ACTON •
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van DAM, INC.

Consulting Scientists, Engineers, and Geologists

Future investigations should include
① Analysis for MTBE from well closest to O line
② GW investigation of 2nd aquifer may be necessary

June 2, 1994

Mr. Terrence Fox
Ultramar Inc.
525 West Third Street
Hanford, California 93232

19024.03

Subject: Off-Site Soil and Ground Water Investigation--Beacon Station #604
1619 West First Street, Livermore, California

Dear Mr. Fox:

Acton • Mickelson • van Dam, Inc. (AMV), has been authorized by Ultramar Inc. (Ultramar), to continue an investigation of soil and ground water conditions at Beacon Station #604 located at 1619 West First Street, Livermore, Alameda County, California (Figures 1 and 2). This letter report summarizes the results of soil boring and soil sampling, ground water monitoring well installation, and ground water sampling performed at the site on March 29 and 30, 1994.

Scope of Work

The work included advancing four 8-inch-diameter soil borings at off-site locations to depths of between 47 and 48 feet below grade and completing each of these borings as 2-inch-diameter monitoring wells MW-4, MW-5, MW-6, and MW-7 (Figure 2). Methods used to drill and sample the soil borings are described in Enclosure A.

Selected soil samples were submitted for laboratory analysis of benzene, toluene, ethylbenzene, xylenes (BTEX), and total petroleum hydrocarbons as gasoline (TPHg). Analytical procedures conformed to U.S. Environmental Protection Agency (EPA) and California Environmental Protection Agency, Department of Toxic Substances Control (Cal-EPA) approved methods.

Soil Borings

Soil samples collected from the borings consisted of silty clay, clay, clayey sand, silty gravel, and/or sandy gravel. Approximately 1 foot of concrete or asphalt and gravel road base was encountered at the surface in the borings for monitoring wells MW-4 through MW-7. Soil samples collected from the soil boring for monitoring well MW-6 indicate the following vertical sediment sequence: from the ground surface to 4.5 feet below grade, the soil encountered

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consisted of silty gravel; from 4.5 feet to 18 feet below grade, sandy gravel was encountered; silty clay is present from 18 to 24 feet below grade; from 24 to 31 feet below grade, sandy gravel is present; under the sandy gravel, clayey sand was encountered from 31 to 35 feet below grade; and from 35 to 48 feet below grade, sandy gravel was encountered. Ground water was encountered at approximately 33 feet below grade. The boring was terminated at 48 feet below grade. Soil borings for monitoring wells MW-4, MW-5, and MW-7, each terminated at 47 feet below grade, generally encountered approximately the same sequence of sedimentary materials. Contacts between the soil types varied between gradational and sharp. Soil boring logs containing detailed descriptions of soil conditions encountered in each boring are included in Enclosure B.

Soil Sample Collection

A portion of each soil sample collected from the soil borings was sealed in a plastic bag and allowed to reach ambient air temperature. The headspace of the bag was then screened in the field with a photoionization detector (PID). The PID reading for each sample was recorded on the right-hand side of the boring logs (Enclosure B).

Soil samples were selected for chemical analysis on the basis of PID screening results. Two soil samples collected from above the water table in the boring for monitoring wells MW-4 through MW-6 were submitted for analysis of concentrations of BTEX and TPHg. Three soil samples were submitted for chemical analysis from the boring for monitoring well MW-7. Analytical results of soil samples submitted by AMV are summarized in Table 1. Copies of certified analytical reports for each soil sample submitted to the laboratory during this phase of work are contained in Enclosure D.

Monitoring Well Installation

Ground water monitoring wells MW-4 though MW-7 were constructed of 2-inch-diameter, Schedule 40 PVC casing. Each new well consisted of 20 feet of 0.020 inch slot screened casing. Blank casing extended from the screened interval to the surface. Monitoring well construction details are contained in Enclosure C. The monitoring wells were developed, purged, and sampled in accordance with methods outlined in Enclosure A. A ground water sample from each new well (MW-4, MW-5, MW-6, and MW-7) was submitted for laboratory analysis of BTEX and TPHg by Cal-EPA and EPA-approved methods.

Ground Water Level Measurements

Depth to ground water was measured in the new and existing monitoring wells (MW-1 through MW-7) on March 30, 1994 (Table 2). Ground water was present at depths ranging from

30.97 (MW-3) to 33.38 (MW-6) feet below the top of the well casing. The casing riser on each newly installed monitoring well was surveyed to the casing riser on existing monitoring well MW-2 within the nearest 0.01 foot. Survey notes are included in Enclosure E. Water level measurements indicate an inferred direction of ground water flow toward the northwest as illustrated on Figure 3. Ground water gradient at the site on March 30, 1994, was calculated to be approximately 0.02 foot per foot (ft/ft). Liquid-phase hydrocarbons (LPH) were not detected in any of the monitoring wells on this date. Copies of field observations and data sheets from work performed at the site on March 29 and 30, 1994 are contained in Enclosure E.

Ground Water Sample Collection

After the newly installed monitoring wells were developed and purged on March 30, 1994, ground water samples were collected from monitoring wells MW-4 through MW-7. Samples were collected as described in Enclosure A. Each ground water sample was analyzed for BTEX and TPHg by EPA and Cal-EPA approved methods. Ground water samples from the newly installed wells were reported to contain petroleum hydrocarbon constituents. Analytical results of sampling conducted on March 30, 1994, are summarized in Table 3. Ground water sample analytical results from previous quarters are also included in Table 3. Copies of certified analytical reports for ground water samples collected on March 30, 1994, are contained in Enclosure F.

Ground water quality data for each of the newly installed ground water monitoring wells are presented on Figure 4. (Each well at the site was sampled by AMV on April 25, 1994, during the scheduled quarterly sampling event; these results will be reported in the quarterly monitoring report for the second quarter of 1994.)

Summary of Analytical Results

Soil samples collected at 30 and 35 feet below grade from the borings for monitoring wells MW-4 and MW-5 and from a depth of 20 feet in the boring for monitoring well MW-7 did not contain detectable concentrations of TPHg or BTEX. Soil samples collected at 30 and 35 feet below grade from the boring for monitoring well MW-6 contained TPHg concentrations of 42 and 3.7 mg/kg and benzene concentrations of 0.65 and 0.061 mg/kg, respectively. The soil samples collected from the 35 and 40 feet below grade from the boring for monitoring well MW-7 (within the zone of water table fluctuation) contained TPHg concentrations of 4.9 and 8.8 mg/kg and benzene concentrations of 0.016 and 0.064 mg/kg, respectively.

Petroleum hydrocarbon constituents were detected in the ground water samples collected from each newly constructed well (MW-4 through MW-7) on March 30, 1994. Benzene concentrations in ground water samples collected on March 30, 1994, ranged from 4.2 µg/l

concentrations in ground water samples collected on March 30, 1994, ranged from 4.2 µg/l (MW-4) to 21,000 µg/l (MW-6).

It is recommended that copies of this report be submitted to the following agencies:

Ms. Eva Chu
Department of Environmental Health
Alameda County Health Care Services
80 Swan Way, Room 200
Oakland, California 94612

Mr. Cecil Felix
California Regional Water Quality Control Board
San Francisco Bay Region
2101 Webster Street
Oakland, California 94612

If you have any questions regarding this project, please contact either of the undersigned immediately.

Sincerely,

ACTON • MICKELSON • van DAM, INC.

Steven A. Liaty
Staff Geologist

Dale A. van Dam, R.G.
California Registered Geologist #4632

SAL:maf/mjd
Enclosures

TABLE 1

SOIL SAMPLE ANALYTICAL RESULTS
Beacon Station #604
1619 West First Street, Livermore, California
(concentrations in milligrams per kilogram)

Boring No.	Sample No.	Date Sampled	Depth (feet below grade)	Benzene	Toluene	Ethylbenzene	Total Xylenes	TPHg[a]
MW-4	MW4-6	03-30-94	30	<0.0050	<0.0050	<0.0050	<0.0050	<1.0
	MW4-7		35	<0.0050	<0.0050	<0.0050	<0.0050	<1.0
MW-5	MW5-6	03-29-94	30	<0.0050	<0.0050	<0.0050	<0.0050	<1.0
	MW5-7		35	<0.0050	<0.0050	<0.0050	<0.0050	<1.0
MW-6	MW6-6	03-29-94	30	0.65	1.7	0.72	4.6	42
	MW6-7		35	0.061	0.16	0.094	0.55	3.7
MW-7	MW7-4	03-30-94	20	<0.0050	<0.0050	<0.0050	<0.0050	<1.0
	MW7-7		35	0.016	0.013	0.025	0.048	4.9
	MW7-8		40	0.064	0.029	0.065	0.39	8.8

TABLE 2

GROUND WATER ELEVATION MEASUREMENTS
Beacon Station #604
1619 West First Street, Livermore, California

Monitoring Well	Date	Top of Riser (feet)	Depth of Water (feet)	Ground Water Elevation (feet)	Physical Observation
MW-1	06-01-93	100.00	37.50	62.50	No Product
	06-22-93		38.46	61.54	No Product
	10-06-93		42.22	57.78	No Product
	01-13-94		34.52	65.48	No Product
	03-30-94		31.93	68.07	No Product
MW-2	06-01-93	98.68	38.02	60.66	No Product
	06-22-93		39.07	59.61	No Product
	10-06-93		43.72	54.96	No Product
	01-13-94		35.85	62.83	No Product
	03-30-94		32.82	65.86	No Product
MW-3	06-01-93	97.08	36.18	61.90	No Product
	06-22-93		37.11	61.97	No Product
	10-06-93		41.15	55.93	No Product
	01-13-94		33.95	63.13	No Product
	03-30-94		30.97	66.11	No Product
MW-4	03-30-94	99.35	31.56	67.79	No Product
MW-5	03-30-94	98.37	32.07	66.30	No Product
MW-6	03-30-94	97.62	33.38	64.24	No Product
MW-7	03-30-94	98.03	31.98	66.05	No Product

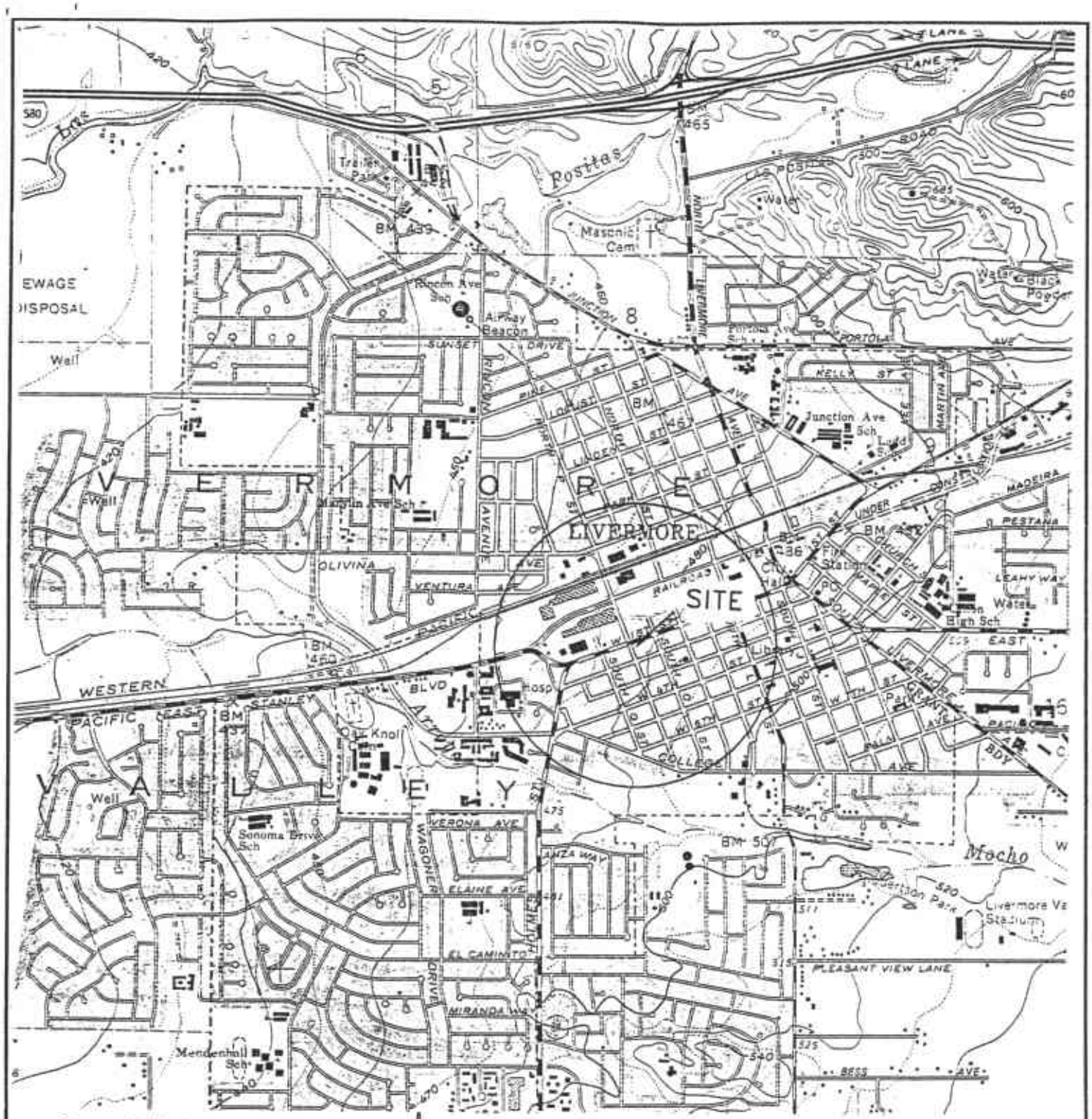
Note: Monitoring well casing elevations were surveyed relative to an arbitrary bench mark at the top of the casing of monitoring well MW-1 with an assumed elevation of 100.00 feet.

TABLE 3

GROUND WATER SAMPLE ANALYTICAL RESULTS
Beacon Station #604
1619 West First Street, Livermore, CA
Concentrations in micrograms per liter (μg/l)

Monitoring Well	Date Sampled	Benzene	Toluene	Ethylbenzene	Total Xylenes	TPHg[a]
MW-1	06-01-93	2,200	400	<50	4,900	27,000
	06-22-93	8,000	10,000	260	10,000	87,000
	10-06-93	4,700	6,500	740	5,300	40,000
	01-13-94	1,300	950	110	850	9,400
	03-30-94[b]					
MW-2	06-01-93	20,000	21,000	3,300	18,000	170,000
	06-22-93	19,000	22,000	3,500	18,000	160,000
	10-06-93	17,000	17,000	3,000	15,000	110,000
	01-13-94	20,000	19,000	2,300	14,000	93,000
	03-30-94[b]					
MW-3	06-01-93	4.6	<0.50	<0.50	1.9	270
	06-22-93	8.2	<0.50	<0.50	0.72	160
	10-06-93	57	110	24	120	740
	01-13-94	2.6	0.67	0.78	4.2	83
	03-30-94[b]					
MW-4	03-30-94	4.2	15	2.5	26	120
MW-5	03-30-94	1,300	20	<13	160	7,500
MW-6	03-30-94	21,000	8,600	1,700	12,000	63,000
MW-7	03-30-94	7,200	2,400	1,600	11,000	43,000

[a]Total petroleum hydrocarbons as gasoline
[b]Well not sampled on this date



General Notes

Base Map from U.S.G.S.
Livermore, California
7.5 Minute Topographic
Photorevised 1980

FIGURE 1

SITE LOCATION MAP
BEACON STATION #604
1619 WEST FIRST STREET
LIVERMORE, CALIFORNIA

Project No.	Drawn
19024	LMC
File No.	Prepared
FIG1	SAL
Revision	Reviewed

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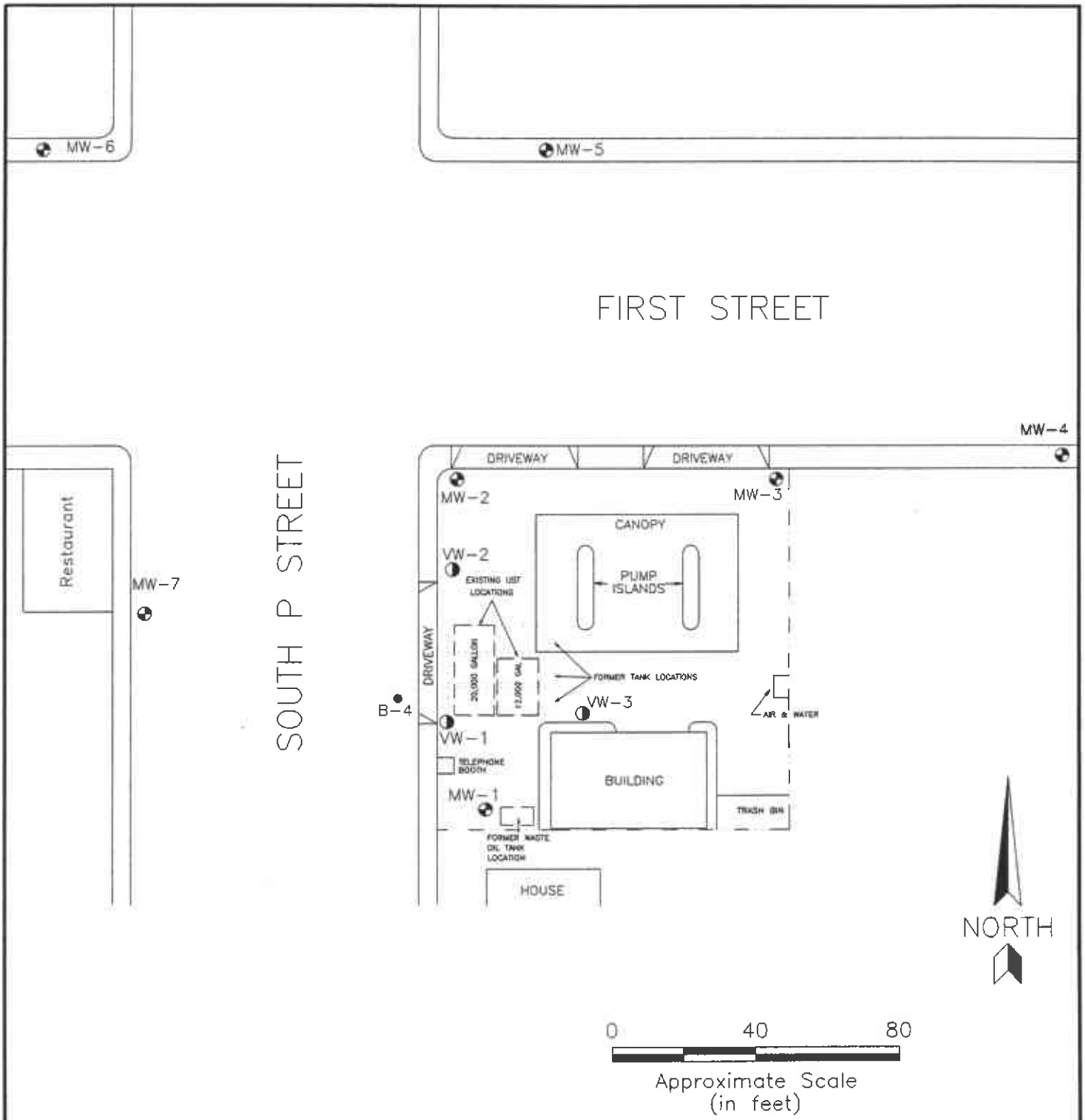

LEGEND

- VW-3 — VADOSE WELL LOCATION AND NUMBER
- MW-3 — MONITORING WELL LOCATION AND NUMBER
- B-4 — SOIL BORING LOCATION AND NUMBER
- — — PROPERTY BOUNDARY

FIGURE 2

SITE MAP

BEACON STATION #604
1619 WEST FIRST STREET
LIVERMORE, CALIFORNIA

Project No.	Drawn
19024.03	LMC
File No.	Prepared
FIG2	TAD
Revision	Reviewed

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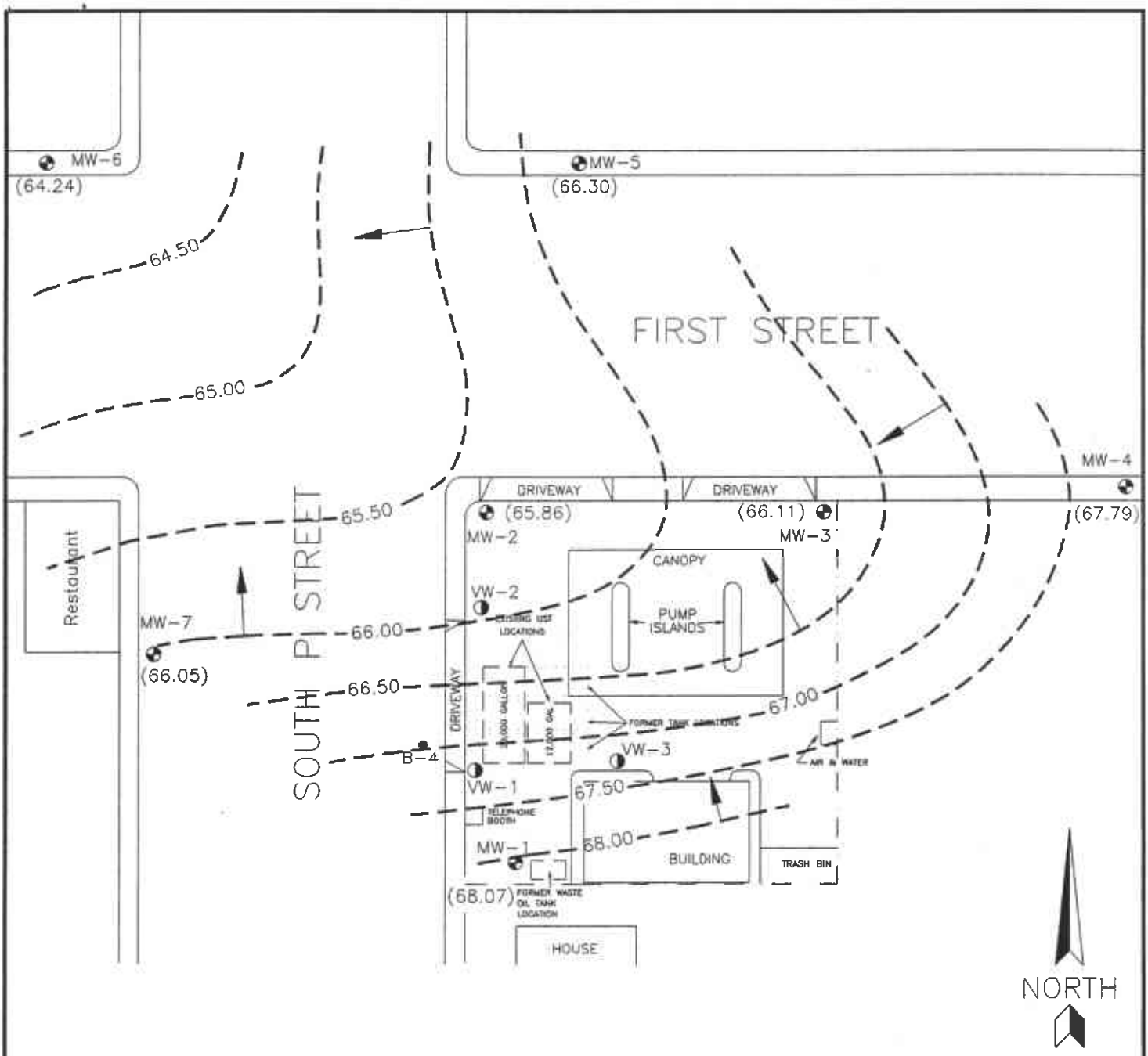

LEGEND

- VW-3 — VADOSE WELL LOCATION AND NUMBER
- MW-3 — MONITORING WELL LOCATION AND NUMBER
- B-4 — SOIL BORING LOCATION AND NUMBER
- — — PROPERTY BOUNDARY
- (66.05) — GROUND WATER ELEVATION (FEET)
- 68.00 — GROUND WATER ELEVATION CONTOUR WITH INFERRED DIRECTION OF FLOW

0 40 80

Approximate Scale (in feet)

FIGURE 3

GROUND WATER TABLE CONTOUR MAP (03/30/94)

BEACON STATION #604
1619 WEST FIRST STREET
LIVERMORE, CALIFORNIA

Project No. 19024.03	Drawn LMC
File No. FIG3A	Prepared SAL
Revision	Reviewed

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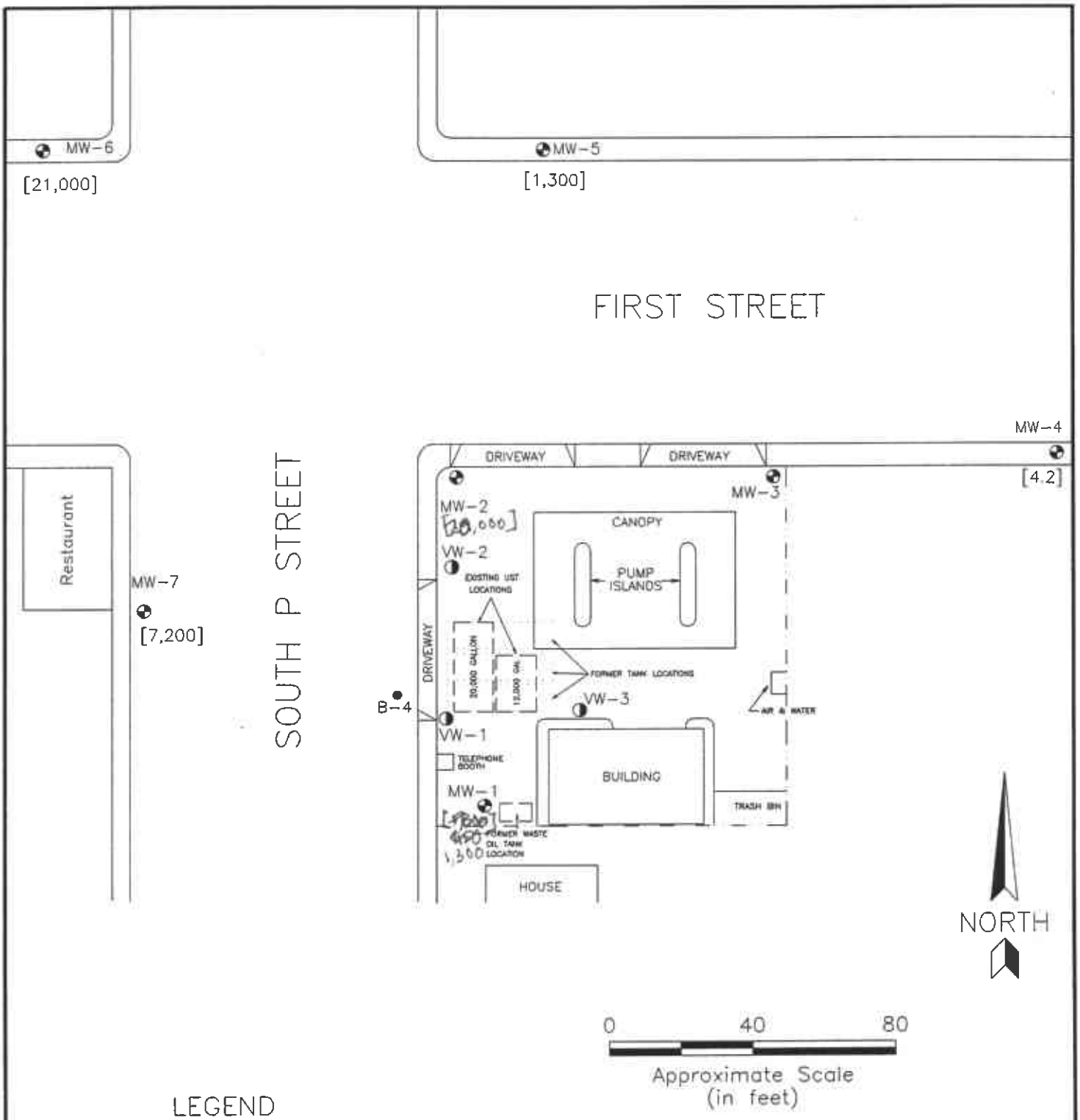

LEGEND

VW-3 ◑	VADOSE WELL LOCATION AND NUMBER
MW-3 ◓	MONITORING WELL LOCATION AND NUMBER
B-4 •	SOIL BORING LOCATION AND NUMBER
— —	PROPERTY BOUNDARY
[4.2]	BENZENE CONCENTRATION IN MICROGRAMS PER/LITER

FIGURE 4
DISTRIBUTION OF BENZENE IN GROUND WATER (3/30/94)

BEACON STATION #604
1619 WEST FIRST STREET
LIVERMORE, CALIFORNIA

Project No. 19024.03	Drawn LMC
File No. FIG4	Prepared SAL
Revision	Reviewed

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ENCLOSURE A

SAMPLING TECHNIQUES

ENCLOSURE A

SAMPLING TECHNIQUES

Proper sampling techniques must be followed to assure that samples represent actual field conditions and that samples are labeled, preserved, and transported properly to retain sample integrity. This exhibit describes procedures to be followed by Acton • Mickelson • van Dam, Inc. (AMV), during collection of samples of subsurface soil and ground water. Sampling guidance documents from the American Society of Testing and Materials (ASTM), U.S. Environmental Protection Agency (EPA), and California Environmental Protection Agency (Cal-EPA) will be followed for all sampling procedures. Actual sampling procedures to be employed will be based on field conditions and may differ from those described here.

1.0 EXPLORATION BORING/SOIL SAMPLING PROCEDURES

Soil borings and soil sampling will be performed under the direction of an AMV geologist. The soil borings will be advanced using a truck-mounted, hollow-stem auger drill rig.

Soil samples will be collected at 5-foot vertical intervals. Soil sampling will be done in accordance with ASTM 1586-84. Using this procedure, three 2-inch-diameter, 6-inch-length, brass tubes are placed in a California-type split-barrel sampler. The sampler is driven into the soil by a 140-pound weight falling 30 inches. After an initial set of 6 inches, the number of blows required to drive the sampler an additional 12 inches is known as penetration resistance, or the "N" value. The "N" value is used as an empirical measure of the relative density of cohensionless soils and the consistency of cohesive soils.

Upon recovery of the split-barrel sampler, the brass tubes containing the soil will be removed. One of the three brass tubes will be sealed at the ends with Teflon tape and plastic end caps. The sample will be labeled with an identification number, time, date, location, and requested laboratory analysis. The sample will then be placed in a plastic bag and stored at approximately 4° Celsius (C) in an ice chest for transport to the laboratory. Sample custody procedures outlined in Section 5.0 of this exhibit will be followed. This will be performed for each sample collection.

Soil in one of the brass tubes will be extracted upon recovery, placed in a plastic bag, and sealed for later screening for organic vapors using a photoionization detector (PID) or a flame ionization detector (FID). The remaining portion of the soil sample will be examined and a complete log of soil conditions will be recorded on a soil boring log (Enclosure A) using the Unified Soil Classification System (Enclosure B). The soil will be examined for grain size, color, and moisture content.

The split-barrel sampler will be cleaned to prevent cross-contamination for each sampling interval using procedures described in Section 3.0.

Soil borings will normally be advanced with 8- or 10-inch-diameter, hollow-stem augers. The soil generated from the soil borings will be wrapped in plastic sheeting and stored on site until characterized for disposal.

2.0 WATER LEVEL AND LIQUID-PHASE HYDROCARBON (LPH) THICKNESS MEASUREMENTS AND GROUND WATER SAMPLING

2.1 Water Level and LPH Thickness Measurements

The static water level and LPH thickness in each well will be measured prior to purging or sampling.

The depth to water/product will be measured using an electronic interface probe. The wire of the interface probe is marked at 0.01 foot intervals. One tone is emitted from the interface probe if LPH is encountered; another tone for water. The wire of the interface probe will be lowered slowly until LPH or water is encountered. At this point, the mark on the interface wire opposite the permanent reference point on the top of the well casing will be read to the nearest 0.01 foot and recorded. If the first encountered substance is LPH, the probe will be lowered until the tone corresponding to water is emitted. This depth will also be recorded. The difference between the two depths corresponds to the LPH thickness. The interface probe will be rinsed in a cleaning solution and deionized water between measurements in different wells.

A permanent reference point will be marked on the well casings. The permanent reference point on the well casings will be surveyed to a common reference point. All well casing riser elevations will be known to within 0.01 foot.

Prior to well development, a disposable bailer will be used to collect a sample of LPH, if present in a well, for subjective analysis. The sample will be collected by gently lowering the bailer approximately one-half the bailer length past the air/LPH interface. The appearance (color, opacity, "freshness") will be described and noted on field notes.

If LPH is encountered in the well, it will be removed by bailing or pumping and the approximate volume of LPH removed will be recorded. LPH thickness will be remeasured. If LPH is still present, the thickness will be recorded and the well will not be sampled. If LPH is not present, the well will be developed, purged, and sampled as described below.

2.2 Well Evacuation

After the static water level in a well is determined and prior to collection of a ground water sample, stagnant water will be removed from the well casing and the surrounding gravel pack by bailing, pumping, or with a vacuum truck. At least three casing volumes of water will be

removed from each well from which a sample was collected. The volume of water in the casing will be determined from the known elevation of the water surface, the well bottom elevation (as measured when the well is installed), and the well diameter.

If the well is bailed or pumped during purging, samples will be collected and field analyzed for pH, temperature, and specific conductance. The well will be considered stabilized when repeated readings of the following parameters are within the ranges indicated as follows:

- Specific conductance ±10 percent of the reading range
- pH ±0.1 pH unit
- Temperature ±0.5° C.

After stabilization, and after at least three well volumes are evacuated, a sample will be collected for analysis. The field container used for well stabilization measurements, and the pH, temperature, and conductivity probes will be rinsed between wells with deionized water.

All purge water will be containerized and properly handled and documented for disposal. If the containers are stored on site, a label specifying the date of purging, source, and the known or suspected nature of the contents will be affixed to each container.

2.3 Sample Collection, Preservation, and Handling

After purging, a new polyethylene disposable bailer will be used to collect samples for analysis. The bailer is attached to a new disposable rope and lowered slowly into the water to avoid agitation of the collected sample. Containers for volatile organics analyses will be filled completely so that no airspace remains in the vial after sealing.

All sample containers will be prewashed and prepared at the analyzing laboratory in accordance with quality assurance/quality control protocols of the laboratory. Only sample containers appropriate for the intended analyses will be used.

3.0 DECONTAMINATION AND DISPOSAL PROCEDURES

3.1 Equipment Decontamination

All equipment that comes in contact with potentially contaminated soil, drilling fluid, air, or water will be decontaminated before each use. Decontamination will consist of steam-cleaning, a high-pressure, hot-water rinse, or trisodium phosphate (TSP) wash and freshwater rinse, as appropriate.

Drilling and sampling equipment will be decontaminated as follows:

1. Drill rig augers, drill rods, and drill bits will be steam-cleaned prior to use and between borings. Visible soil, grease, and other impurities will be removed.

2. Soil sampling equipment will be steam-cleaned prior to use and between each boring. Prior to individual sample collection, any sampling device will also be cleaned in a TSP solution and rinsed twice in clean water. Any visible soil residue will be removed.

3. It is anticipated that disposable equipment will be used to collect water samples. If disposable equipment is not used, water sampling equipment will be decontaminated using methods described in Item 2 above for soil sampling equipment.

4. Water sampling containers will be cleaned and prepared by the respective analytical laboratories.

5. Stainless steel or brass soil sampling tubes will be steam-cleaned or washed in TSP solution and rinsed with clean water.

6. Field monitoring equipment (pH, conductivity, or temperature probes) will be rinsed with clean water prior to use and between samples.

4.0 FIELD MEASUREMENTS

Field data will be collected during various sampling and monitoring activities; this section describes routine procedures to be followed by personnel performing field measurements. The methods presented below are intended to ensure that field measurements are consistent and reproducible when performed by various individuals.

4.1 Buried Utility Locations

Prior to commencement of work on site, AMV will contact appropriate utility companies to have underground utility lines located. All work associated with the borings will be preceded by hand augering to a minimum depth of 5 feet below grade to avoid contact with underground utilities.

4.2 Lithologic Logging

A log of soil conditions encountered during the drilling and sample collection (Enclosure A) will be maintained using the Unified Soil Classification System (Enclosure B) by an AMV geologist. All boring logs will be reviewed by a California registered geologist.

The collected soil samples will be examined and the following information recorded: boring location, sample interval and depth, blow counts, color, soil type, moisture content (qualitative), and depth at which ground water (if present) is first encountered. Also recorded on the soil boring logs will be the field screening results derived from the use of a portable PID or FID.

4.3 Disposal Procedures

Soils and fluids that are produced and/or used during the installation and sampling of borings, and that are known or suspected to contain potentially hazardous materials, will be contained during the above operations. These substances will be retained on site until chemical testing has been completed to determine the proper means of disposal. Handling and disposal of substances known or suspected to contain potentially hazardous materials will comply with the applicable regulations of Cal-EPA, the California Department of Water Resources, and any other applicable regulations. Soils and fluids produced and/or used during the above-described operations that appear to contain potentially hazardous materials will be disposed of appropriately.

Residual substances generated during cleaning procedures that are known or suspected to pose a threat to human health or the environment will be placed in appropriate containers until chemical testing has been completed to determine the proper means for their disposal.

4.4 Conductivity, Temperature, and pH

Specific conductance, water temperature, and pH measurements will be made when a water sample is collected. Regardless of the sample collection method, a representative water sample will be placed in a transfer bottle used solely for field parameter determinations. A conventional pH meter with a combination electrode or equivalent will be used for field-specific conductance measurements. Temperature measurements will be performed using standard thermometers or equivalent temperature meters. Combination instruments capable of measuring two or all three of the parameters may also be used.

All instruments will be calibrated in accordance with manufacturer methods. The values for conductivity standards and pH buffers used in calibration will be recorded daily in a field notebook. All probes will be thoroughly cleaned and rinsed with fresh water prior to any measurements, in accordance with Section 3.1.

5.0 SAMPLE CUSTODY

This section describes standard operating procedures for sample custody and custody documentation. Sample custody procedures will be followed through sample collection, transfer, analysis, and ultimate disposal. The purpose of these procedures is to assure that (1) the

integrity of samples is maintained during their collection, transportation, and storage prior to analysis and (2) post-analysis sample material is properly disposed of. Sample custody is divided into field procedures and laboratory procedures, as described below.

5.1 Field Custody Procedures

Sample quantities, types, and locations will be determined before the actual fieldwork commences. As few people as possible will handle samples. The field sampler is personally responsible for the care and custody of the collected samples until they are properly transferred.

5.1.1 Field Documentation

Each sample will be labeled and sealed properly immediately after collection. Sample identification documents will be carefully prepared so that identification and chain-of-custody records can be maintained and sample disposition can be controlled. Forms will be filled out with waterproof ink. The following sample identification documents will be utilized.

- Sample labels
- Field notebook
- Chain-of-custody forms

5.1.2 Sample Labels

Sample labels provide identification of samples. Preprinted sample labels will be provided. Where necessary, the label will be protected from water and solvents with clean label-protection tape. Each label will contain the following information:

- Name of collector
- Date and time of collection
- Place of collection
- AMV project number
- Sample number
- Preservative (if any)

5.1.3 Field Notebook

Information pertinent to a field survey, measurements, and/or sampling must be recorded in a bound notebook. Entries in the notebook should include the following:

- Name and title of author, date and time of entry, and physical/environmental conditions during field activity.
- Location of sampling or measurement activity.
- Name(s) and title(s) of field crew.

- Type of sampled or measured media (e.g., soil, ground water, air, etc.)
- Sample collection or measurement method(s).
- Number and volume of sample(s) taken.
- Description of sampling point(s).
- Description of measuring reference points.
- Date and time of collection or measurement.
- Sample identification number(s).
- Sample preservative (if any).
- Sample distribution (e.g., laboratory).
- Field observations/comments.
- Field measurements data (pH, etc.).

5.1.4 Chain-of-Custody Record

A chain-of-custody record will be filled out for and will accompany every sample and every shipment of samples to the analytical laboratories in order to establish the documentation necessary to trace sample possession from the time of collection. The record will contain the following information:

- Sample or station number or sample I.D.
- Signature of collector, sampler, or recorder.
- Date and time of collection.
- Place of collection.
- Sample type.
- Signatures of persons involved in the chain of possession.
- Inclusive dates of possession.

The laboratory portion of the form should be completed by laboratory personnel and will contain the following information:

- Name of person receiving the sample.
- Laboratory sample number.
- Date and time of sample receipt.
- Analyses requested.
- Sample condition and temperature.

5.1.5 Sample Transfer and Shipment

Samples will always be accompanied by a chain-of-custody record. When transferring samples, the individuals relinquishing and receiving the samples will sign, date, and note the time on the chain-of-custody record. Samples will be packaged properly for shipment and dispatched to the

appropriate laboratory for analysis. The chain-of-custody record will accompany each shipment. The method of shipment, courier name(s), and other pertinent information will be entered in the chain-of-custody record.

5.2 Laboratory Custody Procedures

A designated sample custodian will accept custody of the shipped samples and verify that the information on the sample label matches that on the chain-of-custody record. Information regarding method of delivery and sample conditions will also be checked on the chain-of-custody record. The custodian will then enter the appropriate data into the laboratory sample tracking system. The laboratory custodian may use the sample number on the sample label or may assign a unique laboratory number to each sample. The custodian will then transfer the sample(s) to the proper analyst(s) or store the sample(s) in the appropriate secure area.

Laboratory personnel are responsible for the care and custody of samples from the time they are received until the sample is exhausted. Once at the laboratory, the samples are handled in accordance with U.S. Environmental Protection Agency SW-846, Test Methods for Evaluating Solid Waste Physical/Chemical Methods, Third Edition, for the intended analyses. All data sheets, chromatographs, and laboratory records will be filed as part of the permanent documentation.

5.3 Corrections to Documentation

Original data recorded in field notebooks, chain-of-custody records, and other forms should be written in ink. These documents should not be altered, destroyed, or discarded, even if they are illegible or contain inaccuracies that require a replacement document.

If an error is made or found on a document, the individual making the corrections will do so by crossing a single line through the error, entering the correct information, and initialing and dating the change. The erroneous information will be obliterated. Any subsequent error(s) discovered on a document will be corrected. All corrections will be initialed and dated.

5.4 Sample Storage and Disposal

Samples and extracts should be retained by the analytical laboratory for 60 days after a written report is issued by the laboratory. Unless notified by the program manager, excess or unused samples should be disposed of by the laboratory in an appropriate manner consistent with applicable government regulations.

ENCLOSURE B

SOIL BORING LOGS

Acton • Mickelson • van Dam, Inc.

Consulting Scientists, Engineers, and Geologists

Log of Soil Boring: MW-4

Project Number: 19024.03

Location: Beacon #604
1619 West First Street
Livermore, Califorina

Drilling Company: V & W Drilling
Drilled By: Robert Vickery
Drilling Method: 8" O.D. HSA, B-61 HDX Mobile Drill Rig
Sampling Method: Califorina Modified Split Spoon Sampler
Fitted With 2"x6" Brass Sample Sleeves

OVM/OVA: hNu PID with 10.2 eV probe

Drilling	Time	Date
Start	1115	3/30/94
Finish	1300	3/30/94

Water Depth (Date): 31.56 Feet (3/30/94)
Casing Elevation: 99.35 Feet
Completion Depth: 47 Feet
Logged By: S. Liaty
Checked By:

DEPTH (feet)	SAMPLE INTERVAL	DESCRIPTION	GRAPHIC LOG	USCS CLASS	WELL CONSTRUCTION	BLOWS/0 IN.	INCHES DRIVEN	INCHES RECOVD	COMMENTS	SAMPLE NO.	FIELD OVM/OVA READING (ppm)
		CONCRETE AND ROAD BASE							Gravel up to 1.75 inches in diameter.		
		SILTY GRAVEL, moderately dark yellowish brown, damp, dense,		GM							
5		SANDY GRAVEL, yellowish brown, damp, very dense, fine- to medium-grained sand		GW		13 15 15	18	18	Gravel up to 1.5 inches in diameter.	MW4-1	<1
10						26 50/ 6"	12	12		MW4-2	<1
15		Mottled reddish brown, partially cemented at 15 feet				22 50/ 6"	12	12		MW4-3	<1
		SILTY CLAY with trace sand, dark yellowish brown, moist, dense, fine- to medium-grained sand		CL		12 13 16	18	18	Gravel up to 1.5 inches in diameter.	MW4-4	<1
20											
25		SANDY GRAVEL, yellowish brown, moist, dense, fine- to medium-grained sand		GW		11 17 26	18	18		MW4-5	<1
		CLAYEY SAND with minor gravel, dark yellowish brown, very dense, coarse-grained		SC							
30											

(Boring continued on next page)

Acton • Mickelson • van Dam, Inc.

Consulting Scientists, Engineers, and Geologists

Log of Soil Boring: MW-4

Project Number: 19024.03

Location: Beacon #604
1619 West First Street
Livermore, Califorina

Drilling Company: V & W Drilling
Drilled By: Robert Vickery
Drilling Method: 8" O.D. HSA, B-61 HDX Mobile Drill Rig
Sampling Method: Califorina Modified Split Spoon Sampler
Fitted With 2"x6" Brass Sample Sleeves

OVM/OVA: hNu PID with 10.2 eV probe

Drilling	Time	Date
Start	1115	3/30/94
Finish	1300	3/30/94

Water Depth (Date): 31.56 Feet (3/30/94)
Casing Elevation: 99.35 Feet
Completion Depth: 47 Feet
Logged By: S. Liaty
Checked By:

DEPTH (feet)	SAMPLE INTERVAL	DESCRIPTION	GRAPHIC LOG	USCS CLASS	WELL CONSTRUCTION	BLOWS/6 IN.	INCHES DRIVEN	INCHES RECOV'D	COMMENTS	SAMPLE NO.	FIELD OVM/OVA READING (ppm)
		CLAYEY SAND with minor gravel, dark yellowish brown, very dense, coarse-grained		SC		29 32 34	18	18		MW4-6	<1
35		SANDY GRAVEL, dark yellowish brown, saturated, very dense, fine- to medium-grained sand		GW		29 50/ 6"	12	12	Gravel up to 1.5 inches in diameter.	MW4-7	<1
40						17 23 36	18	14		MW4-8	<1
45						16 22 35	18	10	Boring terminated approximately 15 feet below the water table.	MW4-9	<1
50		Boring terminated. Total depth = 47 feet									
55											
60											

Acton • Mickelson • van Dam, Inc.

Consulting Scientists, Engineers, and Geologists

Log of Soil Boring: ~~MW-5~~

Project Number: 19024.03

Location: Beacon #604
1619 West First Street
Livermore, Califorina

Drilling Company: V & W Drilling
Drilled By: Robert Vickery
Drilling Method: 8" O.D. HSA, B-61 HDX Mobile Drill Rig
Sampling Method: Califorina Modified Split Spoon Sampler
Fitted With 2"x6" Brass Sample Sleeves

OVM/OVA: hNu PID with 10.2 eV probe

Drilling	Time	Date
Start	1000	3/29/94
Finish	1130	3/29/94

Water Depth (Date) : 32.07 Feet (3/30/94)
Casing Elevation: 98.37 Feet
Completion Depth: 47 Feet
Logged By: S. Liaty
Checked By:

DEPTH (feet)	SAMPLE INTERVAL	DESCRIPTION	GRAPHIC LOG	USCS CLASS	WELL CONSTRUCTION	BLOWS/6 IN.	INCHES DRIVEN	INCHES RECOV'D	COMMENTS	SAMPLE NO.	FIELD OVM/OVA READING (ppm)
		CONCRETE AND ROAD BASE									
		SILTY GRAVEL, moderate yellowish brown, damp, very dense		GM					Gravel up to 1.5 inches in diameter.		
5						50/6"	8	8		MW5-1	<1
		SANDY GRAVEL, dark yellowish brown, damp, very dense, fine- to medium-grained sand		GW					Gravel up to 1.5 inches in diameter.		
10						50 50/3"	9	9		MW5-2	<1
15						38 50/6"	12	12		MW5-3	<1
		SILTY SAND, yellowish brown, moist, medium dense, slightly stiff, fine-grained		SM							
20						7 11 14	18	18		MW5-4	<1
		CLAY, dark yellowish brown, moist, hard		CL							
25		Minor gravel at 25 feet				15 21 19	18	18		MW5-5	<1
30		SANDY GRAVEL, gray, moist, dense, saturated, fine- to medium-grained sand									

(Boring continued on next page)

Acton • Mickelson • van Dam, Inc.

Consulting Scientists, Engineers, and Geologists

Log of Soil Boring: MW-5

Project Number: 19024.03

Location: Beacon #604
1619 West First Street
Livermore, Califorina

Drilling Company: V & W Drilling
Drilled By: Robert Vickery
Drilling Method: 8" O.D. HSA, B-61 HDX Mobile Drill Rig
Sampling Method: Califorina Modified Split Spoon Sampler
Fitted With 2"x6" Brass Sample Sleeves

OVM/OVA: hNu PID with 10.2 eV probe

Drilling	Time	Date
Start	1000	3/29/94
Finish	1130	3/29/94

Water Depth (Date): 32.07 Feet (3/30/94)
Casing Elevation: 98.37 Feet
Completion Depth: 47 Feet
Logged By: S. Liaty
Checked By:

DEPTH (feet)	SAMPLE INTERVAL	DESCRIPTION	GRAPHIC LOG	USCS CLASS	WELL CONSTRUCTION	BLOWS/6 IN.	INCHES DRIVEN	INCHES RECOV'D	COMMENTS	SAMPLE NO.	FIELD OVM/OVA READING (ppm)
35		SANDY GRAVEL, gray, dense, saturated, fine- to medium-grained sand		CL GW		10 21 28	18	18	Gravel up to 1 inch in diameter.	MW5-6	<1
						26 50/ 5"	11	10		MW5-7	<1
40						25 30 50/ 6"	18	18		MW5-8	<1
45									No sample collected at 45 feet.		
		Boring terminated. Total depth = 47 feet							Boring terminated approximately 15 feet below the water table.		
50											
55											
60											

Acton • Mickelson • van Dam, Inc.

Consulting Scientists, Engineers, and Geologists

Log of Soil Boring: MW-6

Project Number: 19024.03

Location: Beacon #604
1619 West First Street
Livermore, Califorina

Drilling Company: V & W Drilling
Drilled By: Robert Vickery
Drilling Method: 8" O.D. HSA, B-61 HDX Mobile Drill Rig
Sampling Method: Califorina Modified Split Spoon Sampler
Fitted With 2"x6" Brass Sample Sleeves

OVM/OVA: hNu PID with 10.2 eV probe

Drilling	Time	Date
Start	1310	3/29/94
Finish	1445	3/29/94

Water Depth (Date): 33.38 Feet (3/30/94)
Casing Elevation: 97.62 Feet
Completion Depth: 48 Feet
Logged By: S. Liaty
Checked By:

DEPTH (feet)	SAMPLE INTERVAL	DESCRIPTION	GRAPHIC LOG	USCS CLASS	WELL CONSTRUCTION	BLOWS/6 IN.	INCHES DRIVEN	INCHES RECOVD	COMMENTS	SAMPLE NO.	FIELD OVM/OVA READING (ppm)
		CONCRETE AND ROAD BASE							Gravel up to 1 inch in diameter.		
		SILTY GRAVEL, dark yellowish brown, damp, very dense		GM							
5		SANDY GRAVEL, dark yellowish brown, moist, very dense, fine- to medium-grained sand		GW		11 21 34	18	14	Gravel up to 1.5 inches in diameter.	MW6-1	<1
10						12 50/ 5"	11	11		MW6-2	<1
15						10 28 36	18	16		MW6-3	<1
20		SILTY CLAY, dark yellowish brown, moist, very stiff		CL		6 8 10	18	18		MW6-4	<1
25		SANDY GRAVEL, yellowish brown, moist, moderately dense, fine- to medium-grained sand		GW		7 17 25	18	18	Gravel up to 1.5 inches in diameter.	MW6-5	<1
30											

(Boring continued on next page)

Acton • Mickelson • van Dam, Inc.

Consulting Scientists, Engineers, and Geologists

Log of Soil Boring: MW-6

Project Number: 19024.03

Location: Beacon #604
1619 West First Street
Livermore, Califorina

Drilling Company: V & W Drilling
Drilled By: Robert Vickery
Drilling Method: 8" O.D. HSA, B-61 HDX Mobile Drill Rig
Sampling Method: Califorina Modified Split Spoon Sampler
Fitted With 2"x6" Brass Sample Sleeves

OVM/OVA: hNu PID with 10.2 eV probe

Drilling	Time	Date
Start	1310	3/29/94
Finish	1445	3/29/94

Water Depth (Date): 33.38 Feet (3/30/94)
Casing Elevation: 97.62 Feet
Completion Depth: 48 Feet
Logged By: S. Liaty
Checked By:

DEPTH (feet)	SAMPLE INTERVAL	DESCRIPTION	GRAPHIC LOG	USCS CLASS	WELL CONSTRUCTION	BLOWS/6 IN.	INCHES DRIVEN	INCHES RECOVD	COMMENTS	SAMPLE NO.	FIELD OVM/OVA READING (ppm)
		SANDY GRAVEL, yellowish brown, moist, moderately dense, fine- to medium-grained sand		GW		6 9 12	18	18	Gravel up to .5 inches in diameter.	MW6-6	<1
				SC							
		CLAYEY SAND with minor gravel, dark yellowish brown, moist, fine- to medium-grained sand				10 28 40	18	18		MW6-7	<1
35				GW							
		SANDY GRAVEL, gray, saturated, very dense, medium- to coarse-grained sand									
40						29 50/ 5"	11	11	Soil appears to be stained. Gravel up to 1 inch in diameter.	MW6-8	<1
45											
		Boring terminated. Total depth = 48 feet							Boring terminated approximately 15 feet below the water table.		
50											
55											
60											

Acton • Mickelson • van Dam, Inc.

Consulting Scientists, Engineers, and Geologists

Log of Soil Boring: MW-7

Project Number: 19024.03

Location: Beacon #604
1619 West First Street
Livermore, Califorina

Drilling Company: V & W Drilling
Drilled By: Robert Vickery
Drilling Method: 8" O.D. HSA, B-61 HDX Mobile Drill Rig
Sampling Method: Califorina Modified Split Spoon Sampler
Fitted With 2"x6" Brass Sample Sleeves

OVM/OVA: hNu PID with 10.2 eV probe

Drilling	Time	Date
Start	0815	3/30/94
Finish	0935	3/30/94

Water Depth (Date): 31.98 Feet (3/30/94)
Casing Elevation: 98.03 Feet
Completion Depth: 47 Feet
Logged By: S. Liaty
Checked By:

DEPTH (feet)	SAMPLE INTERVAL	DESCRIPTION	GRAPHIC LOG	USCS CLASS	WELL CONSTRUCTION	BLOWS/6 IN.	INCHES DRIVEN	INCHES RECOV'D	COMMENTS	SAMPLE NO.	FIELD OVM/OVA READING (ppm)
		ASPHALT AND ROAD BASE							Gravel up to 1.5 inches in diameter.		
		SILTY GRAVEL, yellowish brown, damp, dense to very dense		GM							
5						11 24 28	18	18	Gravel up to 1.5 inches in diameter.	MW7-1	<1
		SANDY GRAVEL, dark yellowish brown with gray mottling, moist, very dense, fine- to medium-grained sand		GW							
10						50 50/ 6"	12	12		MW7-2	<1
15						37 50/ 6"	12	12		MW7-3	<1
		SILTY CLAY, dark yellowish brown, moist, hard		CL							
20						10 17 17	18	18		MW7-4	<1
		SANDY GRAVEL, yellowish brown, moist, very dense, fine- to medium-grained sand		GW					Gravel up to 1.5 inches in diameter.		
25						21 50/ 6"	12	12		MW7-5	<1
30						23					

(Boring continued on next page)

Acton • Mickelson • van Dam, Inc.

Consulting Scientists, Engineers, and Geologists

Log of Soil Boring: MW-7

Project Number: 19024.03

Location: Beacon #604
1619 West First Street
Livermore, Califorina

Drilling Company: V & W Drilling
Drilled By: Robert Vickery
Drilling Method: 8" O.D. HSA, B-61 HDX Mobile Drill Rig
Sampling Method: Califorina Modified Split Spoon Sampler
Fitted With 2"x6" Brass Sample Sleeves

OVM/OVA: hNu PID with 10.2 eV probe

Drilling	Time	Date
Start	0815	3/30/94
Finish	0935	3/30/94

Water Depth (Date): 31.98 Feet (3/30/94)
Casing Elevation: 98.03 Feet
Completion Depth: 47 Feet
Logged By: S. Liaty
Checked By:

DEPTH (feet)	SAMPLE INTERVAL	DESCRIPTION	GRAPHIC LOG	USCS CLASS	WELL CONSTRUCTION	BLOWS/6 IN.	INCHES DRIVEN	INCHES RECOV'D	COMMENTS	SAMPLE NO.	FIELD OVM/OVA READING (ppm)
		SANDY GRAVEL, yellowish brown, moist, very dense, fine- to medium-grained sand		GW		50/5"	11	11	Gravel up to .5 inches in diameter.	MW7-6	<1
35		CLAYEY SAND with minor gravel, dark yellowish brown, saturated, very dense, medium- to coarse-grained sand		SC		28 31 50/5"	17	17	Soil appears to be stained. Gravel up to 1.5 inches in diameter.	MW7-7	19
40		SANDY GRAVEL, light gray, saturated, very dense, fine- to coarse- grained sand		GW		9 17 36	18	15		MW7-8	21
45									No sample collected at 45 feet.		
		Boring terminated. Total depth = 47 feet							Boring terminated approximately 15 feet below the water table.		
50											
55											
60											

ENCLOSURE C

MONITORING WELL CONSTRUCTION DETAILS

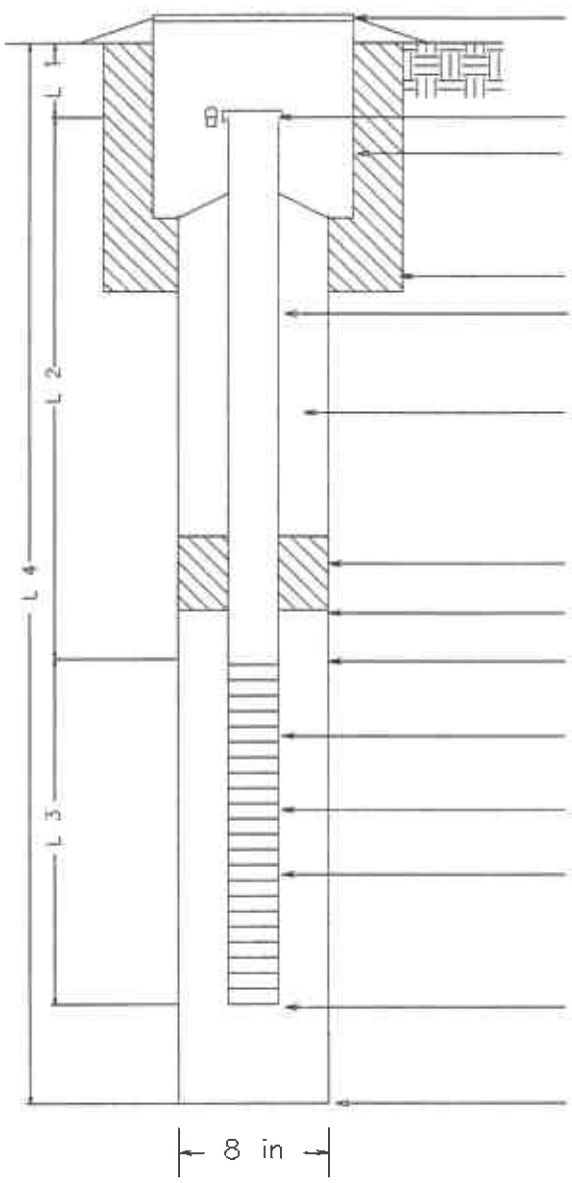
MONITORING WELL CONSTRUCTION DETAILS

PROJECT NO: 19024.03

LOCATION: Beacon #604
1619 West First Street
Livermore, California

MONITORING WELL NO.: MW-4

ELEVATION: 99.35 feet



Protective Casing	
Locking Water Tight Cap	
Flush Grade Well Construction	
Diameter and Mat'l	8-inch steel
Total length	12 inches
Length Above Ground	1/4 inch
Thickness and Type of Seal	2 feet, concrete
Diameter, Mat'l and Joint Type of Riser Pipe	2 inch, SCH 40 PVC flush thread
Type of Backfill Around Riser	cement/ 5% bentonite grout
Thickness and Type of Seal	2 feet bentonite chips
Distance of Filter Sand Above Top of Screen	2 feet
Type of Filter Around Screen	#3 lonestar
Monitoring Well Mat'l	SCH 40 PVC
Screen Gauge/Slot Size	0.020 inch
Diameter and Length of Screen	2 inch, 20 feet
Depth to Bottom of Monitoring Well	47 feet
Depth to the Bottom of Filter Sand	47 feet

L1 = 0.25 feet
L2 = 26.75 feet
L3 = 20.00 feet
L4 = 47.00 feet

MONITORING WELL WATER LEVEL MEASUREMENTS

Date:	Time:	Water Level*
03/30/94	1545	31.56

Completion Date and Time: 03/30/94 1500

* Measuring Point: Top Of Casing

ACTON • MICKELSON • VAN DAM, INC.
4511 Golden Foothill Parkway, Suite 1
El Dorado Hills, CA 95762

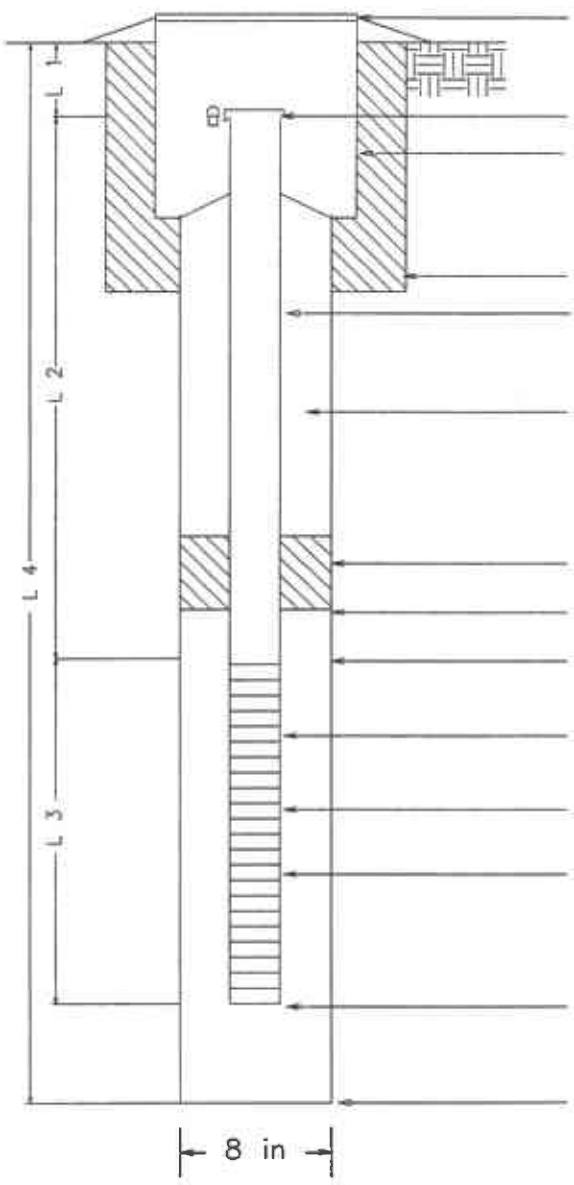
MONITORING WELL CONSTRUCTION DETAILS

PROJECT NO: 19024.03

LOCATION: Beacon #604
1619 West First Street
Livermore, California

MONITORING WELL NO.: MW-5

ELEVATION: 98.37 feet



Protective Casing	
Locking Water Tight Cap	
Flush Grade Well Construction	
Diameter and Mat'l	8-inch steel
Total length	12 inches
Length Above Ground	1/4 inch
Thickness and Type of Seal	2 feet, concrete
Diameter, Mat'l and Joint Type of Riser Pipe	2 inch, SCH 40 PVC flush thread
Type of Backfill Around Riser	cement/ 5% bentonite grout
Thickness and Type of Seal	2 feet bentonite chips
Distance of Filter Sand Above Top of Screen	2 feet
Type of Filter Around Screen	#3 lonestar
Monitoring Well Mat'l	SCH 40 PVC
Screen Gauge/Slot Size	0.020 inch
Diameter and Length of Screen	2 inch, 20 feet
Depth to Bottom of Monitoring Well	47 feet
Depth to the Bottom of Filter Sand	47 feet

L1 = 0.25 feet
L2 = 26.75 feet
L3 = 20.00 feet
L4 = 47.00 feet

MONITORING WELL WATER LEVEL MEASUREMENTS

Date:	Time:	Water Level*
03/30/94	1525	32.07

Completion Date and Time: 03/29/94 1300

* Measuring Point: Top Of Casing

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4511 Golden Foothill Parkway, Suite 1
El Dorado Hills, CA 95762

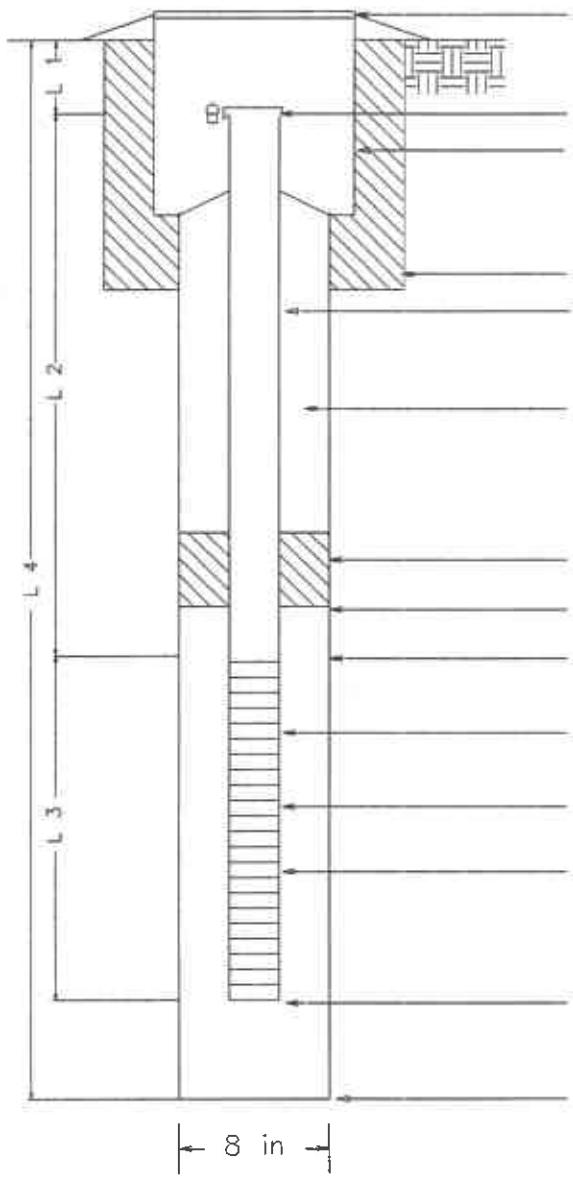
MONITORING WELL CONSTRUCTION DETAILS

PROJECT NO: 19024.03

LOCATION: Beacon #604
1619 West First Street
Livermore, California

MONITORING WELL NO.: MW-6

ELEVATION: 97.62 feet



Protective Casing	
Locking Water Tight Cap	
Flush Grade Well Construction	
Diameter and Mat'l	8-inch steel
Total length	12 inches
Length Above Ground	1/4 inch
Thickness and Type of Seal	2 feet, concrete
Diameter, Mat'l and Joint Type of Riser Pipe	2 inch, SCH 40 PVC flush thread
Type of Backfill Around Riser	cement/ 5% bentonite grout
Thickness and Type of Seal	2 feet bentonite chips
Distance of Filter Sand Above Top of Screen	2 feet
Type of Filter Around Screen	#3 lonestar
Monitoring Well Mat'l	SCH 40 PVC
Screen Gauge/Slot Size	0.020 inch
Diameter and Length of Screen	2 inch, 20 feet
Depth to Bottom of Monitoring Well	48 feet
Depth to the Bottom of Filter Sand	48 feet

L1 = 0.25 feet
L2 = 27.75 feet
L3 = 20.00 feet
L4 = 48.00 feet

MONITORING WELL WATER LEVEL MEASUREMENTS

Date:	Time:	Water Level*
03/30/94	1521	33.38

Completion Date and Time: 03/29/94 1600

* Measuring Point: Top Of Casing

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El Dorado Hills, CA 95762

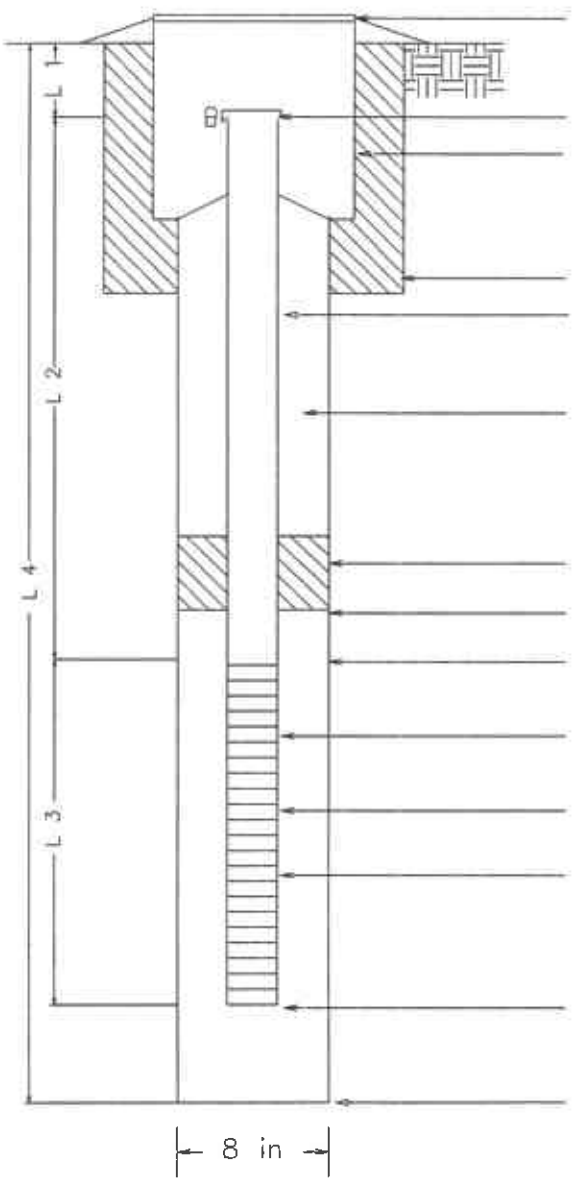
MONITORING WELL CONSTRUCTION DETAILS

PROJECT NO: 19024.03

LOCATION: Beacon #604
1619 West First Street
Livermore, California

MONITORING WELL NO.: MW-7

ELEVATION: 98.03 feet



Protective Casing	
Locking Water Tight Cap	
Flush Grade Well Construction	
Diameter and Mat'l	8-inch steel
Total length	12 inches
Length Above Ground	1/4 inch
Thickness and Type of Seal	2 feet, concrete
Diameter, Mat'l and Joint Type of Riser Pipe	2 inch, SCH 40 PVC flush thread
Type of Backfill Around Riser	cement/ 5% bentonite grout
Thickness and Type of Seal	2 feet bentonite chips
Distance of Filter Sand Above Top of Screen	2 feet
Type of Filter Around Screen	#3 lonestar
Monitoring Well Mat'l	SCH 40 PVC
Screen Gauge/Slot Size	0.020 inch
Diameter and Length of Screen	2 inch, 20 feet
Depth to Bottom of Monitoring Well	47 feet
Depth to the Bottom of Filter Sand	47 feet

L1 = 0.25 feet
L2 = 26.75 feet
L3 = 20.00 feet
L4 = 47.00 feet

MONITORING WELL WATER LEVEL MEASUREMENTS

Date:	Time:	Water Level*
03/30/94	1519	31.98

Completion Date and Time: 03/30/94 1100

* Measuring Point: Top Of Casing

ACTON • MICKELSON • VAN DAM, INC.
4511 Golden Foothill Parkway, Suite 1
El Dorado Hills, CA 95762

ENCLOSURE D

SOIL SAMPLE ANALYTICAL REPORTS

April 13, 1994
Sample Log 9043

Steve Liaty
Acton, Mickelson & van Dam
5090 Robert J. Matthews Pkwy
El Dorado Hills, CA 95762

Subject: Analytical Results for 4 Water Samples and 10 Soil Samples
Identified as: Project # 19024.03 (Beacon 604)
Received: 04/01/94

Dear Mr. Liaty:

Analysis of the sample(s) referenced above has been completed. This report is written to confirm results communicated on April 8, 1994 and describes procedures used to analyze the samples.

Sample(s) were received in 40-mL glass vials sealed with TFE lined septae, and in brass sleeves sealed with TFE sheets and endcaps. Each sample was transported and received under documented chain of custody and stored at 4 degrees C until analysis was performed.

Sample(s) were analyzed using the following method(s):

"BTEX" (EPA Method 8020/Purge-and-Trap)
"BTEX" (EPA Method 602/Purge-and-Trap)
"TPH as Gasoline" (Modified EPA Method 8015/Purge-and-Trap)
"Total Lead" (EPA 6010)

Please refer to the following table(s) for summarized analytical results and contact us at 916-753-9500 if you have questions regarding procedures or results. The chain-of-custody document is enclosed.

Approved by:

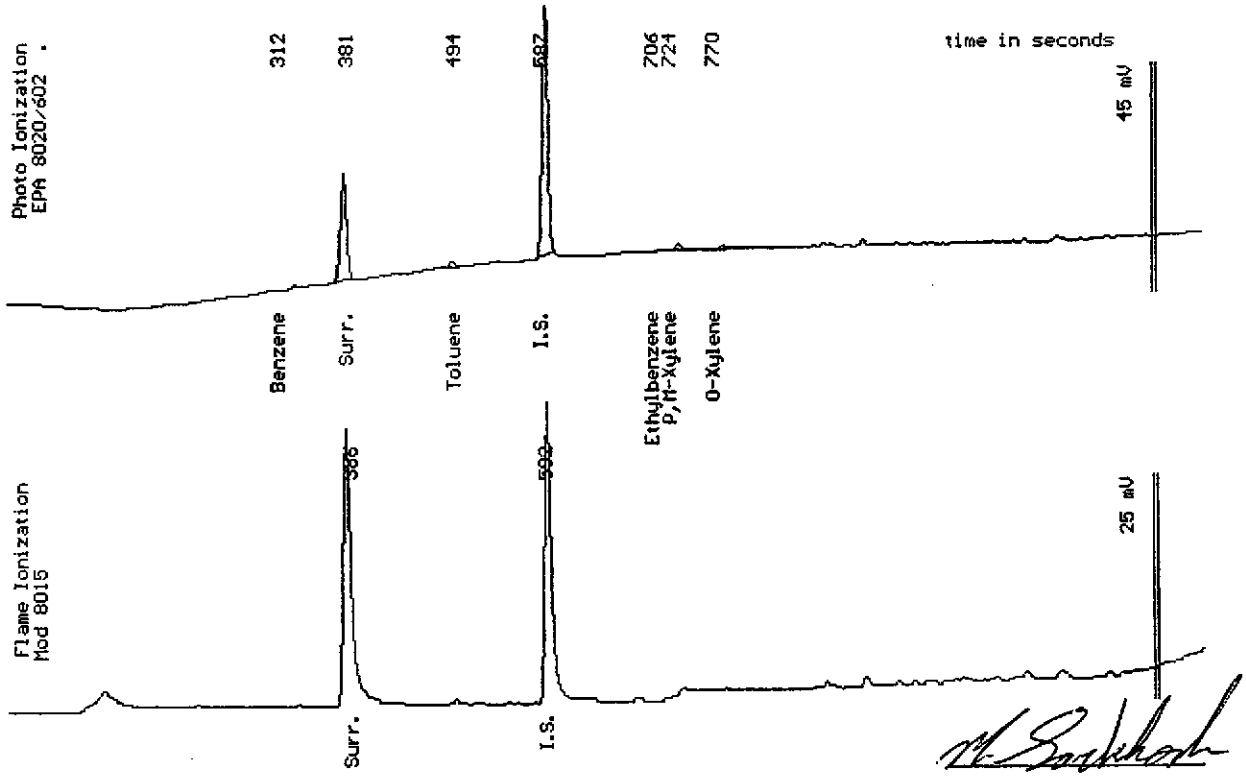
Stewart Podolsky
Senior Chemist

Sample Log 9043
9043-30

Sample: **MW4-6**

From : Project # 19024.03 (Beacon 604)
Sampled : 03/29/94
Dilution : 1:1 QC Batch : 6099B
Matrix : Soil

Parameter	(MRL) mg/kg	Measured Value mg/kg
Benzene	(.0050)	<.0050
Toluene	(.0050)	<.0050
Ethylbenzene	(.0050)	<.0050
Total Xylenes	(.0050)	<.0050
TPH as Gasoline	(1.0)	<1.0
Surrogate Recovery		99 %



Date Analyzed: 04-11-94
Column : 0.53mm ID X 30m DB5 (J&W Scientific)

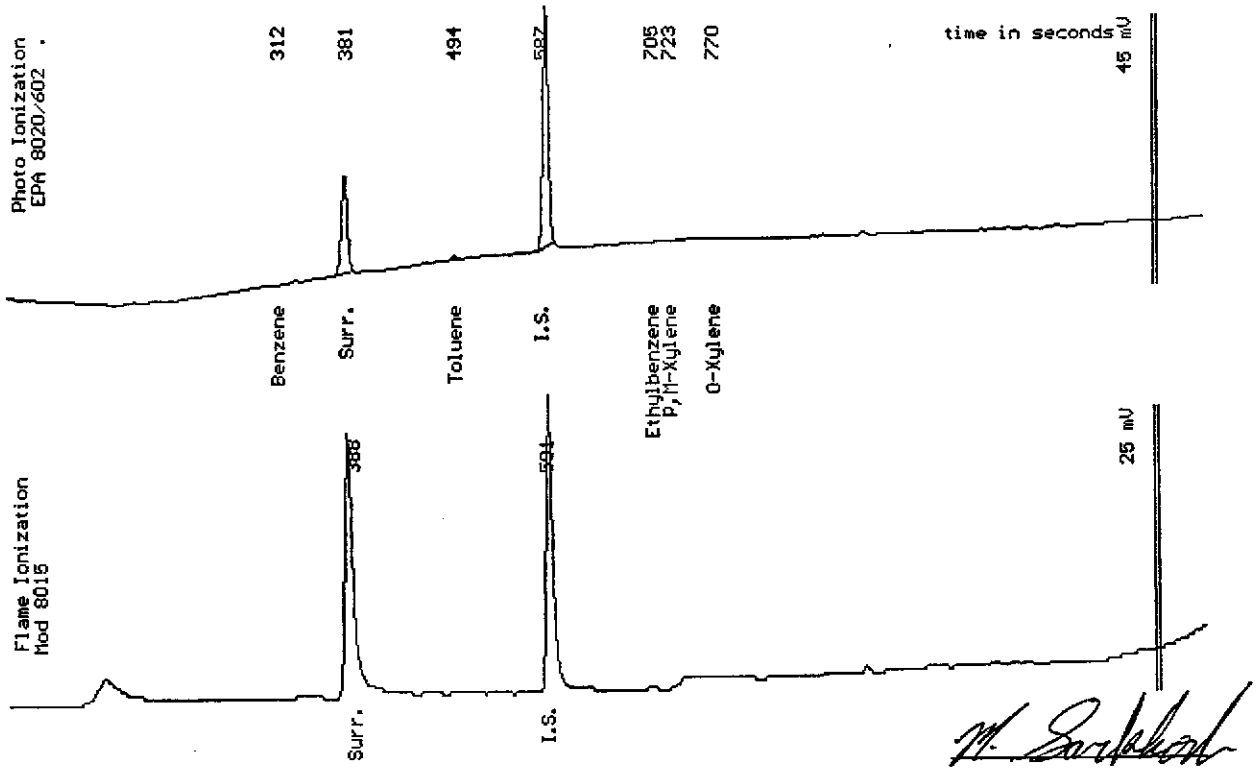
Mitra Sarkhosh
Senior Chemist

Sample Log 9043
9043-31

Sample: **MW4-7**

From : Project # 19024.03 (Beacon 604)
Sampled : 03/29/94
Dilution : 1:1 QC Batch : 6099B
Matrix : Soil

Parameter	(MRL) mg/kg	Measured Value mg/kg
Benzene	(.0050)	<.0050
Toluene	(.0050)	<.0050
Ethylbenzene	(.0050)	<.0050
Total Xylenes	(.0050)	<.0050
TPH as Gasoline	(1.0)	<1.0
Surrogate Recovery		95 %



Date Analyzed: 04-11-94
Column : 0.53mm ID X 30m DB5 (J&W Scientific)

Mitra Sarkhosh
Senior Chemist

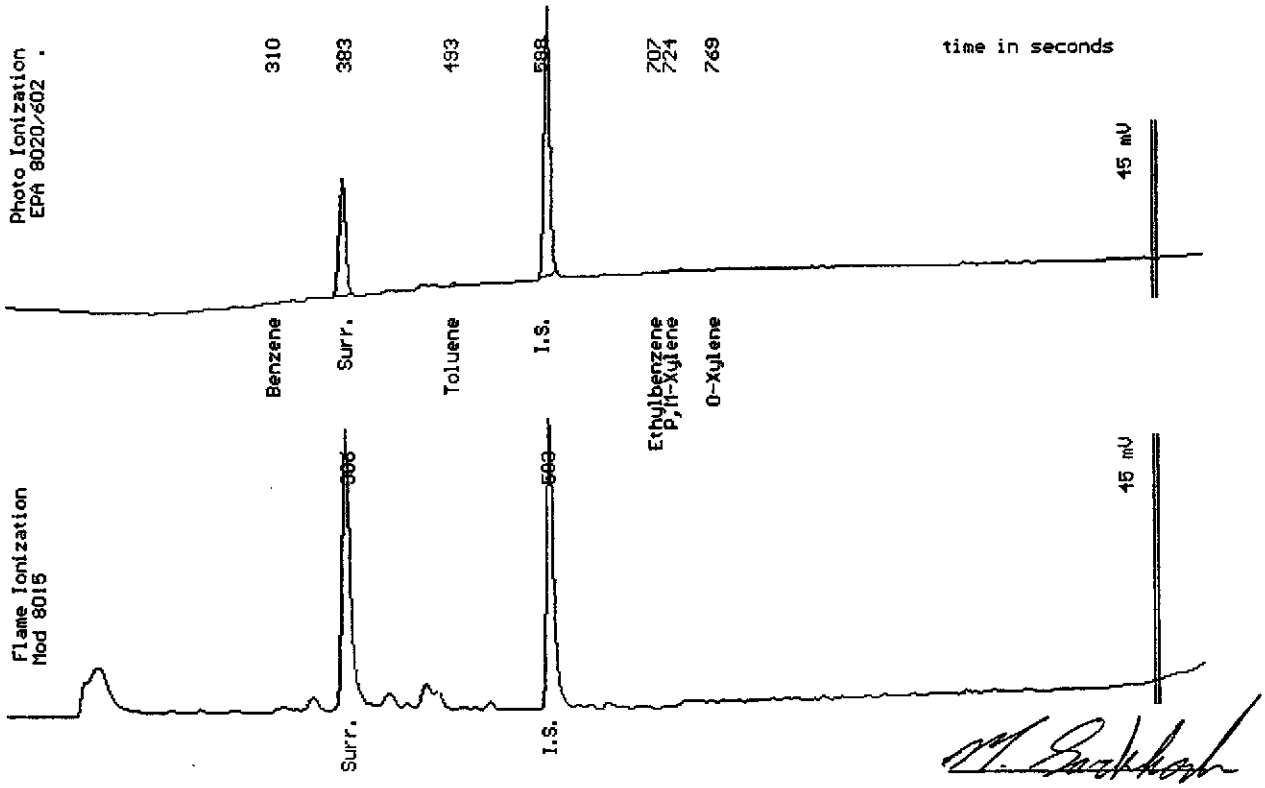
Sample Log 9043

9043-6

Sample: **MW5-6**

From : Project # 19024.03 (Beacon 604)
Sampled : 03/29/94
Dilution : 1:1 QC Batch : 6099B
Matrix : Soil

Parameter	(MRL) mg/kg	Measured Value mg/kg
Benzene	(.0050)	<.0050
Toluene	(.0050)	<.0050
Ethylbenzene	(.0050)	<.0050
Total Xylenes	(.0050)	<.0050
TPH as Gasoline	(1.0)	<1.0
Surrogate Recovery		103 %



Date Analyzed: 04-11-94
Column : 0.53mm ID X 30m DB5 (J&W Scientific)

Mitra Sarkhosh
Senior Chemist

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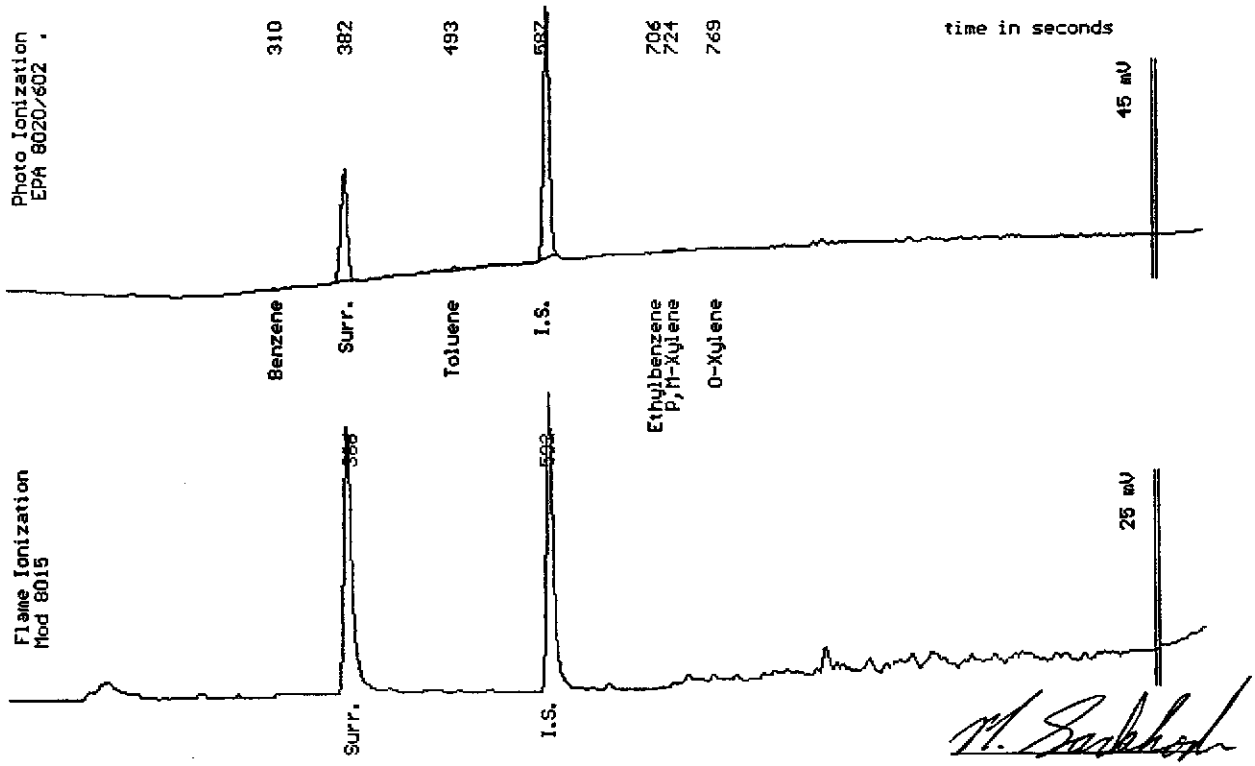
Sample Log 9043
9043-7

Sample: **MW5-7**

From : Project # 19024.03 (Beacon 604)
Sampled : 03/29/94
Dilution : 1:1 QC Batch : 6099B
Matrix : Soil

Parameter	(MRL) mg/kg	Measured Value mg/kg
Benzene	(.0050)	<.0050
Toluene	(.0050)	<.0050
Ethylbenzene	(.0050)	<.0050
Total Xylenes	(.0050)	<.0050
TPH as Gasoline	(1.0)	<1.0
Surrogate Recovery		100 %



Date Analyzed: 04-11-94
Column : 0.53mm ID X 30m DB5 (J&W Scientific)

M. Sarkhosh

Mitra Sarkhosh
Senior Chemist

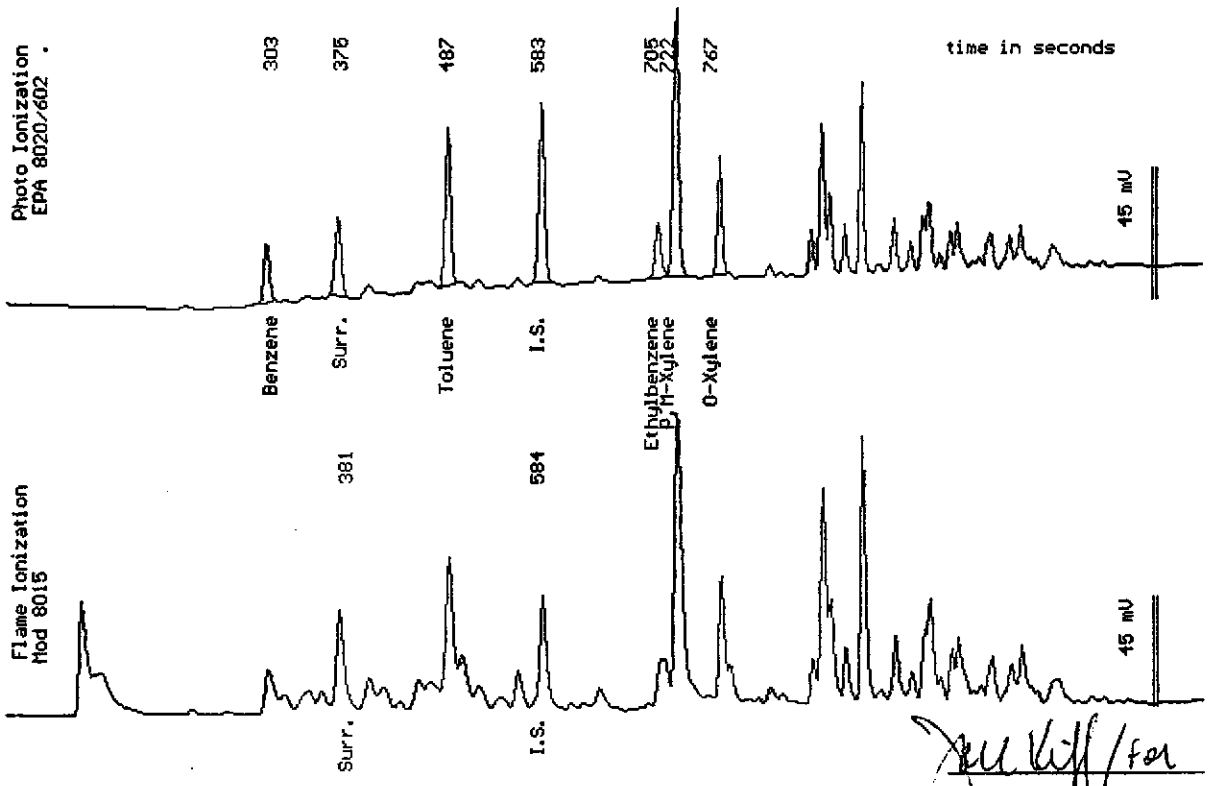
Sample Log 9043

9043-14

Sample: **MW6-6**

From : Project # 19024.03 (Beacon 604)
Sampled : 03/29/94
Dilution : 1:10 QC Batch : 6099D
Matrix : Soil

Parameter	(MRL) mg/kg	Measured Value mg/kg	
Benzene	(.050)	.65	
Toluene	(.050)	1.7	
Ethylbenzene	(.050)	.72	
Total Xylenes	(.050)	4.6	
TPH as Gasoline	(10)	42	
Surrogate Recovery		98	%



Date Analyzed: 04-12-94
Column : 0.53mm ID X 30m DB5 (J&W Scientific)

Mitra Sarkhosh for
Senior Chemist

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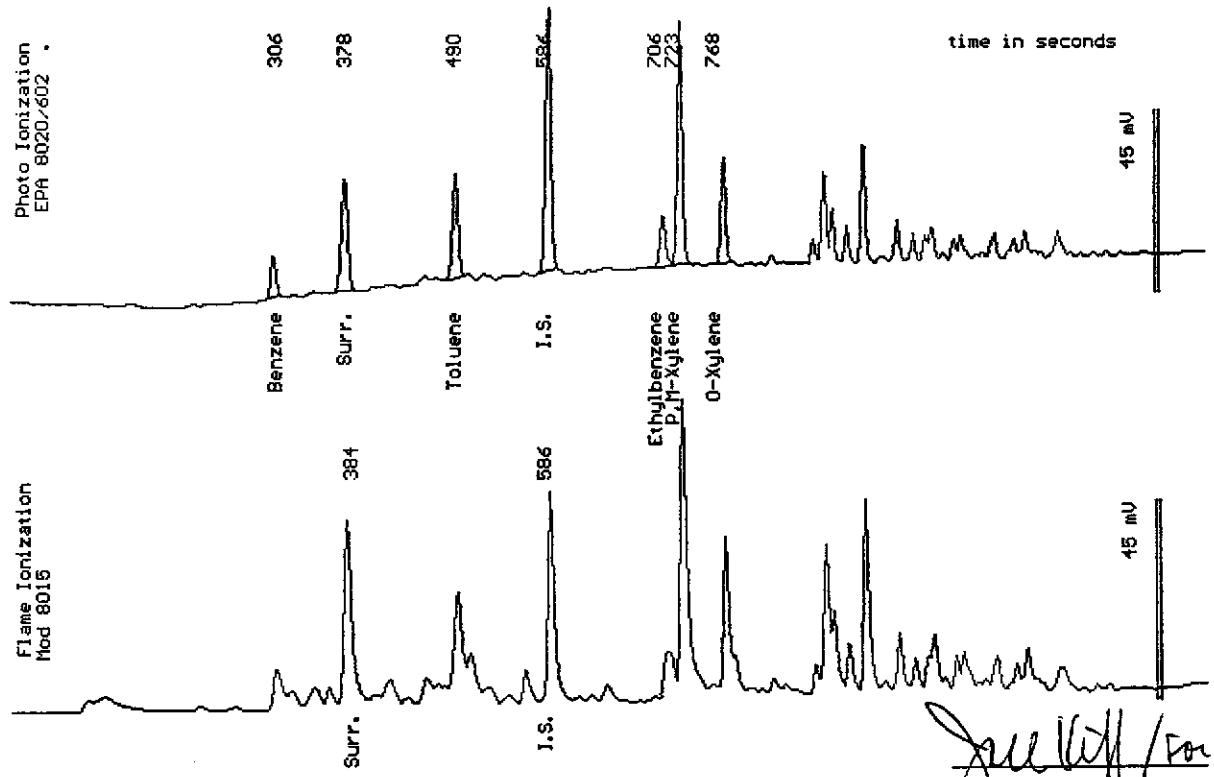
Sample Log 9043
9043-15

Sample: **MW6-7**

From : Project # 19024.03 (Beacon 604)
Sampled : 03/29/94
Dilution : 1:1 QC Batch : 6099D
Matrix : Soil

Parameter	(MRL) mg/kg	Measured Value mg/kg
Benzene	(.0050)	.061
Toluene	(.0050)	.16
Ethylbenzene	(.0050)	.094
Total Xylenes	(.0050)	.55
TPH as Gasoline	(1.0)	3.7
Surrogate Recovery		103 %



Date Analyzed: 04-12-94
Column : 0.53mm ID X 30m DB5 (J&W Scientific)

Mitra Sarkhosh
Senior Chemist

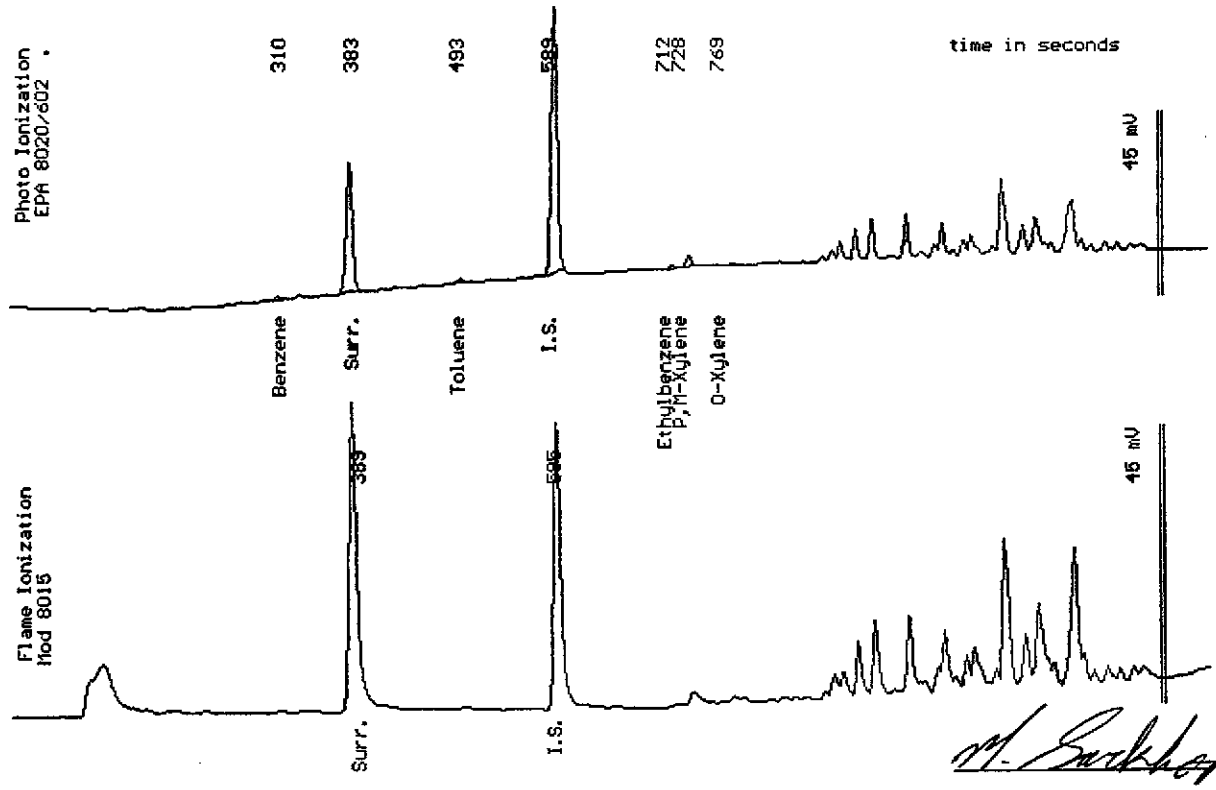
Sample Log 9043

9043-20

Sample: **MW7-4**

From : Project # 19024.03 (Beacon 604)
Sampled : 03/29/94
Dilution : 1:1 QC Batch : 6099B
Matrix : Soil

Parameter	(MRL) mg/kg	Measured Value mg/kg
Benzene	(.0050)	<.0050
Toluene	(.0050)	<.0050
Ethylbenzene	(.0050)	<.0050
Total Xylenes	(.0050)	<.0050
TPH as Gasoline	(1.0)	<1.0
Surrogate Recovery		101 %



Date Analyzed: 04-11-94
Column : 0.53mm ID X 30m DB5 (J&W Scientific)

Mitra Sarkhosh
Senior Chemist

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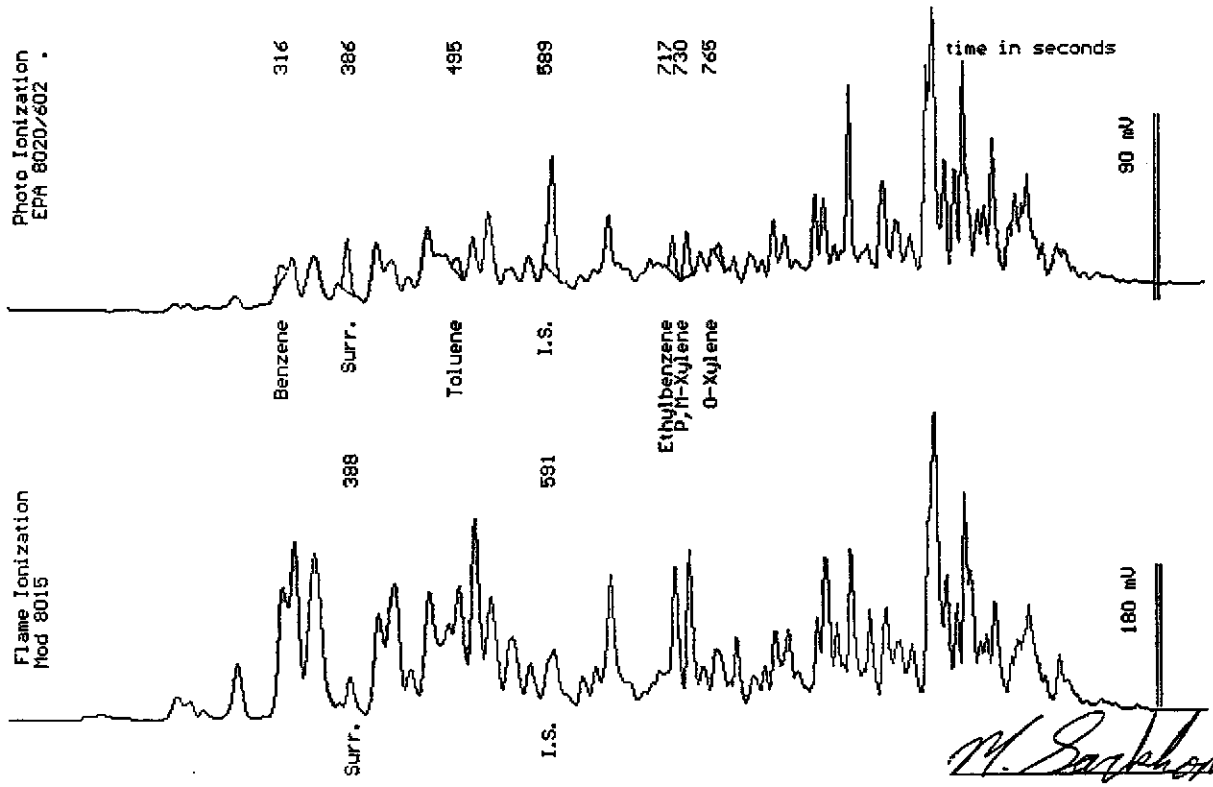
Sample Log 9043

9043-23

Sample: **MW7-7**

From : Project # 19024.03 (Beacon 604)
Sampled : 03/29/94
Dilution : 1:1 QC Batch : 6099B
Matrix : Soil

Parameter	(MRL) mg/kg	Measured Value mg/kg
Benzene	(.0050)	.016
Toluene	(.0050)	.013
Ethylbenzene	(.0050)	.025
Total Xylenes	(.0050)	.048
TPH as Gasoline	(1.0)	4.9
Surrogate Recovery		88 %



Date Analyzed: 04-11-94
Column : 0.53mm ID X 30m DB5 (J&W Scientific)

Mitra Sarkhosh
Senior Chemist

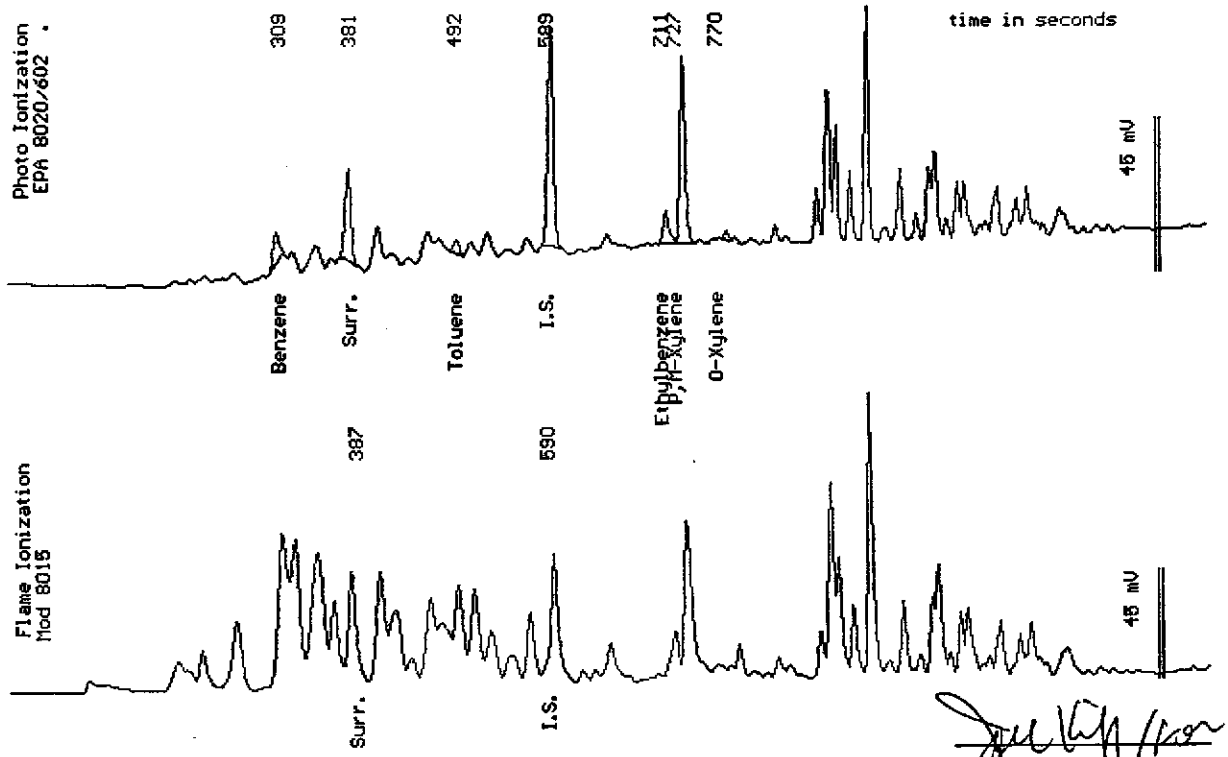
Sample Log 9043

9043-24

Sample: **MW7-8**

From : Project # 19024.03 (Beacon 604)
Sampled : 03/29/94
Dilution : 1:1 QC Batch : 6099D
Matrix : Soil

Parameter	(MRL) mg/kg	Measured Value mg/kg
Benzene	(.0050)	.064
Toluene	(.0050)	.029
Ethylbenzene	(.0050)	.065
Total Xylenes	(.0050)	.39
TPH as Gasoline	(1.0)	8.8
Surrogate Recovery		93 %



Date Analyzed: 04-12-94
Column : 0.53mm ID X 30m DB5 (J&W Scientific)

Mitra Sarkhosh
Senior Chemist

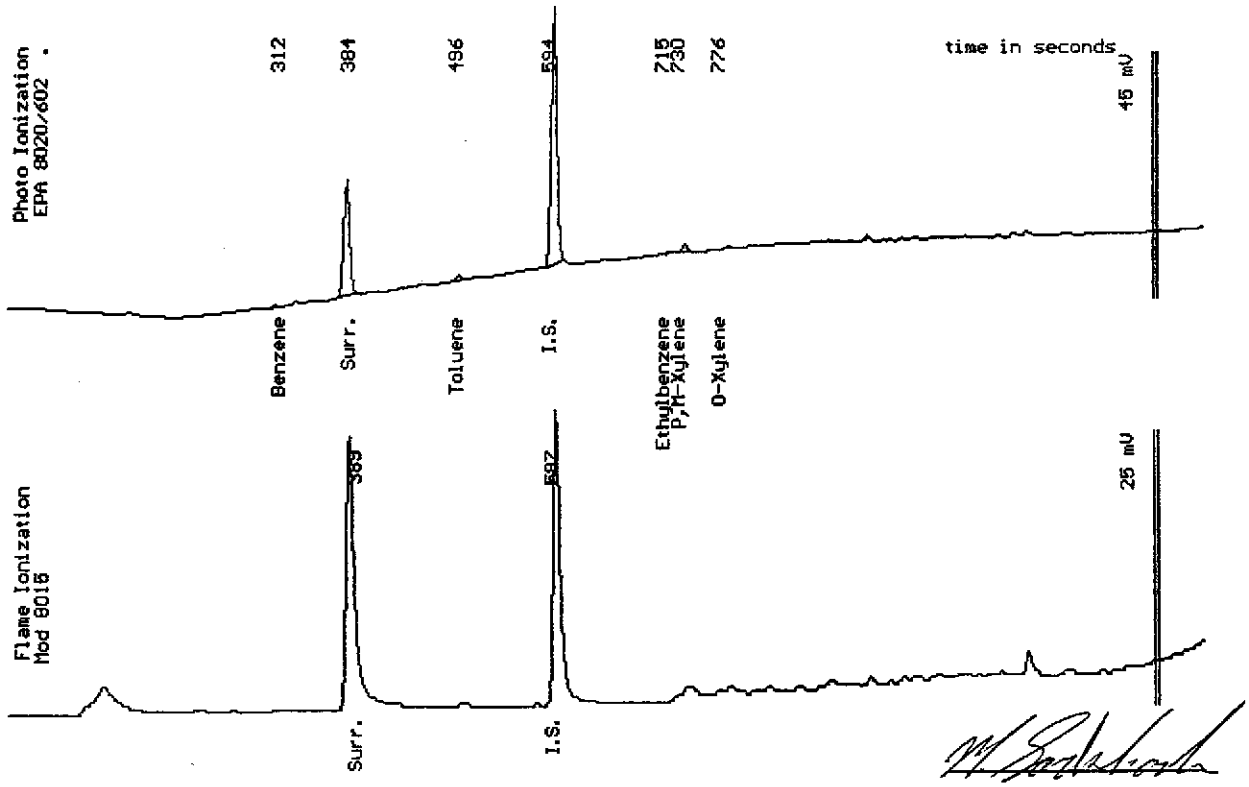
Sample Log 9043

9043-37

Sample: LV-(1->4)

From : Project # 19024.03 (Beacon 604)
Sampled : 03/30/94
Dilution : 1:1 QC Batch : 6098A
Matrix : Soil

Parameter	(MRL) mg/kg	Measured Value mg/kg
Benzene	(.0050)	<.0050
Toluene	(.0050)	<.0050
Ethylbenzene	(.0050)	<.0050
Total Xylenes	(.0050)	<.0050
TPH as Gasoline	(1.0)	<1.0
Surrogate Recovery		100 %



Date Analyzed: 04-05-94
Column : 0.53mm ID X 30m DB5 (J&W Scientific)

Mitra Sarkhosh
Senior Chemist

April 13, 1994
Sample Log 9043

Sample: LV-(1->4)

From : Project # 19024.03 (Beacon 604)
Sampled : 03/30/94
Received : 04/01/94
Matrix : Soil

Parameter	(MRL) mg/kg	Measured Value mg/kg
Total Lead	(10)	<10

Stewart Podolsky
Senior Chemist

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CHAIN OF CUSTODY REPORT

BEACON

Beacon Station No.	Sampler (Print Name)			ANALYSES										Date	Form No.
604	Steve Lucy													3-31-94	1 of
Project No.	Sampler (Signature)														
19024.03	Steve Lucy													Standard TAT	
Project Location	Affiliation														
Livermore	AMV Geo														
Sample No./Identification	Date	Time	Lab No.	BTEX	TPH (gasoline)	TPH (diesel)							No. of Containers	REMARKS	
MW5-1	3-29-94			X	X								1	Hold all	
MW5-2														discreet soil	
MW5-3														samples until	
MW5-4														further notice	
MW5-5															
MW5-6															
MW5-7															
MW5-8															

RECEIVED by W.E.S.T. date 4/1/94

Relinquished by: (Signature/Affiliation)	Date	Time	Received by: (Signature/Affiliation)	Date	Time
Steve Lucy	4-1-94	1305		4/1/94	1305
Relinquished by: (Signature/Affiliation)	Date	Time	Received by: (Signature/Affiliation)	Date	Time
	4/1/94	1430			
Relinquished by: (Signature/Affiliation)	Date	Time	Received by: (Signature/Affiliation)	Date	Time
				4/1/94	1432

Report To:
Steve Lucy
A.M.V.

Bill To: ULTRAMAR INC.
525 West Third Street
Hanford, CA 93230
Attention: Terry Fox

WHITE: Return to Client with Report YELLOW: Laboratory Copy PINK: Originator Copy

32-8003 1/90

Ultramar Inc.

CHAIN OF CUSTODY REPORT

BEACON

Beacon Station No.	Sampler (Print Name)			ANALYSES				Date	Form No.
604	Steve Lisby							3-31-94	2 of
Project No.	Sampler (Signature)								
19024.03	Steve Lisby							Standard TAT	
Project Location	Affiliation								
Livermore	AMU Geo								
Sample No./Identification	Date	Time	Lab No.	BTEX	TPH (gasoline)	TPH (diesel)	No. of Containers	REMARKS	
MW6-1	3-27-94			X	X		1	Hold all direct	
MW6-2								samples until	
MW6-3								further notice	
MW6-4									
MW6-5									
MW6-6									
MW6-7									
MW6-8									

RECEIVED by W.E.S.T. date 4/1/94

Relinquished by: (Signature/Affiliation)	Date	Time	Received by: (Signature/Affiliation)	Date	Time
Steve Lisby	3-31-94	1305	[signature]	4/1/94	1305
Relinquished by: (Signature/Affiliation)	Date	Time	Received by: (Signature/Affiliation)	Date	Time
[signature]	4/1/94	1414			
Relinquished by: (Signature/Affiliation)	Date	Time	Received by: (Signature/Affiliation)	Date	Time
			D. Cantrell	4/1/94	1413

Report To:	Bill to: ULTRAMAR INC.
Steve Lisby AMU.	525 West Third Street Hanford, CA 93230 Attention: Terry Fox

WHITE: Return to Client with Report YELLOW: Laboratory Copy PINK: Originator Copy

32-8003 1/90

Ultramar Inc.
CHAIN OF CUSTODY REPORT

BEACON

Beacon Station No.	Sampler (Print Name)			ANALYSES				Date	Form No.
604	Steve Lidty							4-1-94	3 of
Project No.	Sampler (Signature)								
19024.03	Steve Lidty							Standard TAT	
Project Location	Affiliation								
Livermore	AMV Geo								
Sample No./Identification	Date	Time	Lab No.	BTEX	TPH (gasoline)	TPH (diesel)	No. of Containers	REMARKS	
MW7-1	3-30-94			X	X		1	We'll be until	
MW7-2								for the	
~~MW7-3~~ MW7-3								notice	
MW7-4									
MW7-5									
MW7-6									
MW7-7									
MW7-8									

RECEIVED by W.E.S.T. date 4/1/94

Relinquished by: (Signature/Affiliation)	Date	Time	Received by: (Signature/Affiliation)	Date	Time
Steve Lidty	3-1-94	1305		4/1/94	1305
Relinquished by: (Signature/Affiliation)	Date	Time	Received by: (Signature/Affiliation)	Date	Time
	4/1/94	1405			
Relinquished by: (Signature/Affiliation)	Date	Time	Received by: (Signature/Affiliation)	Date	Time
			S Cantrell	4/1/94	1431

Report To: Steve Lidty AMV

Bill to: ULTRAMAR INC.
525 West Third Street
Hanford, CA 93230
Attention: Terry Fox

WHITE: Return to Client with Report YELLOW: Laboratory Copy PINK: Originator Copy

32-8003 1/90

Ultramar Inc.

CHAIN OF CUSTODY REPORT

BEACON

Beacon Station No.	Sampler (Print Name)			ANALYSES				Date	Form No.
604	Steve Lusty							4-1-94	4 of
Project No.	Sampler (Signature)								
19024.03	Steve Lusty								
Project Location	Affiliation								
Livermore	AMV Geo								
Sample No./Identification	Date	Time	Lab No.	BTEX	TPH (gasoline)	TPH (diesel)	No. of Containers	REMARKS	
MW4-1	3-30-94			X	X		1	Hold until	
MW4-2								further notice	
MW4-3									
MW4-4									
MW4-5									
MW4-6									
MW4-7									
MW4-8									

Standard TAT

RECEIVED by W.E.S.T. date 4/1/94

Relinquished by: (Signature/Affiliation)	Date	Time	Received by: (Signature/Affiliation)	Date	Time
Steve Lusty	4-1-94	1305		4/1/94	1305
Relinquished by: (Signature/Affiliation)	Date	Time	Received by: (Signature/Affiliation)	Date	Time
	4/1/94	1420			
Relinquished by: (Signature/Affiliation)	Date	Time	Received by: (Signature/Affiliation)	Date	Time
				4/1/94	1430

Report To:

Steve Lusty
AMV

Bill to: ULTRAMAR INC.
525 West Third Street
Hanford, CA 93230
Attention: Terry Fox

WHITE: Return to Client with Report YELLOW: Laboratory Copy PINK: Originator Copy

32-8003 1/90

DAILY FIELD REPORT

ACTON • MICKELSON • van DAM, INC.

Project No. 19024.03	Date: 3/29+30/94
Project Name: Beacon #604	Project Location: ~~West~~ First Street & P Street Livermore, CA
Weather: Clear to Partly Cloudy	Field Crew: SAL / V&W Drilling

Today's Work Activities:

3/29/94

0800 Arrive at site and meet with Flash Safety - Discuss procedure and begin setup of safety supply / Lane Closure

0830 V&W crew arrives - transfer supplies from Envirotech to V&W Truck.

0900 Waiting on Concrete cutter

1000 Begin drilling MW-5 - Concrete cutter did not show up on site (1½ hour late)

1130 Finish drilling MW-5 - beginning installation

1310 Begin drilling MW-6 - Vicker's concrete cutter on site.

1445 Finish drilling MW-6 - beginning installation

1600 Concrete cutter has left site - presently V&W grouting wells and setting boxes

1730 leave site.

3/30/94

0730 Arrive at site and meet with Flash Safety/V&W.

0815 Begin drilling MW-7

0935 Finish drilling MW-7 - beginning installation

1115 Setup and begin drilling MW-4

1330 Finish drilling MW-4 - beginning installation

1400 Travis Bond Blacktop on site to blacktop MW-7

1400 - 1500 V&W installing MW-4 / Survey MW-4 through MW-7

1500 Begin grouting MW-7 & MW-4 and setting boxes

1600 Beginning purging and sampling of MW-4 through MW-7

1730 V&W leaves site

1830 Finish sampling, clean and secure site, collect stockpile samples, leave site.

Signature Steve Lug Date 3/30/94

ACTON • MICKELSON • van DAM, INC.

GROUND WATER LEVEL DATA

Project Name Beacon #604 Project Number 19024.05

Date 3-30-94 Field Crew SAL Measuring Device and Number S Interface Probe

Well No.	Time	Depth to Product (feet)	Depth to Ground Water (feet)	Product Thickness (feet)	Reference Elevation (feet)	Ground Water Elevation (feet)	Physical Observations/Comments
MW-1	1534		31.93		100.00	68.07	No Product
MW-2	1526		32.82		98.68	65.86	
MW-3	1514		30.97		97.08	66.11	
MW-4	1545		31.56		99.35	67.79	
MW-5	1525		32.07		98.37	66.30	
MW-6	1521		33.38		97.62	64.24	
MW-7	1519		31.98		98.03	66.05	

Signature Steve Ley

ACTON • MICKELSON • van DAM, INC.

SURVEY FIELD NOTES

Project Name	Project No. 19024.03	Date 3-30-94
Beacon #604	Bench Mark MW-2	Bench Mark Description
Surveyor SAL	Rod Man Eric (F.S.)	Monitoring Well Riser

Station	(+) B.S.	H.I.	(-) F.S.	Elevation	Stadia Readings	Distance	Horizontal Angle	Remarks
MW-2	5.45			98.68				
		104.13						
MW-6			6.52	97.62				
MW-7			6.10	98.03				
MW-5			5.76	98.37				
MW-2	5.57			98.68				
		104.25						
MW-6			6.63	97.62	☆			
MW-7			6.22	98.03	☆			
MW-5			5.88	98.37	☆			
MW-4			4.90	99.35				

SITE SKETCH

Signature Steve Lee

ENCLOSURE F

GROUND WATER SAMPLE ANALYTICAL REPORTS

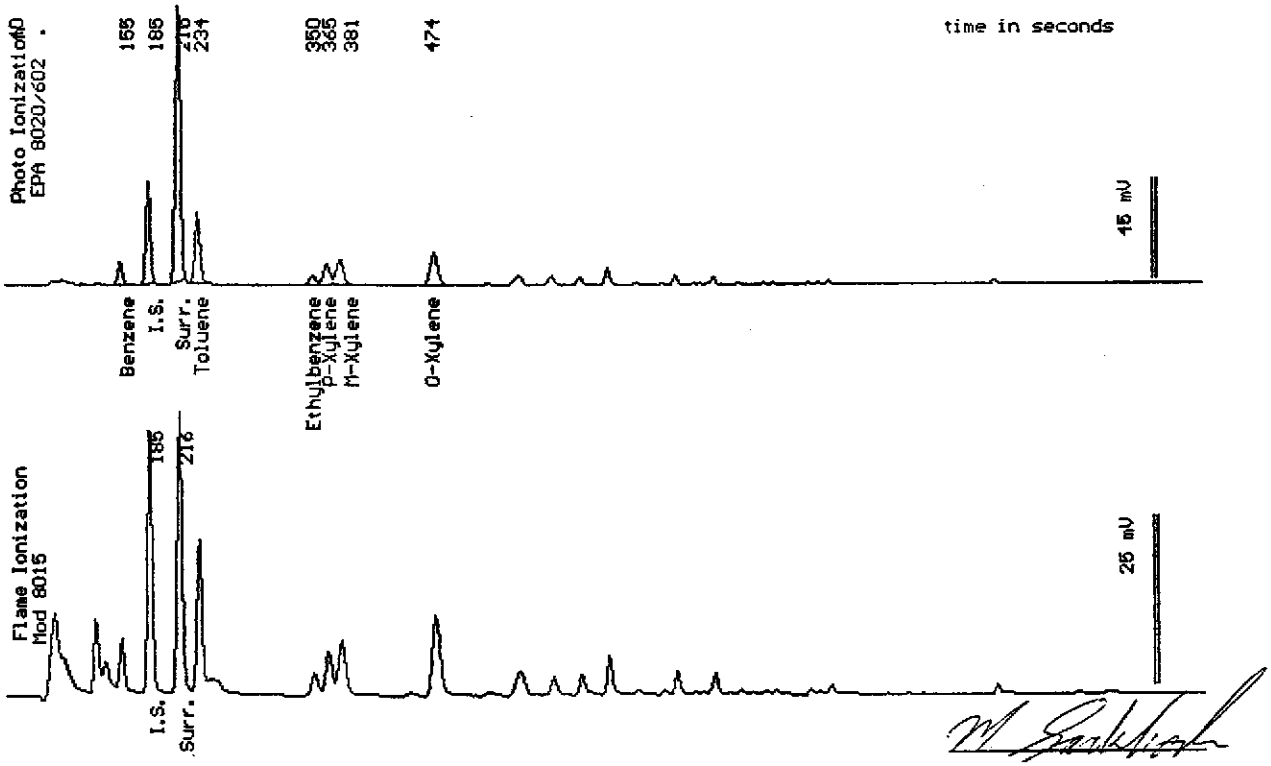
Sample Log 9043

9043-33

Sample: **MW-4**

From : Project # 19024.03 (Beacon 604)
Sampled : 03/30/94
Dilution : 1:1 QC Batch : 4077A
Matrix : Water

Parameter	(MRL) ug/L	Measured Value ug/L
Benzene	(.50)	4.2
Toluene	(.50)	15
Ethylbenzene	(.50)	2.5
Total Xylenes	(.50)	26
TPH as Gasoline	(50)	120
Surrogate Recovery		98 %



Date Analyzed: 04-05-94
Column : 0.53mm ID X 30m DBWAX (J&W Scientific)

Mitra Sarkhosh
Senior Chemist

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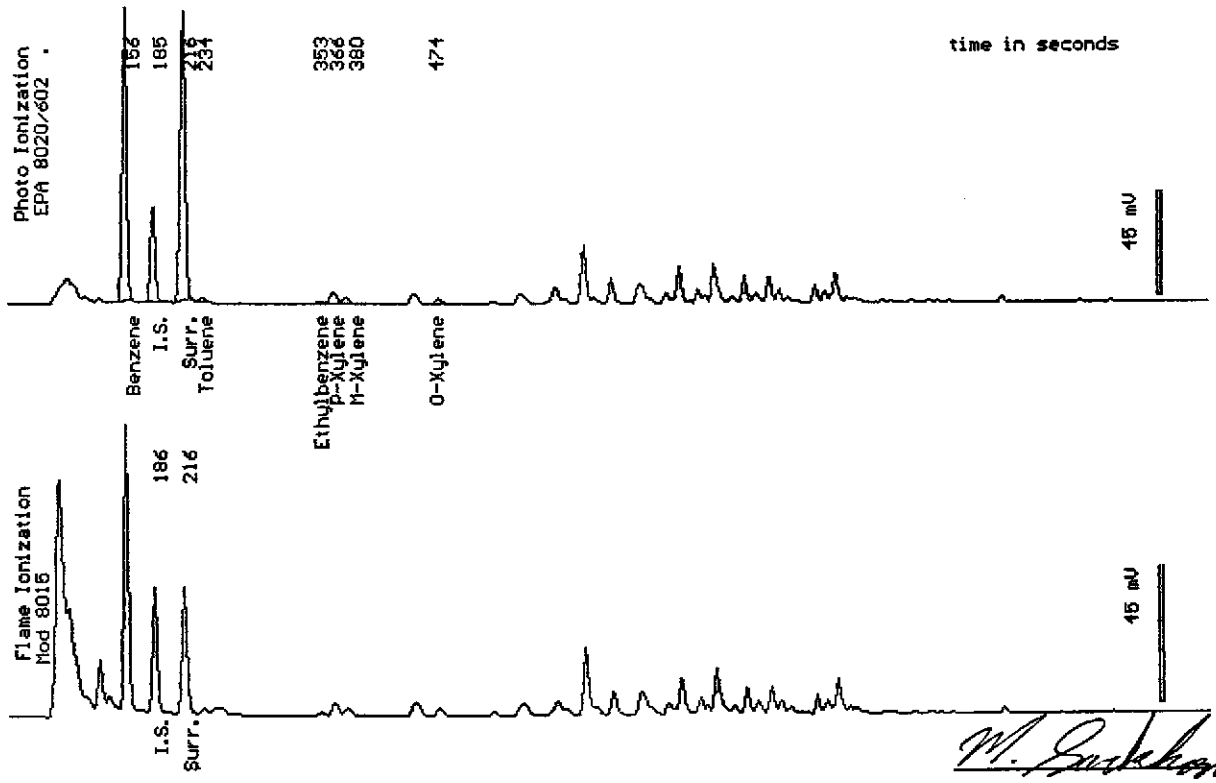
Sample Log 9043

9043-34

Sample: **MW-5**

From : Project # 19024.03 (Beacon 604)
Sampled : 03/30/94
Dilution : 1:25 QC Batch : 4077b
Matrix : Water

Parameter	(MRL) ug/L	Measured Value ug/L
Benzene	(13)	1300
Toluene	(13)	20
Ethylbenzene	(13)	<13
Total Xylenes	(13)	160
TPH as Gasoline	(1300)	7500
Surrogate Recovery		96 %



Date Analyzed: 04-06-94
Column : 0.53mm ID X 30m DBWAX (J&W Scientific)

Mitra Sarkhosh
Senior Chemist

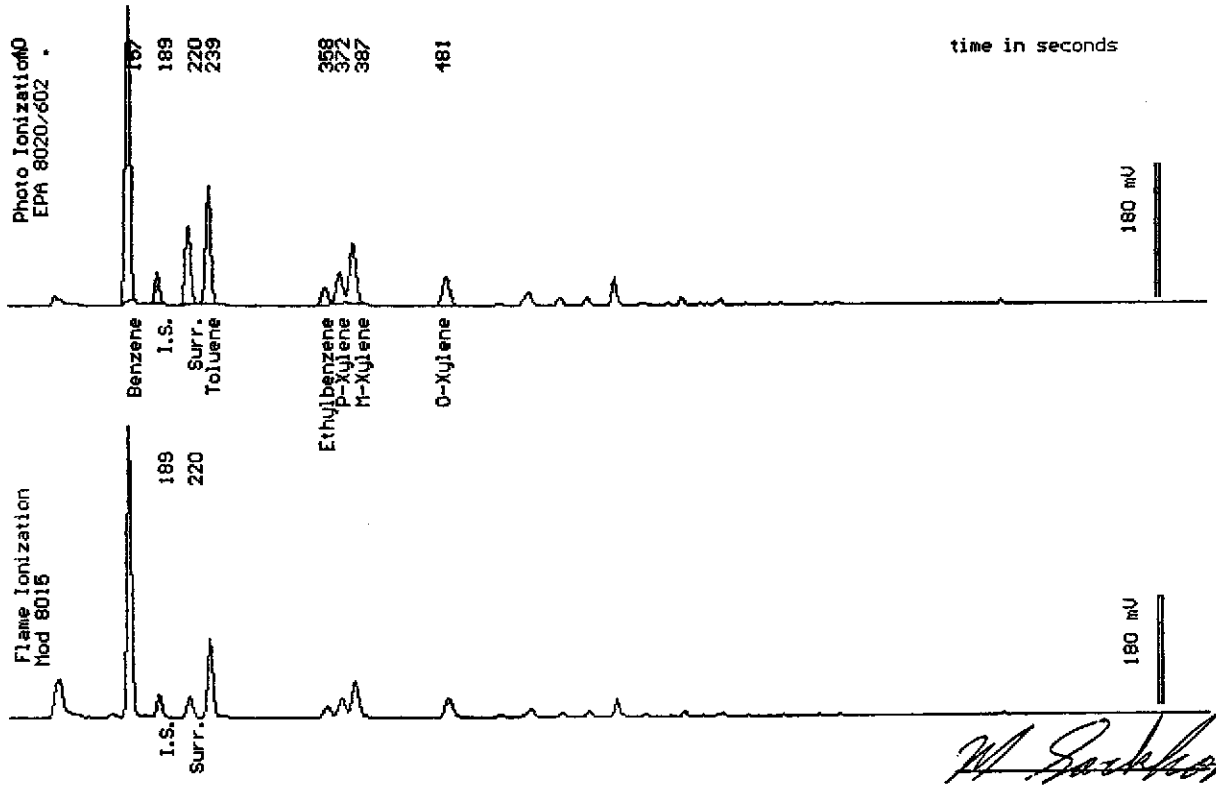
Sample Log 9043

9043-35

Sample: **MW-6**

From : Project # 19024.03 (Beacon 604)
Sampled : 03/30/94
Dilution : 1:100 QC Batch : 4077b
Matrix : Water

Parameter	(MRL) ug/L	Measured Value ug/L
Benzene	(50)	21000
Toluene	(50)	8600
Ethylbenzene	(50)	1700
Total Xylenes	(50)	12000
TPH as Gasoline	(5000)	63000
Surrogate Recovery		99 %



Date Analyzed: 04-06-94
Column : 0.53mm ID X 30m DBWAX (J&W Scientific)

Mitra Sarkhosh
Senior Chemist

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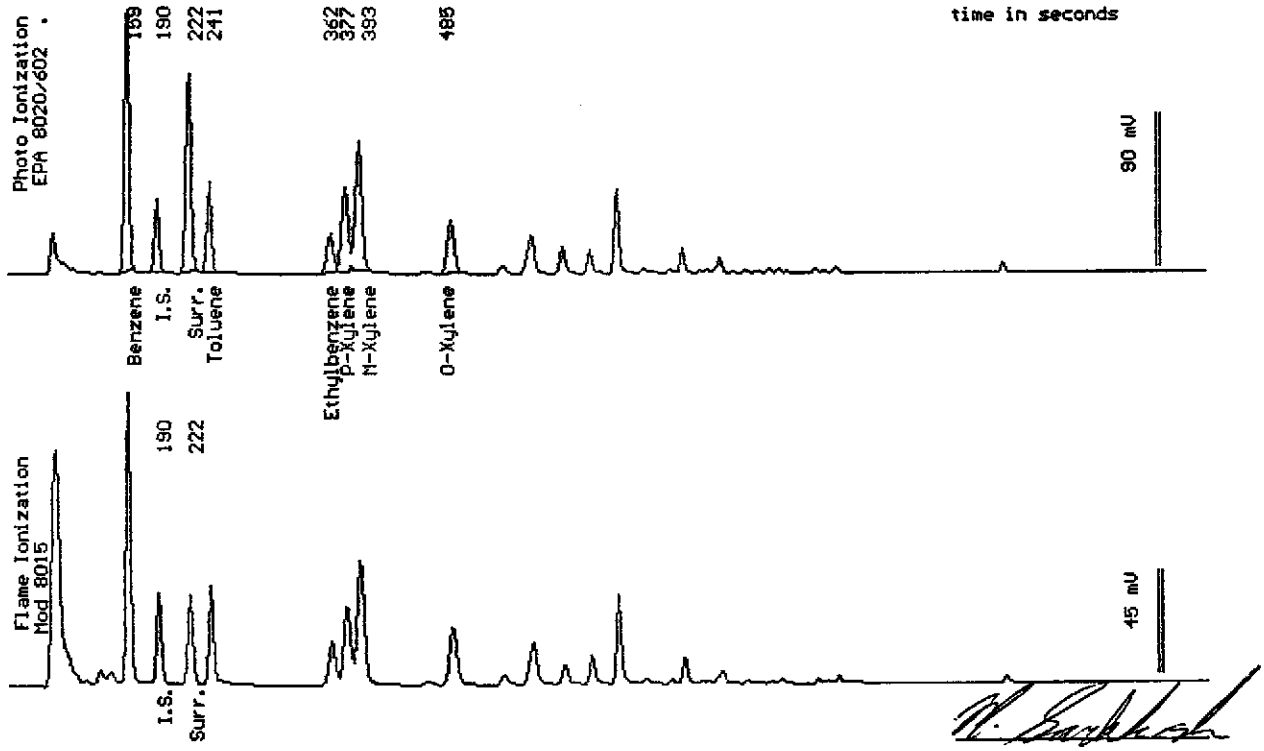
Sample Log 9043
9043-36

Sample: **MW-7**

From : Project # 19024.03 (Beacon 604)
Sampled : 03/30/94
Dilution : 1:100 QC Batch : 4077b
Matrix : Water

Parameter	(MRL) ug/L	Measured Value ug/L
Benzene	(50)	7200
Toluene	(50)	2400
Ethylbenzene	(50)	1600
Total Xylenes	(50)	11000
TPH as Gasoline	(5000)	43000
Surrogate Recovery		98 %



Date Analyzed: 04-06-94
Column : 0.53mm ID X 30m DBWAX (J&W Scientific)

Mitra Sarkhosh
Senior Chemist

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Ultramar Inc.

CHAIN OF CUSTODY REPORT

BEACON

Beacon Station No.	Sampler (Print Name)			ANALYSES				Date	Form No.
604	Steve Lutty							4-1-94	5 of
Project No.	Sampler (Signature)								
19024.03	Steve Lutty							Standard TAT	
Project Location	Affiliation								
Livermore	AMV Geo								
Sample No./Identification	Date	Time	Lab No.	BTEX	TPH (gasoline)	TPH (diesel)	No. of Containers	REMARKS	
MW-4	3-30-94	1640		X	X		3	Water sample	
MW-5		1715					3		
MW-6		1745					3		
MW-7		1630					3		
LV-(1 through 4)	3-30-94	1645					4	Composite to one sample	

RECEIVED by W.E.S.T. date 4/1/94

Relinquished by: (Signature/Affiliation)	Date	Time	Received by: (Signature/Affiliation)	Date	Time
Steve Lutty	4-1-94	1305		4/1/94	1305
Relinquished by: (Signature/Affiliation)	Date	Time	Received by: (Signature/Affiliation)	Date	Time
	4/1/94	1800			
Relinquished by: (Signature/Affiliation)	Date	Time	Received by: (Signature/Affiliation)	Date	Time
				4/1/94	1432

Report To:
Steve Lutty
AMV

Bill to: ULTRAMAR INC.
525 West Third Street
Hanford, CA 93230
Attention: Terry Fox

WHITE: Return to Client with Report YELLOW: Laboratory Copy PINK: Originator Copy

32-8003 1/90