R0350

CAMBRIA

July 12, 2005

Mr. Barney Chan
Alameda County Health Care Services Agency
Department of Environmental Health
1131 Harbor Bay Parkway, Suite 250
Alameda, California 94502

Re: **Two-Phase Extraction Pilot Test Report**
Former Chevron Station 9-5607
5269 Crow Canyon Road
Castro Valley, California
Cambria Project No. 31H-1950

Dear Mr. Chan:

On behalf of Chevron Environmental Management Company (Chevron), Cambria Environmental Technology, Inc. (Cambria) is submitting the results of the two-phase extraction (TPE) pilot test performed in October 2003 at the site referenced above. The primary goal of the TPE test was to determine whether this technology could dewater the site and expose subsurface sediments to allow vapor extraction of volatile hydrocarbons, thereby reducing separate-phase hydrocarbon (SPH) mass in the subsurface. Presented below are the site background, previous remedial activities, the results of the TPE pilot test, and our recommendations for future actions at the site.

SITE BACKGROUND

The site is located on the south side of Crow Canyon Road, on a hillside approximately one mile north of Interstate 580 in Castro Valley, California. The site is a former Chevron service station that was operated from 1982 to 1990 by Mr. Kevin Hinckley. In February 1985, a fuel inventory discrepancy was detected at the site. Subsequent review of inventory records indicated that since September 1984 an estimated loss of approximately 670 gallons of gasoline had occurred. An underground storage tank (UST) that was installed in September 1971 was removed in April 1985 after failing an integrity test. According to Chevron's tank removal report report, no SPH was observed in the tank excavation or on the water table. Several investigations were performed at the site between March 1985 and March 1988. In 1985, hand-bailing of SPH was initiated and a groundwater extraction system was installed. When station operations ceased in 1990, the USTs, fuel dispensers and associated piping were excavated and removed. Since 1985, 17 groundwater monitoring wells (three of which have been abandoned) and one recovery well have been installed on-site and off-site. The site is currently occupied by an auto repair shop owned and operated by Mr. Kevin Hinckley.

Cambria Environmental Technology, Inc.

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Hydrogeology

The site is underlain by sediments consisting of interbedded clays, silts, clayey sands and clayey gravels to depths ranging between approximately 15.5 and 34.5 feet below grade (fbg). A shale to silty sandstone bedrock was noted during several investigations between 18 and 48 fbg. Groundwater has historically been measured at depths ranging from 4 to 30 fbg and generally flows southwesterly at a gradient of 0.09 to 0.2 ft/ft. Hydrocarbons appeared to be localized in the vicinity of well C-3 at depths ranging from 23 to 32 fbg, corresponding with seasonal fluctuations of groundwater levels.

PREVIOUS REMEDIAL ACTIVITIES

Three USTs and associated product lines were removed and replaced in 1985. No soil or groundwater samples were collected during UST and product line removal activities as this was not common practice at the time. In 1990, three 10,000-gallon USTs and associated product lines were removed and the soil was sampled. A 550 gallon waste oil UST tank remains in use at the site.

Recovery well RW-1 was installed in 1985. In May 1985, a groundwater extraction (GWE) system was installed that pumped water from well RW-1 using a submersible pump. Extracted groundwater was treated using activated carbon. The GWE system's effectiveness was limited due to the low transmissivity of the soils underlying the site. The overall extraction rate averaged 0.2 gallons per minute.

Manual bailing of SPH from wells resulted in the removal of at least 32 gallons of SPH by September 1987.

TPE PILOT TEST RESULTS

From October 20 to October 31, 2003, Cambria performed a two-phase extraction (TPE) pilot test at the site to determine if TPE is an appropriate remedial technology for the site. TPE is a technology that simultaneously extracts groundwater and soil vapor in the same process stream under high vacuum from extraction piping that is lowered below the static water table. TPE was evaluated as a possible remedial alternative because previous assessments have demonstrated that petroleum hydrocarbons, including SPH, are present in submerged soils beneath the site, and dewatering these soils would be necessary to maximize vapor-phase hydrocarbon recovery.

Specific goals of this pilot test were to determine:

- Optimum groundwater extraction rates under high vacuum and the extraction rates necessary for dewatering subsurface soils;
- Potential soil vapor extraction vacuum and flow rates;
- Vapor-phase hydrocarbon concentrations and concentration trends in effluent soil vapor over time; and
- Achievable hydrocarbon mass removal rates.

Pilot Test Equipment

A 25-horsepower, 400 cubic-foot-per-minute (cfm) liquid-ring vacuum blower was used to apply vacuum to and extract groundwater and soil vapor from extraction wells C-3 and C-6. These wells were chosen for extraction because of the presence of persistent SPH and elevated aqueous-phase hydrocarbon concentrations. Soil vapor and groundwater were simultaneously extracted by applying vacuum to the well casing through a 1.5-inch diameter hose (stinger) inserted through a seal on the well head. The stinger was progressively lowered into each extraction well during the test until reduced groundwater inflow allowed the stinger opening to be placed near the well bottom.

After extraction from the well through the stinger, the vapor/liquid process stream was passed through a vapor/liquid separator, where groundwater and soil vapor were routed to separate abatement/treatment devices. A thermal oxidizer was used to treat soil vapor. Extracted groundwater was pumped from the vapor/liquid separator to a 6,500-gallon water storage tank before being treated using activated carbon. Treated groundwater was discharged to the sanitary sewer under a permit issued by the Castro Valley Sanitation District.

Data Collection

On October 20, 2003, prior to beginning the test, depth to water measurements were collected in selected monitoring wells that were used as observation wells. The test was then started and continued for twelve days. Throughout the test, Cambria measured the applied vacuum at the manifold, stinger, and well casing, as well as airflow rates, volatile organic vapor concentrations, and depth-to-water in the surrounding observation wells.

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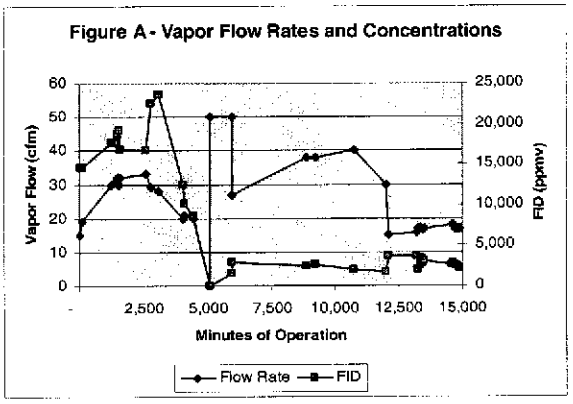
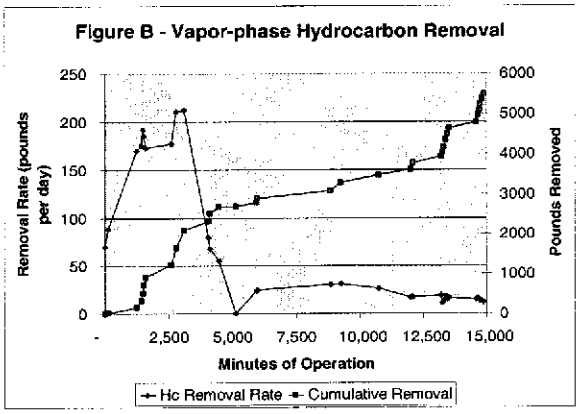
Two-Phase Extraction

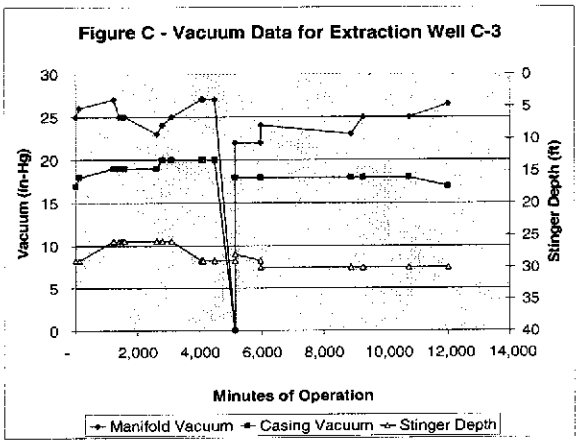
Soil vapor flow rates measured during the test varied from 15 to 50 cfm (Figure A). Hydrocarbon concentrations measured with a flame-ionizing detector (FID) ranged from 1,497 to 23,600 parts per million by volume (ppmv) (Figure A). Based on the observed flow rates and FID readings, estimated petroleum hydrocarbon removal rates during the test ranged from 212 lbs/day shortly after the test began to 11lbs/day near the end of the test (Figure B). Approximately 5,484 lbs of petroleum hydrocarbons were extracted in soil vapor during the test. Two-phase extraction system performance data is summarized in Table 1.





Cambria collected influent and effluent vapor samples from the inlet and effluent of the oxidizer on October 29, 2003. Influent and effluent vapor sample analytical results, presented in Table 2, verify compliance with Bay Area Air Quality Management District requirements. Laboratory analytical results for vapor samples collected on October 29, 2003 are included as Attachment A.

Manifold vacuum readings ranged from 22 to 27 inches of mercury ("Hg) during testing from well C-3 (Figure C). Casing vacuum readings in well C-3 ranged from 17"Hg at the start of the test to 21"Hg at the end of the test (Figure C). Manifold and casing vacuum measurements were similar during extraction from well C-6. The difference in manifold vacuum and casing vacuum is the result of vacuum losses incurred due to groundwater extraction.



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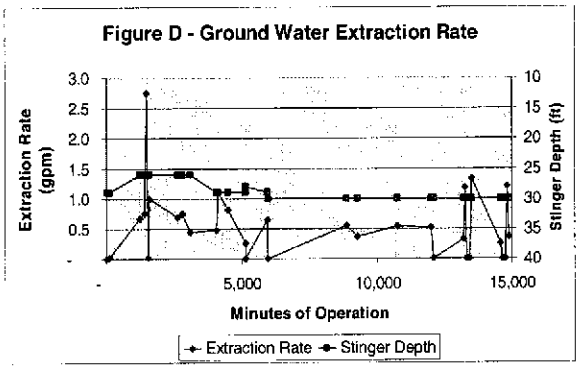
As indicated in Figure D, groundwater extraction rates during the test ranged from 0 to 2.75 gallons per minute (gpm). The average groundwater extraction rate over the course of the entire test was 0.71 gpm, producing about 7,703 gallons of groundwater. Groundwater production data is summarized in Table 3.



As indicated in Figure E, the water table drawdown influence resulting from TPE dewatering activities after almost seven days (154 hours) of extraction from well C-3 was widespread, indicating that groundwater extraction via TPE was effective in depressing the water table beneath the site. The groundwater level in well C-1, located about 37 feet northeast of extraction well C-3, was depressed approximately 3.2 feet after 154 hours of testing. A drawdown of approximately 1.32 feet was observed during the same time period in well C-5, located about 75 feet south of extraction well C-3.

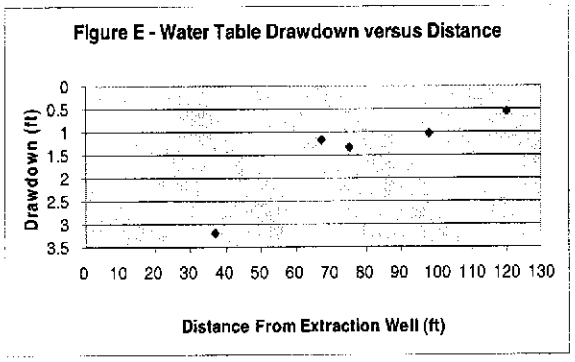
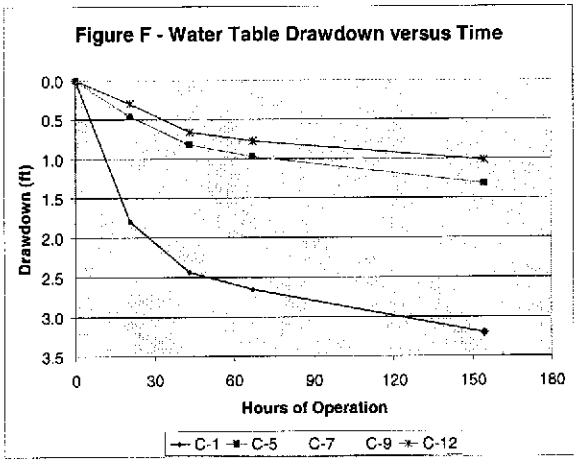


Figure F shows water table drawdown versus time in observation wells C-1, C-5, C-7, C-9, and C-12 during the first 154 hours of extraction from well C-3. Table 4 presents drawdown measurements recorded in observation wells C-1, C-5, C-7, C-9, and C-12 at various intervals during the test.



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CONCLUSIONS AND RECOMMENDATIONS

Based on the test results, it appears that the TPE test conducted at the site achieved all of the primary goals. Test results indicate that TPE could be a viable and applicable remedial option for this site. Sustained groundwater extraction rates of less than 1 gpm and water table drawdown rates of over 3 feet in an observation well located over 30 ft away from the extraction well show that the site can be dewatered using TPE technology. Vapor-phase hydrocarbon mass removal rates observed in source area wells during the test indicate there is significant hydrocarbon mass in the subsurface that can be recovered using TPE technology.

Chevron and Cambria will be meeting in the near future with Chevron's Remediation System Review Team (RSRT) to evaluate the TPE pilot test data and provide recommendations for future remedial actions at the site. We anticipate the RSRT review will take place during the third quarter 2005. We will contact your office after meeting with the RSRT to set up a meeting with the Alameda County Health Care Services Agency to discuss the RSRT recommendations and future site activities.

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CLOSING

Please call Brian Busch at (510) 420-3347, or Mr. Mark Inglis of Chevron at (925) 842-1589 if you have any questions or comments.

Sincerely,
Cambria Environmental Technology, Inc.

Brian Busch
Senior Project Scientist

Scott Macleod, R.G.
Principal Geologist

PROFESSIONAL GEOLOGIST
N. SCOTT MACLEOD
No. 5747
STATE OF CALIFORNIA

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Figures: 1 – Site Map

Tables: 1 – TPE System Performance Data
2 – Soil Vapor Sample Analytical Results
3 – Groundwater Production Data
4 – Water Level Drawdown Data

Attachments: A – Laboratory Analytical Results for Soil Vapor Samples

cc: Mr. Mark Inglis, Chevron Products Company, P.O. Box 6012, Room K2256 San Ramon, CA 94583
Mr. Chuck Headlee, RWQCB – San Francisco Bay Region, 1515 Clay Street, Suite 1400, Oakland, CA 94612
Mr. Kevin Hinckley, 5269 Crow Canyon Road, Castro Valley, CA 94546
Ms. Diane Riggs, Forest Creek Townhomes Assoc., c/o Walsh Property Management, P.O. Box 2657, Castro Valley, CA 94541

07/15/05

EXPLANATION

- C-1 Monitoring well location
- C-4 Abandoned/destroyed monitoring well location
- RW Recovery well location

CROW CREEK

ACCESS ROAD

C-10B

C-10A

Abandoned Lot

C-15

C-16

Residential

Residential

Residential

C-12

C-11

C-9

WATERFORD PLACE

CROW CANYON ROAD

C-6

C-4

RW

Used Oil Tank

C-3

C-1

Former USTs

C-2

Residential

Parking Lot

Property Line

C-7

Former Station Building

Pump Islands

C-5

C-14

C-8

Station Wall

C-13

0 20 40 80

Scale (ft)

Basemap modified from drawing provided by Getler-Ryan, Inc.

119-5607 CASTRO VALLEY\FIGURES\SITE PLAN 7-05.DWG

FIGURE

1

Site Plan

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Chevron Service Station #9-5607

5269 Crow Canyon Road

Castro Valley, California

Table 1. TPE Pilot Test - System Performance Data. Former Chevron Service Station No. 9-5607, 5269 Crow Canyon Road, Castro Valley, California

Date	Elapsed Time (minutes)	Stinger Depth (feet) (C-3 / C-6)	System Flow Rate (cfm)	Total Throughput (ft^3)	Manifold Vacuum ("Hg)	Casing Vacuum ("Hg) (C-3 / C-6)	Influent FID Reading (ppmv)	SVE Hydrocarbon Removal Rate (lbs/day)	Cumulative SVE Hydrocarbon Removal (lbs)	Notes
10/20/03	0	29 / 25	15	0	25	17 / 10	14,550	70.02	0	
"	120	29 / 25	19	1,800	26	18 / 10	14,550	88.69	7.39	
10/21/03	1242	26 / 25	30	23,118	27	19 / 0	17,600	169.40	153.50	
"	1422	26 / 25	31	28,518	25	19 / 0	17,630	175.34	326.65	
"	1482	26 / 25	32	30,378	25	19 / 0	18,690	191.88	524.13	
"	1536	26 / 25	30	32,106	25	19 / 0	19,200	184.80	721.24	
"	1602	26 / 25	32	34,086	25	19 / 0	16,830	172.79	913.47	
10/22/03	2616	26 / 0	33	66,534	23	19 / 0	16,700	176.81	1,234.67	
"	2796	26 / 0	29	72,474	24	20 / 0	22,600	210.27	1,642.95	
"	3096	26 / 0	28	81,174	25	20 / 0	23,600	212.00	2,098.75	
10/23/03	4056	29 / 0	20	108,054	27	20 / 0	12,400	79.57	2,322.86	
"	4116	29 / 0	21	109,254	27	20 / 0	10,050	67.71	2,516.40	Vapor extracted from C-3
"	4476	29 / 0	20	116,814	27	20 / 0	8,640	55.44	2,688.73	
10/24/03	5136	29 / 0	0	130,014	0	0 / 0	NA	0.00	2,688.73	
Arrive onsite @ 0900 on 10/24/03 - system off due to empty propane tank. New test unit installed at site, tank refilled, restarted at 1930 on 10/24/03.										
10/24/03	5136	28 / 0	50	131,166	22	18 / 0	NA	0.00	2,688.73	
10/25/03	5946	29 / 0	50	171,666	22	18 / 0	1,497	24.01	2,787.89	
"	5970	30 / 0	27	172,866	24	18 / 0	2,850	24.69	2,890.24	
10/27/03	8856	30 / 0	38	250,788	23	18 / 0	2,520	30.72	3,079.18	
"	9252	30 / 0	38	265,836	25	18 / 0	2,560	31.21	3,279.71	
10/28/03	10740	30 / 0	40	322,380	25	18 / 0	2,060	26.44	3,476.88	
10/29/03	12000	30 / 0	30	372,780	26.5	17/ 0	1,730	16.65	3,615.64	
"	12090	0 / 30	15	375,480	25	0 / 17	3,630	17.47	3,762.31	
10/30/03	13200	0 / 30	16	392,130	24	0 / 20	3,700	18.99	3,936.41	
"	13260	0 / 30	17	393,090	24	0 / 20	2,050	11.05	4,038.15	
"	13320	0 / 30	17	394,098	25	0 / 20	2,490	13.90	4,166.73	
"	13380	0 / 30	17	395,142	25	0 / 20	3,450	18.60	4,339.51	
"	13440	0 / 30	17	396,150	25	0 / 20	2,760	14.79	4,477.53	
"	13500	0 / 30	17	397,152	25	0 / 20	3,000	16.17	4,629.12	Vapor extracted from C-6
10/31/03	14580	0 / 30	18	415,296	26	0 / 21	2,570	14.84	4,779.39	
"	14640	0 / 30	18	416,376	26	0 / 21	2,780	16.05	4,942.61	
"	14700	0 / 30	17	417,456	26	0 / 21	2,610	14.24	5,087.93	
"	14760	0 / 30	17	418,476	26	0 / 21	2,500	13.64	5,227.69	
"	14820	0 / 30	17	419,496	26	0 / 21	2,380	12.98	5,361.28	
"	14880	0 / 30	17	420,516	25	0 / 21	2,170	11.84	5,483.58	

Total Hours = 248

Notes:
No dilution air used during test.
cfm = cubic feet per minute.
ppm = Parts per million
lbs = Pounds
gpm = Gallons per minute
"Hg = Inches of mercury
FID = Flame Ionization Detector. FID readings were used to calculate HC mass removal rates during test.
Hydrocarbon Removal/Emission Rate = Rate based on Bay Area Air Quality Management District's Manual of Procedures for Soil Vapor Extraction dated July 17, 1991.
Rate = lab concentration (ppmv) x system flowrate (scfm) x (1lb-mole/386 ft^3) x molecular weight (86 lb/lb-mole for TPH-Gas hexane) x 1440 min/day x 1/1,000,000.

Table 2. TPE Pilot Test - Soil Vapor Analytical Results - Former Chevron Service Station No.9-5607, 5269 Crow Canyon Road, Castro Valley

Sample Point	Operating Wells	Date	MTBE	TPHg	B	T	E	X	Flow Rate (CFM)	FID Reading (ppm)
			(All results reported in ppmv)							
INFLUENT	C-3	10/29/03	400	2,600	50	4	6	30	30	1,730
EFFLUENT	C-3	10/29/03	<0.4	4.3	<0.5	1	0.7	3	30.0	---

Abbreviations and Notes:

MTBE = Methyl tert-butyl ether by Modified EPA Method 18 and 25
TPHg = Total petroleum hydrocarbons as gasoline by Modified EPA Method 18 and 25
B = Benzene by Modified EPA Method 18 and 25
T = Toluene by Modified EPA Method 18 and 25
E = Ethlybenzene by Modified EPA Method 18 and 25
X = Xylenes by Modified EPA Method 18 and 25
ppmv = Parts per million by volume
FID = Flame Ionizing Detector
CFM = Cubic feet per minute, measured with TSI anemometer
<n = Below detection limit of n ppmv
--- = Not analyzed / Not available

Table 3. TPE Pilot Test - Groundwater Production Data. Former Chevron Service Station No. 9-5607, 5269 Crow Canyon Road, Castro Valley, California

Date	Elapsed Time (minutes)	Stinger Depth (C-3 / C-6) (feet)	Interval Produced Water Volume (gallons)	Interval Water Flow Rate (gpm)	Cumulative Water Produced (gallons)	Notes
10/20/03	0	29 / 25	0	0.00	0	
"	120	29 / 25	3	0.03	3	
10/21/03	1242	26 / 25	757	0.67	760	
"	1422	26 / 25	137	0.76	897	
"	1482	26 / 25	165	2.75	1,062	
"	1536	26 / 25	1	0.02	1,063	
"	1602	26 / 25	66	1.00	1,129	
10/22/03	2616	26 / 0	704	0.69	1,833	
"	2796	26 / 0	134	0.74	1,967	
"	3096	26 / 0	132	0.44	2,099	
10/23/03	4056	29 / 0	461	0.48	2,560	Water extracted from C-3
"	4116	29 / 0	66	1.10	2,626	
"	4476	29 / 0	294	0.82	2,920	
10/24/03	5136	29 / 0	172	0.26	3,092	
10/24/03	5136	28 / 0	0	0.00	3,092	
10/25/03	5946	29 / 0	527	0.65	3,619	
"	5970	30 / 0	0	0.00	3,619	
10/27/03	8856	30 / 0	1,605	0.56	5,224	
"	9252	30 / 0	145	0.37	5,369	
10/28/03	10740	30 / 0	801	0.54	6,170	
10/29/03	12000	30 / 0	657	0.52	6,827	
"	12090	0 / 30	0	0.00	6,827	
10/30/03	13200	0 / 30	355	0.32	7,182	
"	13260	0 / 30	71	1.18	7,253	
"	13320	0 / 30	0	0.00	7,253	
"	13380	0 / 30	0	0.00	7,253	
"	13440	0 / 30	0	0.00	7,253	
"	13500	0 / 30	80	1.33	7,333	Water extracted from C-6
10/31/03	14580	0 / 30	276	0.26	7,609	
"	14640	0 / 30	0	0.00	7,609	
"	14700	0 / 30	0	0.00	7,609	
"	14760	0 / 30	0	0.00	7,609	
"	14820	0 / 30	72	1.20	7,681	
"	14880	0 / 30	22	0.37	7,703	
	Total: 14,880 minutes		**Total: 7,703 gallons**	**Average Flow Rate = 0.71 GPM**		

lbs = Pounds
gpm = Gallons per minute
ug/l = micrograms per liter

Table 4. TPE Pilot Test - Water Level Drawdown Data. Former Chevron Service Station No. 9-5607, 5269 Crow Canyon Road, Castro Valley, California

Date	Interval Hours	Total Elapsed Hours	GWE Rate (gpm)	C-1 DTW (feet)	C-1 drawdown (feet)	C-5 DTW (feet)	C-5 drawdown (feet)	C-7 DTW (feet)	C-7 drawdown (feet)	C-9 DTW (feet)	C-9 drawdown (feet)	C-12 DTW (feet)	C-12 drawdown (feet)	Notes
10/20/03 12:30 PM	2699	0	0.00	19.50	0.00	21.27	0.00	5.26	0.00	10.40	0.00	10.59	0.00	
10/21/03 9:00 AM	2720	21	1.18	21.30	1.80	21.73	0.46	5.54	0.28	10.80	0.40	10.89	0.30	
10/22/03 8:00 AM	2742	43	0.78	21.93	2.43	22.09	0.82	6.00	0.74	10.88	0.48	11.25	0.66	
10/23/03 8:00 AM	2766	67	0.50	22.15	2.65	22.25	0.98	6.13	0.87	10.97	0.57	11.37	0.78	
10/27/03 3:30 PM	2853	154	0.56	22.70	3.20	22.59	1.32	6.43	1.17	10.95	0.55	11.61	1.02	
Distance from C-3:				**37**		**75**		**67**		**120**		**98**		

Notes:
gpm = Gallons per minute
DTW = Depth to water
Readings collected during extraction from well C-3.

ATTACHMENT A

Laboratory Analytical Results for Soil Vapor Samples

Lancaster Laboratories

ANALYTICAL RESULTS

Prepared for:

ChevronTexaco
6001 Bollinger Canyon Rd L4310
San Ramon CA 94583

925-842-8582

Prepared by:

Lancaster Laboratories
2425 New Holland Pike
Lancaster, PA 17605-2425

SAMPLE GROUP

The sample group for this submittal is 873057. Samples arrived at the laboratory on Friday, October 31, 2003. The PO# for this group is 99011184 and the release number is STREICH.

Client Description	Lancaster Labs Number
IN Grab Tedlar Bag Sample	4154853
EFF Grab Tedlar Bag Sample	4154854

1 COPY TO Cambria Environmental Attn: Brian Busch

Questions? Contact your Client Services Representative
Alison M O'Connor at (717) 656-2300.

Respectfully Submitted,

Robert E. Mellinger
Sr. Chemist/Coordinator

Lancaster Laboratories
2425 New Holland Pike • Lancaster, PA 17601

Explanation of Symbols and Abbreviations

The following defines common symbols and abbreviations used in reporting technical data:

N.D.	none detected	**BMQL**	Below Minimum Quantitation Level
TNTC	Too Numerous To Count	**MPN**	Most Probable Number
IU	International Units	**CP Units**	cobalt-chloroplatinate units
umhos/cm	micromhos/cm	**NTU**	nephelometric turbidity units
C	degrees Celsius	**F**	degrees Fahrenheit
meq	milliequivalents	**lb.**	pound(s)
g	gram(s)	**kg**	kilogram(s)
ug	microgram(s)	**mg**	milligram(s)
ml	milliliter(s)	**l**	liter(s)
m3	cubic meter(s)	**ul**	microliter(s)

< less than - The number following the sign is the limit of quantitation, the smallest amount of analyte which can be reliably determined using this specific test.

> greater than

J estimated value – The result falls within the Method Detection Limit (MDL) and Limit of Quantitation (LOQ).

ppm parts per million - One ppm is equivalent to one milligram per kilogram (mg/kg), or one gram per million grams. For aqueous liquids, ppm is usually taken to be equivalent to milligrams per liter (mg/l), because one liter of water has a weight very close to a kilogram. For gases or vapors, one ppm is equivalent to one microliter of gas per liter of gas.

ppb parts per billion

Dry weight basis Results printed under this heading have been adjusted for moisture content. This increases the analyte weight concentration to approximate the value present in a similar sample without moisture. All other results are reported on an as-received basis.

U.S. EPA CLP Data Qualifiers:

Organic Qualifiers

A	TIC is a possible aldol-condensation product
B	Analyte was also detected in the blank
C	Pesticide result confirmed by GC/MS
D	Compound quantitated on a diluted sample
E	Concentration exceeds the calibration range of the instrument
N	Presumptive evidence of a compound (TICs only)
P	Concentration difference between primary and confirmation columns >25%
U	Compound was not detected
X,Y,Z	Defined in case narrative

Inorganic Qualifiers

B	Value is <CRDL, but >IDL
E	Estimated due to interference
M	Duplicate injection precision not met
N	Spike sample not within control limits
S	Method of standard additions (MSA) used for calculation
U	Compound was not detected
W	Post digestion spike out of control limits
*****	Duplicate analysis not within control limits
+	Correlation coefficient for MSA <0.995

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Analysis Report

Lancaster Laboratories

Lancaster Laboratories Sample No. AQ 4154853

IN Grab Tedlar Bag Sample
Facility# 95607
5269 Crow Canyon Rd.; Castro Valley, CA
Collected:10/29/2003 12:00

Account Number: 10880

Submitted: 10/31/2003 09:50
Reported: 11/06/2003 at 09:52
Discard: 12/07/2003

ChevronTexaco
6001 Bollinger Canyon Rd L4310
San Ramon CA 94583

CAT No.	Analysis Name	CAS Number	As Received Result	As Received Method Detection Limit	Units	Dilution Factor
07045	MTBE	1634-04-4	400.	0.4	ppm(v)	1
07048	C2-C10 Hydrocarbons	n.a.	2,600.	1.0	ppm(v) hexane	1
07059	BTEX					
07063	Benzene	71-43-2	50.	0.5	ppm(v)	1
07064	Toluene	108-88-3	4.	0.8	ppm(v)	1
07065	Ethylbenzene	100-41-4	6.	0.4	ppm(v)	1
07068	Xylene (total)	1330-20-7	30.	0.7	ppm(v)	1

State of California Lab Certification No. 2116

Laboratory Chronicle

CAT No.	Analysis Name	Method	Trial#	Analysis Date and Time	Analyst	Dilution Factor
07045	MTBE	EPA Method 18 modified	1	10/31/2003 20:13	Douglas Graham	1
07048	C2-C10 Hydrocarbons	EPA Method 25 modified	1	10/31/2003 20:13	Douglas Graham	1
07059	BTEX	EPA Method 18 modified	1	10/31/2003 20:13	Douglas Graham	1

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Lancaster, PA 17605-2425
717-656-2300 Fax: 717-656-2681

Lancaster Laboratories
2425 New Holland Pike • Lancaster, PA 17601

Explanation of Symbols and Abbreviations

The following defines common symbols and abbreviations used in reporting technical data:

N.D.	none detected	**BMQL**	Below Minimum Quantitation Level
TNTC	Too Numerous To Count	**MPN**	Most Probable Number
IU	International Units	**CP Units**	cobalt-chloroplatinate units
umhos/cm	micromhos/cm	**NTU**	nephelometric turbidity units
C	degrees Celsius	**F**	degrees Fahrenheit
meq	milliequivalents	**lb.**	pound(s)
g	gram(s)	**kg**	kilogram(s)
ug	microgram(s)	**mg**	milligram(s)
ml	milliliter(s)	**l**	liter(s)
m3	cubic meter(s)	**ul**	microliter(s)

< less than - The number following the sign is the limit of quantitation, the smallest amount of analyte which can be reliably determined using this specific test.

> greater than

J estimated value – The result falls within the Method Detection Limit (MDL) and Limit of Quantitation (LOQ).

ppm parts per million - One ppm is equivalent to one milligram per kilogram (mg/kg), or one gram per million grams. For aqueous liquids, ppm is usually taken to be equivalent to milligrams per liter (mg/l), because one liter of water has a weight very close to a kilogram. For gases or vapors, one ppm is equivalent to one microliter of gas per liter of gas.

ppb parts per billion

Dry weight basis Results printed under this heading have been adjusted for moisture content. This increases the analyte weight concentration to approximate the value present in a similar sample without moisture. All other results are reported on an as-received basis.

U.S. EPA CLP Data Qualifiers:

Organic Qualifiers

A	TIC is a possible aldol-condensation product
B	Analyte was also detected in the blank
C	Pesticide result confirmed by GC/MS
D	Compound quantitated on a diluted sample
E	Concentration exceeds the calibration range of the instrument
N	Presumptive evidence of a compound (TICs only)
P	Concentration difference between primary and confirmation columns >25%
U	Compound was not detected
X,Y,Z	Defined in case narrative

Inorganic Qualifiers

B	Value is <CRDL, but ≥IDL
E	Estimated due to interference
M	Duplicate injection precision not met
N	Spike sample not within control limits
S	Method of standard additions (MSA) used for calculation
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Analysis Report

Lancaster Laboratories

Lancaster Laboratories Sample No. AQ 4154854

EFF Grab Tedlar Bag Sample
Facility# 95607
5269 Crow Canyon Rd.; Castro Valley, CA
Collected:10/29/2003 12:00

Account Number: 10880

Submitted: 10/31/2003 09:50
Reported: 11/06/2003 at 09:52
Discard: 12/07/2003

ChevronTexaco
6001 Bollinger Canyon Rd L4310
San Ramon CA 94583

CAT No.	Analysis Name	CAS Number	As Received Result	As Received Method Detection Limit	Units	Dilution Factor
07045	MTBE	1634-04-4	N.D.	0.4	ppm(v)	1
07048	C2-C10 Hydrocarbons	n.a.	4.3	1.0	ppm(v) hexane	1
07059	BTEX					
07063	Benzene	71-43-2	N.D.	0.5	ppm(v)	1
07064	Toluene	108-88-3	1.	0.8	ppm(v)	1
07065	Ethylbenzene	100-41-4	0.7	0.4	ppm(v)	1
07068	Xylene (total)	1330-20-7	3.	0.7	ppm(v)	1

State of California Lab Certification No. 2116

Laboratory Chronicle

CAT No.	Analysis Name	Method	Trial#	Analysis Date and Time	Analyst	Dilution Factor
07045	MTBE	EPA Method 18 modified	1	10/31/2003 20:43	Douglas Graham	1
07048	C2-C10 Hydrocarbons	EPA Method 25 modified	1	10/31/2003 20:43	Douglas Graham	1
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N	Presumptive evidence of a compound (TICs only)	**U**	Compound was not detected
P	Concentration difference between primary and confirmation columns >25%	**W**	Post digestion spike out of control limits
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Lancaster Laboratories

Quality Control Summary

Client Name: ChevronTexaco Group Number: 873057
Reported: 11/06/03 at 09:52 AM

Laboratory Compliance Quality Control

Analysis Name	Blank Result	Blank MDL	Report Units	LCS %REC	LCSD %REC	LCS/LCSD Limits	RPD	RPD Max
Batch number: M033071AA	Sample number(s): 4154853-4154854							
MTBE	N.D.	0.4	ppm(v)					
C2-C10 Hydrocarbons	N.D.	1.0	ppm(v)					
Benzene	N.D.	0.5	ppm(v)	108		52-155		
Toluene	N.D.	0.8	ppm(v)	119		57-150		
Ethylbenzene	N.D.	0.4	ppm(v)	122		59-152		
Xylene (total)	N.D.	0.7	ppm(v)	120		63-163		

*- Outside of specification
(1) The result for one or both determinations was less than five times the LOQ.
(2) The background result was more than four times the spike added.

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Chevron California Region Analysis Request/Chain of Custody

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Where quality is a science.

For Lancaster Laboratories use only
Acct. #: 10880 Sample #: 415485 3-54 873057 SCR#:

103003-004

Facility #: 9-5607, Castro Valley
Site Address: 5269 Crow Canyon Rd., Castro Valley, CA
Chevron PM: Karen Streich Lead Consultant: Cambria
Consultant/Office: 5900 Hollis St, Ste. H, Emeryville CA 94608
Consultant Prj. Mgr.: Brian Busch
Consultant Phone #: 510-420-3347 Fax #: 510-420-9170
Sampler:
Service Order #: ☐ Non SAR:

Sample Identification	Date Collected	Time Collected	Grab	Composite	Matrix: Soil	Matrix: Water (☐ Potable ☐ NPDES)	Matrix: Oil ☐ Air ☒	Total Number of Containers	Analyses Requested / Preservation Codes: BTEX + MTBE 8260 ☒ 8021 ☐	TPH 8015 MOD GRO	TPH 8015 MOD DRO ☐ Silica Gel Cleanup	8260 full scan	Oxygenates	Lead 7420 ☐ 7421 ☐
IN	10/29/03	1200	X				X	1	X	X				
EFF	10/29/03	1200	X				X	1	X	X				

Preservative Codes
H = HCl T = Thiosulfate
N = HNO_3 B = NaOH
S = H_2SO_4 O = Other

☐ J value reporting needed
☐ Must meet lowest detection limits possible for 8260 compounds
8021 MTBE Confirmation
☐ Confirm highest hit by 8260
☐ Confirm all hits by 8260
☐ Run ____ oxy s on highest hit
☐ Run ____ oxy s on all hits

Comments / Remarks

Turnaround Time Requested (TAT) (please circle)
STD. TAT 72 hour 48 hour
24 hour 4 day 5 day

Data Package Options (please circle if required)
QC Summary
Type VI (Raw Data)
WIP (RWQCB)
Disk
Type I — Full
☒ Coelt Deliverable not needed

	Date	Time		Date	Time
Relinquished by:	10/30/03	1245	Received by: Bernardo Arroyo	10/30/03	1245
Relinquished by: Bernardo Arroyo	10/30/03	1440	Received by: Airborne	10/30/03	
Relinquished by:	Date	Time	Received by:	Date	Time
Relinquished by Commercial Carrier: UPS FedEx Other Airborne			Received by:	Date	Time
Temperature Upon Receipt 2.5 C°			Custody Seals Intact? Yes No		