PURGE	Did Well Dewater?:	Total Gallons Purged:
Start Purge Time:	Stop Purge Time:	Total Time:

 Well Diam.
 Volume/ft (gallons)

 1 Casing Volume = Water column height x Volume/ ft.
 2" 0.16

 4" 0.65

 6" 1.47

Time	Casing Volume	Тетр.	рН	Cond.	Comments
					NO PURGE
					DO= 0.19 ms/L
					-72

Sample ID	Date	Time	Container Type	Preservative	Analytes	Analytic Method
MW-3	09/26/02	12:45	4VOAs	HCL	TPHg BTEX MTBE	8260
			1 Amber		TPHd	

. D:\TEMPLATE\FORMS\FIELD\WELLSAMP.WPD NSM 5/31/94

Project Name: Worthington	Cambria Mgr: RAS	Well ID: MW-4	
Project Number: 130-0105	Date:09/26 /02	Well Yield:	
Site Address:	Sampling Method:	Well Diameter: 4" pvc	
3055 35 <sup>th</sup> St Oakland, Ca	Disposable bailer	Technician(s): SG	
Initial Depth to Water: 17-93	Total Well Depth:	Water Column Height:	
Volume/ft: 065	1 Casing Volume:	3 Casing Volumes:	
Purging Device: NO PURGE	Did Well Dewater?:	Total Gallons Purged:	
Start Purge Time:	Stop Purge Time:	Total Time:	

 Well Diam.
 Volume/ft (gallons)

 1 Casing Volume = Water column height x Volume/ ft.
 2" 0.16

 4" 0.65

 6" 1.47

Time	Casing Volume	Temp.	pН	Cond.	Comments
,					NO PURGE
					00= 0. 24mg/L
					3/2

Sample ID	Date	Time	Container Type	Preservative	Analytes	Analytic Method
MW-4	09/26/02	13:00	4VOAs	HCL	TPHg BTEX MTBE	8260
			1 Amber		ТРН	

D:\TEMPLATE\FORMS\FIELD\WELL\\$AMP\WPD\NSM\5/31/94

# WELL DEPTH MEASUREMENTS

Well ID	Time	Product Depth	Water Depth	Product Thickness	Well Depth	Comments Stinger depth/reset at
MW-1	12:00		a <b>0</b> 30			21.00
MW-2	12:30		20.39			21.00
MW-3	12:40		18.85 820			19.00
MW-4	12:55	-	17.93			18.00 / 18.00
						4that Sample
						Uthat Sample Remediation wells See Ron
						CKON
				-		
. *						
/						

Project Name:_Worthington	Project Number: 130-0105
Measured By:	Date: <u>957110</u> 2 <u>9-26-02</u>

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Telephor	ne: (925) 798	3-1620						79					4	L	)I	ΛC	qui	100						No					_			_	<u></u>	
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	ville, CA 946		E-mail:	150	0005		-						-	MTE		E&I	<u></u>						•	8310				ľ						
Tele: 510-450			Fax: 510						_				$\dashv$	15)/		520	118		ĺ					8270 /				ĺ			ľ			
Project #: 130-		35th	Project l	Name	$\mathcal{A}$	0[-	M	Ž	12	01		-		+ 80		e (5	7) Su		20)		<b>×</b>			/82										
Project Location: Sampler Signature:		1. July 1. 8	<sup>7</sup> ⊃1.—	<u>UN</u>	حام	$\Delta \mathcal{L}$	<b></b> ,	L	-				$\dashv$	Gas (602/8020 + 8015)/ MTBE		Total Petroleum Oil & Grease (5520 E&F/B&F)	Total Petroleum Hydrocarbons (418.1)		BTEX ONLY (EPA 602 / 8020)		EPA 608 / 8080 PCB's ONLY		l	EPA 625 / 8			Lead (7240/7421/239.2/6010)					1		
Sampler Signature:				<del></del>	I		ļ			l n	A IETT	HOD	4	50278		& G	froca		602		3,s (	8	ľ	Ā			9.276					ı		
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SAMPLE ID				ers	Type Containers						!		٦	las (	TPH as Diesel (8015)	eum	una	010	7. (E	EPA 608 / 8080	080	EPA 624 / 8240 / 8260	270	PAH's / PNA's by	CAM-17 Metals	tals	742							
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## **APPENDIX B**

Analytical Results for Quarterly Groundwater Sampling

3.5.00 1.11.1.1.1.1.	110 2nd Avenue South, #D7, Pacheco, CA 94553-5560
McCampbell Analytical Inc.	Telephone: 925-798-1620 Fax: 925-798-1622
<b>y</b>	http://www.mccampbell.com E-mail: main@mccampbell.com

Cambria Env. Technology	Client Project ID: #130-0105-341;	Date Sampled: 09/26/02
6262 Hollis St.	Worthington	Date Received: 09/30/02
Emeryville, CA 94608	Client Contact: Ron Scheele	Date Reported: 10/07/02
Emeryvine, Cri 54000	Client P.O.:	Date Completed: 10/07/02

October 07, 2002

Dear Ron:

Enclosed are:

- 1). the results of 4 analyzed samples from your #130-0105-341; Worthington project,
- 2). a QC report for the above samples
- 3), a copy of the chain of custody, and
- 4). a bill for analytical services.

All analyses were completed satisfactorily and all QC samples were found to be within our control limits. If you have any questions please contact me. McCampbell Analytical Laboratories strives for excellence in quality, service and cost. Thank you for your business and I look forward to working with you again.

Angela Rydelius, Lab Manager

	McCampbell	Analytical	Inc.
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Cambria Env. Technology	Client Project ID: #130-0105-341;	Date Sampled: 09/26/02
6262 Hollis St.	Worthington	Date Received: 09/30/02
Emeryville, CA 94608	Client Contact: Ron Scheele	Date Extracted: 10/04/02
Lineryvine, CA 74008	Client P.O.:	Date Analyzed: 10/04/02

#### Gasoline Range (C6-C12) Volatile Hydrocarbons as Gasoline with BTEX and MTBE\*

Extraction method: SW5030B Analytical methods: SW8021B/8015Cm Work Order: 0209507

Extraction r	nethod: SW50301	В		Analytical i	methods: SW80211	3/8015Cm		work (	Order: ():	09507
Lab ID	Client ID	Matrix	TPH(g)	MTBE	Benzene	Toluene	Ethylbenzene	Xylenes	DF	% SS
001B	MW-1	w	7000,a	ND<100	1300	190	200	760	20	100
002B	MW-2	w	4800,a	ND<50	770	200	. 140	740	10	100
003B	MW-3	w	50,000,a,h	ND<500	3900	5400	820	6600	100	#
004B	MW-4	w	21,000,a	ND<500	3300	1300	450	2900	100	104
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						· · · · · · · · · · · · · · · · · · ·				i
	Limit for DF =1;	W	50	5.0	0.5	0.5	0.5	0.5	1	μg/I
	reporting limit	S	NA	NA	NA	NA	NA	NA	1	mg/K

\*water and vapor samples are reported in ug/L, soil and sludge samples in mg/kg, wipe samples in ug/wipe, product/oil/non-aqueous liquid samples in mg/L, and TCLP extracts in ug/L.

+The following descriptions of the TPH chromatogram are cursory in nature and McCampbell Analytical is not responsible for their interpretation: a) unmodified or weakly modified gasoline is significant; b) heavier gasoline range compounds are significant(aged gasoline?); c) lighter gasoline range compounds (the most mobile fraction) are significant; d) gasoline range compounds having broad chromatographic peaks are significant; biologically altered gasoline?; e) TPH pattern that does not appear to be derived from gasoline (stoddard solvent); f) one to a few isolated non-target peaks present; g) strongly aged gasoline or diesel range compounds are significant; h) lighter than water immiscible sheen/product is present; i) liquid sample that contains greater than ~2 vol. % sediment; j) reporting limit raised due to high MTBE content; k) TPH pattern that does not appear to be derived from gasoline (aviation gas). m) no recognizable pattern.



<sup>#</sup> cluttered chromatogram; sample peak coelutes with surrogate peak.

	McCampbell	Analytical	Inc.
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Cambria Env. Technology	Client Project ID: #130-0105-341;	Date Sampled: 09/26/02		
6262 Hollis St.	Worthington	Date Received: 09/30/02		
P 111. CA 04000	Client Contact: Ron Scheele	Date Extracted: 10/08/02		
Emeryville, CA 94608	Client P.O.:	Date Analyzed: 10/08/02		

Extraction method: SW		ge (C10-C23) I	Extractable Hydrocarbons with Silica Gel Clea Analytical methods: SW8015C	n-Up*  Work Order:	0209507
Lab ID	Client ID	Matrix	TPH(d)	DF	% SS
0209507-001C	MW-1	w	1300,d,b,g	1	94.2
0209507-002C	MW-2	w	660,d	1	110
0209507-003C	MW-3	w	130,000,d,h	100	#
0209507-004C	MW-4	w	800,d	2	85.8
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Reporting	imit for DF =1;	w	50	11	g/L
ND means no	ot detected at or reporting limit	S	NA NA		NA

* water and vapor samples are reported in ug/L, wipe samples in ug/wipe, soil/solid/sludge samples in mg/kg, product/oil/non-aqueous liquid samples in
mg/L, and all TCLP / STLC / SPLP extracts in ug/L

<sup>#</sup> cluttered chromatogram resulting in coeluted surrogate and sample peaks, or; surrogate peak is on elevated baseline, or; surrogate has been diminished by dilution of original extract.

<sup>+</sup>The following descriptions of the TPH chromatogram are cursory in nature and McCampbell Analytical is not responsible for their interpretation: a) unmodified or weakly modified diesel is significant; b) diesel range compounds are significant; no recognizable pattern; c) aged diesel? is significant); d) gasoline range compounds are significant; e) unknown medium boiling point pattern that does not appear to be derived from diesel; f) one to a few isolated peaks present; g) oil range compounds are significant; h) lighter than water immiscible sheen/product is present; i) liquid sample that contains greater than ~2 vol. % sediment; k) kerosene/kerosene range; l) bunker oil; m) fuel oil; n) stoddard solvent.

A	McCampbell Analytical	Inc.
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Cambria Env. Technology	Client Project ID: #130-0105-341;	Date Sampled: 09/26/02
6262 Hollis St.	Worthington	Date Received: 09/30/02
Emeryville, CA 94608	Client Contact: Ron Scheele	Date Extracted: 09/30/02
Emery vine, Cri y 1000	Client P.O.:	Date Analyzed: 10/01/02-10/04/02

		el Range (C10-	-C23) Extractable Hydrocarbons as Diesel*		
Extraction method: SW		-	Analytical methods: SW8015C	Work Order:	020950
Lab ID	Client ID	Matrix	TPH(d)	DF	% SS
0209507-001A	MW-1	w	6200,d,b,g	1	98.7
0209507-002A	MW-2	w	2600,d,b,g	1	100
0209507-003A	MW-3	w	210,000,d,b,h	100	#
0209507-004A	MW-4	W	6800,d,b,g	1	105
				: 	
				<u>:</u> ::	
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				· · · · · · · · · · · · · · · · · · ·	
Reporting L	imit for DF =1;	W	50	μ	g/L
	nt detected at or reporting limit	S	NA	1	NΑ

* water and vapor samples are reported in ug/L, wipe samples in ug/wipe, soil/solid/sludge samples in mg/kg, product/oil/non-aqueous liquid san	nples in
mg/L, and all TCLP / STLC / SPLP extracts in ug/L	

<sup>+</sup>The following descriptions of the TPH chromatogram are cursory in nature and McCampbell Analytical is not responsible for their interpretation: a) unmodified or weakly modified diesel is significant; b) diesel range compounds are significant; no recognizable pattern; c) aged diesel? is significant); d) gasoline range compounds are significant; e) unknown medium boiling point pattern that does not appear to be derived from diesel (corn oil?); f) one to a few isolated peaks present; g) oil range compounds are significant; h) lighter than water immiscible sheen/product is present; i) liquid sample that contains greater than ~2 vol. % sediment; j) sample diluted due to high organic content; k) kerosene/kerosene range; l) bunker oil; m) fuel oil; n) stoddard solvent; o) sample diluted due to matrix interference.



above the reporting limit

<sup>#</sup> cluttered chromatogram resulting in cocluted surrogate and sample peaks, or; surrogate peak is on clevated baseline, or; surrogate has been diminished by dilution of original extract.

### QC SUMMARY REPORT FOR SW8021B/8015Cm

Matrix: W

WorkOrder: 0209507

EPA Method: SW802	1B/8015Cm E	xtraction:	SW5030B	3	BatchID: 4	4211	Spiked Sample ID: 0209508-003A									
Compound	Sample	Spiked	MS*	MSD*	MS-MSD*	LCS	LÇSD	LCS-LCSD	Acceptance	Criteria (%)						
Compound	µg/L	μg/L	% Rec.	% Rec.	% RPD	% Rec.	% Rec.	% RPD	Low	High						
TPH(gas)	ND	60	110	110	0.0880	101	102	0.626	80	120						
мтве	ND	10	98.7	95.1	3.71	96.8	88.4	9.11	80	120						
Benzene	ND	10	97.4	96.5	0.950	100	96.5	3.66	80	120						
Toluene	ND	10	98.3	98.4	0.0894	102	98.7	3.54	80	120						
Ethylbenzene	ND	10	100	99.2	1.23	103	99.4	3.41	80	120						
Xylenes	ND	30	100	96.7	3.39	103	100	3.28	80	120						
%\$S:	99.8	100	92.8	90.4	2.58	93	89.6	3.74	80	120						

All target compounds in the Method Blank of this extraction batch were ND less than the method RL with the following exceptions: NONE

MS = Matrix Spike; MSD = Matrix Spike Duplicate; LCS = Laboratory Control Sample; LCSD = Laboratory Control Sample Duplicate; RPD = Relative Percent Deviation.

N/A = not enough sample to perform matrix spike and matrix spike duplicate.

NR = analyte concentration in sample exceeds spike amount for soil matrix or exceeds 2x spike amount for water matrix or sample diluted due to high matrix or analyte content.

<sup>%</sup> Recovery = 100 \* (MS-Sample) / (Amount Spiked); RPD = 100 \* (MS - MSD) / (MS + MSD) \* 2.

<sup>\*</sup> MS and / or MSD spike recoveries may not be near 100% or the RPDs near 0% if: a) the sample is inhomogenous AND contains significant concentrations of analyte relative to the amount spiked, or b) if that specific sample matrix interferes with spike recovery.

110 2nd Avenue South, #D7, Pacheco, CA 94553-5560 Telephone: 925-798-1620 Fax: 925-798-1622

http://www.mccampbell.com E-mail: main@mccampbell.com

### QC SUMMARY REPORT FOR SW8015C

Matrix: W

WorkOrder: 0209507

EPA Method: SW8015C	E	xtraction:	SW35100	;	BatchID:	4210	Spiked Sample ID: N/A									
Compound	Sample	Spiked	MS*	MSD*	MS-MSD*	LCS	LCSD	LCS-LCSD	Acceptance	Criteria (%)						
Compound	µg/L	μg/L	% Rec.	% Rec.	% RPD	% Rec.	% Rec.	% RPD	Low	High						
TPH(d)	N/A	7500	N/A	N/A	N/A	114	113	0.583	70	130						
%SS:	N/A	100	N/A	N/A	N/A	108	110	1.59	70	130						

All target compounds in the Method Blank of this extraction batch were ND less than the method RL with the following exceptions:

NONE

MS = Matrix Spike; MSD = Matrix Spike Duplicate; LCS = Laboratory Control Sample; LCSD = Laboratory Control Sample Duplicate; RPD = Relative Percent

N/A = not enough sample to perform matrix spike and matrix spike duplicate.

NR = analyte concentration in sample exceeds spike amount for soil matrix or exceeds 2x spike amount for water matrix or sample diluted due to high matrix or analyte content.

% Recovery = 100 \* (MS-Sample) / (Amount Spiked); RPD = 100 \* (MS – MSD) / (MS + MSD) \* 2.

\* MS and / or MSD spike recoveries may not be near 100% or the RPDs near 0% if: a) the sample is inhomogenous AND contains significant concentrations of analyte relative to the amount spiked, or b) if that specific sample matrix interferes with spike recovery.

NONE

#### QC SUMMARY REPORT FOR SW8015C

Matrix: W

WorkOrder: 0209507

EPA Method: SW8015C	E	xtraction:	SW35100	;	BatchID:	4334 Spiked Sample ID: N/A										
Compound	Sample	Spiked	MS*	MSD*	MS-MSD*	LCS	LCSD	LCS-LCSD	Acceptance	Criteria (%)						
Compound	μg/L	µg/L	% Rec.	% Rec.	% RPD	% Rec.	% Rec.	% RPD	Low	High						
TPH(d)	N/A	7500	N/A	N/A	N/A	104	102	1.58	70	130						
%SS:	N/A	100	N/A	N/A	N/A	105	103	2.00	70	130						

All target compounds in the Method Blank of this extraction batch were ND less than the method RL with the following exceptions:

MS = Matrix Spike; MSD = Matrix Spike Duplicate; LCS = Laboratory Control Sample; LCSD = Laboratory Control Sample Duplicate; RPD = Relative Percent Deviation.

N/A = not enough sample to perform matrix spike and matrix spike duplicate.

NR = analyte concentration in sample exceeds spike amount for soil matrix or exceeds 2x spike amount for water matrix or sample diluted due to high matrix or analyte content.

% Recovery = 100 \* (MS-Sample) / (Amount Spiked); RPD = 100 \* (MS – MSD) / (MS + MSD) \* 2.

<sup>\*</sup> MS and / or MSD spike recoveries may not be near 100% or the RPDs near 0% if: a) the sample is inhomogenous AND contains significant concentrations of analyte relative to the amount spiked, or b) if that specific sample matrix interferes with spike recovery.

110 Second Avenue South, #D7 Pacheco, CA 94553-5560 (925) 798-1620

# **CHAIN-OF-CUSTODY RECORD**

Page 1 of 1

WorkOrder: 0209507

Client:

Cambria Env. Technology

6262 Hollis St.

Emeryville, CA 94608

TEL:

(510) 450-1983

FAX: ProjectNo: (510) 450-8295 #130-0105-341;

PO:

30-Sep-02

					!			F	Requested Tests	<b>š</b>		
Sample ID	ClientSamplD	Matrix	Collection Date	Hold	<	<b>&gt;</b>	SW8015C	8021B/8015			I	
			<u></u>									
0209507-001	MW-1	Water	9/26/02 12:15:00 PM	L		A	Α	В	: 1		:	
0209507-002	MW-2	Water	9/26/02 12:30:00 PM	1 1			Α	В				
0209507-003	MW-3	Water	9/26/02 12:45:00 PM				A	В				
0209507-004	MW-4	Water	9/26/02 1:00:00 PM	L			Α	В				

Comments	:
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Date/Time	Date/Time
Relinquished by:	Received by:
Relinquished by:	Received by:
Relinquished by:	Received by:

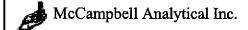
NOTE: Samples are discarded 60 days after results are reported unless other arrangements are made. Hazardous samples will be returned to client or disposed of at client expense.

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Tele: 510-450	-1983		Fax: 510	)-450-	8295		1							N /S		20 E	Total Petroleum Hydrocarbons (418.1)							8/0/					17	4	;					
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## **APPENDIX C**

Analytical Results for TPE System Operation



Cambria Env. Technology	Client Project ID: #130-0105-345;	Date Sampled: 07/02/02
6262 Hollis St.	WORTHINGTON	Date Received: 07/03/02
Emeryville, CA 94608	Client Contact: Ron Scheele	Date Reported: 07/10/02
Dillory vines, CAT 94000	Client P.O.:	Date Completed: 07/10/02

July 10, 2002

#### Dear Ron:

#### Enclosed are:

- 1). the results of 2 samples from your #130-0105-345; WORTHINGTON project,
- 2). a QC report for the above samples
- 3). a copy of the chain of custody, and
- 4). a bill for analytical services.

All analyses were completed satisfactorily and all QC samples were found to be within our control limits. If you have any questions please contact me. McCampbell Analytical Laboratories strives for excellence in quality, service and cost. Thank you for your business and I look forward to working with you again.

Angela Rydelius, Lab Manager

	McCampbell Analytical	Inc.
--	-----------------------	------

Cambria Env. Technology	Client Project ID: #130-0105-345;	Date Sampled: 07/02/02
6262 Hollis St.	WORTHINGTON	Date Received: 07/03/02
Emeryville, CA 94608	Client Contact: Ron Scheele	Date Extracted: 07/03/02-07/04/02
Zinery vine, err 54000	Client P.O.:	Date Analyzed: 07/03/02-07/04/02

#### Gasoline Range (C6-C12) Volatile Hydrocarbons as Gasoline with MTBE and BTEX\*

Extraction r	nethod: SW5030I	3		Analytical :	methods: SW8021F	3/8015Cm		Work Order: 0				
Lab ID	Client ID	Matrix	TPH(g)	МТВЕ	Benzene	Toluene	Ethylbenzene	Xylenes	DF	% S		
001A	INF	A	26,a	ND	0.70	0.23	ИD	0.38	0.5	#		
002A	EFF	A	ND	ND	ND	ND	ND	ND	0.5	103		
								·				
				**A=					-			
			-		A				-			

% ppm (mg/L)	to ppmv	(ul/L) conversion	n for TPH(g) assu	umes the molecul	lar weight of gaso	line to be equal t	o that of hexane.		
Reporting Limit for DF =1; ND means not detected at or	Α	15	1.5	0.15	0.15	0.15	0.25	1	uL/L
above the reporting limit	S	NA	NA	NA	NA	NA	NA	1	mg/Kg

\*water and vapor samples are reported in ug/L, soil and sludge samples in mg/kg, wipe samples in ug/wipe, and TCLP extracts in ug/L.

# cluttered chromatogram; sample peak coelutes with surrogate peak.

+The following descriptions of the TPH chromatogram are cursory in nature and McCampbell Analytical is not responsible for their interpretation: a) unmodified or weakly modified gasoline is significant; b) heavier gasoline range compounds are significant(aged gasoline?); c) lighter gasoline range compounds (the most mobile fraction) are significant; d) gasoline range compounds having broad chromatographic peaks are significant; biologically altered gasoline?; e) TPH pattern that does not appear to be derived from gasoline (stoddard solvent); f) one to a few isolated non-target peaks present; g) strongly aged gasoline or diesel range compounds are significant; h) lighter than water immiscible sheen/product is present; i) liquid sample that contains greater than ~2 vol. % sediment; j) sample diluted due to high MTBE content; k) TPH pattern that does not appear to be derived from gasoline (aviation gas). m) no recognizable pattern,



### QC SUMMARY REPORT FOR SW8021B/8015Cm

Matrix: A

WorkOrder: 0207066

EPA Method: SW802	1B/8015Cm E	ktraction:	SW5030B		BatchID:	2783	Spiked Sample ID: 0207061-002A						
	Sample	Spiked	MS*	MSD*	MS-MSD*	LCS	LCSD	LCS-LCSD	Acceptance	Criteria (%)			
Compound	uL/L	uL/L	% Rec.	% Rec.	% RPD	% Rec.	% Rec.	% RPD	Low	High			
TPH(gas)	ND	60	109	102	5,93	97.3	92.4	5.19	80	120			
МТВЕ	ND	10	102	95.9	6.31	107	114	6.63	80	120			
Benzene	ND	10	111	107	3.61	111	105	5.55	80	120			
Toluene	ND	10	114	110	3.43	112	110	1.79	80	120			
Ethylbenzene	ND	10	116	110	5.07	114	107	5.89	80	120			
Xylenes	ND	30	117	113	2.90	113	107	6.06	80	120			
%SS:	102	100	102	99.3	2.83	104	97.3	7.05	80	120			

All target compounds in the Method Blank of this extraction batch were ND less than the method RL with the following exceptions: NONE

MS = Matrix Spike; MSD = Matrix Spike Duplicate; LCS = Laboratory Control Sample; LCSD = Laboratory Control Sample Duplicate; RPD = Relative Percent Deviation.

N/A = not enough sample to perform matrix spike, or analyte concentration in sample exceeds spike amount.

% Recovery = 100 \* (MS-Sample) / (Amount Spiked); RPD = 100 \* (MS - MSD) / (MS + MSD) \* 2.

\* MS and / or MSD spike recoveries may not be near 100% or their RPDs near 0% if: a) the sample is inhomogeneous AND contains significant concentrations of analyze relative to the amount spiked, or b) if that specific sample matrix interferes with spike recovery.

# **CHAIN-OF-CUSTODY RECORD**

Page 1 of 1

110 Second Avenue South, #D7 Pacheco, CA 94553-5560 (925) 798-1620

WorkOrder: 0207066

Client:

Cambria Env. Technology

6262 Hollis St.

Emeryville, CA 94608

TEL:

(510) 450-1983

FAX:

(510) 450-8295

ProjectNo: PO: #130-0105-345;

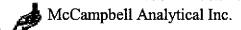
03-Jul-02

						Requested Tests	to a sixte and sixte	
Sample ID	ClientSampID	Matrix	Collection Date	Bottle	8021B/8015		 	
						A STATE OF THE STA	$\mathcal{C}_{i} = \mathcal{C}_{i} = \mathcal{C}_{i} = \mathcal{C}_{i}$	
0207066-001	INF	Air	7/2/02 1:30:00 PM	,	Α		 	
0207000-001	EEF	Air	7/2/02 1:30:00 PM		Α		 m	

Comments:	Date/Time				Date/Time
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NOTE: Samples are discarded 60 days after results are reported unless other arrangements are made. Hazardous samples will be returned to client or disposed of at client expense.

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Cambria Env. Technology	Client Project ID: #130-0105-343;	Date Sampled: 07/02/02
6262 Hollis St.	Worthington	Date Received: 07/03/02
Emeryville, CA 94608	Client Contact: Ron Scheele	Date Reported: 07/10/02
Zanderj vines, Cre y 1000	Client P.O.:	Date Completed: 07/10/02

July 10, 2002

Dear Ron:

Enclosed are:

- 1). the results of 28 samples from your #130-0105-343; Worthington project,
- 2). a QC report for the above samples
- 3). a copy of the chain of custody, and
- 4). a bill for analytical services.

All analyses were completed satisfactorily and all QC samples were found to be within our control limits. If you have any questions please contact me. McCampbell Analytical Laboratories strives for excellence in quality, service and cost. Thank you for your business and I look forward to working with you again.

Angela Rydelius, Lab Manager

110 2nd Avenue South, #D7, Pacheco, CA 94553-5560
Telephone: 925-798-1620 Fax: 925-798-1622
http://www.mccampbell.com E-mail: main@mccampbell.com

Cambria Env. Technology	Client Project ID: #130-0105-343;	Date Sampled: 07/02/02
6262 Hollis St.	Worthington	Date Received: 07/03/02
Emeryville, CA 94608	Client Contact: Ron Scheele	Date Extracted: 07/08/02-07/10/02
Emeryvine, CA 34008	Client P.O.:	Date Analyzed: 07/08/02-07/10/02

#### Gasoline Range (C6-C12) Volatile Hydrocarbons as Gasoline with BTEX and MTBE\*

xtraction me	thod: SW5030B			Analytical n	nethods: SW802	1B/8015Cm		1	Work Orde	r. 020706
Lab ID	Client ID	Matrix	TPH(g)	МТВЕ	Benzene	Toluene	Ethylbenzene	Xylenes	DF	% SS
001A	INF	W	ND	ND	1.5	ND	ND	0.94	1	94.5
002A	EFF-1	W	ND	ND	ND	ND	ND	ND	1	97.1
ND means	Limit for DF =1; not detected at or reporting limit	W	50	5.0 0.05	0.5	0.5 0.005	0.5	0.5		g/L g/Kg

\*water and vapor samples are reported in ug/L, soil and sludge samples in mg/kg, wipe samples in ug/wipe, and TCLP extracts in ug/L.

# cluttered chromatogram; sample peak coelutes with surrogate peak.

+The following descriptions of the TPH chromatogram are cursory in nature and McCampbell Analytical is not responsible for their interpretation: a) unmodified or weakly modified gasoline is significant; b) heavier gasoline range compounds are significant(aged gasoline?); c) lighter gasoline range compounds (the most mobile fraction) are significant; d) gasoline range compounds having broad chromatographic peaks are significant; biologically altered gasoline?; e) TPH pattern that does not appear to be derived from gasoline (stoddard solvent); f) one to a few isolated non-target peaks present; g) strongly aged gasoline or diesel range compounds are significant; h) lighter than water immiscible sheen/product is present; i) liquid sample that contains greater than ~2 vol. % sediment; j) sample diluted due to high MTBE content; k) TPH pattern that does not appear to be derived from gasoline (aviation gas). m) no recognizable pattern.



110 2nd Avenue South, #D7, Pacheco, CA 94553-5560 Telephone: 925-798-1620 Fax: 925-798-1622

http://www.mccampbell.com E-mail: main@mccampbell.com

### QC SUMMARY REPORT FOR SW8021B/8015Cm

Matrix: W

WorkOrder: 0207064

EPA Method: SW802	1B/8015Cm E	xtraction:	SW5030B		BatchID: 2	2783	Spiked Sample ID: 0207061-002A							
Compound	Sample	Spiked	MS*	MSD*	MS-MSD*	LCS	LCSD	LCS-LCSD	Acceptance	Criteria (%)				
Compound	µg/L	μg/L	% Rec.	% Rec.	% RPD	% Rec.	% Rec.	% RPD	Low	High				
TPH(gas)	ND	60	109	102	5.93	97.3	92.4	5.19	80	120				
мтве	ND	10	102	95.9	6.31	107	114	6.63	80	120				
Benzene	ND	10	111	107	3.61	111	105	5.55	80	120				
Toluene	ND	10	114	110	3.43	112	110	1.79	80	120				
Ethylbenzene	ND	10	116	110	5.07	114	107	5.89	80	120				
Xylenes	ND	30	117	113	2.90	113	107	6.06	80	120				
%\$\$:	102	100	102	99.3	2.83	104	97.3	7.05	80	120				

All target compounds in the Method Blank of this extraction batch were ND less than the method RL with the following exceptions: NONE

MS = Matrix Spike; MSD = Matrix Spike Duplicate; LCS = Laboratory Control Sample; LCSD = Laboratory Control Sample Duplicate; RPD = Relative Percent Deviation.

N/A = not enough sample to perform matrix spike, or analyte concentration in sample exceeds spike amount.

% Recovery = 100 \* (MS-Sample) / (Amount Spiked); RPD = 100 \* (MS - MSD) / (MS + MSD) \* 2.

\* MS and / or MSD spike recoveries may not be near 100% or their RPDs near 0% if: a) the sample is inhomogeneous AND contains significant concentrations of analyze relative to the amount spiked, or b) if that specific sample matrix interferes with spike recovery.

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110 Second Avenue South, #D7 Pacheco, CA 94553-5560 (925) 798-1620

# **CHAIN-OF-CUSTODY RECORD**

Page 1 of 1

WorkOrder: 0207064

Client:

Cambria Env. Technology 6262 Hollis St.

Emeryville, CA 94608

TEL:

(510) 450-1983

FAX: ProjectNo: (510) 450-8295 #130-0105-343;

PO:

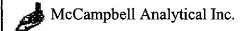
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Sample ID	ClientSamplD	Matrix	Collection Date	Bottle	8021B/8015	esserre se	ng <b>ay</b> ngwas a T	en e e e e e e e e e e e e e e e e e e	e in a service de marce de la companya de la companya de la companya de la companya de la companya de la compa
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0207064-002	EFF-1	Water	7/2/02 12:30:00 PM		Α				
0207064-003	EFF-2	Water	7/2/02 12:30:00 PM		Α				

#### Comments:

Date/Time	Date/Time
Relinquished by:	Received by:
Relinquished by:	Received by:
Relinquished by:	Received by:

NOTE: Samples are discarded 60 days after results are reported unless other arrangements are made. Hazardous samples will be returned to client or disposed of at client expense.



Cambria Env. Technology	Client Project ID: #130-0105-345	Date Sampled: 08/06/02
6262 Hollis St.		Date Received: 08/07/02
Emeryville, CA 94608	Client Contact: Ron Scheele	Date Reported: 08/14/02
Emeryvine, err 94000	Client P.O.:	Date Completed: 08/14/02

August 14, 2002

#### Dear Ron:

#### Enclosed are:

- 1). the results of 2 samples from your #130-0105-345 project,
- 2). a QC report for the above samples
- 3). a copy of the chain of custody, and
- 4). a bill for analytical services.

All analyses were completed satisfactorily and all QC samples were found to be within our control limits. If you have any questions please contact me. McCampbell Analytical Laboratories strives for excellence in quality, service and cost. Thank you for your business and I look forward to working with you again.

Angela Rydelius, Lab Manager

110 2nd Avenue South, #D7, Pacheco, CA 94553-5560
Telephone: 925-798-1620 Fax: 925-798-1622
http://www.mccampbell.com E-mail: main@mccampbell.com

Cambria Env. Technology	Client Project ID: #130-0105-345	Date Sampled: 08/06/02
6262 Hollis St.		Date Received: 08/07/02
Emeryville, CA 94608	Client Contact: Ron Scheele	Date Extracted: 08/07/02-08/08/02
	Client P.O.:	Date Analyzed: 08/07/02-08/08/02

001A Inf A 97,a ND<2.0 2.6 1.1 ND 0.	Extraction	method: SW5030B			Analytical	methods: SW8021		ith MTBE and		Order: 0	208104
002A EFF A ND ND ND ND ND 0.	Lab ID	Client ID	Matrix	TPH(g)	MTBE	Benzene	Toluene	Ethylbenzene	Xylenes	DF	% S
	001A	Inf	A	97,a	ND<2.0	2.6	1.1	ND	0.72	1	#
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% ppm (mg/L) to ppmv (ul/L) conversion for TPH(g) assumes the molecular weight of gasoline to be equal to that of		% ppm (mg/L	.) to ppmv	(ul/L) conversio	n for TPH(g) assi	umes the molecu	lar weight of gas	soline to be equal to	that of hexan	e.	

Reporting Limit for DF =1; ND means not detected at or	A	10	1.5	0.15	0.15	0.15	0.25	1	uL/L	
above the reporting limit	S	NA	NA	NA	NA	NA	NA	1	mg/Kg	

\*vapor samples are reported in uL/L, water samples in ug/L, soil and sludge samples in mg/kg, wipe samples in ug/wipe, and TCLP extracts in ug/L.

# cluttered chromatogram; sample peak coelutes with surrogate peak.

+The following descriptions of the TPH chromatogram are cursory in nature and McCampbell Analytical is not responsible for their interpretation: a) unmodified or weakly modified gasoline is significant; b) heavier gasoline range compounds are significant(aged gasoline?); c) lighter gasoline range compounds (the most mobile fraction) are significant; d) gasoline range compounds having broad chromatographic peaks are significant; biologically altered gasoline?; e) TPH pattern that does not appear to be derived from gasoline (stoddard solvent); f) one to a few isolated non-target peaks present; g) strongly aged gasoline or diesel range compounds are significant; h) lighter than water immiscible sheen/product is present; i) liquid sample that contains greater than ~2 vol. % sediment; j) reporting limit raised due to high MTBE content; k) TPH pattern that does not appear to be derived from gasoline (aviation gas). m) no recognizable pattern.



### QC SUMMARY REPORT FOR SW8021B/8015Cm

Matrix: A

WorkOrder: 0208104

EPA Method: SW802	1B/8015Cm E	xtraction:	SW5030	3	BatchID:	3352	S	piked Sampl	e ID: 02081	06-002A
Compound	Sample	Spiked	MS*	MSD*	MS-MSD*	LCS	LCSD	LCS-LCSD	Acceptance	Criteria (%)
	uL/L	uL/L	% Rec.	% Rec.	% RPD	% Rec.	% Rec.	% RPD	Low	High
TPH(gas)	ND	60	98.9	101	1.71	96.7	101	4.43	80	120
мтве	ND	10	83.8	112	29.2	80.5	82.9	2.98	80	120
Benzene	ND	10	91.7	94.3	2.78	91	94.3	3.57	80	120
Toluene	ND	10	101	102	1.78	97.8	101	3.41	80	120
Ethylbenzene	ND	10	102	105	2.72	101	102	1.39	80	120
Xylenes	ND	30	103	107	3.17	100	103	3.28	80	120
%SS:	97.7	100	96.7	94.5	2.32	98.7	99.6	0.965	80	120

All target compounds in the Method Blank of this extraction batch were ND less than the method RL with the following exceptions:

NONE

MS = Matrix Spike; MSD = Matrix Spike Duplicate; LCS = Laboratory Control Sample; LCSD = Laboratory Control Sample Duplicate; RPD = Relative Percent Deviation.

N/A = not enough sample to perform matrix spike and matrix spike duplicate.

NR = analyte concentration in sample exceeds spike amount for soil matrix or exceeds 2x spike amount for water matrix or sample diluted due to high matrix or analyte content.

% Recovery = 100 \* (MS-Sample) / (Amount Spiked); RPD = 100 \* (MS – MSD) / (MS + MSD) \* 2.

\* MS and / or MSD spike recoveries may not be near 100% or the RPDs near 0% if: a) the sample is inhomogenous AND contains significant concentrations of analyte relative to the amount spiked, or b) if that specific sample matrix interferes with spike recovery.

110 Second Avenue South, #D7 Pacheco, CA 94553-5560 (925) 798-1620

# **CHAIN-OF-CUSTODY RECORD**

Page 1 of 1

WorkOrder: 0208104

Client:

Cambria Env. Technology

6262 Hollis St.

Emeryville, CA 94608

TEL:

(510) 450-1983

FAX:

(510) 450-8295

ProjectNo:

#130-0105-345

PO:

07-Aug-02

						Requested Tests	
Sample ID	ClientSamplD	Matrix	Collection Date	Bottle	W8021B/8015C		
0208104-001	Inf	Air	8/6/2002 5:30:00 AM		Α		
0208104-002	EFF	Air	8/6/2002		Α		

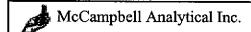
#### Comments:

	e/Time	Date/Time
Relinquished by:	·	Received by:
Relinquished by:		Received by:
Relinquished by:		Received by:

NOTE: Samples are discarded 60 days after results are reported unless other arrangements are made. Hazardous samples will be returned to client or disposed of at client expense.

Bottle Type: L-Liter V-Voa S-Soil Jar O-Orbo T-Tedlar B-Brass P-Plastic OT-Other

Report To: Ron Scher Company: Cambria 5 6262 Holdi Emeryville Tele: (510) 450-1983 Project #: /30 - Project Location: 3 Sampler Signature: C	eige (925) 798 eige Environment (15 Street 16, CA 9460 3 - 0055	140 2"A A PACI - 1620  Ital Tech  3.4.5  3.5 - AMA  SAMI	VENUE SC IECO, CA E nology	Containers  # Containers	o:  S10) 4  Libe Containers  Libe Containers	Nater N	(925 AE. 8295 AJOR MA	5) 7 5 2 Tr	IX	□ PI	METI ESEI		PH 28	s (8015)	Oil & Grease (5520 E&F/B&F)	Total Petroleum Hydrocarbons (418.1)	AR (OEDS) COS MAI	OUI naly	DMLY Sits	T11 eq	ME real	39 EPA 625 / 8270 / 8310	RU	SH	Lead (7240742172392/6010)	YR C 4 H		48 Other	П НО		DAY
Report To: Ron Scher Company: Cambria 5 6262 Holdi Emeryville Tele: (519) 450-1983 Project #: /30 - Project Location: 3: Sampler Signature: C	eele Environmen His Street Ie, CA 9460 3 -0105- 055 LOCATION 20Kland	1620 Ital Tech  B  34.5 35 =   LAMA SAMT	PLING	# Containers	Lige Containers	150- de: V	829: Nor MA	5 ≥\tau 1\_'\TR	IX >	□ PI	METI ESEI	IÓD RVEI	TPH 24 GARISON RODG	s (8015)	Oil & Grease (5520 E&F/B&F)	Hvdrocarbons (418.1)	A	naly	şis P	(eq.	163(	39 EPA 625 / 8270 / 8310				4 H	<u> </u>	Other			
Report To: Ron Scher Company: Cambria 5 6262 Holdi Emeryville Tele: (519) 450-1983 Project #: /30 - Project Location: 3: Sampler Signature: C	eele Environmen His Street Ie, CA 9460 3 -0105- 055 LOCATION 20Kland	B  34.5 35  LAMA SAMT	rology  F  F  Time	# Containers	O: 510) 4 LO I Nam I Nam I Albe Containers	150- de: V	829: Nor MA	5 ≥\tau 1\_'\TR	IX >	□ PI	METI ESEI	IÓD RVEI	TPH 24 GARISON RODG	s (8015)	Oil & Grease (5520 E&F/B&F)	Hvdrocarbons (418.1)	A	naly	şis P	(eq.	163(	39 EPA 625 / 8270 / 8310					<u> </u>	Other			
SAMPLE ID	His Street Lo, CA 9460  3  -0105- 0055  Mann 0  LOCATION  2018/2018	34.5 35 ± ZAMA SAMI Date	rology  F  F  Time	# Containers	Type Containers	150-1-Mater	829: Nor MA	S ZTr 1~2'	IX	SG PI	METI ESEI	IÓD RVEI	TPH 24 GARISON RODG	el (8015)	S. F.	Hydrocarbor						39 EPA 625 / 8270 / 8310	描述	iak	7421/239.2/6010)					Con	HICHS
Emeryville Tele: (519) 450-1983 Project #: /30 - Project Location: 3: Sampler Signature: C  SAMPLE ID L	16, CA 9460 3 -0105- 0055 	3A.5 35 - ZAMA SAMI Date	PLING Time	# Containers	Type Containers O	iae: V	NOR MA	ZTr 12'	IX	SG PI	METI ESEI	IÓD RVEI	TPH 24 GARISON RODG	el (8015)	S. F.	Hydrocarbor	CY (EP'A' 602 / \$020)	08/01	TRACECTES ONLY	240 / 8260	0/2	A's by EPA 625 / 8270 / 8310	Tals	tak	7421/239.2/6010)		6.	,		l.	
Tele: (519) 450-1983 Project #: /30 - Project Location: 3: Sampler Signature: Q  SAMPLE ID	3 -0105- -055 	3A.5 35 - ZAMA SAMI Date	PLING Time	# Containers	Type Containers O	iae: V	NOR MA	ZTr 12'	IX	SG PI	METI ESEI	IÓD RVEI	TPH 24 GARISON RODG	el (8015)	S. F.	Hydrocarbor	CY (BPA 602 / \$020)	ORAS	THREE PETERS ONLY	240 / 8260	9/2	A's by EPA 625 / 8270 / 8310	in the	tak	7421/239.2/6010)		6.	2			
Project #: 130 - Project Location: 3: Sampler Signature: 7  SAMPLE ID D	-0105- 055 Dam 0 LOCATION	SAMT Date	PLING Time	# Containers	Type Containers O	iae: V	NOR MA	ZTr 12'	IX	SG PI	METI ESEI	IÓD RVEI	TPH 24 GARISON RODG	el (8015)	S. F.	Hydrocarbor	EY (EP X 602 / \$020)	080	THREE CHISONLY	240 / 8260	07.0	A's by EPA 625 / 8270 / 8	ints	tak	7421/239.2/6010)		62	,			
Sampler Signature: C	LOCATION  2016/2016	SAMT Date	PLING Time	# Containers	Graff Type Containers	Water	MA	TR	ıx D	PI	METI ESEI	IÓD RVEI	TPH 24 GARISON RODG	el (8015)	S. F.	Hydrocarbor	CY (EP A 602 / \$020)	ORD)	THE SOULY	240 / 8260	270	A's by EPA 625 / 827	HIS.	tak	7421/239.2/6010)		Λ.	3			
Sampler Signature: T	LOCATION  20 Kland	Laun Samt Date	PLING Time	# Containers	Type Containers	Water	МА	TR	IX	PI			PH 28	s Diesel (8015)	S. F.	rolenn Hydrocarbo	LY (EPA 602 / 80	OROS	1686-PCTI'S ONE.	240 / 8260	270	A's by EPA 625	alts	rak	7421/239.2/6010		n:	,			
SAMPLE ID	Cocation  20 Kland	SAMI Date	LING Time	*	Bug	Water							PH 28	s Diesel (8015)	S. F.	roleim Hydroc	LY GEPA 602	0.80	OSO-PCTIS	240 / 8260	270	A's by EPA	शिक्ष	tak	7421/239.2/6		l n			l I	
INF 0	2n Kland	Date BG61	Time	*	Bug	Water							PH 28	Diesel (801	frojeum Ori	roleum Hy	YEPA	ORIO	CARD PC	240/82	270	A's by E	部	tak	7421/23					l oli	•
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Cambria Env. Technology	Client Project ID: #130-0105-345;	Date Sampled: 08/06/02	
6262 Hollis St.	Worthington	Date Received: 08/07/02	
Emeryville, CA 94608	Client Contact: Ron Scheele	Date Reported: 08/14/02	٦
Emeryvine, CA 94000	Client P.O.:	Date Completed: 08/14/02	

August 14, 2002

Dear Ron:

Enclosed are:

- 1). the results of 3 samples from your #130-0105-345; Worthington project,
- 2). a QC report for the above samples
- 3). a copy of the chain of custody, and
- 4). a bill for analytical services.

All analyses were completed satisfactorily and all QC samples were found to be within our control limits. If you have any questions please contact me. McCampbell Analytical Laboratories strives for excellence in quality, service and cost. Thank you for your business and I look forward to working with you again.

Angela Rydelius, Lab Manager

110 2nd Avenue South, #D7, Pacheco, CA 94553-5560 Telephone: 925-798-1620 Fax: 925-798-1622 http://www.mccampbell.com E-mail: main@mccampbeil.com

Cambria Env. Technology	Client Project ID: #130-0105-345;	Date Sampled: 08/06/02
6262 Hollis St.	Worthington	Date Received: 08/07/02
Emeryville, CA 94608	Client Contact: Ron Scheele	Date Extracted: 08/10/02-08/13/02
	Client P.O.:	Date Analyzed: 08/10/02-08/13/02

#### Gasoline Range (C6-C12) Volatile Hydrocarbons as Gasoline with BTEX and MTBE\*

Extraction me	thod: SW5030B			Analytical	Work Order: 0208106					
Lab ID	Client ID	Matrix	TPH(g)	MTBE	Веплепе	Toluene	Ethylbenzene	Xylenes	DF	% SS
001A	INF	w	ND	ND	1.8	0.92	ND	2.0	1	95.8
002A	EFF-1	w	ND	ND	ND	ND	ND	ND	1	97.7
			-							
Reporting Li	mit for DF =1; ot detected at or	W	50	5.0	0.5	0.5	0.5	0.5	1	μg/I
above the reporting limit		S	NA	NA	NA	NA	NA	NA	1	mg/K

<sup>\*</sup>water and vapor samples are reported in ug/L, soil and sludge samples in mg/kg, wipe samples in ug/wipe, product/oil/non-aqueous liquid samples in mg/L, and TCLP extracts in ug/L.

<sup>+</sup>The following descriptions of the TPH chromatogram are cursory in nature and McCampbell Analytical is not responsible for their interpretation: a) unmodified or weakly modified gasoline is significant; b) heavier gasoline range compounds are significant(aged gasoline?); c) lighter gasoline range compounds (the most mobile fraction) are significant; d) gasoline range compounds having broad chromatographic peaks are significant; biologically altered gasoline?; e) TPH pattern that does not appear to be derived from gasoline (stoddard solvent); f) one to a few isolated non-target peaks present; g) strongly aged gasoline or diesel range compounds are significant; h) lighter than water immiscible sheen/product is present; i) liquid sample that contains greater than ~2 vol. % sediment; j) reporting limit raised due to high MTBE content; k) TPH pattern that does not appear to be derived from gasoline (aviation gas). m) no recognizable pattern.



<sup>#</sup> cluttered chromatogram; sample peak coelutes with surrogate peak.

### QC SUMMARY REPORT FOR SW8021B/8015Cm

Matrix: W

WorkOrder: 0208106

EPA Method: SW802	21B/8015Cm E	SW5030E	3	BatchID: 3352			Spiked Sample ID: 0208106-002A			
Campand	Sample	Spiked	d MS*	MSD*	MS-MSD*	LCS % Rec.	LCSD % Rec.	LCS-LCSD % RPD	Acceptance	e Criteria (%)
Compound	μg/L	μg/L		% Rec.					Low	High
TPH(gas)	ND	60	98.9	101	1.71	96.7	101	4.43	80	120
мтве	ND	10	83.8	112	29.2	80.5	82.9	2.98	80	120
Веплеле	ND	10	91.7	94.3	2.78	91	94.3	3.57	80	120
Toluene	ND	10	101	102	1.78	97.8	101	3.41	80	120
Ethylbenzene	ND	10	102	105	2.72	101	102	1.39	80	120
Xylenes	ND	30	103	107	3.17	100	103	3.28	80	120
%SS:	97.7	100	96.7	94.5	2.32	98.7	99.6	0.965	80	120

All target compounds in the Method Blank of this extraction batch were ND less than the method RL with the following exceptions: NONE

MS = Matrix Spike; MSD = Matrix Spike Duplicate; LCS = Laboratory Control Sample; LCSD = Laboratory Control Sample Duplicate; RPD = Relative Percent Deviation.

N/A = not enough sample to perform matrix spike and matrix spike duplicate.

NR = analyte concentration in sample exceeds spike amount for soil matrix or exceeds 2x spike amount for water matrix or sample diluted due to high matrix or analyte content.

% Recovery = 100 \* (MS-Sample) / (Amount Spiked); RPD = 100 \* (MS – MSD) / (MS + MSD) \* 2.

\* MS and / or MSD spike recoveries may not be near 100% or the RPDs near 0% if: a) the sample is inhomogenous AND contains significant concentrations of analyte relative to the amount spiked, or b) if that specific sample matrix interferes with spike recovery.

110 Second Avenue South, #D7 Pacheco, CA 94553-5560 (925) 798-1620

# **CHAIN-OF-CUSTODY RECORD**

Page 1 of 1

WorkOrder: 0208104

Client:

Cambria Env. Technology

6262 Hollis St.

Emeryville, CA 94608

TEL:

(510) 450-1983

FAX:

(510) 450-8295

ProjectNo:

#130-0105-345

PO:

07-Aug-02

					Requested Tests			
Sample ID	ClientSamplD	Matrix	Collection Date	Bottle	W8021B/8015C			
0208104-001	Inf	Air	8/6/2002 5:30:00 AM		Α			
0208104-002	EFF	Air	8/6/2002		Α			

#### Comments:

	e/Time	Date/Time
Relinquished by:	·	Received by:
Relinquished by:		Received by:
Relinquished by:		Received by:

NOTE: Samples are discarded 60 days after results are reported unless other arrangements are made. Hazardous samples will be returned to client or disposed of at client expense.

Bottle Type: L-Liter V-Voa S-Soil Jar O-Orbo T-Tedlar B-Brass P-Plastic OT-Other

Report To: Ron Scher Company: Cambria 5 6262 Holdi Emeryville Tele: (510) 450-1983 Project #: /30 - Project Location: 3 Sampler Signature: C	eige (925) 798 eige Environment (15 Street 16, CA 9460 3 - 0055	140 2" A PACI - 1620 Ital Tech 8 34.5 35 " ZAMA SAMI	VENUE SC IECO, CA E nology	Containers  # Containers	o:  S10) 4  Libe Containers  Libe Containers	Nater N	(925 AE. 8295 AJOR MA	5) 7 5 2 Tr	IX	□ PI	METI ESEI		PH 28	s (8015)	Oil & Grease (5520 E&F/B&F)	Total Petroleum Hydrocarbons (418.1)	AR (OEDS) COS MAI	OUI naly	DMLY Sits	T11 eq	ME real	39 EPA 625 / 8270 / 8310	RU	SH	Lead (7240742172392/6010)	YR C 4 H		48 Other	П НО		DAY
Report To: Ron Scher Company: Cambria 5 6262 Holdi Emeryville Tele: (519) 450-1983 Project #: /30 - Project Location: 3: Sampler Signature: C	eele Environmen His Street Ie, CA 9460 3 -0105- 055 LOCATION 20Kland	1620 Ital Tech  B  34.5 35 =   LAMA SAMT	PLING	# Containers	Lige Containers	150- de: V	829: Nor MA	5 ≥\tau 1\_'\TR	IX >	□ PI	METI ESEI	IÓD RVEI	TPH 24 GARISON RODG	s (8015)	Oil & Grease (5520 E&F/B&F)	Hvdrocarbons (418.1)	A	naly	şis P	(eq.	163(	39 EPA 625 / 8270 / 8310				4 H	<u> </u>	Other			
Report To: Ron Scher Company: Cambria 5 6262 Holdi Emeryville Tele: (519) 450-1983 Project #: /30 - Project Location: 3: Sampler Signature: C	eele Environmen His Street Ie, CA 9460 3 -0105- 055 LOCATION 20Kland	B  34.5 35  LAMA SAMT	rology  F  F  Time	# Containers	O: 510) 4 LO I Nam I Nam I Albe Containers	150- de: V	829: Nor MA	5 ≥\tau 1\_'\TR	IX >	□ PI	METI ESEI	IÓD RVEI	TPH 24 GARISON RODG	s (8015)	Oil & Grease (5520 E&F/B&F)	Hvdrocarbons (418.1)	A	naly	şis P	(eq.	163(	39 EPA 625 / 8270 / 8310					<u> </u>	Other			
SAMPLE ID	His Street Lo, CA 9460  3  -0105- 0055  Mann 0  LOCATION  2018/2018	34.5 35 ± ZAMA SAMI Date	rology  F  F  Time	# Containers	Type Containers	150-1-Mater	829: Nor MA	S ZTr 1~2'	IX	SGT PI	METI ESEI	IÓD RVEI	TPH 24 GARISON RODG	el (8015)	S. F.	Hydrocarbor						39 EPA 625 / 8270 / 8310	描述	iak	7421/239.2/6010)					Con	HICHS
Emeryville Tele: (519) 450-1983 Project #: /30 - Project Location: 3: Sampler Signature: C  SAMPLE ID L	16, CA 9460 3 -0105- 0055 	3A.5 35 - ZAMA SAMI Date	PLING Time	# Containers	Nat Containers O	iae: V	NOR MA	ZTr 12'	IX	SGT PI	METI ESEI	IÓD RVEI	TPH 24 GARISON RODG	el (8015)	S. F.	Hydrocarbor	CY (EP'A' 602 / \$020)	08/01	TRRE-ECTIS-ONLY	240 / 8260	0/2	A's by EPA 625 / 8270 / 8310	Tals	tak	7421/239.2/6010)		6.	,		l.	
Tele: (519) 450-1983 Project #: /30 - Project Location: 3: Sampler Signature: Q  SAMPLE ID	3 -0105- -055 	3A.5 35 - ZAMA SAMI Date	PLING Time	# Containers	Nat Containers O	iae: V	NOR MA	ZTr 12'	IX	SGT PI	METI ESEI	IÓD RVEI	TPH 24 GARISON RODG	el (8015)	S. F.	Hydrocarbor	CY (BPA 602 / \$020)	ORAS	THREE PETERS ONLY	240 / 8260	9/2	A's by EPA 625 / 8270 / 8310	in the	tak	7421/239.2/6010)		6.	2			
Project #: 130 - Project Location: 3: Sampler Signature: 7  SAMPLE ID D	-0105- 055 Dam 0 LOCATION	SAMT Date	PLING Time	# Containers	Nat Containers O	iae: V	NOR MA	ZTr 12'	IX	SGT PI	METI ESEI	IÓD RVEI	TPH 24 GARISON RODG	el (8015)	S. F.	Hydrocarbor	EY (EP X 602 / \$020)	080	THREE CHISONLY	240 / 8260	07.0	A's by EPA 625 / 8270 / 8	ints	tak	7421/239.2/6010)		62	,			
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110 2nd Avenue South, #D7, Pacheco, CA 94553-5560
Telephone: 925-798-1620 Fax: 925-798-1622
http://www.mccampbell.com E-mail: main@mccampbell.com

Cambria Env. Technology	Client Project ID: #130-0105-345;	Date Sampled: 09/10/02
6262 Hollis St.	Worthington	Date Received: 09/11/02
Emeryville, CA 94608	Client Contact: Ron Scheele	Date Reported: 09/17/02
Emery vine, Oil 94000	Client P.O.:	Date Completed: 09/17/02

September 17, 2002

Dear Ron:

Enclosed are:

- 1). the results of 2 analyzed samples from your #130-0105-345; Worthington project,
- 2). a QC report for the above samples
- 3). a copy of the chain of custody, and
- 4). a bill for analytical services.

All analyses were completed satisfactorily and all QC samples were found to be within our control limits. If you have any questions please contact me. McCampbell Analytical Laboratories strives for excellence in quality, service and cost. Thank you for your business and I look forward to working with you again.

Angela Rydelius, Lab Manager

110 2nd Avenue South, #D7, Pacheco, CA 94553-5560
Telephone: 925-798-1620 Fax: 925-798-1622
http://www.mccampbell.com E-mail: main@mccampbell.com

Cambria Env. Technology	Client Project ID: #130-0105-345; Worthington	Date Sampled: 09/10/02
6262 Hollis St.	Wordington	Date Received: 09/11/02
Emeryville, CA 94608	Client Contact: Ron Scheele	Date Extracted: 09/11/02-09/13/02
Lindy vine, Ort > 1000	Client P.O.:	Date Analyzed: 09/11/02-09/13/02

#### Gasoline Range (C6-C12) Volatile Hydrocarbons as Gasoline with MTBE and BTEX\*

Extraction method: SW5030B Analytical methods: SW8021B/8015Cm

Work Order: 0209155

	nethod: SW50301	3		Analytical	methods: SW80211	3/8015Cm		Work (	Order: 0	209155
Lab ID	Client ID	Matrix	TPH(g)	MTBE	Benzene	Toluene	Ethylbenzene	Xylenes	DF	% SS
001A	INF	A	103,a	ND<200	3.2	2.4	0.32	2.0	2	#
002A	EFF	A	ND	ND	ND	ND	ND	ND	1	100
				-						
								****		
		<u> </u>								

ppm (mg/L) t	o ppmv (	ul/L) conversion	for TPH(g) assur	nes the molecular	r weight of gasol	ine to be equal to	that of hexane.		
Reporting Limit for DF =1; ND means not detected at or	A	10	1.5	0.15	0.15	0.15	0.25	1	uL/L
above the reporting limit	S	NA	NA	NA	NA	NA	NA	1	mg/Kg

<sup>\*</sup>vapor samples are reported in uL/L, water samples in ug/L, soil and sludge samples in mg/kg, wipe samples in ug/wipe, and TCLP extracts in ug/L.

<sup>+</sup>The following descriptions of the TPH chromatogram are cursory in nature and McCampbell Analytical is not responsible for their interpretation: a) unmodified or weakly modified gasoline is significant; b) heavier gasoline range compounds are significant(aged gasoline?); c) lighter gasoline range compounds (the most mobile fraction) are significant; d) gasoline range compounds having broad chromatographic peaks are significant; biologically altered gasoline?; e) TPH pattern that does not appear to be derived from gasoline (stoddard solvent); f) one to a few isolated non-target peaks present; g) strongly aged gasoline or diesel range compounds are significant; h) lighter than water immiscible sheen/product is present; i) liquid sample that contains greater than ~2 vol. % sediment; j) reporting limit raised due to high MTBE content; k) TPH pattern that does not appear to be derived from gasoline (aviation gas). m) no recognizable pattern.



<sup>#</sup> cluttered chromatogram; sample peak coelutes with surrogate peak.

110 2nd Avenue South, #D7, Pacheco, CA 94553-5560
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http://www.mccampbell.com E-mail: main@mccampbell.com

### QC SUMMARY REPORT FOR SW8021B/8015Cm

Matrix: A

WorkOrder: 0209155

EPA Method: SW802	21B/8015Cm E	xtraction:	SW5030E	3	BatchID:	3919	S	piked Samp	e ID: 02091	50-002A
Compound	Sample	Spiked	MS*	MSD*	MS-MSD*	LCS	LCSD	LCS-LCSD	Acceptance	Criteria (%)
Compound	uL/t	uL/L	% Rec.	% Rec.	% RPD	% Rec.	% Rec.	% RPD	Low	High
TPH(gas)	ND	60	109	108	0.405	115	112	2.96	80	120
мтве	7.241	10	88.9	96.3	4.48	96.1	97.1	1.07	80	120
Benzene	ND	10	95.5	99.5	4.10	99.4	97.5	1.94	80	120
Toluene	ND	10	91.9	94.8	3.14	93.7	93.1	0.569	80	120
Ethylbenzene	ND	10	97	99.5	2.55	101	97.8	3.13	80	120
Xylenes	ND	30	93	93.3	0.358	96.7	93	3.87	80	120
%SS:	98.3	100	96.3	98.5	2.29	102	98.8	2.91	80	120

All target compounds in the Method Blank of this extraction batch were ND less than the method RL with the following exceptions: NONE

MS = Matrix Spike; MSD = Matrix Spike Duplicate; LCS = Laboratory Control Sample; LCSD = Laboratory Control Sample Duplicate; RPD = Relative Percent Deviation.

N/A = not enough sample to perform matrix spike and matrix spike duplicate.

NR = analyte concentration in sample exceeds spike amount for soil matrix or exceeds 2x spike amount for water matrix or sample diluted due to high matrix or analyte content.

% Recovery = 100 \* (MS-Sample) / (Amount Spiked); RPD = 100 \* (MS – MSD) / (MS + MSD) \* 2.

\* MS and / or MSD spike recoveries may not be near 100% or the RPDs near 0% if: a) the sample is inhomogenous AND contains significant concentrations of analyte relative to the amount spiked, or b) if that specific sample matrix interferes with spike recovery.

110 Second Avenue South, #D7 Pacheco, CA 94553-5560 (925) 798-1620

# **CHAIN-OF-CUSTODY RECORD**

Page 1 of 1

WorkOrder: 0209155

Client:

Cambria Env. Technology

6262 Hollis St.

TEL: FAX: (510) 450-1983

ProjectNo:

(510) 450-8295 #130-0105-345;

Emeryville, CA 94608

PO:

11-Sep-02

						R	equested Test		
Sample ID	ClientSampID	Matrix	<b>Collection Date</b>	Bottle	V8021B/8015C				
0209155-001	INF	Air	9/10/02 2:00:00 PM		Α			i .	
0209155-002	EFF	Air	9/10/02 2:00:00 PM		Α				

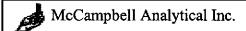
#### **Comments:**

	Date/Time	Date/Time
Relinquished by:		Received by:
Relinquished by:		Received by:
Relinquished by:		Received by:

NOTE: Samples are discarded 60 days after results are reported unless other arrangements are made. Hazardous samples will be returned to client or disposed of at client expense.

Bottle Type: L-Liter V-Voa S-Soil Jar O-Orbo T-Tedlar B-Brass P-Plastic OT-Other

	MCCAN	110 2" A	VENUE'S	OUTH	#122	LΙ	۷C.					\						C	H	$\prod$	I C	F	Cl						CC	RI	٠ (		7	
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Report To: Ron Se	ne: (925) 798	ş-162U		D.247			( <b>9</b> 25)	798	- [6	22	<del></del>													RI	JSH		24 J	<del>t</del> Ot				UR	5 D/	٩Y
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Tele: (510) 450-19		<del></del>		Fav-1	STOY A	150	520 <						NETBE		Grease (5520 F&F/B&F)	=							625 / 8270 / 8310	-		ı			1				:	
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110 2nd Avenue South, #D7, Pacheco, CA 94553-5560 Telephone: 925-798-1620 Fax: 925-798-1622 http://www.mccampbell.com E-mail: main@mccampbell.com

Cambria Env. Technology	Client Project ID: #130-0105-345;	Date Sampled: 09/10/02
6262 Hollis St.	Worthington	Date Received: 09/11/02
Emeryville, CA 94608	Client Contact: Ron Scheele	Date Reported: 09/17/02
Lineryvine, CA 94000	Client P.O.:	Date Completed: 09/17/02

September 17, 2002

#### Dear Ron:

#### Enclosed are:

- 1). the results of 3 analyzed samples from your #130-0105-345; Worthington project,
- 2). a QC report for the above samples
- 3). a copy of the chain of custody, and
- 4). a bill for analytical services.

All analyses were completed satisfactorily and all QC samples were found to be within our control limits. If you have any questions please contact me. McCampbell Analytical Laboratories strives for excellence in quality, service and cost. Thank you for your business and I look forward to working with you again.

Angela Rydelius, Lab Manager

110 2nd Avenue South, #D7, Pacheco, CA 94553-5560 Telephone: 925-798-1620 Fax: 925-798-1622 http://www.mccampbell.com E-mail: main@mccampbell.com

Cambria Env. Technology	, ,	Date Sampled: 09/10/02
6262 Hollis St.	Worthington	Date Received: 09/11/02
Emeryville, CA 94608	Client Contact: Ron Scheele	Date Extracted: 09/15/02-09/16/02
Emeryvine, CA 94000	Client P.O.:	Date Analyzed: 09/15/02-09/16/02

#### Gasoline Range (C6-C12) Volatile Hydrocarbons as Gasoline with RTEX and MTRE\*

Extraction 1	nethod: SW5030B			Analytical	methods: SW80211	3/8015Cm		Work (	Order: 0	209157
Lab ID	Client ID	Matrix	TPH(g)	MTBE	Benzen <del>e</del>	Toluene	Ethylbenzene	Xylenes	DF	% SS
001A	A INF	w	570,a	ND	15	17	2.9	30	1	103
002A	EFF-1	w	ND	ND	ND	ND	ND	ND	1	96.9
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		:								
	Limit for DF =1;	w	50	5.0	0.5	0.5	0.5	0.5	1	μg/
	not detected at or ne reporting limit	S	NA	NA	NA	NA	NA	NA	1	mg/l

\*water and vapor samples are reported in ug/L, soil and sludge samples in mg/kg, wipe samples in ug/wipe, product/oil/non-aqueous liquid samples in mg/L, and TCLP extracts in ug/L.

# cluttered chromatogram; sample peak coelutes with surrogate peak.

+The following descriptions of the TPH chromatogram are cursory in nature and McCampbell Analytical is not responsible for their interpretation: a) unmodified or weakly modified gasoline is significant; b) heavier gasoline range compounds are significant(aged gasoline?); c) lighter gasoline range compounds (the most mobile fraction) are significant; d) gasoline range compounds having broad chromatographic peaks are significant; biologically altered gasoline?; e) TPH pattern that does not appear to be derived from gasoline (stoddard solvent); f) one to a few isolated non-target peaks present; g) strongly aged gasoline or diesel range compounds are significant; h) lighter than water immiscible sheen/product is present; i) liquid sample that contains greater than ~2 vol. % sediment; j) reporting limit raised due to high MTBE content; k) TPH pattern that does not appear to be derived from gasoline (aviation gas). m) no recognizable pattern.



110 2nd Avenue South, #D7, Pacheco, CA 94553-5560
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http://www.mccampbell.com E-mail: main@mccampbell.com

### QC SUMMARY REPORT FOR SW8021B/8015Cm

Matrix: W

WorkOrder: 0209157

EPA Method: SW802	1B/8015Cm E	xtraction:	SW5030E	3	BatchID: 3919 Spiked Sample ID: 0209150-002								
Compound	Sample	Spiked	MS*	MSD*	MS-MSD*	LCS	LCSD	LCS-LCSD	Acceptance	Criteria (%)			
Compound	μg/L	µg/L	% Rec.	% Rec.	% RPD	% Rec.	% Rec.	% RPD	Low	High			
TPH(gas)	ND	60	109	108	0.405	115	112	2.96	80	120			
МТВЕ	7.241	10	88.9	96.3	4.48	96.1	97.1	1.07	80	120			
Benzene	ND	10	95.5	99.5	4.10	99.4	97.5	1.94	80	120			
Toluene	ND	10	91.9	94.8	3.14	93.7	93.1	0.569	80	120			
Ethylbenzene	ND	10	97	99.5	2.55	101	97.8	3.13	80	120			
Xylenes	ND	30	93	93.3	0.358	96.7	93	3.87	80	120			
%SS:	98.3	100	96.3	98.5	2.29	102	98.8	2.91	80	120			

All target compounds in the Method Blank of this extraction batch were ND less than the method RL with the following exceptions: NONE

MS = Matrix Spike; MSD = Matrix Spike Duplicate; LCS = Laboratory Control Sample; LCSD = Laboratory Control Sample Duplicate; RPD = Relative Percent Deviation.

N/A = not enough sample to perform matrix spike and matrix spike duplicate.

NR = analyte concentration in sample exceeds spike amount for soil matrix or exceeds 2x spike amount for water matrix or sample diluted due to high matrix or analyte content.

% Recovery = 100 \* (MS-Sample) / (Amount Spiked); RPD = 100 \* (MS – MSD) / (MS + MSD) \* 2.

\* MS and / or MSD spike recoveries may not be near 100% or the RPDs near 0% if: a) the sample is inhomogenous AND contains significant concentrations of analyte relative to the amount spiked, or b) if that specific sample matrix interferes with spike recovery.

110 Second Avenue South, #D7 Pacheco, CA 94553-5560 (925) 798-1620

# **CHAIN-OF-CUSTODY RECORD**

Page 1 of 1

WorkOrder: 0209157

Cambria Env. Technology 6262 Hollis St.

TEL: FAX: (510) 450-1983 (510) 450-8295

Emeryville, CA 94608

ProjectNo: #130-0105-345;

PO:

17-Sep-02

Sample ID						Requested Tests									
Sample ID	ClientSampID	Matrix	<b>Collection Date</b>	Hold	8021B/8015										
0209157-001	INF	Water	9/10/02 2:00:00 PM		Α										
0209157-002	EFF-1	Water	9/10/02 2:00:00 PM		Α										
0209157-003	EFF-2	Water	9/10/02 2:00:00 PM		Α										

#### **Comments:**

	Date/Time		Date/Time
Relinquished by:		Received by:	
Relinquished by:		Received by:	
Relinquished by:		Received by:	

NOTE: Samples are discarded 60 days after results are reported unless other arrangements are made. Hazardous samples will be returned to client or disposed of at client expense.

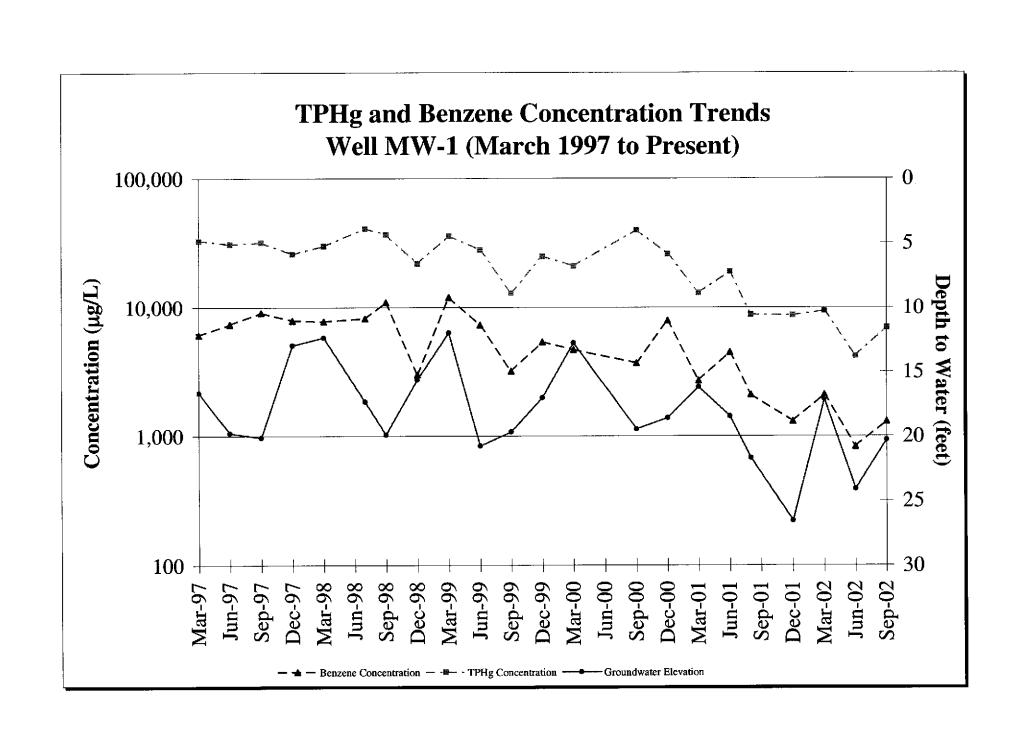
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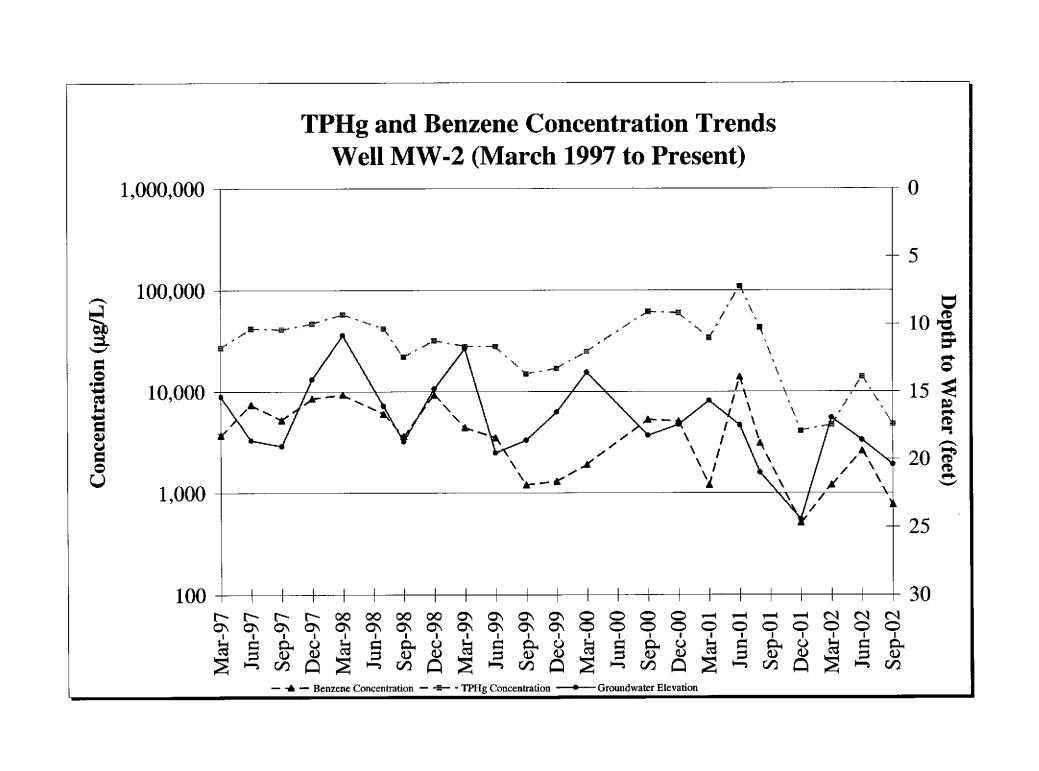
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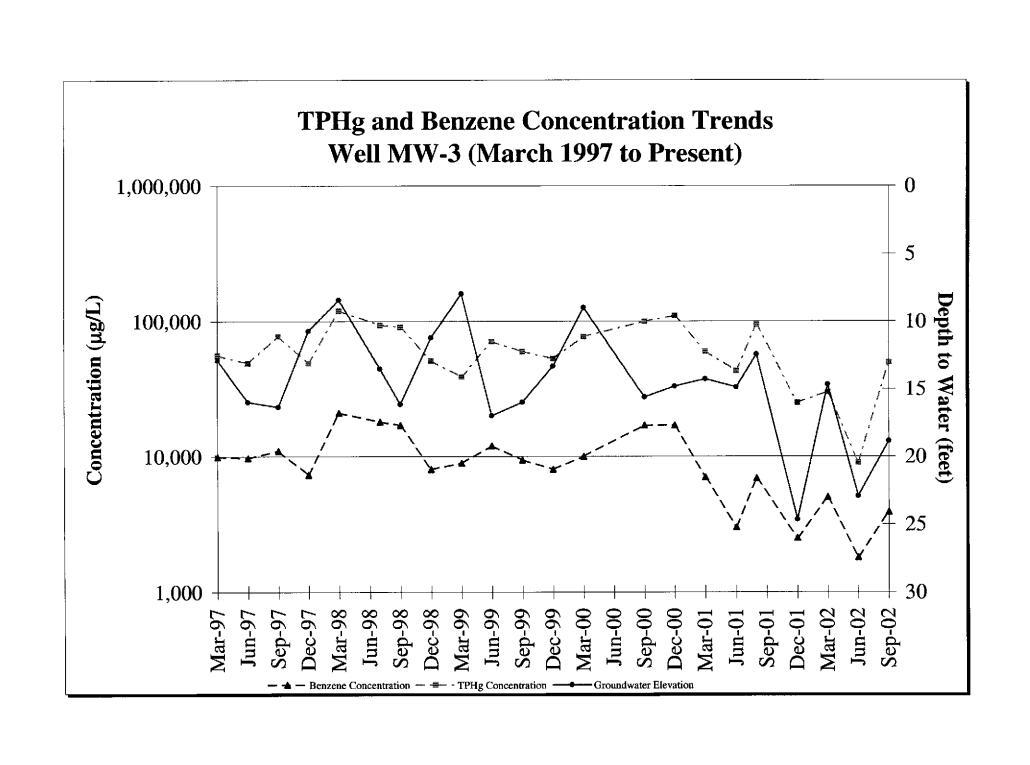


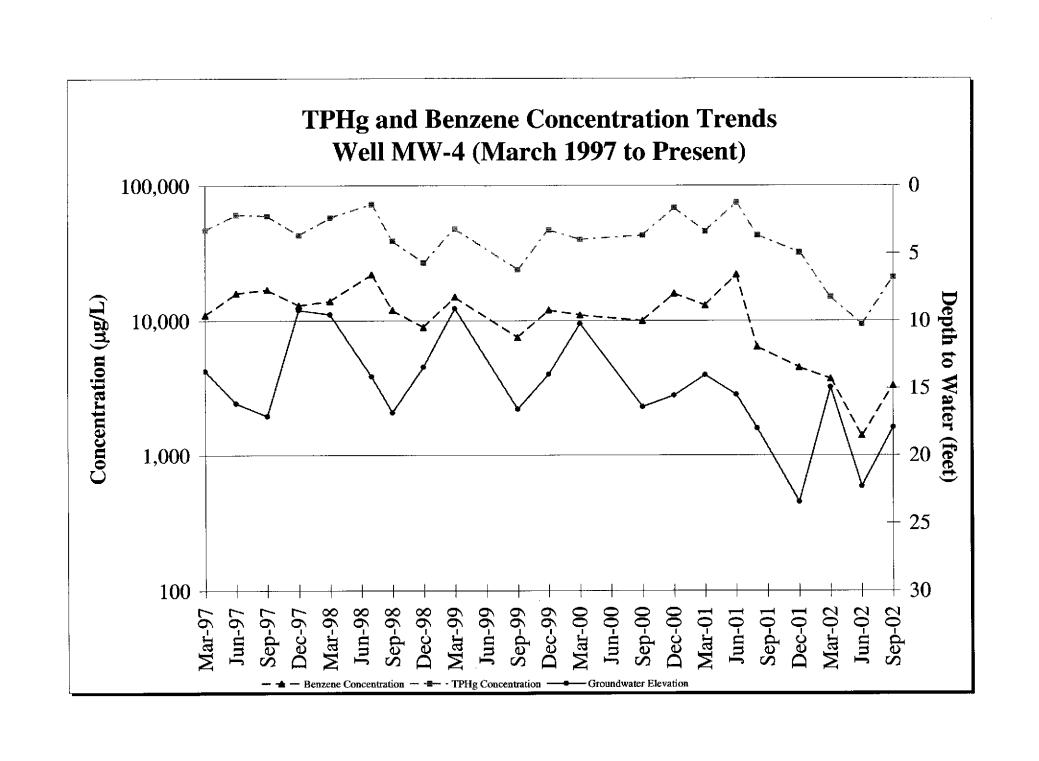
## **APPENDIX D**

TPHg and Benzene Concentration Trend Graphs











### **APPENDIX E**

Electronic Delivery Confirmations

# **AB2886 Electronic Delivery**

Main Menu | View/Add Facilities | Upload EDD | Check EDD

#### UPLOADING A GEO\_WELL FILE

Processing is complete. No errors were found! Your file has been successfully submitted!

Submittal Title:

3rd Qtr 2002 Groundwater Elevation Data: 3055 35th Avenue,

**Oakland** 

Submittal Date/Time: 12/10/2002 5:25:14 PM

Confirmation

4264378190

Number:

Back to Main Menu

Logged in as CAMBRIA-EM (AUTH\_RP)

CONTACT SITE ADMINISTRATOR.

## **AB2886 Electronic Delivery**

Main Menu | View/Add Facilities | Upload EDD | Check EDD

Your EDF file has been successfully uploaded!

Confirmation Number: 4434553086

**Date/Time of Submittal:** 12/10/2002 5:26:32 PM

Facility Global ID: T0600100538 Facility Name: EXXON

Submittal Title: 3rd Qtr 2002, Groundwater Analytical Results

Submittal Type: GW Monitoring Report

Logged in as CAMBRIA-EM (AUTH\_RP)

CONTACT SITE ADMINISTRATOR.