GROUNDWATER CHARACTERIZATION
EMERY BAY MARKETPLACE

JUNE 19, 1990

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TABLE OF CONTENTS

LIST OF APPENDICES

LIST OF TABLES

LIST OF FIGURES

SECTION 1.0
INTRODUCTION

1.1 OBJECTIVE

This report presents the findings from recent groundwater investigations performed at the Emery Bay Marketplace, Emeryville, California. The scope of work for this investigation was developed following a meeting with the Alameda County Department of Environmental Health (ACDEH) on February 15, 1990 and was presented in the work plan entitled "Work Plan for Additional Work to be Performed at Emery Bay Marketplace, Emeryville, California" (Workplan). The Workplan was submitted to the ACDEH on March 22, 1990, and was approved by the ACDEH in a letter dated April 19, 1990.

The principal objective of this investigation is to determine the maximum extent of petroleum hydrocarbons as diesel (TPH/D), benzene, toluene, xylenes, and ethylbenzene (BTXE), and metals in groundwater on the Marketplace property. Determination of the maximum extent of these constituents provides a basis for assessing the potential impact, if any, these chemicals may have on the beneficial uses of groundwater. The field work performed during this investigation included:

- Construction of six new monitoring wells;
- Sampling of newly constructed and existing wells;
- Water level sounding of newly constructed and existing wells.

1.2 SCOPE OF DOCUMENT

This report includes:

- A description of site characteristics;
- A description of procedures used in this investigation;
- A presentation and evaluation of investigation results;

- An assessment of the distribution of chemicals in groundwater and the potential impact on beneficial uses of groundwater; and

- Recommendations for further groundwater characterization, groundwater monitoring, and free product remediation.

SECTION 2.0
BACKGROUND

2.1 SITE DESCRIPTION

The Emery Bay Marketplace property covers an area of about 13.6 acres (Figure 2-1). The property is bounded on the south by the elevated segment of Powell Street and a curved portion of Shellmound Street; on the north by 64th Street; on the west by several industrial-commercial and office buildings; and on the east by the Southern Pacific Railroad.

The property is made up of five parcels as shown in Figure 2-2. Parcel 1 is currently owned by Another Tree Corporation. Parcels 2, 3 and 4 are currently owned by the Christie Avenue Partners-JS. The Bay Street Parcel right-of-way is owned by the City of Emeryville. Figure 2-2 also illustrates the locations of all existing groundwater monitoring wells on these parcels.

2.2 SITE HISTORY

The property is located in an area of Emeryville which was formerly a tidal marsh bordering San Francisco Bay. The historical high water shoreline in the mid 1800's was located parallel to the railroad tracks near the center of the property. The area to the west of the shoreline was a tidal flat and the area to the east was marshland inundated during periods of extremely high tide.

After the late 1800's the tidal flats were filled with artificial fill material and the area was occupied by various industries. Industrial usage of the property has included: manufacturing operations for roofing tar, tar paper, and paint, and a truck repair and maintenance facility. A detailed history of site ownership since the late 1800's is provided in Appendix A.

FIGURE 2-1
SITE LOCATION MAP

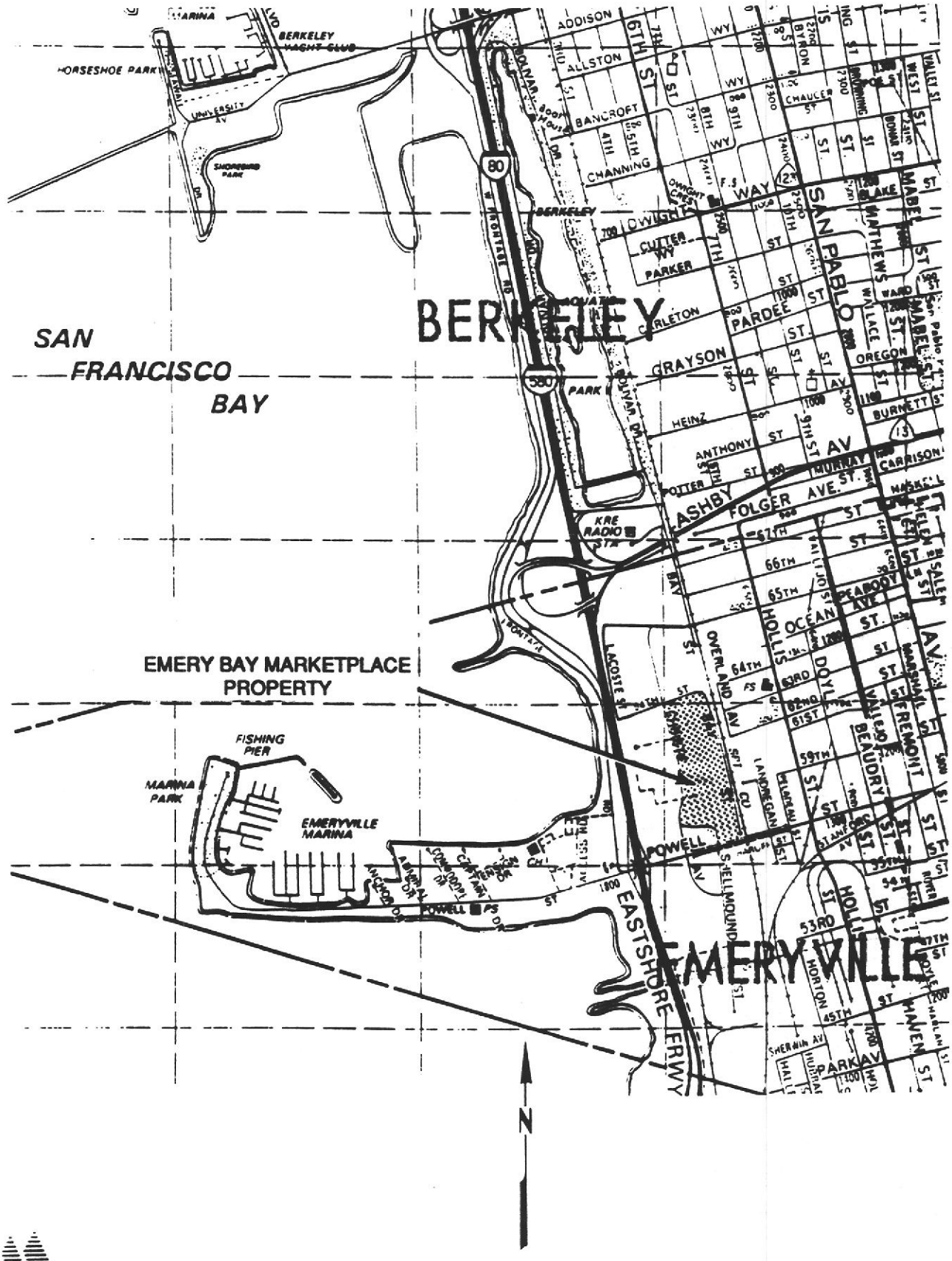

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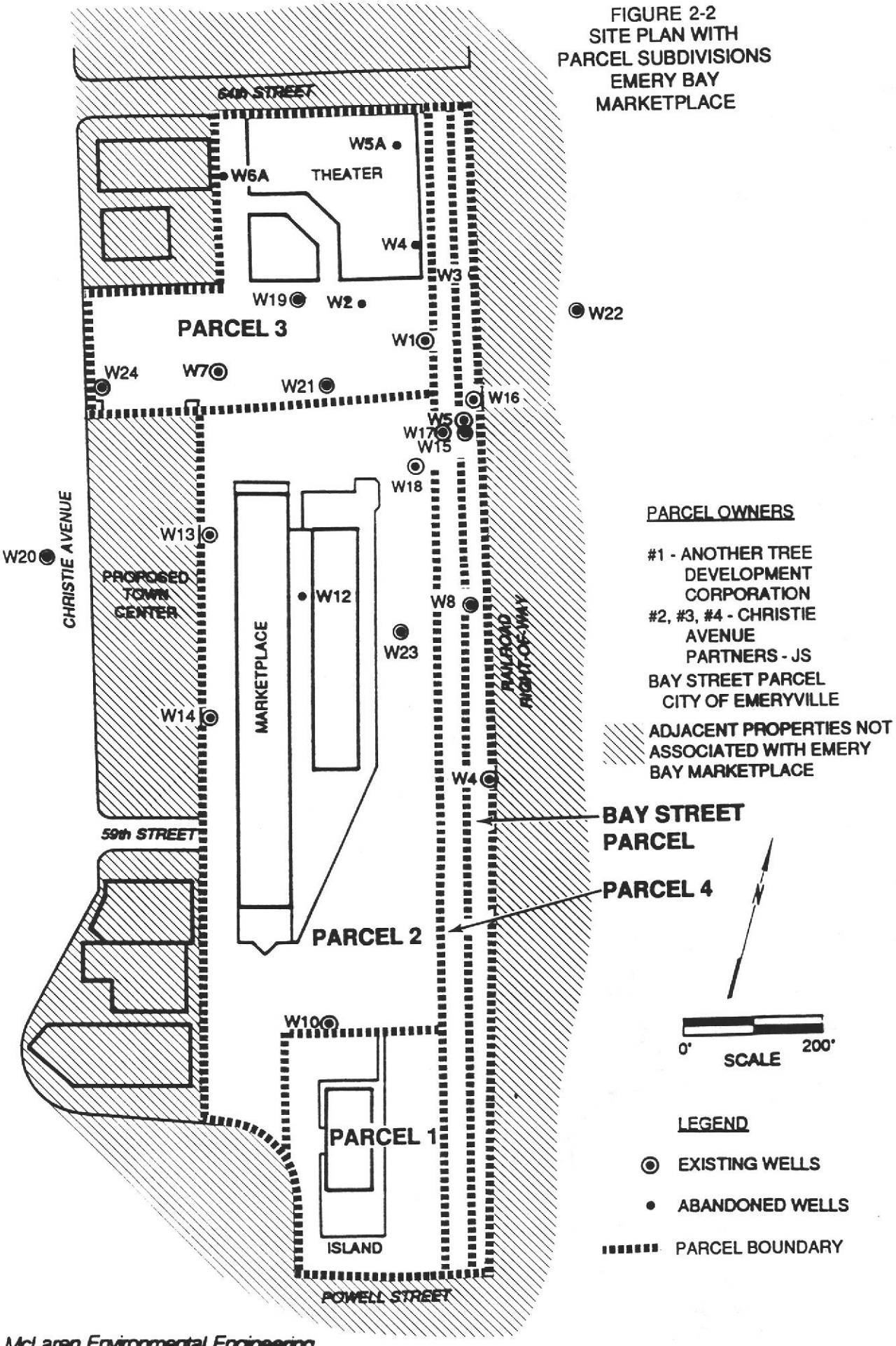
FIGURE 2-2
SITE PLAN WITH
PARCEL SUBDIVISIONS
EMERY BAY
MARKETPLACE



2.3 PREVIOUS INVESTIGATIONS

Soil and groundwater investigations to evaluate conditions beneath the property have been conducted since 1981. These investigation have been principally directed to address specific environmental concerns associated with the development of the property. The results of these investigations indicate that:

- Free petroleum product occurs in groundwater in the vicinity of Wells W-5, W-15, and W-16;
- TPH/D detected in groundwater, may be associated with the free product;
- BTXE and metals have been detected in groundwater, but generally at levels below drinking water standards;
- Asphaltic material found in soil is non-hazardous and physically and chemically unrelated to the free product; therefore no soil remediation is necessary.

Appendix B.1 provides a brief summary of the purpose and conclusions of these investigations.

2.4 HYDROGEOLOGIC SETTING

The property is west of the Hayward fault on the Berkeley Alluvial Plain of the East Bay Plain Area. Uplift of bedrock on the eastern side of the fault occurred approximately 1 million years ago and resulted in the formation of the East Bay Hills to the east. Soils beneath the Emeryville area were deposited by streams as alluvium eroded from the hills and as tidal flat and tidal channel deposits of San Francisco Bay (Alameda Flood Control and Water Conservation District (ACFC and WCD), 1988). These native soils are referred to as the "Older Alluvium" and the "Bay Mud".

Artificial fill material overlies the native "Bay Mud" and "Older Alluvium" deposits over approximately one-third of the land area of Emeryville. The fill was imported and emplaced in order to extend the

shoreline of Emeryville to the west (Earth Metrics, 1988). The original Bay shoreline as it existed before filling, was located parallel to the railroad tracks, near the center of the property, (WCC, 1982 and 1987; Earth Metrics, 1988). A former tidal slough has been identified in a previous report (WCC, 1987) on the northeast side of the property.

SECTION 3.0
HYDROGEOLOGIC INVESTIGATION

This section of the report describes the methods used in this hydrogeologic investigation, including drilling, construction and development of the six new monitoring wells, groundwater sampling, and water level measurement.

3.1 MONITOR WELL DRILLING, CONSTRUCTION, AND DEVELOPMENT PROCEDURES

Five monitoring wells (W-19 through W-23) were installed during April 4 to 6, 1990. Monitoring Well W-24 was installed on June 6, 1990, after data from the first five wells were reviewed. The locations of the six new wells are shown on Figure 2-2.

3.1.1 Drilling Procedures

Prior to drilling, utility clearances were conducted at each of the planned well locations. As part of utility clearance protocol, the first five feet of each borehole were drilled with a hand auger to confirm that no underground utilities were present. The monitoring wells were drilled with a Mobile B-53 drill rig equipped with 8-inch hollow stem augers. All drilling equipment was steam cleaned prior to entering the facility to remove any oils, chemicals, and soil. Drilling equipment was steam cleaned between borings to eliminate possible cross-contamination. Soil samples were continuously collected in each boring using either a Modified California Split-Spoon sampler with 6-inch brass tubes or a 5-foot continuous sampler. A McLaren geologist under the direction of a Certified Engineering Geologist was present throughout the drilling operation and was responsible for preparing a detailed log of the boring and for designing the planned monitoring wells. Soils were logged according to the Unified Soil Classification System (USC) and all samples were monitored for volatile organic compounds (VOCs) with an HNu

photoization detector. The soil boring logs are presented in Appendix C.1.

Soil cuttings generated during drilling were contained in a roll-top soil bin, which will remain on-site pending laboratory analysis for appropriate disposal.

3.1.2 Well Construction Procedures

All wells were constructed of 2-inch diameter, flush threaded Schedule 40 PVC casing and 2-inch diameter, 0.020 inch slot PVC well screen. The bottom of each borehole was backfilled with granular bentonite below the depth where casing was to be installed. The PVC casing was placed in the borehole above the granular bentonite and the well screen extended from the bentonite to a depth of two and one-half feet to three and one-half feet below grade. The annular space of each well was backfilled with 8 x 20 mesh sand to a depth of two feet below grade. A two foot bentonite seal extends above the filter pack to the surface. All wells were equipped with water tight locking well caps, and at-grade traffic-rated vault boxes. The well construction details for the six new wells and all previously installed wells are presented in Table 3-1.

The filter pack material and screen size were selected after sieve analyses were performed in the field on a sample collected from the finest grained saturated material from the screened interval of Well W-23. The sieve analysis methodology and results are presented in Appendix C.2.

The top of casing elevations of Wells W-19 through W-23 were surveyed on April 10, 1990. The top of casing elevation for Well W-24 was surveyed on June 8, 1990. Existing wells with known elevations were used as benchmarks.

TABLE 3-1

GROUNDWATER MONITORING WELL CONSTRUCTION DETAILS
EMERY BAY MARKETPLACE SITE

Well Description and Date Installed	Depth of Boring (feet)	Borehole Diameter (inches)	Depth of Casing (feet)	Screened Interval (feet)	Top of Casing (feet)
W-1 (4/13/87)13.0	8	13.0	3 - 13	11.47	
W-2[a] (4-15-87)	13.5	8	13.5	3.5 - 11.5	---
W-3[a] (4-14-87)	13.5	8	13.5	3.5 - 13.5	---
W-4[a] (4-14-87)	13	8	12.5	12.5	---
W-4 (8/4/81)	12.5	6	12.5	3 - 12.5	9.96
W-5 (7/30/81)	14.0	6	14.0	3 - 14	11.41
W-5A[a] (4-9-87)	11.5	8	11.0	3.5 - 11	---
W-6A[a] (4-13-87)	14	8	14.0	3.5 - 13.5	---
W-7 (4/16/87)	12.5	8	12.5	2 - 12	9.05
W-8 (4/17/87)	13.0	8	13.0	3 - 13	10.43
W-10 (8/4/81)	12.0	6	7.0[b]	3 - 7	7.14
W-12 (1-14-82)	12.0	6	12.0	3 - 12	10.35
W-13 (8/9/89)	11.0	8	10.0	5 - 10	8.15
W-14 (8/9/89)	11.0	8	10.0	5 - 10	7.97
W-15 (8/9 - 10/89)	23.0	8	20.0	10 - 20	11.53
W-16 (9/21/89)	26.5	8	26.0	14 - 26	10.94
W-17 (9/21/89)	26.5	8	25.0	8 - 25	12.14
W-18 (9/22/89)	21.5	8	20.0	4 - 20	11.34
W-19 (4-6-90)	20.0	8	14.0	2.5 - 14	10.27
W-20 (4-5-90)	23.0	8	17.5	2.5 - 17.5	6.82
W-21 (4-5-90)	20.0	8	12.5	2.5 - 12.5	9.48
W-22 (4-6-90)	20.0	8	15.5	2.5 - 15.5	11.67
W-23 (4-4-90)	19.0	8	9.5	2.5 - 9.5	9.16
W-24 (6-6-90)	20.0	8	13.5	3.5 - 13.5	8.72

[a] Abandoned well on Nielsen property.

[b] Discrepancy in boring log indicates that piezometer was installed to 12-feet, however, boring was only drilled to 6-feet, 8-inches (WCC, 1982). Recent soundings indicates a well depth of approximately 7 feet.

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3.1.3 Well Development Procedures

The wells were developed using an inertial pump and/or centrifugal pump to remove 10 casing volumes of water from each well. Temperature, specific conductivity, pH and turbidity measurements were taken during development. Fluids generated during development were contained in 55-gallon drums pending laboratory analysis for appropriate disposal.

3.2 GROUNDWATER SAMPLING PROCEDURES

Wells W-19 through W-23 were initially sampled during April 10 to 13, 1990, and were resampled during April 16 to 18, 1990. All other existing wells with the exception of Wells W-5 and W-10, were sampled during the April 10 to 13, 1990 sampling round. Well W-24 which was constructed on a later date was sampled once, on June 7, 1990. Water quality samples from Well W-5 were not collected because free product was present in this well. Samples from Well W-10 were not collected because previous sampling efforts have shown that recharge is inadequate for sampling.

Prior to sampling, three casing volumes of water were removed from each well and samples were collected using a peristaltic pump. Three samples were collected in one-liter amber bottles for each TPH/D analysis. Four samples were collected in HCL-preserved, 40 milliliter VOA vials for each BTXE analysis. One sample was collected in a one-liter poly bottle for each metals analysis. All samples to be analyzed for metals were filtered in the field with a 0.45 micron filter to remove any suspended material and then each sample was preserved with nitric acid.

All samples were submitted to McLaren Analytical Laboratory (MAL) for chemical analysis. Samples from the first sampling round, which included all existing wells except W-5 and W-10, were analyzed for total petroleum hydrocarbons as diesel (TPH/D) by the California State Water Resources Control Board (SWRCB) LUFT Manual Method; for benzene, toluene, xylene, and ethylbenzene (BTXE) by EPA Method 602; and for the metals lead, zinc,

copper and arsenic by Atomic Absorption Spectrophotometry (AA). Samples from the second sampling round of Wells W-19 through W-23 were analyzed for TPH/D and BTXE. Well W-24 was sampled once for TPH/D and BTXE on June 7, 1990. The analytical laboratory data sheets and chain-of-custody forms are presented in Appendix C-3.

3.3 WATER LEVEL MEASUREMENT PROCEDURES

Groundwater level measurements were performed on April 9, 1990, after Wells W-19 through W-23 were constructed and on June 7, 1990, after Well W-24 was constructed. A water level sounder was used to measure water depth from the top of the well casing. An oil-water interface probe was used to measure product thickness and water depth in wells W-5 and W-16, where product was encountered. The groundwater level measurements are recorded on hydrodata sheets, which are included in Appendix C.4.

SECTION 4.0

RESULTS OF GROUNDWATER INVESTIGATION

Geologic, hydrologic, and water quality data collected during this investigation and during sampling events over the past year are presented and discussed within this section as they relate to the characterization of the site: 1) hydrogeologic system; 2) groundwater flow characteristics; and 3) groundwater quality conditions.

4.1 SITE HYDROGEOLOGIC SYSTEM

Two geologic cross sections were constructed to illustrate the vertical geologic profile across the site. The stratigraphic units recognized and correlated on the cross sections include artificial fill, and native materials. The locations of the two cross sections are shown on Figure 4-1. Cross section A-A' (Figure 4-2) is oriented approximately north-south, perpendicular to the groundwater flow direction. The screened interval and filter pack of each well, and the April 9, 1990 water level measurements are shown on the cross sections. Cross section B-B' (Figure 4-3) is oriented roughly east-west, parallel to the groundwater flow direction. All soil boring logs from this investigation and previous investigations are included in Appendices C.1 and B.2, respectively.

The cross sections show that the property is underlain by, in order of increasing depth below grade, road base and artificial fill, and native materials. A bay mud sequence exists at depths greater than 30 feet below grade as indicated by investigations conducted on nearby properties. This bay mud sequence has not been observed at the Marketplace property, however the maximum depth of investigation was only 26.5 feet.

The artificial fill material consists of road base followed by variable deposits of clay and/or sand containing man-made materials. The road base is one to three feet thick, occurring immediately below the asphalt

FIGURE 4-1
LOCATION OF GEOLOGIC CROSS SECTIONS

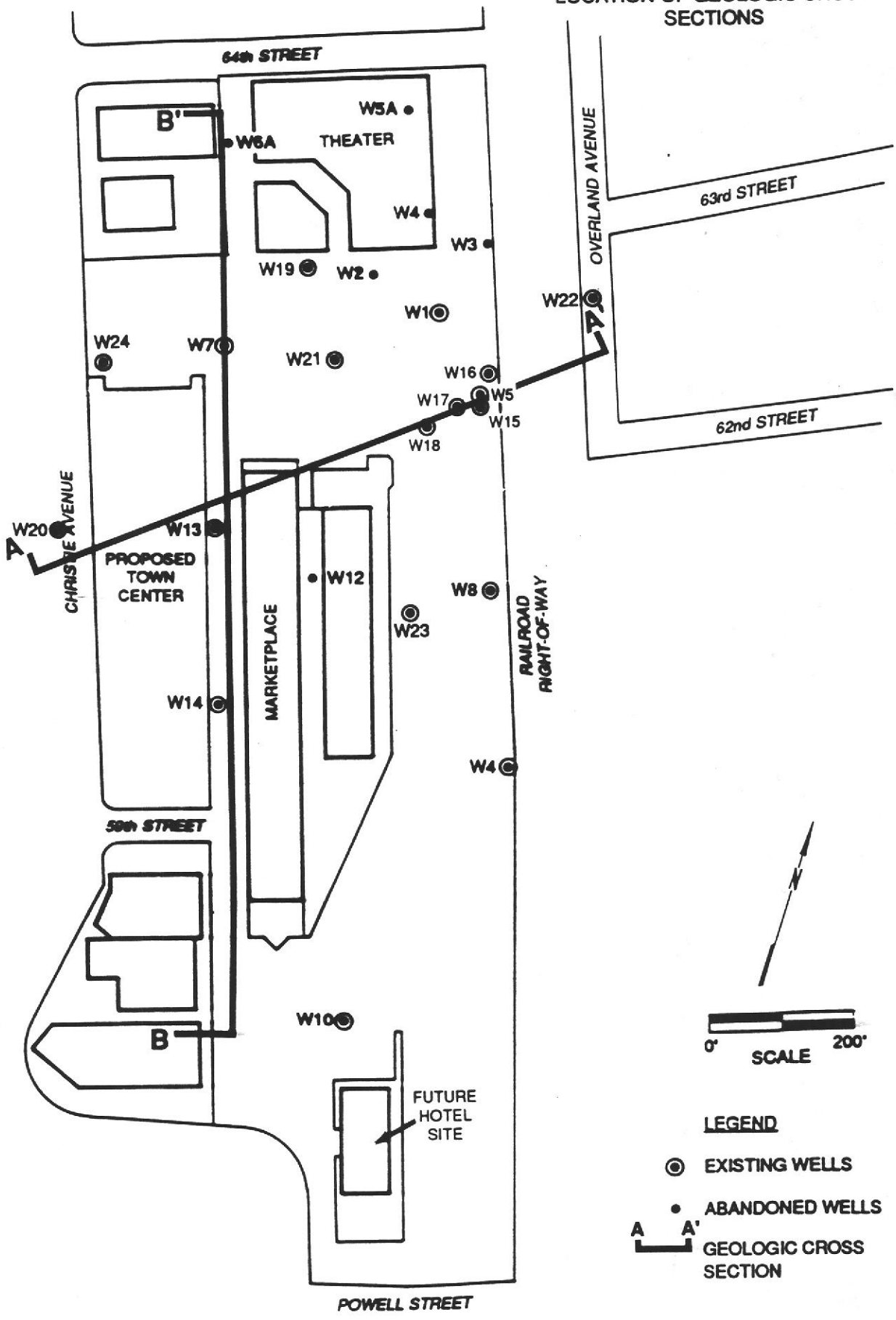

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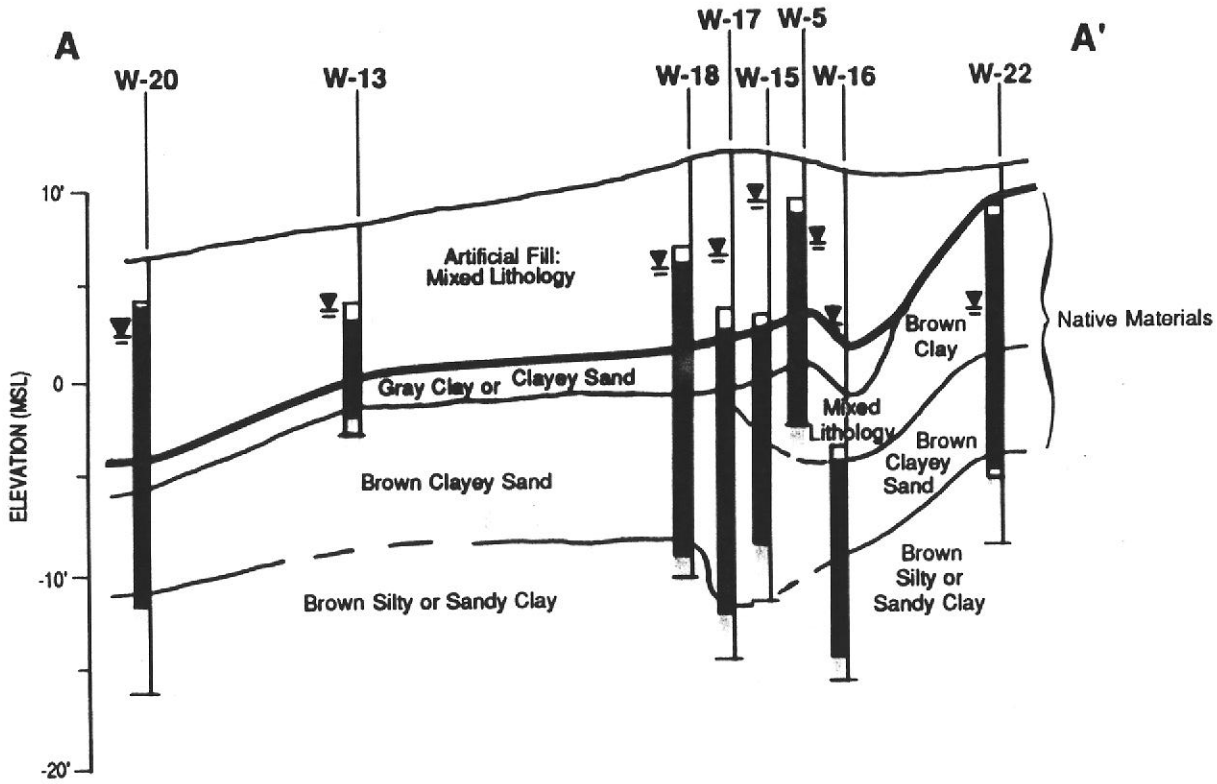
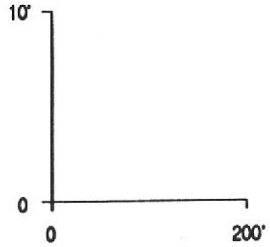
FIGURE 4-2
GEOLOGIC CROSS SECTION
A-A'





HORIZONTAL SCALE: 1" = 200'
VERTICAL SCALE: 1" = 10'
VERTICAL EXAGGERATION : 20X

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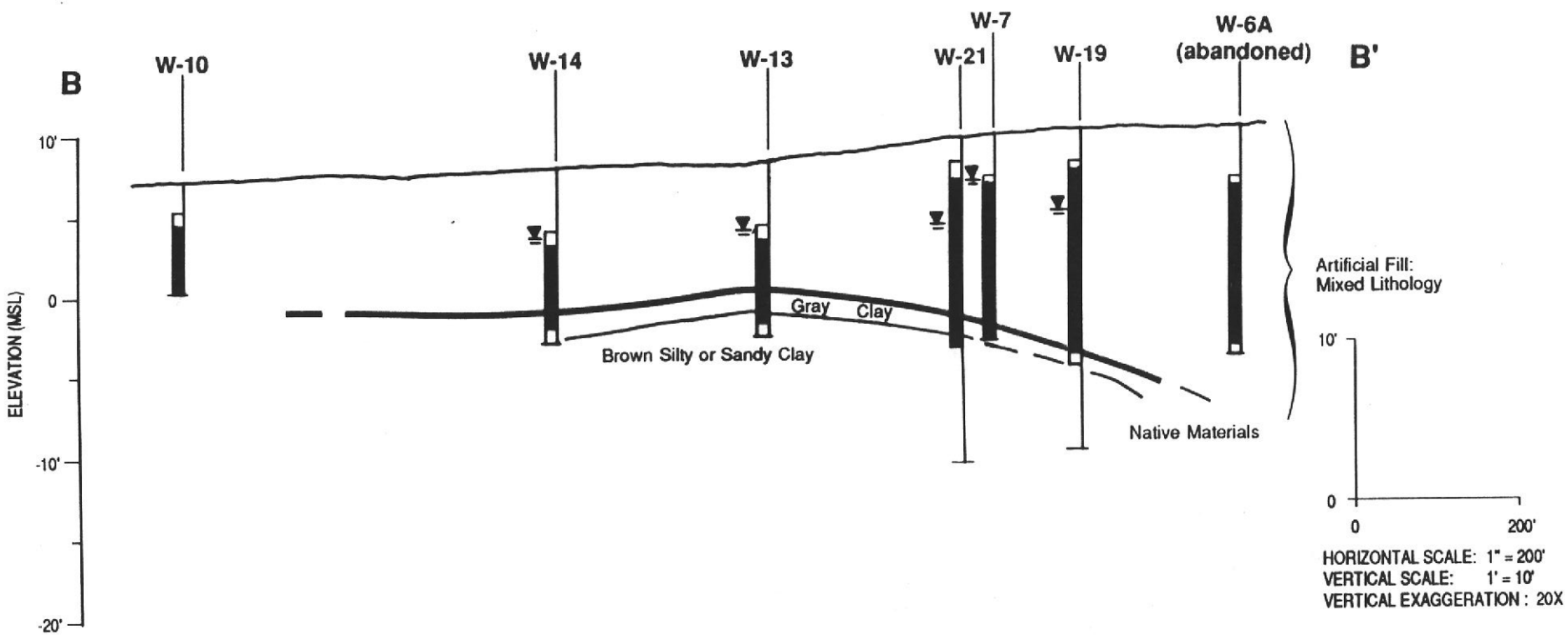
FIGURE 4-3
GEOLOGIC CROSS SECTION
B-B'



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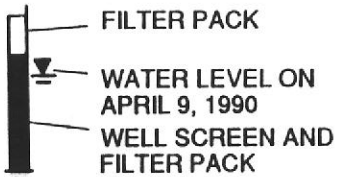

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pavement. It typically consists of yellowish brown to grayish brown, poorly consolidated gravelly sand which may be silty or clayey.

The artificial fill beneath the road base occurs at a depth of one to 15 feet below grade. It is typically five to eight feet thick on the east side of the site and seven to nine feet thick on the west side of the site. The westward thickening of the fill is consistent with the expected paleotopography of the tidal flat. The fill may attain a thickness of 14 feet or more where tidal sloughs were filled or where earlier excavations removed native soil. The fill material is highly variable, but typically consists of dark gray to brownish gray, clayey sand or sandy clay. Gravelly sands also occur but are less common. The variable lithology of the fill materials is not shown on the cross sections. The artificial fill is best recognized by the presence of man-made material including brick, wood, metal, glass and tar paper debris, and by the gray color of the soil.

The native materials typically consist of dark gray to black, sandy or silty clay or clayey sand, which is one-half to three feet thick, followed by light yellowish brown to olive brown, well consolidated, clayey sand or sandy clay. The dark gray to black silty clay is not present throughout the entire site. The native materials are best distinguished from the artificial fill by their color and by the absence of foreign material.

4.2 SITE GROUNDWATER FLOW CHARACTERISTICS

Groundwater elevations measured on April 9, 1990 and June 7, 1990 are presented with historic groundwater level measurements in Table 4-1. Groundwater within the artificial fill material is unconfined. Water elevations from wells completed below the fill in the underlying native materials are not consistent with water elevations from wells completed in the fill, indicating that confined or semi-confined conditions may exist in the native soil. Therefore, groundwater elevations from wells

TABLE 4-1

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
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
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
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
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
W-10	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
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

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TABLE 4-1

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
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
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	---[d]	---
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
W-19	10.27	4-9-90	5.11	5.16
		6-7-90	4.77	5.50
W-20	6.82	4-9-90	4.08	2.74
		6-7-90	3.79	3.03
W-21	9.48	4-9-90	5.21	4.27
		6-7-90	4.84	4.64
W-22	11.67	4-9-90	7.50	4.17
		6-7-90	7.36	4.31
W-23	9.16	4-9-90	1.51	7.65
		6-7-90	1.78	7.38
W-24	8.72	6-7-90	4.75	3.97

[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-17 not accessible on 6-7-90.

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completed only in the native material were not used to construct the groundwater elevation contour maps presented in Figures 4-4 and 4-5. The groundwater flow maps show that groundwater flow in the artificial fill material is toward the west-southwest.

The water level in Well W-7 is significantly higher than in adjacent Wells W-19 and W-21 and was not included on the groundwater elevation maps. The lithologic log from Well W-7 is incomplete and it is possible that perched groundwater occurs at this location. The new data indicate that groundwater flow in the vicinity of Well W-7 is to the west-southwest, corresponding with flow across the rest of the site. Prior to installing Wells W-19 and W-21, groundwater flow appeared to be toward the south in the vicinity of Well W-7.

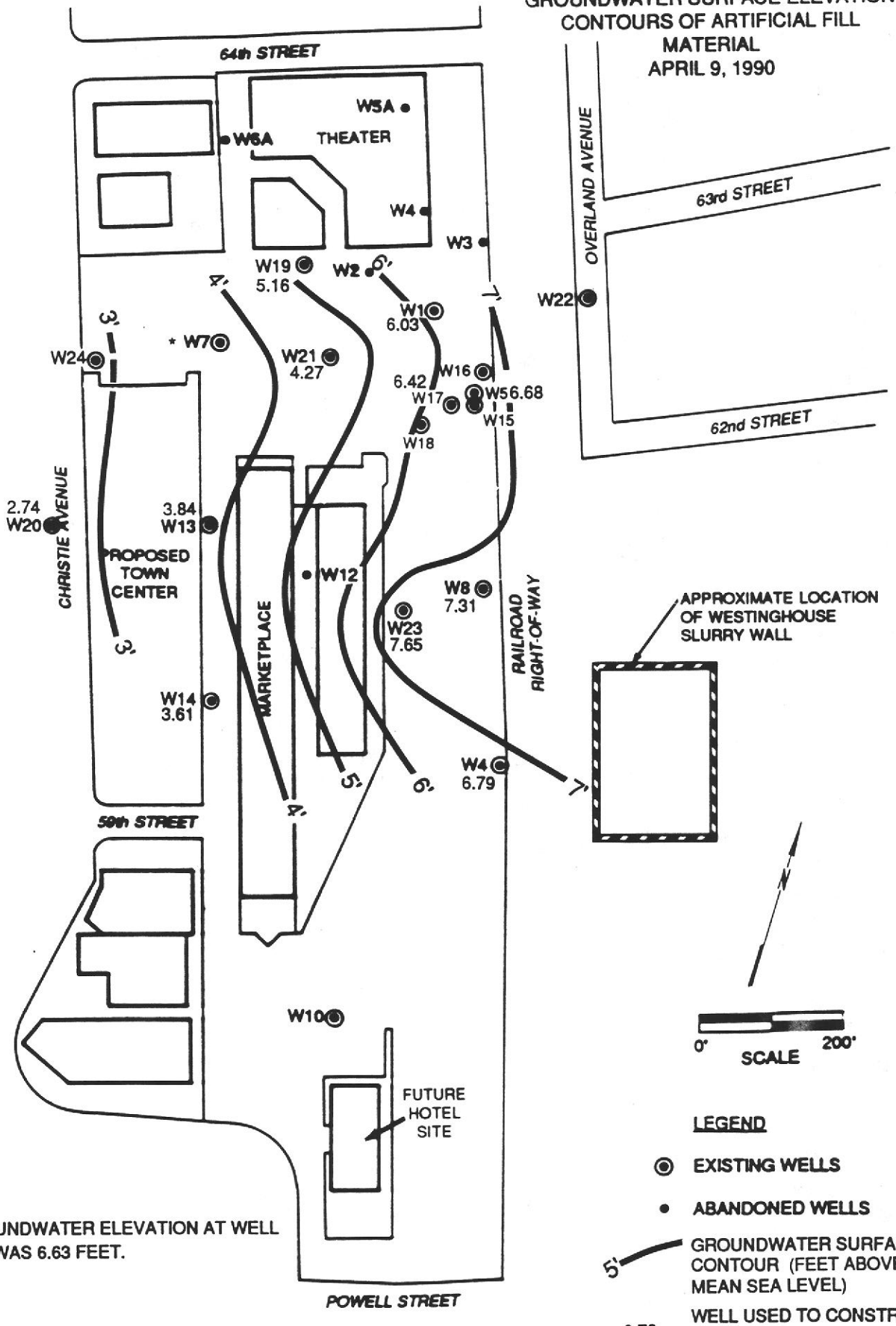
Local variations in groundwater flow near Wells W-4 and W-8 may be caused by a slurry wall installed to a depth of 35 feet on the adjacent upgradient property (Figures 4-4 and 4-5).

4.3 SITE GROUNDWATER QUALITY

Groundwater samples were analyzed for total petroleum hydrocarbons as diesel (TPH/D), benzene, toluene, xylenes, and ethylbenzene (BTXE), and the metals arsenic, copper, lead, and zinc. These chemical analyses were selected based upon analytical results of previous investigations (Appendix B).

When Well W-7 was sampled, it was noted that the water was green and foamy. The water from Wells W-18, W-22, and W-23 also had a light greenish color. The water from well W-13 was black in color. A diesel odor was noted when Wells W-8, W-15, W-16, W-17, W-18, and W-21 were sampled.

FIGURE 4-4
GROUNDWATER SURFACE ELEVATION CONTOURS OF ARTIFICIAL FILL MATERIAL
APRIL 9, 1990



* GROUNDWATER ELEVATION AT WELL W-7 WAS 6.63 FEET.

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

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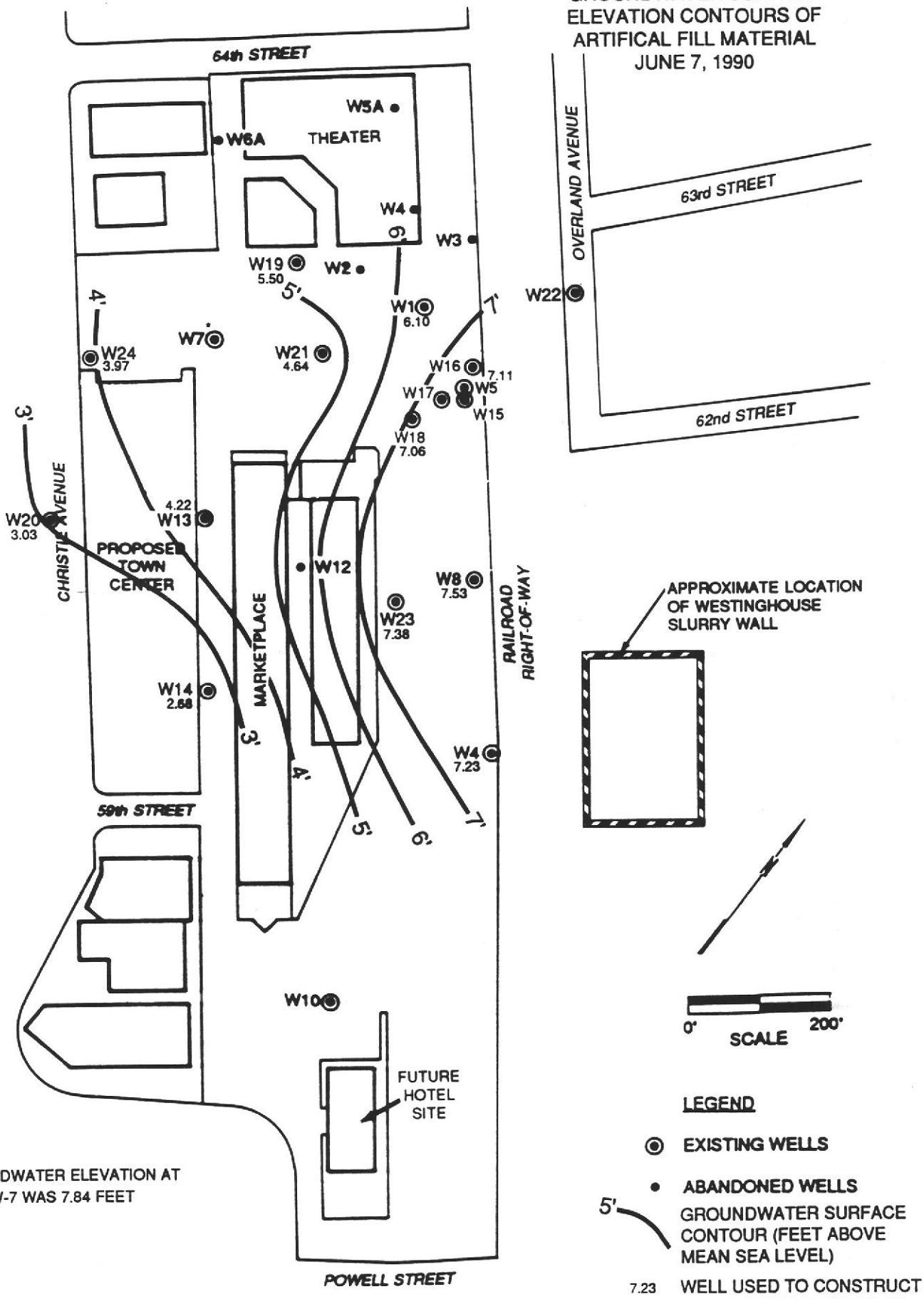
FIGURE 4-5
GROUNDWATER SURFACE ELEVATION CONTOURS OF ARTIFICAL FILL MATERIAL
JUNE 7, 1990



* GROUNDWATER ELEVATION AT WELL W-7 WAS 7.84 FEET

McLaren

4.3.1 Hydrocarbons in Groundwater

An asphalt refining plant located on the east side of the Marketplace site near Wells W-5, W-15 and W-16, is a possible source of hydrocarbons in groundwater, and the free product observed in these three wells. Although no regulatory guidelines exist for TPH/D in groundwater, the RWQCB requires characterization of the extent of TPH/D. BTXE, which is commonly associated with petroleum hydrocarbons, also has been detected at low levels in groundwater in previous investigations. The results of all historical TPH/D and BTXE analyses are presented in Table 4-2 and Figure 4-6.

Well W-19 was constructed upgradient of Well W-7 to determine the upgradient extent of the TPH/D. TPH/D was detected at 1,100 ppb in one sample from Well W-19, but was not detected when resampled. Groundwater from five upgradient wells (W-2, W-3, W-4, W-5A and W6A) drilled by WCC (which are now abandoned) was analyzed for various petroleum hydrocarbons (TPH) in 1987 but showed no detection of TPH. Therefore, Well W-19 is most likely at, or near the upgradient extent of TPH/D in groundwater.

Well W-20 was constructed downgradient of Well W-7 to establish the downgradient extent of TPH/D. Although samples form Well W-20 contained no TPH/D, the new groundwater flow data indicates that Well W-20 is downgradient of Well W-13, rather than W-7 (Figure 4-4).

Well W-21 was constructed to determine whether the TPH/D detected in groundwater from Well W-7 was related to the free product in Well W-5, or whether a second source of TPH/D from a former diesel manifold area is present near well W-7. TPH/D was detected at 1400 and 1700 ppb in samples from Well W-21. The diesel fractions observed on the gas chromatograms from Wells W-7, W-19, W-21 and W-16 were not substantially different; therefore two separate sources can not be distinguished.

TABLE 4-2

HYDROCARBONS IN GROUNDWATER
EMERY BAY MARKETPLACE SITE

Number Well	Sample Date	TPH/D Concentration (ppb)	Benzene (ppb)	Toluene (ppb)	Xylene (ppb)	Ethyl Benzene (ppb)
W-1	4-14-87	<5000[a,b]	<1	<1	---[c]	<1
	2-28-90	<500	---	---	---	---
	4-11-90	<100[d]	<0.5	<0.5	<0.5	<0.5
W-2[e]	4-15-87	<1000[b]	<20	80	---	<20
W-3[e]	4-15-87	---	<1	<1	---	<1
W-4[e]	4-14-87	<5000[b]	<1	<1	---	<1
W-4	3-01-90	<500	---	---	---	---
	4-10-90	<100[f]	<0.5	<0.5	<0.5	<0.5
W-5[g]	9-27-89	20,000	<50	<50	<50	<50
B-5[e]	4-16-87	---	<1000	<1000	---	<1000
W-5A[e]	4-16-87	<1000[h]	<10	<10	---	<10
W-6[e]	4-16-87	<1000[h]	<10	<10	---	<10
W-7	4-16-87	---	<20	<20	---	<20
	9-26-89	1,100	<3	<3	<3	<3
	2-28-90	<500[i]	---	---	---	---
	4-11-90	5,600[j]	<500	<500	<500	<500
W-8	4-17-87	10,000[k]	<100	<100	---	<100
	9-26-89	7,100	<1	<1	<1	<1
	3-01-90	4,500	---	---	---	---
	4-18-90	5,300	<5	<5	<5	<5
W-10[l]	4-17-87	---	<1	1	---	<1
W-13	2-28-90	<500	---	---	---	---
	4-12-90	<500	<0.5	<0.5	<0.5	<0.5
W-14	2-28-90	<500	---	---	---	---
	4-11-90	<100[f]	<0.5	<0.5	<0.5	<0.5

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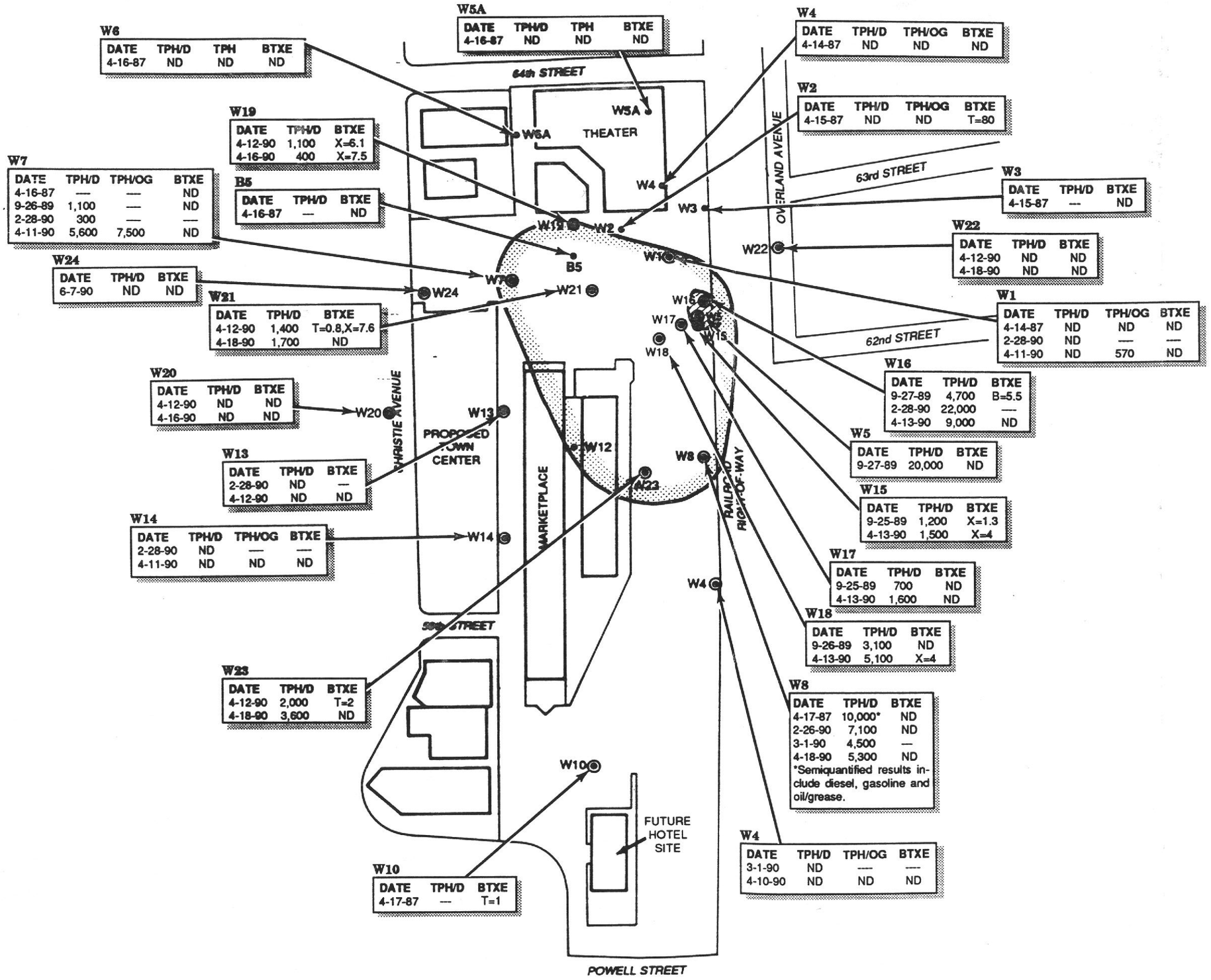
TABLE 4-2
(Continued)

HYDROCARBONS IN GROUNDWATER
EMERY BAY MARKETPLACE SITE

Well Number	Sample Date	TPH/D Concentration (ppb)	Benzene (ppb)	Toluene (ppb)	Xylene (ppb)	Ethyl Benzene (ppb)
W-15	9-25-89	1,200	<1	<1	1.3	<1
	4-13-90	1,500	<2	<2	4	<2
W-16	9-27-89	4,700	5.5	<3	<3	<3
	2-28-90	22,000	---	---	---	---
	4-13-90	9,000	<20	<20	<20	<20
W-17	9-25-89	700	<0.5	<0.5	<0.5	<0.5
	4-13-90	1,600	<0.5	<0.5	<0.5	<0.5
W-18	9-26-89	3,100	<0.5	<0.5	<0.5	<0.5
	4-13-90	5,100	<2	<2	4	<2
W-19	4-12-90	1,100	<0.5	<0.5	6.1	<0.5
	4-16-90	<500[m]	<0.5	<0.5	7.5	<0.5
W-20	4-12-90	<500	<0.5	<0.5	<0.5	<0.5
	4-16-90	<500	<0.5	<0.5	<0.5	<0.5
W-21	4-12-90	1,400	<0.5	0.8	7.6	<0.5
	4-18-90	1,700	<5	<5	<5	<5
W-22	4-12-90	<500	<0.5	<0.5	<0.5	<0.5
	4-18-90	<500	<0.5	<0.5	<0.5	<0.5
W-23	4-12-90	2,000	<2	2	<2	<2
	4-18-90	3,600	<5	<5	<5	<5
W-24	6-7-90	<500	<0.5	<0.5	<0.5	<0.5

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 570 ppb motor oil also detected in well W-1.
e Abandoned well on Nielson property.
f Analysis for motor oil showed no detection above 250 ppb in wells W-4 and W-14.
g Free product in well W-5.
h Indicates gasoline and motor oil also not detected above 1000 ppb in wells W-5A and W-6.
i Review of gas chromatograph indicated TPH/D present at 300 ppb in well W-7.
j 7500 ppb motor oil also detect in well W-7.
k Semiquantified results include gasoline, diesel, and some oil and grease in well W-8.
l Well W-10 could not be sampled in 1989 and 1990 due to presence of asphaltic materials in the well.
m Review of gas chromatograph indicated TPH/D present at 400 ppb in Well W-19.

FIGURE 4-6
DISTRIBUTION OF HYDROCARBONS IN GROUNDWATER
EMERY BAY MARKETPLACE



0' SCALE 200'

LEGEND

- EXISTING WELLS
- ABANDONED WELLS
- APPROXIMATE LIMITS OF TPH/D IN GROUNDWATER
- EXTENT OF FREE PRODUCT
- ND CONSTITUENT NOT DETECTED
- — CONSTITUENT NOT ANALYZED

CHEMICAL LEGEND

TPH/D	TOTAL PETROLEUM HYDROCARBONS AS DIESEL
TPH/OG	TOTAL PETROLEUM HYDROCARBONS AS OIL AND GREASE
TPH	TOTAL PETROLEUM HYDROCARBONS AS GASOLINE, DIESEL AND MOTOR OIL
BTXE	BENZENE, TOLUENE, XYLENES AND ETHYLBENZENE

* 1987 SAMPLES NOT ANALYZED FOR XYLENES

McLaren

Well W-22 was constructed upgradient of the identified free product to establish the upgradient extent of TPH/D in groundwater. No TPH/D was detected in samples from Well W-22. It has previously been suggested (McLaren, 1989b) that the source for the TPH/D detected at the Marketplace site may be upgradient at the Petersen Manufacturing Company, 1600 63rd Street (at Overland Street). This property is being handled by the RWQCB as an Underground Fuel Leak Case and TPH/D was detected at a concentration of 17,000 ppm in groundwater in March, 1988. TPH/D was not detected in Well W-22 which is located between the Marketplace property and the Peterson site indicating that TPH/D from the Peterson property likely has not reached the Marketplace property. A summary of all potential off-site contamination sources is presented in Appendix B.5.

Well W-23 was constructed downgradient of Well W-8 to establish the downgradient extent of TPH/D detected in groundwater in Well W-8. TPH/D was detected at concentrations of 2,000 and 3,600 ppb in groundwater from Well W-23. However TPH/D has not been detected in groundwater from Wells W-13 and W-14, which are located further downgradient. This data indicates that the downgradient extent of TPH/D is located between Well W-23 and Wells W-13 and W-14.

Well W-24 was constructed downgradient of Well W-7 after it was established that Well W-20 was downgradient of Well W-13, rather then Well W-7. No TPH/D was detected in groundwater from Well W-24 indicating that TPH/D in groundwater is confined to the Marketplace site.

The extent of TPH/D and the extent of free product are shown on Figure 4-6. TPH/D has moved further downgradient (westerly) on the north than on the south. This movement may be stratigraphically controlled: the fill material on the north generally consists of clayey sand or gravelly sand which may be more permeable than the fill material observed on the south which generally consists of sandy clay and clayey sand. The groundwater contour maps (Figures 4-4 and 4-5) also suggest that

restriction to flow in the fill material may occur on the south side of the area where TPH/D is detected.

Samples from Wells W-1, W-4, W-7, and W-14 were analyzed for total petroleum hydrocarbons as gasoline (TPH/G), oil and grease (TPH/OG), and TPH/D although TPH/OG and TPH/G were not requested from the laboratory. Oil and grease were detected in Wells W-7 and W-1, but gasoline was not detected in these wells. An earlier investigation on the north side of the property (Earth Metrics, 1988) also found no gasoline in groundwater.

The BTXE analyses performed in this investigation indicated presence of xylenes at 4 ppb in samples from Wells W-15 and W-18 and 6.1 to 7.5 ppb in samples from Well W-19. These concentrations are well below the California Department of Health Services (DHS) Maximum Contaminant Level (MCL) for drinking water of 1750 ppb for xylenes. Historically, only one analysis has detected BTXE above any of the DHS MCL's for these constituents. In September 1989, benzene was detected at a concentration of 5.5 ppb in groundwater from Well W-16 exceeding the 1 ppb MCL. When Well W-16 was resampled in February and April of 1990, no benzene was detected.

4.3.2 Metals in Groundwater

The groundwater from all wells except Well W-24 was analyzed for the metals arsenic, copper, lead and zinc. The results are presented in Table 4-3 along with the results from the 1989 investigation (McLaren, 1989a). All earlier analytical results for metals are included in Appendix B.1. It was determined that a metals analysis of groundwater from Well W-24 was not necessary after reviewing the metals analysis results from all other wells.

Neither lead nor zinc were detected in samples from any wells during this investigation. Although zinc has been detected in previous investigations, the concentrations have always been well below the State secondary MCL of 5000 ppb (CCR, Title 26, Section 22-64473). Lead was

TABLE 4-3

ARSENIC, COPPER, LEAD AND ZINC IN GROUNWATER (1989 - 1990)
EMERY BAY MARKETPLACE SITE

Well Number	Sample Date	Arsenic (ppm)	Copper (ppm)	Lead (ppm)	Zinc (ppm)
W-1	8-9-89	0.1	<0.02	<0.05	<0.08
	4-11-90	0.027	<0.09	<0.1	<0.08
W-4	8-10-89	0.04	<0.02	<0.05	<0.08
	4-10-90	0.006	<0.09	<0.1	<0.08
W-5[a]	---	---	---	---	---
W-7	8-9-89	0.006	0.02	0.08	0.09
	4-11-90	0.034	0.09	<0.1	<0.08
W-8	8-9-89	0.1	<0.02	<0.05	<0.08
	4-18-90	0.014	<0.09	<0.1	<0.08
W-10[b]	8-17-89	0.02	<0.02	<0.05	<0.08
W-13	8-11-89	0.04	<0.02	<0.05	<0.08
	4-12-90	0.02	<0.09	<0.1	<0.08
W-14	8-11-89	0.08	<0.02	<0.05	<0.08
	4-11-90	0.008	<0.09	<0.1	<0.08
W-15	8-11-89	0.04	<0.02	<0.05	<0.08
	4-13-90	0.028	<0.09	<0.1	<0.08
W-16	4-13-90	0.013	<0.09	<0.1	<0.08
W-17	4-13-90	0.009	<0.09	<0.1	<0.08
W-18	4-13-90	0.011	<0.09	<0.1	<0.08
W-19	4-12-90	0.01	<0.09	<0.1	<0.08
W-20	4-12-90	<0.005	<0.09	<0.1	<0.08
W-21	4-12-90	0.02	<0.09	<0.1	<0.08
W-22	4-12-90	<0.005	<0.09	<0.1	<0.08
W-23	4-12-90	0.02	<0.09	<0.1	<0.08

a Free product in this well; not sampled for metals.
b Could not be sampled in 1990 due to low water level in well.

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detected at a concentration of 80 ppb (0.08 ppm) in Well W-7 in 1989, which is slightly above the State MCL of 50 ppb (CCR, Title 26, Section 22-64435).

Copper was detected only in groundwater from Well W-7 at 90 ppb (0.09 ppm) in 1990. This is well below the State secondary MCL of 1000 ppb (CCR, Title 26, Section 22-64473). Copper had been detected in Well W-7 at a concentration of 20 ppb (0.02 ppm) in 1989.

Arsenic was detected in groundwater from all wells except the two offsite wells, W-20 and W-22. Detection of arsenic in groundwater is consistent with the results of earlier investigations. The highest level of arsenic detected was 34 ppb (0.034 ppm) in groundwater from Well W-7. All detected concentrations are below the State primary MCL of 50 ppb (CCR, Title 26, Section 22-64435). In the 1989 investigation arsenic was detected at concentrations of 100 ppb (0.1 ppm) in Wells W-1 and W-8.

Metals have been detected primarily in groundwater from Well W-7 which was noted to be green and foamy when sampled. The water may be green due to poor well construction which may have allowed bentonite clay to enter the well screen. It is unclear whether the metals detected in samples from Well W-7 actually reflect groundwater conditions at that location.

SECTION 5.0

CONCLUSIONS AND RECOMMENDATIONS

The following conclusions can be made about the site hydrogeology:

- The groundwater in the artificial fill material is unconfined and flows toward the west-southwest.
- The artificial fill material is highly variable in nature and can be expected to exhibit highly variable transmissive properties across the site.
- Confined or semi-confined conditions may exist in the native material where thick, well-consolidated material of low permeability overlies the transmissive zones.

The following conclusions can be made about the groundwater quality at the Emery Bay Marketplace property:

- The extent of TPH/D in groundwater appears to be confined to the north-central side of the property, and does not appear to have migrated off-site.
- Because TPH/D was not detected in Well MW-22, it appears that the source of TPH/D, if upgradient, is near the Marketplace property.
- In this investigation, BTXE and the metals, arsenic, copper, lead, and zinc were not detected in groundwater at levels above drinking water standards.
- Arsenic is detected at low levels in groundwater throughout the property.

Based on the findings from this investigation, the following recommendations are made:

1) Sample groundwater from downgradient Wells W-7, W-13, W-14, W-19, W-20 and W-24 on a quarterly basis for total petroleum hydrocarbons by Modified EPA Method 8015 to verify that TPH/D is confined to the Marketplace property. This analytical method will detect both oil and diesel which have been detected in groundwater on the property.

2) Bail free product from Well W-5, which is on City of Emeryville property, on a weekly basis. Free product removal from Well W-5 will be performed as accommodation to the City of Emeryville and is not to be construed as an admission of present or future responsibility for the Christie Avenue Partners-JS.

3) Abandon Well W-10 which cannot be used for monitoring purposes.

4) Evaluate the monitoring results at the end of one year to determine whether continued monitoring is necessary.

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SECTION 6.0

REFERENCES

Aqua Terra Technologies (ATT), (1988). Classification of an Asphalt-like Waste Material Found in the Marketplace and Nielsen Site in Emeryville, California. Letter to the Martin Company, July 11, 1988.

CFR. (1988). Code of Federal Regulations 40. Environmental Protection Agency. Part 268. Land Disposal Restrictions. pp 721.

DHS. (1989). California Department of Health Services Maximum Contaminant Levels (MCL's) for Contaminants in Drinking Water. April.

Driscoll, F.G. (1986). Groundwater and Wells, 2nd ed. Johnson Division, St. Paul, Minn. pp. 1089.

Earth Metrics, (1988). Draft Work Plan for Soils Contamination Characterization of Marketplace Site in Emeryville, California. Revised January 28, 1988.

Hougen, O.A., K.M. Watson, R.A. Ragatz. (1943). Chemical Process Principles. Wiley and Sons Inc. New York. pp 405-406.

Hydrocarbon Processing, (1980). 1980 Refining Process Handbook Hydrocarbon Processing, September, 1980. pp 96.

McLaren. (1989a). Data Review and Workplan to Conduct Further Groundwater Characterization at the Marketplace/Nielson Properties, The Martin Group. August 9, 1989.

McLaren, (1989b). Results of the Hydrogeologic Investigation Conducted at the Marketplace/Nielsen Properties, The Martin Group, September 11, 1989.

McLaren. (1989c). Free Product Subsurface Investigation, Marketplace Site, Emeryville, California, October 19, 1989.

RWQCB, (1989). Regional Board Staff Recommendations for Initial Evaluation and Investigation of Underground Tanks, May, 1989.

USEPA, (1986). Hazardous Waste Management System, Proposed Rule. Federal Register. Vol. 51(114) June 13, 1986. pp 21652.

Woodward-Clyde Consultants (WCC), (1982). Assessment of Subsurface Contaminants, Marketplace Property, Emeryville, California, May 1982.

Woodward-Clyde Consultants (WCC), (1985). Report on Investigations and Recommended Remedial Measures, Westinghouse Property, Emeryville, California. April, 1985.

Woodward-Clyde Consultants (WCC), (1987). Environmental Assessment Former Nielsen Freight Line Site and Adjacent Parcel, Emeryville, California. August 12, 1987.

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APPENDIX A

HISTORICAL SITE OWNERSHIP

APPENDIX A

HISTORICAL SITE OWNERSHIP

The history of site ownership is provided in the following discussion. Figure A-1 illustrates the locations of former buildings, underground tanks, and property boundaries on the site.

A.1 Roofing Material Manufacturing

The area northeast of the Marketplace building was occupied by the Paraffine Company in 1884. In the late 1800's, this company was involved in research and development of bituminous and petroleum-based products and may have also been involved in the refining of asphalt and kerosene. These early operations involved limited product manufacturing. Only limited landfilling, if any, was done at the site during this period. In 1902, the Paraffine Company began to refine asphalt for manufacture of roofing materials. The asphalt refinery was located along the railroad tracks northeast of the Marketplace building (Figure A-1). By 1910 or soon thereafter, it appears that most of the marshland area of the southern part of the site had been filled.

A.2 Paint Manufacturing

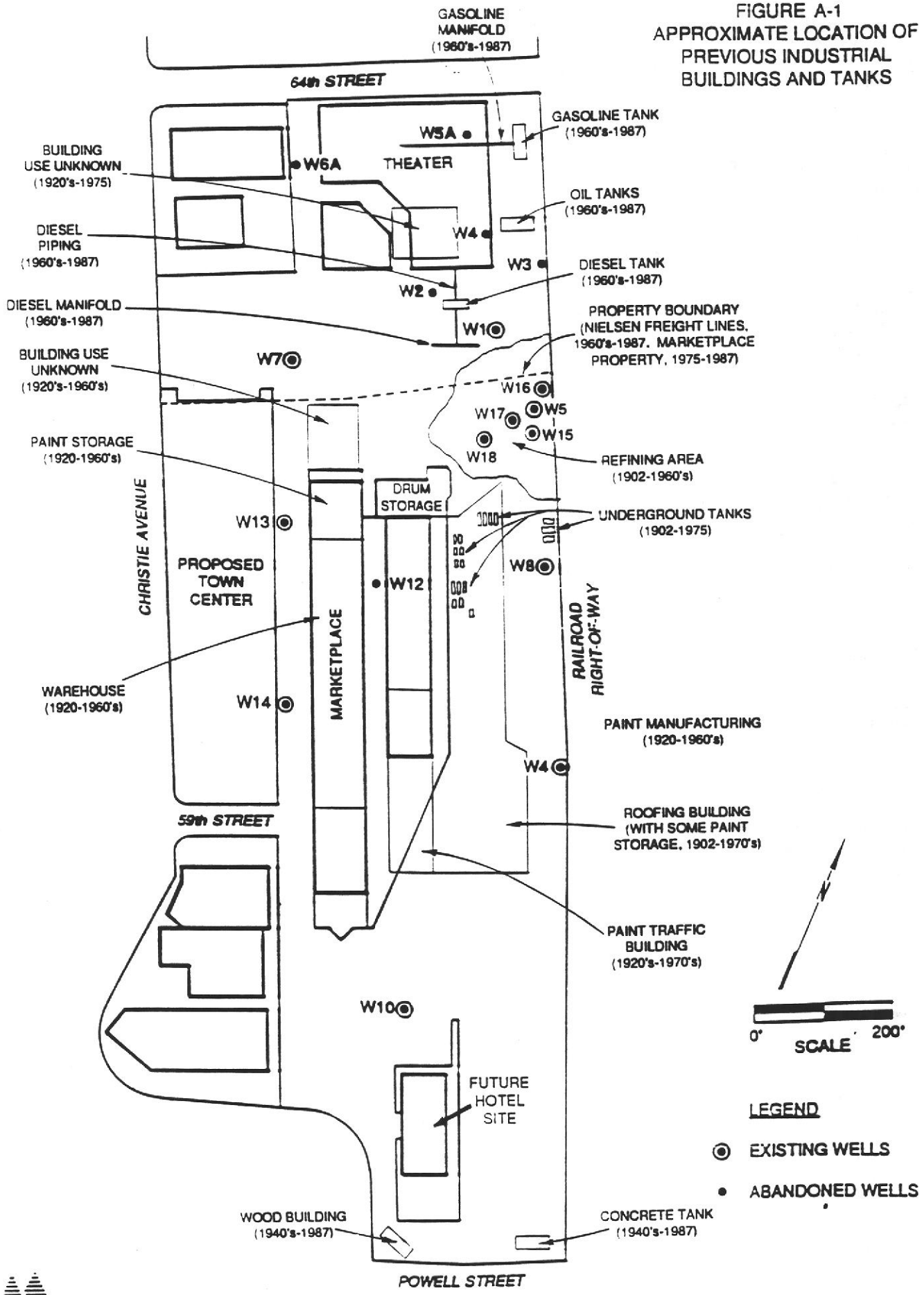
In 1920, the Paraffine Company changed its name to PABCO. In 1929, PABCO began manufacturing paint. By 1930, most of the southern part of the site was covered with buildings. Between 1935 and 1937, the area north of 63rd Street was filled and was part of the roofing product and paint manufacturing operation. At that time there were four large above ground storage tanks, a building, and a storage yard on the northern portion of the property (Earth Metrics, 1988). Paint mediums believed to have been used on site included linseed oil and toluene. Paint pigments believed to have been used included titanium oxide, lead, zinc oxide, zinc chromate, magnesium silicate, and barium sulfate. In 1957, PABCO was purchased by Fiberboard Corporation.

A.3 Nielsen Freight Lines Facility

In the 1960's the northern part of the property was developed as a trucking facility called Nielsen Freight Lines. Diesel fuel, gasoline, and waste oil underground tanks and solvents and degreasers were stored on the ground surface. Storage at the Nielsen site included the following:

- 10,000-gallon gasoline storage tank and fueling manifold,
- 10,000-gallon diesel tank and fueling manifold,
- 500-gallon waste oil tank,
- 500-gallon lube oil tank, and
- antifreeze and motor oil drum storage area.

FIGURE A-1
APPROXIMATE LOCATION OF PREVIOUS INDUSTRIAL BUILDINGS AND TANKS



These underground tanks and fueling manifolds were removed in 1987.

A.4 Marketplace

In 1975, the southern part of the site was graded and construction of the existing Marketplace parking lot was completed. The Marketplace building housed retail shops and a restaurant between 1975 and 1988.

A.5 Emeryville Marketplace Complex

The properties occupied by the Marketplace and Nielsen Freight Lines facilities were purchased by Christie Avenue Partners-JS in 1987. In 1988, these properties were converted into the Emeryville Marketplace, which includes an open air market within the Marketplace building and a movie theatre on what was formerly the Nielsen Freight Lines property. A portion of the property was deeded to the City of Emeryville for the Bay Street right-of-way. A second portion, Parcel 1, was purchased by Another Tree Corporation for a future hotel site (See Figure 2-2 in Report).

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APPENDIX B

DESCRIPTION OF PREVIOUS INVESTIGATIONS

SECTION B.1

SUMMARY OF PREVIOUS INVESTIGATIONS

SECTION B.1

SUMMARY OF PREVIOUS INVESTIGATIONS

Several soil and groundwater investigations have been conducted at the Marketplace site. Each investigation has had a specific objective and scope dictated by the nature of the specific environmental issue determined during site development. This section provides a brief summary of previous investigations including the purpose of each investigation, a summary of the number of wells and soil borings, sampling methodology, and chemical analyses performed. The original reports describing these investigations are listed in Table B-1. Chemical analyses performed on the groundwater and soil are summarized on Tables B-2 and B-3, respectively. Analytical results for soil samples are summarized in Tables B-3.1 and B-3.2. Analytical results for groundwater samples are summarized in Tables B-4 through B-6.

B.1.1 Marketplace Property 1982

The first investigation was reported in "Assessment of Subsurface Contaminants Marketplace Property, Emeryville, California", (WCC, 1982). The purpose of this investigation was to determine whether hazardous waste materials were present in soils at the Marketplace property. At the time, this was a concern voiced by City of Emeryville officials because chemicals had been found in soils at properties located near the Marketplace property.

This investigation was conducted in close coordination and cooperation with representatives of the California State Department of Health Services (DHS) and the Regional Water Quality Control Board, San Francisco Bay Region (RWQCB). Coordination with DHS and the RWQCB began with development of the assessment plan and continued through the review and concurrence with the conclusions of the document (WCC, 1982).

The subsurface investigation was designed to investigate areas of likely contamination based on site history. When the investigation was planned, it included 11 exploratory soil borings and three groundwater monitoring wells. However, during the investigation, the possible presence of subsurface tanks (tank areas A, B, C and D on Figure B-1) was discovered and a supplementary program of trenching and borings in the tank areas was conducted. Additionally, at the request of the RWQCB, a fourth groundwater monitoring well was installed near the tank groups. Analyses were performed on 26 soil samples (Table B-3) and on groundwater from the 4 monitoring wells (Tables B-2).

A total of 15 exploratory soil borings were drilled to investigate the extent of subsurface fill, native soil and groundwater conditions at the site, and to provide soil samples for chemical testing. The locations of these soil borings are marked on Figure B-1. The 4 groundwater monitoring wells were installed at selected boring locations (Wells W-4, W-5, W-10, and W-12). The well logs are provided in Section B.2 and soil sampling, well construction and development techniques are described in Section B.4

TABLE B-1

SOIL AND GROUNDWATER INVESTIGATIONS AT THE MARKETPLACE AND NIELSEN SITES

Date of Report	Consultant	Title
1982	Woodward Clyde Consultants (WCC)	Assessment of Subsurface Contaminants Marketplace Property
1987	Woodward Clyde Consultants (WCC)	Environmental Assessment, Former Nielsen Freight Line Site and Adjacent Parcel
1988	Earth Metrics (EM)	Draft Work Plan for Soils Contamination Characterization of the Marketplace Site
1989a	McLaren	Data Review and Work Plan to Conduct Further Groundwater Characterization at the Marketplace/Nielsen Properties
1989b	McLaren	Marketplace/Nielsen Hydrogeologic Investigation
1989c	McLaren	Marketplace Free Product Subsurface Investigation

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TABLE B-2

SUMMARY OF ANALYSES PERFORMED ON GROUNDWATER SAMPLES FROM MARKETPLACE AND NIELSEN PROPERTIES

Well No.	Date	Report (g)	Lab Name	Metals	General Minerals	Semi-Volatile Organics EPA 625	Total Semi-Volatile Organics EPA 9020	Volatile Organics EPA 624	Halogenated Volatile Organics EPA 601	Ethylene Glycol GC/FID	Oil & Grease EPA 418.1	TPH EPA 8015	BTEX Mod. 602	TPH/D LUFT
City of Emeryville														
W-4 (a)	1/20/81	WCC 1982	B&C (d)	X										
	12/1/87	EM 1988	FF (e)	X										
	8/24/89	McL 1989	M.A. (b)	X	X	X								
W-5 (a)	1/20/81	WCC 1982	B&C	X			X						X	X
	10/2/89	McL 1989	M.A.										X	X
W-8 (a)	8/24/89	McL 1989a	M.A.	X	X	X								
	10/2/89	McL 1989b	M.A.											
W-15 (a)	8/24/89	McL 1989a	M.A.	X	X	X	X						X	X
	10/2/89	McL 1989b	M.A.											
W-16 (a)	10/2/89	McL 1989b	M.A.										X	X
W-17 (a)	10/2/89	McL 1989b	M.A.										X	X

TABLE B-2
(Continued)

SUMMARY OF ANALYSES PERFORMED ON GROUNDWATER SAMPLES
FROM MARKETPLACE AND NIELSEN PROPERTIES

Well No.	Date	Report (g)	Lab Name	Metals	General Minerals	Semi-Volatile Organics EPA 625	Total Semi-Volatile Organics EPA 9020	Volatile Organics EPA 624	Halogenated Volatile Organics EPA 601	Ethylene Glycol GC/FID	Oil & Grease EPA 418.1	TPH EPA 8015	BTEX Mod. 602	TPH/D LUFT
Marketplace														
W-10 (a)	1/20/81	WCC 1982	B&C	X				X	X					
	4/17/87	WCC 1987	B&C					X						
W-12 (c)	1/20/81	WCC 1982	B&C	X				X						
	1/27/82	WCC 1982	B&C				X							
	12/1/87	EM 1988	FF	X										
W-13 (a)	8/24/89	McL 1989a	M.A.	X	X	X								
W-14 (a)	8/24/89	McL 1989a	M.A.	X	X	X							X	X
W-18 (a)	10/2/89	McL 1989b	M.A.											
Nielsen Property														
W-1 (a)	4/14/87	WCC 1987	B&C	X	F (f)			X	X	X	X	X		
		EM 1988	No Lab Data								X	X		
W-2 (c)	4/14/87	WCC 1987	B&C	X	F			X	X			X		
		EM 1988	No Lab Data											
W-3 (c)	4/14/87	WCC 1987	B&C	X	X,F	X		X	X					

TABLE B-2
(Continued)

SUMMARY OF ANALYSES PERFORMED ON GROUNDWATER SAMPLES FROM MARKETPLACE AND NIELSEN PROPERTIES

Well No.	Date	Report (g)	Lab Name	Metals	General Minerals	Semi-Volatile Organics EPA 625	Total Semi-Volatile Organics EPA 9020	Volatile Organics EPA 624	Halogenated Volatile Organics EPA 601	Ethylene Glycol GC/FID	Oil & Grease EPA 418.1	TPH EPA 8015	BTEX Mod. 602	TPH/D LUFT
W-4 (c)	4/14/87	WCC 1987	B&C	X	F			X	X		X	X		
	12/1/87	EM 1988	Anametrix			X		X						
W-5A (c)	4/16/87	WCC 1987	B&C	X	F			X				X		
W-6A (c)	4/16/87	WCC 1987	B&C	X	F			X				X		
		EM 1988	No Lab Data											
W-7 (a)	4/16/87	WCC 1987	B&C	X	X,F	X		X						
	8/24/89	McL 1989a	M.A.	X	X	X							X	X
	10/2/89	McL 1989b	M.A.											
W-8 (a)	4/17/87	WCC 1987	B&C	X	F	X		X	X					

(a) Existing well
(b) McLaren Analytical Laboratory
(c) Well no longer exists.
(d) Brown and Caldwell Analytical Laboratory.
(e) Fireman's Fund Analytical Laboratory
(f) "F" indicates that partial field test were performed including pH and/or specific conductance.
(g) Refer to References for complete report name.

TABLE B-3

SUMMARY OF ANALYSES PERFORMED ON SOIL SAMPLES FROM MARKETPLACE AND NIELSEN PROPERTIES

Boring No.	Depth ft	Date	Report (f)	Lab	Metals	Semi-Volatile Organics EPA 8270	Volatile Organics EPA 624	Ethylene Glycol GC/FID	Oil & Grease EPA 418.1	TPH EPA 8015	BTEX Mod. 602	TPH/D LUFT	PCBs	Fuel Hydro-Carbons	Total Halogenated Organics EPA 9022	PNAs EPA 8310	Volatile Organics EPA 8240	Ignitability CCR Title 22 Sec. 666702	Corrosivity CCR Title 22 Sec. 666708	Aquatic Bioassay CCR Title 22 Sec 66696	TCLP EPA 1312
W-1 (a)	4-4.5	1/20/81	WCC 1982	B&C (d)	X																
	1-1.5	12/1/87	WCC 1987	B&C (d)	X			X		X											
W2	2-2.5	1/20/81	WCC 1982	B&C (d)	X																
	4.5-5	1/20/81	WCC 1982	B&C (d)	X																
	4-4.5	12/1/87	WCC 1987	B&C (d)	X		X			X			X								
	9-9.5	12/1/87	WCC 1987	B&C (d)										X							
W3	2.5-3	1/20/81	WCC 1982	B&C (d)	X																
	6.5-7	1/20/81	WCC 1982	B&C (d)	X																
	2.5-3	12/1/87	WCC 1987	B&C (d)	X					X			X								
3D	6.7-7.2	1/20/81	WCC 1982	B&C (d)	X																
W4	2-2.5	12/1/87	WCC 1987	B&C (d)	X					X			X								
	1-1.5	12/1/87	WCC 1987	B&C (d)	X		X			X											
4C	4.5-5	1/20/81	WCC 1982	B&C (d)	X																
	9-9.5	1/20/81	WCC 1982	B&C (d)	X																
W5	2-2.5	1/20/81	WCC 1982	B&C (d)	X																
	7-7.5	1/20/81	WCC 1982	B&C (d)	X																
W5	4.5-5	12/1/87	WCC 1987	B&C (d)	X					X			X								
5A	5-5.5	1/20/81	WCC 1982	B&C (d)	X																
W6	2.5-3	1/20/81	WCC 1982	B&C (d)	X																
W6A	4-4.5	12/1/87	WCC 1987	B&C (d)	X					X			X								
W7	2-2.5	1/20/81	WCC 1982	B&C (d)	X																

TABLE B-3
(Continued)

SUMMARY OF ANALYSES PERFORMED ON SOIL SAMPLES FROM MARKETPLACE AND NIELSEN PROPERTIES

Boring No.	Depth ft	Date	Report (f)	Lab	Metals	Semi-Volatile Organics EPA 8270	Volatile Organics EPA 624	Ethylene Glycol GC/FID	Oil & Grease EPA 418.1	TPH EPA 8015	BTEX Mod. 602	TPH/D LUFT	PCBs	Fuel Hydro-Carbons	Total Halogenated Organics EPA 9022	PNAs EPA 8310	Volatile Organics EPA 8240	Ignitability CCR Title 22 Sec. 666702	Corrosivity CCR Title 22 Sec. 666708	Aquatic Bioassay CCR Title 22 Sec 66696	TCLP EPA 1312
EM 7	Varied	11/1/87	EM 1988	FF	X										X						
EM 8	Varied	11/1/87	EM 1988	FF	X				X												
EM 8A	Varied	11/1/87	EM 1988	FF	X																
EM 8B	Varied	11/1/87	EM 1988	FF	X											X					
EM 8C	Varied	11/1/87	EM 1988	FF	X																
EM 8D	Varied	11/1/87	EM 1988	FF	X																
EM 4	N.R.		ATT 1988	SEQ (g)	X	X											X	X	X	X	
Test Pit 7	Surface	6/28/88	ATT 1988	SEQ	X	X											X	X	X	X	
Sample of Asphalt	Surface	9/30/89	McL 1989	ACC		X					X (leachate)	X									X

(a) Existing well
(b) McLaren Analytical Laboratory
(c) Well no longer exists.
(d) Brown and Caldwell Analytical Laboratory.
(e) Fireman's Fund Analytical Laboratory
(f) Refer to References for complete report name.
(g) Sequoia Analytical Laboratory

TABLE B-3.1

RESULTS FROM EARTH METRICS INCORPORATED SAMPLING OF (12/87) FROM MARKETPLACE AND NIELSEN PROPERTIES

WELL OR LOG NUMBER	PARCEL NUMBER	SAMPLE DATE	ARSENIC (ppm)	BARIUM (ppm)	CADMIUM (ppm)	CHROMIUM (ppm)	COPPER (ppm)	LEAD (ppm)	NICKEL (ppm)	SELENIUM (ppm)	ZINC (ppm)
EM-1	2	1987	<12.0*	145.6*	100*	56.7*	102.9*	67.9*	41.1	ND	142.3
EM-2	BS	1987	ND	133.6*	3.5*	32.2*	24.2*	30.4*	31.4*	ND	66.0*
EM-3	2	1987	<12.9	517.8*	6.2*	59.1*	176.2*	85.2*	80.2*	ND	137.8*
EM-4 (one sample	2	1987	14.3	98.6	13.1	146.2	615.6	60	167.3	ND	79.1
EM-5	BS	1987	ND	264.3*	5.3*	56.7*	29.4*	5.8*	110.8*	ND	64.8*
EM-6	2	1987	<13.2*	141.7*	9.9*	141.8*	310.5*	45.0*	99.8*	ND	124.5*
EM-7 (one sample	2	1987	ND	45.3	1.3	29.6	7.7	ND	24.1	ND	22.4
EM-8	1	1987	19.2*	377.2*	24.8*	133.3*	46,819.0**	2,129.9**	61.7*	ND	24,317.3**
EM-8A	1	1988	<4.0	30.1	4.02	24.7	61.1	12.1	7.7	<4.0	77.3
EM-8B	1	1988	20.6	203.8	26.8	105.7	4,025.7**	2,347.7**	37.9	<48.7	8,663.4**
EM-8C	1	1988	45.5	92.2	37.6	181.6	11,663.2**	7,080.5**	82.7	<39.6	13,337.4**
EM-8D	1	1988	<3.9	71.6	1.8	33	44.9	29.1	20.3	<3.9	61.7
EM-8E	1	1988	17.9	184.4	9.91	363.6	4,585.4**	10,634.7**	<12.3	<12.5	3787.3
EM-8F	1	1988	<4.0	120.9	3.43	45.1	4,585.4**	210.9	18.6	<4.0	226.1

PARCEL 1 = ANOTHER TREE CORPORATION (RICHARD PRITZKER)
PARCEL 2 = CHRISTIE AVENUE PARTNERS-JS
PARCEL 3 = CHRISTIE AVENUE PARTNERS-JS
PARCEL 4 = CHRISTIE AVENUE PARTNERS-JS
PARCEL BS = BAY STREET - PROPERTY OF CITY OF EMERYVILLE
* Maxium of all samples collected at each depth
** Exceeds the TTLC
ND = Not Detected; NS = Not Sampled

TABLE B-3.2

RESULTS OF SOIL ANALYSIS
FROM MARKETPLACE AND NIELSEN PROPERTIES
PERFORMED BY WOODWARD-CLYDE CONSULTANTS

BORING NUMBER	PARCEL NUMBER	SAMPLE DATE	TAKEN BY	TYPE OF SAMPLE	ARSENIC (ppm)	BERYLLIUM (ppm)	CADMIUM (ppm)	CHROMIUM (ppm)
W-1	3	Jul-87	WCC	SOIL	ND	ND	ND	20
W-2	3	Jul-87	WCC	SOIL	<0.02	<0.02	<0.02	25
W-3	BS	Jul-87	WCC	SOIL	7	0.2	0.4	18
W-4	BS	Jul-87	WCC	SOIL	ND	ND	ND	6.8
W-5	BS	Jul-87	WCC	SOIL	ND	ND	ND	ND
W-6A	3	Jul-87	WCC	SOIL	ND	ND	ND	13
W-8	BS	Jul-87	WCC	SOIL	ND	ND	ND	26
B-3	3	Jul-87	WCC	SOIL	3.3	0.64	<0.2	20
B-5	3	Jul-87	WCC	SOIL	ND	ND	ND	39

WCC = Woodward Clyde Consultants
NS = NO SAMPLE; ND = NOT DETECTED
PARCEL 3 = CHRISTIE AVENUE PARTNERS - JS
PARCEL BS = BAY STREET - PROPERTY OF CITY OF EMERYVILLE

TABLE B- 3.2
(continued)

RESULTS OF SOIL ANALYSIS
FROM MARKETPLACE AND NIELSEN PROPERTIES
PERFORMED BY WOODWARD-CLYDE CONSULTANTS

BORING NUMBER	PARCEL NUMBER	COPPER (ppm)	LEAD (ppm)	NICKEL (ppm)	SELENIUM (ppm)	ZINC (ppm)	PCB (ppm)	TPH (ppm)
W-1	3	ND	130	34	ND	120	NS	78
W-2	3	22	11	29	0.4	41	<0.05	<50
W-3	BS	170	360	37	ND	260	<0.05	<50
W-4	BS	ND	460	49	<0.2	760	<0.05	650
W-5	BS	ND	69	18	ND	50	<0.05	<50
W-6A	3	ND	140	32	ND	570	<0.05	170
W-8	BS	ND	52	26	ND	52	<0.05	ND
B-3	3	28	33	45	<0.2	7	ND	ND
B-5	3	ND	380	71	ND	220	<0.05	570

WCC = Woodward Clyde Consultants
NS = NO SAMPLE; ND = NOT DETECTED
PARCEL 3 = CHRISTIE AVENUE PARTNERS - JS
PARCEL BS = BAY STREET - PROPERTY OF CITY OF EMERYVILLE

TABLE B-3.2
(continued)

RESULTS OF SOIL ANALYSIS
FROM MARKETPLACE AND NIELSEN PROPERTIES
PERFORMED BY WOODWARD-CLYDE CONSULTANTS

BORING NUMBER	PARCEL NUMBER	ETHYLENE GLYCOL (ppm)	TOLUNE (ppm)	ACROLEIN (ppm)	ACRYLONITRILE (ppm)	BENZENE (ppm)	METHYL CHLORIDE (ppm)
W-1	3	ND	ND	2	2	ND	0.2
W-2	3	ND	NS	NS	NS	NS	NS
W-3	BS	ND	NS	NS	NS	NS	NS
W-4	BS	ND	0.7	2	2	1	0.2
W-5	BS	ND	NS	NS	NS	NS	NS
W-6A	3	ND	NS	NS	NS	NS	NS
W-8	BS	ND	NS	NS	NS	NS	NS
B-3	3	ND	ND	2	2	1	0.2
B-5	3	ND	ND	2	2	1	0.2

WCC = Woodward Clyde Consultants
NS = NO SAMPLE; ND = NOT DETECTED
PARCEL 3 = CHRISTIE AVENUE PARTNERS - JS
PARCEL BS = BAY STREET - PROPERTY OF CITY OF EMERYVILLE

TABLE B-3.2
(continued)

RESULTS OF SOIL ANALYSIS
FROM MARKETPLACE AND NIELSEN PROPERTIES
PERFORMED BY WOODWARD-CLYDE CONSULTANTS

BORING NUMBER	PARCEL NUMBER	CHRYSENE (ppm)	FLUORANTHENE (ppm)	PHENANTHRENE (ppm)	PYRENE (ppm)	ACENAPHTHENE (ppm)
W-1	3	NS	NS	NS	NS	NS
W-2	3	NS	NS	NS	NS	NS
W-3	BS	NS	NS	NS	NS	NS
W-4	BS	ND	ND	ND	ND	NS
W-5	BS	NS	NS	NS	NS	NS
W-6A	3	NS	NS	NS	NS	NS
W-8	BS	NS	NS	NS	NS	NS
B-3	3	2	6	6	20	NS
B-5	3	NS	NS	NS	NS	NS

WCC = Woodward Clyde Consultants
NS = NO SAMPLE; ND = NOT DETECTED
PARCEL 3 = CHRISTIE AVENUE PARTNERS - JS
PARCEL BS = BAY STREET - PROPERTY OF CITY OF EMERYVILLE

TABLE B-3.2
(continued)

RESULTS OF SOIL ANALYSIS
FROM MARKETPLACE AND NIELSEN PROPERTIES
PERFORMED BY WOODWARD-CLYDE CONSULTANTS

BORING NUMBER	PARCEL NUMBER	BENZO(B)-FLUORANTHENE (ppm)	BENZO(K)-FLUORANTHENE (ppm)	FLUORENE (ppm)	NAPHTH-ALENE (ppm)	2,4-DINITRO-PHENOL (ppm)
W-1	3	NS	NS	NS	NS	NS
W-2	3	NS	NS	NS	NS	NS
W-3	BS	NS	NS	NS	NS	NS
W-4	BS	NS	NS	NS	NS	10
W-5	BS	NS	NS	NS	NS	NS
W-6A	3	NS	NS	NS	NS	NS
W-8	BS	NS	NS	NS	NS	NS
B-3	3	NS	NS	NS	NS	40
B-5	3	NS	NS	NS	NS	NS

WCC = Woodward Clyde Consultants
NS = NO SAMPLE; ND = NOT DETECTED
PARCEL 3 = CHRISTIE AVENUE PARTNERS - JS
PARCEL BS = BAY STREET - PROPERTY OF CITY OF EMERYVILLE

TABLE B-3.2
(continued)

RESULTS OF SOIL ANALYSIS
FROM MARKETPLACE AND NIELSEN PROPERTIES
PERFORMED BY WOODWARD-CLYDE CONSULTANTS

BORING NUMBER	PARCEL NUMBER	4,-NITRO-PHENOL (ppm)	BIS(2-ETHYLHEXYL)-PHTHALATE (ppm)	BENZIDINE (ppm)	FREON 113 (ppm)
W-1	3	NS	NS	NS	NS
W-2	3	NS	NS	NS	NS
W-3	BS	NS	NS	NS	NS
W-4	BS	20	100	40	NS
W-5	BS	NS	NS	NS	NS
W-6A	3	NS	NS	NS	NS
W-8	BS	NS	NS	NS	NS
B-3	3	200	80	2	NS
B-5	3	NS	NS	NS	NS

WCC = Woodward Clyde Consultants
NS = NO SAMPLE; ND = NOT DETECTED
PARCEL 3 = CHRISTIE AVENUE PARTNERS - JS
PARCEL BS = BAY STREET - PROPERTY OF CITY OF EMERYVILLE

TABLE B-4

SEMIVOLATILE ORGANICS IN GROUNDWATER SAMPLES FROM MARKETPLACE AND NIELSEN PROPERTIES (PPB).

Well No.	Date	Analytical Method	Total Semivolatile Organic Compounds	Other 625 Compounds	Acena-phthene	Benzo (a) Anthracene	Benzo (b) Fluoranthene	Benzo (k) Fluoranthene	Chrysene	Fluorene
Marketplace										
W-4	12/1/87	9020	97	NA	NA	NA	NA	NA	NA	NA
	8/14/89	625	NA	ND	<10	<10	<10	<10	<10	<10
W-10	8/17/89	625	NA	ND	<10	<10	<10	<10	<10	<10
W-12	12/1/87	9020	89	NA	NA	NA	NA	NA	NA	NA
W-13	8/14/89	625	NA	ND	<10	<10	<10	<10	<10	<10
W-14	8/14/89	625	NA	ND	<10	<10	<10	<10	<10	<10
W-15	8/14/89	625	NA	ND	<10	<10	<10	<10	<10	<10
Nielsen										
W-1	8/14/89	625	NA	ND	<10	<10	<10	<10	<10	<10
W-3	4/14/87	625	NA	ND	<2	<2	<2	<2	<2	<2
W-4	12/1/87	625	NA	ND	<2	<2	<2	<2	<2	<2
W-7	4/16/87	625	NA	ND	<2	<2	<2	<2	<2	<2
	8/14/89	625	NA	ND	<10	<10	<10	<10	<10	<10
W-8	4/17/87	625	NA	ND	4	2	1	1	2	9
	8/14/89	625	NA	ND	<10	<10	<10	<10	<10	<10

TABLE B-4
(Continued)

SEMIVOLATILE ORGANICS IN GROUNDWATER SAMPLES FROM MARKETPLACE AND NIELSEN PROPERTIES (PPB).
CONTINUED ...

Well No.	Date	Analytical Method	Fluoranthene	Naphthalene	Phenanthrene	Pyrene	4-Methyl Phenol
Marketplace							
W-4	12/1/87	9020	NA	NA	NA	NA	NA
	8/14/89	625	<10	<10	<10	<10	<10
W-10	8/17/89	625	<10	<10	<10	<10	<10
W-12	12/1/87	9020	NA	NA	NA	NA	NA
W-13	8/14/89	625	<10	<10	<10	<10	<10
W-14	8/14/89	625	<10	<10	<10	<10	22
W-15	8/14/89	625	<10	<10	<10	<10	<10
Nielsen							
W-1	8/14/89	625	<10	<10	<10	<10	<10
W-3	4/14/87	625	<2	<2	<2	<2	4
W-4	12/1/87	625	<2	<2	<2	<2	<2
W-7	4/16/87	625	<2	<2	<2	<2	NA
	8/14/89	625	<10	<10	<10	<10	<10
W-8	4/17/87	625	4	30	5	5	NA
	8/14/89	625	<10	16	<10	<10	<10

TABLE B-4
(Continued)

SEMIVOLATILE ORGANICS IN GROUNDWATER SAMPLES FROM MARKETPLACE AND NIELSEN PROPERTIES (PPB).
CONTINUED ...

Well No.	Date	Analytical Method	C1-Naphthalene	C2-Naphthalene	C2-Phenanthrene	C3-Benzene	C9-C35 Hydrocarbons	Butanoic Acid
Marketplace								
W-4	12/1/87	9020	NA	NA	NA	NA	NA	NA
	8/14/89	625	NA	NA	NA	NA	NA	NA
W-10	8/17/89	625	NA	NA	NA	NA	NA	NA
W-12	12/1/87	9020	NA	NA	NA	NA	NA	NA
W-13	8/14/89	625	NA	NA	NA	NA	NA	NA
W-14	8/14/89	625	NA	NA	NA	NA	NA	NA
W-15	8/14/89	625	NA	NA	NA	NA	NA	NA
Nielsen								
W-1	8/14/89	625	NA	NA	NA	NA	NA	NA
W-3	4/14/87	625	<2	<2	<2	<2	<2	NA
W-4	12/1/87	625	NA	NA	NA	NA	NA	NA
W-7	4/16/87	625	<2	<2	<2	<2	<2	400
	8/14/89	625	NA	NA	NA	NA	260	NA
W-8	4/17/87	625	50	40	NA	60	10000	<1
	8/14/89	625	NA	NA	NA	NA	NA	NA

TABLE B-4
(Continued)

SEMIVOLATILE ORGANICS IN GROUNDWATER SAMPLES FROM MARKETPLACE AND NIELSEN PROPERTIES (PPB).
CONTINUED ...

Well No.	Date	Analytical Method	Hexanoic Acid	Pentanoic Acid	Propanoic Acid
Marketplace					
W-4	12/1/87	9020	NA	NA	NA
	8/14/89	625	NA	NA	NA
W-10	8/17/89	625	NA	NA	NA
W-12	12/1/87	9020	NA	NA	NA
W-13	8/14/89	625	NA	NA	NA
W-14	8/14/89	625	NA	NA	NA
W-15	8/14/89	625	NA	NA	NA
Nielsen					
W-1	8/14/89	625	NA	NA	NA
W-3	4/14/87	625	NA	NA	NA
W-4	12/1/87	625	NA	NA	NA
W-7	4/16/87	625	300	200	1000
	8/14/89	625	NA	NA	NA
W-8	4/17/87	625	<1	<1	<1
	8/14/89	625	NA	NA	NA

TABLE B-5

CONCENTRATIONS OF METALS IN GROUNDWATER SAMPLES FROM WELLS ON MARKETPLACE AND NIELSEN PROPERTIES (PPM).

Well No.	Date	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Cobalt	Copper
Marketplace									
W-4	1/20/81	NA	<0.0005	NA	NA	<0.01	<0.01	<0.01	<0.01
	12/1/87	<0.5	<0.2	0.5	<0.01	<0.005	0.06	0.06	3.88
	8/14/89	<0.5	0.04	NA	<0.05	<0.01	<0.02	NA	<0.02
W-5	1/20/81	NA	<0.0005	NA	NA	<0.01	<0.01	<0.01	<0.01
W-10	1/20/81	NA	<0.0005	NA	NA	<0.01	<0.01	<0.01	0.02
	8/17/89	<0.5	0.02	NA	<0.05	<0.01	<0.02	NA	<0.02
W-12	1/20/81	NA	<0.0005	NA	NA	<0.01	<0.01	<0.01	<0.01
	12/1/87	<0.5	<0.2	26.8	<0.01	<0.058	0.7	0.12	127.5
W-13	8/14/89	<0.5	0.04	NA	<0.05	<0.01	<0.02	NA	<0.02
W-14	8/14/89	<0.5	0.08	NA	<0.05	<0.01	<0.02	NA	<0.02
W-15	8/14/89	<0.5	0.04	NA	<0.05	<0.01	<0.02	NA	<0.02
Nielsen									
W-1	4/14/87	NA	NA	NA	NA	NA	0.05	NA	NA
	8/14/89	<0.5	0.1	NA	<0.05	<0.01	<0.02	NA	<0.02
W-2	4/14/87	<0.1	0.006	NA	<0.1	<0.1	<0.02	<0.050	<0.02
W-3	4/14/87	<0.1	0.002	NA	<0.1	<0.1	<0.02	<0.050	<0.02
W-4	4/14/87	NA	NA	NA	NA	NA	0.11	NA	NA
W-5A	4/16/87	NA	NA	NA	NA	NA	<0.02	NA	NA
W-6A	4/16/87	NA	NA	NA	NA	NA	0.02	NA	NA
W-7	4/16/87	<0.1	0.016	NA	<0.1	<0.1	0.08	<0.05	0.16
	8/14/89	<0.5	0.006	NA	<0.05	<0.01	0.03	NA	0.02
W-8	4/17/87	NA	NA	NA	NA	NA	<0.02	NA	NA
	8/14/89	<0.5	0.1	NA	<0.05	<0.01	<0.02	NA	<0.02

TABLE B-5
(Continued)

CONCENTRATIONS OF METALS IN GROUNDWATER SAMPLES FROM WELLS ON MARKETPLACE AND NIELSEN PROPERTIES (PPM).
CONTINUED ...

Well No.	Date	Lead	Manganese	Mercury	Molybdenum	Nickel	Selenium	Silver
Marketplace								
W-4	1/20/81	0.003	NA	NA	NA	<0.01	NA	NA
	12/1/87	<0.05	9.05	<0.05	0.15	<0.05	<0.2	<0.2
	8/14/89	<0.05	NA	<0.002	NA	<0.02	<0.001	<0.05
W-5	1/20/81	<0.001	NA	NA	NA	<0.01	NA	NA
W-10	1/20/81	0.004	NA	NA	NA	<0.01	NA	NA
	8/17/89	<0.05	NA	<0.002	NA	0.02	<0.001	<0.05
W-12	1/20/81	<0.001	NA	NA	NA	<0.01	NA	NA
	12/1/87	2.9	6.83	<0.05	0.15	0.53	<0.2	<0.2
W-13	8/14/89	<0.05	NA	<0.002	NA	<0.02	<0.001	<0.05
W-14	8/14/89	<0.05	NA	<0.002	NA	0.02	<0.001	<0.05
W-15	8/14/89	<0.05	NA	<0.002	NA	<0.02	<0.001	<0.05
Nielsen								
W-1	4/14/87	0.004	NA	NA	NA	< 0.05	NA	NA
	8/14/89	<0.05	NA	<0.002	NA	<0.02	<0.001	<0.05
W-2	4/14/87	<0.001	NA	0.0003	NA	< 0.05	<0.001	<0.01
W-3	4/14/87	<0.001	NA	0.0002	NA	< 0.05	<0.001	<0.01
W-4	4/14/87	0.002	NA	NA	NA	0.15	NA	NA
W-5A	4/16/87	<0.1	NA	NA	NA	< 0.05	NA	NA
W-6A	4/16/87	0.1	NA	NA	NA	< 0.05	NA	NA
W-7	4/16/87	0.7	NA	0.0017	NA	0.2	<0.001	<0.01
	8/14/89	0.08	NA	<0.002	NA	0.07	<0.001	<0.05
W-8	4/17/87	<0.1	NA	NA	NA	< 0.05	NA	NA
	8/14/89	<0.05	NA	<0.002	NA	<0.02	<0.001	<0.05

TABLE B-5
(Continued)

CONCENTRATIONS OF METALS IN GROUNDWATER SAMPLES FROM WELLS ON MARKETPLACE AND NIELSEN PROPERTIES (PPM).
CONTINUED ...

Well No.	Date	Tin	Thallium
Marketplace			
W-4	1/20/81	NA	NA
	12/1/87	<0.1	<0.5
	8/14/89	NA	<1.0
W-5	1/20/81	NA	NA
W-10	1/20/81	NA	NA
	8/17/89	NA	<1.0
W-12	1/20/81	NA	NA
	12/1/87	<0.1	<0.5
W-13	8/14/89	NA	<1.0
W-14	8/14/89	NA	<1.0
W-15	8/14/89	NA	<1.0
Nielsen			
W-1	4/14/87	NA	NA
	8/14/89	NA	<1.0
W-2	4/14/87	NA	0.1
W-3	4/14/87	NA	<0.1
W-4	4/14/87	NA	NA
W-5A	4/16/87	NA	NA
W-6A	4/16/87	NA	NA
W-7	4/16/87	NA	0.1
	8/14/89	NA	<1.0
W-8	4/17/87	NA	NA
	8/14/89	NA	<1.0

TABLE B-6

GENERAL MINERALS ANALYSIS OF GROUNDWATER SAMPLES FROM WELLS AT THE NIELSEN PROPERTY (mg/L).

Well No.	Date	TDS	Turbidity (NTU)	pH	Specific Conductivity (umhos/cm)	Chloride	Carbonate Alk as CaCO3	Bicarbonate Alk as CaCO3	Hydroxide Alk as CaCO3	Total Alkalinity as CaCO3
W-1	4/14/87	NA	NA	6.9*	1600*	NA	NA	NA	NA	NA
	8/14/89	950	NA	7.2	1300	50	NA	NA	NA	NA
W-2	4/14/87	NA	NA	NA	2900*	NA	NA	NA	NA	NA
W-3	4/14/87	NA	NA	6.7*	400*	NA	NA	NA	NA	NA
	4/14/87	370	130	6.7	520	18	<1	210	<1	210
W-4	4/14/87	NA	NA	6.5*	1500*	NA	NA	NA	NA	NA
W-5A	4/9/87	NA	NA	NA	1600*	NA	NA	NA	NA	NA
	4/16/87	NA	NA	7	1840	NA	NA	NA	NA	NA
W-6A	4/13/87	NA	NA	6.6*	4200*	NA	NA	NA	NA	NA
	4/16/87	NA	NA	7.2	5790	NA	NA	NA	NA	NA
W-7	4/16/87	NA	NA	NA	4800*	NA	NA	NA	NA	NA
	4/16/87	3070	300	6.5	6500	1290	<1	1740	<1	1740
	8/14/89	7100	NA	6.7	10000	2800	NA	NA	NA	NA
W-8	4/17/87	NA	NA	6.7*	1100*	NA	NA	NA	NA	NA
	4/17/87	NA	NA	6.4	1300	NA	NA	NA	NA	NA
	8/14/89	850	NA	6.3	1000	60	NA	NA	NA	NA
Marketplace Property										
W-4	8/14/89	830	NA	7	1300	120	NA	NA	NA	NA
W-10	8/17/89	860	NA	11.7	1200	50	NA	NA	NA	NA
W-13	8/14/89	940	NA	7.8	1400	170	NA	NA	NA	NA
W-14	8/14/89	1500	NA	8.3	2600	950	NA	NA	NA	NA
W-15	8/14/89	830	NA	7.3	1300	180	NA	NA	NA	NA

* Field Test Results From Woodward-Clyde, August 1987, Report

TABLE B-6
(Continued)

GENERAL MINERALS ANALYSIS OF GROUNDWATER SAMPLES FROM WELLS AT THE NIELSEN PROPERTY (mg/L). CONTINUED ...

Well No.	Date	Manganese	Nitrate (as N)	Nitrite (as N)	Ammonia Nitrogen	Total Kjeldahl Nitrogen	Total Phosphorus (as P)	Potassium	Silica as SiO2	Sodium	Sulfate
W-1	4/14/87	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	8/14/89	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
W-2	4/14/87	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
W-3	4/14/87	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	4/14/87	15	1	<0.01	0.66	0.66	0.71	1.7	50	53	57
W-4	4/14/87	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
W-5A	4/9/87	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	4/16/87	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
W-6A	4/13/87	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	4/16/87	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
W-7	4/16/87	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	4/16/87	68	<0.10	<0.01	51	63	4.7	56	72	800	37
	8/14/89	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
W-8	4/17/87	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	4/17/87	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	8/14/89	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Marketplace Property											
W-4	8/14/89	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
W-10	8/17/89	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
W-13	8/14/89	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
W-14	8/14/89	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
W-15	8/14/89	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

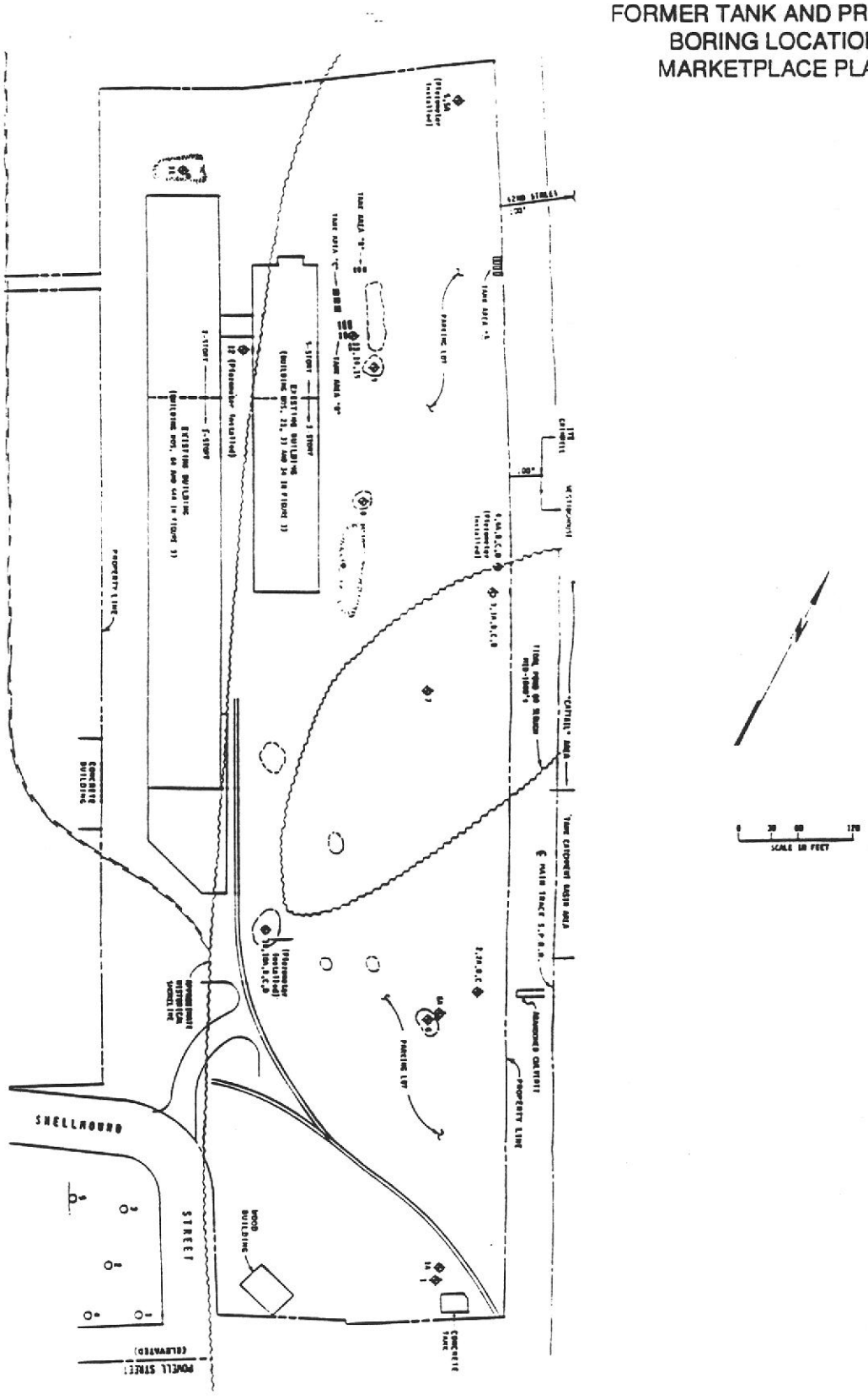
TABLE B-6

(Continued)

GENERAL MINERALS ANALYSIS OF GROUNDWATER SAMPLES FROM WELLS AT THE NIELSEN PROPERTY (mg/L). CONTINUED ...

Well No.	Date	Calcium	Fluoride
W-1	4/14/87	NA	NA
	8/14/89	NA	NA
W-2	4/14/87	NA	NA
W-3	4/14/87	NA	NA
	4/14/87	18	0.33
W-4	4/14/87	NA	NA
W-5A	4/9/87	NA	NA
	4/16/87	NA	NA
W-6A	4/13/87	NA	NA
	4/16/87	NA	NA
W-7	4/16/87	NA	NA
	4/16/87	210	1.3
	8/14/89	NA	NA
W-8	4/17/87	NA	NA
	4/17/87	NA	NA
	8/14/89	NA	NA
Marketplace Property			
W-4	8/14/89	NA	NA
W-10	8/17/89	NA	NA
W-13	8/14/89	NA	NA
W-14	8/14/89	NA	NA
W-15	8/14/89	NA	NA

FIGURE B-1
FORMER TANK AND PREVIOUS
BORING LOCATIONS
MARKETPLACE PLACE



McLaren

FROM: WOODWARD CLYDE, 1982

Groundwater levels were measured at each boring location at the time of drilling (Section B.3.4). Groundwater samples from all wells were analyzed for dissolved metals and groundwater from Well W-4 was analyzed for VOCs (Section B.3.3). The investigation was adequate to assess the possibility of presence of chemicals in soil and groundwater due to previous industrial activities.

The conclusions of this report were as follows:

- Site soils do not appear to contain VOCs, organochlorine pesticides, or PCBs, at concentrations which would be classified as hazardous by DHS.

- Groundwater beneath the site does not contain heavy metals or VOCs at concentrations above DHS drinking water standards or fish toxicity criteria.

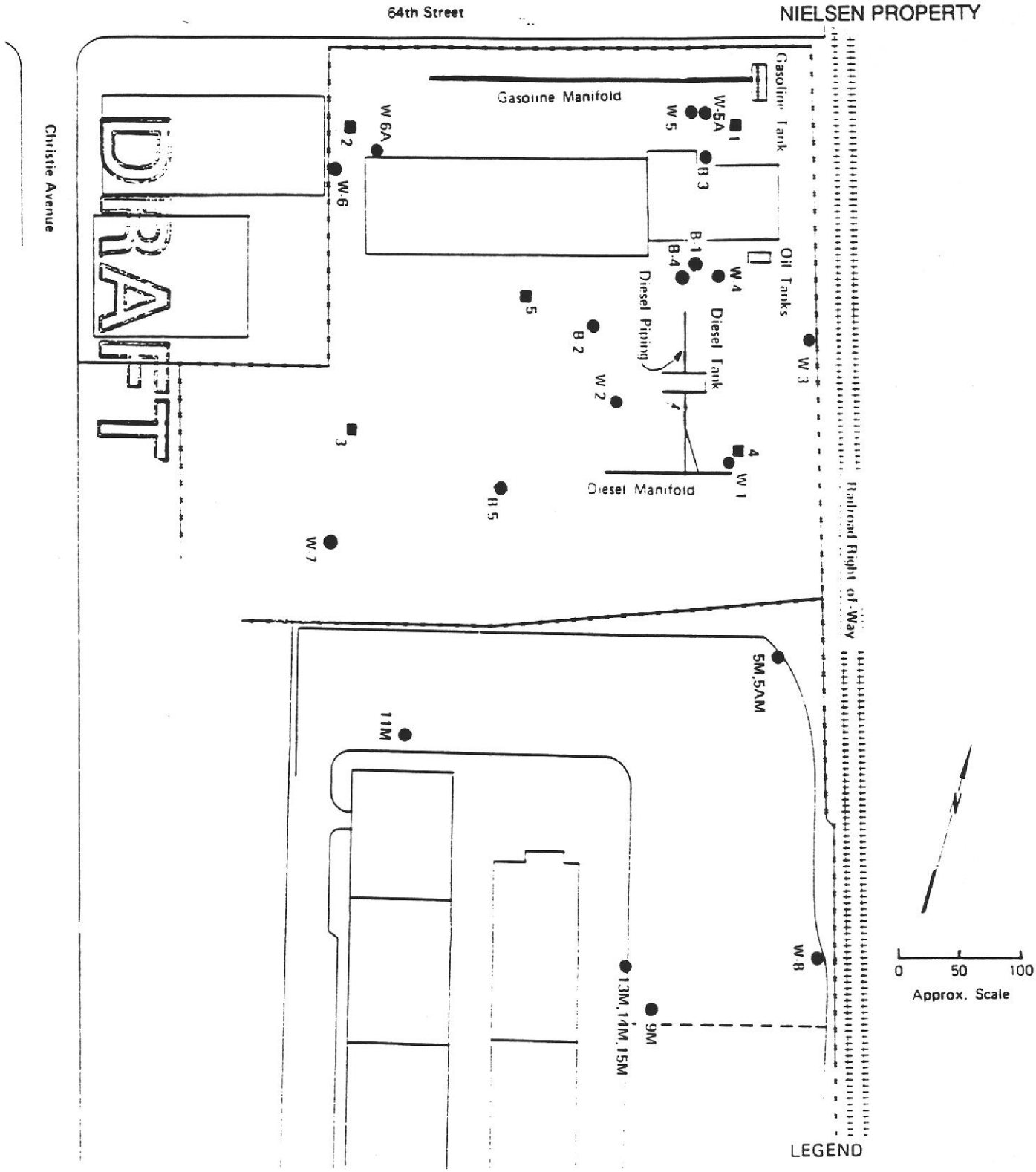
- Several heavy metals in soils on the site exist at concentrations that exceed the total threshold limit concentration (TTLC) for hazardous waste as specified by DHS in the California Code of Regulations (CCR) Title 22 Section 66699. [Note: Since 1982, the TTLCs have been modified and the metal concentrations measured at the Marketplace no longer exceed the current TTLCs.]

- Metals detected in artificial fill appear to be firmly adsorbed by the fill soils, and the sealed condition of the ground surface virtually eliminates the potential for leaching of metal contaminants to groundwater beneath the site.

B.1.2 Nielsen Freight Line Property, 1987

An investigation of the Nielsen Freight Line Property was reported in 1987 in Environmental Assessment Former Nielsen Freight Line Site and Adjacent Parcel Emeryville, California (WCC, 1987). The purpose of this investigation was to document the removal of underground tanks on the Nielsen property and to determine the suitability of the land for future development. This study included 15 soil borings drilled to a maximum depth of 4 to 16 feet, eight of which were converted to groundwater monitoring wells. The borings are labelled B-1 through B-5 and the wells are labelled W-1 through W-8 on Figure B-2. Well W-8 was installed off-site on the Marketplace property. Well construction and development techniques are described in Section B.3.2. Twelve soil samples and groundwater samples from each well were analyzed selectively for various compounds as listed in Table B-2 and B-3. The analyses performed on each sample were chosen based on the sample location relative to a nearby tank or storage area as shown on Figure B-2. Soil and groundwater sampling techniques are described in Sections B.3.1 and B.3.3. Floating product was found in Well 5M on the Marketplace property (presently Well W-5). The analytical results for groundwater samples are provided in Tables 3-4 through 3-6.

FIGURE B-2
WELL AND BORING LOCATIONS
NIELSEN PROPERTY



FROM: WOODWARD CLYDE, 1987

Based on the locations of underground tanks, it appears that an adequate number of soil borings and groundwater wells were installed to evaluate possible tank leak problems. The conclusions drawn in this report were:

- No PCBs were detected in the shallow groundwater for the 4 monitoring wells tested for PCBs in this study. PCBs had previously been detected at the Westinghouse site upgradient from the Marketplace site.

- Metal concentrations in the 12 soil samples were well below TTLC levels.

- The results of metals analyses of groundwater indicated presence of lead in Wells W-6 and W-7 and chromium in Wells W-4 and W-7 above DHS drinking water standards. Otherwise, metal concentrations in groundwater were below drinking water standards.

- A floating black liquid was observed at Well W-5, located on the Marketplace property. This well had been installed during the 1982 investigation of the Marketplace Property. However, no mention of free product on the groundwater was made in that report. In this report, the material was found to contain polynuclear aromatic compounds (PNAs) and was thought to be a heavy oil from early refinery operations. Hydrocarbons were also detected in shallow soils at Well W-8.

B.1.3 Soils Characterization, Marketplace 1988

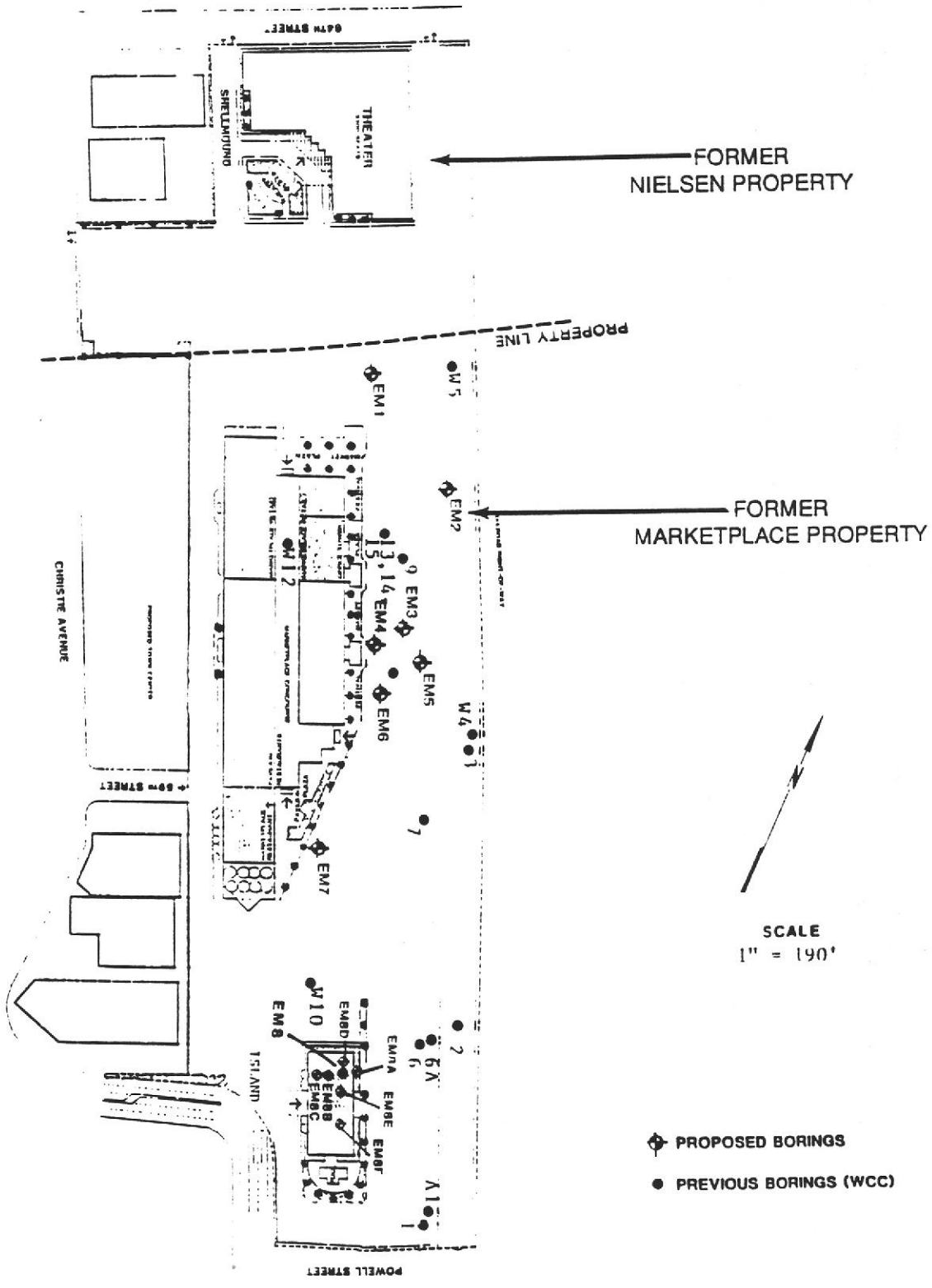
The purpose of the investigation reported in Draft Work Plan For Soils Contamination Characterization of Marketplace Site in Emeryville, California, (Earth Metrics, 1988) was to determine the disposition of the asphaltic material interdispersed in the soil throughout the northern and central parts of the site.

Fourteen exploratory borings were drilled on the site and are labelled EM-1 through EM-8 and EM-8A through EM-8F on Figure B-3. A total of 18 soil samples were sampled according to the methods described in Section B.3.1 and were analyzed according to methods listed in Table B-3. The analytical laboratories which performed the testing were DHS certified and used EPA test methods outlined in SW-846 (Letter to Walter Kaczmarek from Marc Papineau, Earth Metrics dated January 12, 1990).

The boring locations in this investigation were chosen to correspond with potential areas where anomalous subsurface conditions might exist. Previously installed monitoring wells, W-4, W-5, and W-12 were resampled. Both the soil borings and the groundwater wells sampled in this investigation were adequate at the time for the purpose of characterizing the extent of the asphalt material and for determining any migration of the asphalt material into the groundwater.

The conclusions and recommendations drawn in this report were:

FIGURE B-3
BORING LOCATIONS
MARKETPLACE PROPERTY



FROM: EARTH METRICS, 1988

- Based on test results and applicable DHS CCR Title 22 criteria, the asphalt material found in the soils at the site was determined not to be hazardous waste.

- Copper, mercury, lead and zinc exceeded their respective TTLCs in soil samples collected from boring EM-8. Occurrence of these metals is limited to the upper 5 feet of soil beneath the ground surface in this isolated area. The lateral extent of these metals is likely limited to within 15 feet of boring EM-8. [Note: Soil boring EM-8 is located on Parcel 1, owned by Another Tree Development Corporation]

- The report concluded that Well W-5 contains a "waste petroleum product" and that this material should probably be pumped out of this well and containerized for proper disposal.

B.1.4 Characterization of Asphaltic Material, 1988

An investigation was performed to characterize the asphaltic material found in excavated soil (ATT, 1988). The purpose of this investigation was to evaluate the hazardous waste characteristics of the asphaltic material in accordance with criteria set forth in Title 22 CCR, Article 11 for self-classification of waste material.

Two soil samples were collected of the asphaltic material from on-site test pits and one sample of the free product was collected from Well W-5. The samples were collected of what appeared to be nearly pure asphaltic material and product in order to determine if the pure materials were hazardous. The areas where the samples were taken are shown in Figure B-4. Analyses performed on soil samples are listed in Table B-3 and analyses of the free product are tabulated in Table B-8.

Based on the sampling results, ATT concluded that the asphaltic material in the soil was not hazardous in accordance to the criteria set forth in Title 22 CCR, Article 11 and therefore disposal of soil containing the asphaltic material could be managed as nonhazardous.

B.1.5 Marketplace/Nielsen Properties 1989a

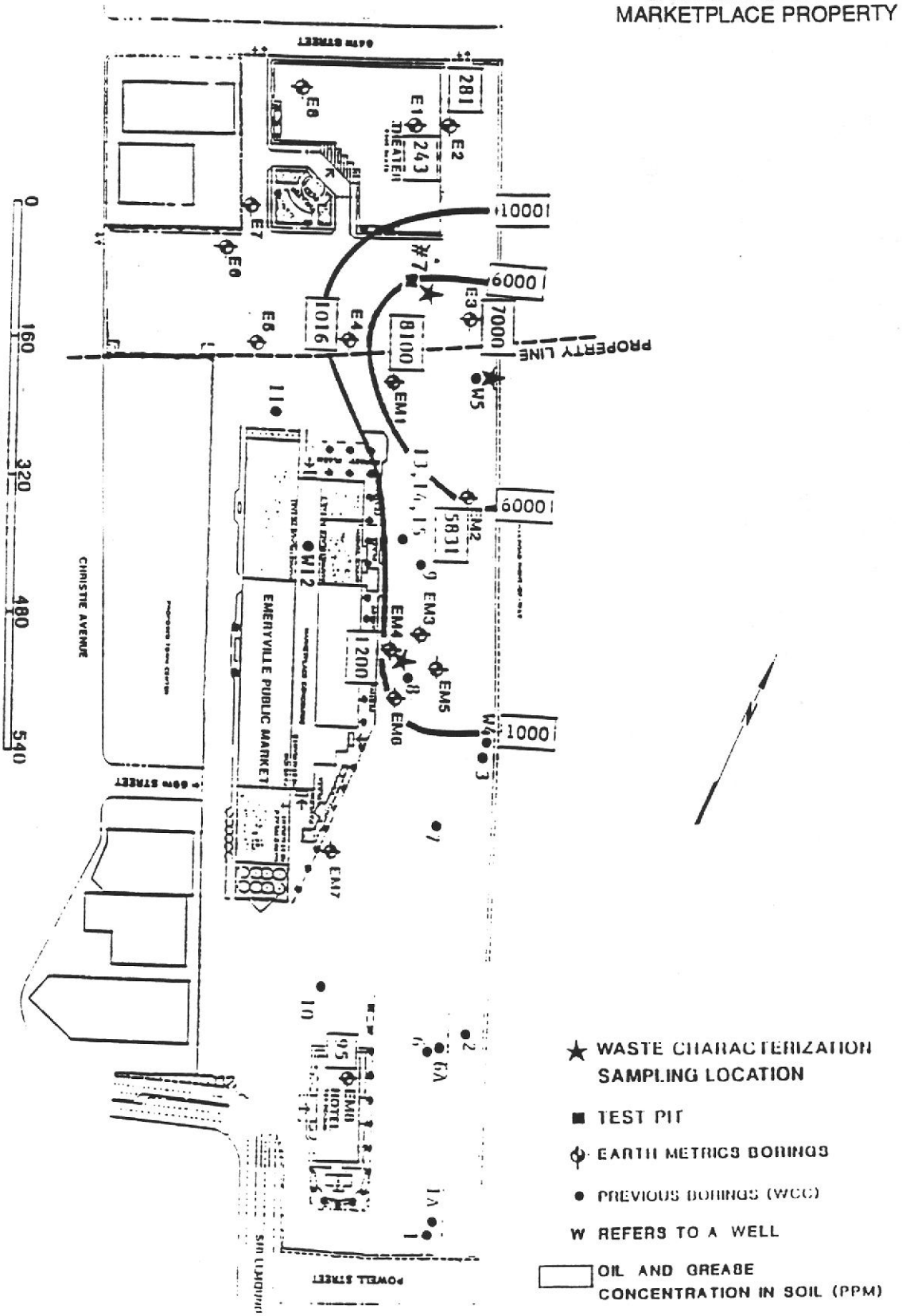
The purpose of "Data Review and Work Plan To Conduct Further Groundwater Characterization at the Marketplace/Nielsen Properties The Martin Group, (McLaren, 1989a) was to evaluate the existing data from previous reports and provide a work plan for additional groundwater investigations to further characterize groundwater quality.

Based on a review of data from previous investigations, the following conclusions were reached about the Marketplace site:

Groundwater Flow

- Based on limited data, groundwater appears to flow beneath the site in a predominantly westerly direction; and

FIGURE B-4
WASTE CHARACTERIZATION
SAMPLING LOCATION
MARKETPLACE PROPERTY



* Sample identified as E1(TP5)(#7) on the chain of custody and 1 on the laboratory reports.

Source: Earth Metrics March 11, 1988

McLaren

FROM: AQUA TERRA TECHNOLOGIES, 1988

- Groundwater occurs in unconfined conditions within fill material and at less than five feet beneath the ground surface.

Additional groundwater flow data are required to determine

- The actual groundwater flow direction across the site; and
- The sustained yield of groundwater wells beneath the site.

Chemical Distribution in Groundwater

- Fuel type hydrocarbons and PNA compounds were previously detected in one upgradient well on the Marketplace site;
- Metals are detected in groundwater beneath the site at several locations; and
- Electrical conductivity across the western part of the site is greater than 5,000 µmhos/cm (above DHS drinking water criteria).

Additional water quality data are required to further define

- The upgradient and downgradient extent of fuel hydrocarbons, PNA compounds and metals;
- The level of total dissolved solids (TDS), electrical conductivity and salinity of groundwater beneath the site; and
- The extent of chemicals in groundwater at Well W-5.

B.1.6 Marketplace/Nielsen Properties 1989b

Further groundwater quality investigations were conducted at the Marketplace site in August, 1989. This investigation was reported in "Results of the Hydrogeologic Investigation Conducted at the Marketplace/Nielsen Properties, The Martin Group" (McLaren, 1989b). The characterization was conducted to determine the extent of chemicals in the groundwater and to assess whether chemicals may be migrating off-site. The investigation was conducted to respond to a regulatory request for more comprehensive groundwater data.

The field investigation for this study involved: 1) the construction of three groundwater monitor wells (described in Section B.3.2), 2) the sampling and analysis of groundwater from five existing wells and the three new wells (described in Section B.3.3), 3) surveying all wells and measuring water table elevations (described in Section B.3.4), and 4) interpretation of site geology, hydrogeology, and the distribution of chemicals in groundwater. Figure 1-2 in the report illustrates the location of monitor Wells W-13, W-14, and W-15, drilled for this investigation. All new and old wells were sampled (Section B.3.3) and the analyses performed are summarized in Table B-2. The analytical results for groundwater samples are provided in Tables B-4 through B-6

This investigation included a review of off-site contamination sources to determine their potential impact on the Marketplace/Nielson site. This review is included in Section B.4.

As shown on Figure 1-2 of the report, two of the new wells (W-13 and W-14) installed on the site were drilled downgradient of all other previous wells. This was done in order to evaluate the extent of off-site chemical migration. The third monitoring well (W-15) was screened vertically below Well W-5 in order to determine if free product from Well W-5 occurred in groundwater at greater depth. The depth range where floating product was observed in Well W-5 was sealed off by surface casing in Well W-5. Additionally, the five existing wells were located in areas likely to identify chemical migration.

Based on data collected from all new and existing wells, McLaren concluded:

- In general metal concentrations did not exceed State MCLs. However, arsenic was detected at 0.1 ppm in two wells (W-1 and W-8), and at 0.08 ppm in well W-14, this exceeds the State MCL of 0.05 ppm (CCR, Title 26 Section 22-64435); and lead was detected in Well W-1 at a concentration of 0.08 ppm, this also exceeds the State MCL for lead of 0.05 ppm (CCR, Title 26 Section 22-64435).

- Floating petroleum product was observed in Well W-5. It was also observed at 3 feet below grade when drilling Well W-15. This depth interval was sealed by surface casing in Well W-15. This liquid substance is distinctly different in appearance from the asphaltic material previously reported in site soils and is believed to be of a different origin.

- TDS and EC levels in groundwater for most of the site are above levels considered suitable for drinking water. Groundwater at this site is not extracted for any beneficial use. These observations support the conclusion that there is no potential for human exposure via drinking water ingestion to chemicals in groundwater.

- The lack of evidence of migration of chemicals in groundwater off-site and the relatively low levels detected on-site, indicate that there is not a significant hazard to aquatic life in the San Francisco Bay from migration of chemicals in the groundwater.

B.1.7 Marketplace Free Product and Asphaltic Material Characterization, October 1989

An additional investigation was conducted on the Marketplace site in October 1989 to chemically characterize and differentiate between the free product in Well W-5 and the asphaltic material found near this well and elsewhere on the site. This investigation was reported in the "Marketplace Free Product Subsurface Investigation" (McLaren, 1989c).

The field investigation for this assessment involved the drilling and construction of three monitoring wells to determine the lateral extent of the free product in the vicinity of Well W-5 (Section B.3.2). These wells are shown on Figure 1-2 of the report as W-16, W-17, and W-18. Groundwater samples were collected from new and selected existing wells and free product was sampled from Well W-5 and analyzed to determine the type of hydrocarbon present (Section B.3.3). The asphaltic material was also characterized to assess its chemical and physical similarities to the free product and to assess potential chemical leaching from this matrix (Section B.5). This investigation included sounding the wells to determine the presence and depth of the free product and removal of any free product from Well W-5 on a weekly basis in order to estimate the rate of free product recharge.

All of the existing and new monitoring wells were sounded with an oil-water interface probe to determine the presence and amount of free product (Sections B.3.4 and B.3.5). Free product was detected only in monitoring Wells W-5 and W-16. The depth of the free product in Well W-5 was sounded on four occasions and ranged from 0.51 to 1.02 feet in depth, with an average depth of 0.74 feet. Well W-16 was reported to contain free product at the time it was constructed and 0.07 feet of free product was measured in October, 1989. Analyses conducted on the groundwater are listed in Table B-2.

Wells W-16, W-17 and W-18 were drilled both upgradient (Well W-16) and downgradient (W-17 and W-18) of Wells W-5 and W-15 to further characterize the extent of free product. Based on the characterization of the free product, the following conclusions were drawn:

- Free product was detected in Wells W-5 and W-16, located on the upgradient side of the site and is believed to be isolated to this area. Free product was not found in samples from Wells W-17 and W-18. The upgradient off-site extent of the free product has not been fully determined;

- The free product was determined to be either a heavy gas oil or a heavy crude oil which may have been in the soil in excess of 30 years and has shown little if no subsurface movement during this time. This observation suggests that this material is unlikely to migrate to downgradient, off-site locations; and

- Under RWQCB "Tri-Regional Staff Recommendations" dated June 2, 1988, groundwater monitoring and removal of product may need to be initiated.

Based on the characterization of the asphalt-like substance, the following conclusions were drawn:

- Under "worst-case" conditions simulated by the Toxicity Characteristic Leaching Procedure (TCLP) only small amounts of Benzene, Toluene, Xylene, and Ethylbenzene (BTEX), (<200 ppb), Total Petroleum. Hydrocarbons as diesel (TPH/D), (<400 ppb) and two SOCs were leached. Under the conditions expected to occur

at the Marketplace site, significant leaching of the asphaltic material is not expected to occur.

- BTXE has been detected at low concentrations (Benzene at 5.5 ppb in W-16 and Xylenes at 1.3 ppb in W-16) in only two wells located on the northeastern, upgradient boundary of the site. This indicates that volatile aromatics have not leached into the groundwater over the extensive period the material has been in the soil.

- As determined previously (ATT, 1988) the asphaltic material was self-classified under CCR Title 22 as non-hazardous.

- Although in areas free product and the asphaltic material are co-located, in other areas of the site the asphaltic material is found alone. Therefore, these appear to be two unrelated substances.

0529rn3

SECTION B.2

BORING LOGS FROM PREVIOUS INVESTIGATIONS

SECTION B.2.1

MARKETPLACE PROPERTY, 1982

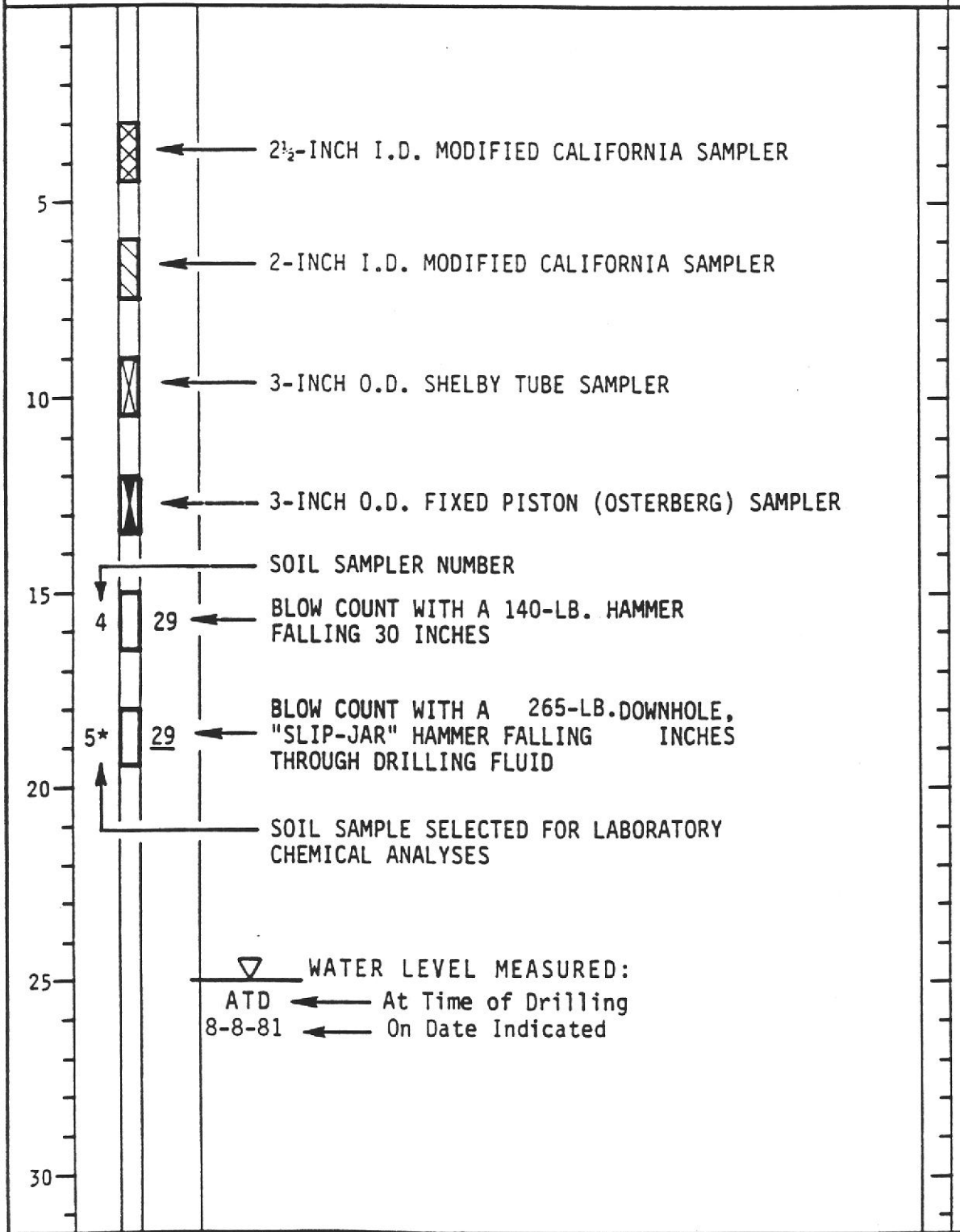
FROM: WOODWARD CLYDE. 1982

Project MARKETPLACE CONTAMINANT ASSESSMENT
Emeryville, California

BORING LOG LEGEND SHEET

Date Drilled: _____ Remarks: _____
Type of Boring: _____
Hammer Weight: _____

Depth, Ft	Samples	Blows/Ft	DESCRIPTION	LABORATORY TESTS: Moisture Content, %	Dry Density, pcf	Unconfined Compressive Strength, psf



Proj. No. 15093A | Woodward-Clyde Consultants | Figure A-g

Project	Log of Boring No. 1
MARKETPLACE CONTAMINANT ASSESSMENT Emeryville, California	

Date Drilled: Auger/Rotary
Type of Boring: July 30, 1981
Hammer Weight: 140 lbs.
Remarks:
(See Legend Sheet for sampler types and hammer weights)

Surface Elevation: 8.64' City of Emeryville Datum

Depth, Ft.	Samples	Blows/Ft.	MATERIAL DESCRIPTION	LABORATORY TESTS: Moisture Content, %	Dry Density, pcf	Unconfined Compressive Strength, psf
	1	25	2" Asphalt GRAVELLY SANDY CLAY; AGGREGATE BASE MATERIAL FILL			
			SILTY CLAY (CH) Medium stiff to stiff, damp, dark brown, Bay Mud			
5	2*	30	SILTY CLAY (CL-CH) Medium stiff to stiff, moist, green-gray			
			BOTTOM OF HOLE @ 5½'			
10						
15						

Proj. No. 15093A | Woodward-Clyde Consultants | Figure A-1

Project MARKETPLACE CONTAMINANT ASSESSMENT
Emeryville, California

Log of Boring No. 1A

Date Drilled: August 5, 1981
Type of Boring: Auger/Rotary
Hammer Weight: 140 lbs.

Remarks:

(See Legend Sheet for sampler types and hammer weights)

Depth, Ft.	Samples	Blows/Ft.	MATERIAL DESCRIPTION	LABORATORY TESTS: Moisture Content, %	Dry Density, pcf	Unconfined Compressive Strength, psf
			Surface Elevation: 8.73' City of Emeryville Datum			
			2" Asphalt 10" SANDY GRAVELLY CLAY; AGGREGATE BASE MATERIAL			
			SANDY CLAY FILL : Damp, with rocks — FILL			
			SILTY CLAY (CH) Stiff, dark brown, with organics, fibers, roots; Bay Mud			
			SILTY CLAY (CL-CH) Stiff, moist, green-gray, with root fibers, trace dark gray and brown			
5			Becomes stiff to very stiff, wet, gray and light brown mottled, trace fine gravel			
	1	11	▽ 8-6-81			
			BOTTOM OF HOLE @ 9'			
10						
15						

Proj. No. 15093A | Woodward-Clyde Consultants | Figure A-1a

Project: MARKETPLACE CONTAMINANT ASSESSMENT
Emeryville, California

Log of Boring No. 2

Date Drilled: August 3, 1981
Type of Boring: Auger/Rotary
Hammer Weight: 140 lbs.

Remarks:

(See Legend Sheet for sampler types and hammer weights)

Surface Elevation: 8.78' City of Emeryville Datum

Depth, Ft.	Samples	Blows/Ft.	MATERIAL DESCRIPTION	LABORATORY TESTS: Moisture Content, %	Dry Density, pcf	Unconfined Compressive Strength, psf
			2" Asphalt 10" GRAVELLY CLAY; AGGREGATE BASE MATERIAL			
	1*	41	RUBBLE FILL Concrete, brick fragments, gravel to 1" Ø in sand Asphalt piece			
	2*	48	SILTY CLAY FILL Medium stiff to stiff, dark green, with wood pieces, gravel			
5	3	28/2"	SAND / SANDSTONE FILL Dense, black / hard, green, with rubble, gravel to 1" Ø Wood FILL			
	4	38	SILTY CLAY (CL): Stiff to very stiff, light brown, with some green-gray mottling, with trace fine gravel Becomes stiffer			
10	5	92	SANDY CLAY (CL): Very stiff, light brown, orange brown and gray mottled, with some gravel			
			BOTTOM OF HOLE @ 11'			
15						

Proj. No. 15093A | Woodward-Clyde Consultants | Figure A-2

Project MARKETPLACE CONTAMINANT ASSESSMENT
Emeryville, California

Log of Boring No. 2A,B,C

Date Drilled: August 3, 1981
Type of Boring: Auger
Hammer Weight: ---

Remarks:

(See Legend Sheet for sampler types and hammer weights)

Depth, Ft.	Samples	Blows/Ft.	MATERIAL DESCRIPTION	LABORATORY TESTS: Moisture Content, %	Dry Density, pcf	Unconfined Compressive Strength, psf
			Surface Elevation:			
			2" Asphalt 6" GRAVELLY CLAY; AGGREGATE BASE MATERIAL			
			SANDY GRAVELLY CLAY FILL Medium stiff, moist, gray-green, with brick, concrete and wood			
5			▽ Water level for Boring No. 2C 8-4-81			
			Concrete slab or foundation →			
			← BOTTOM OF HOLE @ 5½'			
10						
15						

Project MARKETPLACE CONTAMINANT ASSESSMENT
Emeryville, California

Log of Boring No. 3

Date Drilled: July 29, 1981
Type of Boring: Auger/Rotary
Hammer Weight: 140 lbs.

Remarks:

(See Legend Sheet for sampler types and hammer weights)

Surface Elevation: 10.65' City of Emeryville Datum

Depth, Ft.	Samples	Blows/Ft.	MATERIAL DESCRIPTION	LABORATORY TESTS: Moisture Content, %	Dry Density, pcf	Unconfined Compressive Strength, psf
			2" Asphalt CLAYEY GRAVELLY SAND; AGGREGATE BASE MATERIAL Medium dense, moist, brown			
			SAND FILL : With concrete chunks			
	1*	40	SILTY CLAY FILL : Medium stiff, light brown to brown			
			← With brick fragments RUBBLE FILL Brick pieces, sand, clay, dark brown, mixed with organic silty clay, petroleum odor FILL			
	2	10				
5			SILTY CLAY (CL): Medium stiff to stiff, green-gray mottled light brown			
			Becomes sandy and gravelly			
	3*	27				
	4	12				
10			BOTTOM OF HOLE @ 10'			
15						

Proj. No. 15093A

Woodward-Clyde Consultants

Figure A-3

Project MARKETPLACE CONTAMINANT ASSESSMENT Emeryville, California	Log of Boring No. 3A

Date Drilled: July 30, 1981
Type of Boring: Auger/Rotary
Hammer Weight: 140 lbs.
Remarks:
(See Legend Sheet for sampler types and hammer weights)

Depth, Ft.	Samples	Blows/Ft.	MATERIAL DESCRIPTION	LABORATORY TESTS: Moisture Content, %	Dry Density, pcf	Unconfined Compressive Strength, psf
			Surface Elevation:			
			2" Asphalt 8" CLAYEY SANDY GRAVEL; AGGREGATE BASE MATERIAL			
			RUBBLE FILL Bricks, concrete, in brown sandy clay matrix			
			← (½" iron railing, 12" long)			
	1	11	▽ ATD SILTY CLAY (CH) Medium stiff, moist, dark brown; Bay Mud			
5			With concrete chunks			
			} With petroleum odor @ 6'-6½'			
			GRAVELLY CLAY to CLAYEY SAND & GRAVEL (CL/GC) Dense, blue green, fine gravel			
	2	33	With less clay			
10			BOTTOM OF HOLE @ 10'			
15						

Proj. No. 15093A | Woodward-Clyde Consultants | Figure A-3a

Project MARKETPLACE CONTAMINANT ASSESSMENT
Emeryville, California

Log of Boring No. 3B

Date Drilled: August 6, 1981
Type of Boring: Auger/Rotary
Hammer Weight: ---

Remarks:

(See Legend Sheet for sampler types and hammer weights)

Depth, Ft.	Samples	Blows/Ft.	MATERIAL DESCRIPTION	LABORATORY TESTS: Moisture Content, %	Dry Density, pcf	Unconfined Compressive Strength, psf
			Surface Elevation:			
			2" Asphalt 6" GRAVELLY SANDY CLAY; AGGREGATE BASE MATERIAL			
			SILTY SAND FILL Medium dense, damp, gray, with wood, firebrick, bricks			
			obstruction - concrete			
			BOTTOM OF HOLE @ 3'			
5						
10						
15						

Proj. No. 15093A

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Figure A-3b

Project MARKETPLACE CONTAMINANT ASSESSMENT
Emeryville, California

Log of Boring No. 3C

Date Drilled: August 6, 1981
Type of Boring: Auger/Rotary
Hammer Weight: ---

Remarks:

(See Legend Sheet for sampler types and hammer weights)

Depth, Ft.	Samples	Blows/Ft.	MATERIAL DESCRIPTION	LABORATORY TESTS: Moisture Content, %	Dry Density, pcf	Unconfined Compressive Strength, psf
			Surface Elevation:			
			2" Asphalt			
			8" GRAVELLY SANDY CLAY; AGGREGATE BASE MATERIAL			
			CLAYEY SAND FILL: Loose to medium dense, moist, brown, with brick, wood, concrete			
			With concrete piece			
			With petroleum odor			
			BOTTOM OF HOLE @ 2½'			
5						
10						
15						

Proj. No. 15093A

Woodward-Clyde Consultants

Figure A-3c

Project	Log of Boring No. 3D
MARKETPLACE CONTAMINANT ASSESSMENT Emeryville, California	

Date Drilled: August 6, 1981
Type of Boring: Auger/Rotary
Hammer Weight: 140 lbs.
Remarks:
(See Legend Sheet for sampler types and hammer weights)

Depth, Ft.	Samples	Blows/Ft.	MATERIAL DESCRIPTION	LABORATORY TESTS: Moisture Content, %	Dry Density, pcf	Unconfined Compressive Strength, psf
			Surface Elevation:			
			2" Asphalt 6" GRAVELLY SANDY CLAY; AGGREGATE BASE MATERIAL			
			SANDY CLAY FILL (CL) Medium stiff, moist, brown and dark brown, with brick fragments FILL			
	1	7	SILTY CLAY (CH) Medium stiff, moist, dark brown, with organics; Bay Mud			
5			SILTY CLAY (CL) Soft to medium stiff, green-gray and black With petroleum odor; Bay Mud			
	2*		SILTY CLAY (CL) Medium stiff to stiff, green-gray, with trace gravel			
			BOTTOM OF HOLE @ 7'-8"			
10						
15						

Project: MARKETPLACE CONTAMINANT ASSESSMENT
Emeryville, California

Log of Boring No. 4

Date Drilled: August 4, 1981
Type of Boring: Auger/Rotary
Hammer Weight: 140 lbs.

Remarks:

(See Legend Sheet for sampler types and hammer weights)

Depth, Ft.	Samples	Blows/Ft.	MATERIAL DESCRIPTION	LABORATORY TESTS: Moisture Content, %	Dry Density, pcf	Unconfined Compressive Strength, psf
			Surface Elevation:			
	1	77	2" Asphalt CLAYEY SANDY GRAVEL; AGGREGATE BASE MATERIAL			
			FINE SAND FILL (SP-SM): Medium dense, brown, with some brick fragments and gravel			
			CLAYEY SAND FILL (SC) Medium dense, brown and green, with brick fragments and large pieces of wood (3"), petroleum odor w/ black-stained sandy clay @ 2'			
			BOTTOM OF HOLE @ 2½'			
			Concrete obstruction			
5						
10						
15						

Proj. No. 15093A

Woodward-Clyde Consultants

Figure A-4

Project MARKETPLACE CONTAMINANT ASSESSMENT
Emeryville, California

Log of Boring No. 4A

Date Drilled: August 4, 1981
Type of Boring: Auger/Rotary
Hammer Weight: 140 lbs.

Remarks:

(See Legend Sheet for sampler types and hammer weights)

Depth, Ft.	Samples	Blows/Ft.	MATERIAL DESCRIPTION	LABORATORY TESTS: Moisture Content, %	Dry Density, pcf	Unconfined Compressive Strength, psf
			Surface Elevation:			
			2" Asphalt 8" CLAYEY SANDY GRAVEL; AGGREGATE BASE MATERIAL			
	1	24/6"	CLAYEY SAND FILL (SC) Medium dense, moist, brown, with concrete and brick fragments			
			Tar, concrete obstruction			
			With concrete slab and brick rubble			
			BOTTOM OF HOLE @ 3½'			
5						
10						
15						

Proj. No. 15093A

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Figure A-4a

Project: MARKETPLACE CONTAMINANT ASSESSMENT
Emeryville, California

Log of Boring No. 4B

Date Drilled: August 4, 1981
Type of Boring: Auger/Rotary
Hammer Weight: 140 lbs.

Remarks:

(See Legend Sheet for sampler types and hammer weights)

Depth, Ft.	Samples	Blows/Ft.	MATERIAL DESCRIPTION	LABORATORY TESTS: Moisture Content, %	Dry Density, pcf	Unconfined Compressive Strength, psf
			Surface Elevation:			
			2" Asphalt 8" CLAYEY SANDY GRAVEL; AGGREGATE BASE MATERIAL			
			SAND FILL (SM) Medium dense, damp, brown, with brick fragments			
			Wood piling, with tar obstruction			
			BOTTOM OF HOLE @ 3½'			
5						
10						
15						

Proj. No. 15093A

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Figure A-4b

Project MARKETPLACE CONTAMINANT ASSESSMENT
Emeryville, California

Log of Boring No. 4C

Date Drilled: August 4, 1981
Type of Boring: Auger/Rotary
Hammer Weight: 140 lbs.

Remarks: Piezometer installed

(See Legend Sheet for sampler types and hammer weights)

Depth, Ft.	Samples	Blows/Ft.	MATERIAL DESCRIPTION	LABORATORY TESTS: Moisture Content, %	Dry Density, pcf	Unconfined Compressive Strength, psf
			Surface Elevation: 10.45' City of Emeryville Datum			
			2" Asphalt 8" CLAYEY SANDY GRAVEL; AGGREGATE BASE MATERIAL			
			SAND FILL (SP) Medium dense, damp, brown, with brick			
			SILTY FINE SAND FILL (SM) ▽ 1-18-82 Medium dense to dense, moist, green-gray			
	1*	25	8-7-81 ▽ 9-10-81 ▽			
5			SAND FILL (SP) Dense, black, petroleum odor Becomes clayey FILL			
	2	30	SILTY CLAY (CL-CH) Stiff, moist, light brown			
			Grades to green-gray, with trace brown			
			Grades to blue-gray, with trace brown, becomes sandy			
	3*	15				
10						
			SILTY CLAY (CL) Stiff, moist, brown			
	4	17	CLAYEY SANDY GRAVEL (GC) Dense, wet, brown			
			BOTTOM OF HOLE @ 12½'			
15						

Proj. No. 15093A | Woodward-Clyde Consultants | Figure A-4c

Project: MARKETPLACE CONTAMINANT ASSESSMENT
Emeryville, California

Log of Boring No. 4D

Date Drilled: August 6, 1981
Type of Boring: Auger/Rotary
Hammer Weight: 140 lbs.

Remarks:

(See Legend Sheet for sampler types and hammer weights)

Depth, Ft.	Samples	Blows/Ft.	MATERIAL DESCRIPTION	LABORATORY TESTS: Moisture Content, %	Dry Density, pcf	Unconfined Compressive Strength, psf
			Surface Elevation:			
			2" Asphalt 6" CLAYEY SANDY GRAVEL; AGGREGATE BASE MATERIAL			
			SAND FILL Loose to medium dense, damp, brown, with brick fragments and powder			
			FINE SILTY SAND (SM/ML) Medium dense, moist, green, with some gravel			
			Grades to sand and gravel			
	1	P				
5			← Approx. 2" of black, sandy clay, with petroleum odor — FILL			
			SILTY CLAY (CL): Medium stiff to stiff, moist, green, with some gravel			
	2	7				
			SILTY CLAY (CL): Stiff, light brown-gray			
			BOTTOM OF HOLE @ 7'			
10						
15						

Proj. No. 15093A

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Figure A-4d

Project MARKETPLACE CONTAMINANT ASSESSMENT
Emeryville, California

Log of Boring No. 5

Date Drilled: July 30, 1981
Type of Boring: Auger/Rotary
Hammer Weight: 140 lbs.

Remarks: Piezometer installed; water surface appeared oily

(See Legend Sheet for sampler types and hammer weights)

Surface Elevation: 12.15' City of Emeryville Datum

Depth, Ft.	Samples	Blows/Ft.	MATERIAL DESCRIPTION	LABORATORY TESTS: Moisture Content, %	Dry Density, pcf	Unconfined Compressive Strength, psf
			2" Asphalt			
			CLAYEY SANDY GRAVEL; AGGREGATE BASE MATERIAL Dense, brown			
	1	72	SILTY SAND FILL (SP): Damp, brown			
			GRAVELLY CLAY FILL (CL): Stiff, moist, reddish brown			
			1-18-82			
			SANDY CLAY FILL Stiff, moist, with brick, glass; petroleum odor			
	2	8	9-10-81 ▽ 8-7-81			
5			FILL			
			SILTY CLAY (CL-CH) Stiff, gray-green			
	3*	20	Becomes brown			
			ATD ▽			
	4	55				
10						
	5	9				
			BOTTOM OF HOLE @ 14'			
15						

Proj. No. 15093A | Woodward-Clyde Consultants | Figure A-5

Project MARKETPLACE CONTAMINANT ASSESSMENT
Emeryville, California

Log of Boring No. 5A

Date Drilled: August 3, 1981
Type of Boring: Auger/Rotary
Hammer Weight: 140 lbs.

Remarks:

(See Legend Sheet for sampler types and hammer weights)

Depth, Ft.	Samples	Blows/Ft.	MATERIAL DESCRIPTION	LABORATORY TESTS: Moisture Content, %	Dry Density, pcf	Unconfined Compressive Strength, psf
			Surface Elevation:			
			2" Asphalt CLAYEY SANDY GRAVEL; AGGREGATE BASE MATERIAL			
			2" Asphalt CLAYEY SAND FILL With brick fragments With slight petroleum odor FILL			
5	1*	P	SILTY CLAY Soft to medium stiff, black, with heavier petroleum odor; Bay Mud			
	2	P	SILTY CLAY (CL) Medium stiff, gray to blue-gray, with some gravel			
10			BOTTOM OF HOLE @ 8'-10"			
15						

Proj. No. 15093A | Woodward-Clyde Consultants | Figure A-5a

Project MARKETPLACE CONTAMINANT ASSESSMENT
Emeryville, California

Log of Boring No. 6

Date Drilled: July 30, 1981
Type of Boring: Auger/Rotary
Hammer Weight: 140 lbs.

Remarks: **Water appears perched over sandy clay layer (see Boring No. 6A)

(See Legend Sheet for sampler types and hammer weights)

Surface Elevation: 9.89' City of Emeryville Datum

Depth, Ft.	Samples	Blows/Ft.	MATERIAL DESCRIPTION	LABORATORY TESTS: Moisture Content, %	Dry Density, pcf	Unconfined Compressive Strength, psf
			2" Asphalt 10" CLAYEY SANDY GRAVEL; AGGREGATE BASE MATERIAL Moist, brown			
			CLAYEY SAND AND GRAVEL FILL Light brown			
	1*	54	▽** ATD			
			SANDY CLAY Very stiff, moist, orange-brown, with some gravel to 1" Ø			
			FILL			
5	2	11	SILTY CLAY (CH) Medium stiff, dark brown; Bay Mud			
			GRAVELLY CLAY / CLAYEY GRAVEL (CL/GC) Medium stiff/dense, blue-green to blue-gray			
	3	11	Grades to gravel (GP)			
			Grades to sand (SP) Medium dense, light brown-gray			
			Grades to sand and gravel with some clay, dense			
10	4	38				
			BOTTOM OF HOLE @ 11'			
15						

Proj. No. 15093A

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Figure A-6

Project MARKETPLACE CONTAMINANT ASSESSMENT
Emeryville, California

Log of Boring No. 6A

Date Drilled: August 5, 1981
Type of Boring: Auger/Rotary
Hammer Weight: 140 lbs.

Remarks:

(See Legend Sheet for sampler types and hammer weights)

Surface Elevation: 9.40' City of Emeryville Datum

Depth, Ft.	Samples	Blows/Ft.	MATERIAL DESCRIPTION	LABORATORY TESTS: Moisture Content, %	Dry Density, pcf	Unconfined Compressive Strength, psf
			2" Asphalt			
			10" CLAYEY SANDY GRAVEL; AGGREGATE BASE MATERIAL			
			SANDY GRAVELLY CLAY (CL): Medium stiff to stiff, brown			
			FINE SAND (SP): Medium dense, moist, green			
	1	38	GRAVELLY CLAY FILL Medium stiff to stiff, moist, green with trace brown, brick fragments			
			CLAYEY SAND (SC) 8-6-81 ▽ Dense, dark brown, with some gravel — FILL			
	2	30	SILTY CLAY (CH): Medium stiff to stiff, dark brown, with organics and some sand; Bay Mud			
5			SILTY CLAY Soft to medium stiff, green, brown and gray, with some gravel			
	3	5	SANDY GRAVELLY CLAY (CL) Soft to medium stiff, green			
			BOTTOM OF HOLE @ 8'			
10						
15						

Proj. No. 15093A

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Figure A-6a

Project: MARKETPLACE CONTAMINANT ASSESSMENT
Emeryville, California

Log of Boring No. 7

Date Drilled: July 29, 1981
Type of Boring: Auger/Rotary
Hammer Weight: 140 lbs.

Remarks:

(See Legend Sheet for sampler types and hammer weights)

Surface Elevation: 10.70' City of Emeryville Datum

Depth, Ft.	Samples	Blows/Ft.	MATERIAL DESCRIPTION	LABORATORY TESTS: Moisture Content, %	Dry Density, pcf	Unconfined Compressive Strength, psf
			2" Asphalt CLAYEY GRAVELLY SAND; AGGREGATE BASE MATERIAL Dense, dry, brown			
	1*	33	SILTY SAND (SP/SM) Dense, moist, light gray and brown Grades to gray, with some wood fragments, brick fragments and some clay, concrete chunks to 3/4" Ø			
	2	11/6"	Becomes more clayey (Rubble Fill)			
5			ATD ▽ FILL			
	3		SILTY CLAY (CH) Soft to medium stiff, dark brown, with organics; Bay Mud			
	4	25	SILTY CLAY (CL) Medium stiff, blue-gray, with trace shells Grades to gravelly clay with some sand inclusions			
10			BOTTOM OF HOLE @ 10'			
15						

Proj. No. 15093A

Woodward-Clyde Consultants

Figure A-7

Project MARKETPLACE CONTAMINANT ASSESSMENT
Emeryville, California

Log of Boring No. 8

Date Drilled: July 31, 1981
Type of Boring: Auger/Rotary
Hammer Weight: 140 lbs.

Remarks:

(See Legend Sheet for sampler types and hammer weights)

Depth, Ft.	Samples	Blows/Ft.	MATERIAL DESCRIPTION	LABORATORY TESTS: Moisture Content, %	Dry Density, pcf	Unconfined Compressive Strength, psf
			Surface Elevation: 9.49' City of Emeryville Datum			
			2" Asphalt CLAYEY SANDY GRAVEL; AGGREGATE BASE MATERIAL			
	1*	27	CLAYEY GRAVEL (FILL) ▽ ATD — Dense, moist, light brown, to 1" Ø ← With piece of hard tar approx. 1" Ø			
			FILL ↑			
	2*	6	SILTY CLAY (CL): Medium stiff, gray and brown mottled; Bay Mud			
5			SILTY CLAY (CL) Stiff, light brown and dark brown mottled, with some fine gravel			
	3	34	SILTY CLAY (CL) Very stiff, orange-brown, with some fine gravel			
	4	56	CLAYEY GRAVEL Very dense, brown gravel, orange-brown clay			
10	5	42				
			BOTTOM OF HOLE @ 11½'			
15						

Proj. No. 15093A | Woodward-Clyde Consultants | Figure A-8

Project MARKETPLACE CONTAMINANT ASSESSMENT
Emeryville, California

Log of Boring No. 9

Date Drilled: August 5, 1981
Type of Boring: Auger/Rotary
Hammer Weight: 140 lbs.

Remarks:

(See Legend Sheet for sampler types and hammer weights)

Surface Elevation: 10.32' City of Emeryville Datum

Depth, Ft.	Samples	Blows/Ft.	MATERIAL DESCRIPTION	LABORATORY TESTS: Moisture Content, %	Dry Density, pcf	Unconfined Compressive Strength, psf
			2" Asphalt 8" SANDY GRAVEL; AGGREGATE BASE MATERIAL Damp, brown			
	1	33	SANDY GRAVEL FILL (GP) ▽ ATD Medium dense, wet, with piece sheet metal, gravel to 4" Ø			
	2*	6	CLAYEY GRAVEL FILL (GC): Loose to medium dense, dark green-gray, with kerosene odor — FILL			
5			SILTY CLAY (CL) Medium stiff, green-gray, with occasional light brown mottling, petroleum odor — Becomes stiffer, with no petroleum odor			
	3*	25	With trace fine gravel — With slight petroleum odor			
			SANDY CLAY (CL): Stiff, green, with some gravel			
	4*	20	SILTY CLAY Light brown and gray mottled, with trace gravel			
10			BOTTOM OF HOLE @ 10½'			
15						

Proj. No. 15093A

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Figure A-9

Project MARKETPLACE CONTAMINANT ASSESSMENT
Emeryville, California

Log of Boring No. 10

Date Drilled: August 4, 1981
Type of Boring: Auger/Rotary
Hammer Weight: 140 lbs.

Remarks: Piezometer installed @ 12'

(See Legend Sheet for sampler types and hammer weights)

Depth, Ft.	Samples	Blows/Ft.	MATERIAL DESCRIPTION	LABORATORY TESTS: Moisture Content, %	Dry Density, pcf	Unconfined Compressive Strength, psf
			Surface Elevation: 7.56' City of Emeryville Datum			
			2" Asphalt 6" SANDY GRAVEL; AGGREGATE BASE MATERIAL			
	1	47	SANDY GRAVEL (GP) Dense, wet, light brown 8-7-81 ▽ 1-18-82 ▽ 9-10-81 ▽			
	2*	33	FILL : Medium stiff, black (fibreboard?) FILL			
5			FINE SAND (SM) AND SILTY CLAY (CL-CH) Medium dense, black, with petroleum, heavy petroleum odor mixed with medium stiff, green-gray silty clay; Bay Mud			
	3*	27	CLAYEY GRAVEL Dense, green-gray, with petroleum accumulations			
			8" Ø rock; hole abandoned. BOTTOM OF HOLE @ 6'8"			
10						
15						

Proj. No. 15093A

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Figure A-10

Project MARKETPLACE CONTAMINANT ASSESSMENT
Emeryville, California

Log of Boring No. 10A

Date Drilled: August 5, 1981
Type of Boring: Auger/Rotary
Hammer Weight: 140 lbs.

Remarks:

(See Legend Sheet for sampler types and hammer weights)

Depth, Ft.	Samples	Blows/Ft.	MATERIAL DESCRIPTION	LABORATORY TESTS: Moisture Content, %	Dry Density, pcf	Unconfined Compressive Strength, psf
			Surface Elevation:			
			2" Asphalt 8" SANDY GRAVEL; AGGREGATE BASE MATERIAL			
			SANDY GRAVELLY CLAY FILL Medium stiff, moist			
			Becomes wet			
			SILTY CLAY (CL) Medium stiff, green-gray mixed with black			
			FILL : Medium stiff, black, with organic pieces, may be fibreboard or insulation			
5			BOTTOM OF HOLE @ 4½' (obstruction)			
10						
15						

Proj. No. 15093A

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Figure A-10a

Project MARKETPLACE CONTAMINANT ASSESSMENT
Emeryville, California

Log of Boring No. 10B

Date Drilled: August 5, 1981
Type of Boring: Auger/Rotary
Hammer Weight: 140 lbs.

Remarks:

(See Legend Sheet for sampler types and hammer weights)

Depth, Ft.	Samples	Blows/Ft.	MATERIAL DESCRIPTION	LABORATORY TESTS: Moisture Content, %	Dry Density, pcf	Unconfined Compressive Strength, psf
			Surface Elevation:			
			2" Asphalt 8" SANDY GRAVEL; AGGREGATE BASE MATERIAL			
			MIXED SAND GRAVEL AND CLAY FILL Medium dense, wet, brown and green-gray			
			FILL : Medium stiff, black, organic, possible old fibreboard			
			SILTY CLAY : Medium stiff, green-gray with black, with sand lenses, shells, slight ammonia odor			
5			BOTTOM OF HOLE @ 3½' (obstruction)			
10						
15						

Proj. No. 15093A

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Figure A-10b

Project MARKETPLACE CONTAMINANT ASSESSMENT
Emeryville, California

Log of Boring No. 10C

Date Drilled: July 30, 1981
Type of Boring: Auger/Rotary
Hammer Weight: 140 lbs.

Remarks:

(See Legend Sheet for sampler types and hammer weights)

Depth, Ft.	Samples	Blows/Ft.	MATERIAL DESCRIPTION	LABORATORY TESTS: Moisture Content, %	Dry Density, pcf	Unconfined Compressive Strength, psf
			Surface Elevation:			
			2" Asphalt 8"GRAVELLY SANDY CLAY; AGGREGATE BASE MATERIAL			
			GRAVEL Medium dense, wet, purplish brown, rocks to 6" Ø, piece of metal, piece of slag, with some clay FILL			
			SILTY CLAY Soft to medium stiff, green-gray with some black, shells, ammonia odor; Bay Mud			
5	1	13	Becomes gravelly, with petroleum accumulations, no ammonia odor			
			GRAVEL (GP) Dense, green, with shells, fine gravel to 3/8" Ø			
	2	48				
			SILTY CLAY (CL-CH) Soft to medium stiff, green-gray mottled with gray			
	3	P				
10			BOTTOM OF HOLE 10½'			
15						

Project MARKETPLACE CONTAMINANT ASSESSMENT
Emeryville, California

Log of Boring No. 10D

Date Drilled: August 6, 1981
Type of Boring: Auger/Rotary
Hammer Weight: 140 lbs.

Remarks:

(See Legend Sheet for sampler types and hammer weights)

Depth, Ft.	Samples	Blows/Ft.	MATERIAL DESCRIPTION	LABORATORY TESTS: Moisture Content, %	Dry Density, pcf	Unconfined Compressive Strength, psf
			Surface Elevation:			
			2" Asphalt 8" SANDY GRAVEL; AGGREGATE BASE MATERIAL			
			GRAVEL FILL (GP) Medium dense, wet, light brown			
			▽ ATD			
			FIBROUS MATERIAL MIXED WITH CLAY Medium stiff, black, with petroleum odor and accumulations — FILL			
			SILTY CLAY & SAND MIXTURE Medium stiff, green-gray and black, with oil accumulations, shells; Bay Mud			
			Becomes stiffer			
5						
	1	22				
			FINE GRAVEL (GP) Loose to medium dense, green, with some shells			
	2	P	SILTY CLAY (CL/CH) Soft to medium stiff, green-gray			
10			Becomes stiffer			
	3					
			Becomes stiff, dark gray, with shells			
	4*		BOTTOM OF HOLE @ 16'			
16						

Proj. No. 15093A

Woodward-Clyde Consultants

Figure A-10d

Project MARKETPLACE CONTAMINANT ASSESSMENT
Emeryville, California

Log of Boring No. 11

Date Drilled: August 5, 1981
Type of Boring: Auger/Rotary
Hammer Weight: 140 lbs.

Remarks:

(See Legend Sheet for sampler types and hammer weights)

Surface Elevation: 9.38' City of Emeryville Datum

Depth, Ft.	Samples	Blows/Ft.	MATERIAL DESCRIPTION	LABORATORY TESTS: Moisture Content, %	Dry Density, pcf	Unconfined Compressive Strength, psf
			2" Asphalt 2" GRAVELLY CLAY: Medium stiff, damp, green			
	1*	71	TAR Medium stiff to stiff, black			
	2*	15	SANDY CLAY FILL Medium stiff, moist, green-gray, with trace shells, mixed with wood, tar residue No wood, tar			
5	3	11	FINE SAND (SP): Loose to medium dense, wet, green-gray, with trace fine gravel; fill? Becomes very silty, no gravel, green, loose			
	4*	P				
10	5	P	Refusal of shelby			
			BOTTOM OF HOLE @ 11'-2"			
15						

Proj. No. 15093A

Woodward-Clyde Consultants

Figure A-11

Project MARKETPLACE CONTAMINANT ASSESSMENT
Emeryville, California

Log of Boring No. 12

Date Drilled: January 14, 1982
Type of Boring: 6" Auger
Hammer Weight: ---

Remarks: Piezometer Installed

(See Legend Sheet for sampler types and hammer weights)

Depth, Ft.	Samples	Blows/Ft.	MATERIAL DESCRIPTION	LABORATORY TESTS: Moisture Content, %	Dry Density, pcf	Unconfined Compressive Strength, psf
			Surface Elevation: 10.35			
			2" Concrete over 2" brown sand			
			With some gravel SILTY CLAY FILL Medium stiff to stiff, moist, green-gray			
			Becomes medium stiff, dark gray			
			▽ 1-18-82			
5			Concrete chunk			
			FILL			
			SILTY CLAY (BAY MUD) Soft, dark gray			
10			SILTY CLAY Medium stiff, black			
			Stiff, gray			
			BOTTOM OF HOLE @ 12'			
15						

Proj. No. 15093A

Woodward-Clyde Consultants

Figure A-12

Project MARKETPLACE CONTAMINANT ASSESSMENT
Emeryville, California

Log of Boring No. 13

Date Drilled: February 5, 1982
Type of Boring: 6" Auger
Hammer Weight: ---

Remarks:

(See Legend Sheet for sampler types and hammer weights)

Depth, Ft.	Samples	Blows/Ft.	MATERIAL DESCRIPTION	LABORATORY TESTS: Moisture Content, %	Dry Density, pcf	Unconfined Compressive Strength, psf
			Surface Elevation:			
			4" Concrete Slab			
			SILTY CLAY : Stiff, moist, dark gray			
			4" Concrete Slab over 2" dark gray Clay			
			ATD ▽ 6" Concrete Slab over 2" dark gray Clay			
			12" Concrete (Rubble?)			
		2 JAR SAMPLES	CONCRETE RUBBLE Mixed with brown-gray Sandy Clay; trace petroleum odor			
5			GRAVELLY CLAY FILL — FILL			
			SANDY CLAY (FILL?) Medium stiff, dark green-gray, petroleum odor			
		2 JAR SAMPLES	SILTY CLAY Stiff, green-gray, petroleum odor			
10			BOTTOM OF HOLE @ 10'			
15						

Proj. No. 15093A

Woodward-Clyde Consultants

Figure A-13

Project MARKETPLACE CONTAMINANT ASSESSMENT
Emeryville, California

Log of Boring No. 14

Date Drilled: February 5, 1982
Type of Boring: 6" Auger
Hammer Weight: ---

Remarks:

(See Legend Sheet for sampler types and hammer weights)

Depth, Ft.	Samples	Blows/Ft.	MATERIAL DESCRIPTION	LABORATORY TESTS: Moisture Content, %	Dry Density, pcf	Unconfined Compressive Strength, psf
			Surface Elevation:			
			4" Concrete Slab			
			SANDY CLAY FILL Stiff, moist to wet, with gravel and brick fragments			
			▽ ATD			
	2 JAR SAMPLES		With piece of wood and brick, petroleum odor			
5			AUGER REFUSAL, possible underground pipe, boring abandoned			
10						
15						

Proj. No. 15093A | Woodward-Clyde Consultants | Figure A-14

Project MARKETPLACE CONTAMINANT ASSESSMENT
Emeryville, California

Log of Boring No. 15

Date Drilled: February 5, 1982
Type of Boring: 6" Auger
Hammer Weight: ---

Remarks:

(See Legend Sheet for sampler types and hammer weights)

Depth, Ft.	Samples	Blows/Ft.	MATERIAL DESCRIPTION	LABORATORY TESTS: Moisture Content, %	Dry Density, pcf	Unconfined Compressive Strength, psf
			Surface Elevation:			
			4" Concrete Slab			
			SILTY CLAY FILL: Medium stiff, dark gray			
			← Dark green Clayey Sand lens			
			Becomes stiff, with slight petroleum odor ▽ ATD			
			6" Concrete Slab			
			SILTY CLAY FILL Medium stiff, dark gray, trace petroleum odor			
5	2 JAR SAMPLES		CONCRETE RUBBLE With dark gray clay			
			SILTY CLAY FILL Soft, dark gray			
			CONCRETE RUBBLE FILL			
			BROKEN AUGER, boring abandoned			
10						
15						

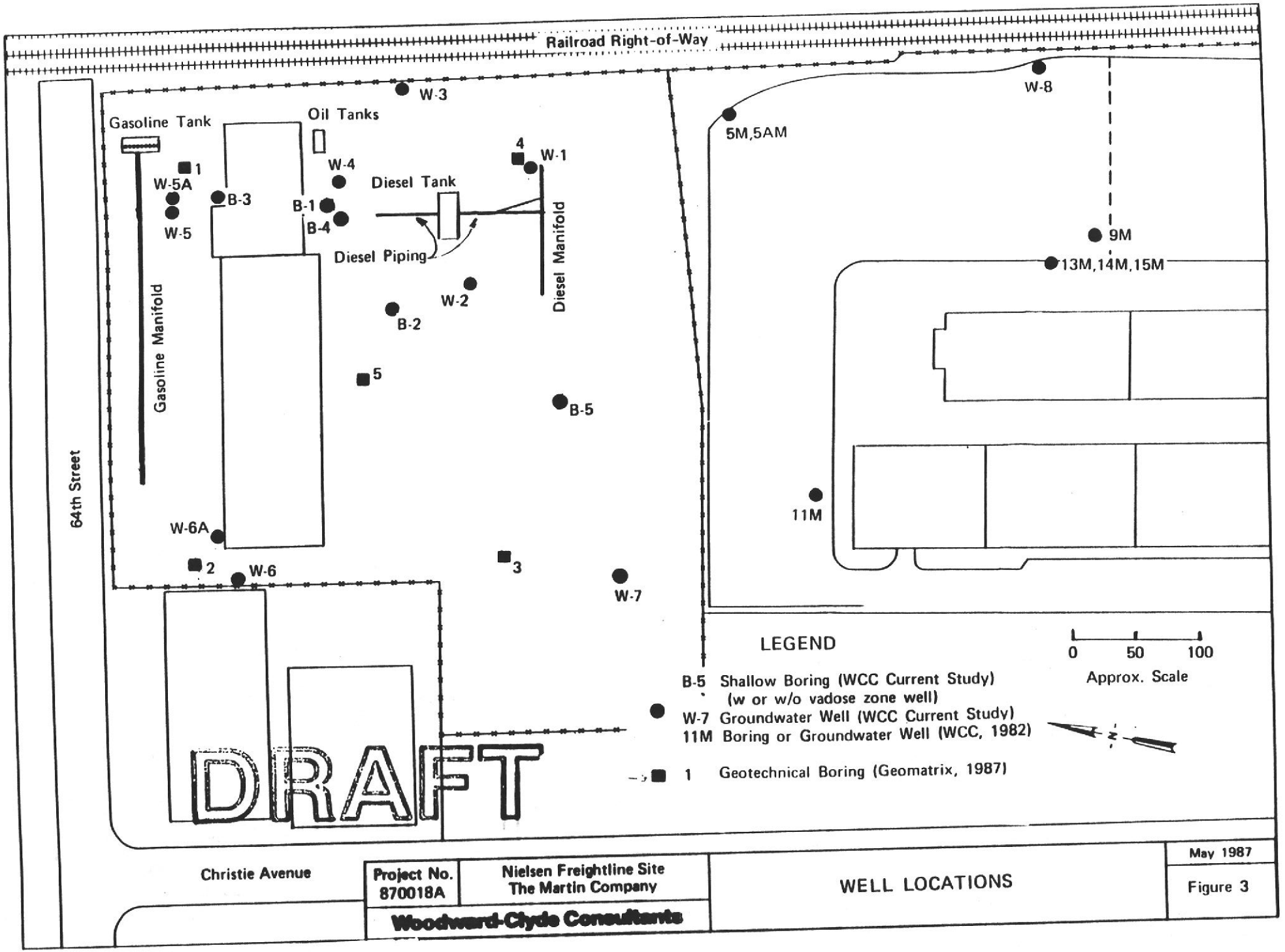
Proj. No. 15093A

Woodward-Clyde Consultants

Figure A-15

SECTION B.2.2

NIELSEN FREIGHT LINES PROPERTY, 1987


Railroad Right-of-Way
W-3
W-8
Gasoline Tank
Oil Tanks
5M,5AM
4
W-1
1
W-4
W-5A
Diesel Tank
B-3
B-1
W-5
B-4
Diesel Piping
9M
13M,14M,15M
Diesel Manifold
Gasoline Manifold
W-2
B-2
5
B-5
64th Street
11M
W-6A
2
W-6
3
W-7
DRAFT
LEGEND
0
50
100
Approx. Scale
B-5 Shallow Boring (WCC Current Study)
(w or w/o vadose zone well)
W-7 Groundwater Well (WCC Current Study)
11M Boring or Groundwater Well (WCC, 1982)
1 Geotechnical Boring (Geomatrix, 1987)
Christie Avenue
Project No.
870018A
Nielsen Freightline Site
The Martin Company
Woodward-Clyde Consultants
WELL LOCATIONS
May 1987
Figure 3

Project : Home Depot - Emeryville	Log of Boring No. B-1

Date Drilled: 4-8-87
Type of Boring: 6" Solid
Hammer: 140 lb 2" California Sampler

Remarks: Immediately adjacent to oil sump

DRAFT

Depth Ft.	Samples	Blows/Ft	H-Nu (ppm)	MATERIAL DESCRIPTION
				Surface Elevation:
	1-4	14	150	CONCRETE Silty Sand (SM), moist, poorly compacted, occasional gravel to 0.75", dark brown, strong oily odor. Saturated with dark black/brownoil, fluid in hole.
5				Bottom of boring at 6 feet.
10				
15				
20				
25				
30				

Project: 8710018A	Woodward-Clyde Consultants	Figure

Project : Home Depot - Emeryville

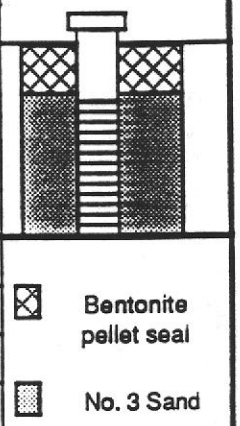
Log of Boring No. B-2

Date Drilled: 4-8-87
Type of Boring: 6" solid
Hammer: 140 lb 2" California sampler

Remarks: Vadose zone well, 100 ft south of Bay 9

DRAFT

Depth Ft.	Samples	Blows/Ft	H-Nu (ppm)	MATERIAL DESCRIPTION
				Surface Elevation:
				3" Asphalt Concrete
	1-4	30	1	Gravelly Sand (SW), moist,loose, gravel to 2", brown, no odor
	2-3	14	30	Silt (ML), moist, poorly compacted fill, gravel to 0.75", gray-green, strong tar odor,underlain by tar & wood
				Tar Material
5				Silty Sand (SM), moist, poorly compacted, tan
				Bottom of boring at 4 feet.
10				
15				
20				
25				
30				



Project: 8710018A	Woodward-Clyde Consultants	Figure

Project : Home Depot - Emeryville

Log of Boring No. B-3

Date Drilled: 4-8-87

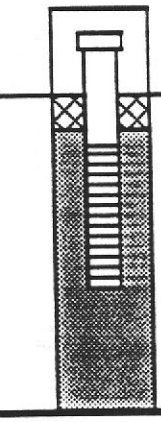
Type of Boring: 7" hollow, 3.25" I.D.

Hammer: 140 lb 2" California sampler

Remarks: Tar seep north of shop.

DRAFT

Depth Ft.	Samples	Blows/Ft	H-Nu (ppm)	MATERIAL DESCRIPTION
				Surface Elevation:
				4" asphalt concrete
	NR	R		Gravelly Sand Fill (SW), medium dense, with gravel to 3.5", dark brown, slight oily odor. Tar layer 2' to 2.5'
	2-4	R	1	Silty Clay Fill (CL), moist, medium stiff, mottled grayish green with rust color
	3-4	R		Wood block or slab at 3.25', strong tar odor, HNu value for wood = 5 ppm
5	4-3		40	Gravelly Sand Fill (SW), moist,dense, light gray,strong tar odor
	4-4	3	2	Silt (ML), moist, very loose fill, soft, dark brown, oily odor
				Bottom of boring at 6.5 feet
				R = REFUSAL
10				
15				
20				
25				
30				



Bentonite

No. 3 Sand

Project: 8710018A

Woodward-Clyde Consultants

Figure

Project : Home Depot - Emeryville

Log of Boring No. B-4

Date Drilled: 4/8/87

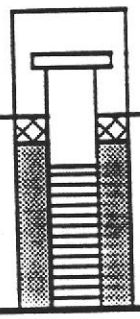
Type of Boring: 6" solid

Hammer: 140 lb 2" California sampler

Remarks: 15 ft SW of oil sump

DRAFT

Depth Ft.	Samples	Blows/Ft	H-Nu (ppm)	MATERIAL DESCRIPTION
				Surface Elevation:
				4" Asphalt Concrete
				Gravelly Sand Fill (SW), moist, medium dense, brown
	1-4	R	1	8" concrete slab
				Silty Clay (CL), moist, medium soft, dark gray, oily odor
	2-3	31	0	Silty Sand (SW), moist, medium dense, light brown, oily odor
	2-4			Gravelly Clay (CL), moist, medium stiff, greenish gray, oily odor
5				Bottom of boring at 4 feet.
				R = Refusal
10				
15				
20				
25				
30				



Project: 8710018A

Woodward-Clyde Consultants

Figure

Project : Home Depot - Emeryville	Log of Boring No. B-5

Date Drilled: 4-8-87
Type of Boring: 6" solid
Hammer: 140 lb 2" California sampler

Remarks: 300' south of bay 21 at sorface depression

DRAFT

Depth Ft.	Samples	Blows/Ft	H-Nu (ppm)	MATERIAL DESCRIPTION
				Surface Elevation:
	1-3	21	4	3" Asphalt Concrete
	1-4		60	Gravelly Sand Fill (SW), moist, loose, green, gravel to 1.5", strong oily odor
				Clay Fill (CL), moist, soft, dark gray, with brick pieces, strong tar odor, tar paper in fourth tube and drive shoe
	2-3	11	5	ATD
	2-4			
5				
10				
15				
20				
25				
30				

Project: 8710018A	Woodward-Clyde Consultants	Figure

Project : Home Depot - Emeryville

Log of Boring No. W-1

Date Drilled: 4-6-87

Type of Boring: 8" Hollow Auger

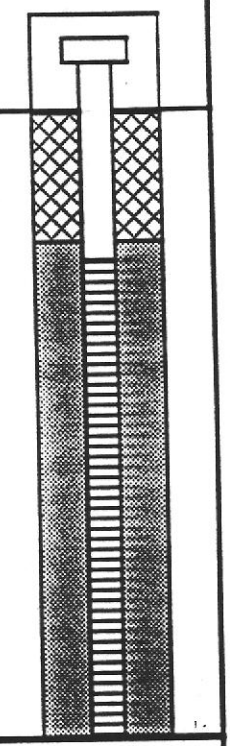
Hammer: 140 lb 2" California sampler

Remarks: At Antifreeze Tank Drum Storage Area

DRAFT

Surface Elevation:

Depth Ft.	Samples	Blows/Ft	H-Nu (ppm)	MATERIAL DESCRIPTION
	1-4	R	50	3" Asphalt Concrete Gravelly Sand Fill (SW), moist, slightly loose, gravel to 2", strong odor
				Concrete Slab
	2-3			Gravely Sand Fill (SW), moist, medium dense, strong odor
	2-4	23	20	Gravelly Clay Fill (CL), moist, medium stiff, sand to .25", greenish gray, no odor, less gravel with depth
	NR	33		Sand Fill (SP), slightly moist, medium dense, light gray, slight odor
5				6 May 87 ▼
				Silty Clay (CL), moist, very soft, dark gray, slight odor
	4-3	29	1	Gravely Clay Fill (CL), moist, soft, gray with green sandy particles, gravel to 0.5", grades to
10	4-4		0	
	5-3	22	0	Silty Clay (CL), moist, stiff, mottled geenish gray with rust stains
	5-4			
				Bottom of boring at 13 feet.
15				
20				
25				
30				



Project: 8710018A

Woodward-Clyde Consultants

Figure

Project : Home Depot - Emeryville

Log of Boring No. W-2

Date Drilled: 4-2-87

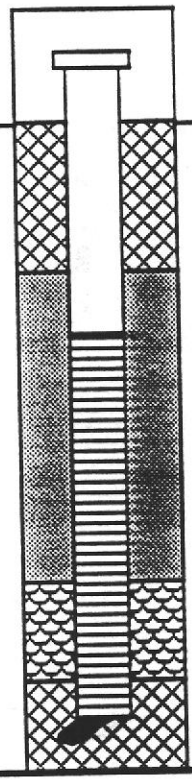
Type of Boring: 8" Hollow Auguer

Hammer: 140 lb 2" California sampler

Remarks: Southwest of diesel tank.

DRAFT

Depth Ft.	Samples	Blows/Ft	H-Nu (ppm)	MATERIAL DESCRIPTION
				Surface Elevation:
				3" Asphalt Concrete
				Gravelly Sand Fill (SW), moist, light brown
	1-4	R		Sandy Gravel Fill (GW),moist, poorly compacted, green, gravel to 2"
	2-4	15	0	Gravelly Clay Fill (CL), moist, stiff, with dark greenish gray fiberous paper pieces with dark stains, strong oily odor
5				6 May 87 ▼ Silty Clay (CL), moist, stiff, greenish gray with rust and black spots unidentifiable odor
	NR	22	10	Sand Fill (SP), wet, medium dense, fine grained with wood fibres, black, strong petroleum odor
	4-2		7	
	4-3	13		wire found on bit after drilling to 10'
10		14		
	6-2	35		MIXTURE SP as above and Silty Clay (CL), soft to med stiff, mottled green-brown with root holes and occasional gravel to .75"
15				Sand (SW), wet, dense, grayish green
				Bottom of boring at 13.5 feet
20				
25				
30				



Project: 8710018A

Woodward-Clyde Consultants

Figure

Project : Home Depot - Emeryville

Log of Boring No. W-3

Date Drilled: 4-1-87

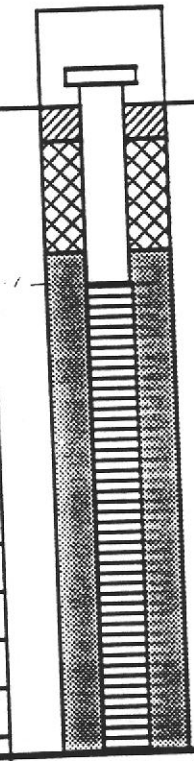
Type of Boring: 8" Hollow Auguer

Hammer: 140 lb 2" California sampler

Remarks: East fence, upgradient well

DRAFT

Depth Ft.	Samples	Blows/Ft	H-Nu (ppm)	MATERIAL DESCRIPTION
				Surface Elevation:
				3" Asphalt Concrete
				Sandy Gravel/Silty Gravel (GW-GM), moist, light brown, sand fine to coarse with gravel to 1.25", very faint oil odor
	1-3	12	1	
	1-4		.5	Silty Clay Fill (CL) stiff, moist, brown with green stains, with some medium to coarse sand particles
				Wood chips at interface
5	2-3	4	0	Silty Clay (CL), medium stiff, moist, dark brown, with some wood fibres, slightly oily
	2-4			10 May 87
				No oily odor
10	3-4	14	0	Silty Sand (SM) to Sandy Silt (ML), moist, medium dense/stiff, mottled grayish green and rust colored, gravel to .75", no odor
				grades to Sand (SW) to Silty Sand (SM), wet, medium dense, sand fine to coarse, no odor
	4-3			Sandy Silt (ML), med stiff, moist, grayish green with rust coloration
	4-4	20	0	and black spots, gravel to .4", no odor
				Bottom of boring at 13'-4"
15				
20				
25				
30				



Project: 8710018A

Woodward-Clyde Consultants

Figure

Project : Home Depot - Emeryville

Log of Boring No. W-4

Date Drilled: 4-2-87

Type of Boring: 8" hollow auguer

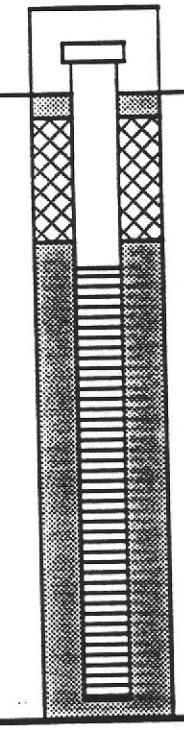
Hammer: 140 lb 2" California sampler

Remarks: 30' downgradient of oil tanks

DRAFT

Surface Elevation:

Depth Ft.	Samples	Blows/Ft	H-Nu (ppm)	MATERIAL DESCRIPTION
				3" Asphalt Concrete
	1-2	37		Gravely Sand Fill (SP), moist, fine/medium with some gravel to 1" light brown,faint oil odor
	1-4			Clayey Sand (SC), moist, med dense fill, gray, with gravel to 1", oily odor
				TAR PAPER
5	2-3	9		6 May 87 Silty Clay Fill (CL), very stiff, moist, fiberous paper and brick pieces, oily odor
	2-4			
				Silty Clay Matrix Fill (CL), moist, Very stiff fill, dark gray, with large particles of rust and green fine sand and with occasional gravel to 1", slight oily odo
	3-3	32	0	
10				Sandy Silt (ML), wet, very stiff , fine sand, with some medium coarse particles, greenish gray with rust stains
	4x	16	0	
				Bottom of boring at 13 feet
15				
20				
25				
30				



Bentonite

No. 3 Sand

Project: 8710018A

Woodward-Clyde Consultants

Figure

Project : Home Depot - Emeryville

Log of Boring No. W-5

Date Drilled: 3-31-87

Remarks: 50' downgradient of gas tank

Type of Boring: 8" hollow auguer

Hammer: 140 lb 2" California sampler

DRAFT

Depth Ft.	Samples	Blows/Ft	H-Nu (ppm)	MATERIAL DESCRIPTION
				Surface Elevation:
				2" Asphalt Concrete
				Sandy Gravel Fill (GM), moist at 6", dark brown, fine sand with some clayey material, faint odor
	1-4	24	15	Silty Clay Fill (CL), moist, stiff, dark brown, some gravelly sand
				Silty Sand Fill (SM), moist, loose, black and dark brown, with white and red particles, slight odor
5	2-3	7		
	2-4		0	Clayey Silt Fill (ML), medium stiff, moist, black, no odor
	3-3			
	3-4	16		... grades to .....
			0	Silty Clay Fill (CL), stiff, moist, tan-green, with some medium to coarse sand particles,
	4-3	17	0	
10				Mottled rust-gray, with rust streaks, fine sand, occasional gravel to .75"
	5-4	33	0	Gravelly Sand (SM/SP), wet, dense, brown, gravel to .75", no odor
15	6-4	20		Silty Clay (CL), moist, stiff, brown with dark brown, no odor, not fill
				Bottom of boring at 16 feet.
20				
25				
30				

Project: 8710018A

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Figure

Project : Home Depot - Emeryville

Log of Boring No. W-5A

Date Drilled: 3-31-87

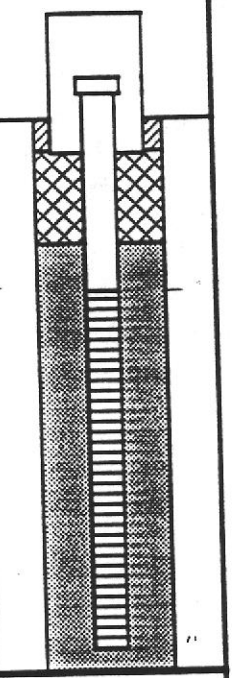
Type of Boring: 8" hollow auguer

Hammer: 140 lb 2" California sampler

Remarks: 40' downgradient of gas tank

DRAFT

Depth Ft.	Samples	Blows/Ft	H-Nu (ppm)	MATERIAL DESCRIPTION
				Surface Elevation:
				2" Asphalt Concrete
				Clayey Gravel Fill (GC), moist , brown
5	1	4		Sandy Clay Fill (CL), moist, medium stiff, black, fine sand with some medium sand particles and wood fragments, petroleum/ tar odor
				▼ 6 May 87
10	2	4		Sandy Clay Fill (CL), wet, medium stiff, greenish-gray, medium and coarse sand with gravel to .75"
				Bottom of boring at 11.5 feet
15				
20				
25				
30				



Cement grout

Bentonite

No. 3 Sand

Project: 8710018A

Woodward-Clyde Consultants

Figure

Project : Home Depot - Emeryville

Log of Boring No. W-6

Date Drilled: 3-30-87

Type of Boring: 8" hollow auguer

Hammer: 140 lb 2" California sampler

Remarks: North west of lot

DRAFT

Depth Ft.	Samples	Blows/Ft	H-Nu (ppm)	MATERIAL DESCRIPTION
				Surface Elevation:
				4" Asphalt Concrete
				Sandy Gravel Fill (GP-GM), dry to moist, brown, with some silt, gravel to 1"
	1-2	12		Silty Clay Fill (CL), moist, medium stiff to soft, light brown Interbedded with Silty Sand Fill (SM), moist, medium dense, light brown, with brick chips
5	2-3	14		
				Silty Clay (CL), moist, stiff, brown with rust and red particles, gravel to .75", no odor
	3-3			
10	3-4	44		Layers of tar paper, with gray, fine Sand Fill with metal chips and red particles, tar odor
				Paper and tar
	4-3	9	7.5	
15				Silty Clay (CL), moist, stiff with black stains (Bay Mud)
				Bottom of boring at 15 feet.
20				
25				
30				

Project: 8710018A

Woodward-Clyde Consultants

Figure

Project : Home Depot - Emeryville

Log of Boring No. W-6A

Date Drilled: 3-30-87

Remarks: North west of lot

Type of Boring: 8" hollow auguer

Hammer: 140 lb 2" California sampler

DRAFT

Depth Ft.	Samples	Blows/Ft	H-Nu (ppm)	MATERIAL DESCRIPTION
				Surface Elevation:
				4" Asphalt Concrete
	1X	grab		Silty Sand Fill (SM), dry to moist, brown, gravel to 1"
				Oily
	2-4	16		Silty Clay Fill (CL), moisl, soft, dark brown mottled with green, with brick chips to 2", tar, charred wood chips and rubber
5				6 May 87
				Gravelly Clay Fill (CL), soft, dark brown, some medium sand, gravel to 1"
				petroleum / tar odor
10	3-2	21		Layers of tar paper, with fill of gray fine sand with metal chips and red particles, tar odor
				Sand Fill (SP), wet, dense, gray, fine to medium, with some shell material, strong tar odor
	4-3	23	1.5	Becomes silty, no odor
15				Bottom of boring at 14 feet.
20				
25				
30				

13.5

- Cement grout
- Bentonite
- No. 3 Sand
- Sluff

Project: 8710018A

Woodward-Clyde Consultants

Figure

Project : Home Depot - Emeryville

Log of Boring No. W-7

Date Drilled: 4-1-87

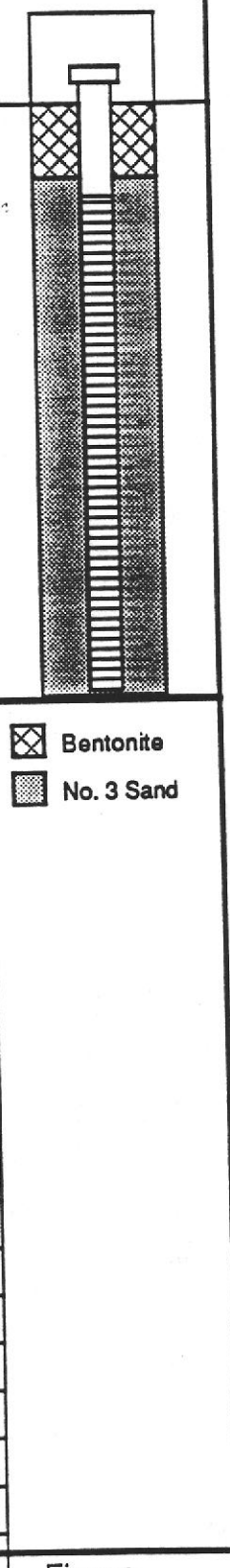
Remarks: Downgradient of site

Type of Boring: 8" hollow auguer

Hammer: 140 lb 2" California sampler

DRAFT

Depth Ft.	Samples	Blows/Ft	H-Nu (ppm)	MATERIAL DESCRIPTION
				Surface Elevation:
				3" Asphalt Concrete
				Sandy Gravel Fill (GW/GM), moist, tan-green, no odor
				Silty Sand Fill (SM), moist, med. dense, black, some fine gravel
	1X	16	6 May 87	Clayey Sand Fill (SC), wet, medium dense, tan-green, with some fine gravel and clay zones
	2-3	46		
5	2-4			
	3-3	15		
	3-4			
				Mixture of wood pieces, fiberous paper and gray Sand with red particles, strong tar odor
10				
	4-2	15		Silty Clay (CL), medium stiff, wet, mottled green-gray with rust, some sand, no odor
	4-4			
15				Bottom of boring 12'-6".
20				
25				
30				



Project: 8710018A

Woodward-Clyde Consultants

Figure

Project : Home Depot - Emeryville

Log of Boring No. W-8

Date Drilled: 4-3-87

Remarks: Market Place parking lot

DRAFT

Type of Boring: 8" hollow auguer

Hammer: 140 lb 2" California sampler

Depth Ft.	Samples	Blows/Ft	H-Nu (ppm)	MATERIAL DESCRIPTION
				Surface Elevation:
				3-4" Asphalt Concrete
				Gravelly Sand Fill (SW), dry, medium dense, light brown, no odor, becomes clayey, gray, with slight odor below 1.5'
				Concrete Slab
	1-4	27		Silty Sand Fill (SM),moist,loose, dark grey, strong kerosine odor
	2-2	11		Silty Clay Fill (CL), dense, moist, grey, strong odor, H-Nu at well=70 ppm at breathing level= 7 ppm
5				▽ 6May87
	3-3	23		
	3-4		170	Silty Clay Fill (CL), moist, dense, green grey mottled with rust color
				Becomes sandy, strong odor
10	4-3	30		
	4-4		10	Gravelly Sand Fill (SW), wet, dense, grey, coarse sand to .25", with brick chips
	5-2	45		Becomes light brown, gravel to 0.5", strong solvent odor
	5-4		1	
				Bottom of boring at 13'.
15				
20				
25				
30				

Christy Box

Bentonite

No. 3 Sand

Project: 8710018A

Woodward-Clyde Consultants

Figure

SECTION B.2.3

MARKETPLACE AND NIELSEN PROPERTIES, 1989a and 1989b

SOIL DRILLING LOG

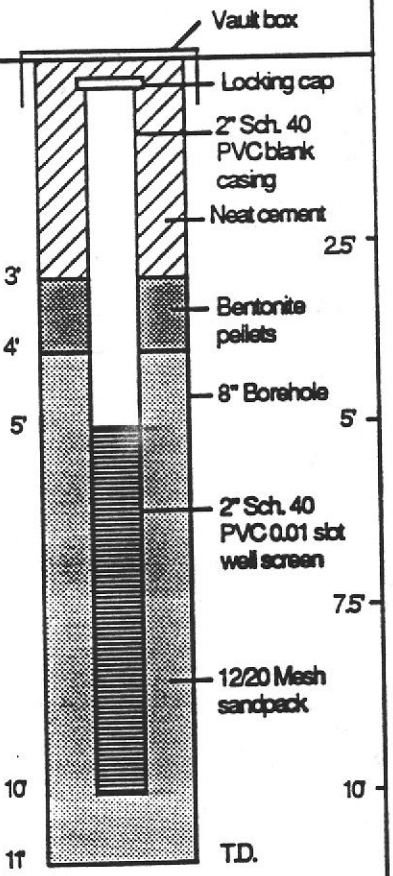
SB/MW # : W-13
D- 2340
Page 1 of 1
Sampler: B. WRIGHT

McLaren Environmental Engineering

PROJECT MARTIN GROUP/MARKETPLACE LOCATION 3' NE OF FENCE, 100' S OF N END OF MARKETPLACE
ELEVATION _____ MONITORING DEVICE 580A OVM
SAMPLING DATE(S) 8-9-89 START 1130 FINISH 1330
SAMPLING METHOD CA MOD. SPLIT SPOON SUBCONTRACTOR & EQUIPMENT ENVIRONMENTAL EXPLORATION, CME-55 HOLLOW STEM AUGER DRILL RIG
MEMO _____

Depth Below Surface(ft.)	Penetration Results: Blows 6"-6"-6"	Penetration Results: BPF	Sampler Depth Interval (ft.)	Sample ID #	OVM reading (ppm)	Soil Description Color, Texture, Moisture, Etc.	Unified Classification	Graphic Log	SubSample
					0	Asphalt Brown (10YR 4/3) gravelly sand, fine grained sand to medium pebble gravel, common brick, fill to 2', moist.	Pb		
2.5'						Greenish gray (5GY 5/1) sand, very fine to medium grained sand, poorly graded, trace pebble gravels and shell fragments, wood at 4'.	SP		
	15-7-7	14	4.0'-5.5'		0				
5'						Greenish gray (5GY 5/1) clayey sand, very fine to medium grained sand, low plasticity, sticky, very moist.	SC		
▽						Light olive brown (2.5Y 5/4) sandy gravel, fine grained sand to medium pebble gravel, well graded, rounded, saturated.	GW		
7.5'	1-1-1	2	7.0'-8.5'		0		SM		
	9-17-21	38	9.0'-10.5'		0	Very dark gray (2.5Y N3/) silty sand, very fine to medium grained sand, dense, soft, sticky, saturated.	OL		
10'							SM		
	7-16-19	35	11.0'-12.5'		0	Very dark gray (2.5Y N3/) clay, medium plasticity, soft, smooth, saturated.	GC		
12.5'						Very dark gray (2.5Y N3/) silty sand, very fine to medium grained sand, dense, medium stiff, common clam shells, moist.			
						Light olive brown (2.5Y 5/4) gravelly clay, coarse grained sand to fine pebble gravel, low plasticity, very stiff, moist.			

Borehole Abandonment/ Well Construction Details



Julie S. Menack RG
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SIGNATURE OF REVIEWER
Supervising Geologist
TITLE
TITLE

SOIL DRILLING LOG

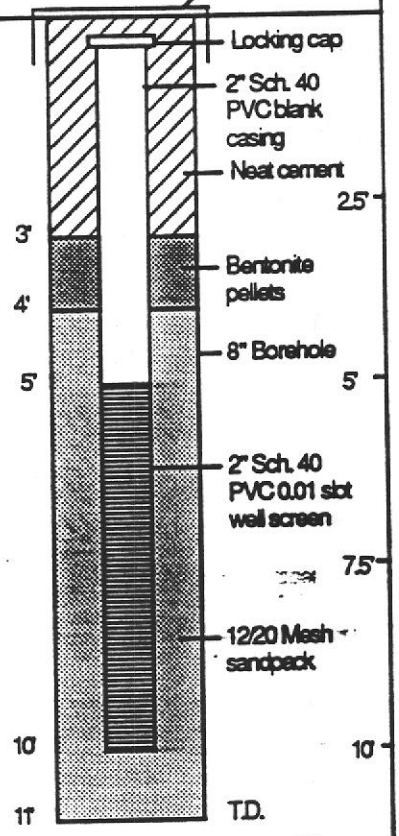
McLaren Environmental Engineering

SB/MW # : W-14
D- 2341
Page 1 of 1
Sampler: B. WRIGHT

PROJECT MARTIN GROUP/MARKETPLACE LOCATION 3' NE OF FENCE, 350' S OF N END OF MARKETPLACE
ELEVATION _____ MONITORING DEVICE 580A OVM
SAMPLING DATE(S) 8-9-89 START 1430 FINISH 1600
SAMPLING METHOD CA MOD. SPLIT SPOON SUBCONTRACTOR & EQUIPMENT ENVIRONMENTAL EXPLORATION, CME-55 HOLLOW STEM AUGER DRILL RIG
MEMO _____

Depth Below Surface(ft.)	Penetration Results: Blows 6"-6"-6"	Penetration Results: BPF	Sampler Depth Interval (ft.)	Sample ID #	OVM reading (ppm)	Soil Description Color, Texture, Moisture, Etc.	Unified Classification	Graphic Log	Sub-Sample
0					0	Asphalt Brown (10YR 4/3) gravelly sand, fine grained sand to medium pebble gravel, common brick, loose, moist.	Fb		
2.5'						Gray (5Y 5/1) to light brownish gray (2.5Y 6/2) sand, very fine to coarse grained sand, loose, poorly graded, moist.	SP		
						Light olive brown (2.5Y 5/4) silty clay, high plasticity, stiff, slightly moist.	CL		
5'	5-4-4	8	5.0'-6.5'		0	Dark greenish gray (5GY 4/1) silty sand, very fine to medium grained sand, loose, very moist.	SM SP		
	4-7-7	14	7.0'-8.5'		0		CL		
7.5'						Very dark gray (2.5Y N3/) sand, fine to very coarse grained sand, loose, trace pebble gravels and shell fragments, saturated.	SM		
	6-9-9	18	9.0'-10.5'		0	Greenish gray (5GY 5/1) silty clay, medium plasticity, stiff, slightly moist.	CL		
10'	5-6-7	13	11.0'-12.5'		0	Very dark gray (2.5Y N3/) silty sand, very fine to coarse sand dense, saturated.	CL		
12.5'						Dark gray (2.5Y N4/) silty clay, low plastic, soft, saturated.			
						Light olive brown (2.5Y 5/6) silty clay, medium plasticity, stiff minor fine sand, trace granules, moist.			

Borehole Abandonment/ Well Construction Details



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Supervising Geologist
TITLE

SOIL DRILLING LOG

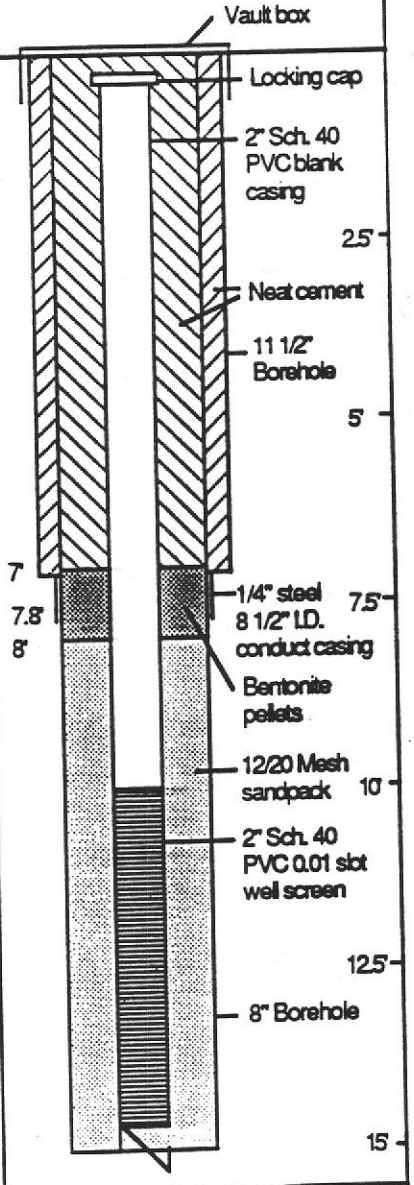
McLaren Environmental Engineering

SB/MW # : W-15
D- 2339
Page 1 of 2
Sampler: B. WRIGHT

PROJECT MARTIN GROUP/MARKETPLACE LOCATION 30' W OF RR RIGHT OF WAY, 50' S OF PROPERTY LINE
ELEVATION _____ MONITORING DEVICE 580A OVM
SAMPLING DATE(S) 8-9/10-89 START 0830 FINISH 1400
SAMPLING METHOD CA MOD. SPLIT SPOON SUBCONTRACTOR & EQUIPMENT ENVIRONMENTAL EXPLORATION, CME-55 HOLLOW STEM AUGER DRILL RIG
MEMO _____

Depth Below Surface(ft.)	Penetration Results: Blows 6"-6"-6"	Penetration Results: BPF	Sampler Depth Interval (ft.)	Sample ID #	OVM reading (ppm)	Soil Description Color, Texture, Moisture, Etc.	Unified Classification	Graphic Log	Sub-Sample
0					1	Asphalt	AC		
						Dark grayish brown (2.5Y 4/2) gravelly sand, roadbase.	Rb		
						Asphalt	AC		
						Dark greenish gray (5BG 4/1) silty sand, fine to medium grained sand, common brick fill, mild oil odor, moist	Rb		
2.5'						Concrete	PCC		
						Black (2.5Y N2/) silty clay, common wood debris, strong oil odor, saturated, product seeped into borehole at 3'	OL		
5'	6-7-15	22	5.0'-6.5'		60-75				
					10-13	Greenish gray (5G 5/1) silty clay, high plasticity, stiff, trace pebble gravel, common burrows at 6', moist.	CL		
7.5'									
	7-12-14	26	9.0'-10.5'		20-26	Greenish gray (5GY 5/1) to dark greenish gray (5G 4/1) gravelly clay, coarse sand to medium pebble gravel, low plasticity, stiff, worm burrows filled with tar, oil odor, moist.	GC		
10'	7-9-9	18	11.0'-12.5'		10-12				
12.5'	5-6-10	16	13'-14.5'		20-25	Light olive brown (2.5Y 5/6) silty clay, medium plasticity, stiff, minor coarse sand, burrows filled with tar, oil odor, slightly moist.	CL		
15'									

Borehole Abandonment/ Well Construction Details



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SIGNATURE OF REVIEWER

Supervising Geologist
TITLE

SOIL DRILLING LOG

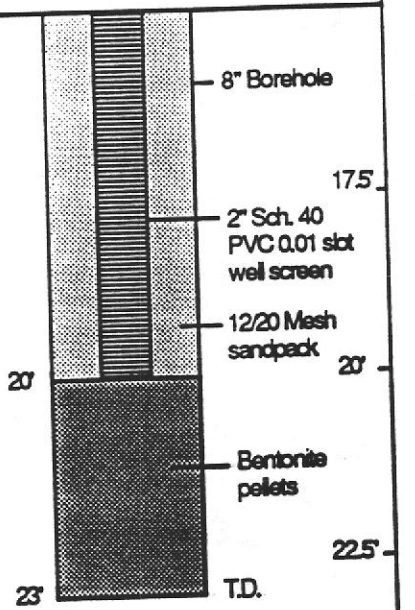
McLaren Environmental Engineering

SB/MW # : W-15
D- 2339
Page 2 of 2
Sampler: B. WRIGHT

PROJECT MARTIN GROUP/MARKETPLACE LOCATION 30' W OF RR RIGHT OF WAY, 50' S OF PROPERTY LINE
ELEVATION _____ MONITORING DEVICE 580A OVM
SAMPLING DATE(S) 8-9/10-89 START 0830 FINISH 1400
SAMPLING METHOD CA MOD. SPLIT SPOON SUBCONTRACTOR & EQUIPMENT ENVIRONMENTAL EXPLORATION, CME-55 HOLLOW STEM AUGER DRILL RIG
MEMO _____

Depth Below Surface (ft.)	Penetration Results: Blows 6"-6"-6"	Penetration Results: BPF	Sampler Depth Interval (ft.)	Sample ID #	OVM reading (ppm)	Soil Description Color, Texture, Moisture, Etc.	Unified Classification	Graphic Log	Sub-Sample
	3-4-6	10	15.0'-16.5'		10-15	Light olive brown (2.5Y 5/6) sandy clay, fine sand, medium plasticity, stiff, tar filled burrows with greenish gray (5BG 5/1) staining, oil odor, slightly moist, moist at 17'.	CL		
17.5'	3-6-11	17	17.0'-18.5'		30-50				
20'	4-5-8	13	20.0'-21.5'		64-87	Yellowish brown (10YR 5/4) silty clay, medium plasticity, hard, trace worm burrows, filled with tar, oil odor, slightly moist.	CL		
22.5'	6-12-14	16	23.0'-24.5'		5-8	Gray (5Y 5/1) silty clay, medium plastic, hard, minor granules, slightly moist.	CL		
25'									

Borehole Abandonment/ Well Construction Details



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SOIL DRILLING LOG

McLAREN

SB/MW # : MW-16
D- 4391
Page 1 of 1
Sampler: H. HIRSCHFELD

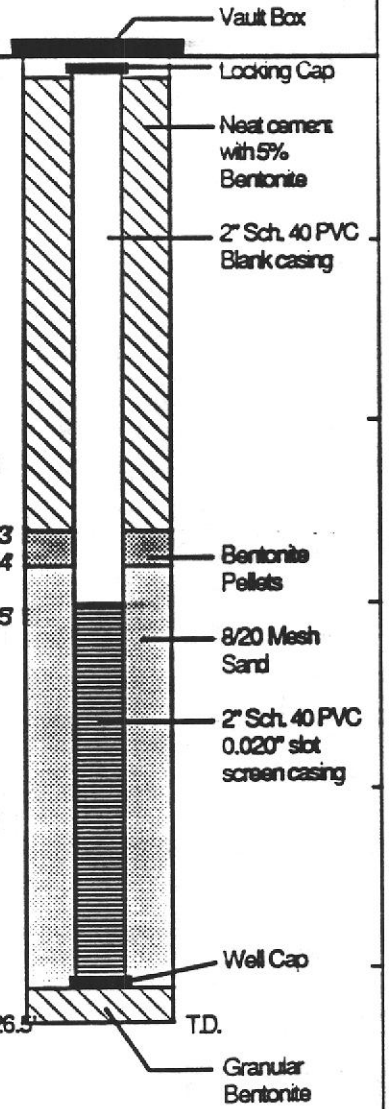
PROJECT MARKETPLACE LOCATION 40' NE OF MW-15A; 5' W OF FENCE
ELEVATION _____ MONITORING DEVICE 580A OVM
SAMPLING DATE(S) 9-21-89 START 0830 FINISH 1130
SAMPLING METHO 8" HOLLOW STEM AUGER SUBCONTRACTOR & EQUIPMENT ENVIRONMENTAL EXPLORATION, CME-55
MEMO _____

Depth Below Surface(ft.)	Penetration Results: Blows 6"-6"-6"	Penetration Results: BPF	Sampler Depth Interval (ft.)	Sample ID #	OVM reading (ppm)	Soil Description Color, Texture, Moisture, Etc.	Unified Classification	Graphic Log	Sampled Depth
			3.0-3.5	–	35	Brown (10YR 4/3) gravelly sand; fine sand to medium pebble gravel; loose; common brick; moist.	RB		
5'	2-3-4	7	5.0-6.5	–	83	Black (10YR 2/1) extremely gravelly sand; gravel to 1.5 cm in diameter; oil and grease common; moist; strong petroleum odor.	GM		
						Dark gray (5Y 4/1) clayey sand; moderately plastic; slightly sticky; medium sand; very moist; strong petroleum odor; streaks of oil and grease.	SC		
10'	8-8-8	16	10.0-11.5	–	80	Dark gray (5Y 3/1) grading to greenish gray (5G 6/1) clayey sand grading to brown (10YR 5/3) clay; very plastic; stiff to very stiff; very moist to slightly moist.	SC/CL		
15'	4-7-12	19	15.0-16.5	–	76	Olive gray (5Y 4/2) silty sand; well sorted medium sand; slightly plastic; very moist; slight petroleum odor.	SC/SM		
20'	4-6-11	17	20.0-21.5	–	157	Greenish gray (5GY 5/1) clayey sand; slightly plastic; very moist; grading to olive (5Y 3/3) sandy clay; highly plastic; very stiff; moist; oil-product; strong odor.	SC/CL		
25'	4-4-8	12	25.0-26.5	–	88	Greenish gray (5GY 5/1) silty sand; medium sand to fine pebble gravel; saturated; grading to brown (10YR 5/3) clayey sand; slightly stiff; slightly plastic; moist.	SM / SC		
30'									

final water 10/11/89

first water

Borehole Abandonment/ Well Construction Details



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SUPERVISING GEOLOGIST
TITLE

SOIL DRILLING LOG

McLAREN

SB/MW # : MW-17
D- 4392
Page 1 of 1
Sampler: H. HIRSCHFELD

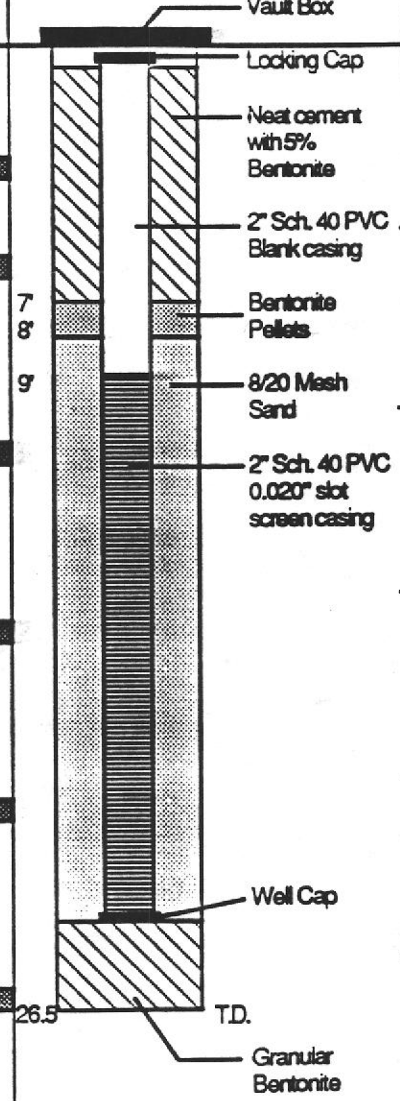
PROJECT: MARKETPLACE
LOCATION: 40' SW OF MW-15A
ELEVATION:
MONITORING DEVICE: 580A OVM
SAMPLING DATE(S): 9-21-89
START: 1130
FINISH: 1530
SAMPLING METHO: 8" HOLLOW STEM AUGER
SUBCONTRACTOR & EQUIPMENT: ENVIRONMENTAL EXPLORATION, CME-55
MEMO:

Depth Below Surface (ft.)	Penetration Results: Blows 6"-6"-6"	Penetration Results: BPF	Sampler Depth Interval (ft.)	Sample ID #	OVM reading (ppm)	Soil Description Color, Texture, Moisture, Etc.	Unified Classification
						Asphalt (6")	AC
						Sand and gravel fill material.	RB
5'	4-7-12	19	5.0-6.5	–	11	Black (10YR 2/1) clayey sand; moderately plastic; moderately stiff; medium grained sand; slightly moist to moist;oil and grease product; slight to moderate petroleum odor.	SC
10'	14-25-22	47	10.0-11.5	–	185	Olive (5Y 5/3) and yellowish brown (10YR 5/4) gravelly clayey sand; medium and coarse sand; gravel to 2.0 cm; moist; pockets of oil; strong odor.	SC
15'	5-8-10	18	15.0-16.5	–	18	Yellowish brown (10YR 5/6) clayey sand; fine sand; slightly plastic; slightly moist to moist.	SC/SM
20'	5-7-10	17	20.0-21.5	–	5.6	Yellowish brown (10YR 5/4) clayey sand; moderately stiff; moderately plastic; medium sand; saturated to very moist.	SC
25'	7-8-9	17	25.0-26.5	–	3.6	Brown (10YR 5/3) silty clay with gray (10YR 5/1) mottles; very stiff; highly plastic; moist.	CL
30'							

final water 10/11/89 (about 8')

first water (about 20')

Borehole Abandonment/Well Construction Details



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ASSOCIATE SOIL SCIENTIST

TITLE

SIGNATURE OF REVIEWER: [signature] RG 4440

SUPERVISING GEOLOGIST

TITLE

SOIL DRILLING LOG

McLAREN

SB/MW # : MW-18
D- 4393
Page 1 of 1
Sampler: H. HIRSCHFELD

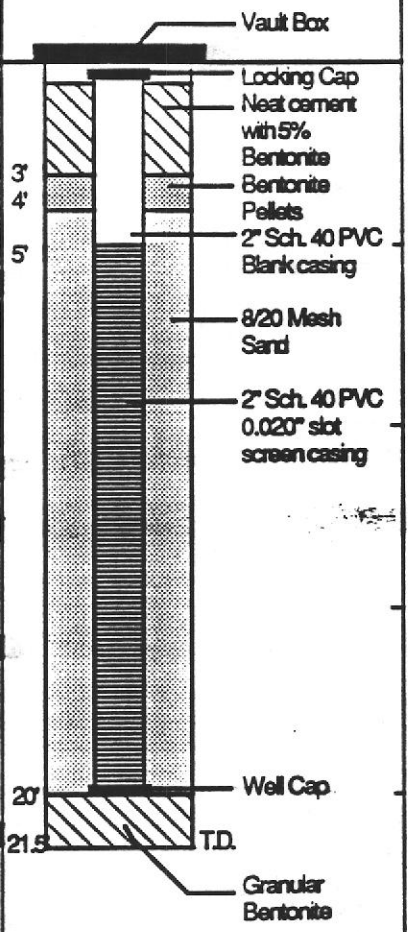
PROJECT MARKETPLACE LOCATION 40' SW OF MW-17
ELEVATION _____ MONITORING DEVICE 580A OVM
SAMPLING DATE(S) 9-22-89 START 0930 FINISH 1330
SAMPLING METHO 8" HOLLOW STEM AUGER SUBCONTRACTOR & EQUIPMENT ENVIRONMENTAL EXPLORATION, CME-55
MEMO _____

Depth Below Surface(ft.)	Penetration Results: Blows 6"-6"-6"	Penetration Results: BPF	Sampler Depth Interval (ft.)	Sample ID #	OVM reading (ppm)	Soil Description Color, Texture, Moisture, Etc.	Unified Classification	Graphic Log	Sampled Depth
5'	2-4-4	8	5.0-6.5	–	52	Asphalt (4") Yellowish brown (10YR 5/4) sand and gravel fill material; medium and coarse sand; gravel to 3.0 cm; dry to slightly moist.	RB		3' 4'
10'	9-13-10	23	10.0-11.5	–	133	Greenish gray (5G 5/1) clay; very stiff; highly plastic; streaks and pockets of grease and oil; strong petroleum odor; moist.	CH		5'
15'	8-8-7	15	15.0-16.5	–	3.4	Black (10YR 2/1) clayey sand; moderately plastic; moist; grading to yellowish brown (10YR 5/4) silty sand; medium and coarse sand; oil product; strong odor; moist.	SC/SM		
20'	4-4-7	11	20.0-21.5	–	6.3	Yellowish brown (10YR 5/4) gravelly clayey sand; coarse sand; gravel to 3.0 cm; saturated; grading to clayey sand; fine sand; moderately stiff and plastic; very moist.	SC		
						Brown (10YR 5/3) sandy clay; stiff; very plastic; fine sand; moist.	CL		20' 21.5

final water 10/11/89

first water

Borehole Abandonment/ Well Construction Details



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SECTION B.3

MONITOR WELL CONSTRUCTION, DEVELOPMENT, SAMPLING, AND SOUNDING TECHNIQUES FROM PREVIOUS INVESTIGATIONS

SECTION B.3

MONITOR WELL CONSTRUCTION, DEVELOPMENT, SAMPLING, AND SOUNDING TECHNIQUES FROM PREVIOUS INVESTIGATIONS

Prior to this investigation, a total of 18 monitoring wells and 32 soil borings had been drilled on this property. Eleven soil borings were drilled in 1981-1982 (WCC, 1982), seven soil borings were drilled in 1987 (WCC, 1987), and 14 soil borings were drilled in 1988 (Earth Metrics, 1988). Four monitor wells were installed in 1981-1982 (WCC, 1982), eight wells were installed in 1987 (WCC, 1987), and six wells were installed in 1989 (McLaren 1989b, 1989c).

Soil sampling, well construction, well development, well sampling, water level sounding, and oil/water interface sounding techniques used in each of the investigations are described in the following sections.

B.3.1 Soil Sampling

Marketplace Property, 1982

Soil samples were collected using a California split spoon sampler which was decontaminated before use with water, hexane, and distilled water. Soil samples were placed in jars which were sealed, marked for identification, refrigerated, and transported and stored in accordance with chain of custody protocol. Placement of samples in jars would likely have allowed any VOCs present to volatilize out of the sample possibly resulting in false readings.

Nielsen Freight Line Property, 1987

Ten of the soil borings in this investigation were drilled to a depth of 11.5 to 16 feet and five were drilled from 4 to 6.5 feet. The borings were sampled using a 2-inch diameter Modified California split spoon sampler.

Soils Characterization, Marketplace 1988

Sampling methods, sample containerization and preservation, and chain of custody procedures used were in accordance with U.S. EPA Test Methods for evaluating solid wastes (SW-846).

Characterization of Asphaltic Material, 1988

Soil samples were collected from on-site test pits with a Teflon coated spatula. The floating product sample was collected with a Teflon bailer. Sufficient sample volume from each site was collected to fill two eight-ounce prewashed glass sample containers with Teflon lined closures. One container of each sample was submitted to Sequoia Analytical Laboratory, a DHS certified analytical laboratory, for chemical and physical analyses and the second was submitted to ATT for bioassay testing. Samples were

transported on ice and accompanied with appropriate chain of custody documentation.

B.3.2 Well Construction and Development Techniques

Marketplace Property, 1982

Wells W-4, W-5, and W-10 were drilled by hollowstem auger between July 30 and August 4, 1981. Well W-12 was drilled on January 14, 1982 at the request of the RWQCB but has since been abandoned. Pertinent information including depth of borehole and casing, and screened interval are provided in Table 2-1 of this report. The well locations are shown in Figure 1-2 of the report. According to available reports (WCC, 1982), the monitor wells were all constructed using 2-inch I.D. PVC pipe. The well screen slot size is unknown. The screened interval for each well extends from three feet below grade to the bottom of the well. The top of the screen was placed at or just above the water table. Coarse sand was used as a filter pack. The filter pack extends from the bottom of the boring to approximately one foot above the screened section. A concrete seal was placed above the filter pack to a level just below the top of the well casing. Concrete utility boxes with locking caps were installed on all monitor wells.

Prior to construction of the monitor wells, the boreholes were cleaned by repeatedly raising the augers in order to remove cuttings. During development, flow of groundwater into the wells was slow. No further monitor well development information is available.

Nielsen Freight Line Property, 1987

Soil borings were drilled at the Nielsen property using 8-inch hollow-stem augers during the period of March 30 to April 6, 1987. Boreholes 1, 2, 3, 4, 5A, 6A, 7 and 8 were converted to groundwater monitor wells between April 13 and April 17, 1987. Wells W-1 through W-6A have been abandoned. Pertinent information including depth of borehole and casing, and screened interval, are provided in Table 2-1 in this report. The well locations are shown in Figure 1-2 of this report. The eight monitor wells were constructed using 2-inch I.D. Schedule 40 PVC pipe with 0.02 inch slot size schedule 40 PVC well screen. The wells are screened from 2 to 4 feet below grade to the bottom of the wells, which are between 10 and 15 feet deep. The top of the screened intervals were placed above the water table. The annular space contains Lonestar No. 3 sand filter pack from the bottom of the boring to approximately 1 foot above the screened section to within 1½ to 3 feet of the ground surface in all cases. A bentonite seal was placed above the filter pack to within 0.5 to 1 foot of the surface. The remaining annular space was grouted to just above the ground surface. All monitor wells were capped with a PVC slip cap. The groundwater monitor wells were developed by surging and pumping between April 9 and 17, 1987. The volume of water pumped during development is not known.

Marketplace/Nielsen Properties, 1989a and 1989b

Six monitor wells were installed by McLaren in 1989. Wells W-13, W-14 and W-15 were installed on August 9 and 10, 1989 and Wells W-16, W-17 and W-18 were installed on September 21 and 22, 1989. Pertinent information including depth of borehole and casing and screened interval are provided in Table 2-1 and the well locations are shown in Figure 1-2 of this report. Each well borehole is 8-inches in diameter and was drilled using a hollow-stem auger rig. All drilling equipment was steam-cleaned prior to the drilling of each boring. To prevent cross-contamination of soil zones in Well W-15 an 8¼-inch steel conductor casing was placed to a depth of 8 feet prior to drilling to the bottom depth.

Soil samples for Wells W-13, W-14, and W-15 were continuously collected during drilling using an 18-inch long California Modified Split-Spoon sampler. Soil samples for Wells W-16, W-17, and W-18 were collected at 5-foot intervals and at the soil groundwater interface. Samples were collected by driving the sampler ahead of the auger bit using a 140-pound drop hammer. Blow counts were taken for each 6-inch interval. Samples were monitored with an OVM detector. The soil samples were classified using the Unified Soil Classification Systems.

All wells were constructed of 2-inch schedule 40 PVC casing. The screen slot size for Wells W-13, W-14, and W-15 was 0.01 inch. The screen slot size for Wells W-16, W-17, and W-18 was 0.02 inch. The bottom of boreholes W-15 through W-18 were backfilled with granular bentonite prior to construction. The filter pack material for Wells W-13, W-14, and W-15 was 12/20 mesh sand. The filter park material for Wells W-16, W-17, and W-18 was 8/20 mesh sand. The filter pack extends one to two feet above the screened interval in all wells. A one-foot bridge of bentonite pellets was placed above the filter pack in all wells. A sanitary seal composed of neat cement with five percent bentonite was placed above bentonite bridge in all wells and the wells were equipped with water tight locking caps and at-grade, traffic-rated vault boxes.

The wells were developed using a centrifugal pump to remove 10 casing volumes of water. All soils and fluids generated during drilling and well development were collected in 55-gallon drums.

B.3.3 Groundwater Sampling Techniques

Marketplace Property, 1982

Groundwater samples for laboratory chemical analyses were obtained from four monitoring wells (W-4, W-5, W-10 and W-12) on January 20, 1982. The sampling was performed by Brown and Caldwell, Emeryville, under subcontract to Woodward-Clyde Consultants (WCC). The sampling methodology was observed by the Regional Water Quality Control Board (RWQCB).

Each well was flushed 2 days before sampling by pumping all groundwater from the well, allowing the well to recharge, and then repeating the pumping a second time.

Groundwater samples were obtained using both a stainless steel bailer for samples to be analyzed for purgable organics and a peristaltic pump with tygon tubing for samples to be analyzed for heavy metals. To avoid cross-contamination of samples among wells, 4 clean bailers and 4 lengths of tygon tubing were used, one each per well. Samples to be analyzed for purgable organics were stored in standard water-quality septum vials and samples to be analyzed for heavy metals (all wells) were stored in 1 liter polyethylene bottles. All samples were placed immediately in an on-site refrigerated container and then transported to Brown and Caldwell's Emeryville laboratory on the day of sampling.

Nielsen Freight Line Property, 1987

One groundwater sample for laboratory chemical analysis was obtained from each of the 8 newly installed monitor wells (W-1, W-2, W-3, W-4, W-5A, W-6A, W-7, and W-8) between April 13 and April 19, 1987. Also, both groundwater and floating product were sampled from well W-5 which was installed in the 1982 investigation. Samples were analyzed by Brown and Caldwell, Emeryville. No other details about the sampling methodology are known.

Marketplace/Nielsen Properties, 1989a and 1989b

McLaren sampled three newly installed wells (W-13, W-14 and W-15) and five existing wells (W-1, W-4, W-7, W-8 and W-10) between August 14 and 17, 1989. McLaren also sampled three additional newly installed wells (W-16, W-17 and W-18) and four selected existing wells (W-5, W-7, W-8 and W-15) between September 25 and 27, 1989. Free product from W-5 also was sampled.

A peristaltic pump was used to purge all wells except W-10 of a minimum of 3 casing volumes prior to sample collection. Well W-10 was sampled with a disposable hand bailer and only one casing volume was removed because the well yielded little water. All sampling equipment was steam cleaned prior to sampling each well. In wells which contained free product (W-5, W-10 and W-16) the free product was removed from the well prior to sampling the groundwater.

The groundwater samples were retained in 1 liter amber bottles except samples to analyzed for BTXE, which were retained in VOA vials. The sample containers and closures were pre-cleaned by the supplier to EPA protocols. The containers were filled using controlled, low flow while maintaining the fill tube submerged below the liquid lead in the container. The sample containers were filled until a meniscus was formed at the rim. The meniscus was sheared and the closure secured. Sample containers were labeled with sample number from a sampling log book. A sample collection record was completed for each well.

The groundwater samples were placed in an ice cooler immediately following collection and remained under refrigeration until delivered to the analytical laboratory. The samples were accompanied by a chain-of-custody record.

B.3.4 Water Level Measurement Techniques

Marketplace Property, 1982 and Nielsen Property, 1987

Although groundwater elevations were measured in each of these investigations (WCC, 1982, 1987) the methodology used is not known.

Marketplace and Nielsen Properties, 1989a and 1989b

Groundwater elevations were measured with an electronic water level sounder from the highest point on the top of the casing. At least three separate measurements were made in each well to verify the results. All water level measurements were made on the same day.

B.3.5 Oil/Water Interface Determination

Marketplace and Nielsen Properties 1989a and 1989b

All of the existing monitoring wells were sounded with an oil-water interface probe to determine the presence and amount of free product, on September 15, 1989. The new wells (W-16, W-17, and W-18) were sounded on September 22, 1989. Free product was detected in monitoring wells W-5 and W-16. In subsequent sounding rounds, all wells were checked for the presence of product, but only wells W-5 and W-16 have required the use of the oil-water interface probe.

0529rn3

SECTION B.4

SOURCES OF OFF-SITE CONTAMINATION

SECTION B.4

SOURCES OF OFF-SITE CONTAMINATION

Review of Agency Files

Various state and federal lists were examined in order to identify other properties where soils and groundwater have been sampled and analyzed in the vicinity of the Marketplace/Nielsen property. The purpose of this review was to determine the status of surrounding area investigations and their potential impact on the Marketplace/Nielsen site. In general, it did not appear that the surrounding sites had much if any impact on the Marketplace/Nielsen site although the potential exists due to localized variation in groundwater flow. However, this review indicates that there are numerous sites in the area and that the general water quality of these sites is poor.

Files available at the Regional Water Quality Control Board (RWQCB) were examined. Table B-7 is a listing of sites within approximately 1/2 mile of the subject property. Brief summaries of site conditions are provided in the following sections. The locations of these sites are shown in Figure B-5; the numbers on this figure correspond to those in Table B-7.

Westinghouse electric Company, 5899 Peladeau Street (#1 on map)

This site is listed as an EPA Superfund site in the CERCLIS list. However, the EPA has turned over the case to the RWQCB and is taking no further action. This site is being handled by the RWQCB as a Toxics Case. The western boundary of the site is located approximately 200 yards east of the subject property in an upgradient direction. Soil and groundwater at the site contain polychlorinated biphenyls (PCBs).

A subsurface cutoff wall made of a bentonite-soil slurry was constructed on the northern portion of the Westinghouse site, east of the center of the Marketplace/Nielsen site in 1985. The purpose of this cutoff wall was to fully encapsulate the area where PCBs occur in soil and prevent chemicals from moving off-site. Because this slurry wall extends down into the impermeable Bay Mud, groundwater in the fill above the Bay Mud does not move downgradient towards the Marketplace/Nielsen site.

There are several groundwater monitor wells both within and outside the cutoff wall. The most recent data available (December, 1987) suggest that concentrations in these wells have dropped since April, 1986 and that the downgradient monitor well, which is directly upgradient of the Marketplace/Nielsen site does not contain PCBs at this time. This indicates that the remedial steps taken (excavation of the contaminated soil and construction of the cutoff wall) appear to have been effective.

Peterson Manufacturing Company, 1600 63rd Street (#2 on map)

This site is being handled by the RWQCB as an Underground Fuel Leak Case and is located less than 1/8 of mile north of the subject property and is

TABLE B-7

SOURCES OF SOIL AND GROUNDWATER CONTAMINATION
IN THE VICINITY OF THE SITE

Map Designation	Site Name	Address	Hydraulic Relation and Impacted Zone
1	Westinghouse Electric Company	5899 Peladeau St.	upgradient
2	Peterson Manufacturing Corporation	1600 63rd St.	upgradient,
3	Henry Horn and Sons, Inc.	1301 65th St.	upgradient
4	Hollis Street Project	6050 Hollis St.	upgradient
5	Getz Construction Company	1351 Ocean Ave.	upgradient
6	HFH Limited	6400 Hollis St.	upgradient
7	Oliver Rubber Company	1200 65th St.	upgradient
8	Chevron Asphalt Plant and Terminal	1520 Powell Ave.	upgradient
9	Benefit Capital Corporation	1650 65th St.	cross gradient
10	Bay Center Project	65th and Christie Ave.	cross gradient
11	Shell Oil Company Service Station	1800 Powell Ave.	downgradient
12	P.I.E. Nationwide Property	5500 Eastshore Freeway	downgradient
13	Garrett Freight Line	64th and Lacoste St.	cross gradient
14	Pfizer Pigments Inc.	4650 Shellmound St.	downgradient

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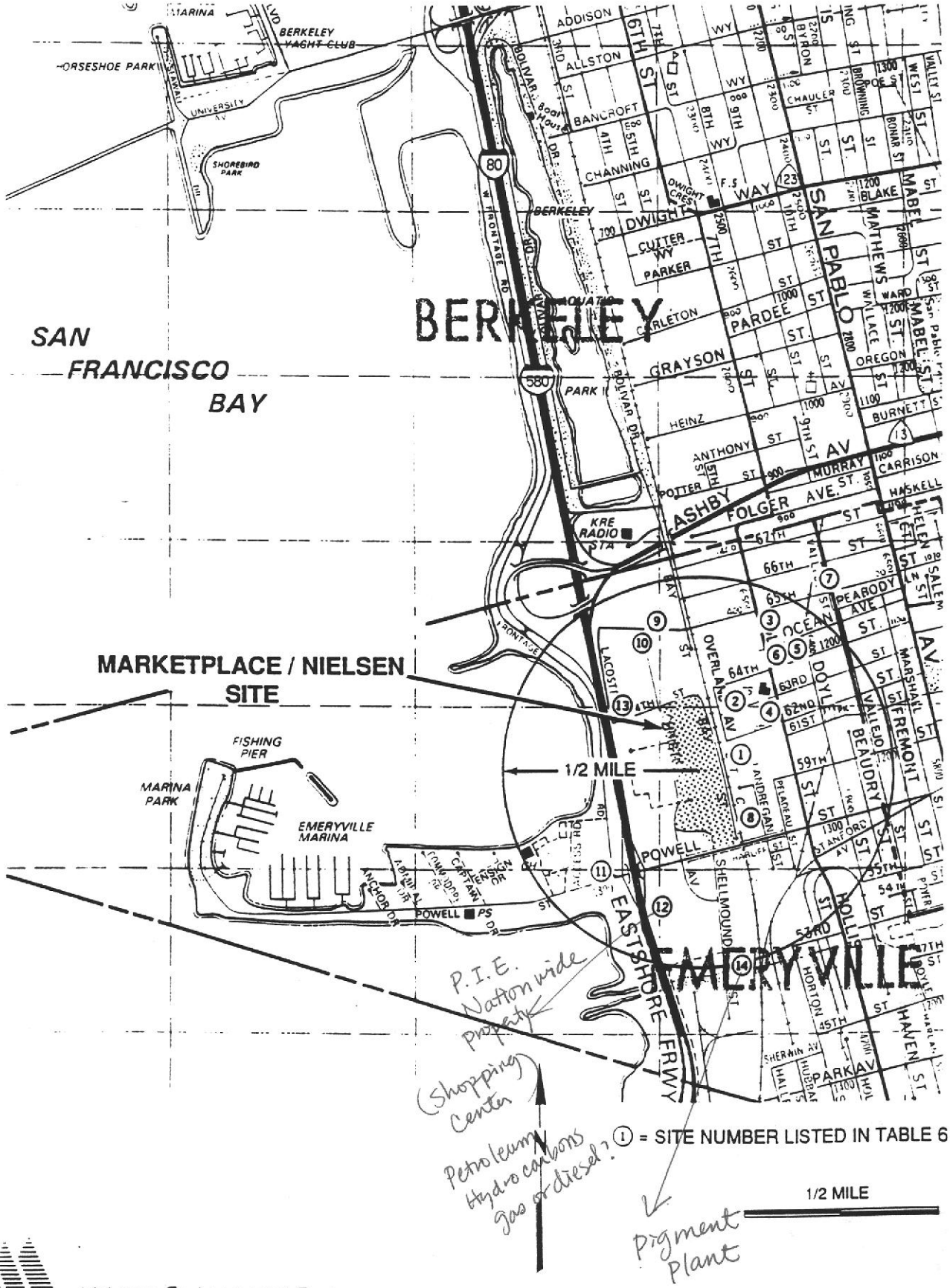
FIGURE B-5
OTHER SITES WITH REPORTED
SOIL OR GROUNDWATER
CONTAMINATION



McLaren Environmental Engineering

now occupied by a new Federal Express terminal. The RWQCB site file indicates that groundwater and soil contain diesel fuel and gasoline. Diesel fuel (as TPH/Diesel) was detected at a concentration of 17,000 ppm in a groundwater sample taken during March, 1988 from an on-site industrial well which the RWQCB has requested be abandoned. Other on-site wells had lower concentrations of diesel but concentrations were not given. The RWQCB site file contained no information regarding tank removal or remediation of this site.

Groundwater samples collected at the Nielsen site in 1987 and analyzed for a variety of petroleum hydrocarbons (McLaren, 1989) indicate that groundwater from the Peterson site had not impacted the Nielsen site as of that time.

Henry Horn and Sons, 1301 65th Street (#3 on map)

This site is being handled by the RWQCB as an Underground Fuel Leak Case. Henry Horn and Sons leased the property to Oakland Diesel Distributing Corporation in 1981. This corporation uses the site for the sale and repair of engine parts and is located less than a 1/2 of a mile north of the subject property. Gasoline occurs in both groundwater and soil at this site.

A letter report written by Blymer Engineers, Inc. (July 14, 1988) indicates that soil and groundwater at the site contain gasoline at concentrations up to 35,000 and 1,400 ppb (as TPH/G), respectively. Xylene was detected at a concentration of 15 ppb. A hydrocarbon sheen (free product) was observed on the local water table. An underground storage tank which was removed on June 9, 1988 was observed to have two holes in it. As of July, 1988, the extent of the hydrocarbons in the soil and groundwater had not been defined and remediation had not been undertaken at the site. Because this site is upgradient of the subject site, it is possible that TPH in groundwater might reach the subject site.

Hollis Street Project, 6050 Hollis Street (#4 on map)

This site is being handled by the RWQCB as an Underground Fuel Leak Case. The site is a service station located approximately 1/4 of a mile east of the subject property. Petroleum hydrocarbons from an underground storage tank have contaminated soils at this site. Based on regional groundwater flow directions and local topography, the Hollis Street Project Site is located hydraulically upgradient from the subject property.

TPH concentrations in the soil did not exceed 1700 ppm. The leaking tank was removed sometime during 1987 and a single groundwater monitor well was installed immediately downgradient of the tank excavation in February, 1989. Groundwater samples did not contain detectable TPH concentrations. RWQCB files indicate that the Alameda County Department of Environmental Health (DEH) is satisfied with the monitoring plan being performed at the site. This plan involves quarterly groundwater sampling of the monitor well immediately downgradient from the tank excavation.

Getz construction Company, 1351 Ocean Avenue (#5 on map)

This site is being handled by the RWQCB as an Underground Fuel Leak Case. The site is located less than 1/2 of a mile north of the subject property and is now occupied by Wind River Systems, Inc. Gasoline leaking from a storage tank has reached soil at the site. The tank was removed and soil samples were taken from the tank excavation. Diesel concentrations in the soil did not exceed 930 ppm. There was no indication that groundwater sampling had been done at the site. Based on regional groundwater flow directions and local topography, the Getz Construction Company Site is located hydraulically upgradient from the subject property.

HFH Limited, 6400 Hollis Street (#6 on map)

This site is being handled by the RWQCB as an Underground Fuel Leak Case. The site is located less than 1/2 of a mile north of the subject property. Soil contaminated by gasoline as the result of a leak in a 2000-gallon underground fuel tank are present at this site. The tank was removed and two soil samples were taken at both ends of the tank excavation. TPH concentrations did not exceed 23 ppm. Because the concentration in the soil was low, no further soil sampling was performed.

Based on regional groundwater flow directions and local topography, the HFH Limited Site is located hydraulically upgradient from the subject property. Because of the low soil concentrations detected, this site is not likely to cause future groundwater contamination at the subject property.

Oliver Rubber Company, 1200 65th Street (#7 on map)

This site is being handled by the RWQCB as a leaking underground tank case. The site is located more than 1/2 of a mile north of the subject property. Soil at the site was discovered to contain low levels of PCE (4-6 ppb). Groundwater has not been affected. There is no indication that soils at the site were treated or excavated. Although this site is located hydraulically upgradient of the subject properties, concentrations in the soils are low; therefore, this site is not expected to cause future groundwater contamination.

Chevron Asphalt Plant and Terminal, 1520 Powell Street (#8 on map)

This site is being handled by the RWQCB as a Toxics Case. The site is an abandoned fueling terminal and asphalt testing laboratory. The site is believed to be located immediately east of the railroad tracks within a few hundred yards of the subject property. Groundwater and soil contaminated by chlorinated solvents and cycloalkanes (C_3 through C_8) are present at this site.

RWQCB files indicate that dichloroethene (DCE), trichloroethene (TCE), and vinyl chloride were detected in groundwater at concentrations of up to 1200, 160, and 1500 ppb, respectively. Cycloalkanes were detected at concentrations of up to 3600 ppb. Extensive groundwater monitoring and soil sampling has taken place at the site but the extent of the contamination has yet to be defined.

Chevron retained Western Geologic Resources, Inc. to excavate 7500 cubic yards of soil. Western Geologic Resources, Inc. requested permission from the RWQCB on May 25, 1989 to discharge water from the excavation after treating it. There are no further records regarding the progress of this remediation.

Based on regional groundwater flow directions and the local topography, the Chevron Site is located hydraulically upgradient from the subject property; therefore, it could possibly result in groundwater contamination beneath the southern portion of the subject property.

Benefit Capital Corporation, 1650 65th Street (#9 on map)

This site is being handled by the RWQCB as an Underground Fuel Leak Case. The site is located less than 1/2 of a mile northwest of the subject property and is now occupied by the Container Repair Center. A leak in the ancillary piping of an underground gasoline tank resulted in both soil and groundwater contamination. The tank was removed and the soil was excavated in February, 1988. Groundwater contained 33 ppm total fuel hydrocarbons (TFH). Soil contained 6,600 ppm TFH at a depth of ten feet below grade.

The removal of the contaminated soil coupled with the fact that this site is located hydraulically cross gradient from the subject property indicates that this site is not a potential source of groundwater contamination at the subject property.

Bay Center Project, 65th and Christie Avenue (#10 on map)

This site is being handled by the RWQCB as a leaking underground storage tank case. The site is located less than 1/2 of a mile northwest of the subject property and is situated on what is now the Emery Bay Business and Apartment Complex. Based on drilling logs, it appears that soils and/or groundwater at this site may have been impacted by industrial activities. This site is located hydraulically cross gradient of the subject property; therefore, it is unlikely that soil conditions at this site would affect conditions at the Marketplace/Nielsen site.

Shell Oil Company Service Station, 1800 Powell Street (#11 on map)

This site is being handled by the RWQCB as an Underground Fuel Leak Case. The site is a service station located less than 1/2 of a mile west of the subject property. Groundwater and soil contain petroleum hydrocarbons at this site. A quarterly groundwater monitoring report dated April 14, 1989 indicates that concentrations (as TPHs) in groundwater range from 0.05 to 700 ppm. Benzene was detected at concentrations ranging from 0.0011 to 37.0 ppm. Free product was detected in one monitor well. Hydrocarbon sheens were observed in other monitor wells. RWQCB files give no indication as to whether remedial action is being taken at the site.

Based on regional groundwater flow directions and local topography, this site is located hydraulically downgradient from the subject property;

therefore, this site is not likely to result in groundwater contamination at the subject property.

P.I.E. Nationwide Property, 5500 Eastshore Freeway (#12 on map)

This site is located less than 1/2 of a mile southeast of the subject property. The shopping center on the southeast corner of the Eastshore Freeway and Powell Avenue may occupy all or a portion of this property. Soil and groundwater containing petroleum hydrocarbons (whether hydrocarbons are gas or diesel is not known) has been identified at this site.

A trench has been dug on the western (downgradient) portion of the site in order to capture groundwater. The captured groundwater is being treated with bioreactors located on-site. The treated water is then being discharged into a storm drain.

This site is located downgradient of the subject property; furthermore, neither free product nor dissolved contaminants in groundwater have been detected in wells on the upgradient portion of the site; therefore, this site does not pose a threat to the quality of groundwater beneath the subject property.

Garrett Freight Line, 64th Street and Lacoste Street (#13 on map)

This site is being handled by the RWQCB as an Underground Fuel Leak Case. The site is located approximately 1/4 of a mile west of the subject property and is located on what is now the Emery Bay Business and Apartment complex. Based on regional groundwater flow directions and local topography, the Garrett Freight Line Site is located hydraulically cross-gradient from the subject property.

A RWQCB fuel leak case form dated May 5, 1986 indicates that soil at this site contains both miscellaneous motor fuels and metals; specifically, lead, zinc, and iron. It can be inferred that since lead and zinc have also been detected at the Marketplace/Nielsen site, it is likely that metals occur in soils throughout the area due to former industrial activities.

Hydrocarbon concentrations in the soil are not known. Lead was detected in the soil at concentrations of 50 to 1000 ppm. Zinc concentrations in the soil did not exceed 2500 ppm. Iron was detected in the soil at concentrations ranging from 6,700 to 140,000 ppm. These values could be the result of rusting scrap metal disposed of in the municipal landfill that once existed at the site (Draft Report, Earth Metrics Incorporated, March 14, 1986). It has not been determined if groundwater contains metals at this site.

Pfizer Pigments, Inc., 4650 Shellmound Street (#14 on map)

This site is being handled by the RWQCB as an Underground Fuel Leak Case. The site is a pigment manufacturing plant and is located approximately 1/2 of a mile south of the subject property. Soil contains grease and waste oil as the result of a leak in an underground tank.

The tank was removed and soil samples were taken. Total oil and grease (TOG) concentrations were as high as 53,750 ppm and indicate that product may be present in site soils. The impact on groundwater was minimal and, for the time being, appears to be confined to the area immediately below the tank excavation.

The extent to which soil has been excavated or treated is not known. The DEH ordered Pfizer Pigments to increase their groundwater sampling frequency from semi-annually to quarterly and submit a remedial action plan by June 30, 1989.

Based on regional groundwater flow directions and local topography, this site is located hydraulically down- and cross gradient from the subject property. Because of the hydraulic relation to, and the distance from, the subject property, this site is not likely to impact the subject property.

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SECTION B.5

CHARACTERIZATION OF ASPHALTIC MATERIAL AND FREE PRODUCT

SECTION B.5

CHARACTERIZATION OF ASPHALTIC MATERIAL AND FREE PRODUCT

The asphaltic material and free product were characterized by McLaren in 1989 (McLaren, 1989c) to determine whether these petroleum products could be derived from the same source. The following sections are summarized from the report.

B.5.1 Asphaltic Materials Characterization

The chemical composition of the asphaltic materials has been characterized in four reports. In 1987, samples of the asphaltic material were collected for analysis of PNAs from borings EM-1 and EM-8C according to EPA Method 8310 (Earth Metrics, 1987). Soil from Boring EM-8C was not saturated with oil and grease whereas soil from Boring EM-1 was relatively saturated with oil and grease. Both samples contained PNAs in the ppb range, notably pyrene and fluoranthene in Boring EM-1 and acenaphthene and phenanthrene in Boring EM-8C. The results of this analysis are presented in Table B-8. The soil boring locations are shown in Figure B-3.

The horizontal and vertical distribution of asphaltic material was determined based on drilling 14 soil borings. Most of the asphaltic material is located northeast of the Emery Bay Marketplace site along the eastern property boundary. The old refinery complex was located in this area. Because refined asphalt was conveyed by pipeline from the refinery complex to a former manufacturing building located near the two existing Marketplace buildings, discharge may have occurred at the pipeline termini where asphaltic material occurs adjacent to the main Marketplace building.

In 1988, the asphaltic material collected from two on-site test pits was analyzed for VOCs, SOCs and metals (ATT, 1988). The only VOCs detected were acetone at 2,500 ppb and methylene chloride at 800 ppb in sample EM-4. Both acetone and methylene chloride are listed in Title 26 CCR Section 22-66680 as hazardous for their potential ignitability. An ignitability test on a sample collected at EM-4 demonstrated that the asphaltic material is not hazardous according to that criteria. Methylene chloride is also listed in Title 26 CCR Section 22-66680 as hazardous according to potential toxicity. The concentration of methylene chloride (800 ppb) measured in sample EM-4 is far less then the toxicity criteria concentration of 1,000 mg/kg for total halogenated organic compounds [Title 22 CCR Section 22-66900(e)]. No SOCs were detected and the metals analyses indicated that concentrations of metals were below TTLC criteria. The results of these analyses are presented in Table B-9.

The asphaltic material was further characterized in 1989 (McLaren, 1989c). A sample of the asphaltic material was analyzed to evaluate its leaching potential using the EPA Toxicity Characterization Leaching Procedure (TCLP). The TCLP is a relatively new procedure developed by the EPA in order to assess the potential leachability of toxicants from liquid, solid and multiphasic wastes under test conditions conducive to leaching. The method involves grinding the solid material and using an acid extract

TABLE B-8

RESULTS FROM EARTH METRICS SAMPLING OF (12/87) FROM
MARKETPLACE AND NIELSON PROPERTIES

Log Number	Parcel Number	Sample Date	Naph-thalene (ppm)	Acenaph-thylene (ppm)	Acenaph-thene (ppm)	Flourene (ppm)	Phenanth-rene (ppm)	Anthra-cene (ppm)	Fluoran-thene (ppm)	Pyree (pp)
EM-1	2	1988	<6.2	<12.5	17.8	<1.2	7.8	<0.2	<1.2	<0.6
EM-8C	1	1988	<6.2	<12.5	<6.2	<1.2	4.3	<0.2	30.2	16.7

Chemicals continued:

Benzo (A) Anthra-cene (ppm)	Chrysene (ppm)	Benzo (B) Fluoran-thene (ppm)	Benzo (K) Fluoran-thene (ppm)	Benzo (A) Pyrene (ppm)	Dibenzo (AH) Anthra-cene (ppm)	Benzo (GHI) Perylene (ppm)	Indeno-pyrene (ppm)
4.8	<0.6	5.5	5.5	1.4	7.6	2.7	1.4
2.6	0.8	3.7	3.1	0.8	2.4	1.8	1

Parcel 1 = Another tree corporation (Richard Pritzker)
Parcel 2 = Christie Avenue Partners - JS

0529rn2

TABLE B-9

RESULTS FROM AQUA TERRA TECHNOLOGIES SAMPLING OF(6/88)
FROM MARKETPLACE AND NIELSEN PROPERTIES

SAMPLE NUMBER	WELL OR LOG NUMBER	PARCEL NUMBER	SAMPLE DESCRIPTION	IGNITABILITY (FLASHPOINT C)	pH (Corositivity)	ARSENIC	BARIUM	CADMIUM
						TTLC (mg/kg-wet weight)		
8061961	W-5	BS	Liquid	90	7	1.3	1.7	0.13
8061962	Em-4	2	Soil	>110	8.8	6.1	66	0.22
8061963	E-1	2	Soil	>110	7	10	130	0.3

* = Except Methylene chloride 800 ug/kg and acetone 2500 ug/kg
# = Except 2-methylnaphthalene 220000 ug/kg
NA = NOT ANALYZED
ND = NOT DETECTED
PARCEL 2 = CHRISTIE AVENUE PARTNERS-JS
PARCEL 3 = CHRISTIE AVENUE PARTNERS-JS
PARCEL 4 = CHRISTIE AVENUE PARTNERS-JS
PARCEL BS - BAY STREET - PROPERTY OF CITY OF EMERYVILLE

TABLE B-9
(Continued)

RESULTS FROM AQUA TERRA TECHNOLOGIES SAMPLING OF(6/88)
FROM MARKETPLACE AND NIELSEN PROPERTIES
CONTINUED

SAMPLE NUMBER	WELL OR LOG NUMBER	PARCEL NUMBER	SAMPLE DESCRIPTION	CHROMIUM (III)	CHROMIUM (VI)	COPPER	LEAD	NICKEL
				TTLC (mg/kg-wet weight)				
8061961	W-5	BS	Liquid	0.75	<0.05	0.35	2.9	3.5
8061962	Em-4	2	Soil	17	<0.05	49	9.5	31
8061963	E-1	2	Soil	30	<0.05	16	0.95	28

* = Except Methylene chloride 800 ug/kg and acetone 2500 ug/kg
# = Except 2-methylnaphthalene 220000 ug/kg
NA = NOT ANALYZED
ND = NOT DETECTED
PARCEL 2 = CHRISTIE AVENUE PARTNERS-JS
PARCEL 3 = CHRISTIE AVENUE PARTNERS-JS
PARCEL 4 = CHRISTIE AVENUE PARTNERS-JS
PARCEL BS - BAY STREET - PROPERTY OF CITY OF EMERYVILLE

TABLE B-9
(Continued)

RESULTS FROM AQUA TERRA TECHNOLOGIES SAMPLING OF(6/88)
FROM MARKETPLACE AND NIELSEN PROPERTIES
CONTINUED

SAMPLE NUMBER	WELL OR LOG NUMBER	PARCEL NUMBER	SAMPLE DESCRIPTION	SELENIUM TTLC (mg/kg-wet weight)	ZINC TTLC (mg/kg-wet weight)	VOLATILE ORGANICS	SEMI-VOLATILE ORGANICS
8061961	W-5	BS	Liquid	0.26	1.4	ND	ND#
8061962	Em-4	2	Soil	0.51	200	ND*	ND
8061963	E-1	2	Soil	0.51	110	ND	ND

* = Except Methylene chloride 800 ug/kg and acetone 2500 ug/kg
# = Except 2-methylnaphthalene 220000 ug/kg
NA = NOT ANALYZED
ND = NOT DETECTED
PARCEL 2 = CHRISTIE AVENUE PARTNERS-JS
PARCEL 3 = CHRISTIE AVENUE PARTNERS-JS
PARCEL 4 = CHRISTIE AVENUE PARTNERS-JS
PARCEL BS - BAY STREET - PROPERTY OF CITY OF EMERYVILLE

TABLE B-9
(Continued)

RESULTS FROM AQUA TERRA TECHNOLOGIES SAMPLING OF(6/88)
FROM MARKETPLACE AND NIELSEN PROPERTIES
CONTINUED

SAMPLE NUMBER	WELL OR LOG NUMBER	PARCEL NUMBER	SAMPLE DESCRIPTION	TRIMETHYL DODECANE	DIMETHYL NAPHTHALENE	TRIMETHYL NAPHATHALENE	TETRAMETHYL PENTADECANE
						(ug/kg)	
8061961	W-5	BS	Liquid	1100000	500000	2000000	1400000
8061962	Em-4	2	Soil	NA	NA	NA	NA
8061963	E-1	2	Soil	NA	NA	NA	NA

* = Except Methylene chloride 800 ug/kg and acetone 2500 ug/kg
# = Except 2-methylnaphthalene 220000 ug/kg
NA = NOT ANALYZED
ND = NOT DETECTED
PARCEL 2 = CHRISTIE AVENUE PARTNERS-JS
PARCEL 3 = CHRISTIE AVENUE PARTNERS-JS
PARCEL 4 = CHRISTIE AVENUE PARTNERS-JS
PARCEL BS - BAY STREET - PROPERTY OF CITY OF EMERYVILLE

TABLE B-9
(Continued)

RESULTS FROM AQUA TERRA TECHNOLOGIES SAMPLING OF(6/88)
FROM MARKETPLACE AND NIELSEN PROPERTIES
CONTINUED

SAMPLE NUMBER	WELL OR LOG NUMBER	PARCEL NUMBER	SAMPLE DESCRIPTION	TETRAMETHYL HEXADECANE	PCBs
8061961	W-5	BS	Liquid	2700000	ND
8061962	Em-4	2	Soil	NA	ND
8061963	E-1	2	Soil	NA	ND

* = Except Methylene chloride 800 ug/kg and acetone 2500 ug/kg
# = Except 2-methylnaphthalene 220000 ug/kg
NA = NOT ANALYZED
ND = NOT DETECTED
PARCEL 2 = CHRISTIE AVENUE PARTNERS-JS
PARCEL 3 = CHRISTIE AVENUE PARTNERS-JS
PARCEL 4 = CHRISTIE AVENUE PARTNERS-JS
PARCEL BS - BAY STREET - PROPERTY OF CITY OF EMERYVILLE

solution. The TCLP procedure is applicable to wastes that may inappropriately be deposited in a sanitary landfill because it was designed to simulate conditions that might be encountered in a landfill. To date, this procedure has not gained full acceptance in the environmental community and has been subject to criticism in two areas:

- The use of acidic extractant is significantly more severe than may be encountered in the environment; and
- Milling of the sample prior to extraction may not be representative of subsurface conditions.

The EPA has suggested that future modifications to the procedure may include elimination of the milling process except where the analysis of VOCs is involved (USEPA, 1986). This is due to the use of a zero-headspace extractor (ZHE) which does not allow the use of the proposed alternative to grinding. In addition, numerous problems have been encountered in the use of the ZHE with regards to the precision of the TCLP.

The results of the TCLP extraction test are summarized in Table B-10. Concentrations of 130 ppb benzene, 180 ppb toluene, 140 ppb xylenes, and 8.5 ppb ethylbenzene were leached from the sample. Published regulatory levels for toluene, xylene and ethylbenzene for a TCLP extract are 330 ppb, 150 ppb and 53 ppb, respectively (40 CFR Section Part 268. Subpart D, 1988). No regulatory standards exist for benzene in TCLP extract. The leachate from the TCLP test also showed 330 ppb of TPH/D, 53 ppb of 2,4-dimethylphenol, and 70 ppb of naphthalene. No regulatory limits have been set for these compounds by TCLP protocol.

These data suggest that under worst case laboratory conditions, low levels of BTXE and other organic chemicals may be extracted from the asphaltic material. None of the established regulatory standards were exceeded under the TCLP protocol.

Although the leaching test results indicate some potential for the leaching of BTXE compounds, the groundwater data indicate that these aromatic hydrocarbons were generally not found on-site with the exception of two samples located on the upgradient border (benzene at 5.5 ppb in Well W-16 and xylene at 1.3 ppb in Well W-15). Therefore, although the TCLP suggests a leaching potential, groundwater data from the site indicate that no significant leaching of BTXE compounds has occurred.

B.5.2 Free Product Characterization

The free product found in monitoring Well W-5 during groundwater investigations has been described as a "black floating fluid" (WCC, 1987) and as free product (McLaren, 1989a). The chemical characterization of the free product was carried out in 1987, 1988 and 1989 (WCC, 1987; ATT, 1988; McLaren 1989c).

In 1987 a sample of the free product was analyzed for VOCs and SOCs. The black fluid was found to have a hydrocarbon matrix and to contain no detectable VOCs. A number of PNAs were detected in the SOC scan. These

TABLE B-10

RESULTS OF THE ASPHALT LEACHIBILITY TEST (TCLP)

Purgeable Aromatics (EPA 602)	Extracted ug/l (ppb)	Waste Extract[a] Standards ug/l (ppb)
Benzene	130.0	---
Toluene	180.0	330
Ethylbenzene	8.5	53
Total Xylenes	140.0	150
TPH/D	330.0	---
Semivolatile Organic Compounds (EPA 8270)		
2,4 - Dimethylphenol	53.0	---
Naphthalene	70.0	---

[a] Source: CFR 40, Part 268, Subpart D pp. 721.

0529rn2

included chrysene, fluorene, and phenanthrene at 170, 170 and 440 ppb, respectively. All metal concentrations were below the TTLC for PNAS listed in Title 26 CCR Section 22-66699.

The free product was analyzed for total SOCs and PCBs according to EPA Method 9020 and for PCBs. The product contained 433 ppm of total SOCs and no detectable concentrations of PCBs.

The floating product was analyzed for hazardous waste characteristics listed in Title 26 CCR Section 22-66680 et seq (ATT, 1988). Specific analyses included:

- VOCs with library search (EPA Method 8240);
- SOCs with library search (EPA Method 8240);
- Heavy metals by inductively coupled argon plasma spectrometry (ICAP) (EPA Method 6010) and atomic absorption graphite furnace (AA) (EPA 7000 series);
- Ignitability (according to the method described in Title 26 CCR Section 22-66702);
- Corrosivity (according to the method described in Title 22 CCR Section 66708); and
- Aquatic toxicity(according to the method described in Title 26 CCR Section 22-66696).

The results of the metals analysis showed that concentrations of metals extracted from the floating product sample were substantially less than the TTLC for these metals. No VOCs were detected in the floating product. The only priority pollutant organic compound detected in the free product SOC analysis was 2-methylnapthalene at 220 mg/kg. Five additional petroleum constituents associated with asphalt were also identified in the library scan of this sample. The identified compounds are trimethyldodecane, dimethylnaphthalene, trimethylnaphthalene, tetramethylpentadecane, and tetra-methylhexadecane.

The results of the ignitability test showed that the sample of the floating product had a flashpoint greater than 60°C. The free product will not cause fire through friction and is not classified as an oxidizer according to CFR 40 Section 173.151. The free product was not unstable, did not react violently with water, or generate toxic fumes when mixed with water. The corrosivity test showed that the sample was within the neutral range of pH from 7 to 8.8. Therefore, the sample is not corrosive according to Title 26 CCR Section 22-66708, which defenses corrosive as less than or equal to pH = 2.0 or greater than or equal to pH = 12.5.

The results of the aquatic toxicity test on the floating product sample from Well W-5 indicated that the 96-hour LC50 for fathead minnows was greater than 500 mg/L. Therefore, the sample was not toxic to aquatic organisms according to Title 26 CCR Section 22-66696.

The free product was analyzed to determine the type of hydrocarbon (McLaren, 1989c). The following tests were proposed to be able to demonstrate that the product is chemically different than the asphaltic material:

- API Gravity by ASTM Method D287;
- Viscosity by ASTM Method D445; and
- Distillation to determine the boiling range of the product by either ASTM Method D1160 (heavy products) and ASTM Method D86 (light products).

The average boiling point for the free product was approximately 750°F and the molecular weight falls within a range of 220 to 260. Petroleum products in this boiling and molecular weight range may be classified as heavy gas oil or heavy crude oil. The free product sample contained too much water (about 34%) for an effective distillation analysis.

B.5.3 Comparison of the Asphaltic Material and Free Product

Based on the results of the testing performed on the asphaltic material and free product and the fact that the two substances do not typically occur together, it was concluded that they are unrelated materials (McLaren, 1989c). This conclusion is supported by the following:

- The D1160 distillation was not completed for either material since the asphaltic material was too dense and could not be distilled and the free product contained too much water.
- The asphaltic material was too dense (solid) to determine API gravity or viscosity.
- API gravity and viscosity measurements for the free product indicate the estimated boiling range is 650° to 850°F, which indicates the product is a heavy gas oil, or heavy crude oil. Hydrocarbons in this boiling range were not leached to an appreciable degree from the asphaltic material even under the severe leaching conditions of the TCLP.
- The free product is found in Well W-5 floating on top of the water table and appears to be isolated to the area surrounding Wells W-5 and W-16.
- These wells are adjacent to a transfer manifold pipeworks located on the Santa Fe Railroad property, which may have historically been used for product off-loading.
- The asphaltic material occurs in aggregated veins to depths of seven feet below grade and is interdispersed in the soil.
- The asphaltic material has been found at several locations throughout the eastern and central portions of the site.

- If the free product were related in origin to the asphaltic material, the two substances would consistently occur in conjunction with each other. Therefore, the asphaltic material and free product are different, unrelated hydrocarbon materials.

0529rn3

APPENDIX C

DATA FROM HYDROGEOLOGIC INVESTIGATION

SOIL DRILLING LOG

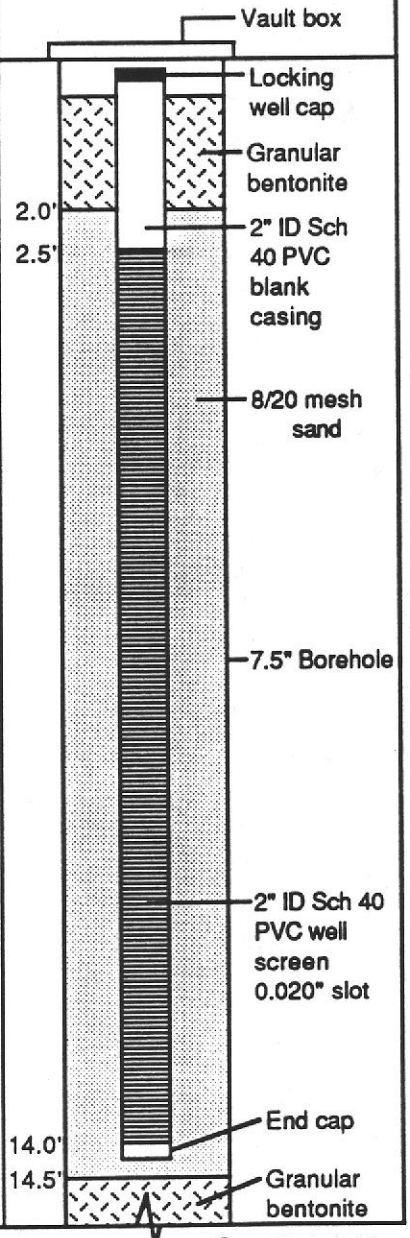
McLaren

SB/MW # W-19
D- 5757, 5758
Page 1 of 2
Sampler: M CHRISTENSEN

PROJECT MARKETPLACE 59801-008 LOCATION 305'SE FROM CENTER OF 64 ST. & 340'NE FROM CENTER OF CHRISTIE AVE
ELEVATION 10.265' (MSL) MONITORING DEVICE Hnu, BENZENE DREAGER
SAMPLING DATE(S) 4-6-90 START 7:30 FINISH 11:00
SAMPLING METHOD 5' CONTINUOUS SAMPLER SUBCONTRACTOR & EQUIPMENT GREGG DRILLING MOBILE B-53
MEMO HAND AUGER TO 5'. 0 ppm BENZENE DETECTED AT 20'.
MODIFIED CALIFORNIA SPLIT SPOON SAMPLER USED FROM 5' TO 10'.
PERCENTAGE ORDER: (GRAVEL-SAND-SILT-CLAY).

Depth Below Surface(ft.)	Penetration Results: Blows 6"-6"-6"	Penetration Results: BPF	Sampler Depth Interval (ft.)	Sample ID #	Hnu reading (ppm)	Soil Description Color, Texture, Moisture, Etc.	Unified Classification	Graphic Log	Sampled Depth
	NA	NA		NA		(0.0-0.5'); Asphalt	AC		NA
					1.7	(0.5'-2.0'); clayey sand; (20-50-15-15); yellowish brown, (10YR5/6); slight plasticity; fine to coarse grained sand; sub-angular gravel (to 3.0 cm); soft; dense; moist. Contains minor brick fragments.	SC (RB)		
2.5'						(2.0'-6.0'); sandy clay; (5-45-20-30); very dark gray, (10YR3/1); low plasticity; fine to medium grained sand; sub-angular gravel (to 1.0 cm); slightly stiff; moist, grading to slightly moist with depth. Contains wood and brick fragments; concrete occurs between 5.5'-6.0'.	CL		
4-9-90 5'			5.0-6.5		2.2				
			6.5-8.0			(6.0'-9.0'); clayey sand; (15-50-15-20); dark grayish brown, (2.5Y4/2); slight plasticity; fine to coarse grained sand; sub-angular gravel(to2.0cm); soft; medium density; saturated. Contains wood and brick fragments; dark brown viscous oil droplets observed in cuttings.	SM/SC		
7.5'			8.0-9.5		3.0				
					7.0	(9.0'-10.5'); sandy clay; (5-30-25-40); black, (10YR2/1); medium plasticity; fine to medium grained sand; sub-rounded gravel (to 3.0cm); stiff; moist. Strong petroleum odor.	CL		
10'			10.0-15.0			(10.5'-13.0'); silty sand; (20-50-20-10); olive brown, (2.5Y4/4); non-plastic; fine to medium grained sand; sub-angular gravel (to2.5cm); loose; moist.	SM		
12.5'					3.2	(13.0'-14.0'); silty sand; (0-70-20-10); black, (10YR2/1); non-plastic; dense; very fine to fine grained sand; very moist.			
					6.4		SM		
					3.8	(14.0'-14.5'); sandy clay; (10-40-20-30); dark greenish gray (5GY4/1); medium plasticity; fine to coarse grained sand; sub-angular gravel (to1.0cm); slightly stiff; moist.	CL		
15'									

Well Construction Details



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Julie S. Menack RG#4440
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SOIL DRILLING LOG

McLaren

SB/MW # W-19
D- 5757, 5758
Page 2 of 2
Sampler: M CHRISTENSEN

PROJECT MARKETPLACE 59801-008 LOCATION 305'SE FROM CENTER OF 64 ST. & 340'NE FROM
ELEVATION 10.265' (MSL) MONITORING DEVICE Hnu, BENZENE DREAGER CENTER OF CHRISTIE AVE
SAMPLING DATE(S) 4-6-90 START 7:30 FINISH 11:00
SAMPLING METHOD 5' CONTINUOUS SAMPLER SUBCONTRACTOR & EQUIPMENT GREGG DRILLING
MEMO HAND AUGER TO 5'. 0 ppm BENZENE DETECTED AT 20'. MOBILE B-53
MODIFIED CALIFORNIA SPLIT SPOON SAMPLER USED FROM 5' TO 10'.
PERCENTAGE ORDER: (GRAVEL-SAND-SILT-CLAY).

Depth Below Surface(ft.)	Penetration Results: Blows 6"-6"-6"	Penetration Results: BPF	Sampler Depth Interval (ft.)	Sample ID #	Hnu reading (ppm)	Soil Description Color, Texture, Moisture, Etc.	Unified Classification	Graphic Log	Sampled Depth	Well Construction Details
	NA	NA	15.0-20.0	NA	2.1	(14.5-16.0'); sandy clay; (0-35-30-35); yellowish brown, (10YR5/4) streaked with gray, (10YR6/1); medium plasticity; fine to medium grained sand; minor sub-angular gravel (to 0.5cm); stiff; moist.	CL		NA	Granular bentonite
17.5					1.9	(16.0'-20.0'); sandy clay; (0-35-35-30); gray, (5Y5/1); medium plasticity; fine grained sand; stiff; moist.	CL			7.5" borehole
20.0'										20' TD
22.5'										
25.0'										
27.5										
30.0'										

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SOIL DRILLING LOG

McLaren

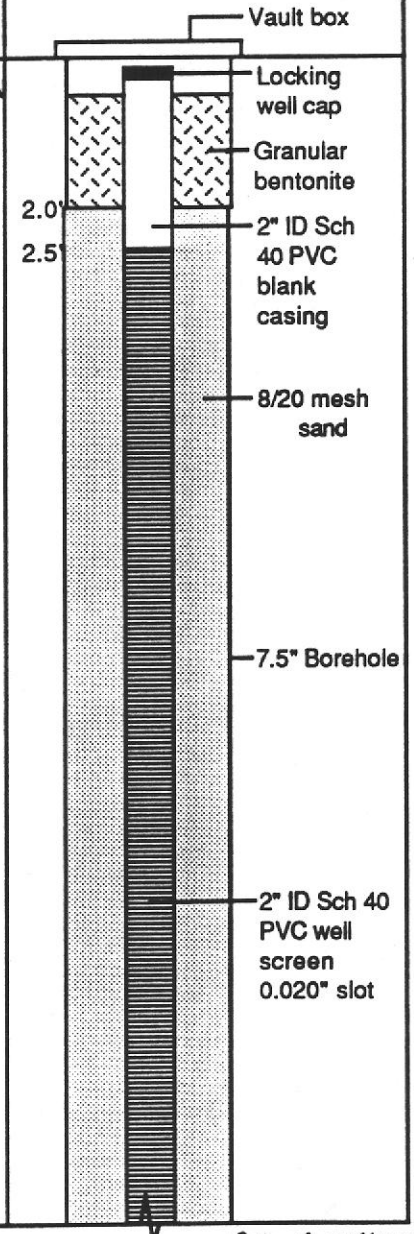
SB/MW # W-20
D- 5753, 5754
Page 1 of 2
Sampler: M CHRISTENSEN

PROJECT MARKETPLACE 59801-008 LOCATION 670'SE FROM CENTER OF 64 ST. & 15'SW FROM
ELEVATION 6.815' (MSL) MONITORING DEVICE Hnu, BENZENE DREAGER CENTER OF CHRISTIE AVE
SAMPLING DATE(S) 4-5-90 START 7:30 FINISH 11:30
SAMPLING METHOD 5' CONTINUOUS SAMPLER SUBCONTRACTOR & EQUIPMENT GREGG DRILLING
MEMO HAND AUGER TO 5'. 0 ppm BENZENE DETECTED AT 18'. MOBILE B-53
PERCENTAGE ORDER; (GRAVEL-SAND-SILT-CLAY).

Depth Below Surface (ft.)	Penetration Results: Blows 6"-6"-6"	Penetration Results: BPF	Sampler Depth Interval (ft.)	Sample ID #	Hnu reading (ppm)	Soil Description Color, Texture, Moisture, Etc.	Unified Classification	Graphic Log	Sampled Depth
	NA	NA		NA		(0.0'-0.25'); Asphalt.	AC		NA
						(0.25'-2.0');clayey sand;(15-50-15-20); light olive brown, (2.5Y5/6); slight plasticity;fine to coarse grained sand; sub-angular gravel (to 4.0 cm); soft; slightly moist to moist.	SC (RB)		
2.5'					7.1	(2.0'-4.0'); sandy clay; (5-35-25-35); dark grayish brown, (2.5Y4/2); medium plasticity; fine to medium grained sand; stiff; moist. Contains wood and brick fragments; petroleum odor.	CL		
5'			5.0-10.0		16.4	(4.0'-6.0'); sandy clay; (5-40-20-35); very dark gray, (5Y3/1); medium plasticity; fine to coarse grained sand; stiff; moist. Contains brick and shell fragments.	CL		
7.5'					10.9	(6.0'-9.75'); silty sand; (10-65-20-10); dark gray, (5Y4/1); non-plastic; very fine to medium grained sand; sub-angular gravel (to 4.0 cm); medium dense; saturated. Contains wood, glass, brick and shell fragments. Black asphaltic material occurs between 9.0'-9.75', hard, dense. Petroleum odor.	SM		
					33	(9.75'-10.5'); silty sand; (5-70-20-5); black, (2.5Y2/0); non-plastic; fine to medium grained sand; medium density; saturated. Contains wood and brick fragments.	SM		
10'			10.0-15.0		10.2	(10.5'-12.0'); sandy clay; (5-30-25-40); dark greenish gray, (5G4/1); high plasticity; fine to medium grained sand; sub-angular gravel (to 1.0 cm); moist.	CL		
12.5'					3.4	(12.0'-13.5'); clayey gravel; (45-30-10-15); dark yellowish brown, (10YR 4/6); very slightly plastic; fine to coarse grained sand, well graded, sub-angular gravel (to 1.0cm); soft; dense; saturated.	GC		
15'					3.3	See following page	SC		

4-9-90

Well Construction Details



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SOIL DRILLING LOG

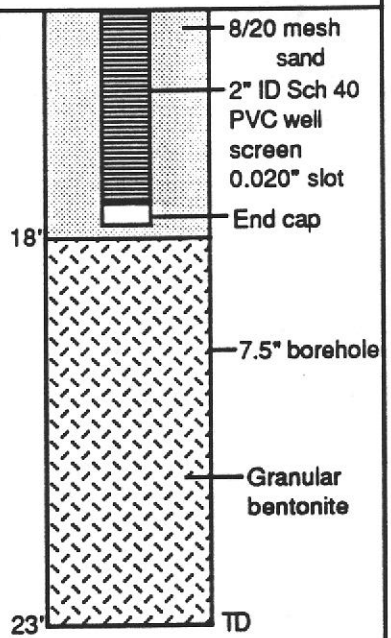
McLaren

SB/MW # W-20
D- 5753, 5754
Page 2 of 2
Sampler: M CHRISTENSEN

PROJECT MARKETPLACE 59801-008 LOCATION 670'SE FROM CENTER OF 64 ST. & 15'SW FROM CENTER OF CHRISTIE AVE
ELEVATION 6.815' (MSL) MONITORING DEVICE Hnu, BENZENE DREAGER
SAMPLING DATE(S) 4-5-90 START 7:30 FINISH 11:30
SAMPLING METHOD 5' CONTINUOUS SAMPLER SUBCONTRACTOR & EQUIPMENT GREGG DRILLING MOBILE B-53
MEMO HAND AUGER TO 5'. 0 ppm BENZENE DETECTED AT 18'.
PERCENTAGE ORDER; (GRAVEL-SAND-SILT-CLAY).

Depth Below Surface (ft.)	Penetration Results: Blows 6"-6"-6"	Penetration Results: BPF	Sampler Depth Interval (ft.)	Sample ID #	Hnu reading (ppm)	Soil Description Color, Texture, Moisture, Etc.	Unified Classification	Graphic Log	Sampled Depth
0	NA	NA	15.0-20.0	NA	2.5	(13.5'-16.0'); clayey sand; (15-50-15-20); dark yellowish brown, (10YR4/6); slightly plastic; fine to coarse grained sand, well graded, sub-angular gravel (to 1.0 cm); soft; dense; moist.	SC		NA
							SC		
17.5					2.9	(16.0'-17.5'); clayey sand; (15-55-15-15); yellowish brown (10YR5/6); very slightly plastic; fine to coarse grained sand, well graded, sub-angular gravel (to 1.5 cm); soft; dense; saturated.			
20.0			20.0-21.5		2.5	(17.5'-23.0'); sandy clay; (0-40-25-35); yellowish brown, (10YR5/4); medium plasticity; fine to medium grained sand, poorly graded; stiff; moist. Minor burrows, filled with greenish gray, (5GY5/1), silt.	CL		
			21.5-23.0			(20.0'-23.0'); samples obtained with Modified California Split Spoon Sampler.			
22.5									
25.0									
27.5									
30.0									

Well Construction Details



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SOIL DRILLING LOG

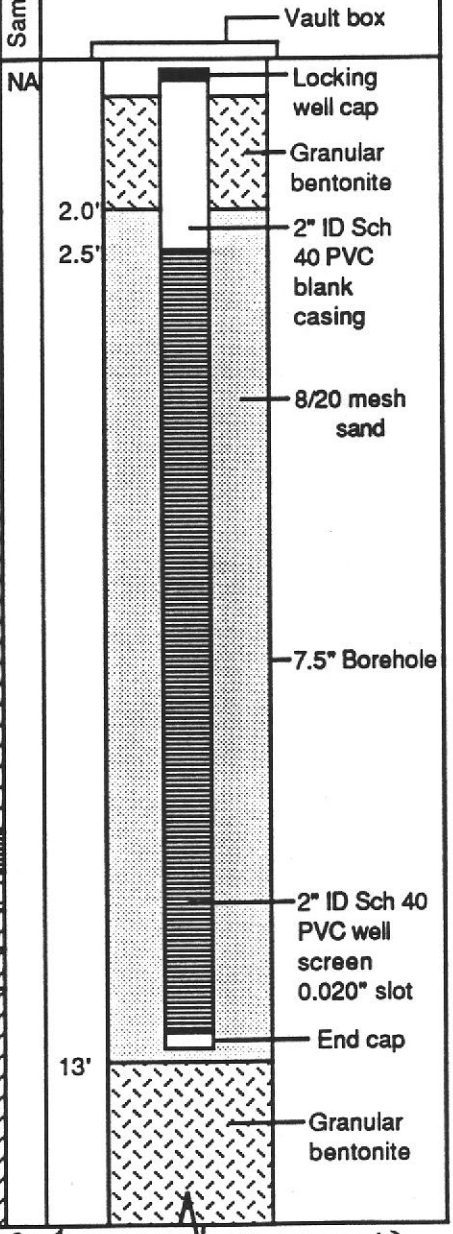
McLaren

SB/MW # W-21
D- 5755, 5756
Page 1 of 2
Sampler: M CHRISTENSEN

PROJECT MARKETPLACE 59801-008 LOCATION 440'SE FROM CENTER OF 64 ST. & 360'NE FROM CENTER OF CHRISTIE AVE
ELEVATION 9.475' (MSL) MONITORING DEVICE Hnu, BENZENE DREAGER
SAMPLING DATE(S) 4-5-90 START 12:20 FINISH 16:00
SAMPLING METHOD 5' CONTINUOUS SAMPLER SUBCONTRACTOR & EQUIPMENT GREGG DRILLING MOBILE B-53
MEMO HAND AUGER TO 5'. 0 ppm BENZENE DETECTED AT 20'.
PERCENTAGE ORDER; (GRAVEL-SAND-SILT-CLAY).
MODIFIED CALIFORNIA SPLIT SPOON SAMPLER USED 10.0'-15.0'.

Depth Below Surface(ft.)	Penetration Results: Blows 6"-6"-6"	Penetration Results: BPF	Sampler Depth Interval (ft.)	Sample ID #	Hnu reading (ppm)	Soil Description Color, Texture, Moisture, Etc.	Unified Classification	Graphic Log	Sampled Depth
	NA	NA		NA		Asphalt	AC		NA
						(0.5'-2.0'); clayey sand; (20-45-15-20); olive, (5Y5/4); slight plasticity; fine to coarse grained sand; sub-angular gravel (to 4.0 cm); well graded; soft; dense; moist. Road base.	SC (RB)		
2.5'					18.0	(2.0'-10.0'); clayey sand; (10-60-10-20); very dark gray, (10YR3/1); slight plasticity; coarse grained sand; sub-angular gravel (to 2.5 cm); soft; moist. Contains wood and brick fragments, brass gromets and patent plate from 1901.			
4-9-90 5'			5.0-10.0		54	5'-10' No recovery			
						(10.0'-10.5'); Tar; black, 10YR2/1); solid.	SC		
7.5'					5.2	(10.5'-11.0'); silty sand; (20-60-15-5); black, (10YR2/1); non-plastic; fine to coarse grained sand; sub-angular gravel (to 2.0 cm); well graded; saturated.			
					3.9	(11.0'-11.5'); sandy clay; (5-35-25-35); dark greenish gray, (5GY4/1); medium plasticity; fine to coarse grained sand; minor sub-angular gravel (to 0.5 cm); well graded; moist. Petroleum odor; contains brick fragments.	TAR		
10'			10.0-11.5				SM		
			11.5-13.0		3.1	(11.5'-12.0'); clayey sand; (15-50-15-20); dark gray, (5Y4/1); slight to low plasticity; fine to coarse grained sand; sub-angular gravel (to 1.5 cm); saturated.	CL		
12.5'							SC		
			13.0-14.5		8.4	(12.0'-15.0'); sandy clay; (5-35-25-35); very pale brown, (10YR7/4) with very dark grayish brown, (10YR3/2) streaking; medium plasticity; fine to medium grained sand; stiff; moist. Contains burrows.	CL		
15'					3.5				

Well Construction Details



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SOIL DRILLING LOG

McLaren

SB/MW # W-21
D- 5755, 5756
Page 2 of 2
Sampler: M CHRISTENSEN

PROJECT MARKETPLACE 59801-008 LOCATION 440'SE FROM CENTER OF 64 ST. & 360'NE FROM CENTER OF CHRISTIE AVE
ELEVATION 9.475' (MSL) MONITORING DEVICE Hnu, BENZENE DREAGER
SAMPLING DATE(S) 4-5-90 START 12:20 FINISH 16:00
SAMPLING METHOD 5' CONTINUOUS SAMPLER SUBCONTRACTOR & EQUIPMENT GREGG DRILLING MOBILE B-53
MEMO HAND AUGER TO 5'. 0 ppm BENZENE DETECTED AT 20'.
PERCENTAGE ORDER: (GRAVEL-SAND-SILT-CLAY).

Depth Below Surface (ft.)	Penetration Results: Blows 6"-6"-6"	Penetration Results: BPF	Sampler Depth Interval (ft.)	Sample ID #	Hnu reading (ppm)	Soil Description Color, Texture, Moisture, Etc.	Unified Classification	Graphic Log	Sampled Depth	Well Construction Details
17.5	NA	NA	15.0-20.0	NA		(15.0'-20.0'); sandy clay; (0-35-25-40); yellowish brown, (10YR5/6) with gray, (10YR6/1) streaking; medium plasticity; fine to medium grained sand; trace sub-rounded gravel (to 0.5 cm); stiff; moist. Contains burrows.	CL		NA	Granular bentonite; 7.5" borehole; 20' TD
20.0										
22.5										
25.0										
27.5										
30.0										

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SOIL DRILLING LOG

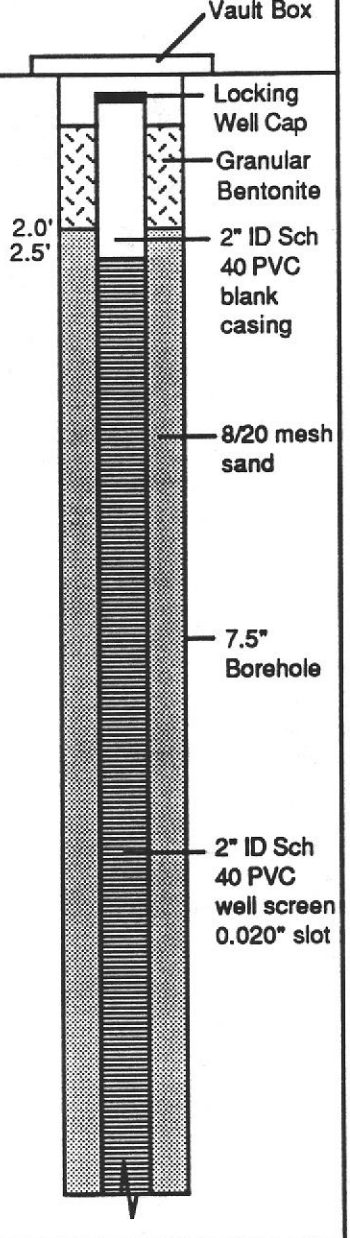
McLaren

SB/MW # W-22
D- 5759
Page 1 of 2
Sampler: M CHRISTENSEN

PROJECT MARKETPLACE 59801-008 LOCATION 105'SE FROM CENTER OF 63 ST. & 15' SW FROM CENTER OF OVERLAND
ELEVATION 11.67' (MSL) MONITORING DEVICE Hnu, BENZENE DREAGER
SAMPLING DATE(S) 4-6-90 START 11:30 FINISH 15:00
SAMPLING METHOD 5' CONTINUOUS SAMPLER SUBCONTRACTOR & EQUIPMENT GREGG DRILLING MOBILE B-53
MEMO HAND AUGER TO 5'. 0 ppm BENZENE DETECTED AT 20'.
PERCENTAGE ORDER; (GRAVEL-SAND-SILT-CLAY).

Depth Below Surface(ft.)	Penetration Results: Blows 6"-6"-6"	Penetration Results: BPF	Sampler Depth Interval (ft.)	Sample ID #	Hnu reading (ppm)	Soil Description Color, Texture, Moisture, Etc.	Unified Classification	Graphic Log	Sampled Depth
	NA	NA		NA		Asphalt	AC		NA
						(0.33'-2.0') clayey sand; (20-50-15-15); gray, (10YR5/1); slight plasticity; fine to coarse grained sand; sub-angular gravel (to 4.0 cm); dense; slightly moist.	SC/ (RB)		
2.5'					1.0	(2.0'-7.5') sandy clay; (0-35-35-30); very dark gray, (10YR3/1); medium plasticity; fine to medium grained sand; stiff; moist.			
5'			5.0-10.0				CL		
4-9-90					0.8	(7.5'-10.0') sandy clay; (5-30-25-30); grayish brown, (2.5Y 5/2); high plasticity; fine to medium grained sand; sub-rounded gravel (to 2.0 cm); very stiff; moist.			
7.5					1.5	(10.0'-13.0') clayey sand; (20-50-15-15); yellowish brown, (10 YR5/4); slight plasticity; fine to coarse grained sand; sub-angular gravel (to 2.5 cm); slightly dense; saturated.	CL		
10'			10.0-15.0		2.6	(13.0'-14.5') sandy clay; (5-35-35-25); yellowish brown, (10YR 5/4); slight to medium plasticity; fine grained sand; sub-angular gravel (to 0.5cm); slightly stiff; moist.	SC		
12.5					2.8	(14.5'-15.5') clayey sand; (15-55-15-15); yellowish brown, (10 YR5/4); slight plasticity; fine to coarse grained sand; sub-angular gravel (to 2.0 cm); slightly dense; very moist to saturated.	CL		
15'							SC		

Well Construction Details



SIGNATURE OF FIELD SUPERVISOR
ASSISTANT GEOLOGIST
TITLE

Julie S. Menack RG#9440
SIGNATURE OF REVIEWER
SENIOR HYDROGEOLOGIST
TITLE

SOIL DRILLING LOG

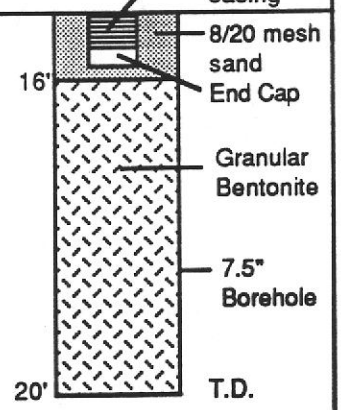
McLaren

SB/MW # W-22
D- 5759
Page 2 of 2
Sampler: M CHRISTENSEN

PROJECT MARKETPLACE 59801-008 LOCATION 105'SE FROM CENTER OF 63 ST. & 15' SW FROM CENTER OF OVERLAND
ELEVATION 11.67' (MSL) MONITORING DEVICE Hnu, BENZENE DREAGER
SAMPLING DATE(S) 4-6-90 START 11:30 FINISH 15:00
SAMPLING METHOD 5' CONTINUOUS SAMPLER SUBCONTRACTOR & EQUIPMENT GREGG DRILLING MOBILE B-53
MEMO HAND AUGER TO 5'. 0 ppm BENZENE DETECTED AT 20'.
PERCENTAGE ORDER; (GRAVEL-SAND-SILT-CLAY).

Depth Below Surface(ft.)	Penetration Results: Blows 6"-6"-6"	Penetration Results: BPF	Sampler Depth Interval (ft.)	Sample ID #	Hnu reading (ppm)	Soil Description Color, Texture, Moisture, Etc.	Unified Classification	Graphic Log	Sampled Depth
	NA	NA	15.0-20.0	NA		See Previous Page			NA
17.5'					1.6	(15.5'-18.0') sandy clay; (0-25-40-35); dark yellowish brown, (10YR4/4); medium plasticity; fine to medium grained sand; trace sub-angular gravel (to 0.5 cm); stiff; moist.	CL		
20'					1.7	(18.0'-20.0') sandy clay; (0-30-25-45); light olive brown, (2.5Y5/4); high plasticity; fine grained sand, poorly graded; very stiff; moist.	CL		
22.5'									
25'									
27.5'									
30'									

Well Construction Details



SIGNATURE OF FIELD SUPERVISOR
ASSISTANT GEOLOGIST
TITLE

John S. Menecke RG # 4440
SIGNATURE OF REVIEWER
SENIOR HYDROGEOLOGIST
TITLE

SOIL DRILLING LOG

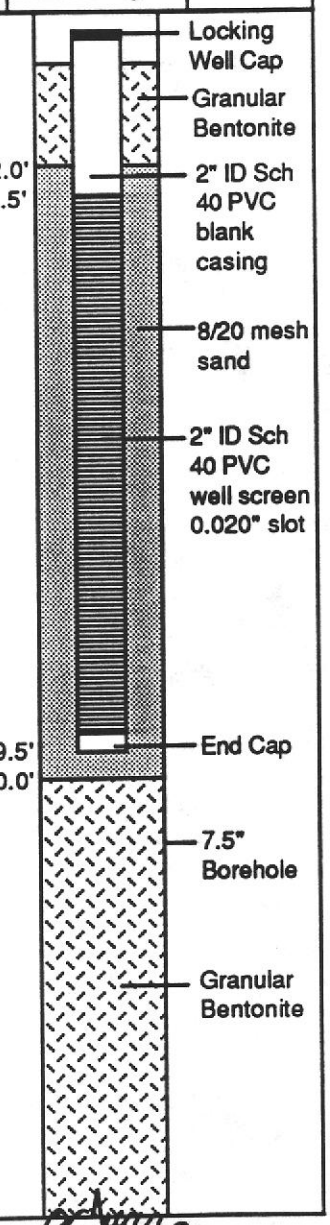
McLaren

SB/MW # W-23
D- 5751-5752
Page 1 of 2
Sampler: M CHRISTENSEN

PROJECT MARKETPLACE 59801-008 LOCATION 800'SE FROM CENTER OF 64TH ST. & 465' NE FROM CENTER OF CHRISTIE AVE.
ELEVATION 9.155' (MSL) MONITORING DEVICE Hnu, BENZENE DREAGER
SAMPLING DATE(S) 4-4-90 START 9:45 FINISH 13:30
SAMPLING METHOD MOD. CALIF. SPLIT SPOON SMPLR SUBCONTRACTOR & EQUIPMENT GREGG DRILLING MOBILE B-53
MEMO HAND AUGER TO 5'. 0 ppm BENZENE DETECTED AT 19'.
MODIFIED CALIFORNIA SPLIT SPOON SAMPLER USED FROM 5' TO 10'.
PERCENTAGE ORDER: (GRAVEL-SAND-SILT-CLAY).

Depth Below Surface(ft.)	Penetration Results: Blows 6"-6"-6"	Penetration Results: BPF	Sampler Depth Interval (ft.)	Sample ID #	Hnu reading (ppm)	Soil Description Color, Texture, Moisture, Etc.	Unified Classification	Graphic Log	Sampled Depth
4-9-90	NA	NA		NA		Asphalt.	AC		NA
					7.7	(0.67'-1.5') silty sand; (30-50-10-10); variegated; non to slight plasticity; fine to coarse grained sand; sub-angular gravel (to 4.0 cm); slightly dense; moist.	SM/(RB)		
2.5'					17.2	(1.5'-3.0') silty sand; (10-65-15-10); olive brown, (2.5Y4/4); slight plasticity fine to medium grained sand; soft; moist. Contains brick & wood fragments.	SM-SC		
					4.2	(3.0'-5.5') sandy clay; (5-40-25-30); very dark gray, (10YR3/1) with minor greenish gray, (5G5/1) streaking; med. plasticity; fine to medium grained sand; slightly stiff; moist. Contains brick fragments; concrete occurs between 5.0'-5.5'.	CL		
5'			5.5-7.0						
					17	(5.5'-7.0') sandy clay; (5-40-20-35); very dark gray, (10YR3/1); medium plasticity; fine to medium grained sand; stiff; very moist. Contains brick fragments.	CL		
7.5			7.0-8.5						
					26	(7.0'-9.0') silty sand; (5-65-20-10); very dark gray, (10YR3/1); very slight plasticity; fine grained sand; soft; dense; saturated. Contains brick fragments; strong petroleum odor.	SM-SC		
			8.5-10.0						
10'						(9.0'-10.0'); sandy clay; (5-30-25-40); gray, (5Y6/1) with olive gray, (5Y5/2) streaking; medium plasticity; very fine to fine grained sand; stiff; moist. Contains shell fragments. Color change to light olive brown, (2.5Y5/6) occurs at 9.5'.	CL		
			10.0-11.5		9.2				
			11.5-13.0		5.4				
12.5'					5.7	(10.0'-11.5') sandy clay; (0-35-25-40); light yellowish brown, (2.5Y6/4); high plasticity; very fine grained sand; very stiff; moist.	CL		
			13.0-14.5		2.9	(11.5'-14.5') sandy clay; (10-20-30-40); brownish yellow, (10YR6/6); high plasticity; very fine to coarse grained sand; sub-angular gravel (to 1.0 cm); very stiff; moist.	CL		
15'			14.5-16.0						

Well Construction Details



Julie S. Menath RG 4440

SIGNATURE OF FIELD SUPERVISOR
ASSISTANT GEOLOGIST
TITLE

SIGNATURE OF REVIEWER
SENIOR HYDROGEOLOGIST
TITLE

SOIL DRILLING LOG

McLaren

SB/MW # W-23
D- 5751-5752
Page 2 of 2
Sampler: M CHRISTENSEN

PROJECT MARKETPLACE 59801-008 LOCATION 800'SE FROM CENTER OF 64th ST. & 465 NE FROM CENTER OF CHRISTY AVE.
ELEVATION 9.155' (MSL) MONITORING DEVICE Hnu, BENZENE DREAGER
SAMPLING DATE(S) 4-4-90 START 9:45 FINISH 13:30
SAMPLING METHOD MOD. CA. SPLIT SPOON SUBCONTRACTOR & EQUIPMENT GREGG DRILLING MOBILE B-53
MEMO HAND AUGER TO 5'. 0 ppm BENZENE DETECTED AT 19'.
MODIFIED CALIFORNIA SPLIT SPOON SAMPLER USED FROM 5' TO 10'.
PERCENTAGE ORDER: (GRAVEL-SAND-SILT-CLAY).

Depth Below Surface (ft.)	Penetration Results: Blows 6"-6"-6"	Penetration Results: BPF	Sampler Depth Interval (ft.)	Sample ID #	Hnu reading (ppm)	Soil Description Color, Texture, Moisture, Etc.	Unified Classification	Graphic Log	Sampled Depth	Well Construction Details
17.5'	NA	NA	16.0-17.5	NA	2.7	(14.5'-19.0') sandy clay; (0-20-45-35); brownish yellow, (10YR6/6); medium plasticity; very fine grained sand; trace gravels, sub-rounded (to 0.5 cm); moist.	CL		NA	Granular Bentonite; 7.5" Borehole; 19' T.D.
			17.5-19.0		2.4					
20'										
22.5										
25'										
27.5'										
30'										

SIGNATURE OF FIELD SUPERVISOR
ASSISTANT GEOLOGIST
TITLE

Julie S. Menacke RG #4440
SIGNATURE OF REVIEWER
SENIOR HYDROGEOLOGIST
TITLE

SOIL DRILLING LOG

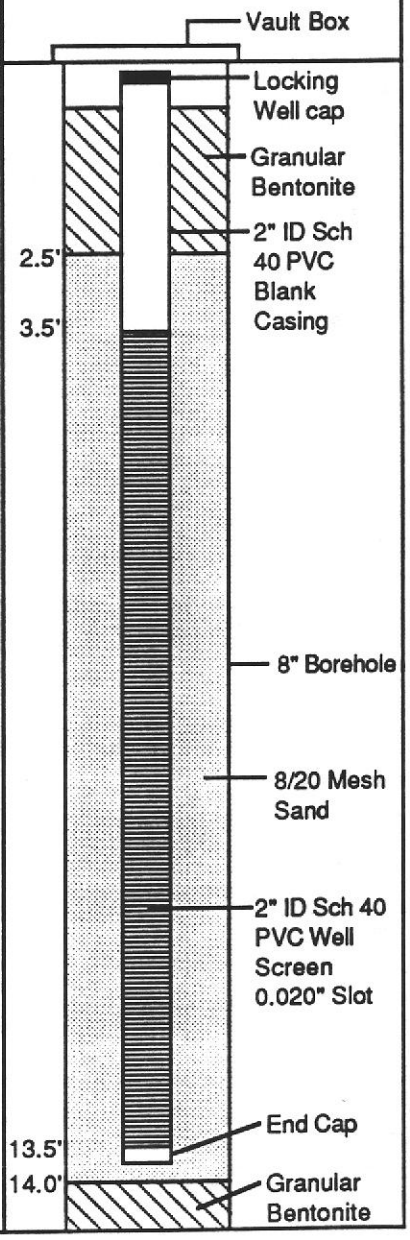
McLaren

SB/MW # W-24
D- 5768,5769,5770
Page 1 of 2
Sampler: M CHRISTENSEN

PROJECT MARKETPLACE LOCATION 420' S from 64th ST. & 35' E from CHRISTIE Ave.
ELEVATION _____ MONITORING DEVICE Hnu, BENZENE DREAGER
SAMPLING DATE(S) 6-6-90 START 8:20 FINISH 11:00
SAMPLING METHOD 5' CONTINUOUS SAMPLER SUBCONTRACTOR & EQUIPMENT ENVIRONMENTAL EXPLORATION CME 75
MEMO HAND AUGER TO 4'. .
PERCENTAGE ORDER; (GRAVEL-SAND-SILT-CLAY) I.E. (15-40-15-30).

Depth Below Surface (ft.)	Penetration Results: Blows 6"-6"-6"	Penetration Results: BPF	Sampler Depth Interval (ft.)	Sample ID #	Hnu reading (ppm)	Soil Description Color, Texture, Moisture, Etc.	Unified Classification	Graphic Log	Sampled Depth
	NA	NA			0	(0-2") Asphalt	AC		
						(2"-8") Road Base	RB		
					0	(8"-1.5') clayey sand; (25-40-15-20); dark grayish brown ,(2.5Y4/2); low plastic fines; fine to coarse grained sand; sub-angular gravel, (to5.0 cm); slightly stiff; slightly moist to moist.	SC		
2.5'									
6-7-90					0	(1.5'-3.5') silty sand; (25-45-20-10); light grayish brown, (2.5Y6/2); non-plastic fines; fine to medium grained sand; sub-rounded gravel (to 3.0 cm); dense; slightly moist.	SM		
			4.0-9.0		0	(3.5'-5.0') silty sand; (0-80-15-5) ; olive gray, (5Y4/2); non-plastic fines; fine to medium grained sand; poorly graded; moist to very moist.	SC		
5'									
					0	(5.0'-7.0') clayey sand; (15-50-15-20); olive gray, (5Y4/2); low plastic fines; fine to coarse grained sand; sub-angular gravel (to 2.0 cm); well graded; slightly stiff; moist to very moist.	CL		
7.5									
					0	(7.0'-8.5') sandy clay; (5-40-20-35); dark grayish brown, (2.5Y4/2); medium plastic fines; fine to medium grained sand; rounded gravel (to 1.0 cm); stiff; moist.	SM-SC		
			9.0-14.0			(8.5'-11.0') silty sand; (15-50-20-15); grayish brown, (2.5Y5/2); slight plastic fines; fine to coarse grained sand; sub-rounded gravel, (to 1.5 cm); well graded; medium dense; moist to saturated at 9'.			
10'					0		SM		
						(11.0'-12.0') silty sand; (0-70-20-10); grayish brown, (2.5Y5/2) streaked with very dark gray, (2.5Y3/0); non-plastic fines; fine grained sand; dense; very moist.			
12.5'					0		SM		
						(12.0'-13.0') silty sand; (0-75-20-5); very dark gray, (2.5Y3/0); non-plastic fines; fine to medium grained sand; sub-rounded gravel, (to 4.0 cm); moist to very moist. Contains shell fragments.	CL		
15'					0				
						(13'-15) See following page			

Well Construction Details



Julie S. Menack RG 4440

SIGNATURE OF FIELD SUPERVISOR
ASSISTANT GEOLOGIST
TITLE

SIGNATURE OF REVIEWER
SENIOR HYDROGEOLOGIST
TITLE

SOIL DRILLING LOG

McLaren

SB/MW # W-24
D- 5768,5769,5770
Page 2 of 2
Sampler: M CHRISTENSEN

PROJECT MARKETPLACE LOCATION 420' S from 64th ST. & 35' E from CHRISTIE Ave.
ELEVATION _____ MONITORING DEVICE Hnu, BENZENE DREAGER
SAMPLING DATE(S) 6-6-90 START 8:20 FINISH 11:00
SAMPLING METHOD 5' CONTINUOUS SAMPLER SUBCONTRACTOR & EQUIPMENT ENVIRONMENTAL EXPLORATION CME 75
MEMO HAND AUGER TO 4'. .
PERCENTAGE ORDER; (GRAVEL-SAND-SILT-CLAY) I.E. (15-40-15-30).

Depth Below Surface (ft.)	Penetration Results: Blows 6"-6"-6"	Penetration Results: BPF	Sampler Depth Interval (ft.)	Sample ID #	Hnu reading (ppm)	Soil Description Color, Texture, Moisture, Etc.	Unified Classification	Graphic Log	Sampled Depth	Well Construction Details
	NA	NA	15.0-20.0		0	(13.0'-15.0') sandy clay; (15-35-15-35); yellowish brown, (10YR5/4); medium plastic fines; fine to coarse grained sand; sub-rounded gravel, (to 4.0 cm); well graded; stiff; moist.	SC			8" Borehole
17.5'					0	(15.0'-15.5') clayey sand; (0-55-15-20); yellowish brown, (10YR5/4); fine to coarse grained sand; sub-rounded gravel, (to 4.0 cm); well graded; slightly stiff; very moist to saturated.	CL			Granular Bentonite
20'					0	(15.5'-20.0') sandy clay; (10-35-20-35); yellowish brown, (10YR5/4); medium plastic fines; fine to medium grained sand; sub-rounded gravel, (to 1.0 cm); stiff; moist. Grading to clayey sand from 18.5' to 20.0'.	(SC)			20.0' TD
22.5'										
25'										
27.5'										
30'										

Julie S. Menacle RG 4440.

SIGNATURE OF FIELD SUPERVISOR
ASSISTANT GEOLOGIST
TITLE

SIGNATURE OF REVIEWER
SENIOR HYDROGEOLOGIST
TITLE

SECTION C.2

SIEVE ANALYSIS METHODOLOGY AND RESULTS

SECTION C.2

SIEVE ANALYSIS METHODOLOGY

The following methodology employed in conducting the sieve analyses was derived from the methodology presented in Groundwater and Wells, (Driscoll, 1986). To determine the appropriate well screen filter pack material for wells to be constructed, a sample was collected from the finest grained saturated material found within the interval selected for screening in Well W-23 the first well drilled. The soil sample was then weighed with a triple beam balance scale. A sample weighing approximately 500 grams was used. Since this was a field sieve analysis the soil sample was not dried but washed through a set of eight U.S. Standard sieves. The mesh sizes used were, from top to bottom, sieve: #4, #10, #18, #35, #40, #60, #140 and #200.

The Unified Soil Classification System was used to differentiate particle sizes in the soil sample and to classify the lithology. The size range of sieves used for the sieve analysis separated particles within the sand size particle range of the Unified Soil Classification System. Those particles failing to pass through the #4 sieve are classified as gravels and those particles that pass through the #200 sieve are classified as silts and clays. The particles caught in between the #4 and the #200 sieves are classified as sands.

After the initial sample was washed through the stack of eight sieves, the sample amount retained in each sieve was weighed and recorded. The percentage of sample retained at each of the sieves was determined by dividing the weight of the portion of the sample retained at each sieve by the total sample weight. The cumulative percent retained on each sieve was then plotted as a function of the sieve size.

Sieve Analysis Interpretation

Once plotted, the grain-size distribution curve was used to determine the uniformity coefficient for the sample by dividing the 40% retained grain size by the 90% retained grain size. Soils with lower uniformity coefficients are more uniform than soils with higher uniformity coefficients.

Based on the uniformity coefficient, a multiplier of three or four was selected. The initial point for the filter pack design curve was then calculated by multiplying the 70% retained grain size by the selected multiplier. This point was plotted. A line was drawn through this point which represented a grain-size distribution with a uniformity coefficient of three or four.

The grain size distribution curves of commercial filter packs were compared to the designed filter pack grain size distribution curve. The commercial filter pack selected was the one whose curve most closely paralleled the designed filter pack grain size distribution.

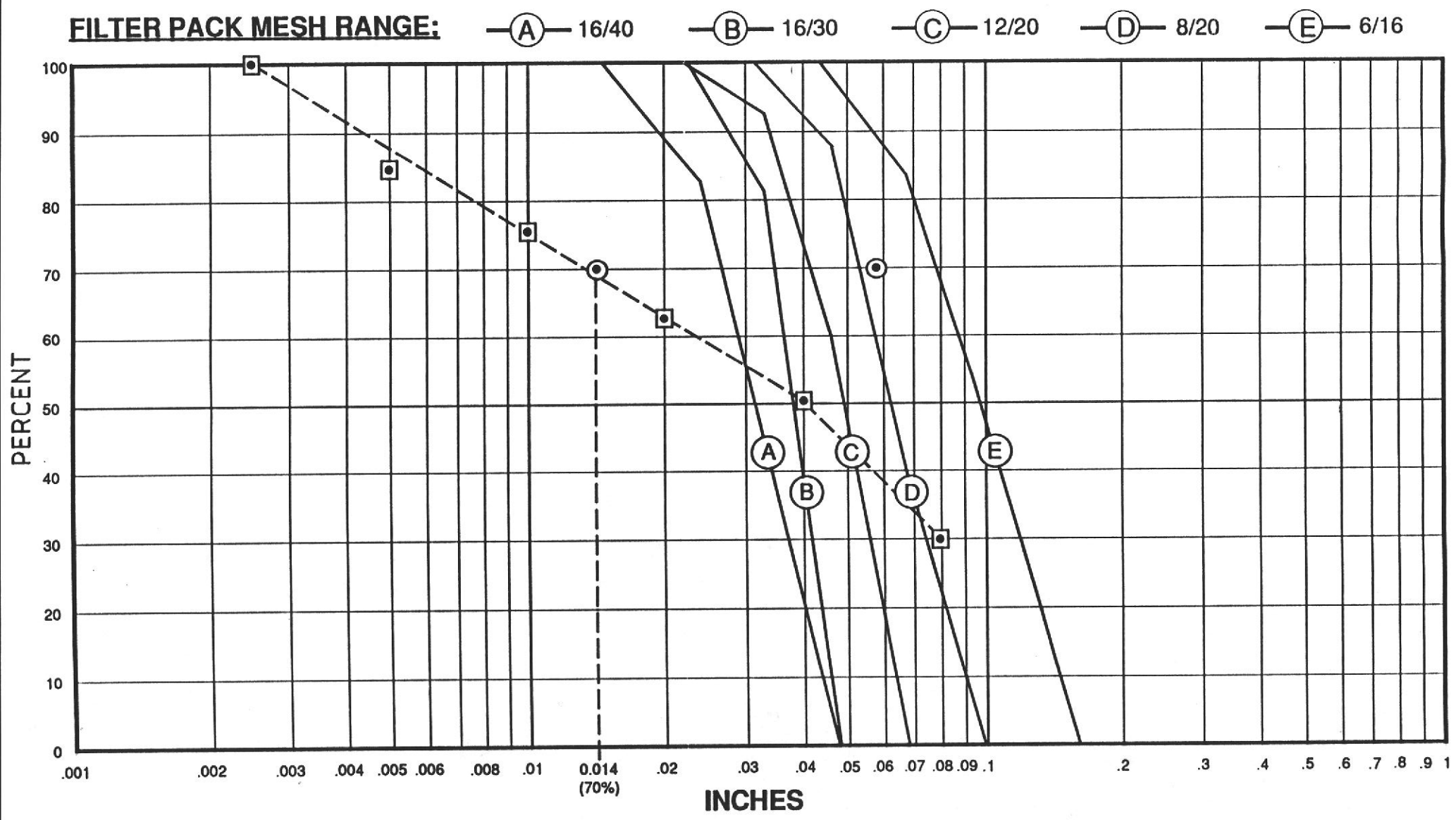
The slot size for the well screen was selected based on the commercial filter pack curve selected. A slot size that retained more than 95% or more of the filter material was selected.

Sieve Analyses Results

The analysis for the W-23 is shown in Figure C-1. A multiplier of four was used to derive the design filter pack. The 8x20 mesh commercial filter pack most closely approximates the design filter pack. A screen slot size of 0.020 inches was selected because it would retain at least 95% of the filter pack.

0529rn3

FIGURE C-1
SIEVE ANALYSIS FROM WELL W-23



SECTION C.3

ANALYTICAL LABORATORY DATA SHEETS

McLaren

Date: April 26, 1990
LP #: 2965

Julie Menack
McLaren
980 Atlantic Avenue, Suite 100
Alameda, CA 94501

Dear Ms. Menack:

Enclosed are the laboratory results for the two sample(s) submitted by you to the McLaren Analytical Laboratory on April 11, 1990, for the project *Market Place*.

The analyses you requested are:

602 (2 - Water)
TPH-D (1 - Water)
Metals (Pb, Zn, Cu, As) (1 - Water)

The sample extract for TPH-D analysis was sent to Eureka Laboratories, Inc. on April 17, 1990. The results are included in this report.

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

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,

Jill P. Slater, 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.: 2905
Storage Refrigerator ID: 4-3
Storage Freezer ID:
Secured: Yes X No

Project Name: Market Place Project #: 59801-008 Sampler: Lana Brown (Printed Name) Lana Brown (Signature)

Relinquished by: (Signature and Printed Name) Lana Brown	Received by: (Signature and Printed Name) Fed-X	Date: 4/16/90	Time: 17:00
Relinquished by: (Signature and Printed Name)	Received by: (Signature and Printed Name) Yukon	Date: 4/17/90	Time: 11:10
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

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)	TAT	Container(s) #	Container(s) Type	FOR LABORATORY USE ONLY Lab ID
*1 135444	4/16/90	8:00	TRIP BLANK	X	X	X	X	X	X	X											4	1	V HCl	39398
*2 135445																								
*3 135446																								
*4 135447																								
5 130129		16:00	MW4																				A	39359
6 130130																								
7 130131																								
8 130132																								
9 130133											X												A	39360
10 130134											X												A	

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

FOR LABORATORY USE ONLY. Sample Condition Upon Receipt: * Samples marked with an asterisk have air bubbles.

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

McLaren

CHAIN OF CUSTODY RECORD

FOR LABORATORY USE ONLY
Laboratory Project No.: 2965
Storage Refrigerator ID: 4-3
Storage Freezer ID:
Secured: Yes X No

Project Name: Market Place Project #: 59801-008 Sampler: Lana Brown (Printed Name) Lana Brown (Signature)

Relinquished by: (Signature and Printed Name) Lana Brown	Received by: (Signature and Printed Name) Fed-X	Date: 4/10/90	Time: 17:00
Relinquished by: (Signature and Printed Name) Lana Brown	Received by: (Signature and Printed Name) Valerie Wilson	Date: 4/11/90	Time: 11:10
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

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)	Pb, Zn, Cu, As	TAT	Container(s) #	Container(s) Type	FOR LABORATORY USE ONLY Lab ID
1	130135	4/10/90	16:00	mw4																X		4	1	O	39360.1
2																									
3																									
4																									
5																									
6																									
7																									
8																									
9																									
10																									

Special Instructions/Comments: Metals sample was filtered and then preserved w/ HNO_3

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 1 L poly

FOR LABORATORY USE ONLY. Sample Condition Upon Receipt:

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

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

Client: Julie Menack
McLaren
Alameda, CA 94501

L.P. #:	2965	Project Name:	Market Place
Date Rec'd:	4/11/90	Project #:	59801-008
Date Due:	4/25/90	Contact:	Julie Menack
Section:	GC	Phone:	415-521-5200

Samples received on 4/11/90 @ 11:10 a.m. under Chain(s) of Custody 220545 and 220590. Chain(s) of Custody agree(s) with sample container(s). Samples received included:

- 1 sample(s) in voa vials for 602 analysis(es); and,

- 1 sample(s) in 1 liter amber bottles for TPH/D analysis(es), in voa vials for 602 analysis(es), and in a 1 liter polyethylene bottle for metals (Pb, Zn, Cu, and As) analysis(es).

Correction(s) made and/or Problem(s): Samples marked with an asterisk had air bubbles.

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 BLANK

Method: 602
Units: ug/L (ppb)

COMPOUNDS	REPORTING LIMITS	RESULTS OF THE MB
Benzene	0.5	BRL
Toluene	0.5	BRL
Chlorobenzene	0.5	BRL
Ethyl Benzene	0.5	BRL
p-Xylene	0.5	BRL
m-Xylene	0.5	BRL
o-Xylene	0.5	BRL
o-Dichlorobenzene	0.5	BRL
m-Dichlorobenzene	0.5	BRL
p-Dichlorobenzene	0.5	BRL

LABORATORY CONTROL SPIKE

Method: 602
Units: ug/L (ppb)

COMPOUNDS	CONCENTRATION SPIKED	CONCENTRATION MEASURED	ACCURACY % RECOVERY	PRECISION RPD
Chlorobenzene	10.	10.	100	0
Benzene	10.	11.	110	9
Ethyl Benzene	10.	11.	110	0

QUALITY CONTROL REPORT

METHOD BLANK

Method: Metals (200 Series)
Units: ug/ml (ppm)

COMPOUNDS	REPORTING LIMITS	RESULTS OF THE MB
Aluminum (Al)/202.1	0.2	Not Requested
Antimony (Sb)/204.1	0.5	Not Requested
* Arsenic (As)/206.3	0.005	BRL
Barium (Ba)/208.1	1.	Not Requested
Beryllium (Be)/210.1	0.05	Not Requested
Cadmium (Cd)/213.1	0.01	Not Requested
Calcium (Ca)/215.1	0.1	Not Requested
Chromium (Cr)/218.1	0.02	Not Requested
Cobalt (Co)/219.1	0.08	Not Requested
Copper (Cu)/220.1	0.09	BRL
Hex. Chromium (CrVI)/218.5	0.05	Not Requested
Iron (Fe)/236.1	0.04	Not Requested
Lead (Pb)/239.1	0.1	BRL
Magnesium (Mg)/242.1	0.07	Not Requested
Manganese (Mn)/243.1	0.05	Not Requested
** Mercury (Hg)/245.1	0.002	Not Requested
Molybdenum (Mo)/246.1	1.	Not Requested
Nickel (Ni)/249.1	0.2	Not Requested
Potassium (K)/255.1	0.2	Not Requested
* Selenium (Se)/270.3	0.001	Not Requested
Silver (Ag)/272.1	0.05	Not Requested
Sodium (Na)/273.1	0.1	Not Requested
Thallium (Tl)/279.1	1.	Not Requested
Titanium (Ti)/283.1	0.6	Not Requested
Vanadium (V)/286.1	0.5	Not Requested
Zinc (Zn)/289.1	0.08	BRL

* Hydride generation method
** Cold vapor method

LABORATORY CONTROL SPIKE

Method: Metals (200 Series)
Units: ug/ml

COMPOUNDS	CONCENTRATION SPIKED	CONCENTRATION MEASURED	ACCURACY % RECOVERY	PRECISION RPD
* Arsenic (As)/206.3	0.42	0.41	98	2
Copper (Cu)/220.1	2.0	2.1	105	5
Lead (Pb)/239.1	2.0	2.2	110	0
Zinc (Zn)/289.1	2.0	2.1	105	0

* Hydride generation method

COMMENTS

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

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.

VOLATILE AROMATIC COMPOUNDS
EPA METHOD 602

Project: Market Place 59801-008

Lab Project Number: 2965

Sample Location: Trip Blank

Lab ID Number: 39358

Sample Number: 135994-97

Date Received: 04/11/90

Date Sampled: 04/10/90

Date Analyzed: 04/11/90

COMPOUND	ANALYTE CONCENTRATION ug/L (ppb)	REPORTING LIMIT ug/L (ppb)
Benzene	BRL	0.5
Toluene	BRL	0.5
Chlorobenzene	BRL	0.5
Ethyl Benzene	BRL	0.5
p-Xylene	BRL	0.5
m-Xylene	BRL	0.5
o-Xylene	BRL	0.5
o-Dichlorobenzene	BRL	0.5
m-Dichlorobenzene	BRL	0.5
p-Dichlorobenzene	BRL	0.5
Surrogate recovery (percent): a,a,a-Trifluorotoluene	109	

Comments:

Approved By: A. Putnam Date: 04/12/90

McLaren

VOLATILE AROMATIC COMPOUNDS
EPA METHOD 602

Project: Market Place 59801-008

Lab Project Number: 2965

Sample Location: MW-4

Lab ID Number: 39359

Sample Number: 130129-32

Date Received: 04/11/90

Date Sampled: 04/10/90

Date Analyzed: 04/12/90

COMPOUND	ANALYTE CONCENTRATION ug/L (ppb)	REPORTING LIMIT ug/L (ppb)
Benzene	BRL	0.5
Toluene	BRL	0.5
Chlorobenzene	BRL	0.5
Ethyl Benzene	BRL	0.5
p-Xylene	BRL	0.5
m-Xylene	BRL	0.5
o-Xylene	BRL	0.5
o-Dichlorobenzene	BRL	0.5
m-Dichlorobenzene	BRL	0.5
p-Dichlorobenzene	BRL	0.5
Surrogate recovery (percent): a,a,a-Trifluorotoluene	105	

Comments:

Approved By: _____ Date: 04/16/90
A. Putnam

McLaren

METAL ANALYSIS

Project: Market Place 59801-008

Lab Project Number: 2965

Sample Location: MW-4

Lab ID Number: 39361

Sample Number: 130135

Date Received: 04/11/90

Date Sampled: 04/10/90

Date Analyzed: 04/17/90

METAL (SYMBOL)/EPA METHOD	CONCENTRATION ug/ml (ppm)	REPORTING LIMIT ug/ml (ppm)
Aluminum (Al)/202.1	Not Requested	0.2
Antimony (Sb)/204.1	Not Requested	0.5
* Arsenic (As)/206.3	0.006	0.005
Barium (Ba)/208.1	Not Requested	1.
Beryllium (Be)/210.1	Not Requested	0.05
Cadmium (Cd)/213.1	Not Requested	0.01
Calcium (Ca)/215.1	Not Requested	0.1
Chromium (Cr)/218.1	Not Requested	0.02
Cobalt (Co)/219.1	Not Requested	0.08
Copper (Cu)/220.1	BRL	0.09
Hex. Chromium (CrVI)/218.5	Not Requested	0.05
Iron (Fe)/236.1	Not Requested	0.04
Lead (Pb)/239.1	BRL	0.1
Magnesium (Mg)/242.1	Not Requested	0.07
Manganese (Mn)/243.1	Not Requested	0.05
** Mercury (Hg)/245.1	Not Requested	0.002
Molybdenum (Mo)/246.1	Not Requested	1.
Nickel (Ni)/249.1	Not Requested	0.2
Potassium (K)/255.1	Not Requested	0.2
* Selenium (Se)/270.3	Not Requested	0.001
Silver (Ag)/272.1	Not Requested	0.05
Sodium (Na)/273.1	Not Requested	0.1
Thallium (Tl)/279.1	Not Requested	1.
Titanium (Ti)/283.1	Not Requested	0.6
Vanadium (V)/286.1	Not Requested	0.5
Zinc (Zn)/289.1	BRL	0.08

* Hydride generation method
** Cold vapor method

Comments:

Approved By: F. Ramezanzadeh Date: 04/23/90

McLaren

EUREKA LABORATORIES, INC.

Corporate Office:
6790 FLORIN PERKINS ROAD
SACRAMENTO, CA 95828
TEL: (916) 381-7953
FAX: (916) 381-4013

Branch Office:
12121 NORTHUP WAY, SUITE 212
BELLEVUE, WA 98005
TEL: (206) 885-0284
FAX: (206) 885-6162

Air Pollution
Chemical Analysis,
Research & Testing
Environmental Studies
Robotics
Toxicology

April 26, 1990

Ms. Shakoora Azimi
MCLAREN ANALYTICAL LABS
11101 White Rock Road
Rancho Cordova, CA 95670

Reference: Project #: 59801-008
Project: 2965
ELI Order No: 90-04-122 (REVISED)

Dear Ms. Azimi:

Eureka Laboratories, Inc. is pleased to submit a laboratory report for the subject project. This report represents analytical results for four (4) extract samples-ONE WEEK RUSH-for the following analysis:

Analysis	Method	Sample ID.
Total Petroleum Hydrocarbons	EPA 8015 (Modified)	39360 MB, 39360 LCS, 39360 LCSD, 39360

Sincerely,
EUREKA LABORATORIES, INC.

By: _____
Shao-Pin Yo, PH.D.
Laboratory Director

SPY/jj

Attachment

TOTAL PETROLEUM HYDROCARBONS
MODIFIED EPA METHOD 8015 (Modified)

EUREKA LABORATORIES, INC.
6790 Florin-Perkins Road
Sacramento, CA 95828
(916) 381-7953

Order No: 90-04-122
Hazardous Waste Testing
Certification: 108

CLIENT: MCLAREN
PROJECT: 2965
PROJECT #: 59801.008
SAMPLE ID: SYSTEM BLANK

DATE RECEIVED: 04/17/1990
DATE ANALYZED: 04/19/1990
DATE COMPLETED: 04/23/1990

PETROLEUM HYDROCARBONS	CONCENTRATION [mg/L (ppm)]	DETECTION LIMIT [mg/L (ppm)]
Gasoline Range	<0.05	0.05
Diesel Range	<0.1	0.1
Motor Oil Range	<0.25	0.25
Total Petroleum Hydrocarbons	-	-
CARBON NO. RANGE		
Gasoline Range	-	-
Diesel Range	-	-
Motor Oil Range	-	-
PEAK CARBON NO		
Gasoline Range	-	-
Diesel Range	-	-
Motor Oil Range	-	-

Sandia Kao
Senior Chemist, Organic Group

April 26, 1990
Date

TOTAL PETROLEUM HYDROCARBONS
MODIFIED EPA METHOD 8015 (Modified)

EUREKA LABORATORIES, INC.
6790 Florin-Perkins Road
Sacramento, CA 95828
(916) 381-7953

Order No: 90-04-122
Hazardous Waste Testing
Certification: 108

CLIENT: MCLAREN
PROJECT: 2965
PROJECT #: 59801.008
SAMPLE ID: 39360

DATE RECEIVED: 04/17/1990
DATE ANALYZED: 04/19/1990
DATE COMPLETED: 04/23/1990

PETROLEUM HYDROCARBONS	CONCENTRATION [mg/L (ppm)]	DETECTION LIMIT [mg/L (ppm)]
Gasoline Range	<0.05	0.05
Diesel Range	<0.1	0.1
Motor Oil Range	<0.25	0.25
Total Petroleum Hydrocarbons	-	-
CARBON NO. RANGE		
Gasoline Range	-	-
Diesel Range	-	-
Motor Oil Range	-	-
PEAK CARBON NO		
Gasoline Range	-	-
Diesel Range	-	-
Motor Oil Range	-	-

Sandia Kao
Senior Chemist, Organic Group

April 26, 1990
Date

TOTAL PETROLEUM HYDROCARBONS
MODIFIED EPA METHOD 8015 (Modified)

EUREKA LABORATORIES, INC.
6790 Florin-Perkins Road
Sacramento, CA 95828
(916) 381-7953

Order No: 90-04-122
Hazardous Waste Testing
Certification: 108

CLIENT: MCLAREN
PROJECT: 2965
PROJECT #: 59801.008
SAMPLE ID: 39360 MB

DATE RECEIVED: 04/17/1990
DATE ANALYZED: 04/19/1990
DATE COMPLETED: 04/23/1990

PETROLEUM HYDROCARBONS	CONCENTRATION [mg/L (ppm)]	DETECTION LIMIT [mg/L (ppm)]
Gasoline Range	<0.05	0.05
Diesel Range	<0.1	0.1
Motor Oil Range	<0.25	0.25
Total Petroleum Hydrocarbons	-	-
CARBON NO. RANGE		
Gasoline Range	-	-
Diesel Range	-	-
Motor Oil Range	-	-
PEAK CARBON NO		
Gasoline Range	-	-
Diesel Range	-	-
Motor Oil Range	-	-

Sandia Kao
Senior Chemist, Organic Group

April 26, 1990
Date

TOTAL PETROLEUM HYDROCARBONS
MODIFIED EPA METHOD 8015 (Modified)

EUREKA LABORATORIES, INC.
6790 Florin-Perkins Road
Sacramento, CA 95828
(916) 381-7953

Order No: 90-04-122
Hazardous Waste Testing
Certification: 108

CLIENT: MCLAREN
PROJECT: 2965
PROJECT #: 59801.008
SAMPLE ID: 39360 LCS

DATE RECEIVED: 04/17/1990
DATE ANALYZED: 04/19/1990
DATE COMPLETED: 04/23/1990

PETROLEUM HYDROCARBONS	CONCENTRATION [mg/L (ppm)]	DETECTION LIMIT [mg/L (ppm)]
Gasoline Range	<0.05	0.05
Diesel Range	1.7	0.1
Motor Oil Range	<0.25	0.25
Total Petroleum Hydrocarbons	1.7	-
CARBON NO. RANGE		
Gasoline Range	-	-
Diesel Range	C12-C18	-
Motor Oil Range	-	-
PEAK CARBON NO		
Gasoline Range	-	-
Diesel Range	C16	-
Motor Oil Range	-	-

Sandia Kao
Senior Chemist, Organic Group

April 26, 1990
Date

TOTAL PETROLEUM HYDROCARBONS
MODIFIED EPA METHOD 8015 (Modified)

EUREKA LABORATORIES, INC.
6790 Florin-Perkins Road
Sacramento, CA 95828
(916) 381-7953

Order No: 90-04-122
Hazardous Waste Testing
Certification: 108

CLIENT: MCLAREN
PROJECT: 2965
PROJECT #: 59801.008
SAMPLE ID: 39360 LCSD

DATE RECEIVED: 04/17/1990
DATE ANALYZED: 04/19/1990
DATE COMPLETED: 04/23/1990

PETROLEUM HYDROCARBONS	CONCENTRATION [mg/L (ppm)]	DETECTION LIMIT [mg/L (ppm)]
Gasoline Range	<0.05	0.05
Diesel Range	1.7	0.1
Motor Oil Range	<0.25	0.25
Total Petroleum Hydrocarbons	1.7	-
CARBON NO. RANGE		
Gasoline Range	-	-
Diesel Range	C12-C18	-
Motor Oil Range	-	-
PEAK CARBON NO		
Gasoline Range	-	-
Diesel Range	C16	-
Motor Oil Range	-	-

Sandia Kao
Senior Chemist, Organic Group

April 26, 1990
Date

TOTAL PETROLEUM HYDROCARBONS
MODIFIED EPA METHOD 8015 (Modified)

EUREKA LABORATORIES, INC.
6790 Florin-Perkins Road
Sacramento, CA 95828
(916) 381-7953

Order No: 90-04-122
Hazardous Waste Testing
Certification: 108

CLIENT: MCLAREN
PROJECT: 2965
PROJECT #: 59801.008
SAMPLE ID: STANDARD SPIKE RECOVERY

DATE RECEIVED: 04/17/1990
DATE ANALYZED: 04/19/1990
DATE COMPLETED: 04/23/1990

PETROLEUM HYDROCARBONS	SPIKE RECOVERY
Gasoline Range	92%
Diesel Range	95%
Motor Oil Range	95%
Total Petroleum Hydrocarbons	
CARBON NO. RANGE	
Gasoline Range	-
Diesel Range	-
Motor Oil Range	-
PEAK CARBON NO	
Gasoline Range	-
Diesel Range	-
Motor Oil Range	-

Sandia Kao
Senior Chemist, Organic Group

April 26, 1990
Date

TOTAL PETROLEUM HYDROCARBONS
MODIFIED EPA METHOD 8015 (Modified)

EUREKA LABORATORIES, INC.
6790 Florin-Perkins Road
Sacramento, CA 95828
(916) 381-7953

Order No: 90-04-122
Hazardous Waste Testing
Certification: 108

CLIENT: MCLAREN
PROJECT: 2965
PROJECT #: 59801.008
SAMPLE ID: STANDARD SPIKE RECOVERY DUPLICATE

DATE RECEIVED: 04/17/1990
DATE ANALYZED: 04/19/1990
DATE COMPLETED: 04/23/1990

PETROLEUM HYDROCARBONS	SPIKE RECOVERY
Gasoline Range	91%
Diesel Range	97%
Motor Oil Range	98%
Total Petroleum Hydrocarbons	
CARBON NO. RANGE	
Gasoline Range	-
Diesel Range	-
Motor Oil Range	-
PEAK CARBON NO	
Gasoline Range	-
Diesel Range	-
Motor Oil Range	-

Sandia Kao
Senior Chemist, Organic Group

April 26, 1990
Date

McLaren

Date: April 26, 1990
LP #: 2972

Julie Menack
McLaren
980 Atlantic Avenue, Suite 100
Alameda, CA 94501

Dear Ms. Menack:

Enclosed are the laboratory results for the four sample(s) submitted by you to the McLaren Analytical Laboratory on April 12, 1990, for the project *Market Place*.

The analyses you requested are:

602 (4 - Water)
TPH-D (3 - Water)
Metals (Pb, Zn, Cu, As) (3 - Water)

The sample extract for TPH-D analysis was sent to Eureka Laboratories, Inc. on April 17, 1990. The results are included in this report.

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

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,

Jill P. Slater, 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

2205

McLaren

CHAIN OF CUSTODY RECORD

FOR LABORATORY USE ONLY
Laboratory Project No.: 2972
Storage Refrigerator ID: 430
Storage Freezer ID:
Secured: Yes / No

Project Name: Marketplace Project #: 59801-008 Sampler: Lana Brown (Printed Name) Lana Brown (Signature)

Relinquished by: (Signature and Printed Name) Lana Brown	Received by: (Signature and Printed Name) Fed-X	Date: 4/11/90	Time: 1700
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:
Relinquished by: (Signature and Printed Name)	Received by: (Signature and Printed Name) Agnes Burton	Date: 4-12-90	Time: 12:30

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

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)	Pb, Zn, Cu, AS	TAT	Container(s) #	Container(s) Type	FOR LABORATORY USE ONLY Lab ID
1 113135	4/11	10:42	MW1								X											4	1	A	39397 CONTINUED
2 113136		↓	↓																		X	4		C	39442
3 113137		12:05	MW7	X	X	X	X																	V	39443
4 113138				X																					
5 113139				X																					
6 113140				X																				A	39444
7 113141											X														
8 113142											X														
9 113143											X														
10 113144																					X			O	39445

EFFERVESCENT

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 1L poly

Special Instructions/Comments: Metals - Filtered when added HNO_3

Sample Archive/Disposal:
☐ Laboratory Standard
☐ 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: Sent fax to Julie Menack 4/12/90 requesting confirmation of request for MW7. She will change request to metals

LR 2972

McLaren

CHAIN OF CUSTODY RECORD

FOR LABORATORY USE ONLY
Laboratory Project No.: 2972
Storage Refrigerator ID: 4-30
Storage Freezer ID:
Secured? Yes ___ No ___

Project Name: Marketplace Project #: 5980i-008 Sampler: Lana Brown (Printed Name) Lana Brown (Signature)

Relinquished by: (Signature and Printed Name) Lana Brown	Received by: (Signature and Printed Name) Fed-X	Date: 4/11/90	Time: 11CC
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:
Relinquished by: (Signature and Printed Name)	Received by: (Signature and Printed Name) Agnes Burton	Date: 4-12-90	Time: 12:30

SHIP TO:
McLaren Analytical Laboratory
11101 White Rock Road
Rancho Cordova, CA 95670
(916) 638-3696
FAX (916) 638-2642

Method of Shipment: Fed-X
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)	Pb 2Cd Cu, As	TAT	Container(s) #:	Container(s) Type:	FOR LABORATORY USE ONLY Lab ID
113135	4/11	10:42	MW1								X											4	1	A	39397 CONTINUED
113136			MW6																	X		4	1	C	39442
113137		12:05	MW7	X																				V	39443
113138				X																					
113139				X																					
113140				X																					39444
113141												X												A	
113142												X													
113143												X													39445
113144																									

EFFERVESCENT

Water

Special Instructions/Comments: Metals - Filtered then added HNO3

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 1L poly

SEND DOCUMENTATION AND RESULTS TO (Check one):
☒ Project Manager/Office: Julie Menack / Alameda.
☐ Client Name:
Company:
Address:

FOR LABORATORY USE ONLY. Sample Condition Upon Receipt:

McLaren

CHAIN OF CUSTODY RECORD

FOR LABORATORY USE ONLY
Laboratory Project No.: 2472
Storage Refrigerator ID:
Storage Freezer ID:
Secured: Yes ___ No ___

Project Name: Marketplace Project #: 59801-008 Sampler: Lana Brown (Printed Name) Lana Brown (Signature)

Relinquished by: (Signature and Printed Name) Lana Brown	Lana Brown	Received by: (Signature and Printed Name) Fed-X	Date: 4/11/90 Time: 1700
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:
Relinquished by: (Signature and Printed Name)		Received by: (Signature and Printed Name) Agnes Burton	Date: 4-12-90 Time: 12:30

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

Method of Shipment: FED EXPRESS
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)	TAT	Container(s) #	Container(s) Type	FOR LABORATORY USE ONLY Lab ID
*1 113125	4/11/90	8	TRIP BLANKS	X																	4	1	V	39392
*2 113126				X																				
*3 113127				X																				
*4 113128		↓	↓	X																				
5 113129		10:42	MW1	X																				39393
6 113130				X																				
7 113131				X																				
8 113132				X																				
9 113133											X												A	39394
10 113134	↓	↓	↓								X										↓	↓	A	

Effervescent

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 ___

FOR LABORATORY USE ONLY. Sample Condition Upon Receipt: GOOD
* SAMPLES HAD AIR BUBBLE AS

SEND DOCUMENTATION AND RESULTS TO (Check one):
☒ Project Manager/Office: Julie Menack/ Ala
☐ Client Name:
Company:
Address:
Phone: ___(___)___ Fax:

McLaren CHAIN OF CUSTODY RECORD

FOR LABORATORY USE ONLY
Laboratory Project No.: 2972
Storage Refrigerator ID: 430
Storage Freezer ID:
Secured: Yes / No

Project Name: Marketplace Project #: 5980-008 Sampler: Lana Brown (Printed Name) Lana Brown (Signature)

Relinquished by: (Signature and Printed Name) Lana Brown Lana Brown	Received by: (Signature and Printed Name) Fed-X	Date: 4/11/90	Time: 1700
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:
Relinquished by: (Signature and Printed Name)	Received by: (Signature and Printed Name) Agnes Burton	Date: 4-12-90	Time: 12:30

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

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)	Pb, Zn, Cu, As	TAT	Container(s) #	Container(s) Type	FOR LABORATORY USE ONLY Lab ID
1 113135	4/11	10:42	MW1								X											4	1	A	39397 CONTINUED
2 113136		↓	↓																	X		4		C	39442
3 113137		12:05	MW7	X																				V	39443
4 113138				X																					
5 113139				X																					
6 113140				X																					
7 113141											X													A	39444
8 113142											X														
9 113143											X														
10 113144																		X						O	39445

EFFERVESCENT

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 Ultrapoly

Special Instructions/Comments: Metals - Filtered then acidified +HNO3

Sample Archive/Disposal:
☐ Laboratory Standard
☐ 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:

McLaren

CHAIN OF CUSTODY RECORD

FOR LABORATORY USE ONLY
Laboratory Project No.: 2972
Storage Refrigerator ID:
Storage Freezer ID:
Secured: Yes ___ No ___

Project Name: Market Place Project #: 59801-008 Sampler: Lana Brown (Printed Name) Lana Brown (Signature)

Relinquished by: (Signature and Printed Name) Lana Brown Lana Brown	Received by: (Signature and Printed Name) Fed-X	Date: 4/11/90	Time: 1700
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:
Relinquished by: (Signature and Printed Name)	Received by: (Signature and Printed Name) Agnes Burton	Date: 4-12-90	Time: 12:30

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

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)	Pb, Zn, Cu, As	TAT	Container(s) #	Container(s) Type	FOR LABORATORY USE ONLY Lab ID
1	113145	4/11/90	15:35	Mw14	X																	4	1	V	39395
*2	113146				X																			A	39396
3	113147				X																				
4	113148				X																			O	39397
5	130136										X														
6	130137										X														
7	130138										X														
8	130139																			X	X				
9																									
10																									

Special Instructions/Comments: Metals were filtered and preserved w/ HNO3 in the lab

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 1L poly

SEND DOCUMENTATION AND RESULTS TO (Check one):
☒ Project Manager/Office: Julie Menack / Ala
☐ Client Name: ___
Company: ___
Address: ___
Phone: ___(___)___ Fax: ___

FOR LABORATORY USE ONLY. Sample Condition Upon Receipt: Good

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

Client: Julie Menack
McLaren
Alameda, CA 94501

L.P. #:	2972	Project Name:	Market Place
Date Rec'd:	4/12/90	Project #:	59801-008
Date Due:	4/26/90	Contact:	Julie Menack
Section:	GC/Inorganics	Phone:	415-521-5200

Samples received on 4/12/90 @ 12:30 p.m. under Chain(s) of Custody 220546-48. Chain(s) of Custody agree(s) with sample container(s). Samples received included:

- 1 sample(s) in voa vials for 602 analysis(es); and,

- 3 sample(s) in voa vials for 602 analysis(es), in 1 liter amber bottles for TPH/D analysis(es), and in 1 liter polyethylene bottles for metals (Pb, Zn, Cu, and As) analysis(es).

Correction(s) made and/or Problem(s): Request for sample MW7 should be metals (Pb, Zn, Cu, and As) analysis instead of specific conductivity as marked on the chain of custody per Julie Menack 4/12/90. Julie Menack will send facsimile to document the request change.

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.

METHOD BLANK

Method: 602
Units: ug/L (ppb)

COMPOUNDS	REPORTING LIMITS	RESULTS OF THE MB
Benzene	0.5	BRL
Toluene	0.5	BRL
Chlorobenzene	0.5	BRL
Ethyl Benzene	0.5	BRL
p-Xylene	0.5	BRL
m-Xylene	0.5	BRL
o-Xylene	0.5	BRL
o-Dichlorobenzene	0.5	BRL
m-Dichlorobenzene	0.5	BRL
p-Dichlorobenzene	0.5	BRL

LABORATORY CONTROL SPIKE

Method: 602
Units: ug/L (ppb)

COMPOUNDS	CONCENTRATION SPIKED	CONCENTRATION MEASURED	ACCURACY % RECOVERY	PRECISION RPD
Chlorobenzene	10.	10.	100	0
Benzene	10.	11.	110	9
Ethyl Benzene	10.	11.	110	0

QUALITY CONTROL REPORT

METHOD BLANK

Method: Metals (200 Series)
Units: ug/ml (ppm)

COMPOUNDS	REPORTING LIMITS	RESULTS OF THE MB
Aluminum (Al)/202.1	0.2	Not Requested
Antimony (Sb)/204.1	0.5	Not Requested
* Arsenic (As)/206.3	0.005	BRL
Barium (Ba)/208.1	1.	Not Requested
Beryllium (Be)/210.1	0.05	Not Requested
Cadmium (Cd)/213.1	0.01	Not Requested
Calcium (Ca)/215.1	0.1	Not Requested
Chromium (Cr)/218.1	0.02	Not Requested
Cobalt (Co)/219.1	0.08	Not Requested
Copper (Cu)/220.1	0.09	BRL
Hex. Chromium (CrVI)/218.5	0.05	Not Requested
Iron (Fe)/236.1	0.04	Not Requested
Lead (Pb)/239.1	0.1	BRL
Magnesium (Mg)/242.1	0.07	Not Requested
Manganese (Mn)/243.1	0.05	Not Requested
** Mercury (Hg)/245.1	0.002	Not Requested
Molybdenum (Mo)/246.1	1.	Not Requested
Nickel (Ni)/249.1	0.2	Not Requested
Potassium (K)/255.1	0.2	Not Requested
* Selenium (Se)/270.3	0.001	Not Requested
Silver (Ag)/272.1	0.05	Not Requested
Sodium (Na)/273.1	0.1	Not Requested
Thallium (Tl)/279.1	1.	Not Requested
Titanium (Ti)/283.1	0.6	Not Requested
Vanadium (V)/286.1	0.5	Not Requested
Zinc (Zn)/289.1	0.08	BRL

* Hydride generation method
** Cold vapor method

LABORATORY CONTROL SPIKE

Method: Metals (200 Series)
Units: ug/ml

COMPOUNDS	CONCENTRATION SPIKED	CONCENTRATION MEASURED	ACCURACY % RECOVERY	PRECISION RPD
* Arsenic (As)/206.3	0.42	0.41	98	2
Copper (Cu)/220.1	2.0	2.1	105	5
Lead (Pb)/239.1	2.0	2.2	110	0
Zinc (Zn)/289.1	2.0	2.1	105	0

* Hydride generation method

COMMENTS

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

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.

VOLATILE AROMATIC COMPOUNDS
EPA METHOD 602

Project: Market Place 59801-008

Lab Project Number: 2972

Sample Location: MW-7

Lab ID Number: 39443

Sample Number: 113137-40

Date Received: 04/12/90

Date Sampled: 04/11/90

Date Analyzed: 04/16/90

COMPOUND	ANALYTE CONCENTRATION ug/L (ppb)	REPORTING LIMIT ug/L (ppb)
Benzene	BRL	500.
Toluene	BRL	500.
Chlorobenzene	BRL	500.
Ethyl Benzene	BRL	500.
p-Xylene	BRL	500.
m-Xylene	BRL	500.
o-Xylene	BRL	500.
o-Dichlorobenzene	BRL	500.
m-Dichlorobenzene	BRL	500.
p-Dichlorobenzene	BRL	500.
Surrogate recovery (percent): a,a,a-Trifluorotoluene	76 *	

Comments: 1:1000 dilution required due to foaming.
* Surrogate recovery is 4% below quality control acceptance limits. Other quality control associated with this sample is within acceptance limits.

Approved By: _____ Date: 04/18/90
A. Putnam

McLaren

VOLATILE AROMATIC COMPOUNDS
EPA METHOD 602

Project: Market Place 59801-008

Lab Project Number: 2972

Sample Location: Trip Blanks

Lab ID Number: 39392

Sample Number: 113125-28

Date Received: 04/12/90

Date Sampled: 04/11/90

Date Analyzed: 04/12/90

COMPOUND	ANALYTE CONCENTRATION ug/L (ppb)	REPORTING LIMIT ug/L (ppb)
Benzene	BRL	0.5
Toluene	BRL	0.5
Chlorobenzene	BRL	0.5
Ethyl Benzene	BRL	0.5
p-Xylene	BRL	0.5
m-Xylene	BRL	0.5
o-Xylene	BRL	0.5
o-Dichlorobenzene	BRL	0.5
m-Dichlorobenzene	BRL	0.5
p-Dichlorobenzene	BRL	0.5
Surrogate recovery (percent): a,a,a-Trifluorotoluene	99	

Comments:

Approved By: A. Putnam Date: 04/16/90

McLaren

VOLATILE AROMATIC COMPOUNDS
EPA METHOD 602

Project: Market Place 59801-008

Lab Project Number: 2972

Sample Location: MW-1

Lab ID Number: 39393

Sample Number: 113129-32

Date Received: 04/12/90

Date Sampled: 04/11/90

Date Analyzed: 04/12/90

COMPOUND	ANALYTE CONCENTRATION ug/L (ppb)	REPORTING LIMIT ug/L (ppb)
Benzene	BRL	0.5
Toluene	BRL	0.5
Chlorobenzene	BRL	0.5
Ethyl Benzene	BRL	0.5
p-Xylene	BRL	0.5
m-Xylene	BRL	0.5
o-Xylene	BRL	0.5
o-Dichlorobenzene	BRL	0.5
m-Dichlorobenzene	BRL	0.5
p-Dichlorobenzene	BRL	0.5
Surrogate recovery (percent): a,a,a-Trifluorotoluene	117	

Comments:

Approved By: A. Putnam Date: 04/16/90

McLaren

VOLATILE AROMATIC COMPOUNDS
EPA METHOD 602

Project: Market Place 59801-008

Lab Project Number: 2972

Sample Location: MW-14

Lab ID Number: 39395

Sample Number: 113145-48

Date Received: 04/12/90

Date Sampled: 04/11/90

Date Analyzed: 04/12/90

COMPOUND	ANALYTE CONCENTRATION ug/L (ppb)	REPORTING LIMIT ug/L (ppb)
Benzene	BRL	0.5
Toluene	BRL	0.5
Chlorobenzene	BRL	0.5
Ethyl Benzene	BRL	0.5
p-Xylene	BRL	0.5
m-Xylene	BRL	0.5
o-Xylene	BRL	0.5
o-Dichlorobenzene	BRL	0.5
m-Dichlorobenzene	BRL	0.5
p-Dichlorobenzene	BRL	0.5
Surrogate recovery (percent): a,a,a-Trifluorotoluene	114	

Comments:

Approved By: A. Putnam Date: 04/16/90

McLaren

METAL ANALYSIS

Project: Market Place 59801-008

Lab Project Number: 2972

Sample Location: MW-14

Lab ID Number: 39397

Sample Number: 130139

Date Received: 04/12/90

Date Sampled: 04/11/90

Date Analyzed: 04/17/90

METAL (SYMBOL)/EPA METHOD	CONCENTRATION ug/ml (ppm)	REPORTING LIMIT ug/ml (ppm)
Aluminum (Al)/202.1	Not Requested	0.2
Antimony (Sb)/204.1	Not Requested	0.5
* Arsenic (As)/206.3	0.008	0.005
Barium (Ba)/208.1	Not Requested	1.
Beryllium (Be)/210.1	Not Requested	0.05
Cadmium (Cd)/213.1	Not Requested	0.01
Calcium (Ca)/215.1	Not Requested	0.1
Chromium (Cr)/218.1	Not Requested	0.02
Cobalt (Co)/219.1	Not Requested	0.08
Copper (Cu)/220.1	BRL	0.09
Hex. Chromium (CrVI)/218.5	Not Requested	0.05
Iron (Fe)/236.1	Not Requested	0.04
Lead (Pb)/239.1	BRL	0.1
Magnesium (Mg)/242.1	Not Requested	0.07
Manganese (Mn)/243.1	Not Requested	0.05
** Mercury (Hg)/245.1	Not Requested	0.002
Molybdenum (Mo)/246.1	Not Requested	1.
Nickel (Ni)/249.1	Not Requested	0.2
Potassium (K)/255.1	Not Requested	0.2
* Selenium (Se)/270.3	Not Requested	0.001
Silver (Ag)/272.1	Not Requested	0.05
Sodium (Na)/273.1	Not Requested	0.1
Thallium (Tl)/279.1	Not Requested	1.
Titanium (Ti)/283.1	Not Requested	0.6
Vanadium (V)/286.1	Not Requested	0.5
Zinc (Zn)/289.1	BRL	0.08

* Hydride generation method
** Cold vapor method

Comments:

Approved By: F. Ramezanzadeh Date: 04/23/90

McLaren

METAL ANALYSIS

Project: Market Place 59801-008

Lab Project Number: 2972

Sample Location: MW-1

Lab ID Number: 39442

Sample Number: 113136

Date Received: 04/12/90

Date Sampled: 04/11/90

Date Analyzed: 04/17/90

	METAL (SYMBOL)/EPA METHOD	CONCENTRATION ug/ml (ppm)	REPORTING LIMIT ug/ml (ppm)
	Aluminum (Al)/202.1	Not Requested	0.2
	Antimony (Sb)/204.1	Not Requested	0.5
*	Arsenic (As)/206.3	0.027	0.005
	Barium (Ba)/208.1	Not Requested	1.
	Beryllium (Be)/210.1	Not Requested	0.05
	Cadmium (Cd)/213.1	Not Requested	0.01
	Calcium (Ca)/215.1	Not Requested	0.1
	Chromium (Cr)/218.1	Not Requested	0.02
	Cobalt (Co)/219.1	Not Requested	0.08
	Copper (Cu)/220.1	BRL	0.09
	Hex. Chromium (CrVI)/218.5	Not Requested	0.05
	Iron (Fe)/236.1	Not Requested	0.04
	Lead (Pb)/239.1	BRL	0.1
	Magnesium (Mg)/242.1	Not Requested	0.07
	Manganese (Mn)/243.1	Not Requested	0.05
**	Mercury (Hg)/245.1	Not Requested	0.002
	Molybdenum (Mo)/246.1	Not Requested	1.
	Nickel (Ni)/249.1	Not Requested	0.2
	Potassium (K)/255.1	Not Requested	0.2
*	Selenium (Se)/270.3	Not Requested	0.001
	Silver (Ag)/272.1	Not Requested	0.05
	Sodium (Na)/273.1	Not Requested	0.1
	Thallium (Tl)/279.1	Not Requested	1.
	Titanium (Ti)/283.1	Not Requested	0.6
	Vanadium (V)/286.1	Not Requested	0.5
	Zinc (Zn)/289.1	BRL	0.08

* Hydride generation method
** Cold vapor method

Comments:

Approved By: F. Ramezanzaden Date: 04/23/90

McLaren

METAL ANALYSIS

Project: Market Place 59801-008

Lab Project Number: 2972

Sample Location: MW-7

Lab ID Number: 39445

Sample Number: 113144

Date Received: 04/12/90

Date Sampled: 04/11/90

Date Analyzed: 04/17/90

	METAL (SYMBOL)/EPA METHOD	CONCENTRATION ug/ml (ppm)	REPORTING LIMIT ug/ml (ppm)
	Aluminum (Al)/202.1	Not Requested	0.2
	Antimony (Sb)/204.1	Not Requested	0.5
*	Arsenic (As)/206.3	0.034	0.005
	Barium (Ba)/208.1	Not Requested	1.
	Beryllium (Be)/210.1	Not Requested	0.05
	Cadmium (Cd)/213.1	Not Requested	0.01
	Calcium (Ca)/215.1	Not Requested	0.1
	Chromium (Cr)/218.1	Not Requested	0.02
	Cobalt (Co)/219.1	Not Requested	0.08
	Copper (Cu)/220.1	0.09	0.09
	Hex. Chromium (CrVI)/218.5	Not Requested	0.05
	Iron (Fe)/236.1	Not Requested	0.04
	Lead (Pb)/239.1	BRL	0.1
	Magnesium (Mg)/242.1	Not Requested	0.07
	Manganese (Mn)/243.1	Not Requested	0.05
**	Mercury (Hg)/245.1	Not Requested	0.002
	Molybdenum (Mo)/246.1	Not Requested	1.
	Nickel (Ni)/249.1	Not Requested	0.2
	Potassium (K)/255.1	Not Requested	0.2
*	Selenium (Se)/270.3	Not Requested	0.001
	Silver (Ag)/272.1	Not Requested	0.05
	Sodium (Na)/273.1	Not Requested	0.1
	Thallium (Tl)/279.1	Not Requested	1.
	Titanium (Ti)/283.1	Not Requested	0.6
	Vanadium (V)/286.1	Not Requested	0.5
	Zinc (Zn)/289.1	BRL	0.08

* Hydride generation method
** Cold vapor method

Comments:

Approved By: F. Ramezanzadeh Date: 04/23/90

McLaren

EUREKA LABORATORIES, INC.

Corporate Office:
6790 FLORIN PERKINS ROAD
SACRAMENTO, CA 95828
TEL: (916) 381-7953
FAX: (916) 381-4013

Branch Office:
12121 NORTHUP WAY, SUITE 212
BELLEVUE, WA 98005
TEL: (206) 885-0284
FAX: (206) 885-6162

Air Pollution
Chemical Analysis.
Research & Testing
Environmental Studies
Robotics
Toxicology

April 26, 1990

Ms. Shakoora Azimi
MCLAREN ANALYTICAL LABS
11101 White Rock Road
Rancho Cordova, CA 95670

Reference: Project: Mclaren-2972
Project No: 59801-008
ELI Order No: 90-04-124 (REVISED)

Dear Ms. Azimi:

Eureka Laboratories, Inc. is pleased to submit a laboratory report for the subject project. This report represents analytical results for three (3) extract samples-ONE WEEK RUSH-for the following analysis:

Analysis	Method	Sample ID.
Total Petroleum Hydrocarbons	EPA 8015 (Modified)	39394, 39396, 39444

Sincerely,
EUREKA LABORATORIES, INC.

By: _____
Shao-Pin Yo, PH.D.
Laboratory Director

SPY/pvc

Attachment

TOTAL PETROLEUM HYDROCARBONS
MODIFIED EPA METHOD 8015 (Modified)

EUREKA LABORATORIES, INC.
6790 Florin-Perkins Road
Sacramento, CA 95828
(916) 381-7953

Order No: 90-04-124
Hazardous Waste Testing
Certification: 108

CLIENT: MCLAREN
PROJECT #: 59801-008
PROJECT: MCLAREN-2972
SAMPLE ID: SYSTEM BLANK

DATE RECEIVED: 04/17/1990
DATE ANALYZED: 04/19/1990
DATE COMPLETED: 04/23/1990

PETROLEUM HYDROCARBONS	CONCENTRATION [mg/L (ppm)]	DETECTION LIMIT [mg/L (ppm)]
Gasoline Range	<0.05	0.05
Diesel Range	<0.1	0.1
Motor Oil Range	<0.25	0.25
Total Petroleum Hydrocarbons	-	-
CARBON NO. RANGE		
Gasoline Range	-	-
Diesel Range	-	-
Motor Oil Range	-	-
PEAK CARBON NO		
Gasoline Range	-	-
Diesel Range	-	-
Motor Oil Range	-	-

April 26, 1990
Date

Sandia Kao
Senior Chemist, Organic Group

TOTAL PETROLEUM HYDROCARBONS
MODIFIED EPA METHOD 8015 (Modified)

EUREKA LABORATORIES, INC.
6790 Florin-Perkins Road
Sacramento, CA 95828
(916) 381-7953

Order No: 90-04-124
Hazardous Waste Testing
Certification: 108

CLIENT: MCLAREN
PROJECT #: 59801-008
PROJECT: MCLAREN-2972
SAMPLE ID: 39396

DATE RECEIVED: 04/17/1990
DATE ANALYZED: 04/19/1990
DATE COMPLETED: 04/23/1990

PETROLEUM HYDROCARBONS	CONCENTRATION [mg/L (ppm)]	DETECTION LIMIT [mg/L (ppm)]
Gasoline Range	<0.05	0.05
Diesel Range	<0.1	0.1
Motor Oil Range	<0.25	0.25
Total Petroleum Hydrocarbons	-	-
CARBON NO. RANGE		
Gasoline Range	-	-
Diesel Range	-	-
Motor Oil Range	-	-
PEAK CARBON NO		
Gasoline Range	-	-
Diesel Range	-	-
Motor Oil Range	-	-

Sandia Kao
Senior Chemist, Organic Group

April 26, 1990
Date

TOTAL PETROLEUM HYDROCARBONS
MODIFIED EPA METHOD 8015 (Modified)

EUREKA LABORATORIES, INC.
6790 Florin-Perkins Road
Sacramento, CA 95828
(916) 381-7953

Order No: 90-04-124
Hazardous Waste Testing
Certification: 108

CLIENT: MCLAREN
PROJECT #: 59801-008
PROJECT: MCLAREN-2972
SAMPLE ID: 39394

DATE RECEIVED: 04/17/1990
DATE ANALYZED: 04/19/1990
DATE COMPLETED: 04/23/1990

PETROLEUM HYDROCARBONS	CONCENTRATION [mg/L (ppm)]	DETECTION LIMIT [mg/L (ppm)]
Gasoline Range	<0.05	0.05
Diesel Range	<0.1	0.1
Motor Oil Range	0.57	0.25
Total Petroleum Hydrocarbons	0.57	-
CARBON NO. RANGE		
Gasoline Range	-	-
Diesel Range	-	-
Motor Oil Range	C18-C28	-
PEAK CARBON NO		
Gasoline Range	-	-
Diesel Range	-	-
Motor Oil Range	C24	-

Sandia Kao
Senior Chemist, Organic Group

April 26, 1990
Date

TOTAL PETROLEUM HYDROCARBONS
MODIFIED EPA METHOD 8015 (Modified)

EUREKA LABORATORIES, INC.
6790 Florin-Perkins Road
Sacramento, CA 95828
(916) 381-7953

Order No: 90-04-124
Hazardous Waste Testing
Certification: 108

CLIENT: MCLAREN
PROJECT #: 59801-008
PROJECT: MCLAREN-2972
SAMPLE ID: 39444

DATE RECEIVED: 04/17/1990
DATE ANALYZED: 04/19/1990
DATE COMPLETED: 04/23/1990

PETROLEUM HYDROCARBONS	CONCENTRATION [mg/L (ppm)]	DETECTION LIMIT [mg/L (ppm)]
Gasoline Range	<0.05	0.05
Diesel Range	5.6 *	0.1
Motor Oil Range	7.5	0.25
Total Petroleum Hydrocarbons	13.1	-
CARBON NO. RANGE		
Gasoline Range	-	-
Diesel Range	C12-C18	-
Motor Oil Range	C18-C26	-
PEAK CARBON NO		
Gasoline Range	-	-
Diesel Range	C16	-
Motor Oil Range	C22	-

* Diesel range hydrocarbon present but their pattern is different from our standard.

Sandia Kao
Senior Chemist, Organic Group

April 26, 1990
Date

TOTAL PETROLEUM HYDROCARBONS
MODIFIED EPA METHOD 8015 (Modified)

EUREKA LABORATORIES, INC.
6790 Florin-Perkins Road
Sacramento, CA 95828
(916) 381-7953

Order No: 90-04-124
Hazardous Waste Testing
Certification: 108

CLIENT: MCLAREN
PROJECT #: 59801-008
PROJECT: MCLAREN-2972
SAMPLE ID: STANDARD SPIKE RECOVERY

DATE RECEIVED: 04/17/1990
DATE ANALYZED: 04/19/1990
DATE COMPLETED: 04/23/1990

PETROLEUM HYDROCARBONS	SPIKE RECOVERY
Gasoline Range	68%
Diesel Range	107%
Motor Oil Range	66%
Total Petroleum Hydrocarbons	
CARBON NO. RANGE	
Gasoline Range	-
Diesel Range	-
Motor Oil Range	-
PEAK CARBON NO	
Gasoline Range	-
Diesel Range	-
Motor Oil Range	-

Sandia Kao
Senior Chemist, Organic Group

April 26, 1990
Date

TOTAL PETROLEUM HYDROCARBONS
MODIFIED EPA METHOD 8015 (Modified)

EUREKA LABORATORIES, INC.
6790 Florin-Perkins Road
Sacramento, CA 95828
(916) 381-7953

Order No: 90-04-124
Hazardous Waste Testing
Certification: 108

CLIENT: MCLAREN
PROJECT #: 59801-008
PROJECT: MCLAREN-2972
SAMPLE ID: STANDARD SPIKE RECOVERY DUPLICATE

DATE RECEIVED: 04/17/1990
DATE ANALYZED: 04/19/1990
DATE COMPLETED: 04/23/1990

PETROLEUM HYDROCARBONS	SPIKE RECOVERY
Gasoline Range	89%
Diesel Range	88%
Motor Oil Range	86%
Total Petroleum Hydrocarbons	
CARBON NO. RANGE	
Gasoline Range	-
Diesel Range	-
Motor Oil Range	-
PEAK CARBON NO	
Gasoline Range	-
Diesel Range	-
Motor Oil Range	-

Sandia Kao
Senior Chemist, Organic Group

April 26, 1990
Date

McLaren

Date: May 1, 1990
LP #: 2981

Julie Menack
McLaren
980 Atlantic Avenue, Suite 100
Alameda, CA 94501

Dear Ms. Menack:

Enclosed are the laboratory results for the seven sample(s) submitted by you to the McLaren Analytical Laboratory on April 13, 1990, for the project *Market Place*.

The analyses you requested are:

602 (7 - Water)
Metal (6 - Water)
TPH-D (6 - 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

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,

Jill P. Slater, 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.: 2981
Storage Refrigerator ID: 4-2, R-1
Storage Freezer ID:
Secured: Yes X No

Project Name: Market Place Project #: 59801-008 Sampler: Lana Brown (Printed Name) Lana Brown (Signature)

Relinquished by: (Signature and Printed Name) Lana Brown Lana Brown	Received by: (Signature and Printed Name) Fed-X	Date: 4/12/90	Time: 1700
Relinquished by: (Signature and Printed Name)	Received by: (Signature and Printed Name) Virginia Nixon	Date: 4/13/90	Time: 3:50 Fed Ex
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

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)	TAT	Container(s) #	Container(s) Type	FOR LABORATORY USE ONLY Lab ID
* 1 113151	4/12	8	TRIP Blanks	X																	4	1	V	39518
* 2 113152				X																				
* 3 113153				X																				
* 4 113154			mw19	X																				
5 113155		10:45	mw19	X																				39519
6 113156				X																				
7 113157				X																				
8 113158				X																			V	
9 113159											X												A	39520
10 113160	V	V	V								X											V	A	

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: TPH/D - Analyze using LUFT Method (LuFT)

Sample Archive/Disposal:
☐ Laboratory Standard
☐ Other

FOR LABORATORY USE ONLY. Sample Condition Upon Receipt: * Samples marked with asterisk had air bubbles. ✓ This sample was broken upon arrival to the laboratory.

SEND DOCUMENTATION AND RESULTS TO (Check one):
☒ Project Manager/Office: Julie Menack/Ala
☐ Client Name:
Company:
Address:

McLaren

CHAIN OF CUSTODY RECORD

FOR LABORATORY USE ONLY
Laboratory Project No.: 2981
Storage Refrigerator ID: 42, E-1
Storage Freezer ID:
Secured: Yes X No

Project Name: Marketplace Project #: 59801-008 Sampler: Lana Brown (Printed Name) Lana Brown (Signature)

Relinquished by: (Signature and Printed Name) Lana Brown Lana Brown	Received by: (Signature and Printed Name) Fed-X	Date: 4/12/90	Time: 17CC
Relinquished by: (Signature and Printed Name)	Received by: (Signature and Printed Name) Marian Nikon	Date: 4/13/90	Time: 3:50 Fed Ex
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

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)	Pb, Zn, Cu, As	TAT	Container(s) #	Container(s) Type	FOR LABORATORY USE ONLY Lab ID
1	113161	4/12	10:45								X											4	1	A	
2	113162		↓																		X			O	39608
3	113163		11:42		X																			V	39521
4	113164				X																				
5	113165				X																				
6	113166				X																				
7	113167										X													A	39522
8	113168										X													A	
9	113169																				X			O	39523
10		↓	↓																			↓	↓		

Special Instructions/Comments: Metals were filtered and then preserved w/ HNO3
TPH/D - LUFT Method

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 1L poly

SEND DOCUMENTATION AND RESULTS TO (Check one):
☒ Project Manager/Office: Julie Menack / Ala.
☐ Client Name:
Company:
Address:
Phone: ( ) Fax:

FOR LABORATORY USE ONLY. Sample Condition Upon Receipt:

McLaren

CHAIN OF CUSTODY RECORD

FOR LABORATORY USE ONLY
Laboratory Project No.: 2981
Storage Refrigerator ID: 4-2, E-1
Storage Freezer ID:
Secured: Yes X No

Project Name: MarketPlace Project #: 59801-008 Sampler: Lana Brown (Printed Name) Lana Brown (Signature)

Relinquished by: (Signature and Printed Name)	Received by: (Signature and Printed Name)	Date	Time
Lana Brown Lana Brown	Fed-X	4/12/90	1700
	[illegible signature]	4/13/90	3:50 fedex

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

a) Identify specific metals requested under Special Instructions

	Sample ID Number	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)	Pb, Zn, Cu, As	TAT	Container(s) #	Type	Lab ID
1	113170	4/12	1400	MW20		X																	4	1	V	39524
2	113171	↓	↓	↓		X																	↓	↓	↓	
3	113172					X																				
4	113173					X																			↓	
5	113174												X												A	39525
6	113175												X												A	
7	113176		↓	↓																		X			O	39526
8	113178		15:20	MW13		X																			V	39527
9	113179		↓	↓		X																				
10	113180	↓	↓	↓		X																	↓	↓	↓	

Special Instructions/Comments: Metals were filtered and then preserved w/ HNO_3. TPH/D - LUFT Method

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 1L poly

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

FOR LABORATORY USE ONLY. Sample Condition Upon Receipt:

McLaren

CHAIN OF CUSTODY RECORD

FOR LABORATORY USE ONLY
Laboratory Project No.: 2981
Storage Refrigerator ID: 4-2, R-1
Storage Freezer ID:
Secured: Yes X No

Project Name: Marketplace Project #: 59801-008 Sampler: Lana Brown (Printed Name) Lana Brown (Signature)

Relinquished by: (Signature and Printed Name) Lana Brown Lana Brown	Received by: (Signature and Printed Name) Fed-X	Date: 4/12/90	Time: ncc.
Relinquished by: (Signature and Printed Name)	Received by: (Signature and Printed Name) Yokogawa Nikon	Date: 4/13/90	Time: 3:50 fedx
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

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)	Ba, Zn, Cu, As	TAT	Container(s) #	Container(s) Type	FOR LABORATORY USE ONLY Lab ID
1 113181	4/12	15:20	MW 13	X																		4	1	V	5
2 113182	↓	↓	↓							X												↓	↓	A	39328
3 113183										X														A	5
4 113184																				X				C	39329
5																									
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 1L poly

Special Instructions/Comments: Metals were filtered and then preserved w/ HNO_3
TPH/D = ND Luft method

Sample Archive/Disposal:
☐ Laboratory Standard
☐ Other

SEND DOCUMENTATION AND RESULTS TO (Check one):
☒ Project Manager/Office: Julie Menack / ALA
☐ Client Name:
Company:
Address:
Fax:

FOR LABORATORY USE ONLY. Sample Condition Upon Receipt:

McLaren

CHAIN OF CUSTODY RECORD

FOR LABORATORY USE ONLY
Laboratory Project No.: 2981
Storage Refrigerator ID: 4-2, F1
Storage Freezer ID:
Secured: Yes X No

Project Name: MARKETPLACE Project #: 59801-008 Sampler: MARK JOHNSON (Printed Name) (Signature)

Relinquished by: (Signature and Printed Name) MARK V. JOHNSON	Received by: (Signature and Printed Name) FED-X	Date: 4-12-90	Time: 4:40
Relinquished by: (Signature and Printed Name)	Received by: (Signature and Printed Name) Adrian Tatum	Date: 4/13/90	Time: 3:50
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:

Shipment ID:

Circle or Add Analysis(es) Requested

a) Identify specific metals requested under Special Instructions

Sample ID Number	Sample Description: Date	Time	Description	TAT	Container(s): #	Type	FOR LABORATORY USE ONLY: Lab ID
1 144401	4/11/90	1205	W-23	4	1	V	39537
2 144402							~~39~~
3 144403							
4 144404							
5 144405						A	39538
6 144406						A	
7 144408						O	39539
8 144407	4/12/90	1455	W-22			C	39635
9 144409						A	39540
10 144410						A	

Analysis(es) Requested: 601/8010 (Halogenated Volatiles-GC); 602/8020 (Aromatic Volatiles-GC); 624/8240 (Volatiles-GC/MS); TPH/G (Gasoline-GC); TPH/D (Diesel-GC); Specific Conductivity (EC); pH, Zn, Cu, As

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 1-L Poly

Special Instructions/Comments:

Sample Archive/Disposal:
☐ Laboratory Standard
☐ Other

SEND DOCUMENTATION AND RESULTS TO (Check one):
☑ Project Manager/Office: JULIE MCNACK - ALAMEDA
☐ Client Name:
Company:
Address:
Phone: ( ) Fax:

FOR LABORATORY USE ONLY. Sample Condition Upon Receipt:

PG 2 OF 2

McLaren

CHAIN OF CUSTODY RECORD

FOR LABORATORY USE ONLY
Laboratory Project No.: 2981
Storage Refrigerator ID: 4-2, K-1
Storage Freezer ID:
Secured: Yes X No

Project Name: MARKETPLACE Project #: 59801-008 Sampler: MARK JOHNSON (Printed Name) (Signature)

Relinquished by: (Signature and Printed Name) MARK V. JOHNSON	Received by: (Signature and Printed Name)	Date: 4/12/90	Time: 4:00
Relinquished by: (Signature and Printed Name)	Received by: (Signature and Printed Name)	Date: 4/12/90	Time: 3:52
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:

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)	TAT	Container(s) #	Container(s) Type	FOR LABORATORY USE ONLY Lab ID
1	4/12/90	14:15	W-22	✓																	4	1	V	39541
2	4/12/90			✓																				
3	4/12/90			✓																				
4	4/12/90			✓																				
5																								
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

FOR LABORATORY USE ONLY. Sample Condition Upon Receipt:

SEND DOCUMENTATION AND RESULTS TO (Check one):
☑ Project Manager/Office: JULIE MCPHAIL - SACRAMENTO
☐ Client Name:
Company:
Address:
Phone: ( ) Fax:

McLaren

CHAIN OF CUSTODY RECORD

FOR LABORATORY USE ONLY
Laboratory Project No.: 2981
Storage Refrigerator ID: 4-2, F-1
Storage Freezer ID:
Secured: Yes X No

Project Name: MARKETPLACE Project #: 59801-008 Sampler: MARK JOHNSON (Printed Name) (Signature)

Relinquished by: (Signature and Printed Name) MARK V. JOHNSON	Received by: (Signature and Printed Name) FED-X	Date: 4-12-90	Time: 4:40
Relinquished by: (Signature and Printed Name)	Received by: (Signature and Printed Name) Valjean Vikan	Date: 4/13/90	Time: 3:50
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:

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)	Oil, Zn, Cu, AS	TAT	Container(s) #	Container(s) Type	FOR LABORATORY USE ONLY Lab ID
1	144401	4/11/90	1205	W-23	✓																	4	1	V	39537
2	144402				✓																				39
3	144403				✓																				
4	144404				✓																			↓	
* 5	144405										✓													A	39538
* 6	144406										✓													A	
7	144408	↓	↓	↓																✓				O	39539
8	144407	4/12/90	1455	W-22																✓				C	39635
* 9	144409	↓	↓	↓							✓													A	39540
* 10	144410	↓	↓	↓							✓											↓	↓	A	

Special Instructions/Comments: * Per Lana Brown 4/18/90, please analyze using ext method. V.V.

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 1-L P.C.T

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:

McLaren

CHAIN OF CUSTODY RECORD

FOR LABORATORY USE ONLY
Laboratory Project No.: 2981
Storage Refrigerator ID: 4-2, F1
Storage Freezer ID:
Secured Yes X No

Project Name: MARKET PLACE Project #: 598.

update 4-16-90

Relinquished by: (Signature and Printed Name) Mark V. Johnson
K Johnson (Printed Name) (Signature)
Date: 4-12-90 Time: 4:
Relinquished by: (Signature and Printed Name)
Date: 4/13/90 Time: 5:50
Relinquished by: (Signature and Printed Name)
Date: Time:
Relinquished 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:

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 Volatile)	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)	pH, Zn, Cu, As	TAT	Container(s) #	Container(s) Type	FOR LABORATORY USE ONLY Lab ID
1 144401	4/11/90	12:05	W-23	✓																		4	1	V	39537
2 144402				✓																					~~39~~
3 144403				✓																					
4 144404				✓																				↓	
5 144405										✓														A	39538
6 144406										✓														A	
7 144408	✓	↓	↓																✓					O	39539
8 144407	4/11/90	14:55	W-22																✓					C	39635
9 144409	↓	↓	↓							✓														A	39540
10 144410	↓	↓	↓							✓												↓	↓	A	

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 1-L Poly

Special Instructions/Comments:

Sample Archive/Disposal:
☐ Laboratory Standard
☐ Other

FOR LABORATORY USE ONLY. Sample Condition Upon Receipt:

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

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

Client: Julie Menack
McLaren
Alameda, CA 94501

L.P. #:	2981	Project Name:	Market Place
Date Rec'd:	4/13/90	Project #:	59801-008
Date Due:	4/27/90	Contact:	Julie Menack
Section:	GC/Inorganics	Phone:	415-521-5200

Samples received on 4/13/90 @ 3:50 p.m. under Chain(s) of Custody 220549-52, 220560, and 220559. Chain(s) of Custody agree(s) with sample container(s). Samples received included:

- 1 sample(s) in voa vials for 602 analysis(es); and,

- 6 sample(s) in voa vials for 602 analysis(es), in 1 liter amber bottles for TPH/D analysis(es), and in 1 liter polyethylene bottles for metals (Pb, Zn, Cu, and As) analysis(es).

Correction(s) made and/or Problem(s): Sample 113160 arrived broken.

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 BLANK

Method: 602
Units: ug/L (ppb)

COMPOUNDS	REPORTING LIMITS	RESULTS OF THE MB
Benzene	0.5	BRL
Toluene	0.5	BRL
Chlorobenzene	0.5	BRL
Ethyl Benzene	0.5	BRL
p-Xylene	0.5	BRL
m-Xylene	0.5	BRL
o-Xylene	0.5	BRL
o-Dichlorobenzene	0.5	BRL
m-Dichlorobenzene	0.5	BRL
p-Dichlorobenzene	0.5	BRL

MATRIX SPIKE*

Method: 602
Units: ug/L (ppb)

COMPOUNDS	CONCENTRATION SPIKED	CONCENTRATION MEASURED	ACCURACY % RECOVERY	PRECISION RPD
Chlorobenzene	10.	8.6	86	1
Benzene	10.	9.8	98	0
Ethyl Benzene	10.	9.7	97	13

QUALITY CONTROL REPORT

METHOD BLANK

Method: Metals (200 Series)
Units: ug/ml (ppm)

COMPOUNDS	REPORTING LIMITS	RESULTS OF THE MB
Aluminum (Al)/202.1	0.2	Not Requested
Antimony (Sb)/204.1	0.5	Not Requested
* Arsenic (As)/206.3	0.005	BRL
Barium (Ba)/208.1	1.	Not Requested
Beryllium (Be)/210.1	0.05	Not Requested
Cadmium (Cd)/213.1	0.01	Not Requested
Calcium (Ca)/215.1	0.1	Not Requested
Chromium (Cr)/218.1	0.02	Not Requested
Cobalt (Co)/219.1	0.08	Not Requested
Copper (Cu)/220.1	0.09	BRL
Hex. Chromium (CrVI)/218.5	0.05	Not Requested
Iron (Fe)/236.1	0.04	Not Requested
Lead (Pb)/239.1	0.1	BRL
Magnesium (Mg)/242.1	0.07	Not Requested
Manganese (Mn)/243.1	0.05	Not Requested
** Mercury (Hg)/245.1	0.002	Not Requested
Molybdenum (Mo)/246.1	1.	Not Requested
Nickel (Ni)/249.1	0.2	Not Requested
Potassium (K)/255.1	0.2	Not Requested
* Selenium (Se)/270.3	0.001	Not Requested
Silver (Ag)/272.1	0.05	Not Requested
Sodium (Na)/273.1	0.1	Not Requested
Thallium (Tl)/279.1	1.	Not Requested
Titanium (Ti)/283.1	0.6	Not Requested
Vanadium (V)/286.1	0.5	Not Requested
Zinc (Zn)/289.1	0.08	BRL

* Hydride generation method
** Cold vapor method

LABORATORY CONTROL SPIKE

Method: Metals (200 Series)
Units: ug/ml

COMPOUNDS	CONCENTRATION SPIKED	CONCENTRATION MEASURED	ACCURACY % RECOVERY	PRECISION RPD
* Arsenic (As)/206.3	0.42	0.37	88	2
Copper (Cu)/220.1	2.0	2.1	105	5
Lead (Pb)/239.1	2.0	2.2	110	0

* Hydride generation method

METHOD BLANK

Method: TPH-D by LUFT
Units: ug/ml (ppm)

COMPOUNDS	REPORTING LIMIT	RESULTS OF THE MB
Total Petroleum Hydrocarbons Diesel	0.5	BRL

LABORATORY CONTROL SPIKE

Method: TPH-D by LUFT
Units: ug/ml (ppm)

COMPOUNDS	CONCENTRATION SPIKED	CONCENTRATION MEASURED	ACCURACY % RECOVERY	PRECISION RPD
Diesel Range	2.5	2.4	96	0

COMMENTS

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

The spike reported for Method 602 is based on a live sample and is performed by the same method as described for the Laboratory Control Spike.

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.

VOLATILE AROMATIC COMPOUNDS
EPA METHOD 602

Project: Market Place 59801-008

Lab Project Number: 2981

Sample Location: W-22

Lab ID Number: 39541

Sample Number: 144411-14

Date Received: 04/13/90

Date Sampled: 04/12/90

Date Analyzed: 04/19/90

COMPOUND	ANALYTE CONCENTRATION ug/L (ppb)	REPORTING LIMIT ug/L (ppb)
Benzene	BRL	0.5
Toluene	BRL	0.5
Chlorobenzene	BRL	0.5
Ethyl Benzene	BRL	0.5
p-Xylene	BRL	0.5
m-Xylene	BRL	0.5
o-Xylene	BRL	0.5
o-Dichlorobenzene	BRL	0.5
m-Dichlorobenzene	BRL	0.5
p-Dichlorobenzene	BRL	0.5
Surrogate recovery (percent): a,a,a-Trifluorotoluene	82	

Comments:

Approved By: _____ Date: 04/23/90
A. Putnam

McLaren

VOLATILE AROMATIC COMPOUNDS
EPA METHOD 602

Project: Market Place 59801-008

Lab Project Number: 2981

Sample Location: W-23

Lab ID Number: 39537

Sample Number: 144401-04

Date Received: 04/13/90

Date Sampled: 04/12/90

Date Analyzed: 04/19/90

COMPOUND	ANALYTE CONCENTRATION ug/L (ppb)	REPORTING LIMIT ug/L (ppb)
Benzene	BRL	2.
Toluene	2.	2.
Chlorobenzene	BRL	2.
Ethyl Benzene	BRL	2.
p-Xylene	BRL	2.
m-Xylene	BRL	2.
o-Xylene	BRL	2.
o-Dichlorobenzene	BRL	2.
m-Dichlorobenzene	BRL	2.
p-Dichlorobenzene	BRL	2.
Surrogate recovery (percent): a,a,a-Trifluorotoluene	90	

Comments: 1:5 dilution required due to matrix interference.

Approved By: _____ Date: 04/23/90
A. Putnam

McLaren

VOLATILE AROMATIC COMPOUNDS
EPA METHOD 602

Project: Market Place 59801-008

Lab Project Number: 2981

Sample Location: Trip Blanks

Lab ID Number: 39518

Sample Number: 113151-54

Date Received: 04/13/90

Date Sampled: 04/12/90

Date Analyzed: 04/17/90

COMPOUND	ANALYTE CONCENTRATION ug/L (ppb)	REPORTING LIMIT ug/L (ppb)
Benzene	BRL	0.5
Toluene	BRL	0.5
Chlorobenzene	BRL	0.5
Ethyl Benzene	BRL	0.5
p-Xylene	BRL	0.5
m-Xylene	BRL	0.5
o-Xylene	BRL	0.5
o-Dichlorobenzene	BRL	0.5
m-Dichlorobenzene	BRL	0.5
p-Dichlorobenzene	BRL	0.5
Surrogate recovery (percent): a,a,a-Trifluorotoluene	91	

Comments:

Approved By: A. Putnam Date: 04/23/90

McLaren

VOLATILE AROMATIC COMPOUNDS
EPA METHOD 602

Project: Market Place 59801-008

Lab Project Number: 2981

Sample Location: MW-19

Lab ID Number: 39519

Sample Number: 113155-58

Date Received: 04/13/90

Date Sampled: 04/12/90

Date Analyzed: 04/17/90

COMPOUND	ANALYTE CONCENTRATION ug/L (ppb)	REPORTING LIMIT ug/L (ppb)
Benzene	BRL	0.5
Toluene	BRL	0.5
Chlorobenzene	BRL	0.5
Ethyl Benzene	BRL	0.5
p-Xylene	3.6	0.5
m-Xylene	2.5	0.5
o-Xylene	*	0.5
o-Dichlorobenzene	BRL	0.5
m-Dichlorobenzene	BRL	0.5
p-Dichlorobenzene	BRL	0.5
Surrogate recovery (percent): a,a,a-Trifluorotoluene	86	

Comments: * Coelutes with para-Xylene

Approved By: A. Putnam Date: 04/23/90

McLaren

VOLATILE AROMATIC COMPOUNDS
EPA METHOD 602

Project: Market Place 59801-008

Lab Project Number: 2981

Sample Location: MW-21

Lab ID Number: 39521

Sample Number: 113163-66

Date Received: 04/13/90

Date Sampled: 04/12/90

Date Analyzed: 04/17/90

COMPOUND	ANALYTE CONCENTRATION ug/L (ppb)	REPORTING LIMIT ug/L (ppb)
Benzene	BRL	0.5
Toluene	0.8	0.5
Chlorobenzene	BRL	0.5
Ethyl Benzene	BRL	0.5
p-Xylene	4.4	0.5
m-Xylene	3.2	0.5
o-Xylene	*	0.5
o-Dichlorobenzene	BRL	0.5
m-Dichlorobenzene	BRL	0.5
p-Dichlorobenzene	BRL	0.5
Surrogate recovery (percent): a,a,a-Trifluorotoluene	79 **	

Comments: * Coelutes with para-Xylene

** Surrogate recovery is 1% below quality control acceptance limits. Other quality control associated with this sample is within acceptance limits. Results confirmed.

Approved By: _____ Date: 04/23/90
A. Putnam

McLaren

VOLATILE AROMATIC COMPOUNDS
EPA METHOD 602

Project: Market Place 59801-008

Lab Project Number: 2981

Sample Location: MW-20

Lab ID Number: 39524

Sample Number: 113170-73

Date Received: 04/13/90

Date Sampled: 04/12/90

Date Analyzed: 04/17/90

COMPOUND	ANALYTE CONCENTRATION ug/L (ppb)	REPORTING LIMIT ug/L (ppb)
Benzene	BRL	0.5
Toluene	BRL	0.5
Chlorobenzene	BRL	0.5
Ethyl Benzene	BRL	0.5
p-Xylene	BRL	0.5
m-Xylene	BRL	0.5
o-Xylene	BRL	0.5
o-Dichlorobenzene	BRL	0.5
m-Dichlorobenzene	BRL	0.5
p-Dichlorobenzene	BRL	0.5
Surrogate recovery (percent): a,a,a-Trifluorotoluene	98	

Comments:

Approved By: A. Putnam Date: 04/23/90

McLaren

VOLATILE AROMATIC COMPOUNDS
EPA METHOD 602

Project: Market Place 59801-008

Lab Project Number: 2981

Sample Location: MW-13

Lab ID Number: 39527

Sample Number: 113178-81

Date Received: 04/13/90

Date Sampled: 04/12/90

Date Analyzed: 04/17/90

COMPOUND	ANALYTE CONCENTRATION ug/L (ppb)	REPORTING LIMIT ug/L (ppb)
Benzene	BRL	0.5
Toluene	BRL	0.5
Chlorobenzene	BRL	0.5
Ethyl Benzene	BRL	0.5
p-Xylene	BRL	0.5
m-Xylene	BRL	0.5
o-Xylene	BRL	0.5
o-Dichlorobenzene	BRL	0.5
m-Dichlorobenzene	BRL	0.5
p-Dichlorobenzene	BRL	0.5
Surrogate recovery (percent): a,a,a-Trifluorotoluene	97	

Comments:

Approved By: A. Putnam Date: 04/23/90

McLaren

METAL ANALYSIS

Project: Market Place 59801-008

Lab Project Number: 2981

Sample Location: MW-19

Lab ID Number: 39608

Sample Number: 113162

Date Received: 04/13/90

Date Sampled: 04/12/90

Date Analyzed: 04/17/90

	METAL (SYMBOL)/EPA METHOD	CONCENTRATION ug/ml (ppm)	REPORTING LIMIT ug/ml (ppm)
	Aluminum (Al)/202.1	Not Requested	0.2
	Antimony (Sb)/204.1	Not Requested	0.5
*	Arsenic (As)/206.3	0.01	0.005
	Barium (Ba)/208.1	Not Requested	1.
	Beryllium (Be)/210.1	Not Requested	0.05
	Cadmium (Cd)/213.1	Not Requested	0.01
	Calcium (Ca)/215.1	Not Requested	0.1
	Chromium (Cr)/218.1	Not Requested	0.02
	Cobalt (Co)/219.1	Not Requested	0.08
	Copper (Cu)/220.1	BRL	0.09
	Hex. Chromium (CrVI)/218.5	Not Requested	0.05
	Iron (Fe)/236.1	Not Requested	0.04
	Lead (Pb)/239.1	BRL	0.1
	Magnesium (Mg)/242.1	Not Requested	0.07
	Manganese (Mn)/243.1	Not Requested	0.05
**	Mercury (Hg)/245.1	Not Requested	0.002
	Molybdenum (Mo)/246.1	Not Requested	1.
	Nickel (Ni)/249.1	Not Requested	0.2
	Potassium (K)/255.1	Not Requested	0.2
*	Selenium (Se)/270.3	Not Requested	0.001
	Silver (Ag)/272.1	Not Requested	0.05
	Sodium (Na)/273.1	Not Requested	0.1
	Thallium (Tl)/279.1	Not Requested	1.
	Titanium (Ti)/283.1	Not Requested	0.6
	Vanadium (V)/286.1	Not Requested	0.5
	Zinc (Zn)/289.1	BRL	0.08

* Hydride generation method

** Cold vapor method

Comments:

Approved By: F. Ramezanzadeh Date: 04/26/90

McLaren

METAL ANALYSIS

Project: Market Place 59801-008

Lab Project Number: 2981

Sample Location: MW-21

Lab ID Number: 39523

Sample Number: 113169

Date Received: 04/13/90

Date Sampled: 04/12/90

Date Analyzed: 04/17/90

	METAL (SYMBOL)/EPA METHOD	CONCENTRATION ug/ml (ppm)	REPORTING LIMIT ug/ml (ppm)
	Aluminum (Al)/202.1	Not Requested	0.2
	Antimony (Sb)/204.1	Not Requested	0.5
*	Arsenic (As)/206.3	0.02	0.005
	Barium (Ba)/208.1	Not Requested	1.
	Beryllium (Be)/210.1	Not Requested	0.05
	Cadmium (Cd)/213.1	Not Requested	0.01
	Calcium (Ca)/215.1	Not Requested	0.1
	Chromium (Cr)/218.1	Not Requested	0.02
	Cobalt (Co)/219.1	Not Requested	0.08
	Copper (Cu)/220.1	BRL	0.09
	Hex. Chromium (CrVI)/218.5	Not Requested	0.05
	Iron (Fe)/236.1	Not Requested	0.04
	Lead (Pb)/239.1	BRL	0.1
	Magnesium (Mg)/242.1	Not Requested	0.07
	Manganese (Mn)/243.1	Not Requested	0.05
**	Mercury (Hg)/245.1	Not Requested	0.002
	Molybdenum (Mo)/246.1	Not Requested	1.
	Nickel (Ni)/249.1	Not Requested	0.2
	Potassium (K)/255.1	Not Requested	0.2
*	Selenium (Se)/270.3	Not Requested	0.001
	Silver (Ag)/272.1	Not Requested	0.05
	Sodium (Na)/273.1	Not Requested	0.1
	Thallium (Tl)/279.1	Not Requested	1.
	Titanium (Ti)/283.1	Not Requested	0.6
	Vanadium (V)/286.1	Not Requested	0.5
	Zinc (Zn)/289.1	BRL	0.08

* Hydride generation method
** Cold vapor method

Comments:

Approved By: F. Ramezanzadeh Date: 04/26/90

McLaren

METAL ANALYSIS

Project: Market Place 59801-008

Lab Project Number: 2981

Sample Location: MW-20

Lab ID Number: 39526

Sample Number: 113176

Date Received: 04/13/90

Date Sampled: 04/12/90

Date Analyzed: 04/17/90

	METAL (SYMBOL)/EPA METHOD	CONCENTRATION ug/ml (ppm)	REPORTING LIMIT ug/ml (ppm)
	Aluminum (Al)/202.1	Not Requested	0.2
	Antimony (Sb)/204.1	Not Requested	0.5
*	Arsenic (As)/206.3	BRL	0.005
	Barium (Ba)/208.1	Not Requested	1.
	Beryllium (Be)/210.1	Not Requested	0.05
	Cadmium (Cd)/213.1	Not Requested	0.01
	Calcium (Ca)/215.1	Not Requested	0.1
	Chromium (Cr)/218.1	Not Requested	0.02
	Cobalt (Co)/219.1	Not Requested	0.08
	Copper (Cu)/220.1	BRL	0.09
	Hex. Chromium (CrVI)/218.5	Not Requested	0.05
	Iron (Fe)/236.1	Not Requested	0.04
	Lead (Pb)/239.1	BRL	0.1
	Magnesium (Mg)/242.1	Not Requested	0.07
	Manganese (Mn)/243.1	Not Requested	0.05
**	Mercury (Hg)/245.1	Not Requested	0.002
	Molybdenum (Mo)/246.1	Not Requested	1.
	Nickel (Ni)/249.1	Not Requested	0.2
	Potassium (K)/255.1	Not Requested	0.2
*	Selenium (Se)/270.3	Not Requested	0.001
	Silver (Ag)/272.1	Not Requested	0.05
	Sodium (Na)/273.1	Not Requested	0.1
	Thallium (Tl)/279.1	Not Requested	1.
	Titanium (Ti)/283.1	Not Requested	0.6
	Vanadium (V)/286.1	Not Requested	0.5
	Zinc (Zn)/289.1	BRL	0.08

* Hydride generation method
** Cold vapor method

Comments:

Approved By: F. Ramezanzadeh Date: 04/26/90

McLaren

METAL ANALYSIS

Project: Market Place 59801-008

Lab Project Number: 2981

Sample Location: MW-13

Lab ID Number: 39529

Sample Number: 113184

Date Received: 04/13/90

Date Sampled: 04/12/90

Date Analyzed: 04/17/90

METAL (SYMBOL)/EPA METHOD	CONCENTRATION ug/ml (ppm)	REPORTING LIMIT ug/ml (ppm)
Aluminum (Al)/202.1	Not Requested	0.2
Antimony (Sb)/204.1	Not Requested	0.5
* Arsenic (As)/206.3	0.02	0.005
Barium (Ba)/208.1	Not Requested	1.
Beryllium (Be)/210.1	Not Requested	0.05
Cadmium (Cd)/213.1	Not Requested	0.01
Calcium (Ca)/215.1	Not Requested	0.1
Chromium (Cr)/218.1	Not Requested	0.02
Cobalt (Co)/219.1	Not Requested	0.08
Copper (Cu)/220.1	BRL	0.09
Hex. Chromium (CrVI)/218.5	Not Requested	0.05
Iron (Fe)/236.1	Not Requested	0.04
Lead (Pb)/239.1	BRL	0.1
Magnesium (Mg)/242.1	Not Requested	0.07
Manganese (Mn)/243.1	Not Requested	0.05
** Mercury (Hg)/245.1	Not Requested	0.002
Molybdenum (Mo)/246.1	Not Requested	1.
Nickel (Ni)/249.1	Not Requested	0.2
Potassium (K)/255.1	Not Requested	0.2
* Selenium (Se)/270.3	Not Requested	0.001
Silver (Ag)/272.1	Not Requested	0.05
Sodium (Na)/273.1	Not Requested	0.1
Thallium (Tl)/279.1	Not Requested	1.
Titanium (Ti)/283.1	Not Requested	0.6
Vanadium (V)/286.1	Not Requested	0.5
Zinc (Zn)/289.1	BRL	0.08

* Hydride generation method

** Cold vapor method

Comments:

Approved By: F. Ramezanzadeh Date: 04/26/90

McLaren

METAL ANALYSIS

Project: Market Place 59801-008

Lab Project Number: 2981

Sample Location: W-23

Lab ID Number: 39539

Sample Number: 144408

Date Received: 04/13/90

Date Sampled: 04/12/90

Date Analyzed: 04/17/90

METAL (SYMBOL)/EPA METHOD	CONCENTRATION ug/ml (ppm)	REPORTING LIMIT ug/ml (ppm)
Aluminum (Al)/202.1	Not Requested	0.2
Antimony (Sb)/204.1	Not Requested	0.5
* Arsenic (As)/206.3	0.02	0.005
Barium (Ba)/208.1	Not Requested	1.
Beryllium (Be)/210.1	Not Requested	0.05
Cadmium (Cd)/213.1	Not Requested	0.01
Calcium (Ca)/215.1	Not Requested	0.1
Chromium (Cr)/218.1	Not Requested	0.02
Cobalt (Co)/219.1	Not Requested	0.08
Copper (Cu)/220.1	BRL	0.09
Hex. Chromium (CrVI)/218.5	Not Requested	0.05
Iron (Fe)/236.1	Not Requested	0.04
Lead (Pb)/239.1	BRL	0.1
Magnesium (Mg)/242.1	Not Requested	0.07
Manganese (Mn)/243.1	Not Requested	0.05
** Mercury (Hg)/245.1	Not Requested	0.002
Molybdenum (Mo)/246.1	Not Requested	1.
Nickel (Ni)/249.1	Not Requested	0.2
Potassium (K)/255.1	Not Requested	0.2
* Selenium (Se)/270.3	Not Requested	0.001
Silver (Ag)/272.1	Not Requested	0.05
Sodium (Na)/273.1	Not Requested	0.1
Thallium (Tl)/279.1	Not Requested	1.
Titanium (Ti)/283.1	Not Requested	0.6
Vanadium (V)/286.1	Not Requested	0.5
Zinc (Zn)/289.1	BRL	0.08

* Hydride generation method

** Cold vapor method

Comments:

Approved By: F. Ramezanzadeh Date: 04/26/90

McLaren

METAL ANALYSIS

Project: Market Place 59801-008

Lab Project Number: 2981

Sample Location: W-22

Lab ID Number: 39535

Sample Number: 144407

Date Received: 04/13/90

Date Sampled: 04/12/90

Date Analyzed: 04/17/90

METAL (SYMBOL)/EPA METHOD	CONCENTRATION ug/ml (ppm)	REPORTING LIMIT ug/ml (ppm)
Aluminum (Al)/202.1	Not Requested	0.2
Antimony (Sb)/204.1	Not Requested	0.5
* Arsenic (As)/206.3	BRL	0.005
Barium (Ba)/208.1	Not Requested	1.
Beryllium (Be)/210.1	Not Requested	0.05
Cadmium (Cd)/213.1	Not Requested	0.01
Calcium (Ca)/215.1	Not Requested	0.1
Chromium (Cr)/218.1	Not Requested	0.02
Cobalt (Co)/219.1	Not Requested	0.08
Copper (Cu)/220.1	BRL	0.09
Hex. Chromium (CrVI)/218.5	Not Requested	0.05
Iron (Fe)/236.1	Not Requested	0.04
Lead (Pb)/239.1	BRL	0.1
Magnesium (Mg)/242.1	Not Requested	0.07
Manganese (Mn)/243.1	Not Requested	0.05
** Mercury (Hg)/245.1	Not Requested	0.002
Molybdenum (Mo)/246.1	Not Requested	1.
Nickel (Ni)/249.1	Not Requested	0.2
Potassium (K)/255.1	Not Requested	0.2
* Selenium (Se)/270.3	Not Requested	0.001
Silver (Ag)/272.1	Not Requested	0.05
Sodium (Na)/273.1	Not Requested	0.1
Thallium (Tl)/279.1	Not Requested	1.
Titanium (Ti)/283.1	Not Requested	0.6
Vanadium (V)/286.1	Not Requested	0.5
Zinc (Zn)/289.1	BRL	0.08

* Hydride generation method
** Cold vapor method

Comments:

Approved By: _____ Date: 04/26/90
F. Ramezanzadeh

McLaren

TOTAL PETROLEUM HYDROCARBONS
DIESEL (by LUFT Method)

Project: Market Place 59801-008

Lab Project Number: 2981

Sample Location: MW-19

Lab ID Number: 39520

Sample Number: 113159, 113161

Date Received: 04/13/90

Date Sampled: 04/12/90

Date Analyzed: 04/27/90

PETROLEUM HYDROCARBONS	CONCENTRATION ug/ml (ppm)	REPORTING LIMIT ug/ml (ppm)
Diesel Range	1.1	0.5

Comments:

Approved By: E. Danek

Date: 04/30/90

McLaren

TOTAL PETROLEUM HYDROCARBONS
DIESEL (by LUFT Method)

Project: Market Place 59801-008

Lab Project Number: 2981

Sample Location: MW-21

Lab ID Number: 39522

Sample Number: 113167-68

Date Received: 04/13/90

Date Sampled: 04/12/90

Date Analyzed: 04/27/90

PETROLEUM HYDROCARBONS	CONCENTRATION ug/ml (ppm)	REPORTING LIMIT ug/ml (ppm)
Diesel Range	1.4	0.5

Comments:

Approved By: E. Danek Date: 04/30/90

E. Danek

McLaren

TOTAL PETROLEUM HYDROCARBONS
DIESEL (by LUFT Method)

Project: Market Place 59801-008

Lab Project Number: 2981

Sample Location: MW-20

Lab ID Number: 39525

Sample Number: 113174-75

Date Received: 04/13/90

Date Sampled: 04/12/90

Date Analyzed: 04/27/90

PETROLEUM HYDROCARBONS	CONCENTRATION ug/ml (ppm)	REPORTING LIMIT ug/ml (ppm)
Diesel Range	BRL	0.5

Comments:

Approved By: E. Danek Date: 04/30/90

E. Danek

McLaren

TOTAL PETROLEUM HYDROCARBONS
DIESEL (by LUFT Method)

Project: Market Place 59801-008

Lab Project Number: 2981

Sample Location: MW-13

Lab ID Number: 39528

Sample Number: 113182-83

Date Received: 04/13/90

Date Sampled: 04/12/90

Date Analyzed: 04/27/90

PETROLEUM HYDROCARBONS	CONCENTRATION ug/ml (ppm)	REPORTING LIMIT ug/ml (ppm)
Diesel Range	BRL	0.5

Comments:

Approved By: E. Danek Date: 04/30/90

E. Danek

McLaren

TOTAL PETROLEUM HYDROCARBONS
DIESEL (by LUFT Method)

Project: Market Place 59801-008

Lab Project Number: 2981

Sample Location: W-23

Lab ID Number: 39538

Sample Number: 144405-06

Date Received: 04/13/90

Date Sampled: 04/12/90

Date Analyzed: 04/27/90

PETROLEUM HYDROCARBONS	CONCENTRATION ug/ml (ppm)	REPORTING LIMIT ug/ml (ppm)
Diesel Range	2.9	0.5

Comments:

Approved By: E. Danek Date: 04/30/90

E. Danek

McLaren

TOTAL PETROLEUM HYDROCARBONS
DIESEL (by LUFT Method)

Project: Market Place 59801-008

Lab Project Number: 2981

Sample Location: W-22

Lab ID Number: 39540

Sample Number: 144409-10

Date Received: 04/13/90

Date Sampled: 04/12/90

Date Analyzed: 04/27/90

PETROLEUM HYDROCARBONS	CONCENTRATION ug/ml (ppm)	REPORTING LIMIT ug/ml (ppm)
Diesel Range	BRL	0.5

Comments:

Approved By: E. Danek Date: 04/30/90

E. Danek

McLaren

McLaren

Date: May 3, 1990
LP #: 2986

Julie Menack
McLaren
1135 Atlantic Avenue
Alameda, CA 94501

Dear Ms. Menack:

Enclosed are the laboratory results for the five sample(s) submitted by you to the McLaren Analytical Laboratory on April 16, 1990, for the project *Market Place*.

The analyses you requested are:

602 (5 - Water)
Metal (4 - Water)
TPH-D (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

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 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.: 2986
Storage Refrigerator ID: 4-2, 1
Storage Freezer ID:
Secured: Yes ✓ No

Project Name: Marketplace Project #: 5980-008 Sampler: Lana Brown (Printed Name) Lana Brown (Signature)

Relinquished by: (Signature and Printed Name) Lana Brown Lana Brown	Received by: (Signature and Printed Name) Fed-X	Date: 4/13/90	Time: 1600
Relinquished by: (Signature and Printed Name)	Received by: (Signature and Printed Name) Brian J O'Connor	Date: 4-16-90	Time: 10:00 AM
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

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)	TAT	Container(s) #	Container(s) Type	FOR LABORATORY USE ONLY Lab ID
1	113185	4/13	8	TRIP Blanks	X																	4	1	V	39619
2	113186				X																				
3	113187				X																				
4	113188		↓	↓	X																				
5	113189		12:01	MW15	X																				39620
6	113190				X																				
7	113191				X	EFFERVESCENT																			
8	113192				X																			↓	
9	113193										X													A	39621
10	113194	↓	↓	↓							X											↓	↓	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 wee'
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: Good

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

McLaren

CHAIN OF CUSTODY RECORD

FOR LABORATORY USE ONLY
Laboratory Project No.: 2986
Storage Refrigerator ID: 4-2, 1
Storage Freezer ID:
Secured: Yes ✓ No

Project Name: Marketplace. Project #: 59801-008 Sampler: Lana Brown (Printed Name) Lana Brown (Signature)

Relinquished by: (Signature and Printed Name) Lana Brown, Lana Brown	Received by: (Signature and Printed Name) Fed-X	Date: 4/13/90	Time: 1600
Relinquished by: (Signature and Printed Name)	Received by: (Signature and Printed Name) Brian J O'Connor	Date: 4-16-90	Time: 10:00 AM
Relinquished by: (Signature and Printed Name)	Received by: (Signature and Printed Name)	Date:	Time:
Relinquished 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

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)	Pb, Zn, Cu, As	TAT	Container(s) #	Container(s) Type	FOR LABORATORY USE ONLY Lab ID
1 113195	4/13	12:01	mw15								X									X		4	1	A	
2 113196		↓	↓																				1	O	39622
3 113197		12:20	mw16	X																			1	V	39623
4 113198				X																				↓	
5 113199				X																			1	A	39624
6 113200				X							X												1	A	
7 130140											X												1	O	39625
8 130141																				X					
9 130142		↓	↓																			↓	↓		
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 1L poly

Special Instructions/Comments: Metals - filtered then preserved w/ HNO3

Sample Archive/Disposal:
☐ Laboratory Standard
☐ Other

SEND DOCUMENTATION AND RESULTS TO (Check one):
☒ Project Manager/Office: Julie Menack / Ala
☐ Client Name
Company:
Address:
Fax:

FOR LABORATORY USE ONLY Sample Condition Upon Receipt: Good

FOR LABORATORY USE ONLY
Laboratory Project No.: 2986
Storage Refrigerator ID: 4-2, 1
Storage Freezer ID:
Secured: Yes ✓ No

McLaren

CHAIN OF CUSTODY RECORD

Project Name: Marketplace Project #: 59801-008 Sampler: Lana Brown (Printed Name) Lana Brown (Signature)

		Date	Time
Relinquished by: (Signature and Printed Name) Lana Brown Lana Brown	Received by: (Signature and Printed Name) Fed-X	4/13/90	1600
Relinquished by: (Signature and Printed Name) Fed-X	Received by: (Signature and Printed Name) Brian O'Connor	4-16-90	10:00 Am
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

a) Identify specific metals requested under Special Instructions

Sample ID Number	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)	Pb, Zn, Cu, As		TAT	Container(s) #	Container(s) Type	FOR LABORATORY USE ONLY Lab ID
1 130143	4/13	14:48	MW17		X	}																	4	1	V	39626
2 130144					X	EFFERVESCENT																				
3 130145					X																				A	39627
4 130146					X							X													A	
5 130147												X									X				C	39628
6 130148																									Y	39629
7 130149					X	}																				
8 ~~135917~~		14:21	MW18		X	EFFERVESCENT																				
9 ~~135918~~					X																					
10 ~~135919~~																										

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 1 L poly

Special Instructions/Comments: Metals - filtered then preserved with HNO_3
MW18: 135914, 135915, 135916

Sample Archive/Disposal:
☐ Laboratory Standard
☐ Other

SEND DOCUMENTATION AND RESULTS TO (Check one):
☒ Project Manager/Office: Julie Menack / Ala
☐ Client Name
Company

FOR LABORATORY USE ONLY Sample Condition Upon Receipt: Good

McLaren

CHAIN OF CUSTODY RECORD

FOR LABORATORY USE ONLY
Laboratory Project No.: 2986
Storage Refrigerator ID: 4-2,1
Storage Freezer ID:

Secured:
Yes ✓
No

Project Name: Marketplace
Project #: 59801-008
Sampler: Lana Brown (Printed Name) Lana Brown (Signature)

Relinquished by: (Signature and Printed Name) Lana Brown Lana Brown	Received by: (Signature and Printed Name) Fed-X	Date: 4/13/90	Time: 1600
Relinquished by: (Signature and Printed Name)	Received by: (Signature and Printed Name) [signature] Brian J O'Connor	Date: 4-16-90	Time: 10:00 AM
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

a) Identify specific metals requested under Special Instructions

Sample ID Number	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)	Pb, Zn, Cu, As	TAT	Container(s) #	Container(s) Type	FOR LABORATORY USE ONLY Lab ID
1 ~~135920~~	4/13	1427	MW18		X) EFFVESCENT							X										4	1	V / A	39630
2 ~~135921~~	↓	↓	↓									X										↓	↓	A	
3 135919	↓	↓	↓																		X	↓	↓	O	39631
4 135920	↓	↓	↓																						
5																									
6																									
7																									
8																									
9																									
10																									

Special Instructions/Comments: Metals - filtered then preserved w/ HNO_3
→ 002-135917, 135918 - TPH/D

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 1L poly

SEND DOCUMENTATION AND RESULTS TO (Check one):
[X] Project Manager/Office: Julie Menack / Alc.
[ ] Client Name
Company
Address
Phone: ( )
Fax:

FOR LABORATORY USE ONLY Sample Condition Upon Receipt: Good

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

Client: Julie Menack
McLaren
Alameda, CA 94501

L.P. #:	2986	Project Name:	Market Place
Date Rec'd:	4/16/90	Project #:	59801-008
Date Due:	4/30/90	Contact:	Julie Menack
Section:	GC/Inorganics	Phone:	415-521-5200

Samples received on 4/16/90 @ 10:00 a.m. under Chain(s) of Custody 220503-05 and 220553. Chain(s) of Custody agree(s) with sample container(s). Samples received included:

- 1 sample(s) in voa vials for 602 analysis(es); and,

- 4 sample(s) in voa vials for 602 analysis(es), in 1 liter amber bottles for TPH/D analysis(es), and in 1 liter polyethylene bottles for metals (Pb, Zn, Cu, and As) analysis(es).

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

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 BLANK

Method: 602
Units: ug/L (ppb)

COMPOUNDS	REPORTING LIMITS	RESULTS OF THE MB
Benzene	0.5	BRL
Toluene	0.5	BRL
Chlorobenzene	0.5	BRL
Ethyl Benzene	0.5	BRL
p-Xylene	0.5	BRL
m-Xylene	0.5	BRL
o-Xylene	0.5	BRL
o-Dichlorobenzene	0.5	BRL
m-Dichlorobenzene	0.5	BRL
p-Dichlorobenzene	0.5	BRL

LABORATORY CONTROL SPIKE

Method: 602
Units: ug/L (ppb)

COMPOUNDS	CONCENTRATION SPIKED	CONCENTRATION MEASURED	ACCURACY % RECOVERY	PRECISION RPD
Chlorobenzene	10.	11.	110	0
Benzene	10.	10.	100	18
Ethyl Benzene	10.	10.	100	10

QUALITY CONTROL REPORT

METHOD BLANK

Method: Metals (200 Series)
Units: ug/ml (ppm)

COMPOUNDS	REPORTING LIMITS	RESULTS OF THE MB
Aluminum (Al)/202.1	0.2	Not Requested
Antimony (Sb)/204.1	0.5	Not Requested
* Arsenic (As)/206.3	0.005	BRL
Barium (Ba)/208.1	1.	Not Requested
Beryllium (Be)/210.1	0.05	Not Requested
Cadmium (Cd)/213.1	0.01	Not Requested
Calcium (Ca)/215.1	0.1	Not Requested
Chromium (Cr)/218.1	0.02	Not Requested
Cobalt (Co)/219.1	0.08	Not Requested
Copper (Cu)/220.1	0.09	BRL
Hex. Chromium (CrVI)/218.5	0.05	Not Requested
Iron (Fe)/236.1	0.04	Not Requested
Lead (Pb)/239.1	0.1	BRL
Magnesium (Mg)/242.1	0.07	Not Requested
Manganese (Mn)/243.1	0.05	Not Requested
** Mercury (Hg)/245.1	0.002	Not Requested
Molybdenum (Mo)/246.1	1.	Not Requested
Nickel (Ni)/249.1	0.2	Not Requested
Potassium (K)/255.1	0.2	Not Requested
* Selenium (Se)/270.3	0.001	Not Requested
Silver (Ag)/272.1	0.05	Not Requested
Sodium (Na)/273.1	0.1	Not Requested
Thallium (Tl)/279.1	1.	Not Requested
Titanium (Ti)/283.1	0.6	Not Requested
Vanadium (V)/286.1	0.5	Not Requested
Zinc (Zn)/289.1	0.08	BRL

* Hydride generation method
** Cold vapor method

LABORATORY CONTROL SPIKE

Method: Metals (200 Series)
Units: ug/ml

COMPOUNDS	CONCENTRATION SPIKED	CONCENTRATION MEASURED	ACCURACY % RECOVERY	PRECISION RPD
* Arsenic (As)/206.3	0.20	0.20	100	0
Copper (Cu)/220.1	1.0	1.0	100	2
Lead (Pb)/239.1	1.0	1.0	100	0
Zinc (Zn)/289.1	1.0	1.0	100	2

* Hydride generation method

QUALITY CONTROL REPORT

METHOD BLANK

Method: TPH-D by LUFT
Units: ug/ml (ppm)

COMPOUNDS	REPORTING LIMIT	RESULTS OF THE MB
Total Petroleum Hydrocarbons Diesel	0.5	BRL

LABORATORY CONTROL SPIKE

Method: TPH-D by LUFT
Units: ug/ml (ppm)

COMPOUNDS	CONCENTRATION SPIKED	CONCENTRATION MEASURED	ACCURACY % RECOVERY	PRECISION RPD
Diesel Range	2.5	2.6	104	4

COMMENTS

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

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.

VOLATILE AROMATIC COMPOUNDS
EPA METHOD 602

Project: Market Place 59801-008

Lab Project Number: 2986

Sample Location: Trip Blanks

Lab ID Number: 39619

Sample Number: 113185-88

Date Received: 04/16/90

Date Sampled: 04/13/90

Date Analyzed: 04/19/90

COMPOUND	ANALYTE CONCENTRATION ug/L (ppb)	REPORTING LIMIT ug/L (ppb)
Benzene	BRL	0.5
Toluene	BRL	0.5
Chlorobenzene	BRL	0.5
Ethyl Benzene	BRL	0.5
p-Xylene	BRL	0.5
m-Xylene	BRL	0.5
o-Xylene	BRL	0.5
o-Dichlorobenzene	BRL	0.5
m-Dichlorobenzene	BRL	0.5
p-Dichlorobenzene	BRL	0.5
Surrogate recovery (percent): a,a,a-Trifluorotoluene	114	

Comments:

Approved By: A. Putnam Date: 04/23/90

McLaren

VOLATILE AROMATIC COMPOUNDS
EPA METHOD 602

Project: Market Place 59801-008

Lab Project Number: 2986

Sample Location: MW-15 *

Lab ID Number: 39620

Sample Number: 113189-92

Date Received: 04/16/90

Date Sampled: 04/13/90

Date Analyzed: 04/21/90

COMPOUND	ANALYTE CONCENTRATION ug/L (ppb)	REPORTING LIMIT ug/L (ppb)
Benzene	BRL	2.
Toluene	BRL	2.
Chlorobenzene	BRL	2.
Ethyl Benzene	BRL	2.
p-Xylene	BRL	2.
m-Xylene	4.	2.
o-Xylene	BRL	2.
o-Dichlorobenzene	BRL	2.
m-Dichlorobenzene	BRL	2.
p-Dichlorobenzene	BRL	2.
Surrogate recovery (percent): a,a,a-Trifluorotoluene	105	

Comments: 1:5 dilution used in analysis.

* Revised 05/11/90.

Approved By: A. Putnam Date: 04/25/90

McLaren

VOLATILE AROMATIC COMPOUNDS
EPA METHOD 602

Project: Market Place 59801-008

Lab Project Number: 2986

Sample Location: MW-16

Lab ID Number: 39623

Sample Number: 113197-200

Date Received: 04/16/90

Date Sampled: 04/13/90

Date Analyzed: 04/23/90

COMPOUND	ANALYTE CONCENTRATION ug/L (ppb)	REPORTING LIMIT ug/L (ppb)
Benzene	BRL	20.
Toluene	BRL	20.
Chlorobenzene	BRL	20.
Ethyl Benzene	BRL	20.
p-Xylene	BRL	20.
m-Xylene	BRL	20.
o-Xylene	BRL	20.
o-Dichlorobenzene	BRL	20.
m-Dichlorobenzene	BRL	20.
p-Dichlorobenzene	BRL	20.
Surrogate recovery (percent): a,a,a-Trifluorotoluene	102	

Comments: 1:50 dilution required due to matrix interference throughout the chromatogram.

Approved By: A. Putnam Date: 04/24/90

McLaren

VOLATILE AROMATIC COMPOUNDS
EPA METHOD 602

Project: Market Place 59801-008

Lab Project Number: 2986

Sample Location: MW-17

Lab ID Number: 39626

Sample Number: 130143-46

Date Received: 04/16/90

Date Sampled: 04/13/90

Date Analyzed: 04/21/90

COMPOUND	ANALYTE CONCENTRATION ug/L (ppb)	REPORTING LIMIT ug/L (ppb)
Benzene	BRL	0.5
Toluene	BRL	0.5
Chlorobenzene	BRL	0.5
Ethyl Benzene	BRL	0.5
p-Xylene	BRL	0.5
m-Xylene	BRL	0.5
o-Xylene	BRL	0.5
o-Dichlorobenzene	BRL	0.5
m-Dichlorobenzene	BRL	0.5
p-Dichlorobenzene	BRL	0.5
Surrogate recovery (percent): a,a,a-Trifluorotoluene	108	

Comments:

Approved By: A. Putnam Date: 04/24/90

McLaren

VOLATILE AROMATIC COMPOUNDS
EPA METHOD 602

Project: Market Place 59801-008

Lab Project Number: 2986

Sample Location: MW-18

Lab ID Number: 39629

Sample Number: 135914-17

Date Received: 04/16/90

Date Sampled: 04/13/90

Date Analyzed: 04/21/90

COMPOUND	ANALYTE CONCENTRATION ug/L (ppb)	REPORTING LIMIT ug/L (ppb)
Benzene	BRL	2.
Toluene	BRL	2.
Chlorobenzene	BRL	2.
Ethyl Benzene	BRL	2.
p-Xylene	BRL	2.
m-Xylene	4.	2.
o-Xylene	BRL	2.
o-Dichlorobenzene	BRL	2.
m-Dichlorobenzene	BRL	2.
p-Dichlorobenzene	BRL	2.
Surrogate recovery (percent): a,a,a-Trifluorotoluene	105	

Comments: 1:5 dilution required due to matrix interference throughout the chromatogram.

Approved By: A. Putnam Date: 04/23/90

McLaren

METAL ANALYSIS

Project: Market Place 59801-008

Lab Project Number: 2986

Sample Location: MW-15

Lab ID Number: 39622

Sample Number: 113196

Date Received: 04/16/90

Date Sampled: 04/13/90

Date Analyzed: 04/30/90

	METAL (SYMBOL)/EPA METHOD	CONCENTRATION ug/ml (ppm)	REPORTING LIMIT ug/ml (ppm)
	Aluminum (Al)/202.1	Not Requested	0.2
	Antimony (Sb)/204.1	Not Requested	0.5
*	Arsenic (As)/206.3	0.028	0.005
	Barium (Ba)/208.1	Not Requested	1.
	Beryllium (Be)/210.1	Not Requested	0.05
	Cadmium (Cd)/213.1	Not Requested	0.01
	Calcium (Ca)/215.1	Not Requested	0.1
	Chromium (Cr)/218.1	Not Requested	0.02
	Cobalt (Co)/219.1	Not Requested	0.08
	Copper (Cu)/220.1	BRL	0.09
	Hex. Chromium (CrVI)/218.5	Not Requested	0.05
	Iron (Fe)/236.1	Not Requested	0.04
	Lead (Pb)/239.1	BRL	0.1
	Magnesium (Mg)/242.1	Not Requested	0.07
	Manganese (Mn)/243.1	Not Requested	0.05
**	Mercury (Hg)/245.1	Not Requested	0.002
	Molybdenum (Mo)/246.1	Not Requested	1.
	Nickel (Ni)/249.1	Not Requested	0.2
	Potassium (K)/255.1	Not Requested	0.2
*	Selenium (Se)/270.3	Not Requested	0.001
	Silver (Ag)/272.1	Not Requested	0.05
	Sodium (Na)/273.1	Not Requested	0.1
	Thallium (Tl)/279.1	Not Requested	1.
	Titanium (Ti)/283.1	Not Requested	0.6
	Vanadium (V)/286.1	Not Requested	0.5
	Zinc (Zn)/289.1	BRL	0.08

* Hydride generation method
** Cold vapor method

Comments:

Approved By: F. Rameezanzadeh Date: 05/02/90

McLaren

METAL ANALYSIS

Project: Market Place 59801-008

Lab Project Number: 2986

Sample Location: MW-16

Lab ID Number: 39625

Sample Number: 130142

Date Received: 04/16/90

Date Sampled: 04/13/90

Date Analyzed: 04/30/90

	METAL (SYMBOL)/EPA METHOD	CONCENTRATION ug/ml (ppm)	REPORTING LIMIT ug/ml (ppm)
	Aluminum (Al)/202.1	Not Requested	0.2
	Antimony (Sb)/204.1	Not Requested	0.5
*	Arsenic (As)/206.3	0.013	0.005
	Barium (Ba)/208.1	Not Requested	1.
	Beryllium (Be)/210.1	Not Requested	0.05
	Cadmium (Cd)/213.1	Not Requested	0.01
	Calcium (Ca)/215.1	Not Requested	0.1
	Chromium (Cr)/218.1	Not Requested	0.02
	Cobalt (Co)/219.1	Not Requested	0.08
	Copper (Cu)/220.1	BRL	0.09
	Hex. Chromium (CrVI)/218.5	Not Requested	0.05
	Iron (Fe)/236.1	Not Requested	0.04
	Lead (Pb)/239.1	BRL	0.1
	Magnesium (Mg)/242.1	Not Requested	0.07
	Manganese (Mn)/243.1	Not Requested	0.05
**	Mercury (Hg)/245.1	Not Requested	0.002
	Molybdenum (Mo)/246.1	Not Requested	1.
	Nickel (Ni)/249.1	Not Requested	0.2
	Potassium (K)/255.1	Not Requested	0.2
*	Selenium (Se)/270.3	Not Requested	0.001
	Silver (Ag)/272.1	Not Requested	0.05
	Sodium (Na)/273.1	Not Requested	0.1
	Thallium (Tl)/279.1	Not Requested	1.
	Titanium (Ti)/283.1	Not Requested	0.6
	Vanadium (V)/286.1	Not Requested	0.5
	Zinc (Zn)/289.1	BRL	0.08

* Hydride generation method
** Cold vapor method

Comments:

Approved By: F. Ramezanzadeh Date: 05/02/90

McLaren

METAL ANALYSIS

Project: Market Place 59801-008

Lab Project Number: 2986

Sample Location: MW-17

Lab ID Number: 39628

Sample Number: 130149

Date Received: 04/16/90

Date Sampled: 04/13/90

Date Analyzed: 04/30/90

	METAL (SYMBOL)/EPA METHOD	CONCENTRATION ug/ml (ppm)	REPORTING LIMIT ug/ml (ppm)
	Aluminum (Al)/202.1	Not Requested	0.2
	Antimony (Sb)/204.1	Not Requested	0.5
*	Arsenic (As)/206.3	0.009	0.005
	Barium (Ba)/208.1	Not Requested	1.
	Beryllium (Be)/210.1	Not Requested	0.05
	Cadmium (Cd)/213.1	Not Requested	0.01
	Calcium (Ca)/215.1	Not Requested	0.1
	Chromium (Cr)/218.1	Not Requested	0.02
	Cobalt (Co)/219.1	Not Requested	0.08
	Copper (Cu)/220.1	BRL	0.09
	Hex. Chromium (CrVI)/218.5	Not Requested	0.05
	Iron (Fe)/236.1	Not Requested	0.04
	Lead (Pb)/239.1	BRL	0.1
	Magnesium (Mg)/242.1	Not Requested	0.07
	Manganese (Mn)/243.1	Not Requested	0.05
**	Mercury (Hg)/245.1	Not Requested	0.002
	Molybdenum (Mo)/246.1	Not Requested	1.
	Nickel (Ni)/249.1	Not Requested	0.2
	Potassium (K)/255.1	Not Requested	0.2
*	Selenium (Se)/270.3	Not Requested	0.001
	Silver (Ag)/272.1	Not Requested	0.05
	Sodium (Na)/273.1	Not Requested	0.1
	Thallium (Tl)/279.1	Not Requested	1.
	Titanium (Ti)/283.1	Not Requested	0.6
	Vanadium (V)/286.1	Not Requested	0.5
	Zinc (Zn)/289.1	BRL	0.08

* Hydride generation method
** Cold vapor method

Comments:

Approved By: F. Ramezanzadeh Date: 05/02/90

F. Ramezanzadeh

McLaren

METAL ANALYSIS

Project: Market Place 59801-008

Lab Project Number: 2986

Sample Location: MW-18

Lab ID Number: 39631

Sample Number: 135920

Date Received: 04/16/90

Date Sampled: 04/13/90

Date Analyzed: 04/30/90

	METAL (SYMBOL)/EPA METHOD	CONCENTRATION ug/ml (ppm)	REPORTING LIMIT ug/ml (ppm)
	Aluminum (Al)/202.1	Not Requested	0.2
	Antimony (Sb)/204.1	Not Requested	0.5
*	Arsenic (As)/206.3	0.011	0.005
	Barium (Ba)/208.1	Not Requested	1.
	Beryllium (Be)/210.1	Not Requested	0.05
	Cadmium (Cd)/213.1	Not Requested	0.01
	Calcium (Ca)/215.1	Not Requested	0.1
	Chromium (Cr)/218.1	Not Requested	0.02
	Cobalt (Co)/219.1	Not Requested	0.08
	Copper (Cu)/220.1	BRL	0.09
	Hex. Chromium (CrVI)/218.5	Not Requested	0.05
	Iron (Fe)/236.1	Not Requested	0.04
	Lead (Pb)/239.1	BRL	0.1
	Magnesium (Mg)/242.1	Not Requested	0.07
	Manganese (Mn)/243.1	Not Requested	0.05
**	Mercury (Hg)/245.1	Not Requested	0.002
	Molybdenum (Mo)/246.1	Not Requested	1.
	Nickel (Ni)/249.1	Not Requested	0.2
	Potassium (K)/255.1	Not Requested	0.2
*	Selenium (Se)/270.3	Not Requested	0.001
	Silver (Ag)/272.1	Not Requested	0.05
	Sodium (Na)/273.1	Not Requested	0.1
	Thallium (Tl)/279.1	Not Requested	1.
	Titanium (Ti)/283.1	Not Requested	0.6
	Vanadium (V)/286.1	Not Requested	0.5
	Zinc (Zn)/289.1	BRL	0.08

* Hydride generation method
** Cold vapor method

Comments:

Approved By: F. Ramezanzadeh Date: 05/02/90

McLaren

TOTAL PETROLEUM HYDROCARBONS
DIESEL (by LUFT Method)

Project: Market Place 59801-008

Lab Project Number: 2986

Sample Location: MW-15

Lab ID Number: 39621

Sample Number: 113193-95

Date Received: 04/16/90

Date Sampled: 04/13/90

Date Analyzed: 04/25/90

PETROLEUM HYDROCARBONS	CONCENTRATION ug/ml (ppm)	REPORTING LIMIT ug/ml (ppm)
Diesel Range	1.5	0.5

Comments:

Approved By: E. Danek Date: 04/25/90

E. Danek

McLaren

TOTAL PETROLEUM HYDROCARBONS
DIESEL (by LUFT Method)

Project:	Market Place 59801-008	Lab Project Number:	2986
Sample Location:	MW-16	Lab ID Number:	39624
Sample Number:	130140-41	Date Received:	04/16/90
Date Sampled:	04/13/90	Date Analyzed:	04/25/90

PETROLEUM HYDROCARBONS	CONCENTRATION ug/ml (ppm)	REPORTING LIMIT ug/ml (ppm)
Diesel Range	9.0	5.0

Comments: 1:10 dilution used in analysis.

Approved By: E. Danek Date: 04/25/90
E. Danek

McLaren

TOTAL PETROLEUM HYDROCARBONS
DIESEL (by LUFT Method)

Project:	Market Place 59801-008	Lab Project Number:	2986
Sample Location:	MW-17	Lab ID Number:	39627
Sample Number:	130147-48	Date Received:	04/16/90
Date Sampled:	04/13/90	Date Analyzed:	04/25/90

PETROLEUM HYDROCARBONS	CONCENTRATION ug/ml (ppm)	REPORTING LIMIT ug/ml (ppm)
Diesel Range	1.6	0.5

Comments:

Approved By: E. Danek Date: 04/25/90

E. Danek

McLaren

TOTAL PETROLEUM HYDROCARBONS
DIESEL (by LUFT Method)

Project: Market Place 59801-008

Lab Project Number: 2986

Sample Location: MW-18

Lab ID Number: 39630

Sample Number: 135918-19

Date Received: 04/16/90

Date Sampled: 04/13/90

Date Analyzed: 04/25/90

PETROLEUM HYDROCARBONS	CONCENTRATION ug/ml (ppm)	REPORTING LIMIT ug/ml (ppm)
Diesel Range	5.1	0.5

Comments:

Approved By: E. Danek Date: 04/25/90

E. Danek

McLaren

McLaren

Date: May 1, 1990
LP #: 2994

Julie Menack
McLaren
980 Atlantic Avenue, Suite 100
Alameda, CA 94501

Dear Ms. Menack:

Enclosed are the laboratory results for the three sample(s) submitted by you to the McLaren Analytical Laboratory on April 17, 1990, for the project *Market Place*.

The analyses you requested are:

602 (3 - Water)
TPH-D (2 - 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

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,

Jill P. Slater, 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

22050

CHAIN OF CUSTODY RECORD

FOR LABORATORY USE ONLY
Laboratory Project No.: 2994
Storage Refrigerator ID: 4-37
Storage Freezer ID:
Secured: Yes ✓ No

Project Name: Marketplace Project #: 59801-008 Sampler: Lana Brown (Printed Name) Lana Brown (Signature)

Relinquished by: (Signature and Printed Name) Lana Brown Lana Brown	Received by: (Signature and Printed Name) Fed-X	Date: 4/16/90	Time: 16:00
Relinquished by: (Signature and Printed Name)	Received by: (Signature and Printed Name) Brian J O'Connor	Date: 4/17/90	Time: 10:00 AM
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

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)	TAT	Container(s) #	Container(s) Type	FOR LABORATORY USE ONLY Lab ID
1 135921	4/16	8	Trip Blanks	X																	4	1	✓	39674
2 135922	↓	↓	↓	X																	↓	↓	↓	
3 135923				X																				
4 135924		↓		X																				
5 135925		11:34	MW19	X																				39675
6 135926		↓	↓	X																				
7 135927				X																				
8 135928				X																				
9 135929											X	X											A	39676
10 135930	↓	↓	↓								X	X									↓	↓	A	

Special Instructions/Comments:
TPH/D - Luft method

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: Good

SEND DOCUMENTATION AND RESULTS TO (Check one):
☒ Project Manager/Office: Julie Menack/Alta.
☐ Client Name:
Company:
Address:
Phone: ( ) Fax:

McLaren

CHAIN OF CUSTODY RECORD

FOR LABORATORY USE ONLY
Laboratory Project No.: 2994
Storage Refrigerator ID: 4-3, 1
Storage Freezer ID:
Secured: Yes ✓ No

Project Name: Marketplace Project #: 9801-008 Sampler: Lana Brown (Printed Name) Lana Brown (Signature)

Relinquished by: (Signature and Printed Name) Lana Brown Lana Brown	Received by: (Signature and Printed Name) Fed-X	Date: 4/16/90	Time: 1600
Relinquished by: (Signature and Printed Name)	Received by: (Signature and Printed Name) Brian J Dannor	Date: 4-17-90	Time: 10:00AM
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

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)	TAT	Container(s) #	Container(s) Type	FOR LABORATORY USE ONLY Lab ID
135931	4/16	11:34	MW19								X										4	1	A	
135932	"	14:30	MW20		X																		V	39677
135933					X																			
135934					X																			
135935					X																			
135936											X												A	39678
135937	↓	↓	↓								X											↓	↓	A

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: PHD - Luft Method

Sample Archive/Disposal:
☐ Laboratory Standard
☐ Other

SEND DOCUMENTATION AND RESULTS TO (Check one):
☒ Project Manager/Office: Julie Menack / Ala.
☐ Client Name:
Company:
Address:
Phone: ( ) Fax:

FOR LABORATORY USE ONLY. Sample Condition Upon Receipt: Good

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

Client: Julie Menack
McLaren
Alameda, CA 94501

L.P. #:	2994	Project Name:	Market Place
Date Rec'd:	4/17/90	Project #:	59801-008
Date Due:	5/1/90	Contact:	Julie Menack
Section:	GC	Phone:	415-521-5200

Samples received on 4/17/90 @ 10:00 a.m. under Chain(s) of Custody 220507-08. Chain(s) of Custody agree(s) with sample container(s). Samples received included:

- 1 sample(s) in voa vials for 602 analysis(es); and,

- 2 sample(s) in voa vials for 602 analysis(es) and in 1 liter amber bottles for TPH/D analysis(es).

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

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.

METHOD BLANK

Method: 602
Units: ug/L (ppb)

COMPOUNDS	REPORTING LIMITS	RESULTS OF THE MB
Benzene	0.5	BRL
Toluene	0.5	BRL
Chlorobenzene	0.5	BRL
Ethyl Benzene	0.5	BRL
p-Xylene	0.5	BRL
m-Xylene	0.5	BRL
o-Xylene	0.5	BRL
o-Dichlorobenzene	0.5	BRL
m-Dichlorobenzene	0.5	BRL
p-Dichlorobenzene	0.5	BRL

LABORATORY CONTROL SPIKE

Method: 602
Units: ug/L (ppb)

COMPOUNDS	CONCENTRATION SPIKED	CONCENTRATION MEASURED	ACCURACY % RECOVERY	PRECISION RPD
Chlorobenzene	10.	10.	100	10
Benzene	10.	11.	110	0
Ethyl Benzene	10.	11.	110	0

QUALITY CONTROL REPORT

METHOD BLANK

Method: TPH-D by LUFT
Units: ug/ml (ppm)

COMPOUNDS	REPORTING LIMIT	RESULTS OF THE MB
Total Petroleum Hydrocarbons Diesel	0.5	BRL

LABORATORY CONTROL SPIKE

Method: TPH-D by LUFT
Units: ug/ml (ppm)

COMPOUNDS	CONCENTRATION SPIKED	CONCENTRATION MEASURED	ACCURACY % RECOVERY	PRECISION RPD
Diesel Range	2.5	2.4	96	0

COMMENTS

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

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.

VOLATILE AROMATIC COMPOUNDS
EPA METHOD 602

Project: Market Place 59801-008

Lab Project Number: 2994

Sample Location: Trip Blanks

Lab ID Number: 39674

Sample Number: 135921-24

Date Received: 04/17/90

Date Sampled: 04/16/90

Date Analyzed: 04/19/90

COMPOUND	ANALYTE CONCENTRATION ug/L (ppb)	REPORTING LIMIT ug/L (ppb)
Benzene	BRL	0.5
Toluene	BRL	0.5
Chlorobenzene	BRL	0.5
Ethyl Benzene	BRL	0.5
p-Xylene	BRL	0.5
m-Xylene	BRL	0.5
o-Xylene	BRL	0.5
o-Dichlorobenzene	BRL	0.5
m-Dichlorobenzene	BRL	0.5
p-Dichlorobenzene	BRL	0.5
Surrogate recovery (percent): a,a,a-Trifluorotoluene	106	

Comments:

Approved By: A. Putnam Date: 04/23/90

McLaren

VOLATILE AROMATIC COMPOUNDS
EPA METHOD 602

Project: Market Place 59801-008

Lab Project Number: 2994

Sample Location: MW-19

Lab ID Number: 39675

Sample Number: 135925-28

Date Received: 04/17/90

Date Sampled: 04/16/90

Date Analyzed: 04/19/90

COMPOUND	ANALYTE CONCENTRATION ug/L (ppb)	REPORTING LIMIT ug/L (ppb)
Benzene	BRL	0.5
Toluene	BRL	0.5
Chlorobenzene	BRL	0.5
Ethyl Benzene	BRL	0.5
p-Xylene	1.0	0.5
m-Xylene	3.5	0.5
o-Xylene	3.0	0.5
o-Dichlorobenzene	BRL	0.5
m-Dichlorobenzene	BRL	0.5
p-Dichlorobenzene	BRL	0.5
Surrogate recovery (percent): a,a,a-Trifluorotoluene	113	

Comments:

Approved By: A. Putnam Date: 04/23/90

McLaren

VOLATILE AROMATIC COMPOUNDS
EPA METHOD 602

Project: Market Place 59801-008

Lab Project Number: 2994

Sample Location: MW-20

Lab ID Number: 39677

Sample Number: 135932-35

Date Received: 04/17/90

Date Sampled: 04/16/90

Date Analyzed: 04/19/90

COMPOUND	ANALYTE CONCENTRATION ug/L (ppb)	REPORTING LIMIT ug/L (ppb)
Benzene	BRL	0.5
Toluene	BRL	0.5
Chlorobenzene	BRL	0.5
Ethyl Benzene	BRL	0.5
p-Xylene	BRL	0.5
m-Xylene	BRL	0.5
o-Xylene	BRL	0.5
o-Dichlorobenzene	BRL	0.5
m-Dichlorobenzene	BRL	0.5
p-Dichlorobenzene	BRL	0.5
Surrogate recovery (percent): a,a,a-Trifluorotoluene	100	

Comments:

Approved By: A. Putnam Date: 04/25/90

McLaren

TOTAL PETROLEUM HYDROCARBONS
DIESEL (by LUFT Method)

Project: Market Place 59801-008

Lab Project Number: 2994

Sample Location: MW-19

Lab ID Number: 39676

Sample Number: 135929-31

Date Received: 04/17/90

Date Sampled: 04/16/90

Date Analyzed: 04/27/90

PETROLEUM HYDROCARBONS	CONCENTRATION ug/ml (ppm)	REPORTING LIMIT ug/ml (ppm)
Diesel Range	BRL	0.5

Comments:

Approved By: E. Danek Date: 04/26/90

E. Danek

McLaren

TOTAL PETROLEUM HYDROCARBONS
DIESEL (by LUFT Method)

Project: Market Place 59801-008

Lab Project Number: 2994

Sample Location: MW-20

Lab ID Number: 39678

Sample Number: 135936-37

Date Received: 04/17/90

Date Sampled: 04/16/90

Date Analyzed: 04/27/90

PETROLEUM HYDROCARBONS	CONCENTRATION ug/ml (ppm)	REPORTING LIMIT ug/ml (ppm)
Diesel Range	BRL	0.5

Comments:

Approved By: E. Danek Date: 04/29/90

E. Danek

McLaren

McLaren

Date: May 3, 1990
LP #: 3005

Julie Menack
McLaren
1135 Atlantic Avenue
Alameda, CA 94501

Dear Ms. Menack:

Enclosed are the laboratory results for the six sample(s) submitted by you to the McLaren Analytical Laboratory on April 19, 1990, for the project *Market Place*.

The analyses you requested are:

602 (6 - Water)
Metals (As, Cu, Pb, Zn) (1 - Water)
TPH-D (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

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 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.: 3005
Storage Refrigerator ID: 4-3, E-1
Storage Freezer ID:
Secured: Yes X No

Project Name: Marketplace Project #: 59801-008 Sampler: Lana Brown (Printed Name) Lana Brown (Signature)

Relinquished by: (Signature and Printed Name) Lana Brown Lana Brown
Received by: (Signature and Printed Name) Fed-X
Date: 4/18/90 Time: 1700

Relinquished by: (Signature and Printed Name)
Received by: (Signature and Printed Name) Falgun Thakore
Date: 4/19/90 Time: 2:40 Fed Ex

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

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)	TAT	Container(s) #	Container(s) Type	FOR LABORATORY USE ONLY Lab ID
1	135138	4/18	8	Trip Blanks	X																4	1	V	39763
2	135139				X																			
3	135140				X																			
4	135141				X																			
5	135942		9:30	field Blanks	X																			39764
6	135143				X																			
7	135144				X																			
8	135145				X																			
9	135946		9:55	MW8	X																			39765
10	135947				X																			

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:

SEND DOCUMENTATION AND RESULTS TO (Check one):
☒ Project Manager/Office: Julie Menack / Ala.
☐ Client Name:
Company:
Address:
Phone: ( ) Fax:

McLaren

CHAIN OF CUSTODY RECORD

FOR LABORATORY USE ONLY
Laboratory Project No.: 3005
Storage Refrigerator ID: 4-3, K-1
Storage Freezer ID:
Secured: Yes X No

Project Name: Marketplace Project #: 59801-008 Sampler: Lana Brown (Printed Name) LanaBrown (Signature)

Relinquished by: (Signature and Printed Name) LanaBrown LanaBrown	Received by: (Signature and Printed Name) Fed-X	Date: 4/18/90	Time: 1700
Relinquished by: (Signature and Printed Name)	Received by: (Signature and Printed Name)	Date: 4/19/90	Time: 2:40 Fed Ex
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

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)	Pb, Zn, Cu, AS	TAT	Container(s) #	Container(s) Type	FOR LABORATORY USE ONLY Lab ID
135948	4/18	9:55	MW8	X																		4	1	Y	
135949				X																				V	
144701											X													A	39766
144702											X													A	
144703											X													A	
135950		↓	↓																X					O	39767
144704		11:09	MW21	X																				V	39768
144705				X																					
144706				X																					
144707	↓	↓	↓	X																		↓	↓		

Special Instructions/Comments: Metals - Filtered and preserved w/ HNO3

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 1L poly

SEND DOCUMENTATION AND RESULTS TO (Check one):
☒ Project Manager/Office: Julie Menack / Ala.
☐ Client Name:
Company:
Address:
Phone: ___(___)___ Fax:

FOR LABORATORY USE ONLY. Sample Condition Upon Receipt:

McLaren

CHAIN OF CUSTODY RECORD

FOR LABORATORY USE ONLY
Laboratory Project No.: 3005
Storage Refrigerator ID: 4-3, R-1
Storage Freezer ID:
Secured. Yes X No

Project Name: Marketplace Project #: 59801-008 Sampler: Lana Brown (Printed Name) Lana Brown (Signature)

Relinquished by: (Signature and Printed Name)	Received by: (Signature and Printed Name)	Date:	Time:
Lana Brown Lana Brown	Fed-X	4/18/90	1700
Relinquished by:	Received by: Valerie Vikers	4/19/90	2:40 Fed Ex
Relinquished by:	Received by:		
Relinquished by:	Received by:		

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

a) Identify specific metals requested under Special Instructions

#	Sample ID Number	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)	TAT	Container(s) #	Container(s) Type	FOR LABORATORY USE ONLY Lab ID
1	144708	4/18	11:09	mw21									X									4	1	A	39773
2	144709	↓	↓	↓									X									↓	↓	A	
3	144710	↓	12:18	mw23		X																↓	↓	V	39769
4	144711	↓	↓	↓		X																↓	↓	↓	
5	144712	↓	↓	↓		X																↓	↓	↓	
6	144713	↓	↓	↓		X																↓	↓	↓	
7	144714	↓	↓	↓									X									↓	↓	A	39770
8	144715	↓	↓	↓									X									↓	↓	A	
9	144716	↓	13:42	mw22		X																↓	↓	V	39771
10	144717	↓	↓	↓		X																↓	↓	V	

Special Instructions/Comments:
TPH/D - LUFT Method

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 marked with an asterisk had air bubbles v.v.
(+) This sample arrived with cracked cap v.v.

SEND DOCUMENTATION AND RESULTS TO (Check one):
☒ Project Manager/Office: Julie Menack / Nla.
☐ Client Name:
Company:
Address:
Phone: ( ) Fax:

McLaren

CHAIN OF CUSTODY RECORD

FOR LABORATORY USE ONLY
Laboratory Project No.: 3005
Storage Refrigerator ID: 4-3, R-1
Storage Freezer ID:
Secured: Yes X No

Project Name: Marketplace Project #: 59801-008 Sampler: Lana Brown (Printed Name) Lana Brown (Signature)

Relinquished by: (Signature and Printed Name) Lana Brown, Lana Brown
Received by: (Signature and Printed Name) Fed-X
Date: 4/18/90 Time: 1700

Relinquished by: (Signature and Printed Name)
Received by: (Signature and Printed Name) Falcon Yukon
Date: 4/19/90 Time: 2:40 FedEx

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

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)	TAT	Container(s) #	Container(s) Type	FOR LABORATORY USE ONLY: Lab ID
144718	4/18	13:42	MW22	X																	4	1	V	3 ~~9~~ V. V.
144719	↓	↓	↓	X																	↓	↓	V	
144720											X												A	3 9 7 7 2 L.
144721											X										↓	↓	A	

Special Instructions/Comments:
TPH/D - Luft Method

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 Merrick / Alta.
☐ Client Name:
Company:
Address:
Phone: ( ) Fax:

FOR LABORATORY USE ONLY. Sample Condition Upon Receipt:

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

Client: Julie Menack
McLaren
Alameda, CA 94501

L.P. #:	3005	Project Name:	Market Place
Date Rec'd:	4/19/90	Project #:	59801-008
Date Due:	5/3/90	Contact:	Julie Menack
Section:	GC	Phone:	415-521-5200

Samples received on 4/19/90 @ 2:40 p.m. under Chain(s) of Custody 220509-12. Chain(s) of Custody agree(s) with sample container(s). Samples received included:

- 2 sample(s) in voa vials for 602 analysis(es);

- 4 sample(s) in voa vials for 602 analysis(es) and in 1 liter amber bottles for TPH/D analysis(es); and,

-1 sample(s) in a 1 liter polyethylene bottle for Pb, Zn, Cu, and As analysis(es).

Correction(s) made and/or Problem(s): Samples marked with an asterisk had air bubbles. Sample 144715 arrived with cracked 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 BLANK

Method: 602
Units: ug/L (ppb)

COMPOUNDS	REPORTING LIMITS	RESULTS OF THE MB
Benzene	0.5	BRL
Toluene	0.5	BRL
Chlorobenzene	0.5	BRL
Ethyl Benzene	0.5	BRL
p-Xylene	0.5	BRL
m-Xylene	0.5	BRL
o-Xylene	0.5	BRL
o-Dichlorobenzene	0.5	BRL
m-Dichlorobenzene	0.5	BRL
p-Dichlorobenzene	0.5	BRL

LABORATORY CONTROL SPIKE

Method: 602
Units: ug/L (ppb)

COMPOUNDS	CONCENTRATION SPIKED	CONCENTRATION MEASURED	ACCURACY % RECOVERY	PRECISION RPD
Chlorobenzene	10.	10.	100	0
Benzene	10.	11.	110	0
Ethyl Benzene	10.	10.	100	10

QUALITY CONTROL REPORT

METHOD BLANK

Method: Metals (200 Series)
Units: ug/ml (ppm)

COMPOUNDS	REPORTING LIMITS	RESULTS OF THE MB
Aluminum (Al)/202.1	0.2	Not Requested
Antimony (Sb)/204.1	0.5	Not Requested
* Arsenic (As)/206.3	0.005	BRL
Barium (Ba)/208.1	1.	Not Requested
Beryllium (Be)/210.1	0.05	Not Requested
Cadmium (Cd)/213.1	0.01	Not Requested
Calcium (Ca)/215.1	0.1	Not Requested
Chromium (Cr)/218.1	0.02	Not Requested
Cobalt (Co)/219.1	0.08	Not Requested
Copper (Cu)/220.1	0.09	BRL
Hex. Chromium (CrVI)/218.5	0.05	Not Requested
Iron (Fe)/236.1	0.04	Not Requested
Lead (Pb)/239.1	0.1	BRL
Magnesium (Mg)/242.1	0.07	Not Requested
Manganese (Mn)/243.1	0.05	Not Requested
** Mercury (Hg)/245.1	0.002	Not Requested
Molybdenum (Mo)/246.1	1.	Not Requested
Nickel (Ni)/249.1	0.2	Not Requested
Potassium (K)/255.1	0.2	Not Requested
* Selenium (Se)/270.3	0.001	Not Requested
Silver (Ag)/272.1	0.05	Not Requested
Sodium (Na)/273.1	0.1	Not Requested
Thallium (Tl)/279.1	1.	Not Requested
Titanium (Ti)/283.1	0.6	Not Requested
Vanadium (V)/286.1	0.5	Not Requested
Zinc (Zn)/289.1	0.08	BRL

* Hydride generation method
** Cold vapor method

LABORATORY CONTROL SPIKE

Method: Metals (200 Series)
Units: ug/ml

COMPOUNDS	CONCENTRATION SPIKED	CONCENTRATION MEASURED	ACCURACY % RECOVERY	PRECISION RPD
* Arsenic (As)/206.3	0.20	0.20	100	0
Copper (Cu)/220.1	1.0	0.98	100	2
Lead (Pb)/239.1	1.0	1.0	100	0
Zinc (Zn)/289.1	1.0	0.98	100	2

* Hydride generation method
** Cold vapor method

QUALITY CONTROL REPORT

METHOD BLANK

Method: TPH-D by LUFT
Units: ug/ml (ppm)

COMPOUNDS	REPORTING LIMIT	RESULTS OF THE MB
Total Petroleum Hydrocarbons Diesel	0.5	BRL

LABORATORY CONTROL SPIKE

Method: TPH-D by LUFT
Units: ug/ml (ppm)

COMPOUNDS	CONCENTRATION SPIKED	CONCENTRATION MEASURED	ACCURACY % RECOVERY	PRECISION RPD
Diesel Range	2.5	2.2	87	0

COMMENTS

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

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.

VOLATILE AROMATIC COMPOUNDS
EPA METHOD 602

Project: Market Place 59801-008

Lab Project Number: 3005

Sample Location: Trip Blanks

Lab ID Number: 39763

Sample Number: 135938-41

Date Received: 04/19/90

Date Sampled: 04/18/90

Date Analyzed: 04/24/90

COMPOUND	ANALYTE CONCENTRATION ug/L (ppb)	REPORTING LIMIT ug/L (ppb)
Benzene	BRL	0.5
Toluene	BRL	0.5
Chlorobenzene	BRL	0.5
Ethyl Benzene	BRL	0.5
p-Xylene	BRL	0.5
m-Xylene	BRL	0.5
o-Xylene	BRL	0.5
o-Dichlorobenzene	BRL	0.5
m-Dichlorobenzene	BRL	0.5
p-Dichlorobenzene	BRL	0.5
Surrogate recovery (percent): a,a,a-Trifluorotoluene	112	

Comments:

Approved By: A. Putnam Date: 5/4/90

McLaren

VOLATILE AROMATIC COMPOUNDS
EPA METHOD 602

Project: Market Place 59801-008

Lab Project Number: 3005

Sample Location: Field Blanks

Lab ID Number: 39764

Sample Number: 135942-45

Date Received: 04/19/90

Date Sampled: 04/18/90

Date Analyzed: 04/24/90

COMPOUND	ANALYTE CONCENTRATION ug/L (ppb)	REPORTING LIMIT ug/L (ppb)
Benzene	BRL	0.5
Toluene	BRL	0.5
Chlorobenzene	BRL	0.5
Ethyl Benzene	BRL	0.5
p-Xylene	BRL	0.5
m-Xylene	BRL	0.5
o-Xylene	BRL	0.5
o-Dichlorobenzene	BRL	0.5
m-Dichlorobenzene	BRL	0.5
p-Dichlorobenzene	BRL	0.5
Surrogate recovery (percent): a,a,a-Trifluorotoluene	94	

Comments:

Approved By: A. Putnam Date: 5/4/90

McLaren

VOLATILE AROMATIC COMPOUNDS
EPA METHOD 602

Project: Market Place 59801-008

Lab Project Number: 3005

Sample Location: MW-8

Lab ID Number: 39765

Sample Number: 135946-49

Date Received: 04/19/90

Date Sampled: 04/18/90

Date Analyzed: 04/24/90

COMPOUND	ANALYTE CONCENTRATION ug/L (ppb)	REPORTING LIMIT ug/L (ppb)
Benzene	BRL	5.
Toluene	BRL	5.
Chlorobenzene	BRL	5.
Ethyl Benzene	BRL	5.
p-Xylene	BRL	5.
m-Xylene	BRL	5.
o-Xylene	BRL	5.
o-Dichlorobenzene	BRL	5.
m-Dichlorobenzene	BRL	5.
p-Dichlorobenzene	BRL	5.
Surrogate recovery (percent): a,a,a-Trifluorotoluene	99	

Comments: 1:10 dilution required due to late eluting matrix interference.

Approved By: A. Putnam Date: 5/4/90

McLaren

VOLATILE AROMATIC COMPOUNDS
EPA METHOD 602

Project: Market Place 59801-008

Lab Project Number: 3005

Sample Location: MW-21

Lab ID Number: 39768

Sample Number: 144704-07

Date Received: 04/19/90

Date Sampled: 04/18/90

Date Analyzed: 04/24/90

COMPOUND	ANALYTE CONCENTRATION ug/L (ppb)	REPORTING LIMIT ug/L (ppb)
Benzene	BRL	5.
Toluene	BRL	5.
Chlorobenzene	BRL	5.
Ethyl Benzene	BRL	5.
p-Xylene	BRL	5.
m-Xylene	BRL	5.
o-Xylene	BRL	5.
o-Dichlorobenzene	BRL	5.
m-Dichlorobenzene	BRL	5.
p-Dichlorobenzene	BRL	5.
Surrogate recovery (percent): a,a,a-Trifluorotoluene	101	

Comments: 1:10 dilution required due to late eluting matrix interference.

Approved By: A. Putnam Date: 5/4/90

McLaren

VOLATILE AROMATIC COMPOUNDS
EPA METHOD 602

Project: Market Place 59801-008

Lab Project Number: 3005

Sample Location: MW-23

Lab ID Number: 39769

Sample Number: 144710-13

Date Received: 04/19/90

Date Sampled: 04/18/90

Date Analyzed: 04/24/90

COMPOUND	ANALYTE CONCENTRATION ug/L (ppb)	REPORTING LIMIT ug/L (ppb)
Benzene	BRL	5.
Toluene	BRL	5.
Chlorobenzene	BRL	5.
Ethyl Benzene	BRL	5.
p-Xylene	BRL	5.
m-Xylene	BRL	5.
o-Xylene	BRL	5.
o-Dichlorobenzene	BRL	5.
m-Dichlorobenzene	BRL	5.
p-Dichlorobenzene	BRL	5.
Surrogate recovery (percent): a,a,a-Trifluorotoluene	82	

Comments: 1:10 dilution required due to late eluting matrix interference.

Approved By: A. Putnam Date: 5/4/90

McLaren

VOLATILE AROMATIC COMPOUNDS
EPA METHOD 602

Project: Market Place 59801-008

Lab Project Number: 3005

Sample Location: MW-22

Lab ID Number: 39771

Sample Number: 144716-19

Date Received: 04/19/90

Date Sampled: 04/18/90

Date Analyzed: 04/23/90

COMPOUND	ANALYTE CONCENTRATION ug/L (ppb)	REPORTING LIMIT ug/L (ppb)
Benzene	BRL	0.5
Toluene	BRL	0.5
Chlorobenzene	BRL	0.5
Ethyl Benzene	BRL	0.5
p-Xylene	BRL	0.5
m-Xylene	BRL	0.5
o-Xylene	BRL	0.5
o-Dichlorobenzene	BRL	0.5
m-Dichlorobenzene	BRL	0.5
p-Dichlorobenzene	BRL	0.5
Surrogate recovery (percent): a,a,a-Trifluorotoluene	105	

Comments:

Approved By: A. Putnam Date: 5/4/90

McLaren

METAL ANALYSIS

Project: Market Place 59801-008

Lab Project Number: 3005

Sample Location: MW-8

Lab ID Number: 39767

Sample Number: 135950

Date Received: 04/19/90

Date Sampled: 04/18/90

Date Analyzed: 04/30/90

	METAL (SYMBOL)/EPA METHOD	CONCENTRATION ug/ml (ppm)	REPORTING LIMIT ug/ml (ppm)
	Aluminum (Al)/202.1	Not Requested	0.2
	Antimony (Sb)/204.1	Not Requested	0.5
*	Arsenic (As)/206.3	0.014	0.005
	Barium (Ba)/208.1	Not Requested	1.
	Beryllium (Be)/210.1	Not Requested	0.05
	Cadmium (Cd)/213.1	Not Requested	0.01
	Calcium (Ca)/215.1	Not Requested	0.1
	Chromium (Cr)/218.1	Not Requested	0.02
	Cobalt (Co)/219.1	Not Requested	0.08
	Copper (Cu)/220.1	BRL	0.09
	Hex. Chromium (CrVI)/218.5	Not Requested	0.05
	Iron (Fe)/236.1	Not Requested	0.04
	Lead (Pb)/239.1	BRL	0.1
	Magnesium (Mg)/242.1	Not Requested	0.07
	Manganese (Mn)/243.1	Not Requested	0.05
**	Mercury (Hg)/245.1	Not Requested	0.002
	Molybdenum (Mo)/246.1	Not Requested	1.
	Nickel (Ni)/249.1	Not Requested	0.2
	Potassium (K)/255.1	Not Requested	0.2
*	Selenium (Se)/270.3	Not Requested	0.001
	Silver (Ag)/272.1	Not Requested	0.05
	Sodium (Na)/273.1	Not Requested	0.1
	Thallium (Tl)/279.1	Not Requested	1.
	Titanium (Ti)/283.1	Not Requested	0.6
	Vanadium (V)/286.1	Not Requested	0.5
	Zinc (Zn)/289.1	BRL	0.08

* Hydride generation method
** Cold vapor method

Comments:

Approved By: F. Ramezanzadeh Date: 5-7-90

F. Ramezanzadeh

McLaren

TOTAL PETROLEUM HYDROCARBONS
DIESEL (by LUFT Method)

Project: Market Place 59801-008

Lab Project Number: 3005

Sample Location: MW-8

Lab ID Number: 39766

Sample Number: 144701-03

Date Received: 04/19/90

Date Sampled: 04/18/90

Date Analyzed: 04/27/90

PETROLEUM HYDROCARBONS	CONCENTRATION ug/ml (ppm)	REPORTING LIMIT ug/ml (ppm)
Diesel Range	5.3	0.5

Comments:

Approved By: E. Danek Date: 5-6-90

E. Danek

McLaren

TOTAL PETROLEUM HYDROCARBONS
DIESEL (by LUFT Method)

Project: Market Place 59801-008

Lab Project Number: 3005

Sample Location: MW-23

Lab ID Number: 39770

Sample Number: 144714-15

Date Received: 04/19/90

Date Sampled: 04/18/90

Date Analyzed: 04/27/90

PETROLEUM HYDROCARBONS	CONCENTRATION ug/ml (ppm)	REPORTING LIMIT ug/ml (ppm)
Diesel Range	3.6	0.5

Comments:

Approved By: E. Danek Date: 5-7-90

E. Danek

McLaren

TOTAL PETROLEUM HYDROCARBONS
DIESEL (by LUFT Method)

Project: Market Place 59801-008

Lab Project Number: 3005

Sample Location: MW-22

Lab ID Number: 39772

Sample Number: 144720-21

Date Received: 04/19/90

Date Sampled: 04/18/90

Date Analyzed: 04/27/90

PETROLEUM HYDROCARBONS	CONCENTRATION ug/ml (ppm)	REPORTING LIMIT ug/ml (ppm)
Diesel Range	BRL	0.5

Comments:

Approved By: E. Danek Date: 5-6-90

E. Danek

McLaren

TOTAL PETROLEUM HYDROCARBONS
DIESEL (by LUFT Method)

Project: Market Place 59801-008

Lab Project Number: 3005

Sample Location: MW-21

Lab ID Number: 39773

Sample Number: 144708-09

Date Received: 04/19/90

Date Sampled: 04/18/90

Date Analyzed: 04/27/90

PETROLEUM HYDROCARBONS	CONCENTRATION ug/ml (ppm)	REPORTING LIMIT ug/ml (ppm)
Diesel Range	1.7	0.5

Comments:

Approved By: E. Danek Date: 5-7-90

E. Danek

McLaren

McLaren

Date: June 15, 1990
LP #: 3160

Gary Foote
McLaren
1135 Atlantic Avenue
Alameda, CA 94501

Dear Mr. Foote:

Enclosed are the laboratory results for the two sample(s) submitted by you to the McLaren Analytical Laboratory on June 8, 1990, for the project *Marketplace*.

The analyses you requested are:

602 (2 - Water)
TPH-D by LUFT (1 - 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

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

24 HOUR TAT

CHAIN OF CUSTODY RECORD

FOR LABORATORY USE ONLY
Laboratory Project No.: 3160
Storage Refrigerator ID: F-1, 2, -78
Storage Freezer ID: _____
Secured: Yes X No ____

Project Name: Marketplace Project #: 59801-008 Sampler: Lana Brown (Printed Name) Lana Brown (Signature)

Relinquished by: (Signature and Printed Name) Lana Brown	Lana Brown	Received by: (Signature and Printed Name) Fed-X	Date: 6-7-90	Time: 1700
Relinquished by: (Signature and Printed Name) Fed Ex		Received by: (Signature and Printed Name) Falgren Tikan	Date: 6/8/90	Time: 9:15
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: 1

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) X	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) LUFT	418.1 (IR)	8015 Modified (GC)	Metals-Total a	Metals-Soluble a	Fluoride/Perchlorate	Chloride/pH	TDS/Percent Solid	Specific Conductivity (EC)	TAT	Container(s) #	Container(s) Type	FOR LABORATORY USE ONLY Lab ID
X 1 147751	6/7/90	8am	Trip Blank	X																		1	V	001
X 2 147752				X																				
X 3 147753				X																				
X 4 147754		↓	↓	X																				
5 147755		1224	MW 24	X																				002
6 147756				X																				
7 147757				X																				
8 147758				X																				
9 147759												X											A	
10 147760/61	↓	↓	↓									X										2	A/A	

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:
* BTXE by 602
TPH/D - Luft Method

Sample Archive/Disposal:
☐ Laboratory Standard
☐ Other _____

FOR LABORATORY USE ONLY. Sample Condition Upon Receipt: * vials marked with an asterisk have air bubbles

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

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

Client: Gary Foote
McLaren
Alameda, CA 94501

L.P. #:	3160	Project Name:	Market Place
Date Rec'd:	6/8/90	Project #:	59801-008
Date Due:	6/11/90	Contact:	Gary Foot
Section:	GC	Phone:	415-521-5200

Samples received on 6/8/90 @ 9:15 a.m. under Chain(s) of Custody 220744. Chain(s) of Custody agree(s) with sample container(s). Samples received included:

- 1 sample(s) in voa vials for 602 analysis(es); and,

- 1 sample(s) in voa vials for 602 analysis(es) and in 1 liter amber bottles for TPH/D analysis(es).

Correction(s) made and/or Problem(s): Samples marked with an asterisk have air bubbles.

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 BLANK

Method: 602
Units: ug/L (ppb)

COMPOUNDS	REPORTING LIMITS	RESULTS OF THE MB
Benzene	0.5	BRL
Toluene	0.5	BRL
Chlorobenzene	0.5	BRL
Ethyl Benzene	0.5	BRL
p-Xylene	0.5	BRL
m-Xylene	0.5	BRL
o-Xylene	0.5	BRL
o-Dichlorobenzene	0.5	BRL
m-Dichlorobenzene	0.5	BRL
p-Dichlorobenzene	0.5	BRL

LABORATORY CONTROL SPIKE

Method: 602
Units: ug/L (ppb)

COMPOUNDS	CONCENTRATION SPIKED	CONCENTRATION MEASURED	ACCURACY % RECOVERY	PRECISION RPD
Chlorobenzene	10.	9.	90	0
Benzene	10.	9.	90	10
Ethyl Benzene	10.	11.	110	0

QUALITY CONTROL REPORT

METHOD BLANK

Method: TPH-D by LUFT
Units: ug/ml (ppm)

COMPOUNDS	REPORTING LIMIT	RESULTS OF THE MB
Total Petroleum Hydrocarbons		
Diesel	0.5	BRL

LABORATORY CONTROL SPIKE

Method: TPH-D by LUFT
Units: ug/ml (ppm)

COMPOUNDS	CONCENTRATION SPIKED	CONCENTRATION MEASURED	ACCURACY % RECOVERY	PRECISION RPD
Diesel Range	2.5	2.0	80	11

COMMENTS

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

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.

VOLATILE AROMATIC COMPOUNDS
EPA METHOD 602

Project: Marketplace 59801-008

Lab Project Number: 3160

Sample Location: Trip Blank

Lab ID Number: 3160-001

Sample Number: 147751-54

Date Received: 06/08/90

Date Sampled: 06/07/90

Date Analyzed: 06/08/90

COMPOUND	ANALYTE CONCENTRATION ug/L (ppb)	REPORTING LIMIT ug/L (ppb)
Benzene	BRL	0.5
Toluene	BRL	0.5
Chlorobenzene	BRL	0.5
Ethyl Benzene	BRL	0.5
p-Xylene	BRL	0.5
m-Xylene	BRL	0.5
o-Xylene	BRL	0.5
o-Dichlorobenzene	BRL	0.5
m-Dichlorobenzene	BRL	0.5
p-Dichlorobenzene	BRL	0.5
Surrogate recovery (percent): a,a,a-Trifluorotoluene	120	

Comments:

Approved By: A Putt Date: 6/15/90

A. Putnam

McLaren

VOLATILE AROMATIC COMPOUNDS
EPA METHOD 602

Project: Marketplace 59801-008

Lab Project Number: 3160

Sample Location: MW24

Lab ID Number: 3160-002

Sample Number: 147755-58

Date Received: 06/08/90

Date Sampled: 06/07/90

Date Analyzed: 06/08/90

COMPOUND	ANALYTE CONCENTRATION ug/L (ppb)	REPORTING LIMIT ug/L (ppb)
Benzene	BRL	0.5
Toluene	BRL	0.5
Chlorobenzene	BRL	0.5
Ethyl Benzene	BRL	0.5
p-Xylene	BRL	0.5
m-Xylene	BRL	0.5
o-Xylene	BRL	0.5
o-Dichlorobenzene	BRL	0.5
m-Dichlorobenzene	BRL	0.5
p-Dichlorobenzene	BRL	0.5
Surrogate recovery (percent): a,a,a-Trifluorotoluene	95	

Comments:

Approved By: A. Putnam Date: 6/15/90

McLaren

TOTAL PETROLEUM HYDROCARBONS
DIESEL (by LUFT Method)

Project:	Marketplace 59801-008	Lab Project Number:	3160
Sample Location:	MW24	Lab ID Number:	3160-002
Sample Number:	147759	Date Received:	06/08/90
Date Sampled:	06/07/90	Date Analyzed:	06/14/90

PETROLEUM HYDROCARBONS	CONCENTRATION ug/ml (ppm)	REPORTING LIMIT ug/ml (ppm)
Diesel Range	BRL	0.5

Comments:

Approved By: E. Danek Date: 6-15-90

E. Danek

McLaren

SAMPLING EVENT DATA SHEET

(fill out completely)

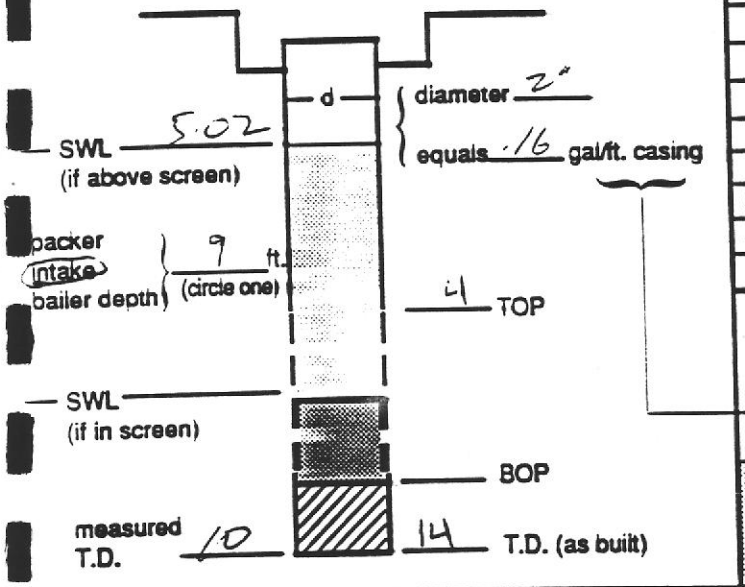
McLaren

WELL OR LOCATION: LL-1

PROJECT Mat. Pl. Bm. EVENT Sampling SAMPLER LX DATE 2/28/90

Well / Hydrologic statistics

Well type MW (MW, EW, etc.)



Action	Time	Pump rate	IWL (low yield)
Start pump / Begin	1130		
	1300		
Stop			
Sampled			
(Final IWL)			

Purge calculation

.16 gal/ft. * 5 ft. = .8 gals x 3 = 2.4 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:

Peri.

Actual gallons purged 3

Actual volumes purged 3

Well yield ⊕ (see below) MY

COC # 002384

Sample I.D.	Analysis	Lab
12285-12287	TPH/D	Mcl.

Additional comments: HNU - 5.0 ppm
Draeger - 0.0 ppm

Gallons purged *	TEMP °C / °F (circle one)	EC (µs / cm)	PH	TURBIDITY (NTU)		
1. 1	67	2310	8.8	75		
2. 2	68	2500	8.6	50		
3. 3	66	2700	7.8	115		
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)

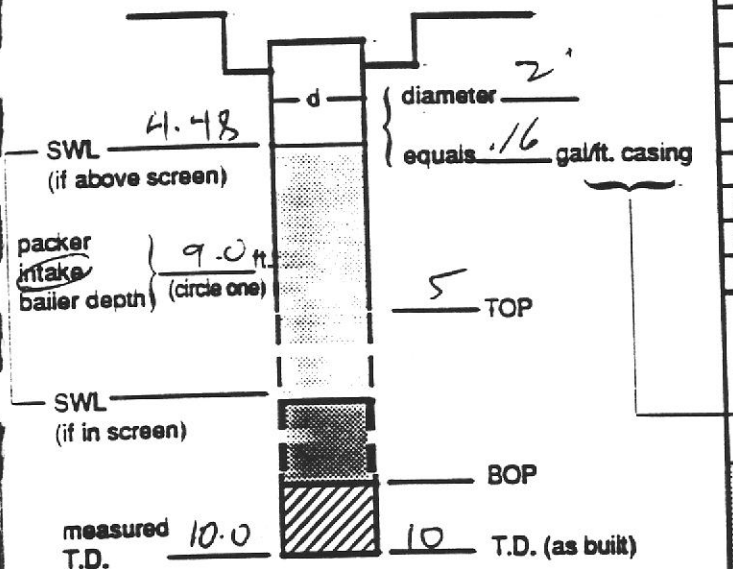
McLaren

WELL OR LOCATION MW 14

PROJECT MRT. Pl. EVENT Sample SAMPLER LX DATE 2/28/90

Well / Hydrologic statistics

Well type MW (MW, EW, etc.)



Action	Time	Pump rate	IWL (low yield)
Start pump / Begin	1400		
Stop	1420		
Start	1515		
Stop	1530		
Sampled			
(Final IWL)			

Purge calculation

.16 gal/ft. * 5 ft. = .8 gals x 3 = 2.4 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:

Peri.

Actual gallons purged 2

Actual volumes purged 2

Well yield ⊕ (see below) LY

COC # 002384

Sample I.D.	Analysis	Lab
122855 / 122856	TPH 10	Incl.

Additional comments: HNU - 3.0 ppm
Oxygen - 0.0 ppm
Waited ½ hr. to Recharge. Only 2 Volumes possible.

Gallons purged *	TEMP °C / °F (circle one)	EC (µs / cm)	PH	TURBIDITY (NTU)		
1. 1	63	6440	7.7	50		
2. 2	62	6530	7.9	30		
3. 3						
4.						
5.						

* Take measurement at approximately each casing volume purged.

⊕ HY- Minimal W.L. drop

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

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

VLY - Minimal recharge - unable to purge - 3 volumes.

SAMPLING EVENT DATA SHEET

(fill out completely)

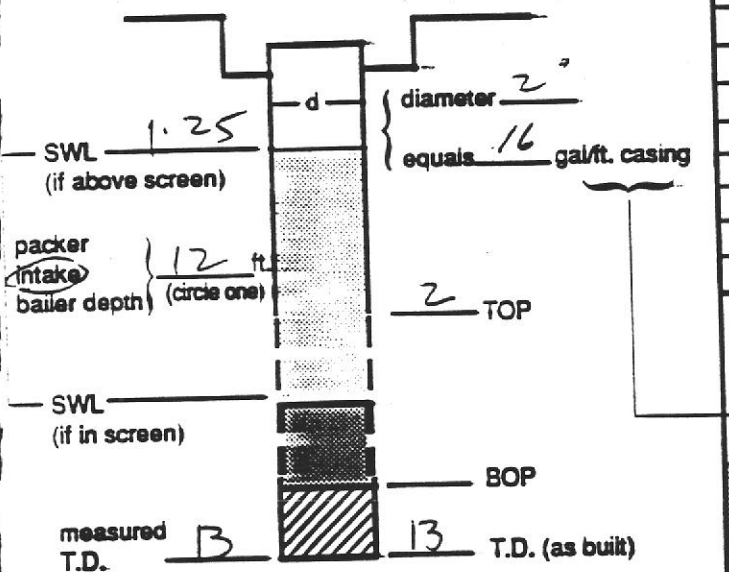
McLaren

WELL OR LOCATION W-57

PROJECT MKT. PL. EVENT Sample SAMPLER LX DATE 2/23/90

Well / Hydrologic statistics

Well type MW (MW, EW, etc.)



Action	Time	Pump rate	IWL (low yield)
Start pump / Begin	1330		
	1600		
Stop			
Sampled			
(Final IWL)			

Purge calculation

.16 gal/ft. * 12 ft. = 2 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:

Peri.

Actual gallons purged 6

Actual volumes purged 3

Well yield ⊕ (see below) MY

COC # 002384

Sample I.D.	Analysis	Lab
122357 - 122359	TPH D	Phcl.

Additional comments: HNU - 2.0 ppm
Draeger - 0.0 ppm

Gallons purged *	TEMP °C / °F (circle one)	EC (µs / cm)	PH	TURBIDITY (NTU)		
1. 2	59	1660	6.1	150		
2. 4	57	1890	6.2	50		
3. 6	53	2120	6.4	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: MW-16

PROJECT: MKT. Pl. Elm. EVENT: Sampling SAMPLER: LX DATE: 2/28/80

Well / Hydrologic statistics

Well type: MW (MW, EW, etc.)

diameter: 2"
equals: .16 gal/ft. casing

SWL (if above screen): 3.95

packer / intake / bailer depth (circle one): 21 ft.

TOP: 15

SWL (if in screen):

BOP: 25

measured T.D.: 23.20

T.D. (as built): 26.5

Action	Time	Pump rate	IWL (low yield)
Start pump / Begin	1700		
	1750		
Stop			
Sampled			
(Final IWL)			

Purge calculation

.16 gal/ft. · 20 ft. = 3.2 gals x 3 = 9.6 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:
Bailer

Actual gallons purged: 10

Actual volumes purged: 3

Well yield (see below): ⊕ HY

COC #: 002370

Sample I.D.	Analysis	Lab
122845 / 122845	TPh/D	Nel

Additional comments: Oily PVC.
HNU - 250ppm
Draeger - 00ppm

Gallons purged *	TEMP °C / °F (circle one)	EC (μs / cm)	PH	TURBIDITY (NTU)		
1. 2	56	3600	6.3	80		
2. 5	54	3510	6.2	90		
3. 10	52	3140	6.3	120		
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)

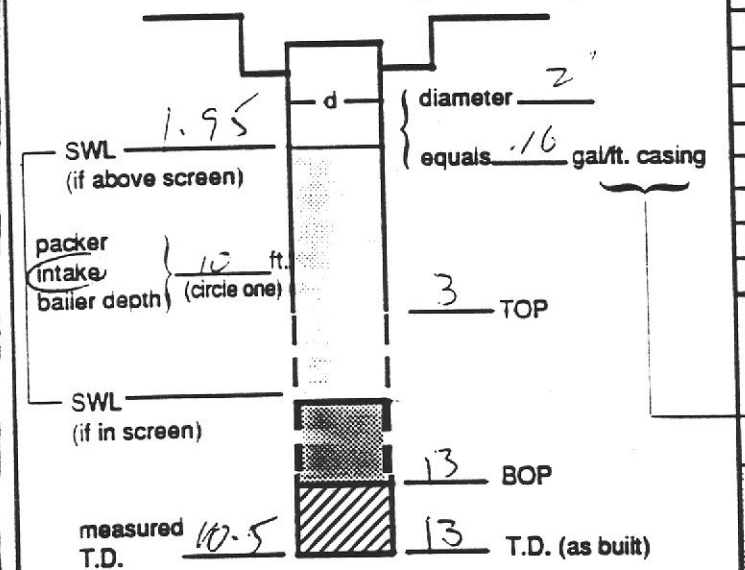
McLaren

WELL OR LOCATION LL-8

PROJECT Emeryville Mkt PL EVENT Sampling SAMPLER LX DATE 3/1/90

Well / Hydrologic statistics

Well type MW (MW, EW, etc.)



Action	Time	Pump rate	IWL (low yield)
Start pump / Begin	0830		
	0915		
Stop			
Sampled			
(Final IWL)			

Purge calculation

.16 gal/ft. * ~~10~~ 9 ft. = 1.4 gals x 3 = 4.0 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

Actual gallons purged 54

Actual volumes purged 3

Well yield ⊕ (see below) Hty

COC # 002372

Sample I.D.	Analysis	Lab
122866 - 122869	TPH/d	Inc l.

Additional comments: MMM - 30 ppm

Draeger - 0.0 ppm

Gallons purged *	TEMP °C / °F (circle one)	EC (µs / cm)	PH	TURBIDITY (NTU)		
1. 2	55	2100	7.5	25		
2. 3	53	3100	7.3			
3. ~~4~~	51	3510	7.1	7		
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)

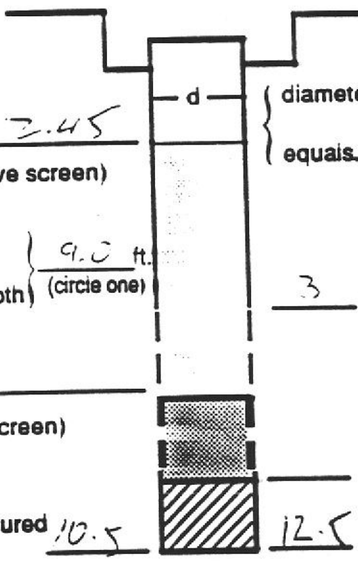
McLaren

WELL OR LOCATION cc-4

PROJECT MKT. Pl. EVENT Sample SAMPLER Lx DATE 3/1/92

Well / Hydrologic statistics

Well type MW
(MW, EW, etc.)



d — diameter 2"
equals .16 gal/ft. casing

SWL 2.45
(if above screen)

packer / intake (circled) / bailer depth 9.0 ft. (circle one)

3 TOP

SWL
(if in screen)

BOP

measured T.D. 10.5

12.5 T.D. (as built)

Action	Time	Pump rate	IWL (low yield)
Start pump / Begin	0945		
	1030		
Stop			
Sampled			
(Final IWL)			

Purge calculation

.16 gal/ft. * 8 ft. = 1.3 gals x 3 = 3.9 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.

Actual gallons purged 4

Actual volumes purged 3

Well yield ⊕ (see below) HY

COC # 002372

Sample I.D.	Analysis	Lab
1220.69T / 1220.7+1	TPH/D	Mcl.

Additional comments: HNU - 2.0ppm
Draeger - 0.0ppm

Gallons purged *	TEMP °C / °F (circle one)	EC (µs / cm)	PH	TURBIDITY (NTU)		
1. 2	56	2300	7.0	15		
2. 3	57	3510	7.5	10		
3. 4	58	4100	7.7	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

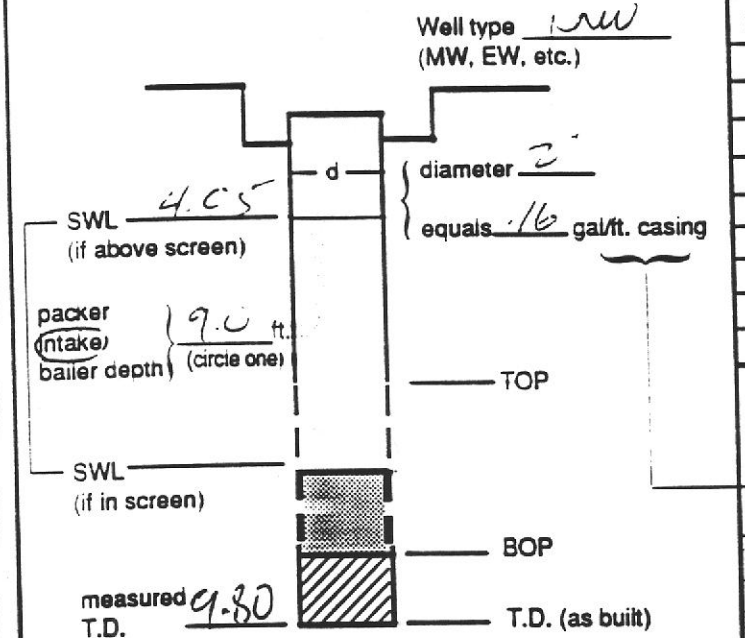
(fill out completely)

McLaren

WELL OR LOCATION W-13

PROJECT MWTPL Energy EVENT Sampling SAMPLER LX DATE 2/28/90

Well / Hydrologic statistics



Action	Time	Pump rate	IWL (low yield)
Start pump / Begin	1800		
	1830		
Stop			
Sampled			
(Final IWL)			

Purge calculation

.16 gal/ft. * 6 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:

Peri

Actual gallons purged 3

Actual volumes purged 3

Well yield ⊕ (see below) HY

COC # 002370

Sample I.D.	Analysis	Lab
122863-122865	TPH/D	Anacl.

Additional comments: PH = 7.0 ppm

Drager - 0 ppm

Gallons purged *	TEMP °C / °F (circle one)	EC (µs / cm)	PH	TURBIDITY (NTU)		
1. 1	53	2000	8.3	41		
2. 2	53	1950	8.5	54		
3. 3	54	1970	8.6	66		
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.

DIRECT READING REPORT

DEPT. NO.	BLDG. NO.	COL.	PLT. ---	SHIFT	WORKSHEET 1 OF ____

PERSON PERFORMING SAMPLING

EMPLOYEE NAME: Lana Brown EST

JOB TITLE: Market Place

PPE (TYPE AND EFFECTIVENESS): Level D

WEATHER CONDITIONS

INTERFERENCES

JOB DESCRIPTION, OPERATION, WORK LOCATIONS, VENTILATION AND CONTROLS:

HNU 0-200 Scale

DIRECT READING DATA

SUBSTANCE/AGENT	INSTRUMENT TYPE & SERIAL #	TIME	READING	LOCATION AND REMARKS
Head	HNU	13:10	0	MW4
"	"	10:45	0	MW 19
"	"	13:30	0	MW20
"	"	9:05	8	MW8
"	"	10:23	15-17	MW21
"	"	11:29	11-15	MW23
"	"	12:50	0	MW22

4/10
4/16
4/18

SAMPLING EVENT DATA SHEET

(fill out completely)

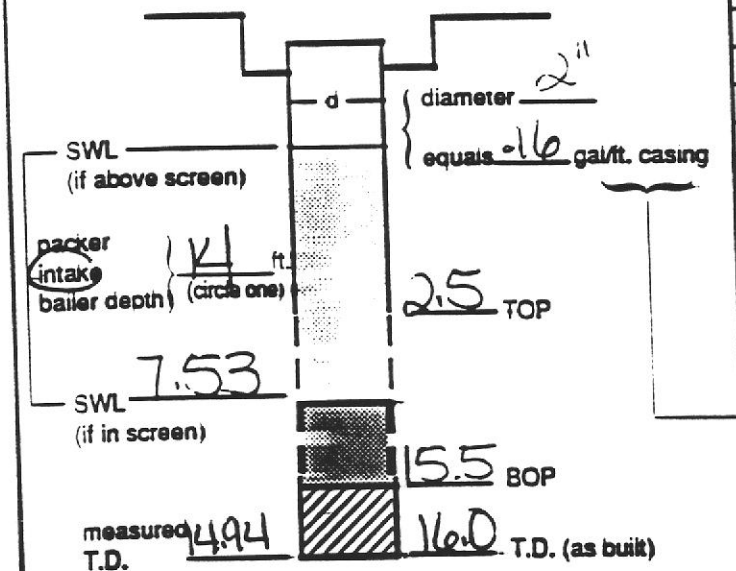
McLaren

WELL OR LOCATION MW22

PROJECT Marketplace EVENT Develop SAMPLER LTB DATE 4/10/90

Well / Hydrologic statistics

Well type MW (MW, EW, etc.)



Action	Time	Pump rate	IWL (low yield)
Start pump / Begin	11:48	5gal	
STOP	11:52		
START	11:58	5gal	
STOP	12:01		
START	12:04	2gal	
STOP	12:05		
Stop			
Sampled			
(Final IWL)	8.74		

Purge calculation

.16 gal/ft. · 7.41 ft. = 1.18 gals x 10 = 11.8 gals.

SWL to BOP or packer to BOP | one volume | 10 | purge volume - 3 casings

Head purge calculation (Airlift only)

gal/ft. · ft. = gals

packer to SWL

Equipment Used / Sampling Method / Description of Event:

Cent. w/ just tubing - pumped at slow rate

Very turbid water

Actual gallons purged 12+

Actual volumes purged 10

Well yield ⊕ (see below) ____

COC. # ____

Sample I.D.	Analysis	Lab

Additional comments:

purged 10 casing volumes

used 14.94 as BOP

Gallons purged * Casings	TEMP °C (°F) (circle one)	EC (µs / cm)	PH	TURBIDITY (NTU) @ 25C		
1. .25	72.7	790	6.59	off scale		
2. 5	71.8	1230	6.59	"		
3. 7.5	70.4	790	6.59	"		
4. 10	69.5	490	6.71	"		
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)

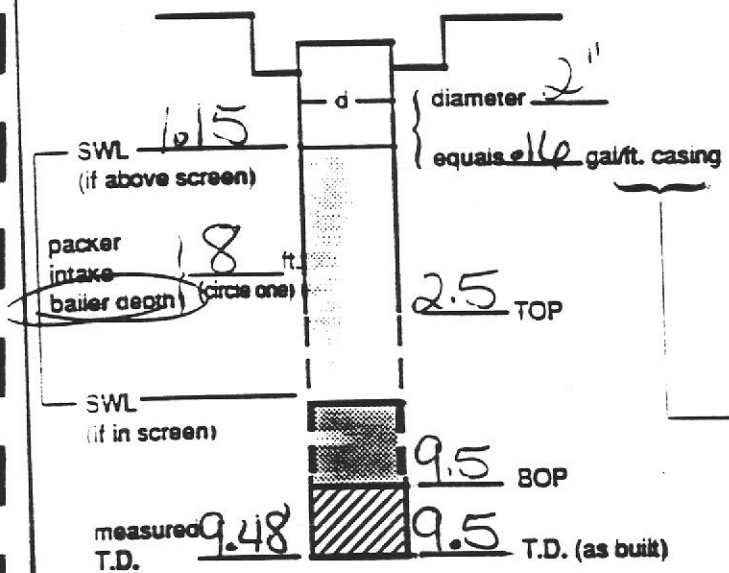
McLaren

WELL OR LOCATION MW23

PROJECT Marketplace EVENT Develop SAMPLER JB DATE 4/10/90

Well / Hydrologic statistics

Well type MW (MW, EW, etc.)



Action	Time	Pump rate GPM	IWL (low yield)
Start pump / Begin	11:00	0.19	
		↓	
Stop	11:35	↓	
Sampled			
(Final IWL)	9.36		

Purge calculation

.16 gal/ft. * 8.35 ft. = 1.33 gals x 3 / 5 = 6.65 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:

already 1/2 developed
Bailed

Actual gallons purged ≈ 6.65

Actual volumes purged 5

Well yield ⊕ (see below) MY

COC # _____

Sample I.D.	Analysis	Lab

Additional comments:

5 casing volumes removed

Gallons purged *	TEMP °C (F) (circle one)	EC (µs / cm)	PH	TURBIDITY (NTU)		
1. 2.5 casings	14.8	3750	6.70	off scale		
2. 5.0	11.2	3550	6.69	"		
3.						
4.						
5.						

* Take measurement at approximately each casing volume purged.

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

SAMPLING EVENT DATA SHEET

(fill out completely)

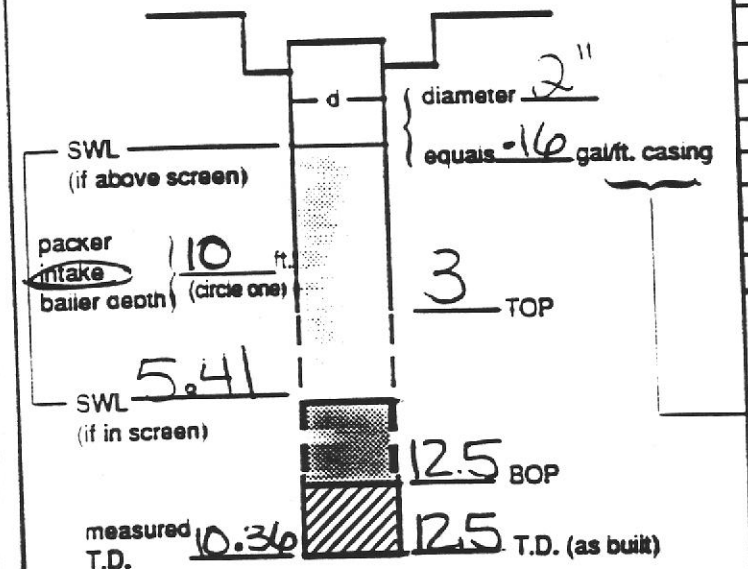
McLaren

WELL OR LOCATION MW1

PROJECT Marketplace EVENT Sample SAMPLER LJB DATE 4/10/90

Well / Hydrologic statistics

Well type MW (MW, EW, etc.)



Action	Time	Pump rate GPM	IWL (low yield)
Start pump / Begin	9:34	.10	
		↓	
Stop	9:50	↓	
Sampled	10:42		
(Final IWL)			

Purge calculation

.16 gal/ft. × 4.95 ft. (SWL to BOP or packer to BOP) = .79 gals (one volume) × 3 = 2.37 gals. (purge volume-3 casings)

Head purge calculation (Airlift only)

gal/ft. × ft. (packer to SWL) = gals.

Equipment Used / Sampling Method / Description of Event:

Perist. w/ ~~SSSS~~ screen only pumped at highest setting Had to let recharge ≈45 mins to finish sampling. Should pump at lower rate.

Actual gallons purged 2.5

Actual volumes purged ~~MY~~ 3+ MY

Well yield ⊕ (see below)

Additional comments:

used 10.36 as BOP
TCL samples from end of tubing

COC # 220546/220547

Sample I.D.	Analysis	Lab
113125 thru 128	GOZ TB	MAL
113129 thru 132	GOZ	↓
113133 thru 135	TPH ID	↓
113136	Pb, Zn, Cu, As	↓

Gallons purged *	TEMP °C / (F) (circle one)	EC (µs / cm)	PH	TURBIDITY (NTU)		
1. .5	68.7	1860	6.68	40.4		
2. 1.0	67.9	1830	6.68	40.2		
3. 1.5	67.1	1840	6.65	26.1		
4.						
5.						

* Take measurement at approximately each casing volume purged.

⊕ HY - Minimal W.L. drop

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

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

VLY - Minimal recharge - unable to purge 3 volumes.

SAMPLING EVENT DATA SHEET

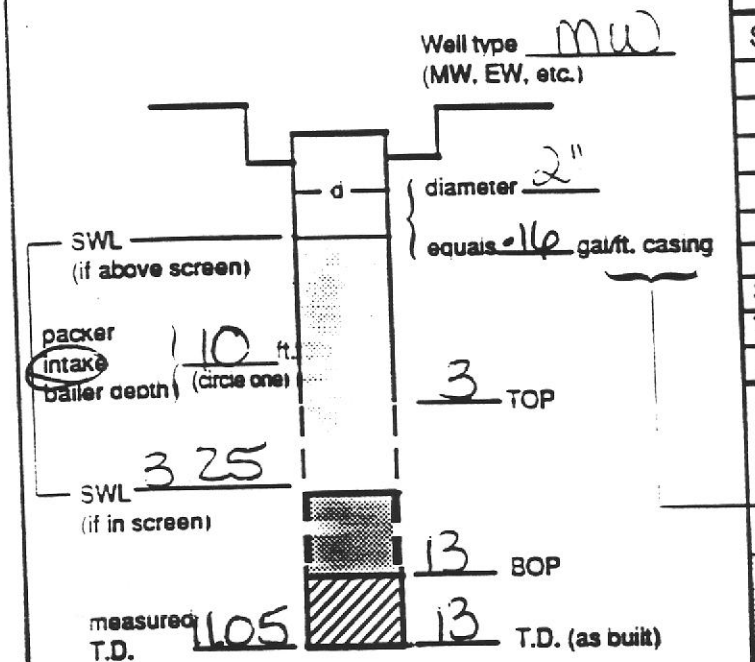
(fill out completely)

McLaren

WELL OR LOCATION MW4

PROJECT Marketplace EVENT Sample SAMPLER LJB DATE 4/10/90

Well / Hydrologic statistics



Action	Time	Pump rate GPM	IWL (low yield)
Start pump / Begin	13:22	Cell	
		↓	
Stop	13:58	↓	
Sampled	16:00		
(Final IWL)	8.41		

Purge calculation

.16 gal/ft. * 7.8 ft. = 1.25 gals x 3 = 3.75 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:

perist. w/ SSSC.

pumped at highest rate

Actual gallons purged 4

Actual volumes purged 3+

Well yield ⊕ (see below) HY

COC. # 220515 / 220590

Sample I.D.	Analysis	Lab
130129 - 132	602	MAL
130133 - 134	TPHID	↓
130135	Pb, Zn, Cu, AS	↓
135944 - 997	602-TB	

Additional comments:

used 11.05 as BOP

Gallons purged *	TEMP °C (F) (circle one)	EC (µs / cm)	PH	TURBIDITY (NTU) (@ 20C)		
1. 1	13.2	1320	6.65	11.4		
2. 2	68.1	1280	6.59	6.2		
3. 3	66.0	1260	6.59	4.5		
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

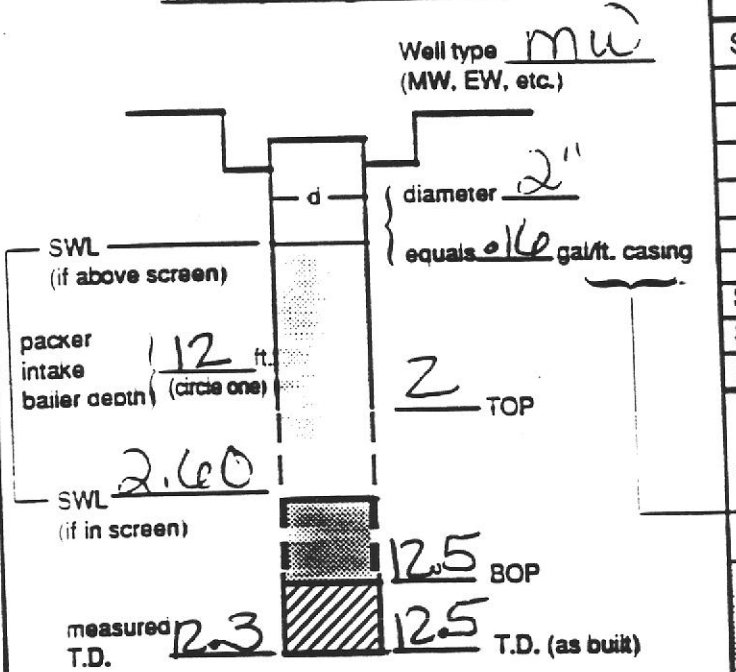
(fill out completely)

McLaren

WELL OR LOCATION MW7

PROJECT MP EVENT Sample SAMPLER LJB DATE 4/11/90

Well / Hydrologic statistics



Action	Time	Pump rate GPM	IWL (low yield)
Start pump / Begin	11:25	0.19	
		↓	
Stop	11:50	↓	
Sampled	12:05		
(Final IWL) 4.06	[redacted]		

Purge calculation

.16 gal/ft. * 9.7 ft. = 1.55 gals x 3 = 4.65 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:

Perist. w/ screen only
sampled from end of tubing.
pumped at highest setting

Actual gallons purged x4.7

Actual volumes purged 3+

Well yield ⊕ HY
(see below)

COC # 220547

Sample I.D.	Analysis	Lab
113137-140	602	MAL
113141-143	TPHID	↓
113144	Pb,Zn,Cu,As	↓

Additional comments:

Water is lime green color and foamy
CC'ing Bentonite - replace ICC

Gallons purged *	TEMP °C (°F) (circle one)	EC (µs / cm)	PH	TURBIDITY (NTU)		
1. 1.5	14.8	4510	5.99	9.9		
2. 3.0	14.3	7100	6.10	13.8		
3. 4.5	15.9	9340	6.14	16.9		
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

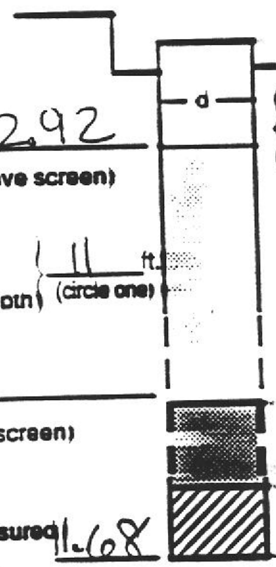
(fill out completely) —

WELL OR LOCATION MW8

PROJECT Marketplace EVENT Sample SAMPLER LJB DATE 4/18/90

Well / Hydrologic statistics

Well type MW (MW, EW, etc.)



diameter 2" equals .16 gal/ft. casing

SWL 2.92 (if above screen)

packer / intake / bailer depth (circle one) 11 ft.

3 TOP

SWL (if in screen)

13 BOP

measured T.D. 11.68

13 T.D. (as built)

Action	Time	Pump rate GPM	IWL (low yield)
Start pump / Begin	9:14	0.15	
Stop	9:42	↓	
Sampled	9:55		
(Final IWL)	5.03		

Purge calculation

.16 gal/ft. · 8.76 ft. = 1.4 gals x 3 = 4.20 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:

perist. w/ screen only
pumped at highest setting.

Actual gallons purged 4.2

Actual volumes purged 3

Well yield (see below) ⊕ HY

COC #: 220509 | 220510

Sample I.D.	Analysis	Lab
135438-441	602 TB	~~ETC~~ MAI
135442-445	602 FB	↓
135446-449	602	
144701-703	TPH/D	
135950	Pb, Zn, Cu, As	↓

Additional comments:

used 11.68 as BOP
Diesel smell

needs new locking cap

Gallons purged *	TEMP °C / °F (circle one)	EC (µs / cm)	PH	TURBIDITY (NTU)		
1. 1.0	60.9	1380	6.10	3.5		
2. 2.0	61.1	1150	6.03	2.3		
3. 3.0	60.2	1170	5.84	2.1		
4.						
5.						

* Take measurement at approximately each casing volume purged.

⊕ HY - Minimal W.L. drop

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

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

VLY - Minimal recharge - unable to purge 3 volumes.

SAMPLING EVENT DATA SHEET

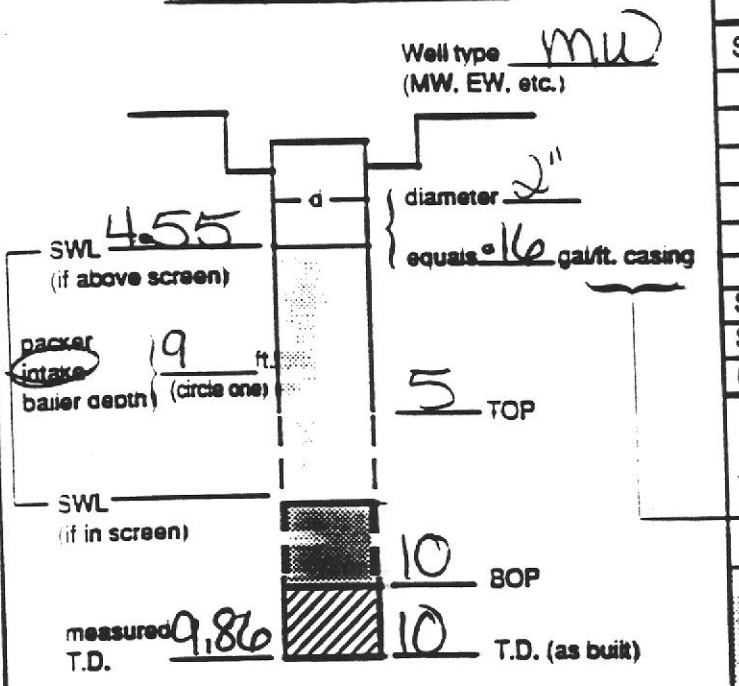
(fill out completely)

McLaren

WELL OR LOCATION MW13

PROJECT Marketplace EVENT Sample SAMPLER LJB DATE 4/12/90

Well / Hydrologic statistics



Action	Time	Pump rate GPM	IWL (low yield)
Start pump / Begin	14:22	0.075	
Stop	14:58		
Sampled	15:20		
(Final IWL)	5.68		

Purge calculation

.16 gal/ft. × 5.45 ft. = .87 gals × 3 = 2.61 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:

perist. w/ tubing only pumped at a very slow rate

Actual gallons purged ≈ 2.7

Actual volumes purged 3+

Well yield ⊕ MY

(see below)

COC # 220551/220552

Sample I.D.	Analysis	Lab
113178-181	GRO	MAL
113182-183	TPH/D	↓
113184	Pb, Zn, Cu, As	↓

Additional comments:

water is black in color and has black flaky specs in it

Gallons purged *	TEMP °C / (F) (circle one)	EC (µs / cm)	PH	TURBIDITY @22C (NTU)		
1. 0.5	75.6	1520	7.24	offscale		
2. 1.0	73.4	1480	7.38	"		
3. 1.5	72.1	1320	7.45	"		
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

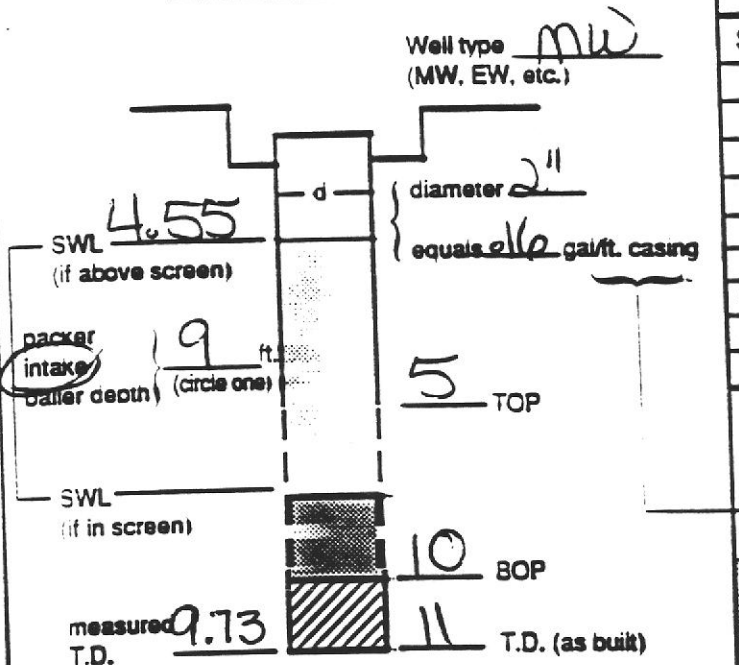
(fill out completely)

McLaren

WELL OR LOCATION MW14

PROJECT MP EVENT Sample SAMPLER CJB DATE 4-11-90

Well / Hydrologic statistics



Action	Time	Pump rate	IWL (low yield)
Start pump / Begin	13:06	1 gal	
STOP	13:21		9.63
START	13:36	.16 gal	6.40
STOP	13:42		
START	14:05	13	
STOP	14:22		9.65
Stop	14:22		
Sampled	15:35		
(Final IWL)	8.85		

Purge calculation

.16 gal/ft. * 5.18 ft. = .83 gals x 3 = 2.49 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:

perist. w/ screen only
need to pump at a very slow rate.

Sampled w/ ≈ 2.5 casings purged, so could get samples to Fed-X

Actual gallons purged ~~2.5~~ ≈2.0

Actual volumes purged ~~3~~ ≈2.5

Well yield ⊕ MV-LY
(see below)

Additional comments:

used 9.73 as BOP
needed to wait mins to let recharge to finish sampling.

COC # 220548

Sample I.D.	Analysis	Lab
130136-148	VOC	MAL
130136-138	TPHD	↓
130139	Pb, Zn, Cu, As	

Gallons purged *	TEMP °C (°F) (circle one)	EC (µs / cm)	PH	TURBIDITY (NTU)		
1. .5	83.8	4470	7.16	30.9		
2. 1.0	82.8	4430	7.05	13.7		
3. 1.5	82.0	4440	7.07	13.0		
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.

15

SAMPLING EVENT DATA SHEET

(fill out completely)

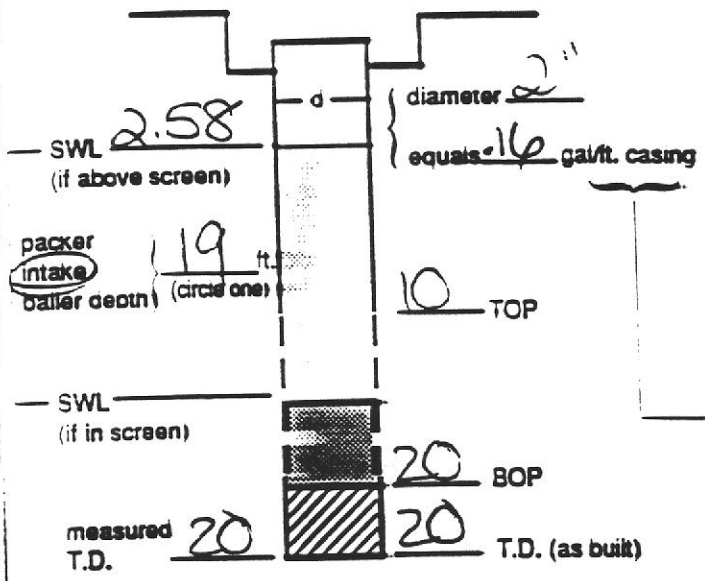
McLaren

WELL OR LOCATION MW [illegible]

PROJECT Marketplace EVENT Sample SAMPLER LTB DATE 4/13/20

Well / Hydrologic statistics

Well type MW (MW, EW, etc.)



Action	Time	Pump rate GPM	IWL (low yield)
Start pump / Begin	10:35	0.13	
Stop	11:38	↓	
Sampled	12:01		
(Final IWL)	8.48		

Purge calculation

.16 gal/ft. * 11.42 ft. = 2.28 gals x 3 = 8.34 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:

perist w/ screen only
pumped at highest setting

Actual gallons purged 8.5

Actual volumes purged 3+

Well yield ⊕ (see below) HY

COC # 220503/220504

Sample I.D.	Analysis	Lab
113185-188	1602-TB	MAL
113189-192	1602	↓
113193-195	TPHID	
113196	Pb, Zn, Cu, As	↓

Additional comments:

Sheen on water, with black flaky particles in water. Diesel smell.

Gallons purged *	TEMP °C / (F) (circle one)	EC (µs / cm)	PH	TURBIDITY (NTU)		
1. 2.5	77.3	1070	7.04	11.5		
2. 5.0	80.4	540	7.00	9.4		
3. 7.5	73.2	510	6.75	4.9		
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 MW 16

PROJECT Marketplace EVENT Sample SAMPLER LJB DATE 4/13/90

Well / Hydrologic statistics

Well type MW (MW, EW, etc.)

diameter 2" equals .16 gal/ft. casing

SWL 3.95 (if above screen)

packer / intake / bailer depth (circle one) 122 ft.

15 TOP

SWL (if in screen)

25 BOP

measured T.D. 23.41

26.5 T.D. (as built)

Action	Time	Pump rate	IWL (low yield)
Start pump / Begin	10:45	5 gal	
STOP	11:00		
START	11:10		(peri)
		4.5	
Stop	11:50		
Sampled	12:20		
(Final IWL)	9.04		

Purge calculation

.16 gal/ft. · 19.46 ft. = 3.1 gals x 3 = 9.3 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:

perist. w/ screen only
Tried to pump, but pump wouldn't pull, so I Bailed. Figured how to make pump, so pumped last 4 gallons w/ perist. Diesel smell.

Actual gallons purged 9.5

Actual volumes purged 3+

Well yield ⊕ (see below) HY

COC #: 220504

Sample I.D.	Analysis	Lab
130141-00	602	MA
130141-142	TPH/D	↓
130143	Pb, Zn, Cu, Fe	↓

Additional comments:

Sheen on water and oily coating on Bailer. Black flaky particles in water
used 23.41 as BOP
locked w/ 1519 lock - Turbid samples

	Gallons purged *	TEMP °C / °F (circle one)	EC (µs / cm)	PH	TURBIDITY (NTU)
1.	3.0	78.8	1840	6.16	77.7
2.	6.0	76.8	1670	6.24	76.8
3.	9.0	74.2	1610	6.21	offscale
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)

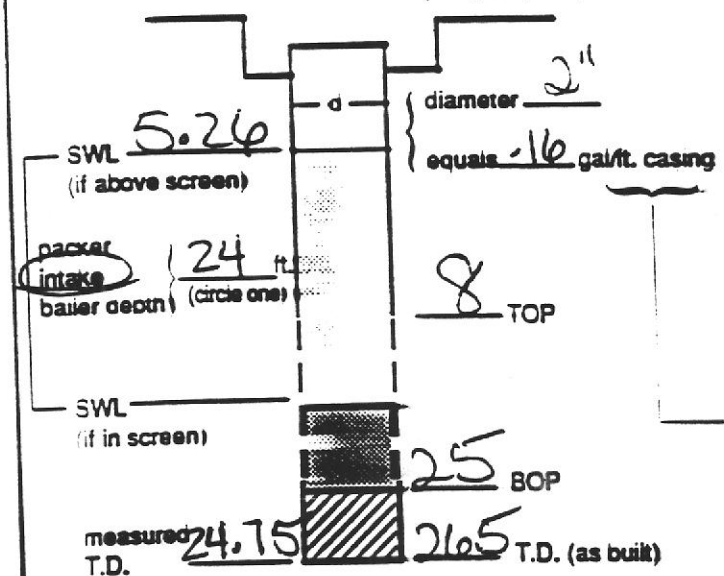
McLaren

WELL OR LOCATION MW17

PROJECT Marketplace EVENT Sample SAMPLER LJB DATE 4/13/10

Well / Hydrologic statistics

Well type MW (MW, EW, etc.)



Action	Time	Pump rate GPM	IWL (low yield)
Start pump / Begin	13:17	0.13	
Stop	14:30	↓	
Sampled	14:48		
(Final IWL)	15.89		

Purge calculation

.16 gal/ft. · 19.49 ft. = 3.12 gals x 3 = 9.36 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:

perist. w/ screen only
pumped at highest setting.

Actual gallons purged 9.5

Actual volumes purged 3+

Well yield ⊕ (see below) HY

COC # 220505/220553

Sample I.D.	Analysis	Lab
B0143 46	VOC	MAL
130147 148	TPH/D	↓
130149	Pb, Zn, Cu, As	

Additional comments:

Used 24.15 as BOP
Diesel smell

Gallons purged *	TEMP °C / (F) (circle one)	EC (µs / cm)	PH	TURBIDITY (NTU) @ 1100		
1. 3	76.0	2350	6.33	4.1		
2. ~~6~~	~~75.3~~	~~2530~~	~~6.11~~	~~3.0+~~		
3. ~~7~~ 6	79.9	2440	6.32	3.8		
4. 9	83.4	2670	6.39			
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

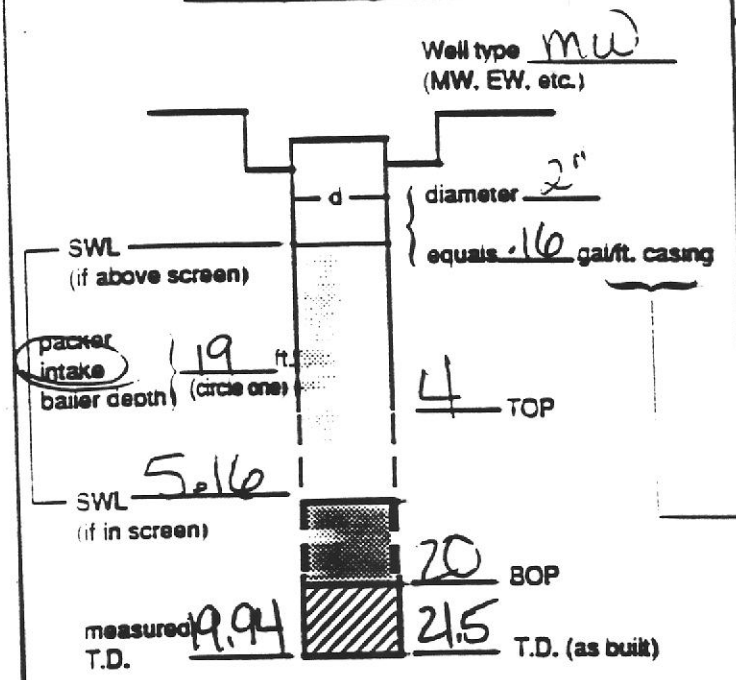
(fill out completely)

McLaren

WELL OR LOCATION MW18

PROJECT Marketplace EVENT Sample SAMPLER GJB DATE 4/13/90

Well / Hydrologic statistics



Action	Time	Pump rate GPM	IWL (low yield)
Start pump / Begin	13:10	0.11	
Stop	14:15	↓	
Sampled	14:27		
(Final IWL)	10.18		

Purge calculation

.16 gal/ft. * 14.78 ft. = 2.36 gals x 3 = 7.08 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:

perist. w/ screen only
pumped at highest setting

Actual gallons purged 7.01

Actual volumes purged 3+

Well yield ⊕ (see below) HY

COC # 220505

Sample I.D.	Analysis	Lab
135914 9/7	VOC	MAL
135918 9/9	TPH/D	
135920	Pb, Zn, Cu, As	

Additional comments:

Diesel smell and lt. green color

Gallons purged *	TEMP °C / (°F) (circle one)	EC (µs / cm)	PH	TURBIDITY (NTU)		
1. 2	79.2	2760	6.14	14.4		
2. 4	75.3	2530	6.11	3.01		
3. 6	74.8	2600	6.14	3.3		
4.						
5.						

* Take measurement at approximately each casing volume purged.

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

I

SAMPLING EVENT DATA SHEET

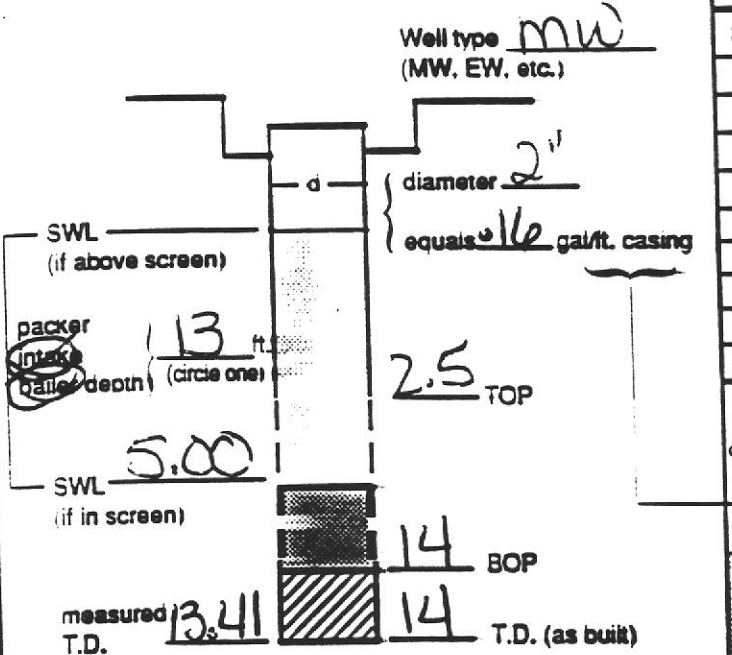
(fill out completely)

McLaren

WELL OR LOCATION MW19

PROJECT Marketplace EVENT Sample SAMPLER LJB DATE 4/12/00

Well / Hydrologic statistics



Action	Time	Pump rate	IWL (low yield)
Start pump / Begin	9:50	) 0	
STOP	10:00		
START	10:05	) 2gal	Bail
STOP	10:10		
START	10:12		
		) 2gal	
Stop	10:29		
Sampled	10:45		
(Final IWL)	5.12		

Purge calculation

.16 gal/ft. · 8.41 ft. = 1.35 gals x 3 = 4.05 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:

perist. w/ screen only wouldn't draw H2O, so bailed 2 gals. Tried pump again, and drew water. Then pumped @ highest setting

Additional comments:

used 13.41 as BOP

Actual gallons purged 4.5

Actual volumes purged 3+

Well yield ⊕ (see below) HY

COC # 220519 | 220550

Sample I.D.	Analysis	Lab
113151-154	6OZ TB	MAL
113155-158	6OZ	
113159-161	TPH/D	
113162	Pb, Zn, Cu, As	

Gallons purged *	TEMP °C / (F) (circle one)	EC (µs / cm)	PH	@ 26.C TURBIDITY (NTU)		
1. 1.0	78.3	7070	7.04	off scale		
2. 2.0	79.4	5520	6.85	159.8		
3. 3.0	78.2	4880	6.89	off scale		
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.

I

SAMPLING EVENT DATA SHEET

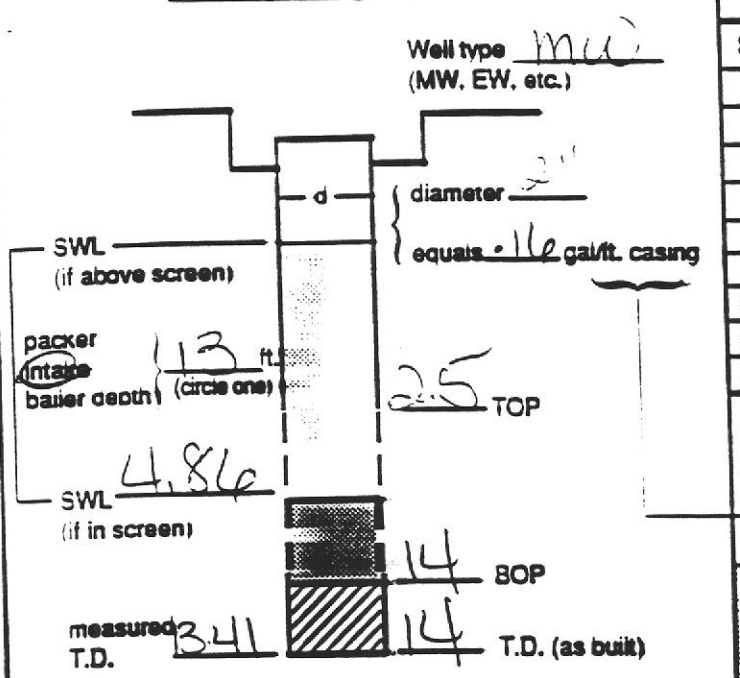
(fill out completely)

McLaren

WELL OR LOCATION MW19

PROJECT marketplace EVENT Sample SAMPLER GTB DATE 4/16/20

Well / Hydrologic statistics



Action	Time	Pump rate	IWL (low yield)
Start pump / Begin	10:56	~~.14~~ .14	
Stop	11:25	V	
Sampled	11:34		
(Final IWL)	5.08		

Purge calculation

.16 gal/ft. * 8.55 ft. = 1.34 gals x 3 = 4.02 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:

penst. w/ screen only — Can use SSSC next time pumped at highest setting

Actual gallons purged ≈4.01

Actual volumes purged 3

Well yield ⊕ (see below) HY

COC # 220507/220508

Sample I.D.	Analysis	Lab
135925-928	VOC	MAL
135929-931	TPH ID	↓

Additional comments:

used 13.41 as BOP

Gallons purged *	TEMP °C (F) (circle one)	EC (µs / cm)	PH	TURBIDITY (NTU)		
1. 1.0	67.9	4440	7.02	2.4		
2. 2.0	66.8	3380	6.85	0.7		
3. 3.5	66.3	2720	6.71	0.9		
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.

I

SAMPLING EVENT DATA SHEET

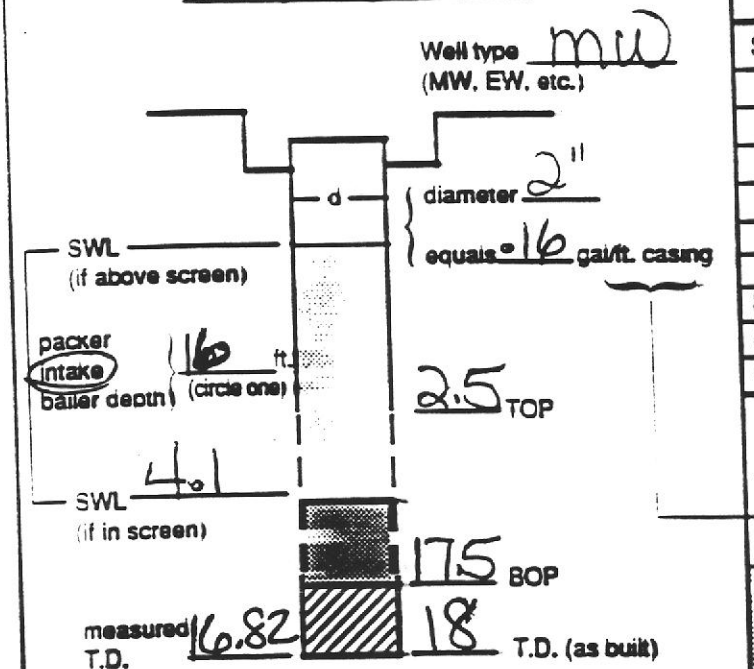
(fill out completely)

McLaren

WELL OR LOCATION MW20

PROJECT Marketplace EVENT Sample SAMPLER LJB DATE 4/12/90

Well / Hydrologic statistics



Action	Time	Pump rate GPM	IWL (low yield)
Start pump / Begin	13:12	0.18	
Stop	13:46		
Sampled	14:00		
(Final IWL)	5.20		

Purge calculation

.16 gal/ft. · 12.72 ft. = 2.03 gals x 3 = 6.09 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:

perist. w/ screen only
pumped at highest setting

Actual gallons purged 6.01

Actual volumes purged 3+

Well yield ⊕ (see below) HY

COC #: 220551

Sample I.D.	Analysis	Lab
113170-173	602	MAL
113174-175	IP+HD	
113176	Pb, Zn, Cu, As	

Additional comments:

used 16.82 as BOP

Gallons purged *	TEMP °C / (F) (circle one)	EC (µs / cm)	PH	TURBIDITY (NTU) (F200)		
1. 2	77.5	7200	6.67	8.8		
2. 4	74.1	9030	6.65	2.3		
3. 6	72.1	8710	6.64	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.

II

SAMPLING EVENT DATA SHEET

(fill out completely)

McLaren

WELL OR LOCATION MW20

PROJECT Marketplace EVENT Sample SAMPLER LJB DATE 4/16/90

Well / Hydrologic statistics

Well type MW
(MW, EW, etc.)

diameter 2"
equals .16 gal/ft. casing

SWL (if above screen)

packer / intake / bailer depth (circle one): 16 ft.

2.5 TOP

SWL 4.16 (if in screen)

17.5 BOP

measured T.D. 16.82

18 T.D. (as built)

Action	Time	Pump rate GPM	IWL (low yield)
Start pump / Begin	1340	0.15	
Stop	14:20		
Sampled	14:30		
(Final IWL)	4.46		

Purge calculation

.16 gal/ft. · 12.66 ft. = 2.02 gals x 3 = 6.06 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:
persist. w/ ~~SSSC~~ screen only
- Can use SSSC next time
pumped at highest setting

Actual gallons purged: 6.1
Actual volumes purged: 3+
Well yield ⊕ (see below): HY

COC # 220508

Sample I.D.	Analysis	Lab
135932-935	602	MAC
135936-937	TPH/D	↓
135921-924	602TB	↓

Additional comments:
used 16.82 as BCP

	Gallons purged *	TEMP °C / (F) (circle one)	EC (µs / cm)	PH	TURBIDITY (NTU)		
1.	2	70.1	6690	6.63	2.5		
2.	4	66.5	6660	6.67	1.1		
3.	6	65.6	6620	6.69	1.5		
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.

I

SAMPLING EVENT DATA SHEET

(fill out completely)

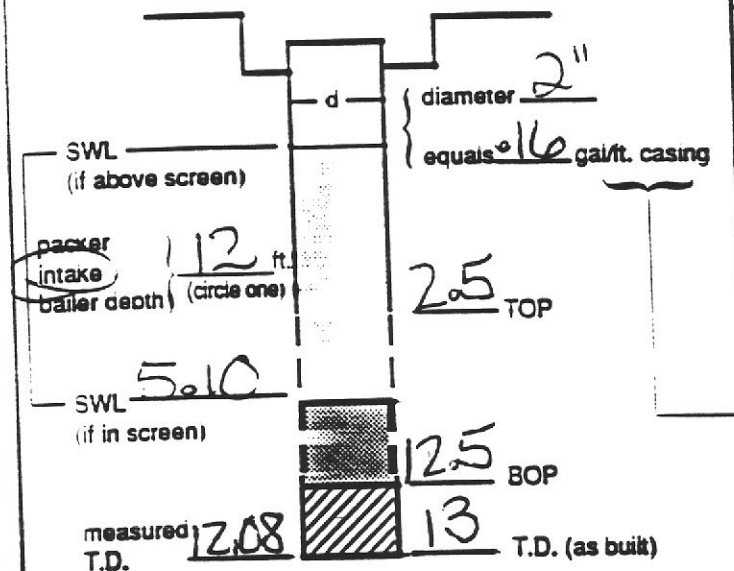
McLaren

WELL OR LOCATION MW 2D

PROJECT Marketplace EVENT Sample SAMPLER CJB DATE 4/12/90

Well / Hydrologic statistics

Well type MW (MW, EW, etc.)



Action	Time	Pump rate GPM	IWL (low yield)
Start pump / Begin	11:07	0.15	
		↓	
Stop	11:30	↓	
Sampled	11:42		
(Final IWL)	6.30		

Purge calculation

.16 gal/ft. * 6.98 ft. = 1.12 gals x 3 = 3.36 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:

perist. w/ screen.
pumped @ highest setting

Actual gallons purged 3.5

Actual volumes purged 3+

Well yield ⊕ (see below) HY

COC # 220550

Sample I.D.	Analysis	Lab
113163-1616	602	MAL
113167-1168	TPH ID	↓
113169	Pb, Zn, Cu, As	↓

Additional comments:

Gallons purged *	TEMP °C / (F) (circle one)	EC (µs / cm)	PH	TURBIDITY (NTU)		
1. 1	69.8	13990	6.26	92.5		
2. 2	71.1	13770	6.29	75.7		
3. 3	70.0	13320	6.28	112.4		
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.

II

SAMPLING EVENT DATA SHEET

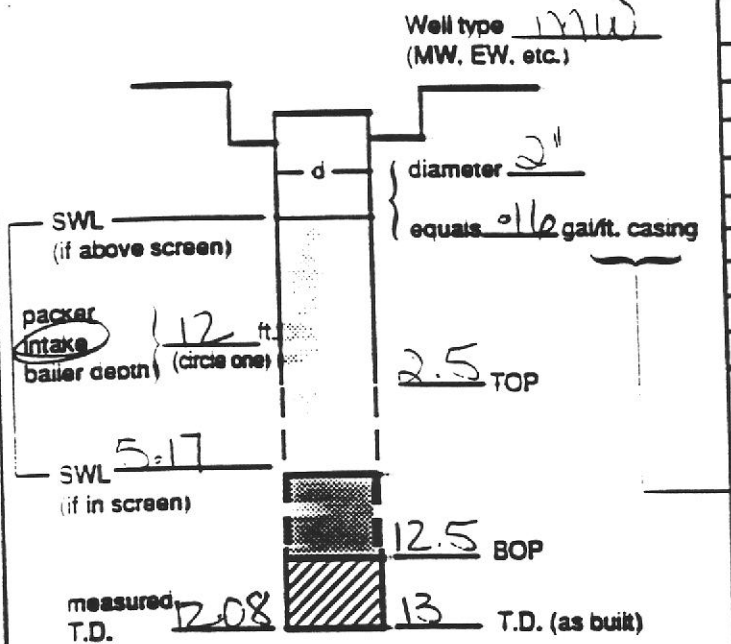
(fill out completely)

McLaren

WELL OR LOCATION MW21

PROJECT Marketplace EVENT Sample SAMPLER WB DATE 4/18/90

Well / Hydrologic statistics



Action	Time	Pump rate (GPM)	IWL (low yield)
Start pump / Begin	10:52	0.13	
		↓	
Stop	10:58	↓	
Sampled	11:09		
(Final IWL)	6.20		

Purge calculation

.16 gal/ft. * 6.91 ft. = 1.10 gals x 3 = 3.30 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:

perist. w/ ~~SSS~~ Screen only

pumped at highest setting

Actual gallons purged 3.3

Actual volumes purged 3

Well yield ⊕ (see below) HY

COC #: 220510 | 511

Sample I.D.	Analysis	Lab
144704=707	VOC	MHL
144708=709	TPHD	↓

Additional comments:

used 12.08 as BOP

Diesel smell

Gallons purged *	TEMP °C / °F (circle one)	EC (µs / cm)	PH	TURBIDITY (NTU)		
1. .C	63.8	11780	6.23	18.7		
2. .C	65.0	11080	6.31	23.5		
3. .C	65.6	11080	6.34	22.8		
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.

1533

I

SAMPLING EVENT DATA SHEET

(fill out completely)

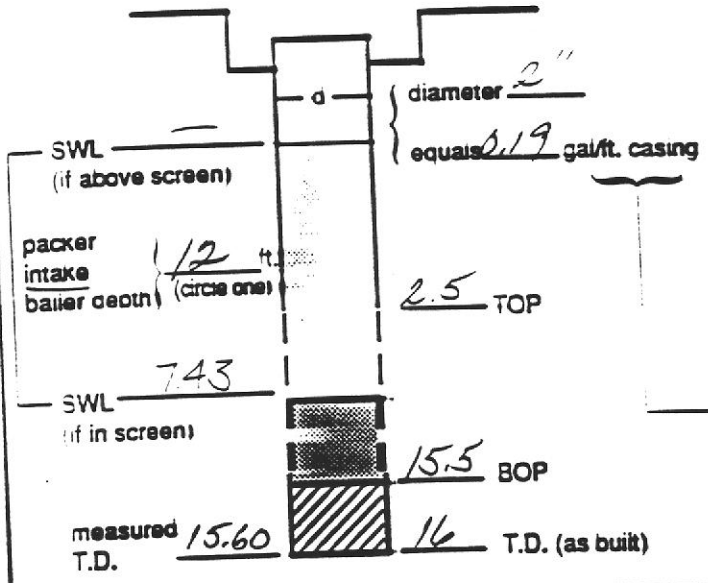
McLaren

WELL OR LOCATION W-22

PROJECT MARKETPLACE EMERYVILLE EVENT 59801-008 SAMPLER M. JOHNSON DATE 4-12-90

Well / Hydrologic statistics

Well type MW (MW, EW, etc.)



Action	Time	Pump rate	IWL (low yield)
Start pump / Begin	1410	1.5 gal/hr	7.43
Stop	1448		7.94
Sampled	1455		-.94
(Final IWL)	1508		7.92

Purge calculation

0.19 gal/ft. * 8.57 ft. = 1.6 gals x 3 = 4.9 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 pump. Cloudy greenish discharge; no odor; good recharge -- no aeration.

Actual gallons purged 4.9

Actual volumes purged 3

Well yield ⊕ (see below) ____

COC # 220560, 220559

Sample I.D.	Analysis	Lab
144411, -12 -13 -14	8020	MAL
144409 144410	TPH/D	MAL
144417	Pb, Zn, Cu, As	MAL
	filtered	

Additional comments: * Sounder malfunction - water level measurement (1420)... operated OK during remainder of sampling

PID not available

Gallons purged *	TEMP °C / (F) (circle one)	EC (µs / cm)	PH	TURBIDITY (NTU)	Water Level	
1. 1.5 (1420)	62.3	550	6.64	10.3	? *	
2. 3.0 (1425)	62.6	530	6.60	4.8	7.88	
3. 4.9 (1443)	63.2	610	6.54	2.2	7.94	
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.

II

SAMPLING EVENT DATA SHEET

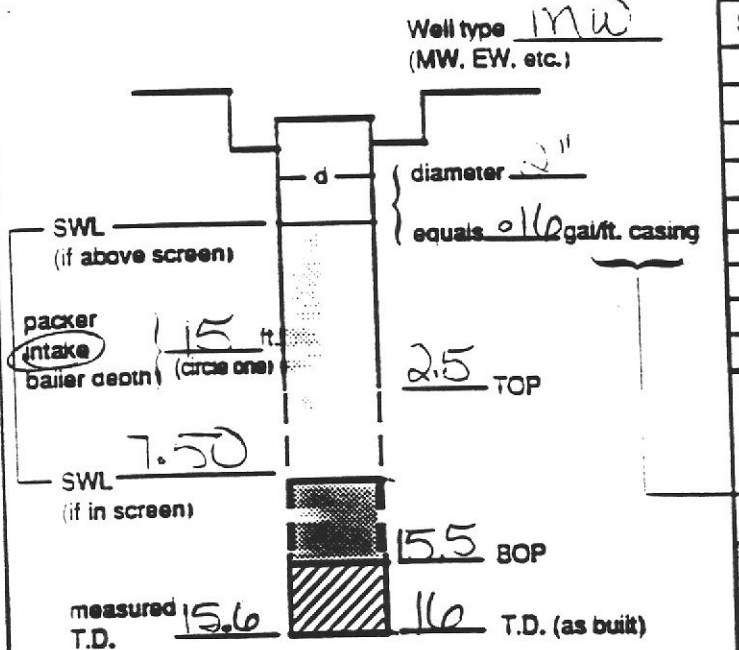
(fill out completely)

McLaren

WELL OR LOCATION MW22

PROJECT Marketplace EVENT Sample SAMPLER LJB DATE 4/18/90

Well / Hydrologic statistics



Action	Time	Pump rate GPM	IWL (low yield)
Start pump / Begin	13:00	0.12	
Stop	13:35	↓	
Sampled	13:42		
(Final IWL)	13:43		7.51

Purge calculation

.16 gal/ft. * 8.0 ft. = 1.28 gals x 3 = 3.84 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:

perist. w/ tubing only
pumped @ highest setting

Actual gallons purged 4.0

Actual volumes purged 3+

Well yield ⊕ (see below) HY

COC # 220511/512

Sample I.D.	Analysis	Lab
144716-719	602	MAL
144720-721	TPH ID	↓

Additional comments:

Gallons purged *	TEMP °C / (F) (circle one)	EC (µs / cm)	PH	TURBIDITY (NTU)		
1. 1.0	65.8	840	6.50	27.1		
2. 2.0	65.0	790	6.47	9.4		
3. 3.0	65.4	830	6.43	5.0		
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.

I

SAMPLING EVENT DATA SHEET

(fill out completely)

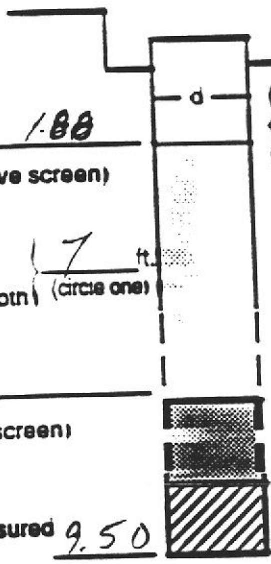
McLaren

WELL OR LOCATION N-23

PROJECT Marketplace- Emeryville EVENT 59801-008 SAMPLER M. Johnson DATE 4-12-90

Well / Hydrologic statistics

Well type MW (MW, EW, etc.)



diameter 2" equals 0.19 gal/ft. casing

SWL 1.88 (if above screen)

packer / intake / bailer depth (circle one) 7 ft.

2.5' TOP

SWL (if in screen)

9.5' BOP

measured T.D. 9.50

9.5' T.D. (as built)

Action	Time	Pump rate	IWL (low yield)
Start pump / Begin	1115	7.2 gal/hour	1.88
Stop	1200		8.02
Sampled	1205		8.47
(Final IWL)	1220		9.03

Purge calculation

0.19 gal/ft. · 7.62 ft. = 1.45 gals x 3 = 4.35 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 pump - cloudy green discharge, no odor; pump set at lowest speed... quick drawdown.

Actual gallons purged 4.5

Actual volumes purged 3+

Well yield ⊕ (see below)

COC # 220560

Sample I.D.	Analysis	Lab
144401, 502, -03, -04	8020	McLaren
144405, 144406	TPH/D	"
144408	Pb, Zn, Cu, As, Se	"
		filtered

Additional comments: HNU:

1055: 6" below casing: 3-13 (A)

TOC: 0.1-1.2 (B)

LSD: ⊖ (C)

see [illegible]

*Casing open on arrival lid [illegible].

Gallons purged *	TEMP °C / °F (circle one)	EC (µs / cm)	PH	TURBIDITY (NTU)	Water level	A	B	C
1. 1.5 (1126)	83.2	2240	6.57	17.8	3.83	3-10	10.2	⊖
2. 3 (1140)	86.3	2300	6.59	11.5	5.65	[illegible]	[illegible]	[illegible]
3. 4.5 (1200)	86.9	2770	6.74	190	2.02	3-12	[illegible]	⊖
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.

II

SAMPLING EVENT DATA SHEET

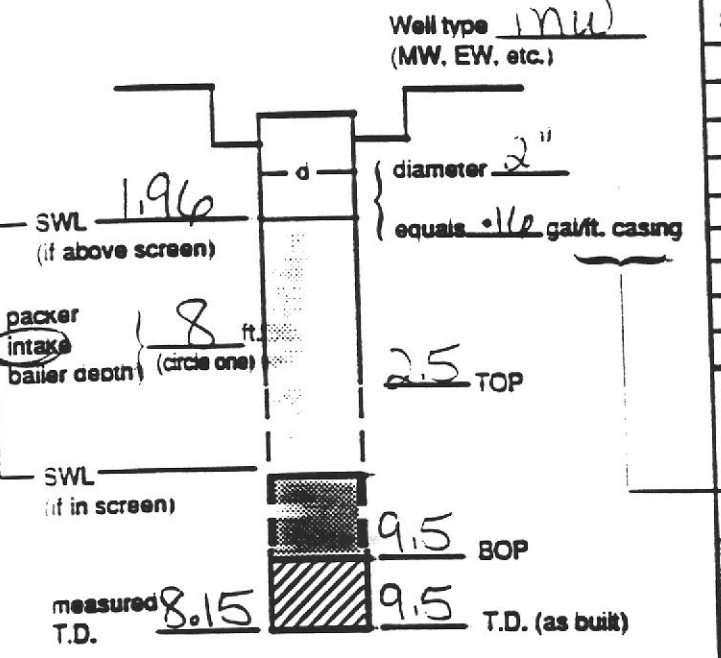
(fill out completely)

McLaren

WELL OR LOCATION MW23

PROJECT Marketplace EVENT Sample SAMPLER LJB DATE 4/18/90

Well / Hydrologic statistics



Action	Time	Pump rate GPM	IWL (low yield)
Start pump / Begin	11:38	0.11	
Stop	12:05	↓	
Sampled	12:18		
(Final IWL)	7.38		

Purge calculation

.16 gal/ft. × 6.19 ft. = 1.0 gals x 3 = 3.0 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:

persist. w/ tubing only

pumped at ≈ 1/2 of highest rate setting.

Actual gallons purged 3.0

Actual volumes purged 3

Well yield ⊕ (see below) MY

Additional comments:

used 8.15 as BOP

COC # 220511

Sample I.D.	Analysis	Lab
144710-713	TOC	MAL
144714-715	TPHID	↓

Gallons purged *	TEMP °C / (F) (circle one)	EC (µs / cm)	PH	TURBIDITY (NTU)		
1. 1.C	64.9	3140	6.68	6.0		
2. 2.C	65.0	2980	6.65	2.9		
3. 3.C	64.1	2950	6.68	2.1		
4.						
5.						

* Take measurement at approximately each casing volume purged.

⊕ HY- Minimal W.L. drop

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

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

VLY - Minimal recharge - unable to purge 3 volumes.

SAMPLING EVENT DATA SHEET

(fill out completely)

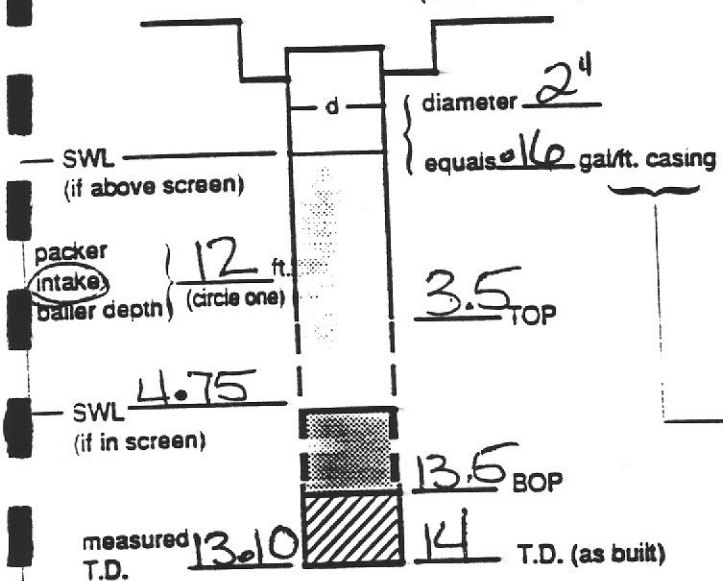
McLaren

WELL OR LOCATION MW24

PROJECT Marketplace EVENT Sample SAMPLER LJB DATE 6-7-90

Well / Hydrologic statistics

Well type MW (MW, EW, etc.)



Action	Time	Pump rate GPM	IWL (low yield)
Start pump / Begin	11:45	0.15	
		↓	
Stop	12:13	↓	4.80
Sampled	12:24		
(Final IWL)	12:26		4.76

Purge calculation

.16 gal/ft. × 8.31 ft. (SWL to BOP or packer to BOP) = 1.33 gals (one volume) × 3 = 4.0 gals. (purge volume-3 casings)

Head purge calculation (Airlift only)

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

Equipment Used / Sampling Method / Description of Event:

peri w/ SSSC

SWL stayed at 4.80 during pumping

Actual gallons purged 4.0

Actual volumes purged 3

Well yield (see below) ⊕ HY

COC # 220144

Sample I.D.	Analysis	Lab
147751-54	BTEX by 602	MAL
147755-58	"	"
147759-61	TPH/Diesel	↓

Additional comments:

Gallons purged *	TEMP °C (°F) (circle one)	EC (µs / cm)	PH	TURBIDITY (NTU)		
1. 1	81.3	2760	7.09	24.1		
2. 2	76.5	2780	6.90	17.44		
3. 3	75.4	2600	6.91	8.62		
4.						
5.						

* Take measurement at approximately each

⊕ HY- Minimal W.L. drop

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

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

VLY - Minimal recharge - unable to purge 3 volumes.

SECTION C.4

WATER LEVEL MEASUREMENTS

McLaren

HYDRODATA

DATE: 2-22-90

PROJECT: Market place EVENT: Sounding SAMPLER: GRF

NO.	WELL OR LOCATION	DATE MO	DA	YR	TIME HR	MIN	MEASUREMENT	CODE	COMMENTS
1	W-1	2	22	90			5.02'		
2	W-4						2.0'		
3	W-5						3.80'		0.1 + Dirt on top casing. Top product: 2.92'
4	W-7						1.75'		Air pressure when opened - Allowed to equil. bottle
5									
6	W-8						1.50'		Cap not on tight covered with mud
7	W-10						2.38'		
8	W-13						3.85'		
9	W-14						4.19'		
10	W-15						2.58'		Annulus to 3' - No seal.
11	W-16						3.92'		Product < 1/10"; Annulus
12									to 3' - No seal.
13	W-17						5.42'		Air pressure when opened - Allowed to equil. bottle
14	W-18						4.42'		covered w/ mud
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)

McLaren

HYDRODATA

DATE: 2/28/20

PROJECT: Emeryville Market Pl. EVENT: Semi-Ref. SAMPLER: LX

NO.	WELL OR LOCATION	DATE MO	DA	YR	TIME HR	MIN	MEASUREMENT	CODE	COMMENTS
1	10	2	28	20	08	00	2.28	SWL	
2	14				08	05	4.46		
3	13					07	4.18		
4	7					10	1.31		
5	1					15	5.02		
6	16					17	3.88		
7	5					25			2.78 oil / 4.43 water
8	17					30	5.35		
9	18					35	4.77		
10	15					40	2.53		
11	8				17	00	1.78		
12	4				08	50	2.39		
13	~~2~~								
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)

McLaren

HYDRODATA

DATE: 4-9-90

PROJECT: Marketplace EVENT: Sounding SAMPLER: CJB

NO.	WELL OR LOCATION	DATE MO	DA	YR	TIME HR	MIN	MEASUREMENT	CODE	COMMENTS
1 ✓	W1	4	9	90	12	28	5.44'		
2 ✓	4				15	26	3.17'		
3 ✓	5	4	10	90	10	48	In-291 H_2O - 4.73		Oil Sounder
4 ✓	7				12	40	2.42'		
5	8				15	34	3.12'		(Block off)
6 ✓	10				15	30	2.68 DRY at T.D.		
7	13				12	54	4.31'		(Block off)
8 ✓	14				12	59	4.36'		
9	15				12	13	2.48'		
10	16				12	30	7.81'		
11	17				12	18	5.72'		
12	18				12	22	5.24		Covered w/ goopy stuff - can't see top of well
13	19				12	35	5.11'		
14	20				13	05	4.08		
15	21				12	40	5.21		
16	22				13	19	7.50'		
17	23				15	22	1.51'		
18									
19	16								
20		4	10	90	10	50	4.13'		

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.

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

McLaren

HYDRODATA

DATE: 6-7-90

PROJECT: Marketplace EVENT: Sound SAMPLER: WJB

NO.	WELL OR LOCATION	DATE MO / DA / YR	TIME HR / MIN	MEASUREMENT	CODE	COMMENTS (Sounder #W22)
1	MW1	6 7 90	10 19	5.37	P519	Box is full of water - Bailed out
2	MW4	(	10 00	2.73	P519	
3	MW5	See Below		~~2.50~~	P519	Box is full of water, bubbles from cap. Bailed but little left
4	MW7		10 55	1.21	P	Same as MW18
5	MW8		10 07	2.90		covered in Bentonite - cap/lock rusted - need new one
6	MW10		9 56	3.14	P519	Tarry splotches on sounder
7	MW13		11 09	3.93	P519	
8	MW14		11 17	5.29	P519	Box is full of water Bailed out
9	MW15		10 27	4.54	P519	Box is full of water - Bailed out
10	MW16		10 12	6.19	P519	
11	MW17				P519	Car on top of well
12	MW18		10 21	4.28		no cap - didn't have any in office last time
13	MW19		10 59	4.77	Dolphin	
14	MW20		11 22	3.79	Dolphin	- needs new one.
15	MW21		11 02	4.84		Dolphin - needs new one
16	MW22		9 45	7.36		Dolphin - needs new one
17	MW23		10 50	1.78		Dolphin
18	MW24	V	11 30	4.75		Dolphin
19						
20	MW5	6 7 90	10 43	Oil 2.50 / H_2O 4.30		

Margin notes: m; ...y strong ...ro ...nell * (MW5); ...ery strong ...esel smell * (MW21)

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)