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June 14, 1993

Mr. Brian Oliva
Alameda County Division of Hazardous Materials
Department of Environmental Health
80 Swan Way, Room 200
Oakland, California 94621

Dear Mr. Oliva:

QUARTERLY GROUNDWATER MONITORING REPORTS, FIRST AND SECOND QUARTERS 1993, EMERY BAY MARKETPLACE, EMERYVILLE, CALIFORNIA

Enclosed are the letter reports "Quarterly Groundwater Monitoring Report First Quarter 1993, Emery Bay Marketplace, Emeryville, California, March 15, 1993 and "Quarterly Groundwater Monitoring Report, Second Quarter 1993," June 14, 1993. The reports summarize the quarterly groundwater monitoring activities performed at the Emery Bay Marketplace property during January and April 1993 in accordance with the "Work Plan for Groundwater Monitoring and Free Product Removal at the Marketplace Site, Emeryville California," July 6, 1990 (Work Plan). The Work Plan was submitted to address recommendations made in the report "Groundwater Characterization, Emery Bay Marketplace", June 19, 1990.

The purpose of the quarterly groundwater monitoring program is to confirm that petroleum hydrocarbons are confined within the Marketplace property and have not migrated to the downgradient edge of the property. Groundwater has been monitored on the Marketplace property on a quarterly basis since the first quarter of 1990 (with the exception of the third quarter of 1990). The enclosed Quarterly Groundwater Monitoring Reports support the conclusion that groundwater conditions beneath the site are stable. Specifically, the subsurface conditions beneath the site are as described below:

- The groundwater flow direction across the site has been consistently towards the west since the inception of the quarterly groundwater monitoring program. This indicates that wells W-13, W-14, W-20, and W-24 are in the verified downgradient direction.

- Hydrocarbons quantified as motor oil were detected in the four wells located on the downgradient side of the site (wells W-13, W-14, W-20, and W-24) less than 0.4 ppm in both January and April 1993. The January and April 1993 analyses were conducted using lower detection limits (0.05 ppm), as requested by the ACDEH in a letter to the Martin Group dated August 5, 1992. The chromatographic pattern of the TPH/MO at all four of these locations did not match the standard chromatograph, indicating that the source of TPH/MO at these locations is not the same as the source at wells W-7 and W-19.

1135 Atlantic Avenue, Alameda, CA 94501 (510) 521-5200 FAX (510) 521-1547

- Wells W-7 and W-19 have shown consistent levels of hydrocarbons throughout the groundwater monitoring program.

If you have any questions regarding this report, please call me at (510) 521-5200.

Sincerely,

Julie S. Menack

Julie S. Menack, CEG
Supervising Geoscientist

Enclosure (1)

cc: Lynn Tolin, Martin Group
Richard Hyatt, Regional Water Quality Control Board

QUARTERLY GROUNDWATER MONITORING REPORT SECOND QUARTER 1993 EMERY BAY MARKETPLACE EMERYVILLE, CALIFORNIA

JUNE 14, 1993

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ENVIRONMENTAL ENGINEERING CORPORATION

McLaren Hart™

June 14, 1993

Ms. Lynn Tolin
Christie Avenue Partners - JS
5800 Shellmound Avenue, Suite 210
Emeryville, California 94608

Dear Ms. Tolin:

QUARTERLY GROUNDWATER MONITORING REPORT SECOND QUARTER 1993, EMERY BAY MARKETPLACE, EMERYVILLE, CALIFORNIA

This letter report documents the results of the quarterly monitoring activities conducted at the Emery Bay Marketplace (Marketplace) property during April 1993. This is the eleventh quarterly report submitted in accordance with the "Work Plan for Groundwater Monitoring and Free Product Removal at the Marketplace Site, Emeryville, California," July 6, 1990 (Work Plan) (McLaren, 1990b). The Work Plan was submitted to address recommendations made in the report "Groundwater Characterization, Emery Bay Marketplace," June 19, 1990 (Groundwater Characterization Report) (McLaren, 1990a).

This letter report presents the results of the depth to groundwater measurements and the groundwater quality sampling and analyses performed during the month of April 1993. The data evaluation compares data collected during this quarter to historic data collected at the site.

FIELD METHODS

Depths to groundwater in all existing wells at the Marketplace property were measured with a Solinist electronic water level indicator on April 29, 1993. A Marine Moisture Control Company oil-water interface probe was used to measure depth to oil and depth to groundwater in the well where free product was present (Well W-5). Hydrologic data sheets with original field water level data are provided in Attachment A. A summary of historic depth to groundwater measurements, monitoring well surface casing elevations, and calculated groundwater surface elevations is presented in Table 1.

A peristaltic pump was used to purge groundwater prior to sampling with a disposable bailer on April 29, 1993. Groundwater was purged until a minimum of three casing volumes of groundwater were removed, turbidity readings were below 50 NTUs and temperature, conductivity and pH readings were stabilized. Groundwater samples were collected in one-liter amber bottles.

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Groundwater samples from wells W-7, W-13, W-14, W-19, W-20, and W-24 were analyzed for TPH/D and TPH/MO by EPA Method 8015 Modified. For this quarter, groundwater samples were also analyzed for gasoline and kerosene by EPA Method 8015 Modified. McLaren/Hart specifically requested lower detection limits of 0.05 ppm for all compounds analyzed. These samples were sent under chain-of-custody to McLaren/Hart Analytical Laboratory (MAL) in Rancho Cordova, California. One travel blank was sent as a Quality Assurance (QA) sample on each day of sampling. The analytical laboratory data sheets, QA laboratory results, chain-of-custody records, and sampling data sheets are included in Attachment B. The analytical results are summarized and presented with the historic analytical data in Table 2.

DATA EVALUATION

The data which are evaluated consist of: 1) groundwater surface elevations, as determined by the April 29, 1993 depth to groundwater measurements; 2) groundwater flow directions, as determined from the groundwater surface contour map that has been prepared based on the groundwater elevations; and 3) groundwater quality data obtained in April 1993.

Groundwater Elevations

The April 29, 1993 groundwater surface elevation contours for the artificial fill material beneath the site are presented in Figure 1. Elevations from the following wells were omitted from the preparation of groundwater surface elevation contours for the reasons described:

- Elevations from Wells W-15, W-16, and W-22 were not used to construct the map because these wells are completed in the native material below the artificial fill material.

- The groundwater elevation for Well W-5 was not used because the free product which occurs in this well is likely to affect the measured groundwater elevation.

- The elevation from Well W-7 was not used because it is significantly higher than elevations in adjacent wells. The higher elevation at Well W-7 has consistently been observed when water elevations have previously been measured. As discussed in the Groundwater Characterization Report, perched groundwater conditions may occur within the artificial fill material at this location.

Groundwater Flow Direction

The groundwater elevation map for wells completed in the native material is consistent with previous groundwater flow maps and indicates that groundwater flows in a westerly to southwesterly direction, toward Christie Avenue. The April 1993 water levels were generally lower than those measured in January 1993. As discussed in the Groundwater Characterization Report (McLaren, 1990a), local variations in groundwater flow near Wells W-4 and W-8 may be caused by the slurry wall that is installed to a depth of 35 feet on the upgradient property. Well W-8 was not accessible on this date.

Groundwater Quality

Groundwater samples were collected on April 29, 1993 from six wells within and on the downgradient side of the property (W-7, W-13, W-14, W-19, W-20, and W-24). All groundwater samples collected in April 1993 were analyzed for total petroleum hydrocarbons (TPH) as diesel (TPH/D), motor oil (TPH/MO), kerosene (TPH/K), and as gasoline (TPH/G) by EPA Method 8015 Modified, with a detection limit of 0.05, where possible. The analytical results are summarized in Table 2 and presented in Figure 1. The following discussion focuses on the results of the analyses in the quarterly monitoring program.

The purpose of the quarterly monitoring program is to confirm that total petroleum hydrocarbons (TPH) are confined to within the Marketplace property and have not migrated off-site. The six wells (W-7, W-13, W-14, W-19, W-20 and W-24) that were sampled during this quarter, have been sampled since 1989 (W-7) and since 1990 (W-13, W-14, W-19, W-20, and W-24). The following is a summary of the past as well as present analytical results for each of the six downgradient wells.

- Well W-7 is located in the center of the site. TPH/D has been detected in groundwater at levels ranging from less than 0.5 (non-detect) to 5.6 ppm. The TPH/D result from the April 1993 sampling was 1.6 ppm. Prior to the April 1993 sampling event, TPH/MO had been detected at levels between 2 and 12 ppm. The April 1993 TPH/MO result was 1.7 ppm, slightly lower than the lowest concentration perviously detected. Therefore, in the April 1993 sampling, both TPH/D and TPH/MO results were confirmed within the past range of results or a similar concentration to groundwater sampled from this well.

- Well W-13 is located on the downgradient, central side of the site. TPH had never been detected in groundwater from this well prior to the January 1993 sampling event, when TPH as motor oil was detected at 0.11 ppm. The April 1993 sampling result of 0.12 ppm confirmed the January 1993 data. As in January, the April laboratory data sheet indicated that the gas chromatographic pattern for motor oil in the sample did not exactly match the

standard chromatograph. TPH/MO was detected in this well for the first time in January because the detection limits for TPH were reduced from 0.5 to 0.05.

- Well W-14 is located on the downgradient, southern side of the site. Similar to well W-13, TPH had never been detected in groundwater from this well prior to the January 1993 sampling event, when TPH as motor oil was detected at 0.13 ppm. The April 1993 sampling result of 0.15 ppm confirmed the January 1993 data. As in January, the laboratory data sheet indicated that the gas chromatographic pattern for motor oil in the sample did not exactly match the standard chromatograph. TPH/MO was detected because the detection limits for TPH were reduced from 0.5 to 0.05.

- Well W-19 is located within the site upgradient of W-7 on the northwestern side of the site. The TPH/D detected in April 1990 and January 1993 was not confirmed in April 1993. TPH/MO has been detected in the past in groundwater sampled from well W-19 at levels ranging from less than one (the detection limit) to 34 ppm. The April 1993 TPH/MO result was within this range at 8.2 ppm. The analytical results indicate that TPH/MO present in this well match the standard chromatograph.

- Well W-20 is located on the far downgradient side of the site. TPH/D has never been detected in groundwater from this well. TPH/MO detected in groundwater sampled from well W-20 in April 1991 at 2.3 ppm and in January 1993 at 0.42 ppm was confirmed in April 1993 at 0.38 ppm. It is likely that TPH/MO has always been present in this well below the detection limits which have ranged from 0.5 to 1 ppm. The laboratory data sheet indicated that the gas chromatographic pattern for motor oil in the sample did not exactly match the standard chromatograph.

- Well W-24 is located on the downgradient side of the site. TPH/D has not been detected in the groundwater sampled from well W-24 in either the previous or the most recent sampling events. The TPH/MO detected in April 1991 at 1.1 ppm, and in January 1993 at 0.2 ppm was confirmed in April 1993 at 0.14 ppm. It is likely that TPH/MO has always been present in this well below the detection limits which have ranged from 0.5 to 1 ppm. The laboratory data sheet indicated that the gas chromatographic pattern for motor oil in the sample did not exactly match the standard chromatograph.

Product thickness has been measured in wells W-5 and W-16 since October 1989. Product thickness in well W-5 has not changed very much since the free product removal program ended in June 1991. Product thickness in the most recent five quarters has ranged between 0.80 and 1.5 feet in well W-5. Prior to the end of monthly product removal for well W-5, product thickness had ranged between 0.71 and 2.12 feet. Prior to October 1991, the

product thickness in well W-16 ranged between not detected and 0.07 feet. Product has not been measurable in well W-16 since October 1991.

SUMMARY AND CONCLUSIONS

The results from the ongoing quarterly monitoring activities conducted at the Emery Bay Marketplace property are summarized as follows:

- The April 1993 groundwater flow map for the artificial fill (Figure 1) is consistent with previous groundwater flow maps, and shows that groundwater flow is toward the west-southwest.

- TPH as gasoline and kerosene were not detected in any wells above the detection limit of 0.05 ppm, consistent with previous results.

- TPH/MO has been confirmed in wells W-7 and W-19 and TPH/D has been confirmed in well W-7, where previously detected. The chromatographic patterns for TPH/D and TPH/MO matched the standard chromatographic range.

- Hydrocarbons quantified as TPH/MO are present at concentrations less than 0.4 ppm in the four wells located on the downgradient side of the site (wells W-13, W-14, W-20, and W-24). Hydrocarbons were detected previously in two of these wells one time in April 1991, and in all of these wells in January 1993, when the analysis was done with lower detection limits. The chromatographic pattern of the TPH/MO detected at all four of these locations did not match the standard chromatograph, indicating that the source of TPH/MO on the downgradient side of the site is not the same as the source at wells W-7 and W-19.

These results confirm the analytical results of January 1993, which first indicated that the TPH/D and TPH/MO detected in wells W-7 and W-19 are from a different source than the TPH/MO detected in wells W-13, W-14, W-20, and W-24, all of which are located on the downgradient side of the site. Based upon the site use history, it is likely that the source of TPH in W-7 and W-19 is the former Nielsen Trucking facility which was in the vicinity of these wells. The site use history for the Marketplace property indicates that an asphalt producing facility was formerly in the vicinity of the Marketplace building and that a tar-like substance is distributed throughout the fill beneath this and adjacent properties.

Because TPH/MO was detected in the four downgradient wells when the EPA Method 8015 analysis was performed with low detection limits (as requested by the Alameda County of Environmental Health), it can be inferred that TPH/MO is present in this area wherever fill is present at these low concentrations.

If you have any questions regarding this report, please call me at (510) 521-5200.

Sincerely,

Julie S. Menack

Julie S. Menack, CEG
Supervising Geoscientist

cc: Brian Oliva, Alameda County Department of Environmental Health
Richard Hyatt, Regional Water Quality Control Board

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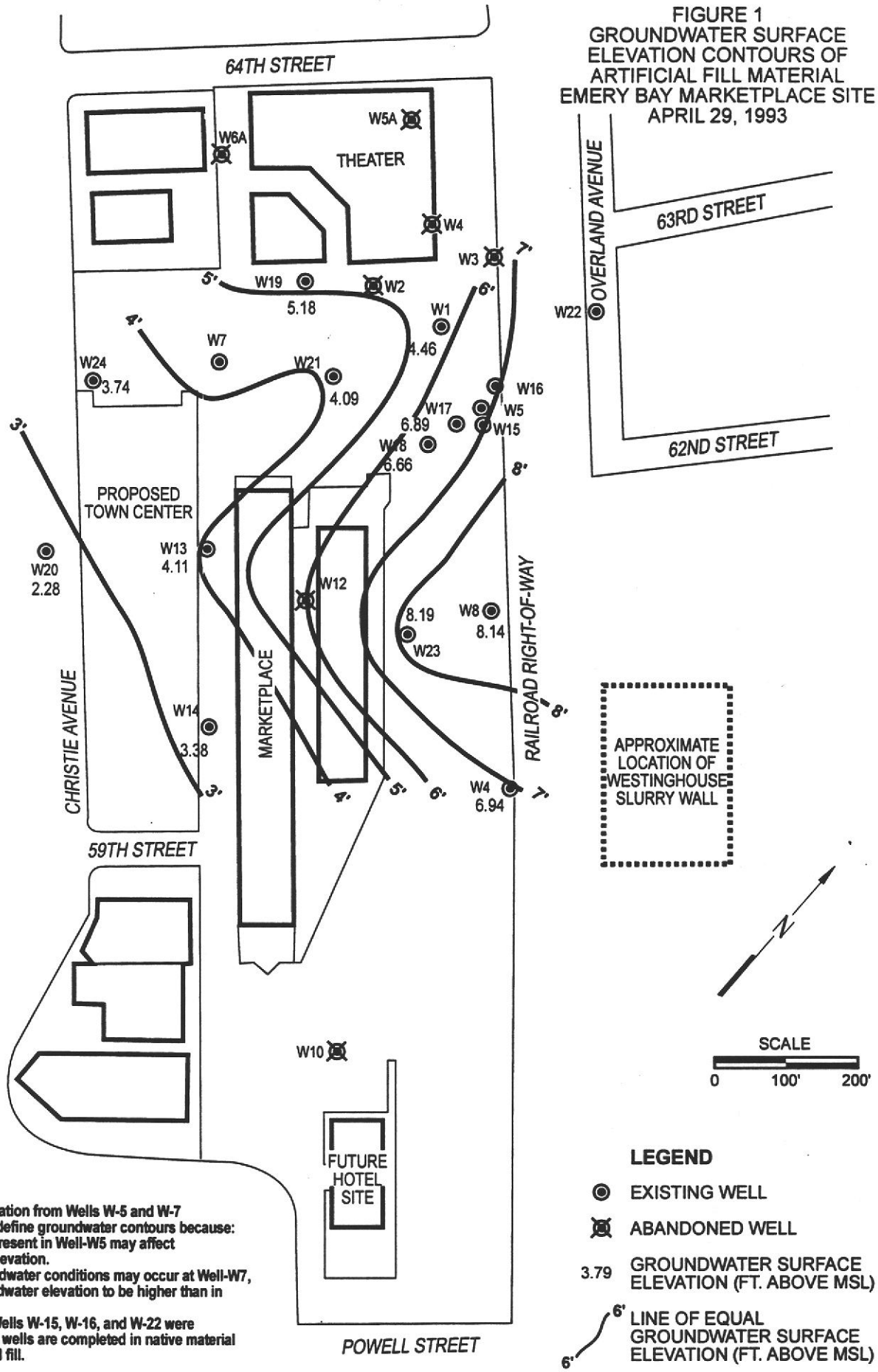
REFERENCES

McLaren. (1990a). Groundwater Characterization, Emery Bay Marketplace, June 19,1990.

McLaren. (1990b). Work Plan for Groundwater Monitoring and Free Product Removal at the Marketplace Site, Emeryville, California, July 6, 1990.

FIGURE 1
GROUNDWATER SURFACE ELEVATION CONTOURS OF ARTIFICIAL FILL MATERIAL EMERY BAY MARKETPLACE SITE APRIL 29, 1993



* Groundwater elevation from Wells W-5 and W-7 were not used to define groundwater contours because:
- * Free product present in Well-W5 may affect groundwater elevation.
- * Perched groundwater conditions may occur at Well-W7, causing groundwater elevation to be higher than in adjacent wells.

** Elevations from Wells W-15, W-16, and W-22 were not used because wells are completed in native material below the artificial fill.

LEGEND

- EXISTING WELL
- ABANDONED WELL
- 3.79 GROUNDWATER SURFACE ELEVATION (FT. ABOVE MSL)
- 6' LINE OF EQUAL GROUNDWATER SURFACE ELEVATION (FT. ABOVE MSL)

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MrktPlc/GWC/6-93/02

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TABLE 1

GROUNDWATER DEPTHS AND ELEVATIONS
EMERY BAY MARKETPLACE SITE

Well Number (Feet)	Top of Casing (Feet)	Date	Depth to Groundwater (Feet)	Groundwater Elevation (Feet)	Product Thickness
W-1[a]	11.47	08-07-81	4.30	6.20[b]	
		09-10-81	4.40	6.10[b]	
		05-06-87	6	6.08[b]	
		08-20-89	5.60	5.87	
		10-11-89	5.63	5.84	
		02-22-90	4.92	6.55	
		02-28-90	5.02	6.45	
		04-09-90	5.44	6.03	
		06-07-90	5.37	6.10	
		07-25-90	5.26	6.21	
		10-03-90	5.43	6.04	
		01-03-91	5.69	5.78	
		04-03-91	4.74	6.73	
		10-25-91	5.22	6.25	
		01-15-92	4.88	6.59	
		04-23-92	4.98	6.49	
		07-21-92	5.16	6.31	
		10-22-92	5.79	5.68	
		01-26-93	4.82	6.65	
		04-29-93	6.01	5.46	
W-4	9.96	08-07-81	4.30	6.20[b]	
		09-10-81	4.40	6.10[b]	
		01-18-82	2.50	8.00[b]	
		03-27-85	?[c]	8.65	
		08-20-89	3.95	6.01	
		10-11-89	3.87	6.09	
		02-22-90	2.0	7.96	
		02-28-90	2.39	7.57	
		04-09-90	3.17	6.79	
		06-07-90	2.73	7.23	
		07-25-90	3.71	6.25	
		10-03-90	4.18	5.78	
		01-03-91	3.64	6.32	
		04-03-91	1.45	8.51	
		10-25-91	4.29	5.67	
		01-15-92	2.56	7.40	
		04-23-92	2.80	7.16	
		07-21-92	4.03	5.93	
		10-22-92	4.50	5.46	
		01-26-93	1.52	8.44	
		04-29-93	3.02	6.94	
W-5	11.41	08-07-81	4.70	7.50[b]	c
		09-10-81	4.90	7.30[b]	c
		01-18-82	2.50	9.60[b]	c
		03-27-85	?[c]	9.28	c
		10-11-89	4.43	6.98	0.71
		02-22-90	3.80	7.61	0.88
		02-28-90	4.43	6.98	1.65
		04-09-90	4.73	6.68	1.82
		06-07-90	4.30	7.11	1.80
		07-25-90	5.10	6.31	2.12
		10-03-90	4.90	6.51	1.11
		01-03-91	4.77	6.64	0.85
		04-03-91	2.42	8.99	0.03
		10-25-91	5.47	5.94	1.18
		01-15-92	3.21	8.2	0.80
		04-23-92	3.13	8.28	1.41

TABLE 1

GROUNDWATER DEPTHS AND ELEVATIONS
EMERY BAY MARKETPLACE SITE
(continued)

Well Number (Feet)	Top of Casing (Feet)	Date	Depth to Groundwater (Feet)	Groundwater Elevation (Feet)	Product Thickness
		07-21-92	3.55	7.86	1.50
		10-22-92	4.28	7.13	1.45
		01-26-93	3.28	8.13	1.24
		04-29-93	2.60	8.81	NM
W-7[a]	9.05	05-06-87	3	6.88[b]	
		08-20-89	3.59	5.46	
		10-11-89	3.08	5.97	
		02-22-90	1.75	7.30	
		02-28-90	1.31	7.74	
		04-09-90	2.42	6.63	
		06-07-90	1.21	7.84	
		07-25-90	2.76	6.29	
		10-03-90	3.22	5.83	
		01-03-91	3.17	5.88	
		04-03-91	1.18	7.87	
		10-25-91	3.47	5.59	
		01-15-92	3.88	5.17	
		04-23-92	3.20	5.85	
		07-21-92	3.65	5.40	
		10-22-92	4.58	4.77	
		01-26-93	1.12	7.93	
		04-29-93	2.90	6.15	
W-8[a]	10.43	05-06-87	5.5	6.88[b]	
		08-20-89	3.59	6.84	
		02-22-90	1.5	8.93	
		02-28-90	1.78	8.65	
		04-09-90	3.12	7.31	
		06-07-90	2.90	7.53	
		07-27-90[c]	3.33	7.10	
		10-03-90	3.65	6.78	
		01-03-91	3.46	6.97	
		04-03-91	1.47	8.96	
		10-25-91	3.54	6.89	
		01-15-92	2.98	7.45	
		04-24-92	3.01	7.42	
		07-21-92	3.41	7.02	
		10-22-92	4.23	6.20	
		04-29-93	2.29	8.14	
W-13	8.15	08-20-89	4.64	3.51	
		10-11-89	4.60	3.55	
		02-22-90	3.85	4.30	
		02-28-90	4.18	3.97	
		04-09-90	4.31	3.84	
		06-07-90	3.93	4.22	
		07-25-90	4.40	3.75	
		10-03-90	4.67	3.48	
		01-03-91	4.43	3.72	
		04-03-91	3.64	4.51	
		10-25-91	4.54	3.72	
		01-15-92	3.82	4.33	
		04-23-92	4.12	4.03	
		07-21-92	4.44	3.71	
		10-22-92	4.42	3.73	
		01-26-93	3.10	5.05	
		04-29-93	4.04	4.11	

TABLE 1

GROUNDWATER DEPTHS AND ELEVATIONS
EMERY BAY MARKETPLACE SITE
(Continued)

Well Number (Feet)	Top of Casing (Feet)	Date	Depth to Groundwater (Feet)	Groundwater Elevation (Feet)	Product Thickness
W-14	7.97	08-20-90	5.02	2.95	
		02-22-90	4.19	3.78	
		02-28-90	4.46	3.51	
		04-09-90	4.36	3.61	
		06-07-90	5.29	2.68	
		07-25-90	4.83	3.14	
		10-03-90	5.09	2.88	
		01-03-91	4.32	3.65	
		04-03-91	4.31	3.66	
		10-25-91	4.41	3.56	
		01-15-92	4.18	3.79	
		04-23-92	4.93	3.04	
		07-21-92	4.57	3.40	
		10-22-92	5.28	2.69	
		01-26-93	3.94	4.03	
		04-29-93	4.59	3.38	
W-15	11.53	08-20-89	3.43	8.10	
		10-11-89	4.26	7.27	
		02-22-90	2.58	8.95	
		02-28-90	2.53	9.00	
		04-09-90	2.48	9.05	
		06-07-90	4.54	6.99	
		07-25-90	4.00	7.53	
		10-03-90	3.46	8.07	
		01-03-91	2.97	8.56	
		04-03-91	3.05	8.48	
		10-25-91	2.88	8.65	
		01-15-92	3.54	7.99	
		04-23-92	2.78	8.75	
		07-21-92	2.67	8.86	
		10-22-92	2.65	8.88	
		01-26-93	2.47	9.06	
		04-29-93	2.56	8.97	
W-16[1]	10.94	10-11-89	4.81	6.13	0.07
		02-22-90	3.92	7.02	NM
		02-28-90	3.88	7.06	NM
		04-09-90	7.81	3.13	NM
		06-07-90	6.19	4.75	NM
		07-27-90[1]	4.44	6.50	NM
		10-03-90	4.38	6.56	0.02
		01-03-91	4.67	6.27	0.02
		04-03-91	3.50	7.48	0.02
		10-25-91	4.64	6.30	NM
		01-15-92	4.11	6.83	NM
		04-23-92	3.89	7.05	NM
		07-21-92	4.28	6.66	NM
		10-22-92	NA	NA	NM
		01-26-93	2.47	8.47	NM
W-17	12.14	10-11-89	9.12	3.02	
		02-22-90	5.42	6.72	
		02-28-90	5.35	6.79	
		04-09-90	5.72	6.42	
		06-07-90	---[2]	---[2]	
		07-26-90	5.59	6.55	
		10-03-90	5.72	6.42	
		01-03-91	6.28	5.86	
		04-03-91	4.69	7.45	

TABLE 1

GROUNDWATER DEPTHS AND ELEVATIONS
EMERY BAY MARKETPLACE SITE
(Continued)

Well Number (Feet)	Top of Casing (Feet)	Date	Depth to Groundwater (Feet)	Groundwater Elevation (Feet)	Product Thickness
		10-25-91	6.00	6.14	
		01-15-92	5.57	6.57	
		04-23-92	5.17	6.97	
		07-21-92	5.54	6.60	
		10-22-92	6.10	6.04	
		01-26-93	4.45	7.69	
		04-29-93	5.25	6.89	
W-18	11.34	10-11-89	5.52	5.82	
		02-22-90	4.42	6.92	
		02-28-90	4.77	6.57	
		04-09-90	5.24	6.10	
		06-07-90	4.28	7.06	
		07-25-90	4.98	6.36	
		10-03-90	5.44	5.90	
		01-03-91	5.84	5.50	
		04-03-91	4.94	6.40	
		10-25-91	5.55	5.79	
		01-15-92	5.24	6.10	
		04-23-92	4.81	6.53	
		07-21-92	5.01	6.33	
		10-22-92	5.55	5.79	
		01-26-93	4.72	6.62	
		04-29-93	4.68	6.66	
W- 19	10.27	04-09-90	5.11	5.16	
		06-07-90	4.77	5.50	
		07-25-90	4.93	5.34	
		10-03-90	4.95	5.32	
		01-03-91	5.95	4.32	
		04-03-91	5.39	4.88	
		10-25-91	5.47	4.80	
		01-15-92	5.18	5.09	
		04-23-92	5.34	4.93	
		07-21-92	5.08	5.19	
		10-22-92	5.31	4.96	
		01-26-93	4.82	5.45	
		04-29-93	5.09	5.18	
W-20	6.82	04-09-90	4.08	2.74	
		06-07-90	3.79	3.03	
		07-25-90	4.00	2.82	
		10-03-90	4.03	2.79	
		01-03-91	4.12	2.70	
		04-03-91	3.84	2.98	
		10-25-91	4.07	2.75	
		01-15-92	3.75	3.07	
		04-23-92	4.08	2.74	
		07-21-92	4.02	2.80	
		10-22-92	4.07	2.75	
		01-26-93	3.30	3.52	
		04-29-93	4.00	2.82	
W-21	9.48	04-09-90	5.21	4.27	
		06-07-90	4.84	4.64	
		07-25-90	5.05	4.43	
		10-03-90	5.18	4.30	
		01-03-91	5.47	4.01	
		04-03-91	4.80	4.68	
		10-25-91	5.04	4.44	

TABLE 1

GROUNDWATER DEPTHS AND ELEVATIONS
EMERY BAY MARKETPLACE SITE
(Continued)

Well Number (Feet)	Top of Casing (Feet)	Date	Depth to Groundwater (Feet)	Groundwater Elevation (Feet)	Product Thickness
		01-15-92	4.95	4.53	
		04-23-92	5.17	4.31	
		07-21-90	5.07	4.41	
		10-22-92	5.28	4.20	
		01-26-93	4.46	5.02	
		04-29-93	5.39	4.09	
W-22	11.67	04-09-90	7.50	4.17	
		06-07-90	7.36	4.31	
		07-25-90	7.49	4.18	
		10-03-90	7.68	3.99	
		01-03-91	7.88	3.79	
		04-03-91	7.64	4.03	
		10-25-91	6.69	4.98	
		01-15-92	7.61	4.06	
		04-23-92	7.21	4.46	
		07-21-92	7.69	3.98	
		10-22-92	7.82	3.85	
		01-26-93	7.40	4.27	
		04-29-93	7.71	3.96	
W-23	9.16	04-09-90	1.51	7.65	
		06-07-90	1.78	7.38	
		07-27-90[f]	2.63	6.53	
		10-03-90	3.20	5.96	
		01-03-91	2.36	6.80	
		04-03-91	0.60[h]	8.56	
		10-25-91	2.36	6.80	
		01-15-92	1.62	7.54	
		04-23-92	1.18	7.98	
		07-21-92	2.17	6.99	
		10-22-92	2.76	6.40	
		01-26-93	0.39	8.77	
		04-29-93	0.97	8.19	
W-24	8.72	06-07-90	4.75	3.97	
		07-25-90	5.02	3.70	
		10-03-90	5.00	3.72	
		01-03-91	5.25	3.47	
		04-03-91	4.56	4.16	
		10-25-91	5.09	3.63	
		01-15-92	4.82	3.90	
		04-23-92	4.94	3.78	
		07-21-92	5.00	3.72	
		10-22-92	5.13	3.59	
		01-26-93	3.38	5.34	
		04-29-93	4.98	3.74	

a Nielson Property
b Groundwater elevation taken from earlier reports; may not agree with calculated elevation using current top of casing elevation.
c Data not available.
d Well W-8 was not accessible on 7-25-90 and 7-26-90. It was sounded on 7-27-90.
e NM indicates product thickness not measurable.
f Wells W-16 and W-23 were under pressure when sounded in 7-25-90. The wells were allowed to equilibrate and were resounded on 7-27-90.
g Well W-17 not accessible on 6-7-90.
h Depth to groundwater measured with tape measure because water level was too shallow to measure with oil-water interface probe.
i Well W-16 not accessible on 10-22-92.
j Well W-8 not accessible on 01-26-93

TABLE 2

HYDROCARBONS IN GROUNDWATER
EMERY BAY MARKETPLACE SITE

Well Number	Sample Date	TPH/D Concentration (ppm)	TPH/MO Concentration (ppm)
W-1	04-14-87	---[a]	<5[b,c]
	02-28-90	<0.5	---
	04-11-90	<0.1	0.57
W-2[d]	04-15-87	<1	---
W-3[d]		---	---
W-4[d]	04-14-87	---	<5[c]
W-4	03-01-90	<0.5	---
	04-10-90	<0.1	<0.25
W-5[e]	09-27-89	20	---
B-5[d]		---	---
W-5A[d]	04-16-87	<1[f]	<1[f]
W-5[n]	10-25-91	HFA: Crude Oil or Waste Oil	
W-6[d]	04-16-87	<1[f]	<1[f]
W-7	09-26-89	1.1	---
	02-28-90	<0.5[g]	---
	04-11-90	5.6	7.5
	07-30-90	2.6	2
	10-04-90	5	6
	01-04-91	4	12
	04-03-91	<1.0[h]	3.2
	10-25-91	1.4	2.3
	10-25-91[n]	HFA: Biogenic or highly degraded material	
	01-16-92	1.6	3.6
	04-24-92	3.3	4.9
	07-23-92	2.6	4.0
	10-23-92[i,e]	3.8	4.2
	01-27-93	<0.5	8.0[i]
	04-29-93	1.6	1.7[i]
W-8	04-17-87	10[i]	---
	09-26-89	7.1	---
	03-01-90	4.5	---
	04-18-90	5.3	---
W-13	02-28-90	<0.5	---
	04-12-90	<0.5	---
	07-27-90	<0.5	<1
	10-04-90	<0.5	<1
	01-03-91	<0.5	<1
	04-04-91	<0.5	<1
	10-25-91	<0.5	<1
	01-16-92	<0.5	<0.5
	04-24-92	<0.5	<0.5
	07-22-92	<0.5	<0.5
	10-23-92	<0.5	<0.5
	01-27-93	<0.05	0.11[i]
	04-29-93	<0.5	0.12[i]

TABLE 2

HYDROCARBONS IN GROUNDWATER
EMERY BAY MARKETPLACE SITE
(Continued)

Number Well	Sample Date	TPH/D Concentration (ppm)	TPH/MO Concentration (ppm)
W-14	02-28-90	<0.5	---
	04-11-90	<0.1	<0.25
	07-30-90	<0.6	<1
	10-04-90	<0.5	<1
	01-04-91	<0.5	<1
	04-04-91	<0.5	<1
	10-25-91	<0.5	<1
	01-16-92	<0.5	<0.5
	04-24-92	<0.5	<0.5
	07-22-92	<0.5	<0.5
	10-23-92	<0.5	<0.5
	01-27-93	<0.05	0.13[1]
	04-29-93	<0.05	0.15[1]
W-15	09-25-89	1.2	---
	04-13-90	1.5	---
W-16	09-27-89	4.7	---
	02-28-90	22	---
	04-13-90	9	---
W-17	09-25-89	0.7	---
	04-13-90	1.6	---
W-18	09-26-89	3.1	---
	04-13-90	5.1	---
W-19	04-12-90	1.1	---
	04-16-90	<0.5[j]	---
	07-27-90	<1	8
	10-03-90	<0.5[k]	3
	01-03-91	<0.5	<1
	04-03-91	<2.5[n]	8.4
	10-25-91[n]	<0.5	34
	10-25-91	HFA: Motor Oil	---
	01-17-92	<10.0	29
	04-23-92	<2.0	7.1
	07-23-92	<0.1	7.3
	10-22-92[1]	<10	28
	01-26-93	0.79	35
	04-29-93	<0.05	8.2
W-20	04-12-90	<0.5	---
	04-16-90	<0.5	---
	07-30-90	<0.5	<1
	10-03-90	<0.5	<1
	01-04-91	<0.5	<1
	04-04-91	<0.5	2.3[1]
	10-25-91[n]	<0.5	<1
	10-25-91[n]	HFA: Volatiles and Semi-Volatiles not detected	---
	01-17-92	<0.5	<0.5
	04-24-92	<0.5	<0.5
	07-22-92	<0.5	<0.5
	10-22-92	<0.5	<0.5
	01-27-93	<0.10	0.42[1]
	04-29-93	<0.05	0.38[1]
W-21	04-12-90	1.4	---
	04-18-90	1.7	---

TABLE 2

HYDROCARBONS IN GROUNDWATER
EMERY BAY MARKETPLACE SITE

Well Number	Sample Date	TPH/D Concentration (ppm)	TPH/MO Concentration (ppm)
W-22	04-12-90	<0.5	---
	04-18-90	<0.5	---
W-23	04-12-90	2.9	---
	04-18-90	3.6	---
W-24	06-07-90	<0.5	---
	07-27-90	<0.5	<1
	10-03-90	<0.5	<1
	01-03-91	<0.5	<1
	04-03-91	<0.5	1.1[1]
	10-25-91[m]	<0.5	<1
	10-25-91[n]	HFA: Volatiles and Semi-Volaties not detected	---
	01-17-92	<0.5	<0.5
	04-24-92	<0.5	<0.5
	07-23-92	<0.5	<0.5
	10-22-92	<0.5	<0.5
	01-26-93	<0.05	0.20[1]
	04-29-93	<0.05	0.14[1]

Footnotes:

a --- indicates no analysis made for constituent.
b < indicates constituent not detected above this level.
c Grease also not detected above 5 ppm in Wells W-1 and W-4 (Nielson)
d Abandoned well on Nielson property.
e Free product in Well W-5.
f Indicates total gasoline, diesel, and motor oil also not detected above 1 ppm in wells W-5A and W-6.
g Review of gas chromatograph indicated TPH/D present at 0.3 ppm in Well W-7 on 2-28-90.
h Reporting limits increased from 0.5 ppm to 1.0 ppm (W-7) and 2.5 ppm (W-19) TPH/D on 4-3-91 because samples were diluted due to presence of motor oil.
i Semiquantified results include gasoline, diesel, and some oil and grease in well W-8.
j Review of gas chromatograph indicated TPH/D present at 0.4 ppm in Well W-19 on 4-16-90.
k Review of gas chromatograph indicated TPH/D present at 0.3 ppm in Well W-19 on 10-3-90.
l The chromatographic pattern in the sample does not exactly match the motor oil standard chromatograph.
m BTEX analyzed 10/25/91, not detected.
n Hydrocarbon Fingerprinting Analysis (HFA)
o The chromatographic pattern in the sample does not exactly match the diesel standard chromatograph.

ATTACHMENT A

HYDROLOGIC DATA SHEETS

McLaren Hart

INSTRUMENT CALIBRATION LOG

Client Name and Site:	Project Manager:	Task Number:
MARKET PLACE / EMERYVILLE	J. MENACK	04.0059805.000

Calibration Event:

Person Calibrating:	D. WATTI	Date:	4/29/93
Instrument Type:	OVM	Calibration Gas:	ISOBUTYLENE IN AIR
Model:	580A	Calibration Gas Concentration (ppm):	100
Serial #:	200	Reading (ppm):	99.2
Calibrator Model:	TEDLAR BAG	Adjusted Reading (If Necessary)	NA
Comments:			D Watti

Person Calibrating:		Date:	
Instrument Type:		Calibration Gas:	
Model:		Calibration Gas Concentration (ppm):	
Serial #:		Reading (ppm):	
Calibrator Model:		Adjusted Reading (If Necessary)	
Comments:			

Person Calibrating:		Date:	
Instrument Type:		Calibration Gas:	
Model:		Calibration Gas Concentration (ppm):	
Serial #:		Reading (ppm):	
Calibrator Model:		Adjusted Reading (If Necessary)	
Comments:			

Person Calibrating:		Date:	
Instrument Type:		Calibration Gas:	
Model:		Calibration Gas Concentration (ppm):	
Serial #:		Reading (ppm):	
Calibrator Model:		Adjusted Reading (If Necessary)	
Comments:			

Person Calibrating:		Date:	
Instrument Type:		Calibration Gas:	
Model:		Calibration Gas Concentration (ppm):	
Serial #:		Reading (ppm):	
Calibrator Model:		Adjusted Reading (If Necessary)	
Comments:			

Comments:

NOTE: Return to **REHSC** Upon Completion of Site Work.

DIRECT READING REPORT

Sheet 1 of 1

Client Name and Site:	Project Manager:	Task Number:	Date:
MARKET PLACE / EMERYVILLE	J. MENICK	04.0059805.000	4/29/93

Employee:	Title:	Weather Conditions/ Observations:	Wind Speed:	Wind Direction:	Temperature:
D. WITT	Asst. Env. Sci.	CLEAR, SUNNY	TRACE	S	74 F

Direct Reading Data

Location:	Task Description (Drilling, Sampling, etc.)	Time	Instrument Type (& lamp size if applicable)	Substance/ Agent	Concentration	Source: S Breathing Zone: B
W-4	SAMPLING	0951	OVM 580A	VOC	0/0	S/B
W-8	↓	1008	10.0eV	↓	21/0	↓
W-17		1014	↓		0/0	
W-15		1024			0/0	
W-5		1034			17/0	
W-1		1055			0/0	
W-22		1059			0/0	
W-18		1105			1.5/0	
W-23		1111			8.2/0	
W-14		1120			0/0	
W-13		1127			0/0	
W-7		1129			0/0	
W-19		1134			2/0	
W-21		1139			0/0	
W-24		1142			0/0	
W-20	↓	1149	↓	↓	4.4/0	↓

Comments:

NOTE: Return to REHSC Upon Completion of Site Work. Use Additional Forms if Necessary.

McLaren

HYDRODATA

DATE: 4/29/93

PROJECT: MARKET PLACE EVENT: QUARTERLY SAMPLER: D. WATT

	NO.	WELL OR LOCATION	DATE MO	DA	YR	TIME HR	MIN	MEASUREMENT	CODE	COMMENTS
	1	W-1	4	29	93	10	55	6.01	SWL	VAULT BOX FLOODED
C	2	W-4				09	58	3.02		
C	3	W-5				10	34	2.60	OIL	OWI = 4.83 VAULT BOX FLOODED.
	4	W-7				10	14	(2.90) ~~5.25~~		
C	5	W-8				10	10	2.29		
C	6	W-13				10	27	4.04		
C	7	W-14				10	24	(4.59) ~~2.56~~		VAULT BOX FLOODED.
C	8	W-15				10	25	2.56		VAULT BOX FLOODED.
	9	W-16				—	—	—	—	BURIED / INACCESSIBLE
C	10	W-17				10	15	5.25	SWL	
	11	W-18				11	05	4.68		VAULT BOX FLOODED
	12	W-19				11	34	5.09		
C	13	W-20				11	49	4.00		
	14	W-21				11	39	5.39		
	15	W-22				10	59	7.71		
	16	W-23				11	11	0.97		
	17	W-24				11	42	4.98		
	18									
	19									
	20									

CODES:

- *SWL - Static Water Level (Feet)
- *IWL - Instant Water Level; Non-Static (Feet)
- *OIL - Oil Level (Feet)
- *OWI - Oil/Water Interface (Feet)
- *MTD - Measured Total Depth (Feet)
- FLO - Flow Rate (Gallons/Minute)
- CUM - Cumulative (Gallons)
- HRS - Total (Hours)
- PSI - Pressure (psi)²
- pH - 1 to 14
- Ec - Conductivity (µm HOS)
- TMP - Temperature (°C)
- TRB - Turbidity (NTU)
- ___ - _____ (Additional Code)

*All levels are depth from inner casing - describe any other reference points in comments column; when in doubt, describe reference point.

Note in comments column if well is not: property labeled, locked, or able to be locked. Describe corrective action.

Note flooding of vault box, odor, access problems.

²Negative pressure (Vacuum) psi = approx -(1/2 x mmHg)

C = CONE OFF

SAMPLING EVENT DATA SHEET

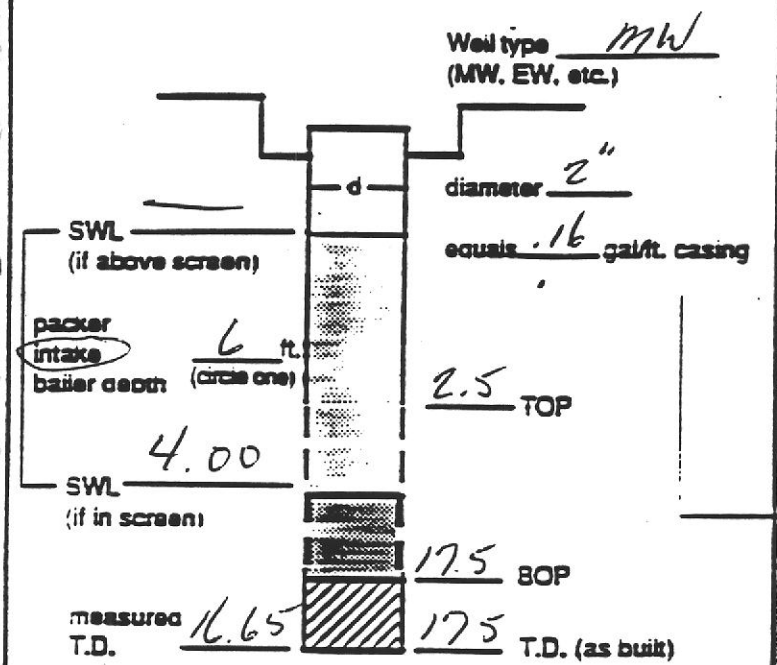
(fill out completely)

McLaren

WELL OR LOCATION W-20

PROJECT MARKET PLACE EVENT Quarterly SAMPLER D. WATTS DATE 4/29/93

Well / Hydrologic statistics



Action	Time	Pump rate	IWL (low vlek
Start pump / Begin	1223		
	1232	.25 GPM	4.68
	1243	.23 GPM	4.85
	1252	.25 GPM	4.94
Stop	1253	↓	4.94
Sampled	1256		
(Final IWL)	1302		4.37

Purge calculation

.16 gal/ft. * 13.5 ft. = 2.2 gals x 3 = 6.6 gals.

SWL to BOP or packer to BOP | one volume | purge volume- 3 casings

Head purge calculation (Airlift only)

gal/ft. * ft. = gals.

packer to SWL

Equipment Used / Sampling Method / Description of Event:

DC PERI @ DISPOSABLE BAILER.
USED DESIGN T.D FOR PURGE CALCULATION.

Actual gallons purged 6.75

Actual volumes purged 3.07

Well yield ⊕ (see below) HY

COC # 37024

Sample I.D.	Analysis	Lab
235631-32	8015 MOD (TPH Gas)	MBT
235633-34	8015 MOD	↓

Additional comments:

50% RECOVERY: 10.75

80% RECOVERY: 6.70 SAMPLE TURBIDITY: 8.42

Gallons purged *	TEMP °C / °F (circle one)	EC (µs / cm)	PH	TURBIDITY (NTU)		
1. 2.25	73.0	9400	6.43	10.02		
2. 4.50	72.4	8960	6.37	1.35		
3. 6.75	72.0	8800	6.41	0.96		
4.						
5.						

* Take measurement at approximately each casing volume purged.

⊕ HY- Minimal W.L. drop | MY - WL drop - able to purge 3 volumes during one sitting by reducing pump rate or cycling pump. | LY - Able to purge 3 volumes by returning later or next day. | VLY - Minimal recharge - unable to purge 3 volumes.

IF 5% .15

SAMPLING EVENT DATA SHEET

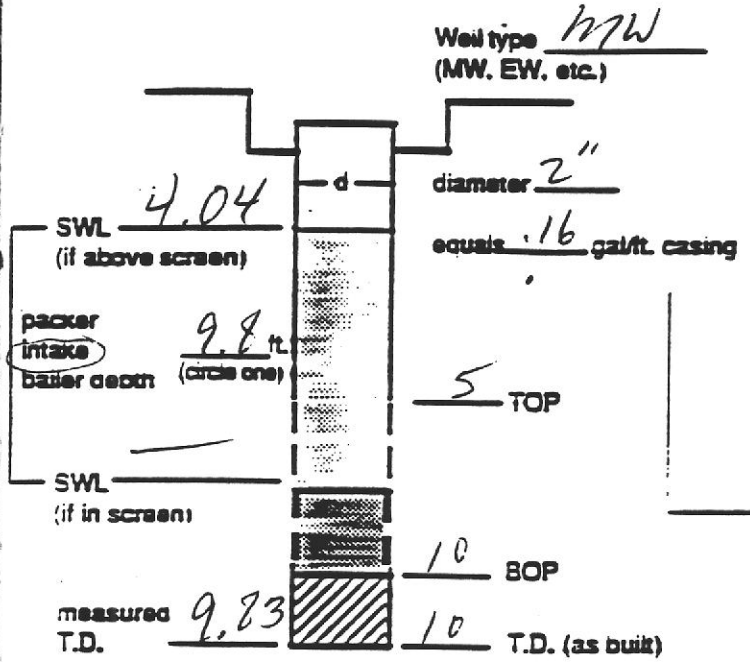
(fill out completely)

McLaren

WELL OR LOCATION MW-13

PROJECT MARKET PLACE EVENT Quarterly SAMPLER D. WATTS DATE 4/29/93

Well / Hydrologic statistics



Action	Time	Pump rate	IWL (low vlek
Start pump / Begin	1357		
	1401	.25 GPM	6.05
	1406	.25 GPM	9.02
	1412	.17 GPM	9.70
Stop	1413	↓	9.70
Sampled	1425		4.85
(Final IWL)	1430		5.55

Purge calculation

.16 gal/ft. * 5.96 ft. = 1 gals x 3 = 3 gals.

SWL to BOP or packer to BOP — one volume — purge volume- 3 casings

Head purge calculation (Airlift only)

gal/ft. * ft. = gals.

packer to SWL

Equipment Used / Sampling Method / Description of Event:

DC ELEC. W/ DISPOSABLE BAILER.
USED DESIGN T.D FOR PURGE CALCULATION

Actual gallons purged 3

Actual volumes purged 3

Well yield ⊕ (see below) HY/.174

COC # 37024

Sample I.D.	Analysis	Lab
235637-38	8015 MOD	MBT

Additional comments:

50% RECOVERY: 7.02

80% RECOVERY: 5.23 SAMPLE TURBIDITY: 42.3

Gallons purged *	TEMP °C / (F) (circle one)	EC (µs / cm)	PH	TURBIDITY (NTU)		
1. 1	69.0	1130	7.14	4.09		
2. 2	68.1	1050	7.20	32.6		
3. 3	67.9	1010	7.24	10.24		
4.						
5.						

* Take measurement at approximately each casing volume purged.

⊕ HY- Minimal W.L. drop

MY - WL drop - able to purge 3 volumes during one sitting by reducing pump rate or cycling pump.

LY - Able to purge 3 volumes by returning later or next day.

VLY - Minimal recharge - unable to purge 3 volumes.

IF 57: .15

SAMPLING EVENT DATA SHEET

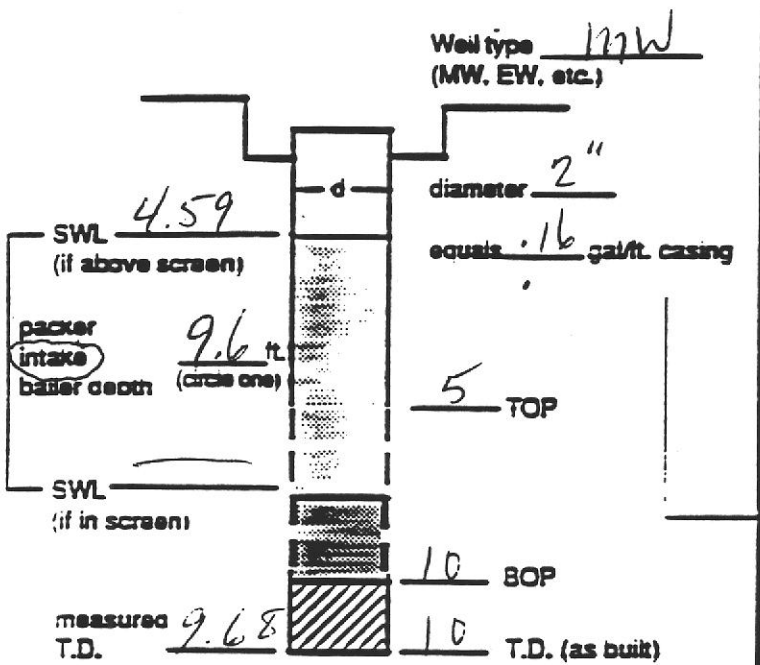
(fill out completely)

McLaren

WELL OR LOCATION W-14

PROJECT MARKET PLACE EVENT QUARTERLY SAMPLER D. WATTS DATE 4/29/93

Well / Hydrologic statistics



Action	Time	Pump rate	IWL (low yield)
Start pump / Begin	1328		
	1332	.21 GPM	7.65
Stop	1334	↓	DRY
Sampled	1442		4.72
(Final IWL)	1457		6.45

Purge calculation

.16 gal/ft. * 5.09 ft. = .82 gals x 3 = 2.5 gals.

SWL to BOP or packer to BOP | one volume | purge volume- 3 casings

Head purge calculation (Airlift only)

gal/ft. * ft. = gals.

packer to SWL

Equipment Used / Sampling Method / Description of Event:

DC Peri @ Disposable Bailer. Used measured T.D. for Purge calculation.

Actual gallons purged 1.25

Actual volumes purged 1.52

Well yield (see below) ⊕ VLY

COC # 37024

Sample I.D.	Analysis	Lab
235635-36	8015 mod	MBT

Additional comments:

50% Recovery: 7.13

80% Recovery: 5.60 Sample Turbidity: 38.5

Gallons purged *	TEMP °C (°F) (circle one)	EC (µs / cm)	PH	TURBIDITY (NTU)		
1. .82	74.7	3050	6.84	34.6		
2.						
3.						
4.						
5.						

* Take measurement at approximately each casing volume purged.

⊕ HY- Minimal W.L. drop

MY - WL drop - able to purge 3 volumes during one sitting by reducing pump rate or cycling pump.

LY - Able to purge 3 volumes by returning later or next day.

VLY - Minimal recharge - unable to purge 3 volumes.

1F 50% .15

SAMPLING EVENT DATA SHEET

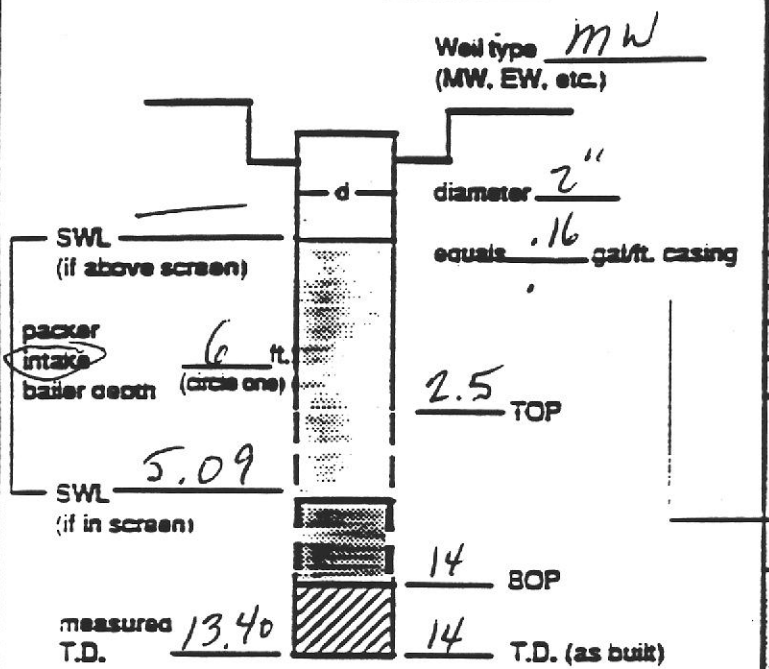
(fill out completely)

McLaren

WELL OR LOCATION W-19

PROJECT MARKET PLACE EVENT Quarterly SAMPLER D. WATTS DATE 4/29/93

Well / Hydrologic statistics



Action	Time	Pump rate	IWL (low vlek
Start pump / Begin	1522		
	1527	.3 GPM	5.11
	1533	.25 GPM	5.16
	1539	.25 GPM	5.14
Stop	1540		5.14
Sampled	1548		
(Final IWL)	1555		5.05

Purge calculation

.16 gal/ft. * 8.91 ft. = 1.5 gals x 3 = 4.5 gals.

SWL to BOP or packer to BOP | one volume | purge volume- 3 casings

Head purge calculation (Airlift only)

gal/ft. * ft. = gals.

packer to SWL

Equipment Used / Sampling Method / Description of Event:

DC PERI W DISPOSABLE BAILER.
USED DESIGN T.D. FOR PURGE CALCULATION.

Actual gallons purged 4.5

Actual volumes purged 3

Well yield ⊕ (see below) HY

COC # 37024

Sample I.D.	Analysis	Lab
235639-40	8015 MOD	MBT

Additional comments:

PRODUCT IN WELL / OIL SHEEN ON WATER
50% RECOVERY: 9.54
80% RECOVERY: 6.87 SAMPLE TURBIDITY: 12.12

Gallons purged *	TEMP °C / (°F) (circle one)	EC (µs / cm)	PH	TURBIDITY (NTU)		
1. 1.5	72.4	4640	6.73	5.29		
2. 3.0	71.5	2990	6.62	1.89		
3. 4.5	70.6	2900	6.48	3.50		
4.						
5.						

* Take measurement at approximately each casing volume purged.

⊕ HY- Minimal W.L. drop | MY - WL drop - able to purge 3 volumes during one sitting by reducing pump rate or cycling pump. | LY - Able to purge 3 volumes by returning later or next day. | VLY - Minimal recharge - unable to purge 3 volumes.

IF 5% .15

SAMPLING EVENT DATA SHEET

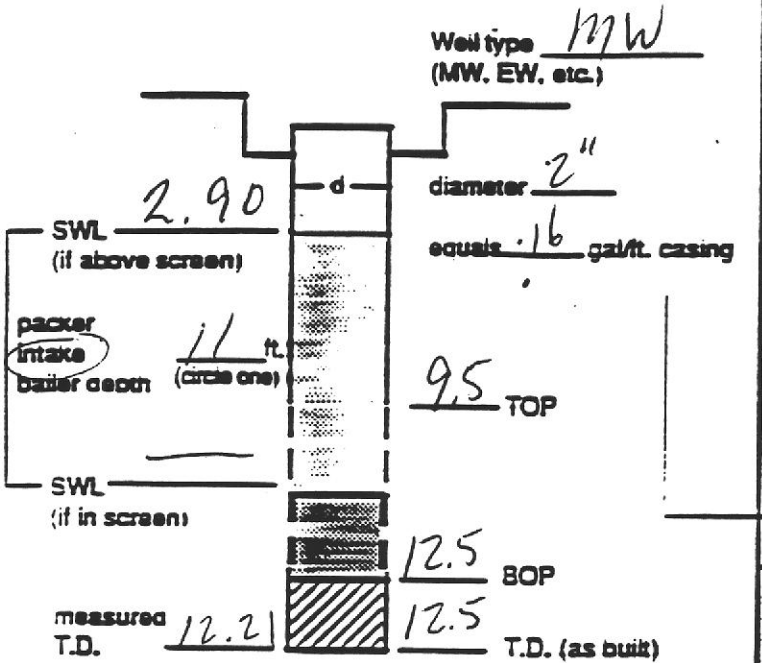
(fill out completely)

McLaren

WELL OR LOCATION W-7

PROJECT MARKET PLACE EVENT Quarterly SAMPLER D. WATTS DATE 4/29/93

Well / Hydrologic statistics



Action	Time	Pump rate	IWL (low vial
Start pump / Begin	1616		
	1622	.25 GPM	5.83
	1628	.25 GPM	7.85
	1635	.23 GPM	10.78
Stop	1636	↓	10.78
Sampled	1650		4.75
(Final IWL)	1655		5.81

Purge calculation

.16 gal/ft. * 9.6 ft. = 1.6 gals x 3 = 4.80 gals.

SWL to BOP or packer to BOP | one volume | purge volume- 3 casings

Head purge calculation (Airlift only)

gal/ft. * ft. = gals.

packer to SWL

Equipment Used / Sampling Method / Description of Event:

DC PER. @ DISPOSABLE BAILER. USED DESIGN T.D. FOR PURGE CALCULATION.

Actual gallons purged 4.8

Actual volumes purged 3

Well yield (see below) ⊕ HY/MY

COC # 37024

Sample I.D.	Analysis	Lab
235641-42	8015 MOD	MBT

Additional comments:

50% RECOVERY: 7.70

80% RECOVERY: 4.82 SAMPLE TURBIDITY: 66.7

Gallons purged *	TEMP °C / °F (circle one)	EC (µs / cm)	PH	TURBIDITY (NTU)		
1. 1.5	75.7	2890	6.07	26.3		
2. 3.25	72.8	6800	6.00	52.6		
3. 4.80	72.0	7000	5.88	42.1		
4.						
5.						

* Take measurement at approximately each casing volume purged.

⊕ HY- Minimal W.L. drop | MY - WL drop - able to purge 3 volumes during one sitting by reducing pump rate or cycling pump. | LY - Able to purge 3 volumes by returning later or next day. | VLY - Minimal recharge - unable to purge 3 volumes.

IF 5% .15

SAMPLING EVENT DATA SHEET

(fill out completely)

McLaren

WELL OR LOCATION MW-24

PROJECT Market Place EVENT Quarterly SAMPLER D. Watts DATE 4/29/93

Well / Hydrologic statistics

Well type (MW, EW, etc.) MW

d — diameter 2"

equals .16 gal/ft. casing

SWL (if above screen) —

packer / intake / bailer depth 6 ft. (circle one)

SWL (if in screen) 4.98

3.5 TOP

13.5 BOP

measured T.D. 13.07

13.5 T.D. (as built)

Action	Time	Pump rate	IWL (low vlek
Start pump / Begin	1714		
	1720	.23 GPM	5.08
	1726	.23 GPM	5.11
	1732	.23 GPM	5.15
Stop	1733		5.13
Sampled	1740		
(Final IWL)	1747		5.03

Purge calculation

.16 gal/ft. * 8.52 ft. = 1.4 gals x 3 = 4.2 gals.

SWL to BOP or packer to BOP — one volume — purge volume- 3 casings

Head purge calculation (Airlift only)

gal/ft. * ft. = gals.

packer to SWL

Equipment Used / Sampling Method / Description of Event:

DC Peri @ Disposable Bailer.
Used Design T.D. for Purge Calculation.

Actual gallons purged 4.2

Actual volumes purged 3

Well yield ⊕ (see below) HY

COC # 37024

Sample I.D.	Analysis	Lab
23543-44	8015 mod	MBT

Additional comments:

50% Recovery: 9.24

80% Recovery: 6.68 Sample Turbidity: 26.2

Gallons purged *	TEMP °C (°F) (circle one)	EC (µs / cm)	PH	TURBIDITY (NTU)		
1. 1.4	69.0	2210	6.81	15.97		
2. 2.8	68.1	2190	6.77	3.20		
3. 4.2	69.0	2100	6.80	1.09		
4.						
5.						

* Take measurement at approximately each casing volume purged.

⊕ HY- Minimal W.L. drop

MY - WL drop - able to purge 3 volumes during one sitting by reducing pump rate or cycling pump.

LY - Able to purge 3 volumes by returning later or next day.

VLY - Minimal recharge - unable to purge 3 volumes.

IF 5% .15

McLaren Hart
Environmental Engineering Corporation

CHAIN OF CUSTODY RECORD

37024

SEE SIDE 2 FOR COMPLETE INSTRUCTIONS

Ship To: MBT ENV. LABS
Address: 3083 GOLD CANAL DR.
RANCHO CORDOVA, CA 95670

Project Name: MARKET PLACE
Project Number: 04.0059805.000
Project Location: (State) CA

FOR LABORATORY USE ONLY
Laboratory Project #:
Storage Refrigerator ID:
Storage Freezer ID:

Sampler Name: D. WATT
Signature: D Watt
PPE Worn in Field: D

Relinquished By: D Watt
Date/Time: 4/30/93 1700
Received By or Method of Shipment/Shipment I.D.: EXPRESS-IT
Date/Time: 4/30/93 1700

Relinquished By:
Date/Time
Received By or Method of Shipment/Shipment I.D.
Date/Time

Relinquished By:
Date/Time
Received By or Method of Shipment/Shipment I.D.
Date/Time

Sample Disposal (check one)
[X] Laboratory Standard
[ ] Other

Level of QC (see Side 2): [X] 1 [ ] 2 [ ] 3 [ ] 4 [ ] 5 [ ] 6A [ ] 6B [ ] 6C [ ] 6D [ ] 6E [ ] 7

Write in Analysis Method →

SAMPLE INFORMATION

ANALYSES REQUESTED

FOR LABORATORY USE ONLY Lab ID	Sample ID Number	Date	Time	Description: Locator	Description: Depth	Container(s): #	Container(s): Type	Matrix Type	Pres. Type	TAT	* 8015 MOD
1	235631-32	4/29/93	1155	TRIP BLANK	NA	2	A	H_2O	NP	4	X
2	235633-34		1258	MW-20							X
3	235635-36		1442	MW-14							X
4	235637-38		1425	MW-13							X
5	235639-40		1548	MW-19							X
6	235641-42		1650	MW-7							X
7	235643-44		1740	MW-24							X
8											
9											
10											

Special Instructions/Comments:
* GASOLINE, KEROSENE, DIESEL, AND MOTOR OIL
(PLEASE USE LOWER DETECTION LIMITS)
(PLEASE RETURN COOLERS ASAP)

Container Types: B=Brass Tube, G=Glass Jar, O=Other ____, A=1 Liter Amber, C=Cassette, P=Polyethylene, V=Voa Vial
TAT (Analytical Turn Around Time): 1 = 24 hours, 2 = 48 hours, 3 = 1 week, 4 = 2 weeks, 0 = Other ____

FOR LABORATORY USE ONLY Sample Condition Upon Receipt:

SEND DOCUMENTATION AND RESULTS TO (Check one):
[X] Project Manager/Office: JULIE MENNICK/ALAMEDA
[ ] Client Name:
Company:
Address:
Phone: FAX:

Common Analytical Methods
413.1
413.2 Long Method
413.2 Short Method
418.1 Long Method
418.1 Short Method
420.1
502.2
503E
503.1
524.2
601
602
604
608
610
624
625
8010
8015
8015 Mod.
8020
8021
8040
8080
8100
8150
8240
8270
8310
Acidity
Alkalinity
BTEX
Chloride
CLP (see Side 2)
COD
Color
Conductivity
Corrosivity
Cyanide
Flashpoint
Fluoride
General Mineral
Hex. Chromium
Ion Balance
Metals (write specific metal & method #)*
Metals 6010*
Metals PP*
Metals Title 22:
TTLC Level
STLC Level
(see Side 2)
Nitrate
Nitrite
Odor
Org. Lead
Org. Mercury
Percent Moisture
Percent Solid
Perchlorate
pH
Phosphates
Phosphorus
Sulfate
Sulfides
TCLP:
VOA
Semivoa
Metals
Pesticide
TDS
Total Hardness
Total Solids
TPH/D
TPH/G
TSS
Turbidity

* Specify Total or Dissolved

ATTACHMENT B

LABORATORY ANALYTICAL DATA SHEETS, QA LABORATORY RESULTS, CHAIN-OF-CUSTODY FORMS, AND SAMPLING DATA SHEETS

MBT Environmental
Laboratories

3083 Gold Canal Drive
Rancho Cordova
CA 95670
Phone 916/852-6600
Fax 916/852-7292

Master Builders Technologies

Date: May 11, 1993
LP #: 7489

Julie Menack
McLaren/Hart Environmental Engineering
1135 Atlantic Avenue
Alameda, CA 94501

Dear Ms. Menack:

Enclosed are the laboratory results for the seven samples submitted by you to the MBT Environmental Laboratories on May 1, 1993, for the project *Market Place*.

The analysis you requested is:

EPA 8015 Modified (7 - Water)

The report consists of the following sections:

1. A copy of the Chain-of-Custody
2. Quality Control Definitions and Report
3. Abbreviations and Comments
4. Analytical results

Unless otherwise instructed by you, samples will be disposed of two weeks from the date of this letter.

Thank you for choosing MBT Environmental Laboratories. We are looking forward to serving you in the future. Should you have any questions concerning this analytical report or the analytical methods employed, please do not hesitate to call.

Sincerely,

Shakoora Azimi
Laboratory Director, Principal Scientist

McLaren Hart
Environmental Engineering Corporation

CHAIN OF CUSTODY RECORD

SEE SIDE 2 FOR COMPLETE INSTRUCTIONS

Ship To: MBT ENV. LABS
Address: 3083 GOLD CANAL DR.
RANCHO CORDOVA, CA 95670

Project Name: MARKET PLACE
Project Number: 04.0059805.000
Project Location: (State) CA

FOR LABORATORY USE ONLY
Laboratory Project #: 7489
Storage Refrigerator ID: 4-6
Storage Freezer ID:

Sampler Name: D. WATT
Signature: D Watt
PPE Worn in Field: D

Relinquished By: D Watt — Date/Time: 4/30/93 1700 — Received By or Method of Shipment/Shipment I.D.: EXPRESS-IT — Date/Time: 4/30/93 1700
Relinquished By: Express IT — Date/Time: — Received By or Method of Shipment/Shipment I.D.: [illegible] — Date/Time: 5-1-93 1130
Relinquished By: — Date/Time: — Received By or Method of Shipment/Shipment I.D. — Date/Time

Sample Disposal (check one)
[X] Laboratory Standard
[ ] Other

Level of QC (see Side 2): [X] 1 [ ] 2 [ ] 3 [ ] 4 [ ] 5 [ ] 6A [ ] 6B [ ] 6C [ ] 6D [ ] 6E [ ] 7

Write in Analysis Method →

SAMPLE INFORMATION

ANALYSES REQUESTED

FOR LABORATORY USE ONLY Lab ID	Sample ID Number	Date	Time	Description: Locator	Description: Depth	Container(s): #	Container(s): Type	Matrix Type	Pres. Type	TAT	* 8015 MOD
1 7489 - 001	235631-32	4/29/93	1155	TRIP BLANK	NA	2	A	H2O	NP	4	X
2 - 002	235633-34		1258	MW-20							X
3 - 003	235635-36		1442	MW-14							X
4 - 004	235637-38		1425	MW-13							X
5 - 005	235639-40		1548	MW-19							X
6 - 006	235641-42		1650	MW-7							X
7 - 007	235643-44		1740	MW-24							X
8											
9											
10											

Special Instructions/Comments:
* GASOLINE, KEROSENE, DIESEL, AND MOTOR OIL
(PLEASE USE LOWER DETECTION LIMITS)
(PLEASE RETURN COOLERS ASAP)

Container Types: B=Brass Tube, C=Cassette, G=Glass Jar, P=Polyethylene, O=Other ____, V=Voa Vial, A=1 Liter Amber
TAT (Analytical Turn Around Time): 1 = 24 hours, 2 = 48 hours, 3 = 1 week, 4 = 2 weeks, 0 = Other ____

FOR LABORATORY USE ONLY Sample Condition Upon Receipt: Temp OK, Samples intact.

SEND DOCUMENTATION AND RESULTS TO (Check one):
[X] Project Manager/Office: JULIE MEANICK/ALAMEDA
[ ] Client Name:
Company:
Address:
Phone: FAX:

Common Analytical Methods
413.1
413.2 Long Method
413.2 Short Method
418.1 Long Method
418.1 Short Method
420.1
502.2
503E
503.1
524.2
601
602
604
608
610
624
625
8010
8015
8015 Mod.
8020
8021
8040
8080
8100
8150
8240
8270
8310
Acidity
Alkalinity
BTEX
Chloride
CLP (see Side 2)
COD
Color
Conductivity
Corrosivity
Cyanide
Flashpoint
Fluoride
General Mineral
Hex. Chromium
Ion Balance
Metals (write specific metal & method #)*
Metals 6010*
Metals PP*
Metals Title 22:
TTLC Level
STLC Level
(see Side 2)
Nitrate
Nitrite
Odor
Org. Lead
Org. Mercury
Percent Moisture
Percent Solid
Perchlorate
pH
Phosphates
Phosphorus
Sulfate
Sulfides
TCLP:
VOA
Semivoa
Metals
Pesticide
TDS
Total Hardness
Total Solids
TPH/D
TPH/G
TSS
Turbidity

* Specify Total or Dissolved

QUALITY CONTROL DEFINITIONS

METHOD BLANK RESULTS: A method blank (MB) is a laboratory generated sample free of any contamination. The method blank assesses the degree to which the laboratory operations and procedures cause false-positive analytical results for your samples.

LABORATORY CONTROL SPIKES

The LCS Program:

The laboratory control spike is a well-characterized matrix (organic pure type II water for water samples and contamination-free sand for soil samples) which is spiked with certain target parameters, and analyzed in duplicate at approximately 5% of the sample load, in order to assure the accuracy and precision of the analytical method.

Control limits for accuracy and precision are different for different methods and may vary with the different sample matrices. They are based on laboratory average historical data and EPA limits which are approved by the Quality Assurance Department.

QUALITY CONTROL REPORT

METHOD BLANK

Method: Mod. EPA 8015
Units: mg/L (ppm)

Date Analyzed: 05/07/93
Date Extracted: 05/04/93
Batch Number: 930504-1903

Petroleum Fraction	Carbon Range	Reporting Limit	Concentration
Gasoline Range	C7 - C14	0.050	BRL
Kerosene Range	C12 - C18	0.050	BRL
Diesel Range	C12 - C22	0.050	BRL
Motor Oil Range	C22 - C32	0.050	BRL
Total Petroleum Hydrocarbons		0.050	BRL

(DC2-CN7489)

Laboratory Control Sample/Laboratory Control Sample Duplicate
Method 8015 - Modified

LP#: 7489

Analyst: EB

Batch #: 930504-1903

Date Of Analysis: 05/07/93

Spike Sample ID: LCSW/LCSDW #54

Column: DB-1

Spike ID Code: W2-1565, W2-1556

Instrument #: PGC #4

Surrogate ID Code: NA

Matrix: Water Units: mg/L

COMPOUNDS	(a) SAMPLE CONC.	(b) SPIKE CONC.	(c) SAMPLE + SPIKE CONC.	(d) SPIKE REC. %	(e) SAMPLE DUP. + SPIKE CONC.	(f) SPIKE DUP. REC. %	(g) RPD %	ACCEPTANCE LIMITS % REC	ACCEPTANCE LIMITS RPD
Gasoline	0	2.50	1.33	53	0.97	39	31[a]	26 - 90	≤ 25
Diesel	0	2.50	2.28	91	2.22	89	3	43 - 152	≤ 25

Spike Recovery = d = ((c-a)/b) x 100
Spike Duplicate Recovery = f = ((e-a)/b) x 100
Relative Percent Difference = g = (|c-e|)/((c+e) x .5) x 100

[a] The RPD recovery is beyond advisory acceptance limits. The calibration data associated with this laboratory project for the same instrument on the same day were within acceptance limits.

ABBREVIATIONS USED IN THIS REPORT

BRL	Below Reporting Limit
MB	Method Blank
MS	Matrix Spike
MSD	Matrix Spike Duplicate
LCS	Laboratory Control Spike
LCSD	Laboratory Control Spike Duplicate
RPD	Relative Percent Difference
NS	Not Specified
NA	Not Applicable

COMMENTS

Test methods may include minor modifications of published EPA methods (e.g., reporting limits or parameter lists). Reporting limits are adjusted to reflect dilution of the sample when appropriate. Solids and waste are analyzed with no correction made for moisture content.

Values for total petroleum hydrocarbons were calculated based only on detected peaks.

The gasoline standard was obtained from a local BP station. Gasoline is sold commercially as unleaded gasoline.

The diesel standard was obtained from a local Chevron station. Diesel is sold commercially as Diesel Fuel #2.

The kerosene standard was obtained from Post Jeff Chevron/Mobil Products. Kerosene is sold commercially as jet fuel and kerosene. Other jet fuel sources may produce different instrument responses and contain different hydrocarbon chains. The kerosene standard contains the same hydrocarbon chain as commercial jet fuel.

The motor oil standard was obtained from a local automotive store. Manufacturer and motor oil type are Pennzoil SAE 10W-40.

The laboratory reported result for Total Petroleum Hydrocarbons is a summation result of the individual analytes.

A reporting limit of 0.05 mg/L (ppm) was requested by the client, which is lower than the established reporting limit of 0.50 mg/L (ppm). As a result, 1000 mLs of sample were extracted and concentrated to a final volume of 1.0 mL, causing the established reporting limit to be lowered by a factor of 10.

TOTAL PETROLEUM HYDROCARBONS

Analytical Method: Modified EPA 8015 (a)
Preparation Method: EPA 3510

Project Name: Market Place

Project Number: 04.0059805.000

Sample Description: Trip Blank

Lab Project-ID Number: 7489-001

Sample Number: 235631

Date Sampled: 04/29/93

Date Received: 05/01/93

Date Extracted: 05/04/93

Date Analyzed: 05/07/93

Batch Number: 930504-1903

PETROLEUM FRACTION	CARBON RANGE	CONCENTRATION mg/L (ppm)	REPORTING LIMIT mg/L (ppm)
Gasoline Range	C7 - C14	BRL	0.050
Kerosene Range	C12 - C18	BRL	0.050
Diesel Range	C12 - C22	BRL	0.050
Motor Oil Range	C22 - C32	BRL	0.050
Total Petroleum Hydrocarbons		BRL	0.050

Comments: (a) Derived from EPA 8015. Gas Chromatograph with flame ionization detector is used to perform the analysis. Modification is due to the quantitation of petroleum fraction instead of non-halogenated volatile compounds.

Only the requested petroleum fractions are reported.

Approved By: Cheryl Matterson for: Date: 5/11/93
Nancy McDonald, Quality Control Chemist

The cover letter and attachments are integral parts of this report.

0127938015MODW

TOTAL PETROLEUM HYDROCARBONS

Analytical Method: Modified EPA 8015 {a}
Preparation Method: EPA 3510

Project Name: Market Place

Project Number: 04.0059805.000

Sample Description: MW-20

Lab Project-ID Number: 7489-002

Sample Number: 235633

Date Sampled: 04/29/93

Date Received: 05/01/93

Date Extracted: 05/04/93

Date Analyzed: 05/10/93

Batch Number: 930504-1903

PETROLEUM FRACTION	CARBON RANGE	CONCENTRATION mg/L (ppm)	REPORTING LIMIT mg/L (ppm)
Gasoline Range	C7 - C14	BRL	0.050
Kerosene Range	C12 - C18	BRL	0.050
Diesel Range	C12 - C22	BRL	0.050
Motor Oil Range	C22 - C32	0.38 {b}	0.050
Total Petroleum Hydrocarbons		0.38	0.050

Comments: {a} Derived from EPA 8015. Gas Chromatograph with flame ionization detector is used to perform the analysis. Modification is due to the quantitation of petroleum fraction instead of non-halogenated volatile compounds.

{b} The chromatographic pattern of motor oil in the sample does not exactly match the standard chromatograph.

Only the requested petroleum fractions are reported.

Approved By: Cheryl Matteson for: Date: 5/11/93
Nancy McDonald, Quality Control Chemist

The cover letter and attachments are integral parts of this report.

0127938015MODW

TOTAL PETROLEUM HYDROCARBONS

Analytical Method: Modified EPA 8015 (a)
Preparation Method: EPA 3510

Project Name: Market Place

Project Number: 04.0059805.000

Sample Description: MW-14

Lab Project-ID Number: 7489-003

Sample Number: 235635

Date Sampled: 04/29/93

Date Received: 05/01/93

Date Extracted: 05/04/93

Date Analyzed: 05/07/93

Batch Number: 930504-1903

PETROLEUM FRACTION	CARBON RANGE	CONCENTRATION mg/L (ppm)	REPORTING LIMIT mg/L (ppm)
Gasoline Range	C7 - C14	BRL	0.050
Kerosene Range	C12 - C18	BRL	0.050
Diesel Range	C12 - C22	BRL	0.050
Motor Oil Range	C22 - C32	0.15 (b)	0.050
Total Petroleum Hydrocarbons		0.15	0.050

Comments:

(a) Derived from EPA 8015. Gas Chromatograph with flame ionization detector is used to perform the analysis. Modification is due to the quantitation of petroleum fraction instead of non-halogenated volatile compounds.

(b) The chromatographic pattern of motor oil in the sample does not exactly match the standard chromatograph.

Only the requested petroleum fractions are reported.

Approved By: Cheryl Matteson for: Date: 5/11/93
Nancy McDonald, Quality Control Chemist

The cover letter and attachments are integral parts of this report.

0127938015MODW

TOTAL PETROLEUM HYDROCARBONS

Analytical Method: Modified EPA 8015 (a)
Preparation Method: EPA 3510

Project Name: Market Place

Project Number: 04.0059805.000

Sample Description: MW-13

Lab Project-ID Number: 7489-004

Sample Number: 235637

Date Sampled: 04/29/93

Date Received: 05/01/93

Date Extracted: 05/04/93

Date Analyzed: 05/07/93

Batch Number: 930504-1903

PETROLEUM FRACTION	CARBON RANGE	CONCENTRATION mg/L (ppm)	REPORTING LIMIT mg/L (ppm)
Gasoline Range	C7 - C14	BRL	0.050
Kerosene Range	C12 - C18	BRL	0.050
Diesel Range	C12 - C22	BRL	0.050
Motor Oil Range	C22 - C32	0.12 (b)	0.050
Total Petroleum Hydrocarbons		0.12	0.050

Comments: (a) Derived from EPA 8015. Gas Chromatograph with flame ionization detector is used to perform the analysis. Modification is due to the quantitation of petroleum fraction instead of non-halogenated volatile compounds.

(b) The chromatographic pattern of motor oil in the sample does not exactly match the standard chromatograph.

Only the requested petroleum fractions are reported.

Approved By: Cheryl Matterson for: Date: 5/11/93
Nancy McDonald, Quality Control Chemist

The cover letter and attachments are integral parts of this report.

0127938015MODW

TOTAL PETROLEUM HYDROCARBONS

Analytical Method: Modified EPA 8015 (a)
Preparation Method: EPA 3510

Project Name: Market Place

Project Number: 04.0059805.000

Sample Description: MW-19

Lab Project-ID Number: 7489-005

Sample Number: 235639

Date Sampled: 04/29/93

Date Received: 05/01/93

Date Extracted: 05/04/93

Date Analyzed: 05/07/93

Batch Number: 930504-1903

PETROLEUM FRACTION	CARBON RANGE	CONCENTRATION mg/L (ppm)	REPORTING LIMIT mg/L (ppm)
Gasoline Range	C7 - C14	BRL	0.50
Kerosene Range	C12 - C18	BRL	0.50
Diesel Range	C12 - C22	BRL	0.50
Motor Oil Range	C22 - C32	8.2	0.50
Total Petroleum Hydrocarbons		8.2	0.50

Comments: (a) Derived from EPA 8015. Gas Chromatograph with flame ionization detector is used to perform the analysis. Modification is due to the quantitation of petroleum fraction instead of non-halogenated volatile compounds.

The sample was diluted 10 fold to bring target petroleum fractions within linear working range.

Only the requested petroleum fractions are reported.

Approved By: Cheryl Matterson for: Date: 5/11/93
Nancy McDonald, Quality Control Chemist

The cover letter and attachments are integral parts of this report.

0127938015MODW

TOTAL PETROLEUM HYDROCARBONS

Analytical Method: Modified EPA 8015 (a)
Preparation Method: EPA 3510

Project Name: Market Place

Project Number: 04.0059805.000

Sample Description: MW-7

Lab Project-ID Number: 7489-006

Sample Number: 235641

Date Sampled: 04/29/93

Date Received: 05/01/93

Date Extracted: 05/04/93

Date Analyzed: 05/08/93

Batch Number: 930504-1903

PETROLEUM FRACTION	CARBON RANGE	CONCENTRATION mg/L (ppm)	REPORTING LIMIT mg/L (ppm)
Gasoline Range	C7 - C14	BRL	0.50
Kerosene Range	C12 - C18	BRL	0.50
Diesel Range	C12 - C22	1.6	0.50
Motor Oil Range	C22 - C32	1.7	0.50
Total Petroleum Hydrocarbons		3.3	0.50

Comments: (a) Derived from EPA 8015. Gas Chromatograph with flame ionization detector is used to perform the analysis. Modification is due to the quantitation of petroleum fraction instead of non-halogenated volatile compounds.

The sample was diluted 10 fold to bring target petroleum fractions within linear working range.

Only the requested petroleum fractions are reported.

Approved By: Cheryl Matterson for: Date: 5/11/93
Nancy McDonald, Quality Control Chemist

The cover letter and attachments are integral parts of this report.

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TOTAL PETROLEUM HYDROCARBONS

Analytical Method: Modified EPA 8015 (a)
Preparation Method: EPA 3510

Project Name: Market Place

Project Number: 04.0059805.000

Sample Description: MW-24

Lab Project-ID Number: 7489-007

Sample Number: 235643

Date Sampled: 04/29/93

Date Received: 05/01/93

Date Extracted: 05/04/93

Date Analyzed: 05/08/93

Batch Number: 930504-1903

PETROLEUM FRACTION	CARBON RANGE	CONCENTRATION mg/L (ppm)	REPORTING LIMIT mg/L (ppm)
Gasoline Range	C7 - C14	BRL	0.050
Kerosene Range	C12 - C18	BRL	0.050
Diesel Range	C12 - C22	BRL	0.050
Motor Oil Range	C22 - C32	0.14 (c)	0.050
Total Petroleum Hydrocarbons		0.14	0.050

Comments: (a) Derived from EPA 8015. Gas Chromatograph with flame ionization detector is used to perform the analysis. Modification is due to the quantitation of petroleum fraction instead of non-halogenated volatile compounds.

(c) The chromatographic pattern of motor oil in the sample does not exactly match the standard chromatograph.

Only the requested petroleum fractions are reported.

Approved By: Cheryl Matterson for: Date: 5/11/93
Nancy McDonald, Quality Control Chemist

The cover letter and attachments are integral parts of this report.

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