Oakland
All-America City
1993

CITY OF OAKLAND

98 DEC -7 PM 1:10

DALZIEL BUILDING • 250 FRANK H. OGAWA PLAZA, SUITE 5301 • OAKLAND, CALIFORNIA 94612

Public Works Agency
Environmental Services

(510) 238-6688
FAX (510) 238-7286
TDD (510) 238-7644

#3978

December 3, 1998

Mr. Barney Chan
Alameda County Environmental Health Services
1131 Harbor Bay Parkway
Alameda, California 94502-6577

Subject: Third Quarter (August 1998) Monitoring Report – City of Oakland Municipal Service Center (94407)

Dear Mr. Chan:

Enclosed is one copy of the *Third Quarter (August 1998) Monitoring Report*, prepared by our consultant, Cambria Environmental Technology, Inc., for the City of Oakland's Municipal Service Center at 7101 Edgewater Drive. Several changes to the sampling and analysis schedule are proposed in the report for your consideration. I will call you in the near future to discuss the possibility of implementing the proposed changes in time for the February 1999 sampling event.

Fourth quarter 1998 groundwater monitoring was performed in November in accordance with the current quarterly monitoring schedule. A report containing the results will be sent to you in January 1999.

Please call me at 238-7695, if you have any questions or require additional information.

Sincerely,

/Mark B Hersh

Mark B. Hersh
Environmental Program Specialist

cc: (w enclosure)
Dianne Heinz, Port of Oakland
(w/o enclosure)
Andrew Clark-Clough
David Elias, Cambria Environmental Technology, Inc.

CAMBRIA

November 11, 1998

Mr. Mark Hersh, R.G.
City of Oakland, Public Works Agency
Environmental Services Division
250 Frank H. Ogawa Plaza, Ste. 5301
Oakland, California 94612

Re: **Third Quarter 1998 Monitoring Report**
City of Oakland, Municipal Services Center
7101 Edgewater Drive
Oakland, California
Cambria Project #153-1247-007

Dear Mr. Hersh:

As required by the Alameda County Health Care Services Agency (ACHCSA), Cambria Environmental Technology, Inc. (Cambria) has prepared this third quarter 1998 groundwater monitoring report for the site referenced above. Presented below are the third quarter 1998 activities and results and the anticipated fourth quarter 1998 activities. Groundwater elevations and hydrocarbon concentrations are presented on Figure 1. Analytic results are tabulated in Tables 1, 2, and 3, and the laboratory analytical report is included as Attachment A. Well sampling forms, completed in the field, are included as Attachment B, and our standard field procedures for sampling monitoring wells are included in Attachment C.

THIRD QUARTER 1998 ACTIVITIES AND RESULTS

On August 18, 1998, Cambria gauged and collected groundwater samples from wells MW-1 through MW-10 (Figure 1). Cambria inspected all wells for separate-phase hydrocarbons (SPH) prior to sampling. Samples were analyzed for total petroleum hydrocarbons (TPH) as gasoline (TPHg), TPH as diesel (TPHd), TPH as kerosene (TPHk), TPH as motor oil (TPHmo), benzene, toluene, ethylbenzene and xylenes (BTEX), and methyl tert-butyl ether (MTBE), sodium, chloride, nitrate, sulfate, lead, nickel, and total alkalinity at McCampbell Analytical of Pacheco, California, a California state-certified laboratory. In addition, Cambria measured dissolved oxygen (DO) concentrations, oxidation reduction potential (ORP), and ferrous iron concentrations in the field. The analytes selected for each well are listed in the table below titled "Approved Well Sampling Protocol". Our well sampling protocol was approved by the Alameda County Health Care Services Agency (ACHCSA) prior to sampling.

Oakland, CA
Sonoma, CA
Portland, OR
Seattle, WA

Cambria Environmental Technology, Inc.

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

Approved Well Sampling Protocol

Well	Sampling Frequency	Analytes
MW-1	1st and 3rd Quarter	TPHd, TPHg/BTEX/ MTBE, bioparameters, sodium, chloride
MW-2	1st and 3rd Quarter	TPHd , TPHg/BTEX/MTBE, total lead, bioparameters, sodium, chloride
MW-3	1st and 3rd Quarter	Bioparameters, sodium, chloride
MW-4	1st and 3rd Quarter	Bioparameters, sodium, chloride
MW-5	1st and 3rd Quarter	TPHd, TPHk, TPHmo, TPHg/BTEX/MTBE, bioparameters, sodium, chloride
MW-6	1st and 3rd Quarter	TPHd, TPHg/BTEX/MTBE, bioparameters, sodium, chloride
MW-7	1st and 3rd Quarter	Nickel, bioparameters, sodium, chloride
MW-8	1st, 2nd, 3rd, and 4th Quarter	TPHd, TPHk, TPHmo, TPHg/BTEX/MTBE, bioparameters, sodium, chloride
MW-9	1st, 2nd, 3rd, and 4th Quarter	TPHd, TPHk, TPHmo, TPHg/BTEX/MTBE, bioparameters, sodium, chloride
MW-10	1st, 2nd, 3rd, and 4th Quarter	TPHd, TPHk, TPHmo, TPHg/BTEX/MTBE, bioparameters, sodium, chloride

Bioparameters = ferrous iron, ORP, DO, total alkalinity, nitrate and sulfate.

Groundwater Flow Direction

Depth-to-water measurements collected on August 18, 1998 indicate a groundwater gradient of 0.006 ft/ft toward Damon Slough in the northern portion of the site and a groundwater gradient of 0.004 ft/ft toward San Leandro Bay in the southern portion of the site (Figure 1). Groundwater gradients and elevations are tidally influenced and, therefore, are expected to vary as is the groundwater flow direction. All wells, except well MW-2, were gauged within a thirty-minute period to minimize tidal influence and ensure proper determination of groundwater flow direction at the time of gauging. Groundwater elevation data are presented in Table 1.

Hydrocarbon Distribution in Groundwater

Well MW-6 contained 0.125 inches of SPH. With the exception of TPHmo concentrations in MW-10, concentrations of all other chemicals of concern were highest in site well MW-5, located adjacent to three active underground storage tanks (USTs). MW-5 contained 5,800 ppb TPHg, 500 ppb benzene, 6,700 ppb MTBE, 1,400 ppb TPHd, and 1,700 ppb TPHk. MW-10 contained 520 ppb

1.8 89,500,000 Cl

1 ~~49,500,000~~ Na

139

	Na	Cl	
SLB	5700	14400	1 : 2.5
Dana Slough	5700	14400	1 : 2.4

TPHmo. MW-5 was the only well sampled that contained MTBE. The source of this positive MTBE result may be the adjacent fuel dispensing system. However, the tanks tested tight recently, and the piping is scheduled for a complete upgrade in the near future.

Hydrocarbons were detected in downgradient wells MW-8, MW-9, and MW-10. Of these three wells, MW-9 had the highest TPHg and benzene concentrations: 740 ppb TPHg and 370 ppb benzene. Downgradient concentrations of TPHd and TPHmo were highest in MW-10 at 240 ppb and 520 ppb, respectively. Downgradient concentrations of TPHk were highest in MW-9 at 160 ppb.

In general, hydrocarbon concentrations in wells MW-1, 2, and 5 increased slightly and concentrations in wells MW-7, 8, 9, and 10 decreased or remained stable. The concentration trends at the site were generally similar to those detected during historical 3rd quarter sampling events.

Salt Water Intrusion

To determine the degree of salt water intrusion beneath the site, the City of Oakland's former environmental consultant, Dove Engineering Group, Inc. (DEGI), had proposed collecting and analyzing groundwater samples for sodium and chloride. By comparing the concentrations of these two elements in groundwater with those found in the bay and slough, DEGI reasoned that preferential hydraulic conductivity pathways through the site's subsurface could be identified.

Cambria analyzed samples collected from wells MW-1 through MW-5 and MW-7 through MW-10, and from San Leandro Bay and Damon Slough for sodium and chloride. Analytic results are presented in Table 2.

Sodium and chloride concentrations vary from well to well, and between groundwater and surface water. No patterns can be identified that relate sodium or chloride ratios to the distance between the well and San Leandro Bay or Damon Slough, or that relate sodium or chloride ratios to borehole lithology. However, the groundwater collected from well MW-3 contains higher concentrations of both sodium and chloride than the samples collected from the bay, and all of the samples collected contain higher concentrations of chloride than sodium.

Although the groundwater collected from the wells is brackish, it contains significantly lower concentrations of both sodium and chloride than the San Leandro Bay (with the exception of clean, crossgradient well MW-3). Therefore, based on the existing well locations, it is unlikely that significant high permeability hydraulic conduits connect the Municipal Service Center subsurface to the bay.

Bioparameter Analyses Results

To assess the present level of intrinsic bioremediation, Cambria measured ferrous iron, total alkalinity, oxidation reduction potential (ORP), and dissolved oxygen (DO) and analyzed samples for nitrate and sulfate content. Comparison of hydrocarbon concentrations with the above bioparameters indicate that active biodegradation of hydrocarbons may be occurring at the site. The analytic results and the relative hydrocarbon concentrations are presented in Table 2.

Nitrate was not detected in any of the wells. Sulfate concentrations were one to two orders of magnitude greater in wells containing little or no hydrocarbons. Ferrous iron concentrations appeared to increase with increasing hydrocarbon concentrations. Alkalinity and DO concentrations did not vary consistently in relation to changes in hydrocarbon concentrations. However, the lowest DO concentration of 7.0 ppm was detected in tank backfill well TBW-3, that contained the highest TPHd concentration of 810,000 ppb.

The relationships between the bioparameters and hydrocarbon concentrations present apparently conflicting conclusions. The inverse relationship between sulfate and hydrocarbon concentrations and the direct relationship between ferrous iron and hydrocarbon concentrations indicate active anaerobic degradation of hydrocarbons. However, nitrate, total alkalinity, and DO concentrations do not vary in consistent patterns suggesting that biodegradation may not be occurring at a substantial rate. Additional sampling for bioparameters during subsequent quarters may clarify the apparently conflicting analytic results.

ANTICIPATED FOURTH QUARTER 1998 MONITORING ACTIVITIES

Cambria will gauge and measure any SPH detected MW-1 through MW-10, and collect groundwater samples from well MW-8, 9, and 10. Cambria proposes collecting and analyzing water samples according to the protocol tabulated below for future sampling events.

We recommend analyzing samples from MW-1 for TPHk and TPHmo because concentrations of these chemicals were detected in downgradient well MW-10. We also recommend adding TPHg/BTEX and TPHd to well MW-7 to compare to the bioparameter analyses. The total lead concentration in MW-2 and the nickel concentration in MW-7 were both below detection limits. These metals are not chemicals of concern at the site, so we recommend discontinuing these analyses. We propose removing sodium and chloride from the sampling protocol because the preliminary results indicate that relative concentrations of these elements are not controlled by identifiable variations in site lithology. If MTBE is detected in MW-5, we recommend against confirmation analysis by mass spectrometer since the results were positively confirmed this quarter

by EPA Method 8260. Any positive MTBE results in other wells, however, will be confirmed by EPA Method 8260.

We also recommend destroying wells MW-3 and MW-4. Concentrations of chemicals of concern in these offsite and crossgradient wells have always been below laboratory detection levels.

OK

Proposed Well Sampling Protocol

Well	Sampling Frequency	Proposed Analytes	Additions	Removals
MW-1	1st and 3rd Quarter	TPHd, TPHk, TPHmo, TPHg/ BTEX/ MTBE, bioparameters	TPHk, TPHmo	sodium, chloride
MW-2	1st and 3rd Quarter	TPHd , TPHg/BTEX/MTBE, bioparameters		Total lead, sodium, chloride
MW-3		None - destroy well		Sodium, chloride
MW-4		None - destroy well		Sodium, chloride
MW-5	1st and 3rd Quarter	TPHd, TPHk, TPHmo, TPHg/ BTEX/MTBE*, bioparameters		Sodium, chloride
MW-6	1st and 3rd Quarter	TPHd, TPHg/BTEX/MTBE, bioparameters		Sodium, chloride
MW-7	1st and 3rd Quarter	Bioparameters	TPHd, TPHg/ BTEX/MTBE	Nickel, sodium, chloride
MW-8	1st, 2nd, 3rd, and 4th Quarter	TPHd, TPHk, TPHmo, TPHg /BTEX/MTBE, bioparameters		Sodium, chloride
MW-9	1st, 2nd, 3rd, and 4th Quarter	TPHd, TPHk, TPHmo, TPHg/ BTEX/MTBE, bioparameters		Sodium, chloride
MW-10	1st, 2nd, 3rd, and 4th Quarter	TPHd, TPHk, TPHmo, TPHg/ BTEX/MTBE, bioparameters		Sodium, chloride

*MTBE to be analyzed by EPA Method 8020 in MW-5, confirmation by EPA Method 8260 not necessary due to positive confirmation results this quarter.
Bioparameters = Ferrous iron, ORP, DO, total alkalinity, nitrate, and sulfate and conducted only during 1st and 3rd quarters.

Following field activities, Cambria will tabulate the analytic data, contour groundwater elevations, and write a quarterly monitoring report.

1/7/99 Conv/D Schultz.
Na/Cl can used to predict preferential pathways. (channels) not that there's no saltwater intrusion

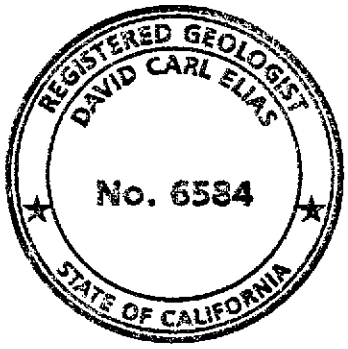
CLOSING

Please call me at (510) 420-3341 or David Elias at (510) 420-3307, if you have any questions or comments regarding this report or anticipated site activities.

Sincerely,
Cambria Environmental Technology, Inc.

Robert W. Schultz
Senior Staff Geologist

David Elias, R.G.
Senior Geologist



Attachment: A - Laboratory Analytical Report
B - Well Sampling Forms
C - Standard Procedures for Monitoring Wells

H:\City of Oakland\MSC\QM\3rdqtr98\3q98.wpd

10/23/98

Groundwater Elevation Contour Map

August 19, 1998

EXPLANATION

- Monitoring well location
- TBW-1 — Tank Backfill Well
- NG — Not gauged this quarter
- NSV — Not surveyed
- NS — Not sampled for TPHg/TPHd/benzene
- SPH — Not sampled due to presence of separate phase hydrocarbons
- * — Well gauged outside of 30 minute time frame; may have had tidal influence
- Well-ID / ELEV — Ground water elevation, feet above mean sea level (msl)
- TPHg / TPHd / Benzene — TPHg, TPHd, and benzene concentrations are in parts per billion (ppb)
- 0.004 — Approximate ground water flow direction and gradient
- Fence

DAMON SLOUGH

EDGEWATER DRIVE

SAN LEANDRO BAY

MW-4 2.91 NS

MW-3 NSV NS

MW-2 3.91* <50 330 4.1

MW-10 3.60 <50 740 <0.5

MW-1 5.42 780 1,200 89

MW-5 5.01 5,800 1,400 500

MW-7 4.63 NS

MW-6 NG SPH

MW-9 2.89 740 190 370

MW-8 2.73 <50 <50 1.8

TBW-1 TBW-2 TBW-3 TBW-4 TBW-5 TBW-6

Public Works Building

911 Center

Admin.

Crafts and Storage

Storage

Building No. 5

Active USTs

Former USTs

Former UST

3.0 4.0 5.0

0.006 0.004

0 75 150 300

Scale (ft)

H:\CITY OF OAK\MSC\PDS\RES\GW CONTOURS.DWG

FIGURE

1

CAMBRIA

Municipal Service Center

7101 Edgewater Drive

Oakland, California

CAMBRIA

Table 1. Groundwater Analytical Results for Fuel Hydrocarbons - City of Oakland Municipal Service Center, Oakland, California

Date	TOC Elev.	DTW	GW Elev.	BTEX Method	Notes	TPHd	TPHmo	TPHk	TPHg	Benzene	Toluene	Ethyl-benzene	Xylenes	MTBE	Organic Lead
						µg/l									
MW-1															
10/04/89	10.20	---	---	8020		---	---	---	540	65	26	14	22	---	---
10/04/89	10.20	---	---	8240		---	---	---	---	120	46	43	78	---	---
04/27/93	10.20	---	---	8020		---	---	---	<1,000	<1.0	<1.0	<1.0	<1.0	---	---
04/19/95	10.20	---	---	8020		---	---	---	3,200	880	15	23	21	---	---
07/27/95	10.20	4.62	5.58	8020		---	---	---	980	130	3.6	1.4	5.6	---	---
11/20/95	10.20	6.08	4.12	8020		---	---	---	400	99	2.8	1.1	4.6	---	---
02/21/96	10.20	4.62	5.58	8020		---	---	---	1,700	340	8.4	5.3	16	---	---
05/13/96	10.20	4.33	5.87	8020		---	---	---	7,300	2,000	30	42	38	---	---
08/27/96	10.20	5.25	4.95	8020		---	---	---	380	61	2.4	<0.5	4.2	---	---
02/23/98	10.20	1.75	8.45	8020		<50	<500	<50	820	160	4.9	3	9.7	---	---
08/19/98	10.20	4.78	5.42	8020		1,200	---	---	780	69	4.1	0.84	8.5	<5.0	---
MW-2															
10/04/89	10.47	---	---	8020		---	---	---	<30	<0.3	<0.3	<0.3	<0.3	---	---
10/04/89	10.47	---	---	8240		---	---	---	---	2.0	<2.0	<2.0	<2.0	---	---
04/27/93	10.47	---	---	8020		---	---	---	<1,000	<1.0	<1.0	<1.0	<1.0	---	---
04/19/95	10.47	---	---	8020		---	---	---	<50	1.8	<0.5	<0.5	<0.5	---	---
07/27/95	10.47	6.22	4.25	8020		---	---	---	<50	2.3	<0.5	<0.5	<0.5	---	---
11/20/95	10.47	7.49	2.98	8020		---	---	---	<50	2.2	<0.5	<0.5	<0.5	---	---
02/21/96	10.47	6.68	3.79	8020		---	---	---	<50	1.7	<0.5	<0.5	0.5	---	---
05/13/96	10.47	6.32	4.15	8020		---	---	---	---	2.0	<0.5	<0.5	<0.5	---	---
08/27/96	10.47	6.84	3.63	8020		---	---	---	---	2.4	<0.5	<0.5	<0.5	---	---

Table 1. Groundwater Analytical Results for Fuel Hydrocarbons - City of Oakland Municipal Service Center, Oakland, California

Date	TOC Elev.	DTW	GW Elev.	BTEX Method	Notes	TPHd	TPHmo	TPHk	TPHg	Benzene	Toluene	Ethyl-benzene	Xylenes	MTBE	Organic Lead
						<---------- µg/l ---------->									
MW-2															
02/24/98	10.47	5.44	5.03	8020		<50	<500	<50	---	1.6	<0.5	<0.5	<0.5	---	---
08/19/98	10.47	6.56	3.91	8020		330	---	---	<50	4.1	3.4	0.8	2.6	<5.0	<100
MW-3															
10/04/89	---	---	---	8020		---	---	---	<30	<0.3	<0.3	<0.3	<0.3	---	---
10/04/89	---	---	---	8240		---	---	---	---	<2.0	<2.0	<2.0	<2.0	---	---
02/23/98	---	---	---	8020		<50	<500	<50	---	---	---	---	---	---	---
MW-4															
10/04/89	7.89	---	---	8020		---	---	---	<30	<0.3	<0.3	<0.3	<0.3	---	---
10/04/89	7.89	---	---	8240		---	---	---	---	<2.0	<2.0	<2.0	<2.0	---	---
MW-5															
12/13/91	11.15	---	---	8020		1,900	---	---	13,000	1,500	190	970	2,500	---	---
12/13/91	11.15	---	---	8240		---	---	---	---	1,800	<250	1,000	3,800	---	---
04/27/93	11.15	---	---	8240		12,000	---	---	35,000	2,100	<1.0	1,800	2,700	---	---
04/19/95	11.15	---	---	8240		880	4,700	---	14,000	490	51	610	1,200	---	---
07/27/95	11.15	6.29	4.86	8240		590	5,000	---	22,000	1,300	54	1,500	2,400	---	---
11/20/95	11.15	6.98	4.17	8020		<50	<50	<50	8,900	430	31	610	880	---	---
02/21/96	11.15	5.97	5.18	8020		480	<50	<50	1,000	540	65	700	970	---	---
05/13/96	11.15	6.25	4.90	8020		<50	<50	<50	5,900	430	26	580	760	---	---
08/27/96	11.15	6.40	4.75	8020		2,000	<51	<51	6,600	430	27	600	650	---	---
02/23/98	11.15	4.22	6.93	8020		<50	<500	<50	740	19	1.4	41	34	---	---

Table 1. Groundwater Analytical Results for Fuel Hydrocarbons - City of Oakland Municipal Service Center, Oakland, California

Date	TOC Elev.	DTW	GW Elev.	BTEX Method	Notes	TPHd	TPHmo	TPHk	TPHg	Benzene	Toluene	Ethyl-benzene	Xylenes	MTBE	Organic Lead
						<---------- µg/l ---------->									
MW-5															
08/19/98	11.15	6.14	5.01	8020		1,400	<250	1,700	5,800	500	25	730	300	5,900	---
08/19/98	11.15	6.14	5.01	8260		---	---	---	---	---	---	---	---	6,700	---
MW-5 Dup															
12/13/91	---	---	---	8020		---	---	---	16,000	1,400	180	870	2,500	---	---
12/13/91	---	---	---	8240		---	---	---	---	1,600	<250	980	3,500	---	---
05/13/96	---	---	---	8020		<50	<50	<50	7,300	360	22	49	640	---	---
08/27/96	---	---	---	8020		6,600	<51	<51	6,300	410	25	580	620	---	---
MW-6															
12/13/91	10.98	---	---	8020		520	---	---	780	110	2.7	<2.5	5.5	---	---
12/13/91	10.98	---	---	8240		---	---	---	---	95	5	<5	<5	---	---
04/27/93	10.98	---	---	8020		<1,000	---	---	<1,000	430	4	5	10	---	---
04/19/95	10.98	---	---	8020		6,700	---	---	5,700	40	<0.8	3.9	29	---	---
07/27/95	10.98	7.09	3.89	8020		3,900	---	---	6,100	430	15	200	600	---	---
11/20/95	10.98	7.89	3.09	8020		850	---	---	6,800	160	4.6	8.0	240	---	---
02/21/96	10.98	7.40	3.58	8020		1,700	---	---	2,800	230	2.8	3.8	44	---	---
05/13/96	10.98	7.10	3.88	8020		400	<50	<50	3,100	430	12	5.2	67	---	---
08/27/96	10.98	7.42	3.56	8020		3,100	---	---	4,200	300	9.3	110	110	---	---
MW-6 DUP															
04/19/95	---	---	---	8020		3,700	---	---	3,000	310	3.1	2.7	100	---	---
07/27/95	---	---	---	8020		2,600	---	---	6,300	420	15	200	600	---	---

Table 1. Groundwater Analytical Results for Fuel Hydrocarbons - City of Oakland Municipal Service Center, Oakland, California

Date	TOC Elev.	DTW	GW Elev.	BTEX Method	Notes	TPHd	TPHmo	TPHk	TPHg	Benzene	Toluene	Ethyl-benzene	Xylenes	MTBE	Organic Lead
						<---------- µg/l ---------->									
MW-6 DUP															
11/20/95	---	---	---	8020		---	---	---	3,600	130	11	4.4	200	---	---
02/21/96	---	---	---	8020		2,500	---	---	2,200	280	3.0	4.0	4.6	---	---
MW-7															
12/13/91	11.51	---	---	8020		<50	---	---	<50	<0.5	<0.5	<0.5	<0.5	---	---
12/13/91	11.51	---	---	8240		---	---	---	---	<5	<5	<5	<5	---	---
04/27/93	11.51	---	---	8240		<1,000	---	---	<1,000	<1.0	<1.0	<1.0	<1.0	---	---
04/19/95	11.51	---	---	8240		<50	<1,000	---	<50	<2.0	<2.0	<2.0	<2.0	---	---
07/27/95	11.51	6.87	4.64	8240		<50	<1,000	---	<50	<2.0	<2.0	<2.0	<2.0	---	---
11/20/95	11.51	8.48	3.03	8020		<50	---	---	<50	<0.5	<0.5	<0.5	1.5	---	---
02/21/96	11.51	6.29	5.22	8020		<50	---	---	<50	<0.5	<0.5	<0.5	<0.5	---	---
05/13/96	11.51	6.95	4.56	8020		<50	---	---	---	<0.5	<0.5	<0.5	<0.5	---	---
08/27/96	11.51	6.80	4.71	8020		---	---	---	---	<0.5	<0.5	<0.5	<0.5	---	---
MW-8															
11/20/96	12.22	---	---	8020		880	---	---	<50	0.66	<0.5	<0.5	<0.5	---	---
11/20/97	12.22	9.59	2.63	8020		200	---	---	<50	<0.5	<0.5	<0.5	<0.5	2.0	---
02/24/98	12.22	8.42	3.80	8020		<50	<500	<50	<50	<0.5	<0.5	<0.5	<0.5	---	---
06/08/98	12.22	9.57	2.65	8020		1,200	1,000	<50	<50	<0.5	<0.5	<0.5	<0.5	---	---
08/19/98	12.22	9.49	2.73	8020		<50	<250	<50	<50	1.6	3.4	1.0	2.8	<5.0	---
MW-9															
11/20/96	10.77	---	---	8020		1,900	---	---	240	21	0.81	1.8	2.2	---	---

Table 1. Groundwater Analytical Results for Fuel Hydrocarbons - City of Oakland Municipal Service Center, Oakland, California

Date	TOC Elev.	DTW	GW Elev.	BTEX Method	Notes	TPHd	TPHmo	TPHk	TPHg	Benzene	Toluene	Ethyl-benzene	Xylenes	MTBE	Organic Lead
						<---------- µg/l ---------->									
MW-9															
11/20/97	10.77	7.91	2.86	8020		---	---	---	300	20	<0.5	<0.5	1.8	<1.0	---
02/24/98	10.77	6.11	4.66	8020		<50	<500	<50	2,200	540	5.6	1.6	4.9	---	---
06/08/98	10.77	7.14	3.63	8020		1,800	890	<50	840	450	6.1	3.3	5.3	---	---
08/19/98	10.77	7.88	2.89	8020		190	<250	160	740	370	8.6	0.99	7.3	<5.0	---
MW-10															
11/20/96	10.59	---	---	8020		940	---	---	<50	49	0.59	0.54	1.2	---	---
11/20/97	10.59	7.70	2.89	8020		---	---	---	<50	<0.5	<0.5	<0.5	<0.5	---	---
02/24/98	10.59	4.39	6.20	8020		<50	<500	<50	<50	<0.5	<0.5	<0.5	<0.5	---	---
06/08/98	10.59	6.94	3.65	8020		500	<500	<50	<50	7.3	<0.5	<0.5	<0.5	---	---
08/19/98	10.59	6.99	3.60	8020		240	520	110	<50	<0.5	<0.5	<0.5	<0.5	<5.0	---
TBW-3															
08/19/98	---	2.67	---	8020		810,000	---	---	920	3.2	<0.5	<0.5	0.77	<10	---
08/19/98	---	2.67	---	8260		---	---	---	---	---	---	---	---	<5.0	---
Trip Blank															
08/19/98	---	---	---	8020		---	---	---	<50	<0.5	<0.5	<0.5	<0.5	<5.0	---

Table 1. Groundwater Analytical Results for Fuel Hydrocarbons - City of Oakland Municipal Service Center, Oakland, California

Date	TOC Elev.	DTW	GW Elev.	BTEX Method	Notes	TPHd	TPHmo	TPHk	TPHg	Benzene	Toluene	Ethyl-benzene	Xylenes	MTBE	Organic Lead
						<---------- µg/l ----------									---------->

Notes

All concentrations in micrograms per liter (µg/l)
--- = not measured/analyzed
TOC = Top of Casing
DTW = Depth to Water
GW = Ground Water
BTEX = benzene, toluene, ethylbenzene, and xylenes - analyzed by EPA Method 8020 or 8240/8260
TPHd = Total Petroleum Hydrocarbons as diesel - analyzed by Modified EPA method 8015
TPHmo = Total Petroleum Hydrocarbons as motor oil - analyzed by Modified EPA method 8015
TPHk = Total Petroleum Hydrocarbons as kerosene - analyzed by EPA method 8015
TPHg= Total Petroleum Hydrocarbons as gasoline - analyzed by Modified EPA method 8015
MTBE = Methyl tert-butyl ether - analyzed by EPA Method 8020 or 8260
FP = Free Product observed in well
TBW = Tank Backfill Well

CAMBRIA

Table 2. Groundwater Analytical Results for Bioparameters, Sodium, and Chloride

City of Oakland Municipal Service Center, Oakland, California

Sample ID	Date	TPHg (µg/l)	TPHd (µg/l)	ORP (mV)	Ferrous Iron	DO-B	DO-A	Nitrate	Sulfate	Total Alkalinity	Sodium	Chloride
						<---------- mg/l ----------						---------->
Damon Slough	08/19/98	---	---	---	---	---	---	---	---	---	5,900	14,400
MW-1	08/19/98	780	1,200	60	>5.0	9.8	8.47	<1.0	<1	1,270	1,600	3,750
MW-2	08/19/98	<50	330	120	>5.0	8.63	8.56	<1.0	5	215	4,700	8,000
MW-3	08/19/98	---	---	-170	0.9	9.33	9.21	<1.0	400	3,260	14,000	23,750
MW-4	08/19/98	---	---	-178	2.6	9.41	8.0	<1.0	280	1,700	3,600	7,000
MW-5	08/19/98	5,800	1,400	75	>5.0	9.43	9.18	<1.0	10	820	970	2,520
MW-7	08/19/98	---	---	110	>5.0	8.6	7.86	<1.0	300	970	920	1,800
MW-8	11/20/96	<50	880	50	<0.10	---	---	<0.50	478	---	---	7,490
MW-8	11/20/97	<50	200	262	<1.0	4	---	<0.050	1,200	380	---	---
MW-8	08/19/98	<50	<50	220	3.4	10.18	9.82	<1.0	610	490	4,300	7,500
MW-9	11/20/96	240	1,900	-73	0.24	---	---	<0.50	<3.0	---	---	2,230
MW-9	11/20/97	300	---	202	<1.0	<1.0	---	<0.050	1.0	1,300	---	---
MW-9	08/19/98	740	190	275	>5.0	10.15	9.67	<1.0	1	1,180	820	1,400
MW-10	11/20/96	<50	940	-54	<0.1	---	---	<0.50	52	---	---	1,940
MW-10	11/20/97	<50	---	226	<1.0	<1.0	---	<0.050	<0.10	870	---	---
MW-10	08/19/98	<50	240	68	4.2	10.21	9.84	<1.0	10	900	330	350
San Leandro Bay	08/19/98	---	---	---	---	---	---	---	---	---	5,700	14,400
TBW-3	08/19/98	920	810,000	135	1.8	6.86	7	<1.0	45	410	91	175
Ideal Relationship with Hydrocarbon Concentrations:				Inverse	Direct	Inverse	Inverse			Inverse	Inverse	Direct
Observed Relationship with Hydrocarbon Concentrations:				Inverse	Direct	Inconclusive	Inconclusive			Inconclusive	Inverse	Inconclusive

Legend

ORP = Oxidation/reduction potential
DO = Dissolved Oxygen (B = before purging, A = After purging)

Notes

All concentrations in milligrams per liter (mg/l), unless otherwise noted
--- = not measured/analyzed

CAMBRIA

Table 3. Groundwater Analytical Results for Metals

City of Oakland Municipal Service Center, Oakland, California

Date	Arsenic	Cadmium	Chromium (total)	Copper	Lead	Nickel	Zinc
	<---------- mg/l ---------->						
MW-1							
04/27/93	---	---	---	---	<3	---	---
04/19/95	---	---	---	---	<10	---	---
07/27/95	---	---	---	---	<10	---	---
11/20/95	---	---	---	---	<10	---	---
02/21/96	---	---	---	---	<10	---	---
MW-2							
04/27/93	---	---	---	---	83	---	---
04/19/95	---	---	---	---	100	---	---
07/27/95	---	---	---	---	70	---	---
11/20/95	---	---	---	---	<10	---	---
02/21/96	---	---	---	---	<10	---	---
05/13/96	---	---	---	---	<5.0	---	---
08/27/96	---	---	---	---	470	---	---
08/19/98	---	---	---	---	<5.0	---	---
MW-5							
12/13/91	<10.0	---	22.6	56.2	173	<40	201
04/27/93	---	<5.0	30	---	<3	<20	<20
04/19/95	---	<5.0	<10	---	<10	<10	20
07/27/95	---	<5	<10	---	<10	<10	<10
11/20/95	---	<5.0	<10	---	<10	<10	<10
02/21/96	---	<5.0	<10	---	<10	<10	<10
05/13/96	---	---	---	---	---	---	<10
08/27/96	---	---	---	---	---	---	<10
MW-6							
12/13/91	14.3	---	42.2	94.2	1,040	126	837
04/27/93	---	---	---	---	<3	---	---
04/19/95	---	---	---	---	410	---	---
07/27/95	---	---	---	---	<10	---	---

Table 3. Groundwater Analytical Results for Metals

City of Oakland Municipal Service Center, Oakland, California

Date	Arsenic	Cadmium	Chromium (total)	Copper	Lead	Nickel	Zinc
	<---------- mg/l ---------->						
11/20/95	---	<5.0	<10	---	<10	10	10
02/21/96	---	<5.0	<10	---	<10	20	<10
05/13/96	---	<2.0	<5.0	---	<5.0	16	<10
08/27/96	---	<2.0	<5.0	---	<5.0	17	15
MW-6 DUP							
04/19/95	---	---	---	---	390	---	---
07/27/95	---	---	---	---	<10	---	---
11/20/95	---	<5.0	<10	---	<10	20	<10
MW-7							
12/13/91	<10.0	---	10.6	35.1	11.4	270	101
04/27/93	---	9	190	---	<3	300	50
04/19/95	---	69	71	---	<10	80	40
07/27/95	---	<5.0	<10	---	<10	80	110
11/20/95	---	<5.0	<10	---	<10	140	20
02/21/96	---	<5.0	<10	---	<10	240	60
05/13/96	---	<2.0	<5.0	---	---	120	15
08/24/96	---	<2.0	<5.0	---	---	92	30
08/19/98	---	---	---	---	---	<50	---

Notes

All concentrations in milligrams per liter (mg/l), unless otherwise noted

--- = not measured/analyzed

CAMBRIA

ATTACHMENT A

Laboratory Analytical Report

McCAMPBELL ANALYTICAL INC.
110 Second 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 Environmental Technology 1144 65th Street, Suite C Oakland, CA 94608	Client Project ID: #153-1247-7; COFO, MSC - QM	Date Sampled: 08/19/98
		Date Received: 08/20/98
	Client Contact: Bob Schultz	Date Extracted: 08/20/98
	Client P.O:	Date Analyzed: 08/20/98

08/27/98

Dear Bob:

Enclosed are:

1). the results of 8 samples from your **#153-1247-7; COFO, MSC - QM** 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.

Yours truly,

Edward Hamilton, Lab Director

McCAMPBELL ANALYTICAL INC.
110 Second 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 Environmental Technology	Client Project ID: #153-1247-7; COFO, MSC - QM	Date Sampled: 08/19/98
1144 65th Street, Suite C		Date Received: 08/20/98
Oakland, CA 94608	Client Contact: Bob Schultz	Date Extracted: 08/20/98
	Client P.O:	Date Analyzed: 08/20-08/24/98

Gasoline Range (C6-C12) Volatile Hydrocarbons as Gasoline*, with Methyl tert-Butyl Ether* & BTEX*

EPA methods 5030, modified 8015, and 8020 or 602; California RWQCB (SF Bay Region) method GCFID(5030)

Lab ID	Client ID	Matrix	TPH(g)+	MTBE	Benzene	Toluene	Ethylben-zene	Xylenes	% Recovery Surrogate
93863	MW-1	W	780,a	ND	69	4.1	0.84	8.5	---#
93864	MW-2	W	ND	ND	4.1	3.4	0.80	2.6	95
93865	MW-5	W	5800,a	5900	500	25	730	300	---#
93866	TBW-3	W	920,g,h	ND<10	3.2	ND	ND	0.77	93
93867	MW-8	W	ND	ND	1.6	3.4	1.0	2.8	95
93868	MW-9	W	740,a	ND	370	8.6	0.99	7.3	108
93869	MW-10	W	ND	ND	ND	ND	ND	ND	98
93870	Trip Blank	W	ND	ND	ND	ND	ND	ND	101
Reporting Limit unless otherwise stated; ND means not detected above the reporting limit		W	50 ug/L	5.0	0.5	0.5	0.5	0.5	
		S	1.0 mg/kg	0.05	0.005	0.005	0.005	0.005	

* water and vapor samples are reported in ug/L, wipe samples in ug/wipe, soil and sludge samples in mg/kg, and all TCLP and SPLP 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 (?); f) one to a few isolated peaks present; g) strongly aged gasoline or diesel range compounds are significant; h) lighter than water immiscible sheen is present; i) liquid sample that contains greater than ~5 vol. % sediment; j) no recognizable pattern.

DHS Certification No. 1644

Edward Hamilton, Lab Director

McCAMPBELL ANALYTICAL INC.
110 Second 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 Environmental Technology 1144 65th Street, Suite C Oakland, CA 94608	Client Project ID: #153-1247-7; COFO, MSC - QM	Date Sampled: 08/19/98
		Date Received: 08/20/98
	Client Contact: Bob Schultz	Date Extracted: 08/20-08/26/98
	Client P.O:	Date Analyzed: 08/20-08/26/98

Diesel Range (C10-C23) , Oil-Range (C18+) and Kerosene (C9-C18) Extractable Hydrocarbons as Diesel, Motor Oil* and Kerosene with Silica Gel Clean Up

EPA methods modified 8015, and 3550 or 3510; California RWQCB (SF Bay Region) method GCFID(3550) or GCFID(3510)

Lab ID	Client ID	Matrix	TPH(d)+	TPH(mo)+	TPH (k)+	% Recovery Surrogate
93863	MW-1	W	1200,c,b,g	---	---	108
93864	MW-2	W	330,g	---	---	110
93865	MW-5	W	1400,d	ND	1700	100
93866	TBW-3	W	810,000,c,b,h	---	---	97
93867	MW-8	W	ND	ND	ND	103
93868	MW-9	W	190,b	ND	160	99
93869	MW10	W	240,g,b	520	110	99
Reporting Limit unless otherwise stated; ND means not detected above the reporting limit		W	50 ug/L	250 ug/L	50 ppb	
		S	1.0 mg/kg	5.0 mg/kg	1 ppm	

*water samples are reported in ug/L, wipe samples in ug/wipe, soil and sludge samples in mg/kg, and all TCLP / STLC / SPLP extracts in ug/L

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.

+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) medium boiling point pattern that does not match diesel (?); f) one to a few isolated peaks present; g) oil range compounds are significant; h) lighter than water immiscible sheen is present; i) liquid sample that contains greater than ~5 vol. % sediment.

DHS Certification No. 1644

Edward Hamilton, Lab Director

McCAMPBELL ANALYTICAL INC.
110 Second 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 Environmental Technology 1144 65th Street, Suite C Oakland, CA 94608	Client Project ID: #153-1247-7; COFO, MSC - QM	Date Sampled: 08/19/98
		Date Received: 08/20/98
	Client Contact: Bob Schultz	Date Extracted: 08/27/98
	Client P.O:	Date Analyzed: 08/27/98

Methyl tert-Butyl Ether *

EPA method 8260 modified

Lab ID	Client ID	Matrix	MTBE*	% Recovery Surrogate
93865	MW-5	W	6700	102
93866	TBW-3	W	ND,h	103
Reporting Limit unless otherwise stated; ND means not detected above the reporting limit		W	5.0 ug/L	
		S	50 ug/kg	

* water samples are reported in ug/L, soil and sludge samples in ug/kg, wipe samples in ug/wipe and all TCLP / STLC / SPLP extracts in ug/L

h) lighter than water immiscible sheen is present; i) liquid sample that contains greater than ~5 vol. % sediment.

DHS Certification No. 1644

Edward Hamilton, Lab Director

McCAMPBELL ANALYTICAL INC.

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

QC REPORT FOR HYDROCARBON ANALYSES

Date: 08/19/98-08/20/98 Matrix: WATER

Analyte	Concentration (mg/L) Sample (#93743)	MS	MSD	Amount Spiked	% Recovery MS	MSD	RPD
TPH (gas)	0.0	109.1	112.6	100.0	109.1	112.6	3.1
Benzene	0.0	10.2	10.3	10.0	102.0	103.0	1.0
Toluene	0.0	10.8	10.9	10.0	108.0	109.0	0.9
Ethyl Benzene	0.0	10.5	10.7	10.0	105.0	107.0	1.9
Xylenes	0.0	31.4	31.7	30.0	104.7	105.7	1.0
TPH(diesel)	0.0	169	174	150	113	116	2.8
TRPH (oil & grease)	0	24700	25200	23700	104	106	2.0

% Rec. = (MS - Sample) / amount spiked x 100

RPD = (MS - MSD) / (MS + MSD) x 2 x 100

McCAMPBELL ANALYTICAL INC.
110 2nd Avenue South, #D7, Pacheco, CA 94553
Tele: 925-798-1620 Fax: 925-798-1622

QC REPORT FOR HYDROCARBON ANALYSES

Date: 08/24/98-08/25/98 Matrix: WATER

Analyte	Concentration (mg/L) Sample (#94042)	MS	MSD	Amount Spiked	% Recovery MS	MSD	RPD
TPH (gas)	0.0	92.2	94.9	100.0	92.2	94.9	2.8
Benzene	0.0	9.6	9.4	10.0	96.0	94.0	2.1
Toluene	0.0	9.8	9.6	10.0	98.0	96.0	2.1
Ethyl Benzene	0.0	9.9	9.8	10.0	99.0	98.0	1.0
Xylenes	0.0	29.9	29.4	30.0	99.7	98.0	1.7
TPH(diesel)	0.0	169	162	150	113	108	4.0
TRPH (oil & grease)	N/A	N/A	N/A	N/A	N/A	N/A	N/A

% Rec. = (MS - Sample) / amount spiked x 100

RPD = (MS - MSD) / (MS + MSD) x 2 x 100

McCAMPBELL ANALYTICAL INC.
110 2nd Avenue South, #D7, Pacheco, CA 94553
Tele: 925-798-1620 Fax: 925-798-1622

QC REPORT FOR HYDROCARBON ANALYSES

Date: 08/26/98-08/27/98 Matrix: WATER

Analyte	Concentration (mg/L) Sample (#94024)	MS	MSD	Amount Spiked	% Recovery MS	MSD	RPD
TPH (gas)	0.0	88.6	93.1	100.0	88.6	93.1	5.0
Benzene	0.0	9.9	9.7	10.0	99.0	97.0	2.0
Toluene	0.0	10.1	9.9	10.0	101.0	99.0	2.0
Ethyl Benzene	0.0	10.0	10.1	10.0	100.0	101.0	1.0
Xylenes	0.0	30.0	30.4	30.0	100.0	101.3	1.3
TPH(diesel)	0.0	174	168	150	116	112	3.5
TRPH (oil & grease)	N/A	N/A	N/A	N/A	N/A	N/A	N/A

% Rec. = (MS - Sample) / amount spiked x 100

RPD = (MS - MSD) / (MS + MSD) x 2 x 100

McCAMPBELL ANALYTICAL INC.
110 2nd Avenue South, #D7, Pacheco, CA 94553
Tele: 925-798-1620 Fax: 925-798-1622

QC REPORT FOR VOCs (EPA 8240/8260)

Date: 08/27/98-08/28/98 Matrix: WATER

Analyte	Concentration (ug/kg,u Sample (#94086)	MS	MSD	Amount Spiked	% Recovery MS	MSD	RPD
1,1-Dichloroethe	0	76	86	100	76	86	12.3
Trichloroethene	0	77	86	100	77	86	11.0
EDB	0	97	93	100	97	93	4.3
Chlorobenzene	0	89	101	100	89	101	12.6
Benzene	0	88	99	100	88	99	11.8
Toluene	0	97	113	100	97	113	15.2

% Rec. = (MS - Sample) / amount spiked x 100

RPD = (MS - MSD) / (MS + MSD) x 2 x 100

1212 ~~BH~~ xc311.doc

McCAMBELL ANALYTICAL INC.

110 2nd AVENUE SOUTH, #D7
PACHECO, CA 94553
Telephone: (510) 798-1620 Fax: (510) 798-1622

CHAIN OF CUSTODY RECORD

TURN AROUND TIME ☐ RUSH ☐ 24 HOUR ☐ 48 HOUR ☒ 5 DAY

Report To: Schultz Bill To: Cambria

Company: Cambria Environmental Technology
1144 65th Street, Suite C
Oakland, CA 94608

Tele: (510) 420-0700 Fax: (510) 420-9170

Project #: 153-1247-7 Project Name: Cofo, MSC - am

Project Location: 7101 Edgewater

Sampler Signature: Schultz

SAMPLE ID	LOCATION	SAMPLING Date	SAMPLING Time	# Containers	Type Containers	MATRIX: Water	Soil	Air	Sludge	Other	METHOD PRESERVED: Ice	HCl	HNO_3	Other
MW-1		8/19		5	VOA	X					X	X		
MW-2														
MW-4														
MW-6	TBW-3													
MW-8														
MW-9														
MW-10														
TRIP BLK				1	VOA	X					X	X		
MW-1		8/19		2	1L amb	X					X	X		
MW-2														
MW-5														
MW-6	TBW-3													
MW-8														
MW-9														
MW-10														

Analysis Request	Other	Comments
BTEX & TPH as Gas (602/8020 + 8015)/ MTBE	TPHd, TPHmo, Kerosene by 8015	Pls. confirm any detected MTBE concentrations with EPA Method 8260. If no MTBE detected by 8020, then do not run 8260. Thanks Yon.
TPH as Diesel (8015)		
Total Petroleum Oil & Grease (5520 E&F/B&F)		
Total Petroleum Hydrocarbons (418.1)		
EPA 601 / 8010		
BTEX ONLY (EPA 602 / 8020)		
EPA 608 / 8080		
EPA 608 / 8080 PCB's ONLY		
EPA 624 / 8240 / 8260 MTBE Add on 8/27/96		
EPA 625 / 8270		
PAH's / PNA's by EPA 625 / 8270 / 8310		
CAM-17 Metals		
LUFT 5 Metals		
Lead (7240/7421/239.2/6010)		
RCI		

93863 93868
93864 93869
93866 93870
93866
93867

Relinquished By:	Date:	Time:	Received By:
Schultz	8/20	11:55am	
Relinquished By:	Date:	Time:	Received By:
	8/20	1:30	
Relinquished By:	Date:	Time:	Received By:

Remarks: USE SILICA GEL CLEAN UP ON ALL TPH EXTRACTION ANALYSES.

ICE/T ✓
GOOD CONDITION ✓
HEAD SPACE ABSENT ✓

PRESERVATION APPROPRIATE ✓
CONTAINERS ✓

VOAS | O&G | METALS | OTHER

McCAMPBELL ANALYTICAL INC.
110 Second 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 Environmental Technology	Client Project ID: #153-1247-7; COFO, MSC-QM	Date Sampled: 08/19/98
1144 65th Street, Suite C		Date Received: 08/20/98
Oakland, CA 94608	Client Contact: Bob Schultz	Date Extracted: 08/21/98
	Client P.O:	Date Analyzed: 08/21/98

Sodium*

EPA analytical methods 6010, 200.7

Lab ID	Client ID	Matrix	Extraction°	Sodium*	Q
93838	MW-1	W	Dissolved	1600	3750
93839	MW-2	W	Dissolved	4700	8000
93840	MW-3	W	Dissolved	14000	23750
93841	MW-4	W	Dissolved	3600	7000
93842	MW-5	W	Dissolved	970	2520
93843	TBW-3	W	Dissolved	91	175
93844	MW-7	W	Dissolved	920	1800
93845	MW-8	W	Dissolved	4300	7500
93846	MW-9	W	Dissolved	820	1400
93847	MW-10	W	Dissolved	330	350

Reporting Limit unless otherwise stated; ND means not detected above the reporting limit	W	TTLC	0.1 mg/L
	S	TTLC	5.0 mg/kg
	---	STLC,TCLP	---

* water samples are reported in mg/L, soil and sludge samples in mg/kg, wipes in ug/wipe and all TCLP / STLC / SPLP extracts in mg/L

° EPA extraction methods 1311(TCLP), 3010/3020(water,TTLC), 3040(organic matrices,TTLC), 3050(solids,TTLC); STLC - CA Title 22

& reporting limit raised due to matrix interference

i) liquid sample that contains greater than ~2 vol. % sediment; this sediment is extracted with the liquid, in accordance with EPA methodologies and can significantly effect reported metal concentrations; j) dissolved iron assumed to be equal to ferrous iron.

DHS Certification No. 1644

Edward Hamilton, Lab Director

McCAMPBELL ANALYTICAL INC.
110 2nd Avenue South, #D7, Pacheco, CA 94553
Tele: 925-798-1620 Fax: 925-798-1622

QC REPORT FOR METALS

Date: 08/24/98-08/25/98 Matrix: WATER

Extraction: DISSOLVED

Analyte	Concentration (mg/L)			Amount Spiked	% Recovery		RPD
	Sample	MS	MSD		MS	MSD	
Arsenic	0.0	5.5	5.4	5.0	111	108	2.4
Selenium	0.0	5.3	5.3	5.0	106	107	0.5
Molybdenum	0.0	5.4	5.4	5.0	108	107	0.8
Silver	0.0	0.5	0.5	0.5	100	100	0.7
Thallium	0.0	4.8	4.7	5.0	96	94	2.4
Barium	0.0	4.6	4.6	5.0	92	92	0.7
Nickel	0.0	5.0	4.9	5.0	100	98	1.7
Chromium	0.0	5.1	5.2	5.0	103	104	1.3
Vanadium	0.0	4.8	4.8	5.0	95	96	1.2
Beryllium	0.0	5.4	5.5	5.0	108	110	1.3
Zinc	0.0	5.3	5.4	5.0	106	108	1.8
Copper	0.0	4.7	4.7	5.0	94	94	0.4
Antimony	0.0	4.8	4.9	5.0	96	98	2.3
Lead	0.0	4.9	5.0	5.0	99	99	0.9
Cadmium	0.0	5.3	5.3	5.0	106	106	0.0
Cobalt	0.0	5.0	5.0	5.0	100	100	0.3
Mercury	0.000	0.186	0.193	0.2	93	97	3.7

% Rec. = (MS - Sample) / amount spiked x 100

RPD = (MS - MSD) / (MS + MSD) x 2 x 100

McCAMPBELL ANALYTICAL INC.
110 2nd Avenue South, #D7, Pacheco, CA 94553
Tele: 925-798-1620 Fax: 925-798-1622

QC REPORT FOR ICP and/or AA METALS

Date: 08/21/98-08/22/98 Matrix: WATER

Extraction:

Analyte	Concentration (mg/L)			Amount	% Recovery		RPD
	Sample	MS	MSD		MS	MSD	
Total Lead	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Total Cadmium	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Total Chromium	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Total Nickel	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Total Zinc	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Total Copper	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Organic Lead	0.00	4.17	4.37	5.00	83	87	4.7

% Rec. = (MS - Sample) / amount spiked x 100

RPD = (MS - MSD) / (MS + MSD) x 2 x 100

McCAMPBELL ANALYTICAL INC.
110 2nd Avenue South, #D7, Pacheco, CA 94553
Tele: 925-798-1620 Fax: 925-798-1622

QC REPORT FOR ICP and/or AA METALS

Date: 08/21/98-08/22/98 Matrix: WATER

Extraction: DISSOLVED

Analyte	Concentration (mg/L)			Amount	% Recovery		RPD
	Sample	MS	MSD		MS	MSD	
Total Sodium	0.00	4.36	4.40	5.00	87	88	1.0
Total Cadmium	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Total Chromium	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Total Nickel	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Total Zinc	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Total Copper	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Organic Lead	N/A	N/A	N/A	N/A	N/A	N/A	N/A

% Rec. = (MS - Sample) / amount spiked x 100

RPD = (MS - MSD) / (MS + MSD) x 2 x 100

GeoAnalytical Laboratories, Inc.

1405 Kansas Avenue
Modesto, CA 95351

Phone (209) 572-0900
FAX (209) 572-0916

CERTIFICATE OF ANALYSIS

Report # J233-04
McCampbell Analytical
110 2nd Avenue #D7
Pacheco CA 94553-5560

Date Sampled 08/19/98

Date of Report: 08/28/98
Date Received: 08/21/98
Date Started : 08/21/98
Date Completed: 08/27/98

Project Name:
Project # 12117
Sample ID: MW-1
Lab ID: J34224

Method	Detection Limit	Analyte	Results	Units mg/L
300	1	Chloride	3750	
300	1	Nitrate	ND	
300	1	Sulfate	ND	
310.1	10	Total Alkalinity	1270	

Ramiro Salgado
Chemist

Certification # 1157

Donna Keller
Laboratory Director

GeoAnalytical Laboratories, Inc.

1405 Kansas Avenue
Modesto, CA 95351

Phone (209) 572-0900
FAX (209) 572-0916

CERTIFICATE OF ANALYSIS

Report # J233-04

McCampbell Analytical
110 2nd Avenue #D7
Pacheco CA 94553-5560

Date Sampled 08/19/98

Date of Report: 08/28/98
Date Received: 08/21/98
Date Started : 08/21/98
Date Completed: 08/27/98

Project Name:
Project # 12117
Sample ID: MW-2
Lab ID: J34225

Method	Detection Limit	Analyte	Results	Units mg/L
300	1	Chloride	8000	
300	1	Nitrate	ND	
300	1	Sulfate	5	
310.1	10	Total Alkalinity	215	

Ramiro Salgado
Chemist

Certification # 1157

Donna Keller
Laboratory Director

GeoAnalytical Laboratories, Inc.

1405 Kansas Avenue
Modesto, CA 95351

Phone (209) 572-0900
FAX (209) 572-0916

CERTIFICATE OF ANALYSIS

Report # J233-04
McCampbell Analytical
110 2nd Avenue #D7
Pacheco CA 94553-5560

Date Sampled 08/19/98

Date of Report: 08/28/98
Date Received: 08/21/98
Date Started : 08/21/98
Date Completed: 08/27/98

Project Name:
Project # 12117
Sample ID: MW-3
Lab ID: J34226

Method	Detection Limit	Analyte	Results	Units mg/L
300	1	Chloride	23750	
300	1	Nitrate	ND	
300	1	Sulfate	400	
310.1	10	Total Alkalinity	3260	

Ramiro Salgado
Chemist

Certification # 1157

Donna Keller
Laboratory Director

GeoAnalytical Laboratories, Inc.

1405 Kansas Avenue
Modesto, CA 95351

Phone (209) 572-0900
FAX (209) 572-0916

CERTIFICATE OF ANALYSIS

Report # J233-04

McCampbell Analytical
110 2nd Avenue #D7
Pacheco CA 94553-5560

Date Sampled 08/19/98

Date of Report: 08/28/98
Date Received: 08/21/98
Date Started : 08/21/98
Date Completed: 08/27/98

Project Name:
Project # 12117
Sample ID: MW-4
Lab ID: J34227

Method	Detection Limit	Analyte	Results	Units mg/L
300	1	Chloride	7000	
300	1	Nitrate	ND	
300	1	Sulfate	280	
310.1	10	Total Alkalinity	1700	

Ramiro Salgado
Chemist

Certification # 1157

Donna Keller
Laboratory Director

GeoAnalytical Laboratories, Inc.

1405 Kansas Avenue
Modesto, CA 95351

Phone (209) 572-0900
FAX (209) 572-0916

CERTIFICATE OF ANALYSIS

Report # J233-04
McCampbell Analytical
110 2nd Avenue #D7
Pacheco CA 94553-5560

Date Sampled 08/19/98

Date of Report: 08/28/98
Date Received: 08/21/98
Date Started : 08/21/98
Date Completed: 08/27/98

Project Name:
Project # 12117
Sample ID: MW-5
Lab ID: J34228

Method	Detection Limit	Analyte	Results	Units mg/L
300	1	Chloride	2520	
300	1	Nitrate	ND	
300	1	Sulfate	10	
310.1	10	Total Alkalinity	820	

Ramiro Salgado
Chemist

Certification # 1157

Donna Keller
Laboratory Director

GeoAnalytical Laboratories, Inc.

1405 Kansas Avenue
Modesto, CA 95351

Phone (209) 572-0900
FAX (209) 572-0916

CERTIFICATE OF ANALYSIS

Report # J233-04

McCampbell Analytical
110 2nd Avenue #D7
Pacheco CA 94553-5560

Date Sampled 08/19/98

Date of Report: 08/28/98
Date Received: 08/21/98
Date Started : 08/21/98
Date Completed: 08/27/98

Project # 12117
Sample ID: TBW-3
Lab ID: J34229

Method	Detection Limit	Analyte	Results	Units mg/L
300	1	Chloride	175	
300	1	Nitrate	ND	
300	1	Sulfate	45	
310.1	10	Total Alkalinity	410	

Ramiro Salgado
Chemist

Certification # 1157

Donna Keller
Laboratory Director

GeoAnalytical Laboratories, Inc.

1405 Kansas Avenue
Modesto, CA 95351

Phone (209) 572-0900
FAX (209) 572-0916

CERTIFICATE OF ANALYSIS

Report # J233-04
McCampbell Analytical
110 2nd Avenue #D7
Pacheco CA 94553-5560

Date Sampled 08/19/98

Date of Report: 08/28/98
Date Received: 08/21/98
Date Started : 08/21/98
Date Completed: 08/27/98

Project Name:
Project # 12117
Sample ID: MW-7
Lab ID: J34230

Method	Detection Limit	Analyte	Results	Units mg/L
300	1	Chloride	1800	
300	1	Nitrate	ND	
300	1	Sulfate	300	
310.1	10	Total Alkalinity	970	

Ramiro Salgado
Chemist

Certification # 1157

Donna Keller
Laboratory Director

GeoAnalytical Laboratories, Inc.

1405 Kansas Avenue
Modesto, CA 95351

Phone (209) 572-0900
FAX (209) 572-0916

CERTIFICATE OF ANALYSIS

Report # J233-04

McCampbell Analytical
110 2nd Avenue #D7
Pacheco CA 94553-5560

Date Sampled 08/19/98

Date of Report: 08/28/98
Date Received: 08/21/98
Date Started : 08/21/98
Date Completed: 08/27/98

Project Name:
Project # 12117
Sample ID: MW-8
Lab ID: J34231

Method	Detection Limit	Analyte	Results	Units mg/L
300	1	Chloride	7500	
300	1	Nitrate	ND	
300	1	Sulfate	610	
310.1	10	Total Alkalinity	490	

Ramiro Salgado
Chemist

Certification # 1157

Donna Keller
Laboratory Director

GeoAnalytical Laboratories, Inc.

1405 Kansas Avenue
Modesto, CA 95351

Phone (209) 572-0900
FAX (209) 572-0916

CERTIFICATE OF ANALYSIS

Report # J233-04
McCampbell Analytical
110 2nd Avenue #D7
Pacheco CA 94553-5560

Date Sampled 08/19/98

Date of Report: 08/28/98
Date Received: 08/21/98
Date Started : 08/21/98
Date Completed: 08/27/98

Project Name:
Project # 12117
Sample ID: MW-9
Lab ID: J34232

Method	Detection Limit	Analyte	Results	Units mg/L
300	1	Chloride	1400	
300	1	Nitrate	ND	
300	1	Sulfate	1	
310.1	10	Total Alkalinity	1180	

Ramiro Salgado
Chemist

Certification # 1157

Donna Keller
Laboratory Director

GeoAnalytical Laboratories, Inc.

1405 Kansas Avenue
Modesto, CA 95351

Phone (209) 572-0900
FAX (209) 572-0916

CERTIFICATE OF ANALYSIS

Report # J233-04

McCampbell Analytical
110 2nd Avenue #D7
Pacheco CA 94553-5560

Date Sampled 08/19/98

Date of Report: 08/28/98
Date Received: 08/21/98
Date Started : 08/21/98
Date Completed: 08/27/98

Project Name:
Project # 12117
Sample ID: MW-10
Lab ID: J34233

Method	Detection Limit	Analyte	Results	Units mg/L
300	1	Chloride	350	
300	1	Nitrate	ND	
300	1	Sulfate	10	
310.1	10	Total Alkalinity	900	

Ramiro Salgado
Chemist

Certification # 1157

Donna Keller
Laboratory Director

J233-04

McCAMBELL ANALYTICAL INC.

110 2nd AVENUE SOUTH, #D7
PACHECO, CA 94553-5560
Telephone: (925) 798-1620 Fax: (925) 798-1622

CHAIN OF CUSTODY RECORD

TURN AROUND TIME ☐ RUSH ☐ 24 HOUR ☐ 48 HOUR ☒ 5 DAY ☐ ROUTINE

Report To: Ed Hamilton Bill To: MAI
Project #: 12117 Project Name: C.E.T.- Msc
Project Location:

SAMPLE ID	LOCATION	SAMPLING Date	SAMPLING Time	# Containers	Type Containers	MATRIX: Water	Soil	Air	Sludge	Other	METHOD PRESERVED: Ice	HCl	HNO_3	Other	EPA 601/8010	EPA 602/8020	EPA 608/808	EPA 608/8080-PCB's only	EPA 624/8240/8260	EPA 625/8270	CAM - 17 Metals	EPA - Priority Pollutant Metals	LUFT Metals	LEAD (7240/7421/239.2/6010)	ORGANIC LEAD	RCI	Sulfate nitrate Alkalinity	chloride	COMMENTS
MW-1		8/19				X					X							J34224									X	X	93838
MW-2																		J34225											93839
MW-3																		J34226											93840
MW-4																		J34227											93841
MW-5																		J34228											93842
~~MW-6~~ TBW-3 per Heidi 9/8/98 kc																		J34229											93843
MW-7																		J34230											93844
MW-8																		J34231											93845
MW-9																		J34232											93846
MW-10																		J34233											93847

Relinquished By	Date	Time	Received By	Remarks
Dina A. Bulls	8/20			
Relinquished By:	Date:	Time:	Received By:	8/21/98 12:40 pm
Relinquished By:	Date:	Time:	Received By:	

12117 XC313

McCAMBELL ANALYTICAL INC.

110 2nd AVENUE SOUTH, #D7
PACHECO, CA 94553
Telephone: (510) 798-1620 Fax: (510) 798-1622

CHAIN OF CUSTODY RECORD

TURN AROUND TIME ☐ RUSH ☐ 24 HOUR ☐ 48 HOUR ☒ 5 DAY

Report To: Schultz Bill To: Cambria
Company: Cambria Environmental Technology
1144 65th Street, Suite B
Oakland, CA 94608
Tele: (510) 420-0700 Fax: (510) 420-9170
Project #: 153-1247-7 Project Name: CofO, MSC-Q4
Project Location: 7101 Edgewater
Sampler Signature: Schultz

SAMPLE ID	LOCATION	SAMPLING Date	SAMPLING Time	# Containers	Type Containers	MATRIX Water	MATRIX Soil	MATRIX Air	MATRIX Sludge	MATRIX Other	METHOD PRESERVED Ice	METHOD PRESERVED HCl	METHOD PRESERVED HNO_3	METHOD PRESERVED Other
MW-1		8/19		1	1L plastic	X					X			
MW-2														
MW-3														
MW-4														
MW-5														
MW-6	TBW-3													
MW-7														
MW-8														
MW-9														
MW-10														

Analysis Request

BTEX & TPH as Gas (602/8020 + 8015) MTBE	TPH as Diesel (8015)	Total Petroleum Oil & Grease (5520 E&F/B&F)	Total Petroleum Hydrocarbons (418.1)	EPA 601 / 8010	BTEX ONLY (EPA 602 / 8020)	EPA 608 / 8080	EPA 608 / 8080 PCB's ONLY	EPA 624 / 8240 / 8260	EPA 625 / 8270	PAH's / PNA's by EPA 625 / 8270 / 8310	CAM-17 Metals	LUFT 5 Metals	Lead (7240/7421/239.2/6010)	RCI	Other: ~~Total~~ Organic Lead 6010 Dissolved	Other: Nickel 6010 Dissolved	Other: sulfate, nitrate, alkalinity	Other: chloride, sodium
													X		X		X	X
													X		X		X	X
																X		

Comments: REPORT SEPARATELY

93838
93839
93840
93841
93842
93843
93844
93845
93846
93847

Relinquished By:	Date:	Time:	Received By:
Schultz	8/20	11:55am	[illegible]
[illegible]	8/20	150	[illegible]

Remarks:

ICE/T ✓ PRESERVATION ✓ VOAS | O&G | METALS | OTHER
GOOD CONDITION ___ APPROPRIATE ___
HEAD SPACE ABSENT ✓ CONTAINERS ✓

Level

McCAMPBELL ANALYTICAL INC.
110 Second 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 Environmental Technology 1144 65th Street, Suite C Oakland, CA 94608	Client Project ID: #153-1247-7; COFO, MSC-QM	Date Sampled: 08/20/98
		Date Received: 08/21/98
	Client Contact: Bob Schultz	Date Extracted: 08/21/98
	Client P.O:	Date Analyzed: 08/21/98

08/28/98

Dear Bob:

Enclosed are:

1). the results of **2** samples from your **#153-1247-7; COFO, MSC-QM** 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.

Yours truly,

Edward Hamilton, Lab Director

McCAMPBELL ANALYTICAL INC.
110 Second 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 Environmental Technology	Client Project ID: #153-1247-7; COFO, MSC-QM	Date Sampled: 08/20/98
1144 65th Street, Suite C		Date Received: 08/21/98
Oakland, CA 94608	Client Contact: Bob Schultz	Date Extracted: 08/21-08/24/98
	Client P.O:	Date Analyzed: 08/21-08/24/98

Sodium*

EPA analytical methods 6010, 200.7

Lab ID	Client ID	Matrix	Extraction°	Sodium*
93977	San Leandro Bay	W	Dissolved	5700
93978	Damon Slough	W	Dissolved	5900

Reporting Limit unless otherwise stated; ND means not detected above the reporting limit	W	TTLC	0.1 mg/L
	S	TTLC	5.0 mg/kg
	—	STLC,TCLP	—

* water samples are reported in mg/L, soil and sludge samples in mg/kg, wipes in ug/wipe and all TCLP / STLC / SPLP extracts in mg/L

° EPA extraction methods 1311(TCLP), 3010/3020(water,TTLC), 3040(organic matrices,TTLC), 3050(solids,TTLC); STLC - CA Title 22

& reporting limit raised due to matrix interference

i) liquid sample that contains greater than ~2 vol. % sediment; this sediment is extracted with the liquid, in accordance with EPA methodologies and can significantly effect reported metal concentrations; j) dissolved iron assumed to be equal to ferrous iron.

DHS Certification No. 1644

Edward Hamilton, Lab Director

McCAMPBELL ANALYTICAL INC.
110 2nd Avenue South, #D7, Pacheco, CA 94553
Tele: 925-798-1620 Fax: 925-798-1622

QC REPORT FOR ICP and/or AA METALS

Date: 08/21/98-08/22/98 Matrix: WATER

Extraction: DISSOLVED

Analyte	Concentration (mg/L)			Amount	% Recovery		RPD
	Sample	MS	MSD		MS	MSD	
Total Sodium	0.00	4.36	4.40	5.00	87	88	1.0
Total Cadmium	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Total Chromium	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Total Nickel	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Total Zinc	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Total Copper	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Organic Lead	N/A	N/A	N/A	N/A	N/A	N/A	N/A

% Rec. = (MS - Sample) / amount spiked x 100

RPD = (MS - MSD) / (MS + MSD) x 2 x 100

GeoAnalytical Laboratories, Inc.

1405 Kansas Avenue
Modesto, CA 95351

Phone (209) 572-0900
FAX (209) 572-0916

CERTIFICATE OF ANALYSIS

Report # J237-01
McCampbell Analytical
110 2nd Avenue #D7
Pacheco CA 94553-5560

Date of Report: 09/03/98
Date Received: 08/25/98
Date Started: 08/25/98
Date Completed: 09/02/98

Project Name: C.E.T.

Project # 12136

Sample ID	Lab ID	Detection Limit	Method	Analyte	Results	Units mg/L
San Leandro Bay	J34245	1	300	Chloride	14400	
Damon Slough	J34246	1	300	Chloride	14400	

Ramiro Salgado
Chemist

Certification # 1157

Donna Keller
Laboratory Director

GD

J237-01

McCAMBELL ANALYTICAL INC.

110 2nd AVENUE SOUTH, #D7
PACHECO, CA 94553-5560
Telephone: (925) 798-1620 Fax: (925) 798-1622

CHAIN OF CUSTODY RECORD

TURN AROUND TIME ☐ RUSH ☐ 24 HOUR ☐ 48 HOUR ☒ 5 DAY ☐ ROUTINE

Report To: Ed Hamilton Bill To: MAI
Project #: 92136 Project Name: C.E.T.
Project Location:

SAMPLE ID	LOCATION	SAMPLING Date	SAMPLING Time	# Containers	Type Containers	MATRIX Water	Soil	Air	Sludge	Other	METHOD PRESERVED Ice	HCl	HNO_3	Other	EPA 601/8010	EPA 602/8020	EPA 608/808	EPA 608/8080-PCB's only	EPA 624/8240/8260	EPA 625/8270	CAM – 17 Metals	EPA – Priority Pollutant Metals	LUFT Metals	LEAD (7240/7421/239.2/6010)	ORGANIC LEAD	RCI	Chloride	OTHER					COMMENTS
San Leandro Bay		8/20		1	pint	X					X																X		J342145				93177
Damon Slough		↓		↓	↓	↓					X																X		J342146				93178

Relinquished By:	Date:	Time:	Received By:
Lisa V MAI	8/24		
Relinquished By: Cali overnight	Date: 8/25	Time: 840	Received By: Karen Cole
Relinquished By:	Date:	Time:	Received By:

Remarks:

McCAMPBELL ANALYTICAL

110 2nd AVENUE, # D7
(510) 798-1620 PACHECO, CA 94553 FAX (510) 798-1622

CHAIN OF CUSTODY RECORD

TURN AROUND TIME: ☐ RUSH ☐ 24 HOUR ☐ 48 HOUR ☒ 5 DAY

REPORT TO: Schultz BILL TO: Cambria

COMPANY: Cambria Env. Tech.
1144 65th St, Ste. B
Oakland, CA 94608

TELE: 510 420 0700 FAX #: 510 420 9170

PROJECT NUMBER: 153-1247-7 PROJECT NAME: CeFO, MSC-QM

PROJECT LOCATION: 7101 Edgewater SAMPLER SIGNATURE: Schultz

SAMPLE ID	LOCATION	SAMPLING DATE	SAMPLING TIME	# CONTAINERS	TYPE CONTAINERS	MATRIX: WATER	SOIL	AIR	SLUDGE	OTHER	METHOD PRESERVED: HCL	HNO3	OTHER ICE	BTEX & TPH as Gasoline (602/8020 & 8015)	TPH as Diesel (8015)	Total Petroleum Oil & Grease (5520 E&F/5520 B&F)	Total Petroleum Hydrocarbons (418.1)	EPA 601/8010	EPA 602/8020	EPA 608/8080	EPA 608/8080 - PCBs Only	EPA 624/8240/8260	EPA 625/8270	CAM - 17 Metals	EPA - Priority Pollutant Metals	LEAD (7240/7421/239.2/6010)	ORGANIC LEAD	RCI	OTHER: Sodium	OTHER: Chloride	COMMENTS
San Leandro Bay		8/20		1	Plastic	X							X																X	X	93977
Damon Slough		8/20		1	Plastic	X							X																X	X	93978

RELINQUISHED BY:	DATE	TIME	RECEIVED BY:
Schultz	8/21	10:00am	[illegible] 2570
RELINQUISHED BY:	DATE	TIME	RECEIVED BY:
[illegible]	8/21	12:00	Anna A. Butler
RELINQUISHED BY:	DATE	TIME	RECEIVED BY LABORATORY:

REMARKS:

ICE/T ✓ PRESERVATION ✓
GOOD CONDITION ___ APPROPRIATE
HEAD SPACE ABSENT ___ CONTAINERS ✓

VOAS	O&G	METALS	OTHER

McCAMPBELL ANALYTICAL INC.
110 Second 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 Environmental Technology 1144 65th Street, Suite C Oakland, CA 94608	Client Project ID: #153-1247-7; COFO, MSC-QM	Date Sampled: 08/19/98
		Date Received: 08/20/98
	Client Contact: Bob Schultz	Date Extracted: 08/20/98
	Client P.O:	Date Analyzed: 08/20/98

08/27/98

Dear Bob:

Enclosed are:

1). the results of **10** samples from your **#153-1247-7; COFO, MSC-QM** 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.

Yours truly,

Edward Hamilton, Lab Director

McCAMPBELL ANALYTICAL INC.
110 Second 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 Environmental Technology 1144 65th Street, Suite C Oakland, CA 94608	Client Project ID: #153-1247-7; COFO, MSC-QM	Date Sampled: 08/19/98
		Date Received: 08/20/98
	Client Contact: Bob Schultz	Date Extracted: 08/21-08/24/98
	Client P.O:	Date Analyzed: 08/21-08/24/98

Lead*

EPA analytical methods 6010/200.7, 239.2+

Lab ID	Client ID	Matrix	Extraction °	Lead*	Nickel*	% Recovery Surrogate
93839	MW-2	W	Dissolved	ND	---	NA
93844	MW-7	W	Dissolved	---	ND	NA
Reporting Limit unless otherwise stated; ND means not detected above the reporting limit		S	TTLC	3.0 mg/kg	2.0	
		W	TTLC	0.005 mg/L	0.05	
		---	STLC,TCLP	0.2 mg/L	0.05	

* soil and sludge samples are reported in mg/kg, wipe samples in ug/wipe, and water samples and all STLC / SPLP / TCLP extracts in mg/L

+Lead is analysed using EPA method 6010 (ICP)for soils, sludges, STLC & TCLP extracts and method 239.2 (AA Furnace) for water samples

° EPA extraction methods 1311(TCLP), 3010/3020(water,TTLC), 3040(organic matrices,TTLC), 3050(solids,TTLC); STLC - CA Title 22

surrogate diluted out of range; N/A means surrogate not applicable to this analysis

& reporting limit raised due matrix interference

i) liquid sample that contains greater than ~2 vol. % sediment; this sediment is extracted with the liquid, in accordance with EPA methodologies and can significantly effect reported metal concentrations.

DHS Certification No. 1644

Edward Hamilton, Lab Director

McCAMPBELL ANALYTICAL INC.
110 Second 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 Environmental Technology 1144 65th Street, Suite C Oakland, CA 94608	Client Project ID: #153-1247-7; COFO, MSC-QM	Date Sampled: 08/19/98
		Date Received: 08/20/98
	Client Contact: Bob Schultz	Date Extracted: 08/21/98
	Client P.O:	Date Analyzed: 08/21/98

Organic Lead

CA Title 22, Chapter 11, Appendix XI

Lab ID	Client ID	Matrix	Organic Lead *
93839	MW-2	W	ND
Reporting Limit unless otherwise stated; ND means not detected above the reporting limit		W	0.1 mg/L
		S	0.5 mg/kg

* water samples are reported in mg/L, soil and sludge samples in mg/kg and wipes in mg/wipe

h) lighter than water immiscible sheen is present; i) liquid sample that contains greater than ~5 vol. % sediment.

DHS Certification No. 1644

Edward Hamilton, Lab Director

CAMBRIA

ATTACHMENT B

Well Sampling Forms

CAMBRIA

WELL SAMPLING FORM

Project Name: City of Oakland	Cambria Mgr: DE	Well ID: MW-1
Project Number:	Date: 9/10/99 Wells	Well Yield: —
Site Address: 701 Edwards Oakland CA	Sampling Method: Disp Bailer	Well Diameter: 2"
		Technician(s): JM/ES
Initial Depth to Water: 4.73	Total Well Depth: 15.56	Water Column Height: 10.78
Volume/ft: 0.16	1 Casing Volume: 1.72	3 Casing Volumes: 5.17
Purging Device: Disp Bailer	Did Well Dewater?: No	Total Gallons Purged: 5.2
Start Purge Time: 250	Stop Purge Time: 255	Total Time: 5 min

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

Well Diam.	Volume/ft (gallons)
2"	0.16
4"	0.65
6"	1.47

Time	Casing Volume	Temp.	pH	Cond.	Comments		
					ORP	DO	SAL
250	1	23.7	7.32	9.3	112	9.8	0.52
252	2	23.0	7.41	11.7	109	9.39	0.54
254	3	24.3	7.31	9.78	500	8.47	0.54

ORP : 60

Ferrous Iron: >5.0 mg/L pH adjusted to 3.0

Sample ID	Date	Time	Container Type	Preservative	Analytes	Analytic Method
MW-1	9/10/99	259	5 VOA's	HCl		
		259	1 AMB	None		
			1 Metals	None		

DS1

O:\TEMPLATE\FORMS\FIELD\WELLSAMP.WPD
WSM 5/31/94

CAMBRIA

WELL SAMPLING FORM

Project Name: Conoco, MSC	Cambria Mgr: DCE	Well ID: MW-2
Project Number: 153-1247-7	Date: 8/19	Well Yield:
Site Address: 7101 Edgewater	Sampling Method: ~~Field~~ disp. bailer	Well Diameter: 2"
		Technician(s): Schultz/Riggi
Initial Depth to Water: 6.56'	Total Well Depth: 15.46	Water Column Height: 8.95'
Volume/ft: 0.16	1 Casing Volume: 1.42	3 Casing Volumes: 4.26
Purging Device: sub. pump	Did Well Dewater?: yes	Total Gallons Purged: 5.0
Start Purge Time: 518	Stop Purge Time: 525	Total Time: 7 min

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

Well Diam.	Volume/ft (gallons)
2"	0.16
4"	0.65
6"	1.47

Time	Casing Volume	Temp.	pH	Cond.	Comments: TURB	DO	SAL
5:15	1	21.6	7.73	19.6	601	8.63	1.26
520	2	20.5	7.71	20.5	999	8.48	1.24
524	3	21.2	7.71	20.6	956	8.50	1.23
					H2O spray/WK		

ORP: 120

Ferrous Iron: >5.0 pH adjusted to 4.0

Sample ID	Date	Time	Container Type	Preservative	Analytes	Analytic Method
MW-2						

CAMBRIA

WELL SAMPLING FORM

Project Name: ConocoPhillips - Cambria	Cambria Mgr: DCE	Well ID: MW-3
Project Number: 153-1247	Date: 8/19/98	Well Yield:
Site Address: 701 Edgewater	Sampling Method: disp. bailer	Well Diameter: 2"
		Technician(s): Schultz/Riggs
Initial Depth to Water: 4.66	Total Well Depth: 18.16	Water Column Height: 13.50
Volume/ft: 0.16	1 Casing Volume: 2.16	3 Casing Volumes: 6.48
Purging Device: sub. pump.	Did Well Dewater?:	Total Gallons Purged:
Start Purge Time: 11:22 am	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

Time	Casing Volume	Temp.	pH	Cond.	Comments	
		SAL			turb	DO
11:32	1	19.7°C 2.87‰	7.99	44.4 mS/cm	35	9.33 mg/l
11:40	2	19.4°C 2.97‰	7.99	45.7	114	9.53
11:45	3	19.1°C 2.94‰	8.00	45.3	225	9.21

ORP : -170

Ferrous Iron: 0.9 mg/l pH adjusted to 50 mg/l

Sample ID	Date	Time	Container Type	Preservative	Analytes	Analytic Method

CAMBRIA

WELL SAMPLING FORM

Project Name: City of Oakland	Cambria Mgr:	Well ID: MW-4
Project Number: 153-1247	Date: 8/16/13	Well Yield:
Site Address: 7101 Edgewater Dr Oakland Ca	Sampling Method: disp bailer	Well Diameter: 2"
		Technician(s): JR/BS
Initial Depth to Water: 4.98	Total Well Depth: 15.40	Water Column Height: 10.42
Volume/ft: 0.16	1 Casing Volume: 1.68	3 Casing Volumes: 5.04
Purging Device: Sub pump	Did Well Dewater?: No	Total Gallons Purged: 5.04
Start Purge Time: 11.56	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

Time	Casing Volume	Temp. C°	pH	Cond. mS/cm	Comments		
					SU	DO mg/L	ORP
1158	1	21.3	7.92	30.2	1.98	9.41	31
1201	2	22.7	7.91	18.4	1.04	8.21	21
1204	3	22.7	7.91	19.9	1.19	8.80	4

ORP: -178

Fe = 2.6 mg/L

pH adjusted to 5.0

Sample ID	Date	Time	Container Type	Preservative	Analytes	Analytic Method
MW-4						

831

CAMBRIA

WELL SAMPLING FORM

Project Name: City of Oakland	Cambria Mgr: DE	Well ID: MW-5
Project Number:	Date: 8/19/99 wells.	Well Yield:
Site Address: 7101 Edgewater Oakland Ca 11:56	Sampling Method: disp bailer	Well Diameter: 2"
		Technician(s): JR/BS
Initial Depth to Water: 6.14	Total Well Depth: 14.21	Water Column Height: 8.07
Volume/ft: 0.16	1 Casing Volume: 1.29	3 Casing Volumes: 3.87
Purging Device:	Did Well Dewater?:	Total Gallons Purged: 3.9
Start Purge Time: 116	Stop Purge Time: 124	Total Time: 9 min

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

Well Diam.	Volume/ft (gallons)
2"	0.16
4"	0.65
6"	1.47

Time	Casing Volume	Temp.	pH	Cond.	Comments TURB	DO	SAL
119	1	23.7	7.57	41.8	130	9.43	269
119	2	24.3	7.47	11.3	23	9.16	0.56
124	3	24.3	7.46	11.7	21	9.18	0.48

ORP = 75 in field

Ferrous Iron = >5.0 mg/l pH adjusted to 4.1 w/ HCl

Sample ID	Date	Time	Container Type	Preservative	Analytes	Analytic Method

251

CAMBRIA

WELL SAMPLING FORM

Project Name: Chevron, MSC	Cambria Mgr: DCB	Well ID: MW-6
Project Number: 153-12477	Date: 8/19/98	Well Yield:
Site Address: 7101 Edgewater	Sampling Method: disp. bailer	Well Diameter: 2"
		Technician(s): Schaffner
Initial Depth to Water: —	Total Well Depth: —	Water Column Height: —
Volume/ft: 0.16	1 Casing Volume: —	4 Casing Volumes: —
Purging Device: —	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

Time	Casing Volume	Temp.	pH	Cond.	Comments
Free product					
Did not sample or purge					

Sample ID	Date	Time	Container Type	Preservative	Analytes	Analytic Method

CAMBRIA

WELL SAMPLING FORM

Project Name: City of Oakland	Cambria Mgr: DCE	Well ID: MW-7
Project Number: 153-1247	Date: 2/19/98	Well Yield: —
Site Address: 7101 Edgewater 10,152	Sampling Method: disp. bailer	Well Diameter: 2"
		Technician(s): Riggi/Schultz
Initial Depth to Water: 6.88	Total Well Depth: 14.10	Water Column Height: 7.22
Volume/ft: 0.16	1 Casing Volume: 1.16	3 Casing Volumes: 3.48
Purging Device: Sub. pump	Did Well Dewater?:	Total Gallons Purged:
Start Purge Time: 12:45	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

Time	Casing Volume	Temp.	pH	Cond.	Comments	
					Turb	DO
12:50	1	24.3	7.57	1.10	22	8.60
		24.2	7.71	19.3	999	7.92
		24.1	7.69	19.2	27	7.86

ORP 110

Ferrous Iron >5.0 mg/l (first darker than 5.0) — pH adjusted to 5.0

Sample ID	Date	Time	Container Type	Preservative	Analytes	Analytic Method

CAMBRIA

WELL SAMPLING FORM

Project Name: City of Oakland	Cambria Mgr: DE	Well ID: MW-8
Project Number:	Date: 9/14/05 WJ	Well Yield:
Site Address: 7101 Edgewater Oakland CA	Sampling Method: disp bailer	Well Diameter: 2"
		Technician(s): JK/ES
Initial Depth to Water: 9.49	Total Well Depth: 15.14	Water Column Height: 5.65
Volume/ft: 0.16	1 Casing Volume: 0.9	4 Casing Volumes: 2.7
Purging Device: sub pump	Did Well Dewater?:	Total Gallons Purged: 2.7
Start Purge Time: 209	Stop Purge Time: 212	Total Time: 4 min

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

Well Diam.	Volume/ft (gallons)
2"	0.16
4"	0.65
6"	1.47

Time	Casing Volume	Temp.	pH	Cond.	Comments TURB	DO	ORP
209	1	22.5	7.31	17.0	125	10.18	1.0
210	2	22.4	7.34	17.6	100	10.14	0.9
212	3	21.5	7.36	15.7	68	9.82	0.92

ORP : 220

Ferrous Iron : 3.4 mg/L (pH adjusted to 5.0)

Sample ID	Date	Time	Container Type	Preservative	Analytes	Analytic Method
MW-8						

681

CAMBRIA

WELL SAMPLING FORM

Project Name: Chevron Oakland	Cambria Mgr: DCE	Well ID:
Project Number: 153-1247	Date: 9/19/08 Weds.	Well Yield: MW-9
Site Address: 7101 Edgewater Oakland	Sampling Method: Grab bailer	Well Diameter: 2"
		Technician(s): JL/ES
Initial Depth to Water: 7.83	Total Well Depth: 13.91	Water Column Height: 6.08
Volume/ft: 0.16	1 Casing Volume: 0.96	3 Casing Volumes: 2.89
Purging Device: Sub pump	Did Well Dewater?: N/O	Total Gallons Purged: 3.00
Start Purge Time: 231	Stop Purge Time: 234	Total Time: 3 min

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

Well Diam.	Volume/ft (gallons)
2"	0.16
4"	0.65
6"	1.47

Time	Casing Volume	Temp.	pH	Cond.	Comments: turb	DO	SAL
231	1	21.4	7.39	6.08	362	10.15	0.32
232	2	21.1	7.36	6.11	680	10.02	0.34
233	3	20.9	7.40	6.43	610	9.67	0.34

ORP 275

Ferrous Iron >5.0 mg/l pH adjusted to 4.0, sample filte

Sample ID	Date	Time	Container Type	Preservative	Analytes	Analytic Method

CAMBRIA

WELL SAMPLING FORM

Project Name: City of Oakland	Cambria Mgr: DE	Well ID: MW-10
Project Number:	Date: 8/19/99 Weds	Well Yield:
Site Address: 7101 Edgewater Oakland CA	Sampling Method: Disp Bailer	Well Diameter: 2"
		Technician(s): DK/BS
Initial Depth to Water: 6.99	Total Well Depth: 13.44	Water Column Height: 6.45
Volume/ft: 0.16	1 Casing Volume: 1.03	3 Casing Volumes: 3.09
Purging Device: Sub	Did Well Dewater?: NO	Total Gallons Purged: 3.09
Start Purge Time: 219	Stop Purge Time: 224	Total Time: 5 min

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

Well Diam.	Volume/ft (gallons)
2"	0.16
4"	0.65
6"	1.47

Time	Casing Volume	Temp.	pH	Cond.	Comments TURB	DO	SAL
219	1	22.3	7.34	13.9	253	10.21	0.80
220	2	22.1	7.4	14.2	210	9.67	0.70
221	3	21.7	7.36	4.88	657	9.84	0.24

ORP : 68

Ferrous Iron: 4.2 mg/l (pH adjusted to 5.0)

Sample ID	Date	Time	Container Type	Preservative	Analytes	Analytic Method

CAMBRIA

ATTACHMENT C

Standard Field Procedures for Monitoring Wells

STANDARD FIELD PROCEDURES FOR MONITORING WELLS

This document describes Cambria Environmental Technology's standard field methods for drilling, installing, developing and sampling ground water monitoring wells. These procedures are designed to comply with Federal, State and local regulatory guidelines. Specific field procedures are summarized below.

Well Construction and Surveying

Ground water monitoring wells are installed in soil borings to monitor ground water quality and determine the ground water elevation, flow direction and gradient. Well depths and screen lengths are based on ground water depth, occurrence of hydrocarbons or other compounds in the borehole, stratigraphy and State and local regulatory guidelines. Well screens typically extend 10 to 15 feet below and 5 feet above the static water level at the time of drilling. However, the well screen will generally not extend into or through a clay layer that is at least three feet thick.

Well casing and screen are flush-threaded, Schedule 40 PVC. Screen slot size varies according to the sediments screened, but slots are generally 0.010 or 0.020 inches wide. A rinsed and graded sand occupies the annular space between the boring and the well screen to about one to two ft above the well screen. A two feet thick hydrated bentonite seal separates the sand from the overlying sanitary surface seal composed of Portland type I,II cement.

Well-heads are secured by locking well-caps inside traffic-rated vaults finished flush with the ground surface. A stovepipe may be installed between the well-head and the vault cap for additional security. The well top-of-casing elevation is surveyed with respect to mean sea level and the well is surveyed for horizontal location with respect to an onsite or nearby offsite landmark.

Well Development

Wells are generally developed using a combination of ground water surging and extraction. Surging agitates the ground water and dislodges fine sediments from the sand pack. After about ten minutes of surging, ground water is extracted from the well using bailing, pumping and/or reverse air-lifting through an eductor pipe to remove the sediments from the well. Surging and extraction continue until at least ten well-casing volumes of ground water are extracted and the sediment volume in the ground water is negligible. This process usually occurs prior to installing the sanitary surface seal to ensure sand pack stabilization. If development occurs after surface seal installation, then development occurs 24 to 72 hours after seal installation to ensure that the Portland cement has set up correctly.

All equipment is steam-cleaned prior to use and air used for air-lifting is filtered to prevent oil entrained in the compressed air from entering the well. Wells that are developed using air-lift evacuation are not sampled until at least 24 hours after they are developed.

Ground Water Sampling

Depending on local regulatory guidelines, three to four well-casing volumes of ground water are purged prior to sampling. Purging continues until ground water pH, conductivity, and temperature have stabilized. Ground water samples are collected using bailers or pumps and are decanted into the appropriate containers supplied by the analytic laboratory. Samples are labeled, placed in protective foam sleeves, stored on crushed ice at or below 4°C, and transported under chain-of-custody to the laboratory. Laboratory-supplied trip blanks accompany the samples and are analyzed to check for cross-contamination. An equipment blank may be analyzed if non-dedicated sampling equipment is used.

F:\TEMPLATE\SOPS\GWMON.WPD