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April 8, 1992

Mr. Larry Seto
Division of Hazardous Materials
Department of Environmental Health
80 Swan Way, Room 200
Oakland, California 94621

Dear Mr. Seto:

**QUARTERLY GROUNDWATER MONITORING REPORT FIRST QUARTER 1992,
EMERY BAY MARKETPLACE, EMERYVILLE, CALIFORNIA**

Enclosed is the letter report "Quarterly Groundwater Monitoring Report First Quarter 1992, Emery Bay Marketplace, Emeryville, California," March 4, 1992. The report summarizes the quarterly groundwater monitoring activities performed at the Emery Bay Marketplace property during January 1992 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.

If you have any questions, please call me.

Sincerely,

A handwritten signature in cursive script that reads "Julie S. Menack".

Julie S. Menack, RG #4440
Supervising Geoscientist

Enclosure (1)

cc: Lynn Tolin (with enclosure)

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**QUARTERLY GROUNDWATER
MONITORING REPORT
FIRST QUARTER 1992
EMERY BAY MARKETPLACE
EMERYVILLE, CALIFORNIA**

APRIL 8, 1992





April 8, 1992

Ms. Lynn Tolin
Christie Avenue Partners - JS
6475 Christie Avenue, Suite 500
Emeryville, California 94608

Dear Ms. Tolin:

**QUARTERLY GROUNDWATER MONITORING REPORT FIRST QUARTER 1992,
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 January 1992. This is the sixth 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).

It was determined in the Groundwater Characterization Report that a former asphalt refining plant, located on the northeast side of the site, may be a source of: 1) dissolved hydrocarbons detected in groundwater samples from monitoring wells located downgradient from the former refining plant location, and 2) separate-phase product observed in Well W-5 which is located near the former refining plant location.

The following activities have been completed as proposed in the Work Plan:

- Depths to groundwater have been measured at all monitoring wells on a quarterly basis since July 1990 and the data have been used to prepare groundwater elevation maps.
- Groundwater from six downgradient wells (wells W-7, W-13, W-14, W-19, W-20, and W-24) have been sampled on a quarterly basis since July 1990 to verify that petroleum hydrocarbons in groundwater are confined to the Marketplace property and have not migrated off-site. Samples were analyzed for total petroleum hydrocarbons as diesel (TPH/D) and as motor oil (TPH/MO) by modified EPA Method 8015.

Ms. Lynn Tolin
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Page 2

- Free product was removed from well W-5 on a bi-weekly basis for four months from July through October 1990 and on a monthly basis between October 1990 and June 1991.
- Well W-10, which could not be used for sampling because of low groundwater recharge, was abandoned on October 1, 1990. The well abandonment activities are described in the Quarterly Report dated November 28, 1990 (McLaren/Hart, 1990b).

This letter report presents the results of the depth to groundwater measurements and the groundwater quality sampling and analyses performed during the month of January 1992. 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 Solinst electronic water level indicator on January 15, 1992. A Marine Moisture Control Company oil-water interface probe was used to measure depth to oil and depth to groundwater in wells where free product was present (Wells W-5 and W-16). 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 January 16 and 17, 1992. 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 and 40 milliliter volatile organic analysis (VOA) bottles.

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 Modified EPA Method 8015. 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 on Table 2.



DATA EVALUATION

The data which are evaluated consist of: 1) groundwater surface elevations as determined by the January 15, 1992 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 January 1992.

Groundwater Elevations

The January 15, 1992 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 January 1992 water levels were 0.09 to 1.7 feet higher than those measured in October 1991 at the end of the dry season. The higher water levels measured in January 1992 are likely a result of shallow recharge from precipitation that occurred in December 1991 and January 1992. 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.

Groundwater Quality

Groundwater samples were collected on January 16 and 17, 1992 from six wells on the downgradient side of the property (W-7, W-13, W-14, W-19, W-20, and W-24). The analytical results are summarized on Table 2. 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. TPH has not been detected in groundwater from wells W-13 and W-14 which are located on the downgradient side of the property. Groundwater from wells W-7 and W-19 have had low concentrations of TPH throughout the sampling period. The only TPH detected in downgradient wells prior to the January 1992 sampling event was TPH/MO detected in groundwater from wells W-20 (2.3 ppm) and W-24 (1.1 ppm), in the samples collected in April 1991. Presence of this TPH/MO was not confirmed when these wells were subsequently sampled in October 1991.

The results of the January 1992 TPH analyses are consistent with previous results. The slightly elevated concentration of TPH/MO detected in well W-19 in October 1991 (34 ppm) was confirmed in January 1992 (29 ppm). Previously, TPH/MO had been detected in well W-19 at between 1 and 8 ppm.

Therefore, all of the wells located on the downgradient side of the Marketplace property showed no TPH in groundwater during January 1992. This indicates that occurrence of TPH is limited to the Marketplace property and does not occur near the property boundary.

CONCLUSIONS


In summary, the results from the January 1992 quarterly monitoring activities conducted at the Emery Bay Marketplace property are as follows:


- The January 1992 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.
- The January 1992 groundwater sampling event confirms the conclusion from the Groundwater Characterization Report that petroleum hydrocarbons do not occur downgradient of Wells W-7 and W-19, and that hydrocarbons are limited to the site property.

Ms. Lynn Tolin
April 8, 1992
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If you have any questions regarding this report, please call us at (510) 521-5200.

Sincerely,


Julie S. Menack, RG #4440
Supervising Geoscientist


Paula A. Bolio
Associate Geoscientist

cc: Larry Seto, Alameda County Department of Environmental Health
Regional Water Quality Control Board

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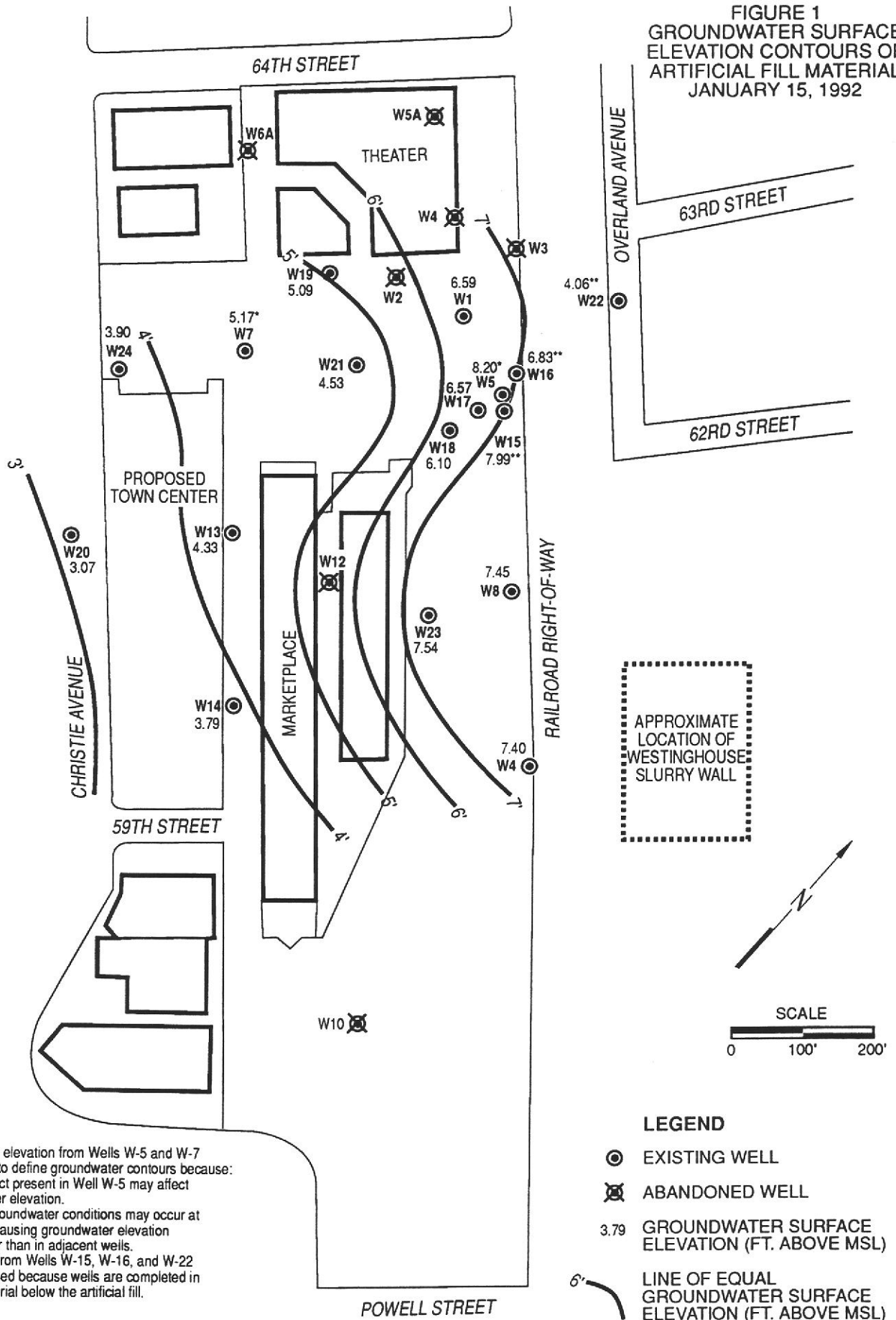
REFERENCES

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.

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FIGURE 1
GROUNDWATER SURFACE
ELEVATION CONTOURS OF
ARTIFICIAL FILL MATERIAL
JANUARY 15, 1992



* Groundwater elevation from Wells W-5 and W-7 were not used to define groundwater contours because:
 * Free product present in Well W-5 may affect groundwater elevation.
 * Perched groundwater conditions may occur at Well W-7, 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)

TABLE 1
GROUNDWATER DEPTHS AND ELEVATIONS
EMERY BAY MARKETPLACE SITE

| Well Number | Top of Casing (Feet) | Date | Depth to Groundwater (Feet) | Groundwater Elevation (Feet) | Product Thickness (Feet) |
|----------------------|----------------------|----------|-----------------------------|------------------------------|--------------------------|
| W-1 ^a | 11.47 | 8-7-81 | 4.30 | 6.20 ^b | |
| | | 9-10-81 | 4.40 | 6.10 ^b | |
| | | 5-6-87 | 6 | 6.08 ^b | |
| | | 8-20-89 | 5.60 | 5.87 | |
| | | 10-11-89 | 5.63 | 5.84 | |
| | | 2-22-90 | 4.92 | 6.55 | |
| | | 2-28-90 | 5.02 | 6.45 | |
| | | 4-9-90 | 5.44 | 6.03 | |
| | | 6-7-90 | 5.37 | 6.10 | |
| | | 7-25-90 | 5.26 | 6.21 | |
| | | 10-3-90 | 5.43 | 6.04 | |
| | | 1-3-91 | 5.69 | 5.78 | |
| | | 4-3-91 | 4.74 | 6.73 | |
| | | 10-25-91 | 5.22 | 6.25 | |
| 1-15-92 | 4.88 | 6.59 | | | |
| W-4 | 9.96 | 8-7-81 | 4.30 | 6.20 ^b | |
| | | 9-10-81 | 4.40 | 6.10 ^b | |
| | | 1-18-82 | 2.50 | 8.00 ^b | |
| | | 3-27-85 | ? _c | 8.65 | |
| | | 8-20-89 | 3.95 | 6.01 | |
| | | 10-11-89 | 3.87 | 6.09 | |
| | | 2-22-90 | 2.0 | 7.96 | |
| | | 2-28-90 | 2.39 | 7.57 | |
| | | 4-9-90 | 3.17 | 6.79 | |
| | | 6-7-90 | 2.73 | 7.23 | 1.7 |
| | | 7-25-90 | 3.71 | 6.25 | |
| | | 10-3-90 | 4.18 | 5.78 | |
| | | 1-3-91 | 3.64 | 6.32 | |
| | | 4-3-91 | 1.45 | 8.51 | |
| 10-25-91 | 4.29 | 5.67 | | | |
| 1-15-92 | 2.56 | 7.40 | | | |
| W-5 | 11.41 | 8-7-81 | 4.70 | 7.50 ^b | c |
| | | 9-10-81 | 4.90 | 7.30 ^b | c |
| | | 1-18-82 | 2.50 | 9.60 ^b | c |
| | | 3-27-85 | ? _c | 9.28 | c |
| | | 10-11-89 | 4.43 | 6.98 | 0.71 |
| | | 2-22-90 | 3.80 | 7.61 | 0.88 |
| | | 2-28-90 | 4.43 | 6.98 | 1.65 |
| | | 4-9-90 | 4.73 | 6.68 | 1.82 |
| | | 6-7-90 | 4.30 | 7.11 | 1.80 |
| | | 7-25-90 | 5.10 | 6.31 | 2.12 |
| | | 10-3-90 | 4.90 | 6.51 | 1.11 |
| | | 1-3-91 | 4.77 | 6.64 | 0.85 |
| | | 4-3-91 | 2.42 | 8.99 | 0.03 |
| | | 10-25-91 | 5.47 | 5.94 | 1.18 |
| 1-15-92 | 3.21 | 8.2 | 0.80 | | |
| W-7 ^a | 9.05 | 5-6-87 | 3 | 6.88 ^b | |
| | | 8-20-89 | 3.59 | 5.46 | |
| | | 10-11-89 | 3.08 | 5.97 | |
| | | 2-22-90 | 1.75 | 7.30 | |
| | | 2-28-90 | 1.31 | 7.74 | |
| | | 4-9-90 | 2.42 | 6.63 | |
| | | 6-7-90 | 1.21 | 7.84 | |
| | | 7-25-90 | 2.76 | 6.29 | |
| | | 10-3-90 | 3.22 | 5.83 | |
| | | 1-3-91 | 3.17 | 5.88 | |
| | | 4-3-91 | 1.18 | 7.87 | |
| | | 10-25-91 | 3.47 | 5.59 | |
| | | 1-15-92 | 3.88 | 5.17 | |
| | | W-8 | 10.43 | 5-6-87 | 5.5 |
| 8-20-89 | 3.59 | | | 6.84 | |
| 2-22-90 | 1.5 | | | 8.93 | |
| 2-28-90 | 1.78 | | | 8.65 | |
| 4-9-90 | 3.12 | | | 7.31 | |
| 6-7-90 | 2.90 | | | 7.53 | |
| 7-27-90 ^d | 3.33 | | | 7.10 | .50 |
| 10-3-90 | 3.65 | | | 6.78 | |
| 1-3-91 | 3.46 | | | 6.97 | |
| 4-3-91 | 1.47 | | | 8.96 | |
| 10-25-91 | 3.54 | | | 6.89 | |
| 1-15-92 | 2.98 | | | 7.45 | |

TABLE 1
GROUNDWATER DEPTHS AND ELEVATIONS
EMERY BAY MARKETPLACE SITE
(Continued)

| Well Number | Top of Casing (Feet) | Date | Depth to Groundwater (Feet) | Groundwater Elevation (Feet) | Product Thickness (Feet) |
|-------------|----------------------|----------------------|-----------------------------|------------------------------|--------------------------|
| W-13 | 8.15 | 8-20-89 | 4.64 | 3.51 | |
| | | 10-11-89 | 4.60 | 3.55 | |
| | | 2-22-90 | 3.85 | 4.30 | |
| | | 2-28-90 | 4.18 | 3.97 | |
| | | 4-9-90 | 4.31 | 3.84 | |
| | | 6-7-90 | 3.93 | 4.22 | |
| | | 7-25-90 | 4.40 | 3.75 | |
| | | 10-3-90 | 4.67 | 3.48 | .61 |
| | | 1-3-91 | 4.43 | 3.72 | |
| | | 4-3-91 | 3.64 | 4.51 | |
| | | 10-25-91 | 4.54 | 3.72 | |
| | | 1-15-92 | 3.82 | 4.33 | |
| W-14 | 7.97 | 8-20-90 | 5.02 | 2.95 | |
| | | 2-22-90 | 4.19 | 3.78 | |
| | | 2-28-90 | 4.46 | 3.51 | |
| | | 4-9-90 | 4.36 | 3.61 | |
| | | 6-7-90 | 5.29 | 2.68 | |
| | | 7-25-90 | 4.83 | 3.14 | |
| | | 10-3-90 | 5.09 | 2.88 | .23 |
| | | 1-3-91 | 4.32 | 3.65 | |
| | | 4-3-91 | 4.31 | 3.66 | |
| | | 10-25-91 | 4.41 | 3.56 | |
| | | 1-15-92 | 4.18 | 3.79 | |
| | | W-15 | 11.53 | 8-20-89 | 3.43 |
| 10-11-89 | 4.26 | | | 7.27 | |
| 2-22-90 | 2.58 | | | 8.95 | .66 |
| 2-28-90 | 2.53 | | | 9.00 | |
| 4-9-90 | 2.48 | | | 9.05 | |
| 6-7-90 | 4.54 | | | 6.99 | |
| 7-25-90 | 4.00 | | | 7.53 | |
| 10-3-90 | 3.46 | | | 8.07 | |
| 1-3-91 | 2.97 | | | 8.56 | |
| 4-3-91 | 3.05 | | | 8.48 | |
| 10-25-91 | 2.88 | | | 8.65 | |
| 1-15-92 | 3.54 | | | 7.99 | |
| W-16 | 10.94 | 10-11-89 | 4.81 | 6.13 | 0.07 |
| | | 2-22-90 | 3.92 | 7.02 | NM |
| | | 2-28-90 | 3.88 | 7.06 | NM |
| | | 4-9-90 | 7.81 | 3.13 | NM |
| | | 6-7-90 | 6.19 | 4.75 | NM |
| | | 7-27-90 ^r | 4.44 | 6.50 | NM |
| | | 10-3-90 | 4.38 | 6.56 | 0.02 |
| | | 1-3-91 | 4.67 | 6.27 | 0.02 |
| | | 4-3-91 | 3.50 | 7.48 | 0.02 |
| | | 10-25-91 | 4.64 | 6.30 | NM |
| | | 1-15-92 | 4.11 | 6.83 | |
| | | W-17 | 12.14 | 10-11-89 | 9.12 |
| 2-22-90 | 5.42 | | | 6.72 | |
| 2-28-90 | 5.35 | | | 6.79 | |
| 4-9-90 | 5.72 | | | 6.42 | |
| 6-7-90 | --- | | | --- | |
| 7-26-90 | 5.59 | | | 6.55 | |
| 10-3-90 | 5.72 | | | 6.42 | |
| 1-3-91 | 6.28 | | | 5.86 | |
| 4-3-91 | 4.69 | | | 7.45 | |
| 10-25-91 | 6.00 | | | 6.14 | |
| 1-15-92 | 5.57 | | | 6.57 | |
| W-18 | 11.34 | | | 10-11-89 | 5.52 |
| | | 2-22-90 | 4.42 | 6.92 | |
| | | 2-28-90 | 4.77 | 6.57 | |
| | | 4-9-90 | 5.24 | 6.10 | |
| | | 6-7-90 | 4.28 | 7.06 | |
| | | 7-25-90 | 4.98 | 6.36 | |
| | | 10-3-90 | 5.44 | 5.90 | |
| | | 1-3-91 | 5.84 | 5.50 | |
| | | 4-3-91 | 4.94 | 6.40 | |
| | | 10-25-91 | 5.55 | 5.79 | |
| | | 1-15-92 | 5.24 | 6.10 | |

TABLE 1
GROUNDWATER DEPTHS AND ELEVATIONS
EMERY BAY MARKETPLACE SITE
(Continued)

| Well Number | Top of Casing (Feet) | Date | Depth to Groundwater (Feet) | Groundwater Elevation (Feet) | Product Thickness (Feet) |
|-------------|----------------------|----------------------|-----------------------------|------------------------------|--------------------------|
| W-19 | 10.27 | 4-9-90 | 5.11 | 5.16 | |
| | | 6-7-90 | 4.77 | 5.50 | |
| | | 7-25-90 | 4.93 | 5.34 | |
| | | 10-3-90 | 4.95 | 5.32 | |
| | | 1-3-91 | 5.95 | 4.32 | |
| | | 4-3-91 | 5.39 | 4.88 | |
| | | 10-25-91 | 5.47 | 4.80 | |
| | | 1-15-92 | 5.18 | 5.09 | |
| W-20 | 6.82 | 4-9-90 | 4.08 | 2.74 | |
| | | 6-7-90 | 3.79 | 3.03 | |
| | | 7-25-90 | 4.00 | 2.82 | |
| | | 10-3-90 | 4.03 | 2.79 | |
| | | 1-3-91 | 4.12 | 2.70 | |
| | | 4-3-91 | 3.84 | 2.98 | |
| | | 10-25-91 | 4.07 | 2.75 | |
| | | 1-15-92 | 3.75 | 3.07 | |
| W-21 | 9.48 | 4-9-90 | 5.21 | 4.27 | |
| | | 6-7-90 | 4.84 | 4.64 | |
| | | 7-25-90 | 5.05 | 4.43 | |
| | | 10-3-90 | 5.18 | 4.30 | |
| | | 1-3-91 | 5.47 | 4.01 | |
| | | 4-3-91 | 4.80 | 4.68 | |
| | | 10-25-91 | 5.04 | 4.44 | |
| | | 1-15-92 | 4.95 | 4.53 | |
| W-22 | 11.67 | 4-9-90 | 7.50 | 4.17 | |
| | | 6-7-90 | 7.36 | 4.31 | |
| | | 7-25-90 | 7.49 | 4.18 | |
| | | 10-3-90 | 7.68 | 3.99 | |
| | | 1-3-91 | 7.88 | 3.79 | |
| | | 4-3-91 | 7.64 | 4.03 | |
| | | 10-25-91 | 6.69 | 4.98 | |
| | | 1-15-92 | 7.61 | 4.06 | |
| W-23 | 9.16 | 4-9-90 | 1.51 | 7.65 | |
| | | 6-7-90 | 1.78 | 7.38 | |
| | | 7-27-90 ^d | 2.63 | 6.53 | |
| | | 10-3-90 | 3.20 | 5.96 | |
| | | 1-3-91 | 2.36 | 6.80 | |
| | | 4-3-91 | 0.60 ^e | 8.56 | |
| | | 10-25-91 | 2.36 | 6.80 | |
| | | 1-15-92 | 1.62 | 7.54 | |
| W-24 | 8.72 | 6-7-90 | 4.75 | 3.97 | |
| | | 7-25-90 | 5.02 | 3.70 | |
| | | 10-3-90 | 5.00 | 3.72 | |
| | | 1-3-91 | 5.25 | 3.47 | |
| | | 4-3-91 | 4.56 | 4.16 | |
| | | 10-25-91 | 5.09 | 3.63 | |
| | | 1-15-92 | 4.82 | 3.90 | |

- ^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.

TABLE 2
HYDROCARBONS IN GROUNDWATER
EMERY BAY MARKETPLACE SITE

| Number Well | Sample Date | TPH/D Concentration (ppm) | TPH/MO Concentration (ppm) |
|-------------------|-----------------------|---|----------------------------|
| W-1 | 4-14-87 | --- ^a | <5 ^{b,c} |
| | 2-28-90 | <0.5 | --- |
| | 4-11-90 | <0.1 | 0.57 |
| W-2 ^d | 4-15-87 | <1 | --- |
| W-3 ^d | | --- | --- |
| W-4 ^d | 4-14-87 | --- | <5 ^c |
| W-4 | 3-01-90 | <0.5 | --- |
| | 4-10-90 | <0.1 | <0.25 |
| W-5 ^e | 9-27-89 | 20 | --- |
| B-5 ^d | | --- | --- |
| W-5A ^d | 4-16-87 | <1 ^f | <1 ^f |
| W-5 ^g | 10-25-91 | HFA: Crude Oil or Waste Oil | |
| W-6 ^d | 4-16-87 | <1 ^f | <1 ^f |
| W-7 | 9-26-89 | 1.1 | --- |
| | 2-28-90 | <0.5 ^o | --- |
| | 4-11-90 | 5.6 | 7.5 |
| | 7-30-90 | 2.6 | 2 |
| | 10-4-90 | 5 | 6 |
| | 1-4-91 | 4 | 12 |
| | 4-3-91 | <1.0 ^h | 3.2 |
| | 10-25-91 | 1.4 | 2.3 |
| | 10-25-91 ⁿ | HFA: Biogenic or highly degraded material | |
| | 1-16-92 | 1.6 | 3.6 |
| W-8 | 4-17-87 | 10 ⁱ | --- |
| | 9-26-89 | 7.1 | --- |
| | 3-01-90 | 4.5 | --- |
| | 4-18-90 | 5.3 | --- |
| W-13 | 2-28-90 | <0.5 | --- |
| | 4-12-90 | <0.5 | --- |
| | 7-27-90 | <0.5 | <1 |
| | 10-4-90 | <0.5 | <1 |
| | 1-3-91 | <0.5 | <1 |
| | 4-4-91 | <0.5 | <1 |
| | 10-25-91 | <0.5 | <1 |
| | 1-16-92 | <0.5 | <0.5 |
| W-14 | 2-28-90 | <0.5 | --- |
| | 4-11-90 | <0.1 | <0.25 |
| | 7-30-90 | <0.6 | <1 |
| | 10-4-90 | <0.5 | <1 |
| | 1-4-91 | <0.5 | <1 |
| | 4-4-91 | <0.5 | <1 |
| | 10-25-91 | <0.5 | <1 |
| | 1-16-92 | <0.5 | <0.5 |
| W-15 | 9-25-89 | 1.2 | --- |
| | 4-13-90 | 1.5 | --- |
| W-16 | 9-27-89 | 4.7 | --- |
| | 2-28-90 | 22 | --- |
| | 4-13-90 | 9 | --- |
| W-17 | 9-25-89 | 0.7 | --- |
| | 4-13-90 | 1.6 | --- |
| W-18 | 9-26-89 | 3.1 | --- |
| | 4-13-90 | 5.1 | --- |

TABLE 2
(Continued)

HYDROCARBONS IN GROUNDWATER
EMERY BAY MARKETPLACE SITE

| Number Well | Sample Date | TPH/D Concentration (ppm) | TPH/MO Concentration (ppm) |
|-------------|-----------------------|--|----------------------------|
| W-19 | 4-12-90 | 1.1 | --- |
| | 4-16-90 | <0.5 ^j | --- |
| | 7-27-90 | <1 | 8 |
| | 10-3-90 | <0.5 ^k | 3 |
| | 1-3-91 | <0.5 | <1 |
| | 4-3-91 | <2.5 ^h | 8.4 |
| | 10-25-91 ^a | <0.5 | 34 |
| | 10-25-91 | HFA: Motor Oil | --- |
| | 1-17-92 | <10.0 | 29 |
| W-20 | 4-12-90 | <0.5 | --- |
| | 4-16-90 | <0.5 | --- |
| | 7-30-90 | <0.5 | <1 |
| | 10-3-90 | <0.5 | <1 |
| | 1-4-91 | <0.5 | <1 |
| | 4-4-91 | <0.5 | 2.3 ⁱ |
| | 10-25-91 ^a | <0.5 | <1 |
| | 10-25-91 ^a | HFA: Volatiles and Semi-Volatiles not detected | --- |
| | 1-17-92 | <0.5 | <0.5 |
| W-21 | 4-12-90 | 1.4 | --- |
| | 4-18-90 | 1.7 | --- |
| W-22 | 4-12-90 | <0.5 | --- |
| | 4-18-90 | <0.5 | --- |
| W-23 | 4-12-90 | 2.9 | --- |
| | 4-18-90 | 3.6 | --- |
| W-24 | 6-7-90 | <0.5 | --- |
| | 7-27-90 | <0.5 | <1 |
| | 10-3-90 | <0.5 | <1 |
| | 1-3-91 | <0.5 | <1 |
| | 4-3-91 | <0.5 | 1.1 ⁱ |
| | 10-25-91 ^a | <0.5 | <1 |
| | 10-25-91 ^a | HFA: Volatiles and Semi-Volatiles not detected | --- |
| | | 1-17-92 | <0.5 |

^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 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)

ATTACHMENT A
HYDROLOGIC DATA SHEETS

| PROJECT: <u>MARKETPLACE</u> EVENT: <u>SOUNDING</u> SAMPLER: <u>D. WITTS</u> | | | | | | | | | |
|---|------------------|------|----|----|------|-----|-------------|------|--|
| NO. | WELL OR LOCATION | DATE | | | TIME | | MEASUREMENT | CODE | COMMENTS |
| | | MO | DA | YR | HR | MIN | | | |
| 1 | W-1 | 1 | 15 | 92 | 12 | 14 | 4.88 | SWL | C.O PPM non VAULT BOX FLOODED |
| 2 | W-4 | 1 | 15 | 92 | 08 | 47 | 2.56 * | SWL | 0.2 (WELL UNDER PRESSURE) VAULT BOX FLOODED |
| 3 | W-5 | 1 | 15 | 92 | 13 | 10 | 3.21 | OIL | 13.9 PPM (4.01 = OWI) VAULT BOX FLOODED (SOOTY PRODUCT) |
| 4 | W-7 | 1 | 15 | 92 | 10 | 29 | 3.88 | SWL | 3.2 PPM |
| 5 | W-8 | 1 | 15 | 92 | 11 | 05 | 2.98 | SWL | 6.4 PPM VAULT BOX FILLED WITH BENTONITE |
| 6 | W-13 | 1 | 15 | 92 | 08 | 10 | 3.82 | SWL | 0 PPM |
| 7 | W-14 | 1 | 15 | 92 | 08 | 20 | 4.18 | SWL | 1.6 PPM (PRESSURE CAP 2200) VAULT BOX FLOODED |
| 8 | W-15 | 1 | 15 | 92 | 12 | 40 | 3.54 | SWL | 4.3 PPM VAULT BOX FLOODED |
| 9 | W-16 | 1 | 15 | 92 | 13 | 25 | 4.11 | SWL | 35.4 PPM (USED OIL SOUNDING) |
| 10 | W-17 | 1 | 15 | 92 | 10 | 45 | 5.57 | SWL | 3.2 PPM |
| 11 | W-18 | 1 | 15 | 92 | 11 | 20 | 5.24 | SWL | 1.0 PPM VAULT BOX FILLED WITH BENTONITE |
| 12 | W-19 | 1 | 15 | 92 | 09 | 59 | 5.18 | SWL | 2.1 PPM VAULT BOX FLOODED |
| 13 | W-20 | 1 | 15 | 92 | 09 | 14 | 3.75 | SWL | 15.9 PPM VAULT BOX FLOODED |
| 14 | W-21 | 1 | 15 | 92 | 10 | 20 | 4.95 | SWL | 4.3 PPM NO LOCK (ADDED I) VAULT BOX FLOODED |
| 15 | W-22 | 1 | 15 | 92 | 12 | 25 | 7.61 | SWL | 0.0 PPM NO LOCK (ADDED I) |
| 16 | W-23 | 1 | 15 | 92 | 09 | 47 | 1.62 * | SWL | 12.6 PPM (30 MIN WAIT BEFORE SOUNDING) * |
| 17 | W-24 | 1 | 15 | 92 | 09 | 35 | 4.82 | SWL | 0 PPM REPLACED LOCK |
| 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: properly labeled, locked, or able to be locked. Describe corrective action.
 Note flooding of vault box, odor, access problems.

*Negative pressure (Vacuum) psi = approx $-(1/2 \times \text{mmHg})$

* 30 MIN WAIT BEFORE SOUNDING (PRESSURIZED)



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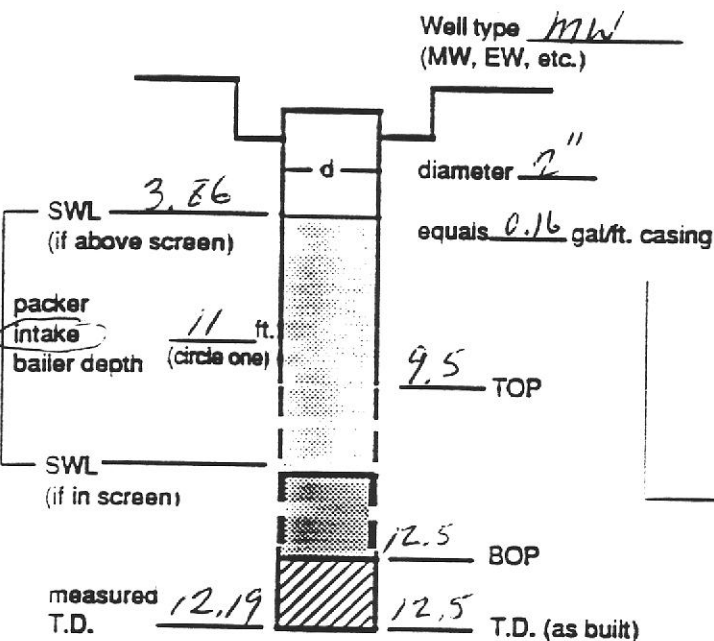
SAMPLING EVENT DATA SHEET

(fill out completely)

WELL OR LOCATION W-7

PROJECT MARKET PLACE EVENT Quarterly SAMPLER D. WATP DATE 1/16/92

Well / Hydrologic statistics



| Action | Time | Pump rate | IWL (low yield) |
|--------------------|------|-----------|-----------------|
| Start pump / Begin | 1350 | .15 GPM | |
| | 1400 | .15 GPM | 6.80 |
| | 1410 | .15 GPM | 7.11 |
| | 1420 | .15 GPM | 7.52 |
| Stop | 1426 | | |
| Sampled | 1430 | | 5.38 |
| (Final IWL) | | | |

Purge calculation

$0.16 \text{ gal/ft.} \cdot 8.64 \text{ ft.} = 1.4 \text{ gals} \times 3 = 4.2 \text{ gals.}$

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:

PERISTALTIC (DC) PUMP USED TO PURGE THREE CASING VOLUMES. DISPOSABLE SAMPLER USED TO SAMPLE.

Actual gallons purged 4.5
Actual volumes purged 3+
Well yield \oplus HY
(see below)

| COC # | Analysis | Lab |
|---------------|-------------|------------|
| 226085 | | |
| Sample I.D. | | |
| <u>182683</u> | <u>8015</u> | <u>MAL</u> |
| <u>182684</u> | <u>8015</u> | <u>MAL</u> |
| | | |
| | | |
| | | |
| | | |

80% RECHARGE = 5.53

Additional comments: 3.2 ppm (1/15/92) SOURCE

Sample Turbidity: 20.5

| Gallons purged * | TEMP °C (circle one) | EC (us/cm) | PH | TURBIDITY (NTU) | | |
|------------------|----------------------|------------|------|-----------------|--|--|
| 1. 1.5 | 61.4 | 5220 | 6.29 | 16.19 | | |
| 2. 3.0 | 62.4 | 7840 | 6.35 | 15.39 | | |
| 3. 4.5 | 61.9 | 8400 | 6.38 | 11.63 | | |
| 4. | | | | | | |
| 5. | | | | | | |

* Take measurement at approximately each casing volume purged.

\oplus 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.



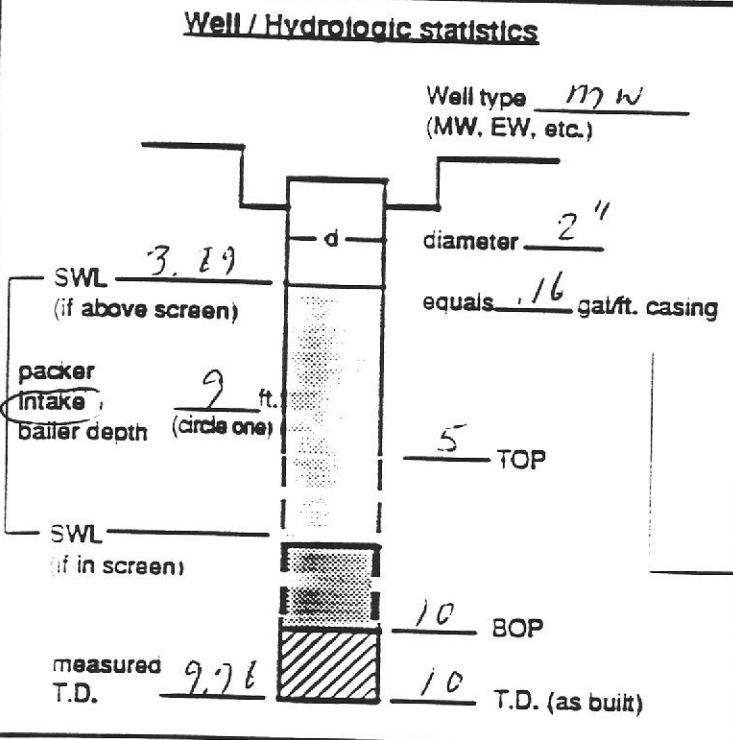
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SAMPLING EVENT DATA SHEET

(fill out completely)

WELL OR LOCATION W-13

PROJECT MARKET PLACE EVENT Quarterly SAMPLER WATTS DATE 1/16/92



| Action | Time | Pump rate | IWL (low yield) |
|---|-------------|-----------------|-----------------|
| Start pump / Begin | <u>1240</u> | <u>.125 GPM</u> | |
| | <u>1248</u> | <u>.125 GPM</u> | <u>5.40</u> |
| | <u>1256</u> | <u>.125 GPM</u> | <u>5.48</u> |
| | <u>1304</u> | <u>.125 GPM</u> | <u>5.44</u> |
| Stop | <u>1305</u> | | |
| Sampled (Final IWL) | <u>1315</u> | | <u>4.24</u> |
| | <u>1325</u> | | <u>4.42</u> |
| Purge calculation | | | |
| <u>.16</u> gal/ft. * <u>6.11</u> ft. = <u>1</u> gals x 3 = <u>3</u> 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 USED TO PURGE THREE CASING VOLUMES.
DISPOSABLE BAILER USED TO SAMPLE.

| | |
|------------------------|--------------|
| Actual gallons purged | <u>3+</u> |
| Actual volumes purged | <u>3+</u> |
| Well yield (see below) | <u>⊕ 14Y</u> |

| | | |
|---------------|---------------|------------|
| COC # | <u>226085</u> | |
| Sample I.D. | Analysis | Lab |
| <u>182861</u> | <u>8015</u> | <u>MAC</u> |
| <u>182862</u> | <u>8015</u> | <u>MAC</u> |
| | | |
| | | |

Additional comments: 80% RECHARGE = 5.07
0 PPM (1/15/92) SOURCE

SAMPLE TURBIDITY: 6.84

| Gallons purged * | TEMP °C (°F) (circle one) | EC (µs/cm) | PH | TURBIDITY (NTU) | | |
|------------------|------------------------------|---------------|-------------|--------------------|--|--|
| <u>1</u> | <u>54.5</u> | <u>1280</u> | <u>7.60</u> | <u>5.94</u> | | |
| <u>2</u> | <u>55.7</u> | <u>1160</u> | <u>7.42</u> | <u>1.30</u> | | |
| <u>3</u> | <u>55.7</u> | <u>1080</u> | <u>7.45</u> | <u>0.68</u> | | |
| <u>4</u> | | | | | | |
| <u>5</u> | | | | | | |

* 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.



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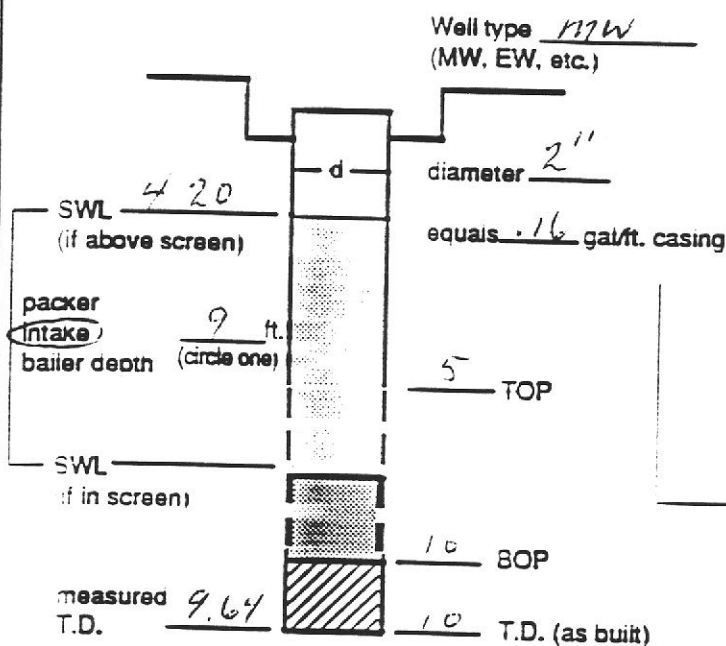
SAMPLING EVENT DATA SHEET

(fill out completely)

WELL OR LOCATION W-14

PROJECT MURKIN SOURCE EVENT Quarterly SAMPLER W-173 DATE 1/16/92

Well / Hydrologic statistics



| Action | Time | Pump rate | IWL (low yield) |
|--------------------|------|-----------|-----------------|
| Start pump / Begin | 1015 | .125 GPM | |
| (STOP) | 1023 | .125 GPM | 7.34 |
| (START) | 1024 | ↓ | ↓ |
| (RE-START) | 1055 | ↓ | 6.41 |
| (RE-START) | 1120 | ↓ | 9.01 |
| Stop | 1135 | | 9.21 |
| Sampled | 1157 | | 5.26 |
| (Final IWL) | 1205 | | 7.24 |

Purge calculation
.16 gal/ft. * 5.2 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:
 DE PERI Pump used to Purge THREE casing VOLUMES. Disposable Bailer used to sample.
 ALLOWED WELL to RECHARGE to ≥ 20% BEFORE Sampling.
 20% RECHARGE = 5.29 MW

| | | |
|------------------------|---------------|-------------|
| Actual gallons purged | <u>3+</u> | |
| Actual volumes purged | <u>3+</u> | |
| Well yield (see below) | <u>MY</u> | |
| COC # | <u>226085</u> | |
| Sample I.D. | Analysis | Lab |
| <u>182858</u> | <u>8015</u> | <u>NIAL</u> |
| <u>182859</u> | <u>8015</u> | <u>NIAL</u> |

Additional comments: 1.6 PPM (1/15/92) SOURCE
Sample Turbidity: 35.3

| Gallons purged * | TEMP °C (°F) (circle one) | EC (us/cm) | PH | TURBIDITY (NTU) |
|------------------|------------------------------|------------|------|-----------------|
| 1 | 56.9 | 7100 | 7.31 | 533 |
| 2 | 54.9 | 5030 | 7.33 | 9.09 |
| 3 | 55.1 | 5030 | 7.40 | 7.03 |
| 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.



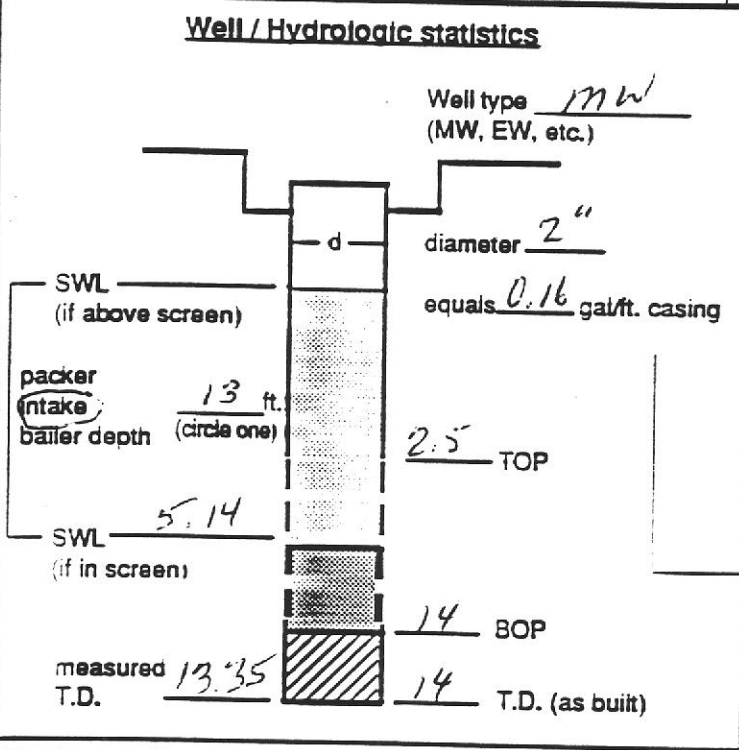
McLaren

SAMPLING EVENT DATA SHEET

(fill out completely)

WELL OR LOCATION W-19

PROJECT Mittlet Pond EVENT Quarterly SAMPLER D. W. JTS DATE 1/17/92



| Action | Time | Pump rate | IWL (low yield) |
|--------------------|------|-----------|-----------------|
| Start pump / Begin | 0920 | .125 Gpm | |
| | 0932 | .125 Gpm | 5.18 |
| | 0944 | .125 Gpm | 5.20 |
| | 0956 | .125 Gpm | 5.18 |
| Stop | 0958 | | |
| Sampled | 1010 | | 5.18 |
| (Final IWL) | 1012 | | 5.18 |

Purge calculation
 $0.16 \text{ gal/ft.} \cdot 8.76 \text{ ft.} = 1.5 \text{ gals} \times 3 = 4.5 \text{ gals.}$

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:
DO PERI used to Purge THREE VOLUMES.
Disposable Bailer used to sample.

80 To RECHARGE = 6.79

| | | |
|------------------------|---------------|------------|
| Actual gallons purged | <u>4.5+</u> | |
| Actual volumes purged | <u>MA 3+</u> | |
| Well yield (see below) | <u>HY</u> | |
| COC # | <u>225275</u> | |
| Sample I.D. | Analysis | Lab |
| <u>182867</u> | <u>8015</u> | <u>MAL</u> |
| <u>182868</u> | <u>8015</u> | <u>MAL</u> |
| | | |
| | | |
| | | |

Additional comments: 2.1 ppm (1/15/92) SOURCE

SAMPLE TURBIDITY: 15.78

| Gallons purged * | TEMP °C / °F (circle one) | EC (µs / cm) | PH | TURBIDITY (NTU) | | |
|------------------|---------------------------|--------------|-------------|-----------------|--|--|
| 1. <u>1.5</u> | <u>59.2</u> | <u>4970</u> | <u>7.04</u> | <u>4.99</u> | | |
| 2. <u>3.0</u> | <u>58.4</u> | <u>4280</u> | <u>6.98</u> | <u>2.09</u> | | |
| 3. <u>4.5</u> | <u>58.4</u> | <u>3930</u> | <u>6.90</u> | <u>3.54</u> | | |
| 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.

SAMPLING EVENT DATA SHEET

(fill out completely)

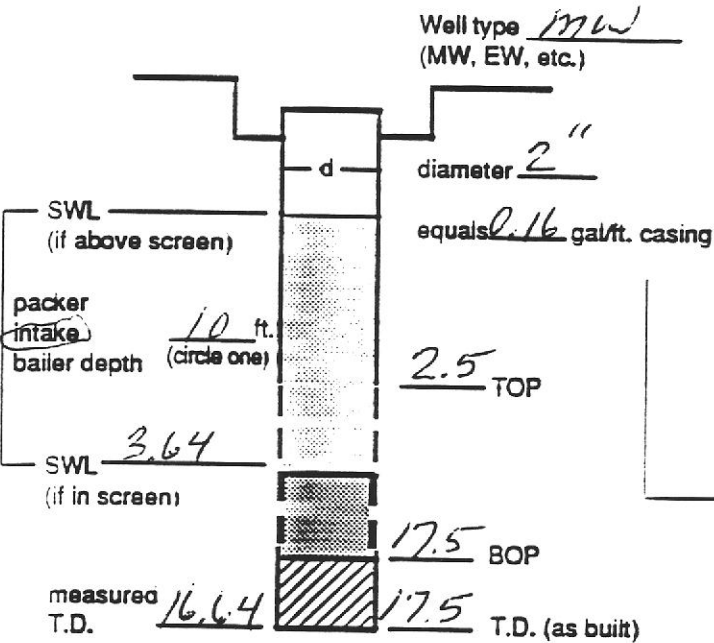


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WELL OR LOCATION W-20

PROJECT MARKET PLACE EVENT Quarterly SAMPLER D. WATTS DATE 1/17/92

Well / Hydrologic statistics



| Action | Time | Pump rate | IWL (low yield) |
|--------------------|-------------|----------------|-----------------|
| Start pump / Begin | <u>1210</u> | <u>.15 GPM</u> | |
| | <u>1225</u> | <u>.15 GPM</u> | <u>4.15</u> |
| | <u>1240</u> | <u>.15 GPM</u> | <u>4.18</u> |
| | <u>1255</u> | <u>.15 GPM</u> | <u>4.20</u> |
| Stop | <u>1258</u> | | |
| Sampled | <u>1305</u> | | <u>4.00</u> |
| (Final IWL) | <u>1310</u> | | <u>4.00</u> |

Purge calculation
.16 gal/ft. * 13.86 ft. = 2.25 gals x 3 = 6.75 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:
DO PERI USED TO PURGE THREE CASING VOLUMES. DISPOSABLE BAILEY USED TO SAMPLE.

80% RECHARGE = 6.24

Actual gallons purged 7
 Actual volumes purged 3+
 Well yield ⊕ MY/HY
 (see below)

| COC # | Sample I.D. | Analysis | Lab |
|---------------|---------------|-------------|------------|
| <u>225275</u> | <u>182871</u> | <u>8015</u> | <u>MAL</u> |
| | <u>182872</u> | <u>8015</u> | <u>MAL</u> |
| | | | |
| | | | |
| | | | |

Additional comments:

SAMPLE TURBIDITY: 9.89

| Gallons purged * | TEMP °C (°F) (circle one) | EC (µs / cm) | PH | TURBIDITY (NTU) | | |
|------------------|---------------------------|--------------|-------------|-----------------|--|--|
| <u>1. 2.25</u> | <u>60.1</u> | <u>9090</u> | <u>7.03</u> | <u>5.24</u> | | |
| <u>2. 4.50</u> | <u>59.1</u> | <u>8700</u> | <u>7.04</u> | <u>2.22</u> | | |
| <u>3. 6.75</u> | <u>59.8</u> | <u>9050</u> | <u>7.05</u> | <u>0.93</u> | | |
| <u>4.</u> | | | | | | |
| <u>5.</u> | | | | | | |

* 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.



McLaren

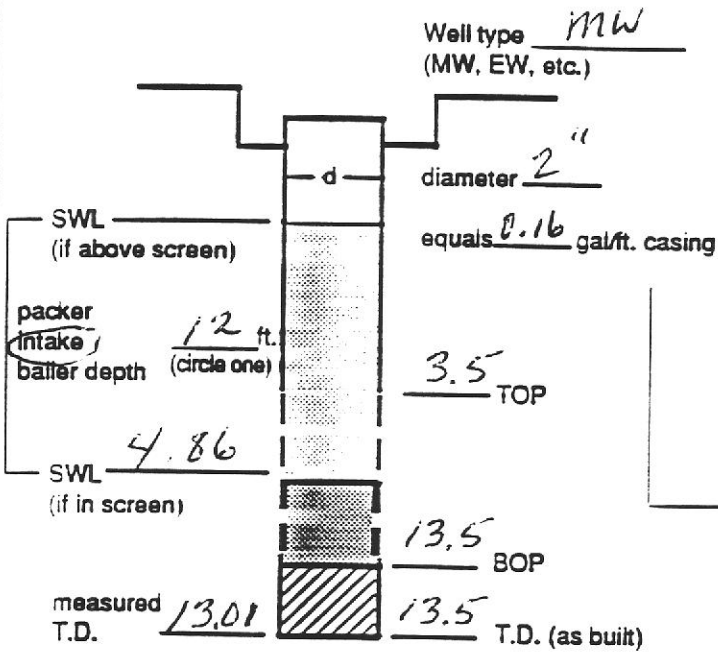
SAMPLING EVENT DATA SHEET

(fill out completely)

WELL OR LOCATION W-24

PROJECT MARKET PLACE EVENT Quarterly SAMPLER D. WATT DATE 1/17/92

Well / Hydrologic statistics



| Action | Time | Pump rate | IWL (low yield) |
|--------------------|-------------|----------------|-----------------|
| Start pump / Begin | <u>1046</u> | <u>.15 GPM</u> | |
| | <u>1056</u> | <u>.15 GPM</u> | <u>4.90</u> |
| | <u>1106</u> | <u>.15 GPM</u> | <u>4.84</u> |
| | <u>1116</u> | <u>.15 GPM</u> | <u>4.90</u> |
| | <u>1126</u> | <u>.15 GPM</u> | <u>4.92</u> |
| Stop | <u>1128</u> | | |
| Sampled | <u>1130</u> | | <u>4.90</u> |
| (Final IWL) | <u>1140</u> | | <u>4.98</u> |

Purge calculation
0.16 gal/ft. * 8.64 ft. = 1.4 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:
Peri Pump (DC) USED TO PURGE THREE CASING VOLUMES. DISPOSABLE BAIER USED TO SAMPLE.

80% RECHARGE = 6.49

| | |
|------------------------|------------------------|
| Actual gallons purged | <u>6+</u> |
| Actual volumes purged | <u>4+</u> |
| Well yield (see below) | <u>44</u> |
| COC # | <u>225275</u> |
| Sample I.D. | Analysis Lab |
| <u>182869</u> | <u>8015</u> <u>MAZ</u> |
| <u>182870</u> | <u>8015</u> <u>MAZ</u> |

Additional comments:
SAMPLE TURBIDITY: 35.0

| Gallons purged * | TEMP °C (F) (circle one) | EC (µs/cm) | PH | TURBIDITY (NTU) |
|------------------|--------------------------|-------------|-------------|-----------------|
| <u>1.5</u> | <u>56.2</u> | <u>8550</u> | <u>7.30</u> | <u>8.84</u> |
| <u>3.0</u> | <u>58.4</u> | <u>6150</u> | <u>7.07</u> | <u>2.39</u> |
| <u>4.5</u> | <u>57.4</u> | <u>3980</u> | <u>6.95</u> | <u>2.68</u> |
| <u>6.0</u> | <u>57.0</u> | <u>3900</u> | <u>6.90</u> | <u>0.62</u> |
| <u>5.</u> | | | | |

* 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.

ATTACHMENT B

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



Date: January 28, 1992
LP #: 5444

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

Dear Ms. Menack:

Enclosed are the laboratory results for the four samples submitted by you to the McLaren Analytical Laboratory on January 17, 1992, for the project *Market Place*.

The analysis you requested is:

Mod. EPA 8015 (4 - Water)

The report consists of the following sections:

1. A copy of the chain of custody
2. Quality Control Definitions and Report
3. Comments
4. Analytical results
5. Copy of final billing submitted to accounting.

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

Thank you for choosing McLaren Analytical Laboratory. 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,

A handwritten signature in cursive script that reads 'Anthony S. Wong'.

Anthony S. Wong, Ph.D.
Director, Laboratory/Managing Principal



220085

CHAIN OF CUSTODY RECORD

FOR LABORATORY USE ONLY

Laboratory Project No.: 5444 Secured: Yes No
 Storage Refrigerator ID: 418
 Storage Freezer ID: _____

Project Name: MARKET PLACE Project #: 59805 Sampler: DAVID WATTS (Printed Name) [Signature] (Signature)
 Relinquished by: (Signature and Printed Name) [Signature] D. WATTS Received by: (Signature and Printed Name) FED EX Date: 1/16/92 Time: Pm
 Relinquished by: (Signature and Printed Name) _____ Received by: (Signature and Printed Name) [Signature] Date: 1-17-92 Time: 1245
 Relinquished by: (Signature and Printed Name) _____ Received by: (Signature and Printed Name) _____ Date: _____ Time: _____
 Relinquished by: (Signature and Printed Name) _____ Received by: (Signature and Printed Name) _____ Date: _____ Time: _____

SHIP TO:
 McLaren Analytical Laboratory
 11101 White Rock Road
 Rancho Cordova, CA 95670
 (916) 638-3696
 FAX (916) 638-2842

Method of Shipment: FED - X
 Shipment ID: _____

Circle or Add Analysis(es) Requested

- 601/8010 (Halogenated Volatiles-GC)
- 602/8020 (Aromatic Volatiles-GC)
- 604/8040 (Phenols-GC)
- 608/8080 (Pesticides/PCB-GC)
- 610/8100 (PNA-GC)
- 624/8240 (Volatiles-GC)
- 625/8270 (BNA-GC/MS)
- TPH/G (Gasoline-GC)
- TPH/D (Diesel-GC)
- 418.1 (IR)
- 8015 Modified (GC)
- Metals-Total a
- Metals-Soluble a
- Fluoride/Soluble a
- Chloride/Perchlorate
- TDS/Percent pH
- Specific Conductivity (EC)

a) Identify specific metals requested under Special Instructions

| Sample ID Number | Sample Description | | | Analysis Requested | | | | | | | | | | | | | TAT | Container(s) | | FOR LABORATORY USE ONLY | | | | | | |
|------------------|--------------------|------|--------------------|--------------------|----------|----------|----------|----------|----------|----------|-------|-------|------------|--------------------|----------------|------------------|-----|--------------------|----------------------|-------------------------|----------------------------|---|------|--------|-----------|------|
| | Date | Time | Description | 601/8010 | 602/8020 | 604/8040 | 608/8080 | 610/8100 | 624/8240 | 625/8270 | TPH/G | TPH/D | 418.1 (IR) | 8015 Modified (GC) | Metals-Total a | Metals-Soluble a | | Fluoride/Soluble a | Chloride/Perchlorate | TDS/Percent pH | Specific Conductivity (EC) | # | Type | Lab ID | | |
| 1 | 1/16/92 | 1035 | TRIP BLANK | | | | | | | | | | X | | | | | | | | | 4 | 1 | V | 5444-1001 | |
| 2 | 1/16/92 | 1035 | TRIP BLANK (BRASS) | | | | | | | | | | X | | | | | | | | | | | | V | L |
| 3 | 1/16/92 | 1157 | MW-14 | | | | | | | | | | X | | | | | | | | | | | | A | 1002 |
| 4 | 1/16/92 | 1157 | MW-14 (BRASS) | | | | | | | | | | X | | | | | | | | | | | | A | L |
| 5 | 1/16/92 | 1315 | MW-13 | | | | | | | | | | X | | | | | | | | | | | | A | 1003 |
| 6 | 1/16/92 | 1315 | MW-13 (SPARE) | | | | | | | | | | X | | | | | | | | | | | | A | L |
| 7 | 1/16/92 | 1430 | MW-7 | | | | | | | | | | X | | | | | | | | | | | | A | 1004 |
| 8 | 1/16/92 | 1430 | MW-7 (SPARE) | | | | | | | | | | X | | | | | | | | | | | | A | L |
| 9 | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 10 | | | | | | | | | | | | | | | | | | | | | | | | | | |

Special Instructions/Comments: _____
 Sample Archive/Disposal:
 Laboratory Standard
 Other _____

TAT (Analytical Turn-Around Times) 1 = 24 hours 2 = 48 hours 3 = 1 week 4 = 2 weeks
 Container Types: B=Brass Tube, V=VOA Vial, A=1-Liter Amber, G=Glass Jar, C=Cassette, O = Other _____

SEND DOCUMENTATION AND RESULTS TO (Check one):
 Project Manager/Office: _____
 Client Name: _____
 Company: _____
 Address: _____
 Phone: () _____ Fax: _____

FOR LABORATORY USE ONLY. Sample Condition Upon Receipt: SAMPLES INTACT, TEMP. GOOD (YES)



REVISION

226085

CHAIN OF CUSTODY RECORD

FOR LABORATORY USE ONLY

Laboratory Project No.: 5444 Secured: Yes No
 Storage Refrigerator ID: 418
 Storage Freezer ID: _____

Project Name: MARKET PLACE Project #: 59805 Sampler: DAVID WATTS (Printed Name) [Signature] (Signature)
 Relinquished by: (Signature and Printed Name) [Signature] D. WATTS Received by: (Signature and Printed Name) FED - X Date: 1/16/92 Time: Pm
 Relinquished by: (Signature and Printed Name) FED EX Received by: (Signature and Printed Name) [Signature] Date: 1-17-92 Time: 1245
 Relinquished by: (Signature and Printed Name) Received by: (Signature and Printed Name) Date: _____ Time: _____
 Relinquished by: (Signature and Printed Name) Received by: (Signature and Printed Name) Date: _____ Time: _____

SHIP TO: McLaren Analytical Laboratory
 11101 White Rock Road
 Rancho Cordova, CA 95670
 (916) 638-3696
 FAX (916) 638-2842

Method of Shipment: FED - X
 Shipment ID: _____

Circle or Add Analysis(es) Requested

- 601/8010 (Halogenated Volatiles-GC)
- 602/8020 (Aromatic Volatiles-GC)
- 604/8040 (Phenols-GC)
- 608/8080 (Pesticides-GC)
- 610/8100 (PNA-GC)
- 624/8240 (Volatiles-GC/MS)
- TPH/G (BNA-GC/MS)
- TPH/D (Diesel-GC)
- 418.1 (IR)
- (8015 Modified GC)
- Metals-Total a
- Metals-Soluble a
- Fluoride/Perchlorate
- Chloride/Ph
- TDS/Percent Solid
- Specific Conductivity (EC)

a) Identify specific metals requested under Special Instructions

| Sample ID Number | Sample Description | | | TAT | Container(s) | | FOR LABORATORY USE ONLY Lab ID |
|------------------|--------------------|------|--------------------|-----|--------------|------|--------------------------------|
| | Date | Time | Description | | # | Type | |
| 1 | 1/16/92 | 1055 | TRIP BLANK | X | 4 | 1 | V 5444-001 |
| 2 | | 1055 | TRIP BLANK (WATER) | X | | | V / / |
| 3 | | 1157 | MW-14 | X | | | A / / |
| 4 | | 1157 | MW-14 (SPARE) | X | | | A / / |
| 5 | | 1315 | MW-13 | X | | | A / / |
| 6 | | 1315 | MW-13 (SPARE) | X | | | A / / |
| 7 | | 1430 | MW-7 | X | | | A / / |
| 8 | | 1430 | MW-7 (SPARE) | X | | | A / / |
| 9 | | | | | | | |
| 10 | | | | | | | |

Special Instructions/Comments: _____

Sample Archive/Disposal:
 Laboratory Standard
 Other _____

TAT (Analytical Turn-Around Times) 1 = 24 hours 2 = 48 hours 3 = 1 week 4 = 2 weeks
 Container Types: B=Brass Tube, V=VOA Vial, A=1-Liter Amber, G=Glass Jar, C=Cassette, O = Other

SEND DOCUMENTATION AND RESULTS TO (Check one):

Project Manager/Office: Julie Menack
 Client Name: Alameda
 Company: _____
 Address: _____
 Phone: () _____ Fax: _____

FOR LABORATORY USE ONLY. Sample Condition Upon Receipt: SAMPLES INTACT, TEMP. GOOD (PSP)
REC'D VOA VIAL LABELLED AS 182856 BUT NO VOA VIAL LABELLED
182586, WE WILL ACCESS 182856 WITH 182860 FOR THE ANALYSIS. -K20



REVISION

220085

CHAIN OF CUSTODY RECORD

FOR LABORATORY USE ONLY

Laboratory Project No.: 5444 Secured: Yes No
 Storage Refrigerator ID: 418
 Storage Freezer ID: _____

Project Name: MARKET PLACE Project #: 59805 Sampler: DAVID WATTS
 Relinquished by: (Signature and Printed Name) [Signature] D. WATTS Received by: (Signature and Printed Name) [Signature] FED - X Date: 1/16/92 Time: Pm
 Relinquished by: (Signature and Printed Name) _____ Received by: (Signature and Printed Name) [Signature] FED EX Date: 1-17-92 Time: 1245
 Relinquished by: (Signature and Printed Name) _____ Received by: (Signature and Printed Name) _____ Date: _____ Time: _____
 Relinquished by: (Signature and Printed Name) _____ Received by: (Signature and Printed Name) _____ Date: _____ Time: _____

SHIP TO: McLaren Analytical Laboratory
 11101 White Rock Road
 Rancho Cordova, CA 95670
 (916) 638-3696
 FAX (916) 638-2842

Method of Shipment: FED - X
 Shipment ID: _____

- Circle or Add Analysis(es) Requested
- 601/8010 (Halogenated Volatiles-GC)
 - 602/802n (Aromatic Volatiles-GC)
 - 604/804d (Phenols-GC)
 - 608/8080 (Pesticides/PCB-GC)
 - 610/8100 (PNA-GC)
 - 624/8240 (Volatiles-GC/MS)
 - 625/8270 (BNA-GC/MS)
 - TPH/G (Gasoline-GC)
 - TPH/D (Diesel-GC)
 - 418.1 (IR)
 - (8015 Modified GC)
 - Metals: Total &
 - Metals: Soluble &
 - Fluoride/Perchlorate
 - Chloride/pH
 - TDS/Percent Solid
 - Specific Conductivity (EC)

a) Identify specific metals requested under Special Instructions

| Sample ID Number | Sample Description | | | TAT | Container(s) | | FOR LABORATORY USE ONLY | |
|------------------|--------------------|------|--------------------|-----|--------------|------|-------------------------|----------|
| | Date | Time | Description | | # | Type | Lab ID | |
| 1 | 1/16/92 | 1055 | TRIP BLANK | X | 4 | 1 | V | 5444-001 |
| 2 | 1/16/92 | 1055 | TRIP BLANK (BRASS) | X | 1 | 1 | V | L |
| 3 | 1/16/92 | 1157 | MW-14 | X | 1 | 1 | A | 1002 |
| 4 | 1/16/92 | 1157 | MW-14 (SPARE) | X | 1 | 1 | A | L |
| 5 | 1/16/92 | 1315 | MW-13 | X | 1 | 1 | A | 1003 |
| 6 | 1/16/92 | 1315 | MW-13 (SPARE) | X | 1 | 1 | A | L |
| 7 | 1/16/92 | 1430 | MW-7 | X | 1 | 1 | A | 1004 |
| 8 | 1/16/92 | 1430 | MW-7 (SPARE) | X | 1 | 1 | A | L |
| 9 | | | | | | | | |
| 10 | | | | | | | | |

Special Instructions/Comments: _____
 Sample Archive/Disposal: Laboratory Standard Other _____

TAT (Analytical Turn-Around Times) 1 = 24 hours 2 = 48 hours 3 = 1 week 4 = 2 weeks
 Container Types: B=Brass Tube, V=VOA Vial, A=1-Liter Amber, G=Glass Jar, C=Cassette, O = Other _____

SEND DOCUMENTATION AND RESULTS TO (Check one):
 Project Manager/Office: Julie Menack
 Client Name: Alameda
 Company: _____
 Address: _____
 Phone: () _____ Fax: _____

FOR LABORATORY USE ONLY. Sample Condition Upon Receipt: SAMPLES INTACT, TEMP. GOOD (VSP)
REC'D VOA VIAL LABELLED AS 182856 BUT NO VOA VIAL LABELLED
182586, WE WILL ACCESS 182856 WITH 182860 FOR THE ANALYSIS, -KSP

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. The method blank results associated with your samples are attached.

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. The results of the laboratory control spike associated with your samples are attached.

Accuracy is measured using percent recovery, i.e.:

$$\text{Percent Recovery} = \frac{\text{(measured concentration)}}{\text{(actual concentration)}} \times 100$$

Precision is measured using the relative percent difference (RPD) from duplicate tests, i.e.:

$$\text{RPD} = \frac{\% \text{ Recovery of Spike}_{(1)} - \% \text{ Recovery of Spike}_{(2)}}{(\% \text{ Recovery of Spike}_{(1)} + \% \text{ Recovery of Spike}_{(2)})/2} \times 100$$

Control limits for accuracy and precision are different for different methods. They may also 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.

(DC1-CN5444)



QUALITY CONTROL REPORT

METHOD BLANK

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

Date Analyzed: 01/26/92
Date Extracted: 01/20/92
Batch Number: 920120-1902

| <u>Compound</u> | <u>Reporting Limit</u> | <u>Results of the MB</u> |
|-------------------------|----------------------------|--------------------------|
| Gasoline Range | 0.50 | BRL |
| Jet Fuel/Kerosene Range | 0.50 | BRL |
| Diesel Range | 0.50 | BRL |
| Motor Oil Range | 0.50 | BRL |

(DC1-CN5444)



QUALITY CONTROL REPORT

McLaren Analytical Laboratory
Spike/Spike Duplicate Recovery
Method 8015 - Modified
Total Petroleum Hydrocarbons/TPH - Diesel

LP#: 5444

Analyst: EB

Batch #: 920106-2601

Date Of Analysis: 01/08/92

Spike Sample ID: LCSW/LCSDW #21

Column: DB-1

Spike ID Code: W2-756 W2-757

Instrument #: PGC#4

Surrogate ID Code: NA

Matrix: Water Units: mg/L

| COMPOUNDS | (a) | (b) | (c) | (d) | (e) | (f) | (g) | ACCEPTANCE LIMITS | |
|-----------|--------------|-------------|----------------------|--------------|---------------------------|-------------------|-------|-------------------|------|
| | SAMPLE CONC. | SPIKE CONC. | SAMPLE + SPIKE CONC. | SPIKE REC. % | SAMPLE DUP. + SPIKE CONC. | SPIKE DUP. REC. % | RPD % | % REC | RPD |
| Gasoline | NA | 2.5 | 1.7 | 68 | 1.5 | 60 | 12 | 26 - 90 | ≤ 25 |
| Diesel | NA | 2.5 | 2.1 | 84 | 2.5 | 100 | 17 | 43 - 152 | ≤ 25 |

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

Comments: _____

8015MSDR.W91



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. Blank results are reported in the Case Narrative.

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

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

Diesel standard obtained from local Chevron station. Diesel is sold commercially as diesel fuel #2.

Kerosene standard obtained from Post Jeff Chevron/Mobil Products. It 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.

Motor oil standard obtained from 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.

Results are reported on the attached data sheets.

(DC1-CN5444)



TOTAL PETROLEUM HYDROCARBONS

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

| | |
|---------------------------------------|---|
| Project Name: <u>Market Place</u> | Project Number: <u>59805</u> |
| Sample Description: <u>Trip Blank</u> | Lab Project- ID Number: <u>5444-001</u> |
| Sample Number: <u>182856, 182860</u> | Date Sampled: <u>01/16/92</u> |
| Date Received: <u>01/17/92</u> | Date Extracted: <u>01/20/92</u> |
| Date Analyzed: <u>01/26/92</u> | Batch Number: <u>920120-1902</u> |

| <u>PETROLEUM HYDROCARBONS</u> | <u>CONCENTRATION</u> mg/L (ppm) | <u>REPORTING LIMIT</u> mg/L (ppm) |
|-------------------------------|------------------------------------|--------------------------------------|
| Gasoline Range | BRL | 6.2 |
| Jet Fuel/Kerosene Range | BRL | 6.2 |
| Diesel Range | BRL | 6.2 |
| Motor Oil Range | BRL | 6.2 |
| Total Petroleum Hydrocarbons | BRL | 6.2 |

Dilution: None

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.

Due to insufficient sample volume supplied to the laboratory, the established reporting limits were elevated by the ratio of standard volume, 1000 mL, to that of the laboratory provided volume, 80 mL.

Approved By: Chris Phillips C.M. Date: 1/28/92
Cheryl Matterson, Associate Chemist

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

110691



TOTAL PETROLEUM HYDROCARBONS

Analytical Method: Modified EPA 8015 (a)

Preparation Method: EPA 3510

Project Name: Market Place

Project Number: 59805

Sample Description: MW-14

Lab Project-ID Number: 5444-002

Sample Number: 182858

Date Sampled: 01/16/92

Date Received: 01/17/92

Date Extracted: 01/20/92

Date Analyzed: 01/26/92

Batch Number: 920120-1902

PETROLEUM HYDROCARBONS

CONCENTRATION
mg/L (ppm)

REPORTING LIMIT
mg/L (ppm)

| | | |
|------------------------------|-----|------|
| Gasoline Range | BRL | 0.50 |
| Jet Fuel/Kerosene Range | BRL | 0.50 |
| Diesel Range | BRL | 0.50 |
| Motor Oil Range | BRL | 0.50 |
| Total Petroleum Hydrocarbons | BRL | 0.50 |

Dilution: None

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.

Approved By: Chris Phillips for C.M.
Cheryl Matterson, Associate Chemist

Date: 1/28/92

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

110691



TOTAL PETROLEUM HYDROCARBONS

Analytical Method: Modified EPA 8015 (a)

Preparation Method: EPA 3510

Project Name: Market Place

Project Number: 59805

Sample Description: MW-13

Lab Project-ID Number: 5444-003

Sample Number: 182862

Date Sampled: 01/16/92

Date Received: 01/17/92

Date Extracted: 01/20/92

Date Analyzed: 01/26/92

Batch Number: 920120-1902

PETROLEUM HYDROCARBONS

CONCENTRATION
mg/L (ppm)

REPORTING LIMIT
mg/L (ppm)

| | | |
|------------------------------|-----|------|
| Gasoline Range | BRL | 0.50 |
| Jet Fuel/Kerosene Range | BRL | 0.50 |
| Diesel Range | BRL | 0.50 |
| Motor Oil Range | BRL | 0.50 |
| Total Petroleum Hydrocarbons | BRL | 0.50 |

Dilution: None

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.

Approved By: Chris Phillips C.M. Date: 1/28/92
Cheryl Matterson, Associate Chemist

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

110691



TOTAL PETROLEUM HYDROCARBONS

Analytical Method: Modified EPA 8015 (a)

Preparation Method: EPA 3510

Project Name: Market Place

Project Number: 59805

Sample Description: MW-7

Lab Project-ID Number: 5444-004

Sample Number: 182863

Date Sampled: 01/16/92

Date Received: 01/17/92

Date Extracted: 01/20/92

Date Analyzed: 01/26/92

Batch Number: 920120-1902

PETROLEUM HYDROCARBONS

CONCENTRATION
mg/L (ppm)

REPORTING LIMIT
mg/L (ppm)

| | | |
|----------------------------------|---------|----------|
| Gasoline Range | BRL | 0.50 |
| Jet Fuel/Kerosene Range | BRL | 0.50 |
| Diesel Range | 1.6 | 0.50 |
| Motor Oil Range | 3.6 | 0.50 |
| Total Petroleum Hydrocarbons | 5.2 | 0.50 |

Dilution: None

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.

Approved By: Cheryl Matterson Date: 1/28/92
Cheryl Matterson, Associate Chemist

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

110691





Date: January 28, 1992
LP #: 5449

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

Dear Ms. Menack:

Enclosed are the laboratory results for the four samples submitted by you to the McLaren Analytical Laboratory on January 18, 1992, for the project *Market Place*.

The analysis you requested is:

Mod. EPA 8015 (4 - Water)

The report consists of the following sections:

1. A copy of the chain of custody
2. Quality Control Definitions and Report
3. Comments
4. Analytical results
5. Copy of final billing submitted to accounting.

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

Thank you for choosing McLaren Analytical Laboratory. 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,

A handwritten signature in cursive script that reads 'Anthony S. Wong'.

Anthony S. Wong, Ph.D.
Director, Laboratory/Managing Principal



225215

CHAIN OF CUSTODY RECORD

FOR LABORATORY USE ONLY
 Laboratory Project No.: 5449 Secured: Yes No
 Storage Refrigerator ID: 4-15
 Storage Freezer ID: _____

Project Name: MARKET PLACE Project #: 59805 Sampler: D. WATTS
 Relinquished by: (Signature and Printed Name) D. Watts Received by: (Signature and Printed Name) [Signature]
 Relinquished by: (Signature and Printed Name) FED EX Received by: (Signature and Printed Name) [Signature]
 Relinquished by: (Signature and Printed Name) _____ Received by: (Signature and Printed Name) Kathleen Fontaine
 Relinquished by: (Signature and Printed Name) _____ Received by: (Signature and Printed Name) _____

SHIP TO:
 McLaren Analytical Laboratory
 11101 White Rock Road
 Rancho Cordova, CA 95670
 (916) 638-3696
 FAX (916) 638-2842

Method of Shipment: FED-X
 Shipment ID: _____

| Circle or Add Analysis(es) Requested | 6018010 (Halogenated Volatiles-GC) | 6028020 (Aromatic Volatiles-GC) | 6048040 (Phenols-GC) | 6088080 (Pesticides/PCB-GC) | 6108100 (PNA-GC) | 6248240 (Volatiles-GC/MS) | TPHIG (BNA-GC/MS) | TPHID (Gasoline-GC) | 418.1 (IR) | 6015 Modified (GC) | Metals Total & | Metals Soluble & | Fluoride/Perchlorate | Chloride/PH | TDS/Percent Solid | Specific Conductivity (EC) |
|--------------------------------------|------------------------------------|---------------------------------|----------------------|-----------------------------|------------------|---------------------------|-------------------|---------------------|------------|--------------------|----------------|------------------|----------------------|-------------|-------------------|----------------------------|
| | | | | | | | | | | | | | | | | |

a) Identify specific metals requested under Special Instructions

| Sample ID Number | Sample Description | | | TAT | Container(s) | | FOR LABORATORY USE ONLY | |
|------------------|--------------------|------|-------------|-----|--------------|------|-------------------------|--|
| | Date | Time | Description | | # | Type | Lab ID | |
| 182865 | 1/17/92 | 0870 | TRIP BLANK | 4 | 1 | V | 5449-001 | |
| 182866 | | 0840 | ↓ (SPARE) | | | V | ↓ | |
| 182867 | | 1010 | MW-19 | | | A | -002 | |
| 182868 | | 1010 | ↓ (SPARE) | | | A | ↓ | |
| 182869 | | 1130 | MW-24 | | | A | -003 | |
| 182870 | | 1130 | ↓ (SPARE) | | | A | ↓ | |
| 182871 | | 1305 | MW-20 | | | A | -004 | |
| 182872 | | 1305 | ↓ (SPARE) | | | A | ↓ | |
| | | | | | | | | |
| | | | | | | | | |

Special Instructions/Comments: _____
 Sample Archive/Disposal:
 Laboratory Standard
 Other _____

TAT (Analytical Turn-Around Times) 1 = 24 hours 2 = 48 hours 3 = 1 week 4 = 2 weeks
 Container Types: B=Brass Tube, V=VOA Vial, A=1-Liter Amber, G=Glass Jar, C=Cassette, O = Other _____

SEND DOCUMENTATION AND RESULTS TO (Check one):
 Project Manager/Office: Julie Menack / Alameda
 Client Name: _____
 Company: _____
 Address: _____
 Phone: () _____ Fax: _____

FOR LABORATORY USE ONLY. Sample Condition Upon Receipt: TEMP. GOOD, Samples intact (X-7) 1/20/92

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. The method blank results associated with your samples are attached.

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. The results of the laboratory control spike associated with your samples are attached.

Accuracy is measured using percent recovery, i.e.:

$$\text{Percent Recovery} = \frac{\text{(measured concentration)}}{\text{(actual concentration)}} \times 100$$

Precision is measured using the relative percent difference (RPD) from duplicate tests, i.e.:

$$\text{RPD} = \frac{\% \text{ Recovery of Spike}_{(1)} - \% \text{ Recovery of Spike}_{(2)}}{(\% \text{ Recovery of Spike}_{(1)} + \% \text{ Recovery of Spike}_{(2)})/2} \times 100$$

Control limits for accuracy and precision are different for different methods. They may also 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.

(DC1-CN5449)



QUALITY CONTROL REPORT

METHOD BLANK

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

Date Analyzed: 01/26/92
Date Extracted: 01/20/92
Batch Number: 920120-1902

| <u>Compound</u> | <u>Reporting Limit</u> | <u>Results of the MB</u> |
|-------------------------|----------------------------|--------------------------|
| Gasoline Range | 0.50 | BRL |
| Jet Fuel/Kerosene Range | 0.50 | BRL |
| Diesel Range | 0.50 | BRL |
| Motor Oil Range | 0.50 | BRL |

(DC1-CN5449)



QUALITY CONTROL REPORT

McLaren Analytical Laboratory
Spike/Spike Duplicate Recovery
Method 8015 - Modified
Total Petroleum Hydrocarbons/TPH - Diesel

LP#: 5449

Analyst: EB

Batch #: 920106-2601

Date Of Analysis: 01/08/92

Spike Sample ID: LCSW/LCSDW #21

Column: DB-1

Spike ID Code: W2-756 W2-757

Instrument #: PGC#4

Surrogate ID Code: NA

Matrix: Water Units: mg/L

| COMPOUNDS | (a) | (b) | (c) | (d) | (e) | (f) | (g) | ACCEPTANCE LIMITS | |
|-----------|--------------|-------------|----------------------|--------------|---------------------------|-------------------|-------|-------------------|------|
| | SAMPLE CONC. | SPIKE CONC. | SAMPLE + SPIKE CONC. | SPIKE REC. % | SAMPLE DUP. + SPIKE CONC. | SPIKE DUP. REC. % | RPD % | % REC | RPD |
| Gasoline | NA | 2.5 | 1.7 | 68 | 1.5 | 60 | 12 | 26 - 90 | ≤ 25 |
| Diesel | NA | 2.5 | 2.1 | 84 | 2.5 | 100 | 17 | 43 - 152 | ≤ 25 |

$$\begin{aligned} \text{Spike Recovery} &= d = ((c-a)/b) \times 100 \\ \text{Spike Duplicate Recovery} &= f = ((e-a)/b) \times 100 \\ \text{Relative Percent Difference} &= g = (|c-e|)/((c+e) \times .5) \times 100 \end{aligned}$$

Comments: _____

8015MSDR.W91



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. Blank results are reported in the Case Narrative.

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

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

Diesel standard obtained from local Chevron station. Diesel is sold commercially as diesel fuel #2.

Kerosene standard obtained from Post Jeff Chevron/Mobil Products. It 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.

Motor oil standard obtained from 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.

Results are reported on the attached data sheets.

(DC1-CN5449)



TOTAL PETROLEUM HYDROCARBONS

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

Project Name: Market Place

Project Number: 59805

Sample Description: Trip Blank

Lab Project-ID Number: 5449-001

Sample Number: 182865, 182866

Date Sampled: 01/17/92

Date Received: 01/18/92

Date Extracted: 01/20/92

Date Analyzed: 01/26/92

Batch Number: 920120-1902

PETROLEUM HYDROCARBONS

CONCENTRATION
mg/L (ppm)

REPORTING LIMIT
mg/L (ppm)

| | | |
|------------------------------|-----|-----|
| Gasoline Range | BRL | 6.2 |
| Jet Fuel/Kerosene Range | BRL | 6.2 |
| Diesel Range | BRL | 6.2 |
| Motor Oil Range | BRL | 6.2 |
| Total Petroleum Hydrocarbons | BRL | 6.2 |

Dilution: None

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.

Due to insufficient sample volume supplied to the laboratory, the established reporting limits were elevated by the ratio of standard volume, 1000 mL, to that of the laboratory provided volume, 80 mL.

Approved By: Cheryl Matterson Date: 1/28/92
Cheryl Matterson, Associate Chemist

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

110691



TOTAL PETROLEUM HYDROCARBONS

Analytical Method: Modified EPA 8015 {a}

Preparation Method: EPA 3510

Project Name: Market Place

Project Number: 59805

Sample Description: MW-19

Lab Project-ID Number: 5449-002

Sample Number: 182867

Date Sampled: 01/17/92

Date Received: 01/18/92

Date Extracted: 01/20/92

Date Analyzed: 01/26/92

Batch Number: 920120-1902

| <u>PETROLEUM HYDROCARBONS</u> | <u>CONCENTRATION</u> mg/L (ppm) | <u>REPORTING LIMIT</u> mg/L (ppm) |
|-------------------------------|------------------------------------|--------------------------------------|
| Gasoline Range | BRL | 10. |
| Jet Fuel/Kerosene Range | BRL | 10. |
| Diesel Range | BRL | 10. |
| Motor Oil Range | 29. | 10. |
| Total Petroleum Hydrocarbons | 29. | 10. |

Dilution: The sample was diluted 20 fold to bring target analytes within linear working range.

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.

Approved By: Cheryl Matterson, Associate Chemist Date: 1/28/92

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

110691



TOTAL PETROLEUM HYDROCARBONS

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

Project Name: Market Place

Project Number: 59805

Sample Description: MW-24

Lab Project-ID Number: 5449-003

Sample Number: 182869

Date Sampled: 01/17/92

Date Received: 01/18/92

Date Extracted: 01/20/92

Date Analyzed: 01/26/92

Batch Number: 920120-1902

PETROLEUM HYDROCARBONS

CONCENTRATION
mg/L (ppm)

REPORTING LIMIT
mg/L (ppm)

| | | |
|------------------------------|-----|------|
| Gasoline Range | BRL | 0.50 |
| Jet Fuel/Kerosene Range | BRL | 0.50 |
| Diesel Range | BRL | 0.50 |
| Motor Oil Range | BRL | 0.50 |
| Total Petroleum Hydrocarbons | BRL | 0.50 |

Dilution: None

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.

Approved By: Cheryl Matterson Date: 1/28/92
Cheryl Matterson, Associate Chemist

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

110691



TOTAL PETROLEUM HYDROCARBONS

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

Project Name: Market Place

Project Number: 59805

Sample Description: MW-20

Lab Project-ID Number: 5449-004

Sample Number: 182871

Date Sampled: 01/17/92

Date Received: 01/18/92

Date Extracted: 01/20/92

Date Analyzed: 01/26/92

Batch Number: 920120-1902

PETROLEUM HYDROCARBONS

CONCENTRATION
mg/L (ppm)

REPORTING LIMIT
mg/L (ppm)

| | | |
|------------------------------|-----|------|
| Gasoline Range | BRL | 0.50 |
| Jet Fuel/Kerosene Range | BRL | 0.50 |
| Diesel Range | BRL | 0.50 |
| Motor Oil Range | BRL | 0.50 |
| Total Petroleum Hydrocarbons | BRL | 0.50 |

Dilution: None

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.

Approved By: Cheryl Matterson, Associate Chemist

Date: 1/28/92

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



110691