McLaren Hart

90 OCT 18 AM 11:38

October 17, 1990

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, EMERY BAY MARKETPLACE, EMERYVILLE, CALIFORNIA

Attached is the letter report "Quarterly Groundwater Monitoring Report, Emery Bay Marketplace, Emeryville, California," October 3, 1990. The report summarizes the quarterly groundwater monitoring activities performed at the Emery Bay Marketplace property during the months of July, August and September 1990 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,

Julie S. Menack

Julie S. Menack, RG #4440
Senior Hydrogeologist

cc: Walter Kaczmarek

1017RN1

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1135 Atlantic Avenue, Alameda, CA 94501 (415) 521-5200 FAX (415) 521-1547

QUARTERLY GROUNDWATER MONITORING REPORT EMERY BAY MARKETPLACE EMERYVILLE, CALIFORNIA

October 3, 1990

McLaren Hart

McLaren Hart

October 3, 1990

Mr. Walter Kaczmarek
Christie Avenue Partners-JS
6475 Christie Avenue, Suite 500
Emeryville, California 94608

Dear Mr. Kaczmarek:

QUARTERLY GROUNDWATER MONITORING REPORT, EMERY BAY MARKETPLACE, EMERYVILLE, CALIFORNIA

This letter report documents the results of the quarterly monitoring activities conducted at the Emery Bay Marketplace property during the month of July 1990 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 Workplan was submitted to address recommendations made in the report "Groundwater Characterization, Emery Bay Marketplace," June 19, 1990 (Groundwater Characterization Report).

The following activities were proposed in the Work Plan:

- Obtain groundwater elevation measurements at all monitoring wells on a quarterly basis (July and October 1990; January and April 1991) and prepare groundwater elevation maps;

- Sample groundwater from six downgradient wells (Wells W-7, W-13, W-14, W-19, W-20, and W-24) on a quarterly basis (July and October 1990; January and April 1991) to verify that petroleum hydrocarbons in groundwater are confined to the Marketplace property and have not migrated off-site. Analyze samples for total petroleum hydrocarbons as diesel (TPH/D)and motor oil (TPH/MO) by modified EPA Method 8015;

- Remove free product from Well W-5 on a bi-weekly basis for four months and on a monthly basis for eight months;

- Abandon Well W-10 which cannot be used for sampling because recharge is inadequate.

1135 Atlantic Avenue, Alameda, CA 94501 (415) 521-5200 FAX (415) 521-1547

This letter presents the results of the depth to groundwater measurements and the groundwater quality sampling and analyses performed during the month of July 1990. The activities associated with the free product removal from Well W-5 also are summarized. Well W-10 is scheduled to be abandoned during the month of October 1990.

GROUNDWATER ELEVATIONS

Depths to groundwater in all existing wells at the Emery Bay Marketplace property were measured during a 24-hour period on July 25 and 26, 1990. Depth to groundwater at Well W-8 was measured on July 27, 1990 because the well was inaccessible on July 25 and 26, 1990. Hydrologic data sheets for all measurements are provided in Attachment A. A summary of historical depth to groundwater measurements, monitoring well surface casing elevations, and calculated groundwater surface elevations are presented in Table 1.

Wells W-16 and W-23 were found to be under pressure when depths to groundwater were measured on July 25, 1990. When the groundwater elevations for these two wells were compared to historical measurements, it appeared that the July 25 water levels were not at static equilibrium. The depths to groundwater in Wells W-16 and W-23 were remeasured on July 27 after the water levels were allowed to reach static equilibrium. The water level in Well W-16 had risen 0.49 feet and the water level in Well W-23 had risen 2.35 feet since the first measurements were made. The July 27 measurements are considered to be representative of static conditions and are presented in Table 1.

The July 25 through 27 groundwater surface elevation contours for the artificial fill are presented in Figure 1. Groundwater elevations from wells completed only in the native material which underlies the artificial fill (Wells W-15, W-16, and W-22), were not used to construct the map because it was determined in the Groundwater Characterization Report that confined or semi-confined conditions may exist in the native material. The groundwater elevations observed in July for wells completed in the native material are consistent with previous measurements and support this conclusion (Table 1).

The groundwater flow map for the artificial fill (Figure 1) is consistent with the groundwater flow maps presented in the Groundwater Characterization Report and shows that groundwater flow is toward the west-southwest. As suggested in the Groundwater Characterization Report, local variations in groundwater flow near Wells W-4 and W-8 may be caused

by a slurry wall installed to a depth of 35 feet on the adjacent upgradient property.

The water level in Well W-7 is significantly higher than in adjacent wells. This elevated water level has consistently been observed at Well W-7 and it was suggested in the Groundwater Characterization Report that perched groundwater conditions may occur at this location. Therefore, the water level from Well W-7 was not included in the preparation of the groundwater elevation map.

GROUNDWATER QUALITY SAMPLING AND ANALYTICAL RESULTS

Groundwater samples were collected on July 27 and July 30, 1990 from the six wells on the downgradient side of the property (W-7, W-13, W-14, W-19, W-20 and W-24) to verify the conclusion of the Groundwater Characterization Report that total petroleum hydrocarbons (TPH) are confined to the Marketplace property and have not migrated off-site. TPH/D and TPH/MO previously have been detected in groundwater from Wells W-7 and W-19 which are the most downgradient occurrences of TPH in groundwater at the Marketplace property. TPH has not been detected in Wells W-13, W-14, W-20 and W-24.

The groundwater samples were analyzed for TPH/D and TPH/MO by Modified EPA Method 8015. Groundwater samples were sent under chain-of-custody to McLaren/Hart Analytical Laboratory (MAL) in Rancho Cordova, California. One travel blank was sent on each day of sampling as a Quality Assurance (QA) sample. The analytical laboratory data sheets, QA laboratory results, chain-of-custody records, and sampling data sheets are included in Appendix B. The analytical results are summarized and presented with the historical analytical data in Table 2.

The analyses of the groundwater samples show the following results:

- TPH/D was detected in groundwater from Well W-7 at 2600 parts per billion (ppb) and TPH/MO was detected at 2000 ppb. Both constituents previously have been detected at similar concentrations.

- TPH/D was not detected in groundwater from Well W-19 but TPH/MO was detected at 8000 ppb. Groundwater from this well has not been previously analyzed for TPH/MO. TPH/D has been previously detected at low levels (400 ppb to 1100 ppb), which are at or below the detection limit of 1000 ppb in the July 1990 analysis.

- TPH/D and TPH/MO were not detected in groundwater samples from downgradient Wells W-13, W-14, W-20 and W-24. These constituents previously have not been detected in groundwater from these four wells.

The results from the July 1990 sampling event confirm the conclusion from the Groundwater Characterization Report that petroleum hydrocarbons do not occur downgradient of Wells W-7 and W-19.

FREE PRODUCT REMOVAL FROM WELL W-5

Free product has been removed from Well W-5 on five occasions since July 25, 1990. In the Groundwater Characterization Report, it was recommended that free product be removed from Well W-5 on a weekly basis. However, the schedule was changed to biweekly to allow adequate time for product to enter the well.

The free product thickness is measured with an oil-water prior to removal. Product is then removed with a disposable bailer or a peristaltic pump. The product thickness, both before and after product removal, and an estimate of the volume of fluid removed is recorded in Table 3. It should be noted that the volume of fluid removed includes water.

When free product was removed from Well W-5 on July 25, 1990, the product thickness was 2.12 feet prior to removal. During the four subsequent occasions when product was removed, the thickness was 1.16 to 1.24 feet prior to product removal, (Table 3) and appears to have stabilized.

CONCLUSIONS

In summary, the results from the July 1990 quarterly monitoring activities conducted at the Emery Bay Marketplace property are as follows:

- The July 1990 groundwater flow map for the artificial fill (Figure 1) is consistent with groundwater flow maps presented in the Groundwater Characterization Report and shows that groundwater flow is toward the west-southwest.

- The July 1990 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.

- Free product thickness in Well W-5 decreased after product was removed from the well the first time, and appears to have stabilized at 1.16 to 1.24 feet.

If you have any questions regarding this report, please do not hesitate to call.

Sincerely,

Gary R. Foote for

Julie S. Menack, RG #4440
Senior Hydrogeologist

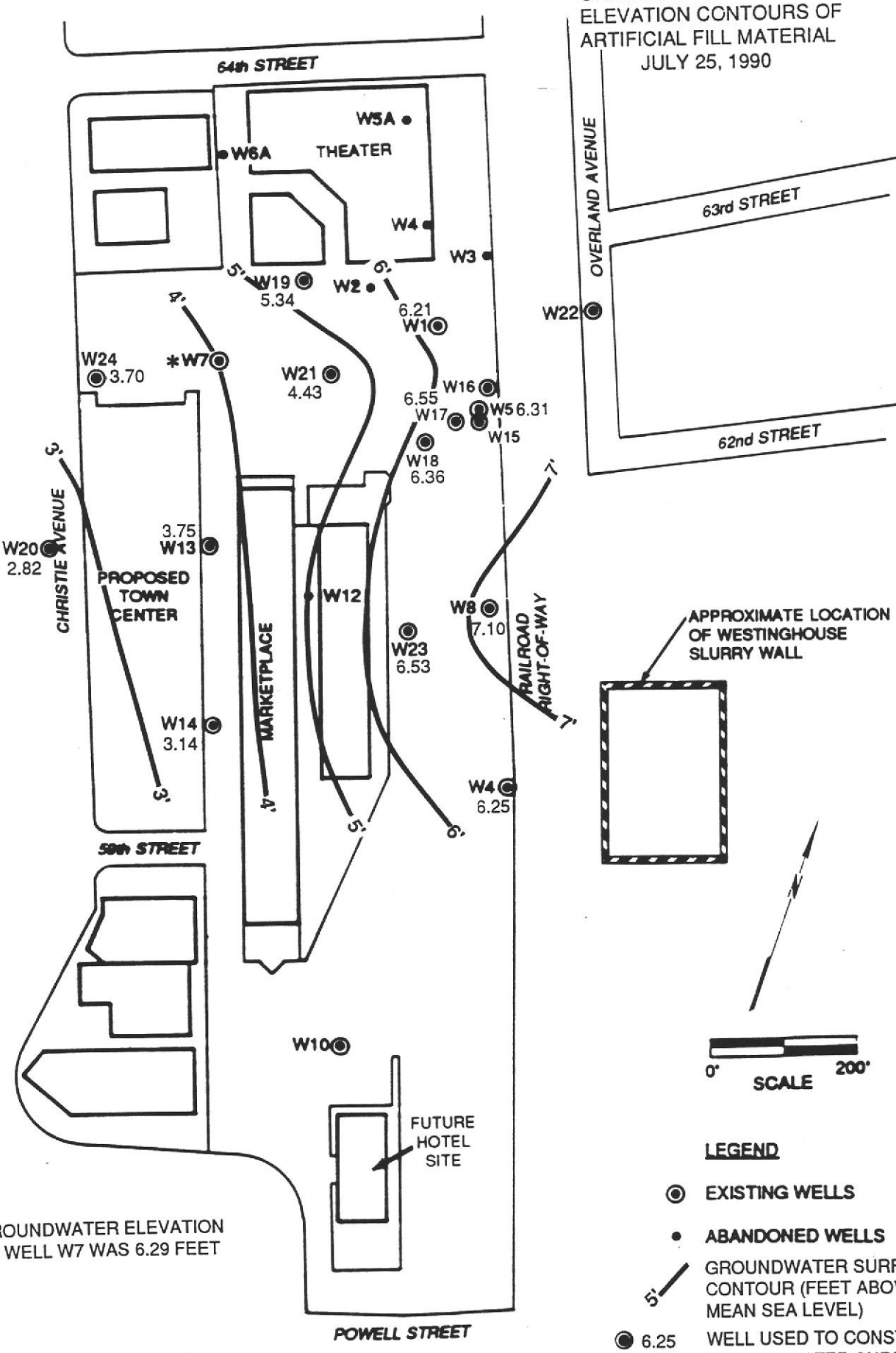
Gary R Foote

Gary R. Foote
Senior Geologist

0730RN1

McLaren Hart

FIGURE 1
GROUNDWATER SURFACE ELEVATION CONTOURS OF ARTIFICIAL FILL MATERIAL
JULY 25, 1990



* GROUNDWATER ELEVATION AT WELL W7 WAS 6.29 FEET

LEGEND

- ◉ **EXISTING WELLS**
- • **ABANDONED WELLS**
- 5' GROUNDWATER SURFACE CONTOUR (FEET ABOVE MEAN SEA LEVEL)
- ◉ 6.25 WELL USED TO CONSTRUCT GROUNDWATER SURFACE CONTOUR

McLaren

TABLE 1

GROUNDWATER DEPTHS AND ELEVATIONS
EMERY BAY MARKETPLACE SITE

Well Number	Top of Casing (Feet)	Date	Depth to Groundwater (feet)	Groundwater Elevation (Feet)
W-1[a]	11.47	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
W-4	9.96	1-18-82	2.55	7.95[b]
		3-27/28-85	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
		7-25-90	3.71	6.25
W-5	11.41	1-18-82	2.50	9.65[b]
		3-27/28-85	c	9.26
		10-11-89	4.43	6.98
		2-22-90	3.80	7.61
		2-28-90	4.43	6.98
		4-9-90	4.73	6.68
		6-7-90	4.30	7.11
		7-25-90	5.10	6.31
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
W-8	10.43	5-6-87	5.5	6.88[b]
		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
W-10[e]	7.14	1-18-82	2.50	5.06[b]
		3-27/28-85	c	4.96
		8-20-89	3.58	3.56
		10-11-89	3.67	3.47
		2-22-90	2.38	4.76
		2-28-90	2.28	4.86
		6-7-90	3.14	4.00
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
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

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)
W-15	11.53	8-20-89	3.43	8.10
		10-11-89	4.26	7.27
		2-22-90	2.58	8.95
		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
W-16	10.94	10-11-89	4.81	6.13
		2-22-90	3.92	7.02
		2-28-90	3.88	7.06
		4-9-90	7.81	3.13
		6-7-90	6.19	4.75
		7-27-90[f]	4.44	6.50
W-17	12.14	10-11-89	9.12	3.02
		2-22-90	5.42	6.72
		2-28-90	5.35	6.79
		4-9-90	5.72	6.42
		6-7-90	---[g]	---
		7-26-90	5.59	6.55
W-18	11.34	10-11-89	5.52	5.82
		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
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
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
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
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
W-23	9.16	4-9-90	1.51	7.65
		6-7-90	1.78	7.38
		7-27-90[f]	2.63	6.53
W-24	8.72	6-7-90	4.75	3.97
		7-25-90	5.02	3.70

a Nielson Property
b Groundwater elevation taken from earlier reports; may not agree with calculated elevation using current top of casing.
c Depth to groundwater measurement 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 Well W-10 was not sounded on 7-25-90 because asphaltic material was present in the well.
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.

TABLE 2

HYDROCARBONS IN GROUNDWATER
EMERY BAY MARKETPLACE SITE

Well Number	Sample Date	TPH/D Concentration (ppb)	TPH/MO Concentration (ppb)
W-1	4-14-87	<5000[a,b]	---[c]
	2-28-90	<500	---
	4-11-90	<100	570
W-2[d]	4-15-87	<1000[b]	---
W-3[d]		---	---
W-4[d]	4-14-87	<5000[b]	---
W-4	3-01-90	<500	---
	4-10-90	<100	<250
W-5[e]	9-27-89	20,000	---
B-5[d]		---	---
W-5A[d]	4-16-87	<1000[f]	<1000[f]
W-6[d]	4-16-87	<1000[f]	<1000[f]
W-7	9-26-89	1,100	---
	2-28-90	<500[g]	---
	4-11-90	5,600	7,500
	7-30-90	2,600	2,000
W-8	4-17-87	10,000[h]	---
	9-26-89	7,100	---
	3-01-90	4,500	---
	4-18-90	5,300	---
W-10[i]		---	---
W-13	2-28-90	<500	---
	4-12-90	<500	---
	7-27-90	<500	<1000
W-14	2-28-90	<500	---
	4-11-90	<100	<250
	7-30-90	<600	<1000
W-15	9-25-89	1,200	---
	4-13-90	1,500	---
W-16	9-27-89	4,700	---
	2-28-90	22,000	---
	4-13-90	9,000	---
W-17	9-25-89	700	---
	4-13-90	1,600	---
W-18	9-26-89	3,100	---
	4-13-90	5,100	---
W-19	4-12-90	1,100	---
	4-16-90	<500[j]	---
	7-27-90	<1000	8,000
W-20	4-12-90	<500	---
	4-16-90	<500	---
	7-30-90	<500	<1000

TABLE 2
(Continued)

HYDROCARBONS IN GROUNDWATER
EMERY BAY MARKETPLACE SITE

Number Well	Sample Date	TPH/D Concentration (ppb)	TPH/MO Concentration (ppb)
W-21	4-12-90	1,400	---
	4-18-90	1,700	---
W-22	4-12-90	<500	---
	4-18-90	<500	---
W-23	4-12-90	2,000	---
	4-18-90	3,600	---
W-24	6-7-90	<500	---
	7-27-90	<500	<1000

a < indicates constituent not detected above this level.
b Oil and grease also not detected above 5000 ppb in Wells W-1, W-2 and W-4 (Nielson)
c --- indicates no analysis made for constituent.
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 1000 ppb in wells W-5A and W-6.
g Review of gas chromatograph indicated TPH/D present at 300 ppb in Well W-7 on 2-28-90.
h Semiquantified results include gasoline, diesel, and some oil and grease in well W-8.
i Well W-10 could not be sampled in 1989 and 1990 due to presence of asphaltic materials in the well.
j Review of gas chromatograph indicated TPH/D present at 400 ppb in Well W-19 on 4-16-90.

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TABLE 3
PRODUCT THICKNESS DATA FOR WELL W-5
EMERY BAY MARKETPLACE SITE

Date	Before Product Removal			After Product Removal			Volume Removed (Gal.)
	Depth to Oil	Depth to Water	Product Thickness	Depth to Oil	Depth to Water	Product Thickness	
7/25/90	2.98	5.10	2.12	*	*	*	0.72**
8/8/90	3.56	4.72	1.16	4.43	4.47	0.04	0.96**
8/24/90	3.56	4.80	1.24	4.94	4.94	0.00	0.50
9/7/90	3.62	4.83	1.21	4.58	4.79	0.21	0.33**
9/21/90	3.72	4.93	1.21	4.44	4.54	0.10	0.40**

*Product thickness not measured after product was removed on 7/25/90.
**Product removed with a bailer. The estimated volume removed includes an undetermined amount of water.

ATTACHMENT A

HYDROLOGIC DATA SHEETS

McLaren

HYDRODATA

DATE: 7-25-90

PROJECT: Marketplace EVENT: Sounding SAMPLER: CMS

NO.	WELL OR LOCATION	DATE MO	DA	YR	TIME HR	MIN	MEASUREMENT	CODE	COMMENTS
1	W1	7	25	90	11	25	5.26	SWL	
2	W4				10	02	3.71	SWL	
3	W5				9	50	2.98	OIL	5.1 OWI
4	W7				11	05	2.76	SWL	NO CAP
5	W8						→		CAR PARKED OVER
6	W10				8	15	→		TARMAT AT 7'
7	W13				11	57	4.40	SWL	
8	W14				12	55	4.83	SWL	
9	W15				9	05	4.00	SWL	
10	W16				10	15	4.93	SWL	WELL UNDER PRESSURE
11	W17						→		CAR PARKED OVER
12	W18				10	30	4.98	SWL	AT 15:45 | 4.97
13	W19				11	15	4.93	SWL	
14	W20				10	50	4.00	SWL	
15	W21				11	16	5.05	SWL	
16	W22				11	35	7.49	SWL	
17	W23				10	40	4.98	SWL	WELL UNDER PRESSURE
18	W24		↓		11	00	5.02	SWL	
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.
[2]Negative pressure (Vacuum) psi = approx -(1/2 x mmHg)

McLaren

HYDRODATA

DATE: 7-26-90

PROJECT: Marketplace EVENT: Sounding SAMPLER: CMS

NO.	WELL OR LOCATION	DATE MO	DA	YR	TIME HR	MIN	MEASUREMENT	CODE	COMMENTS
1									
2	W-8	7	26	90	8	20	~~5.59~~	SWL	still car parked over well
3									
4	W-17	7	26	90	8	17	5.59	SWL	
5									
6	W-7	7	26	90	8	00	2.85	SWL	AS calibration
7									
8									
9									
10									
11									
12									
13									
14									
15									
16									
17									
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.
[2]Negative pressure (Vacuum) psi = approx -(1/2 x mmHg)

McLaren

HYDRODATA

DATE: 7-27-90

PROJECT: Marketplace EVENT: Sounding SAMPLER: CMS

NO.	WELL OR LOCATION	DATE MO	DA	YR	TIME HR	MIN	MEASUREMENT	CODE	COMMENTS
1									
2	W-8	7	27	90	10	07	3.33	SWL	NO CAP
3									
4	W-16				10	10	4.44	SWL	Product in well
5									
6	W-23				10	20	3.36	SWL	under pressure
7	W-23				13	34	2.63	SWL	after 3 hours
8	W-7				13	40	2.98	SWL	as calibration
9									
10									
11									
12									
13									
14									
15									
16									
17									
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.

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

ATTACHMENT B

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

McLaren

RECEIVED
AUG
McLAREN

Date: August 10, 1990
LP #: 3310

Gary Foote
McLaren/Hart
1135 Atlantic Avenue
Alameda, CA 94501

Dear Mr. Foote:

Enclosed are the laboratory results for the five sample(s) submitted by you to the McLaren Analytical Laboratory on July 30, 1990, for the project *Marketplace*.

The analyses you requested are:

Mod. EPA 8015 (Plus Motor Oil) (4 - Water)

The report consists of the following sections:

1. A copy of the chain of custody
2. Sample description (chain of custody summary form)
3. Quality Control Report
4. Comments
5. Analytical results
6. 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,

Anthony S. Wong, Ph.D.
Laboratory Director

Shakoora S. Azimi
Quality Assurance Officer

11101 White Rock Road, Rancho Cordova, CA 95670 916.638.3696 FAX 916.638.2842

McLaren

CHAIN OF CUSTODY RECORD

FOR LABORATORY USE ONLY
Laboratory Project No.: 3310
Storage Refrigerator ID: 4-10
Storage Freezer ID:
Secured: Yes ✓ No

Project Name: Marketplace Project #: 59804 Sampler: Colette Shelly (Printed Name) colette shelly (Signature)

		Date	Time
Relinquished by: (Signature and Printed Name)	colette shelly colette shelly Fax		
Received by: (Signature and Printed Name)			
Relinquished by: (Signature and Printed Name)	Fax	Date: 7/28/90	Time: 9:00
Received by: (Signature and Printed Name)		Date: 7-30-90	Time: 10:15
Relinquished by: (Signature and Printed Name)		Date:	Time:
Received by: (Signature and Printed Name)	Logged in By: Brian J. Clar		

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

Method of Shipment: Fed EX

Shipment ID:

Circle or Add Analysis(es) Requested

a) Identify specific metals requested under Special Instructions

Sample ID Number	Sample Description: Date	Time	Description	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/MS)	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/Perchlorate	Chloride/pH	TDS/Percent Solid	Specific Conductivity (EC)	+/-MTBE (DI)	TAT	Container(s) #	Container(s) Type	FOR LABORATORY USE ONLY Lab ID
1	147402-03	7-27-90	11:25	Wash									✓						✓			4	2	A	3310-001
2	147404-VB		10:00	Trip Blank									✓						✓			4	2	A	-002 BD B/D
* 3	147406-07		13:05	W-14									✓						✓			4	2	A	-003 004
4	147408-09		12:45	W-19									✓						✓			4	2	A	B/D 004 003
** 5	147410-11	✓	13:27	W-24									✓						✓			4	2	A	B/D 005 004
6																									
7																									
8																									
9																									
10																									

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

Special Instructions/Comments:

Sample Archive/Disposal:
☐ Laboratory Standard
☐ Other

SEND DOCUMENTATION AND RESULTS TO (Check one):
☒ Project Manager/Office: Gary Foote
☐ Client Name:
Company: McLaren-Hart
Address: 1125 Atlantic Ave, Alameda
Phone: (415) 521-5200 Fax:

FOR LABORATORY USE ONLY. Sample Condition Upon Receipt:
* Sample 147406-07 arrived broken rec'd 7/28/90
** sample 147410 had a broken cap.

McLaren Analytical Laboratory
11101 White Rock Road
Rancho Cordova, CA 95670
(916) 638-3696

Client: Gary Foote
McLaren
Alameda, CA 94501

L.P. #:	3310	Project Name:	Market Place
Date Rec'd:	7/28/90	Project #:	59804
Date Due:	8/13/90	Phone:	415-521-5200

A total of 5 samples were received on 7/28/90 at 9:00 under chain of custody number(s) 220652. The chain of custody form(s) agree(s) with the sample container(s). The analysis(es) requested for the sample(s) received included:

- 5 sample(s) for 8015 and motor oil analysis.

Correction(s) made and/or Problem(s): Samples 142406-07 arrived broken 7/28/90. Sample 14710 had a broken cap.

McLaren

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 10% 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. McLaren Analytical Laboratory reanalyzes samples if the precision or accuracy is out of acceptance control limits.

QUALITY CONTROL REPORT

Method: Mod. EPA 8015
Units: ug/ml (ppm)

Date Analyzed: 08/03/90
Date Extracted: 07/31/90
Batch Number: 90731-0302

METHOD BLANK

Compounds	Reporting Limits	Results of the MB
Gasoline Range	0.5	BRL
Jet Fuel/Kerosene Range	0.5	BRL
Diesel Range	0.5	BRL

LABORATORY CONTROL SPIKE

Compounds	Concentration Spiked	Concentration Measured	Accuracy % Recovery	Precision RPD	Acceptance Limits[a] % Recovery	Acceptance Limits[a] RPD
Diesel Range	2.5	1.8	71	25	43 - 152	<25

[a] Acceptance limits were obtained statistically from McLaren quality control data.

COMMENTS

The samples in this project were analyzed by the methods requested on the chain of custody with no deviations in procedure.

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

ANALYTICAL RESULTS

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. Results are corrected for concentrations of analytes which may be found in the blanks.

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

Results are on the attached data sheets.

TOTAL PETROLEUM HYDROCARBONS

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

Project Name:	Marketplace	Project Number:	59804
Sample Description:	W-13	Lab Project-ID Number:	3310-001
Sample Number:	147402-03	Date Sampled:	07/27/90
Date Received:	07/28/90	Date Extracted:	07/31/90
Date Analyzed:	08/03/90	Batch Number:	900731-0302

PETROLEUM HYDROCARBONS	CONCENTRATION ug/ml (ppm)	REPORTING LIMIT ug/ml (ppm)
Gasoline Range	BRL	0.5
Jet Fuel/Kerosene Range (b)	BRL	0.5
Diesel Range	BRL	0.5
Motor Oil	BRL	1.
Total Petroleum Hydrocarbons	BRL	1.

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.

(b) 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.

Approved By: C. Fong Date: 8/13/90.

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

McLaren

TOTAL PETROLEUM HYDROCARBONS

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

Project Name:	Marketplace	Project Number:	59804
Sample Description:	Trip Blank	Lab Project-ID Number:	3310-002
Sample Number:	147404-05	Date Sampled:	07/27/90
Date Received:	07/28/90	Date Extracted:	07/31/90
Date Analyzed:	08/03/90	Batch Number:	900731-0302

PETROLEUM HYDROCARBONS	CONCENTRATION ug/ml (ppm)	REPORTING LIMIT ug/ml (ppm)
Gasoline Range	BRL	0.5
Jet Fuel/Kerosene Range (b)	BRL	0.5
Diesel Range	BRL	0.5
Motor Oil	BRL	1.
Total Petroleum Hydrocarbons	BRL	1.

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.

(b) 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.

Approved By: C. Fong Date: 8/13/90.

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

McLaren

TOTAL PETROLEUM HYDROCARBONS

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

Project Name:	Marketplace	Project Number:	59804
Sample Description:	W-19 (c)	Lab Project-ID Number:	3310-003
Sample Number:	147408-09	Date Sampled:	07/27/90
Date Received:	07/28/90	Date Extracted:	07/31/90
Date Analyzed:	08/03/90	Batch Number:	900731-0302

PETROLEUM HYDROCARBONS	CONCENTRATION ug/ml (ppm)	REPORTING LIMIT ug/ml (ppm)
Gasoline Range	BRL	1.
Jet Fuel/Kerosene Range (b)	BRL	1.
Diesel Range	BRL	1.
Motor Oil	8.	2.
Total Petroleum Hydrocarbons	8.	2.

Dilution: 1:2

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) 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.

Quantitation for motor oil based on a cutting oil standard.

(c) Revised 08/20/90.

Approved By: _____ Date: 8/20/90.
C. Fong

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

McLaren Hart

TOTAL PETROLEUM HYDROCARBONS

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

Project Name: Marketplace

Project Number: 59804

Sample Description: W-24

Lab Project-ID Number: 3310-004

Sample Number: 147410-11

Date Sampled: 07/27/90

Date Received: 07/28/90

Date Extracted: 07/31/90

Date Analyzed: 08/03/90

Batch Number: 900731-0302

PETROLEUM HYDROCARBONS	CONCENTRATION ug/ml (ppm)	REPORTING LIMIT ug/ml (ppm)
Gasoline Range	BRL	0.5
Jet Fuel/Kerosene Range (b)	BRL	0.5
Diesel Range	BRL	0.5
Motor Oil	BRL	1.
Total Petroleum Hydrocarbons	BRL	1.

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.

(b) 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.

Approved By: C. Fong Date: 8/13/90.

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

McLaren

Date: August 13, 1990
LP #: 3319

Gary Foote
McLaren/Hart
1135 Atlantic Avenue
Alameda, CA 94501

Dear Mr. Foote:

Enclosed are the laboratory results for the four sample(s) submitted by you to the McLaren Analytical Laboratory on August 1, 1990, for the project *Marketplace*.

The analyses you requested are:

Mod. EPA 8015 (Plus Motor Oil) (4 - Water)

The report consists of the following sections:

1. A copy of the chain of custody
2. Sample description (chain of custody summary form)
3. Quality Control Report
4. Comments
5. Analytical results
6. 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,

Anthony S. Wong, Ph.D.
Laboratory Director

Shakoora S. Azimi
Quality Assurance Officer

11101 White Rock Road, Rancho Cordova, CA 95670 916.638.3696 FAX 916.638.2842

CHAIN OF CUSTODY RECORD

FOR LABORATORY USE ONLY
Laboratory Project No.: 3319
Storage Refrigerator ID: 4-10
Storage Freezer ID:
Secured: Yes ✓ No

Project Name: Marketplace Project #: 59804 Sampler: Colette Shelly (Printed Name) colette shelly (Signature)

Relinquished by: (Signature and Printed Name) colette shelly	Received by: (Signature and Printed Name) fed-x	Date:	Time:
Relinquished by: (Signature and Printed Name) fed-x	Received by: (Signature and Printed Name)	Date:	Time:
Relinquished by: (Signature and Printed Name)	Received by: (Signature and Printed Name) BRIAN O'CONNOR	Date: 8-1-90	Time: 11:35
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 EX
Shipment ID:

Circle or Add Analysis(es) Requested

a) Identify specific metals requested under Special Instructions

Sample ID Number	Sample Description: Date	Time	Description	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/MS)	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/Perchlorate	Chloride/pH	TDS/Percent Solid	Specific Conductivity (EC)	+ Motor Oil	TAT	Container(s) #	Container(s) Type	FOR LABORATORY USE ONLY Lab ID
1	A7795	7-30	1:00	Trip Blank										✓					✓			4	2	A	3319-001
2	A7791-92	|	11:15	W-20										✓					✓			4	2	A	002
3	A7795-96	↓	12:05	W-7										✓					✓			4	2	A	003
4	A7797-98	↓	10:10	W-14										✓					✓			4	2	A	004
5																									
6																									
7																									
8																									
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

FOR LABORATORY USE ONLY. Sample Condition Upon Receipt:
SAMPLES RECEIVED IN GOOD CONDITION

SEND DOCUMENTATION AND RESULTS TO (Check one):
☒ Project Manager/Office: Gary Foote
☐ Client Name:
Company: McLaren-Hart
Address: 1135 Atlantic Ave. Alameda
Phone: 415 521-5200 Fax:

McLaren Analytical Laboratory
11101 White Rock Road
Rancho Cordova, CA 95670
(916) 638-3696

Client: Gary Foote
McLaren
Alameda, CA 94501

L.P. #:	3319	Project Name:	Market Place
Date Rec'd:	8/1/90	Project #:	59804
Date Due:	8/15/90	Phone:	415-521-5200

A total of 4 samples were received on 8/1/90 at 11:35 under chain of custody number(s) 220903. The chain of custody form(s) agree(s) with the sample container(s). The analysis(es) requested for the sample(s) received included:

- 4 sample(s) for 8015 modified + motor oil analysis.

Correction(s) made and/or Problem(s): None

McLaren

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 10% 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. McLaren Analytical Laboratory reanalyzes samples if the precision or accuracy is out of acceptance control limits.

QUALITY CONTROL REPORT

Method: Mod. EPA 8015
Units: ug/ml (ppm)

Date Analyzed: 08/03/90
Date Extracted: 08/02/90
Batch Number: 900802-0302

METHOD BLANK

Compounds	Reporting Limits	Results of the MB
Gasoline Range	0.5	BRL
Jet Fuel/Kerosene Range	0.5	BRL
Diesel Range	0.5	BRL

LABORATORY CONTROL SPIKE

Compounds	Concentration Spiked	Concentration Measured	Accuracy % Recovery	Precision RPD	Acceptance Limits[a] % Recovery	Acceptance Limits[a] RPD
Diesel Range	2.5	2.1	85	1	43 - 152	<25

[a] Acceptance limits were obtained statistically from McLaren quality control data.

COMMENTS

The samples in this project were analyzed by the methods requested on the chain of custody with no deviations in procedure.

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

ANALYTICAL RESULTS

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. Results are corrected for concentrations of analytes which may be found in the blanks.

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

Results are on the attached data sheets.

TOTAL PETROLEUM HYDROCARBONS

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

Project Name:	Marketplace	Project Number:	59804
Sample Description:	Trip Blank	Lab Project-ID Number:	3319-001
Sample Number:	147793	Date Sampled:	07/30/90
Date Received:	08/01/90	Date Extracted:	08/02/90
Date Analyzed:	08/06/90	Batch Number:	900802-0302

PETROLEUM HYDROCARBONS	CONCENTRATION ug/ml (ppm)	REPORTING LIMIT ug/ml (ppm)
Gasoline Range	BRL	0.5
Jet Fuel/Kerosene Range (b)	BRL	0.5
Diesel Range	BRL	0.5
Motor Oil	BRL	1.
Total Petroleum Hydrocarbons	BRL	1.

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.

(b) 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.

Approved By: _____ Date: 8/13/90
C. Fong

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

McLaren

TOTAL PETROLEUM HYDROCARBONS

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

Project Name:	Marketplace	Project Number:	59804
Sample Description:	W-20	Lab Project-ID Number:	3319-002
Sample Number:	147791	Date Sampled:	07/30/90
Date Received:	08/01/90	Date Extracted:	08/02/90
Date Analyzed:	08/04/90	Batch Number:	900802-0302

PETROLEUM HYDROCARBONS	CONCENTRATION ug/ml (ppm)	REPORTING LIMIT ug/ml (ppm)
Gasoline Range	BRL	0.5
Jet Fuel/Kerosene Range (b)	BRL	0.5
Diesel Range	BRL	0.5
Motor Oil	BRL	1.
Total Petroleum Hydrocarbons	BRL	1.

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.

(b) 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.

Approved By: C. Fong Date: 8/13/90

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

McLaren

TOTAL PETROLEUM HYDROCARBONS

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

Project Name: Marketplace

Project Number: 59804

Sample Description: W-7

Lab Project-ID Number: 3319-003

Sample Number: 147795

Date Sampled: 07/30/90

Date Received: 08/01/90

Date Extracted: 08/02/90

Date Analyzed: 08/04/90

Batch Number: 900802-0302

PETROLEUM HYDROCARBONS	CONCENTRATION ug/ml (ppm)	REPORTING LIMIT ug/ml (ppm)
Gasoline Range	BRL	0.5
Jet Fuel/Kerosene Range (b)	BRL	0.5
Diesel Range	2.6	0.5
Motor Oil	2.	1.
Total Petroleum Hydrocarbons	4.6	1.

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.

(b) 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.

Quantitation for motor oil was based on a cutting oil standard since motor oil and cutting oil have similar hydrocarbon chains.

Approved By: C. Fong Date: 8/13/90

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

McLaren

TOTAL PETROLEUM HYDROCARBONS

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

Project Name:	Marketplace	Project Number:	59804
Sample Description:	W-14	Lab Project-ID Number:	3319-004
Sample Number:	147797	Date Sampled:	07/30/90
Date Received:	08/01/90	Date Extracted:	08/02/90
Date Analyzed:	08/04/90	Batch Number:	900802-0302

PETROLEUM HYDROCARBONS	CONCENTRATION ug/ml (ppm)	REPORTING LIMIT ug/ml (ppm)
Gasoline Range	BRL	0.6
Jet Fuel/Kerosene Range (b)	BRL	0.6
Diesel Range	BRL	0.6
Motor Oil	BRL	1.
Total Petroleum Hydrocarbons	BRL	1.

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.

(b) 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.

Approved By: C. Fong Date: 8/13/90

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

McLaren

SAMPLING EVENT DATA SHEET

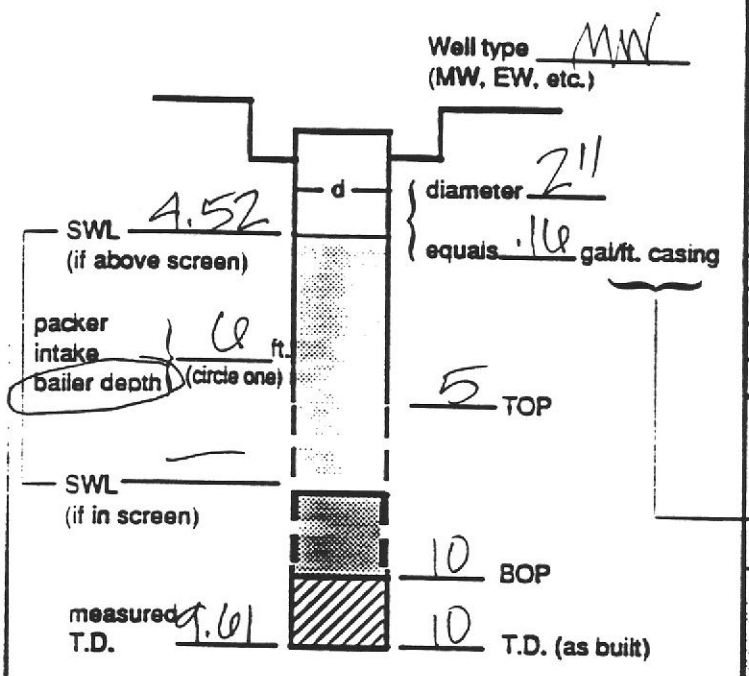
(fill out completely)

McLaren

WELL OR LOCATION MW-13

PROJECT Marketplace EVENT Quarterly SAMPLER CMS DATE 7-27-90

Well / Hydrologic statistics



Action	Time	Pump rate	IWL (low yield)
Start pump / Begin	10:50	> 2.6 gpm	
	11:15		
Stop	11:13		
Sampled	11:25		
(Final IWL)			6.58

Purge calculation

.16 gal/ft. • 5.46 ft. = .88 gals x 3 = 2.63 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 to purge 3 casing volumes and disp. bailer to sample.

Actual gallons purged 2.6

Actual volumes purged 3

Well yield ⊕ (see below) HY

COC # 220652

Sample I.D.	Analysis	Lab
A7402	8015+	MAL
A7403	Motoroil	↓

Additional comments:

Gallons purged *	TEMP °C / (F) (circle one)	EC (µs / cm)	PH	TURBIDITY (NTU) (200)		
1. 1	71.9	1300	7.72	2.0		
2. 2	72.0	1400	7.57	1.5		
3. 2.6	72.3	1490	7.58	1.4		
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

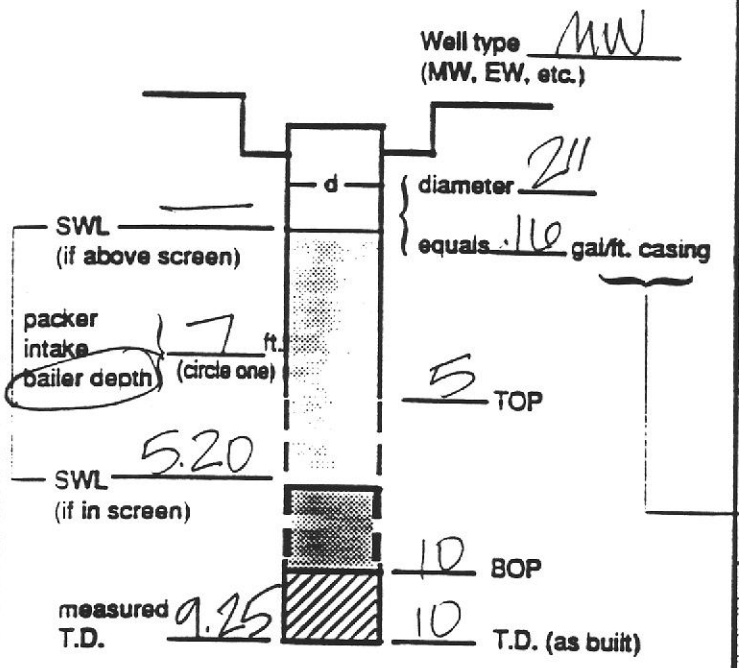
(fill out completely)

McLaren

WELL OR LOCATION W-14

PROJECT Marketplace EVENT Quarterly SAMPLER CMS DATE 7-27-90

Well / Hydrologic statistics



Action	Time	Pump rate	IWL (low yield)
Start pump / Begin	10:30	> 2.3 gpm	
	12:45		
Stop	12:45		
Sampled	13:05		5.91
(Final IWL)			

Purge calculation

.16 gal/ft. * 4.8 ft. = .77 gals x 3 = 2.3 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:

Peristaltic used to purge 3 casing volumes. disp. bailer used to sample.

Let well recharge for 30 min. before sampling. 5.91 IWL.

Actual gallons purged 2.3

Actual volumes purged 3

Well yield ⊕ (see below) MY

COC # 220652

Sample I.D.	Analysis	Lab
147406	80157	MAL
147407	Motoroil	↓

Additional comments:

Gallons purged *	TEMP °C / °F (circle one)	EC (µs / cm)	PH	TURBIDITY (NTU) 200		
1. 1	71.6	3120	7.84	1.9		
2. 2	71.4	3310	7.89	4.9		
3. 2.3	71.8	3490	7.93	2.0		
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

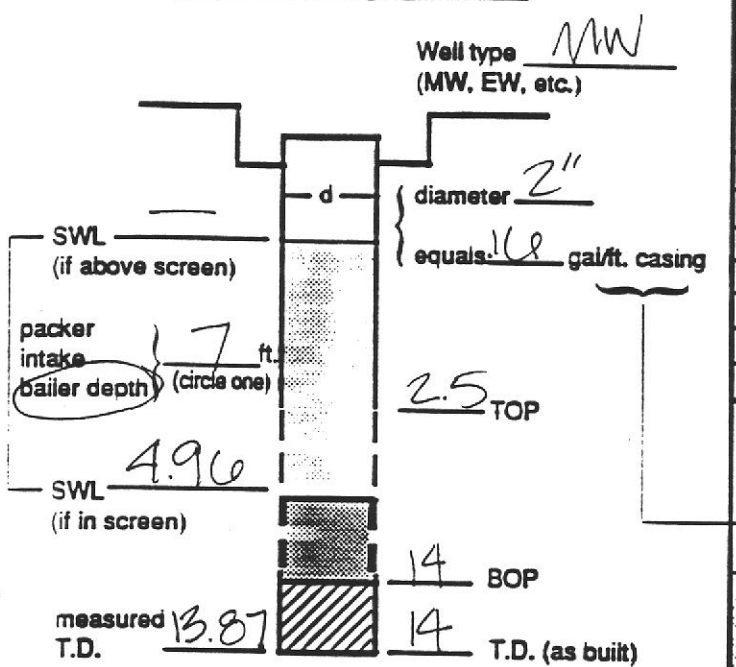
(fill out completely)

McLaren

WELL OR LOCATION W-19

PROJECT Marketplace EVENT Quarterly SAMPLER CMS DATE 7-27-90

Well / Hydrologic statistics



Action	Time	Pump rate	IWL (low yield)
Start pump / Begin	11:55	4.5 gals	
	12:35		
Stop	12:35		
Sampled	12:45		4.97
(Final IWL)			

Purge calculation

.16 gal/ft. * 9 ft. = 1.44 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:

peristaltic used to purge 3 casing volumes, disp. bailer used to sample.

Actual gallons purged 4.5

Actual volumes purged 3

Well yield ⊕ (see below) HY

COC # 220652

Sample I.D.	Analysis	Lab
147408	8015+	MAL
147409	Motoroil	↓

Additional comments:

Gallons purged *	TEMP °C (°F) (circle one)	EC (µs / cm)	PH	TURBIDITY (NTU)		
1. 1.5	74.3	5550	6.96	1.8		
2. 3	72.1	4730	6.81	1.2		
3. 4.5	70.4	3690	6.70	1.0		
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

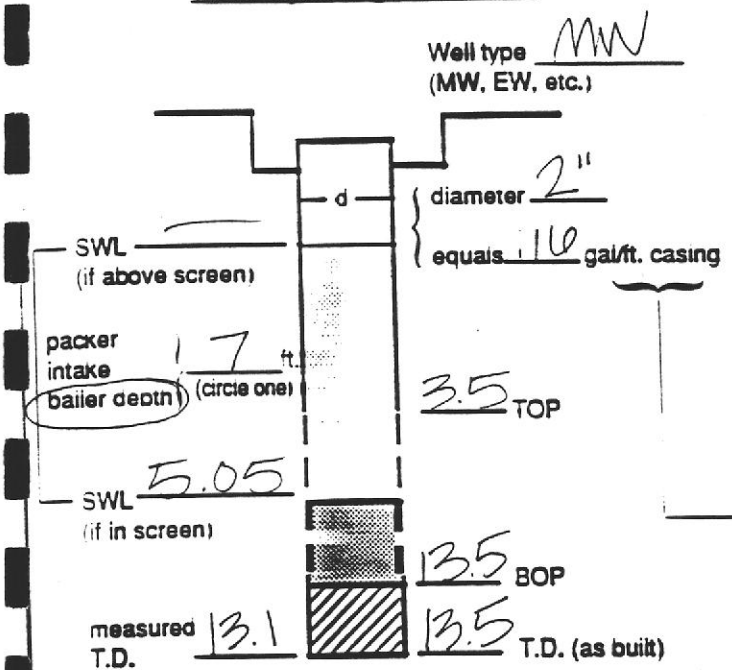
(fill out completely)

McLaren

WELL OR LOCATION MW-24

PROJECT Marketplace EVENT Quarterly SAMPLER CMS DATE 7-27-90

Well / Hydrologic statistics



Action	Time	Pump rate	IWL (low yield)
Start pump / Begin	12:50	>4 gpm	
	13:15		
Stop	13:15		
Sampled	13:27		5.08
(Final IWL)			

Purge calculation

.16 gal/ft. • 8.5 ft. = 1.4 gals x 3 = 4 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:

Used peristaltic to purge 3 casing volumes and disp. bailer to sample

Actual gallons purged 4

Actual volumes purged 3

Well yield ⊕ (see below) HY

COC # 2201052

Sample I.D.	Analysis	Lab
147410	8015+	MAL
147411	Motoroil	↓

Additional comments:

Gallons purged *	TEMP °C (°F) (circle one)	EC (µs / cm)	PH	TURBIDITY (NTU)		
1. 1	78.4	4010	6.62	0.69		
2. 2	77.9	3890	6.63	0.61		
3. 3	76.1	3320	6.65	0.75		
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)

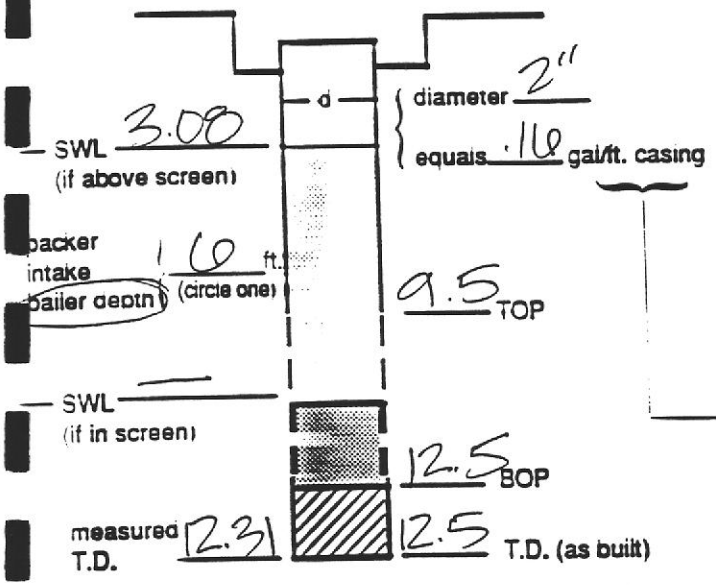
McLaren

WELL OR LOCATION W-7

PROJECT Marketplace EVENT Quarterly SAMPLER CMS DATE 7-30-90

Well / Hydrologic statistics

Well type MW (MW, EW, etc.)



Action	Time	Pump rate	IWL (low yield)
Start pump / Begin	11:35	4.5 gpk	
	12:00		
Stop	12:00		
Sampled	12:05		3.26
(Final IWL)			

Purge calculation

.16 gal/ft. (SWL to BOP or packer to BOP) • 9.2 ft. = 1.47 gals (one volume) x 3 = 4.5 gals. (purge volume-3 casings)

Head purge calculation (Airlift only)

____ gal/ft. (packer to SWL) • ____ ft. = ____ gals.

Equipment Used / Sampling Method / Description of Event:

peristaltic used to purge 3 casing volumes, disp. bailer used to sample.

Actual gallons purged 4.5

Actual volumes purged 3

Well yield ⊕ (see below) HY

COC # 220903

Sample I.D.	Analysis	Lab
147795	8015+	MAL
147796	Motor oil	↓

Additional comments:

Water is dark yellow/brown with strong odor.

Gallons purged *	TEMP °C (°F) (circle one)	EC (µs / cm)	PH	TURBIDITY (NTU)		
1. 1.5	73.3	9620	6.28	11.3		
2. 3	75.9	9580	6.28	9.2		
3. 4.5	77.5	9540	6.26	9.0		
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)

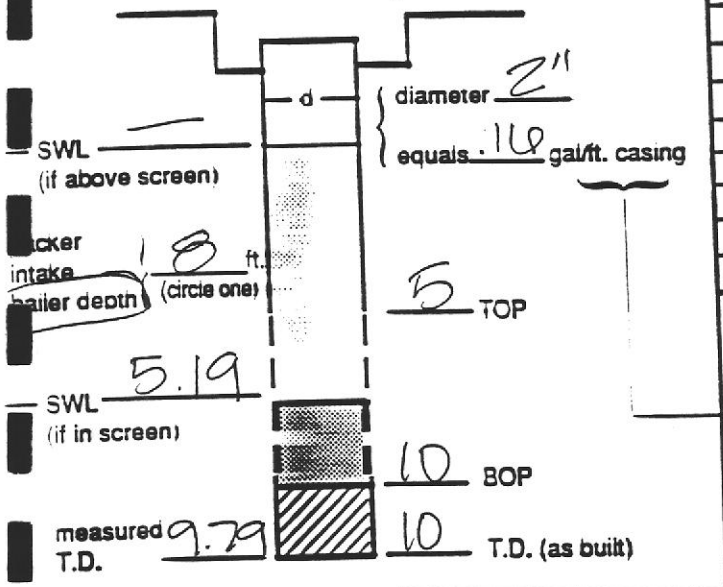
McLaren

WELL OR LOCATION MW-14

PROJECT Marketplace EVENT Quarterly SAMPLER CMS DATE 7-30-90

Well / Hydrologic statistics

Well type MW (MW, EW, etc.)



Action	Time	Pump rate	IWL (low yield)
Start pump / Begin	13:55		
Stop	16:01		
Sampled	16:10		0.25
(Final IWL)			

Purge calculation

.16 gal/ft. • 4.6 ft. = .73 gals x 3 = 2.2 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:

peristaltic used to purge 3 casing volumes. Disp. bailer used to sample.

Actual gallons purged 2.2

Actual volumes purged 3

Well yield ⊕ (see below) MY

COC # 220903

Sample I.D.	Analysis	Lab
147797	8015 + Motoroil	MAL
147798		↓

Additional comments:

slow producer ≈ 2 hours to purge

Gallons purged *	TEMP °C (°F) (circle one)	EC (µs / cm)	PH	TURBIDITY (NTU)		
1. .7	75.4	3190	7.48	5.1		
2. 1.4	78.2	2820	7.69	4.0		
3. 2.2	77.5	2710	7.76	2.8		
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

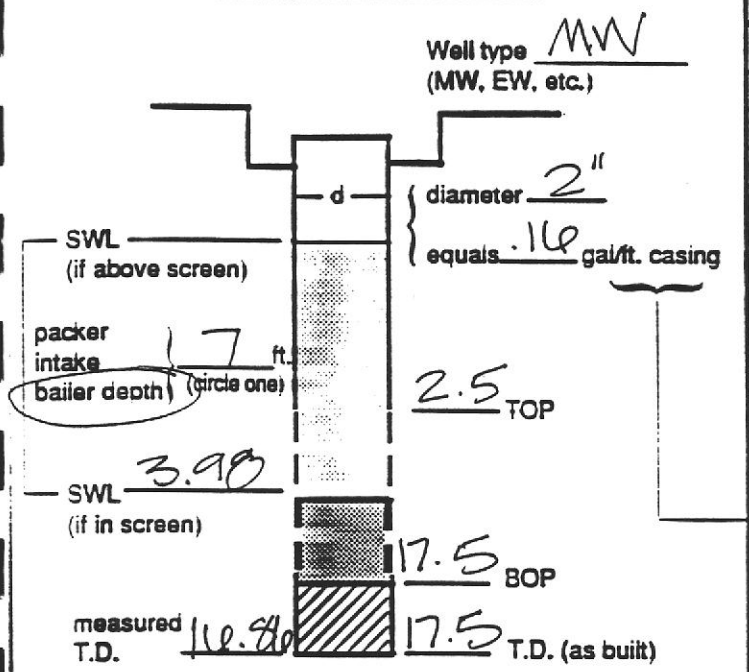
(fill out completely)

McLaren

WELL OR LOCATION W-20

PROJECT Marketplace EVENT Quarterly SAMPLER CMS DATE 7-30-90

Well / Hydrologic statistics



Action	Time	Pump rate	IWL (low yield)
Start pump / Begin	10:30		
Stop	11:10		
Sampled	11:15		4.21
(Final IWL)			

Purge calculation

.16 gal/ft. * 13 ft. = 2.08 gals x 3 = 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:

peristaltic used to purge 3 casing volumes, disp. bailer used to sample.

Actual gallons purged 6

Actual volumes purged 3

Well yield ⊕ (see below) HY

COC # 220903

Sample I.D.	Analysis	Lab
147791	8015 +	MAL
147792	Motoroil	↓

Additional comments:

MTD used for purge calculation

Gallons purged *	TEMP °C (°F) (circle one)	EC (µs / cm)	PH	TURBIDITY (NTU)		
1. 2	64.6	9880	7.04	2.3		
2. 4	69.1	9300	6.74	1.9		
3. 6	69.4	9280	6.69	1.8		
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.