HYDRO
ENVIRONMENTAL
TECHNOLOGIES, INC.

QUARTERLY MONITORING REPORT

Former Mobil Service Station No. 10-L1X
15884 Hesperian Boulevard
San Lorenzo, California

Sampling date: November 19, 1993

Prepared for:

MOBIL OIL CORPORATION
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Prepared by:

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HETI Job No. 8-019

February 1, 1994

HYDRO ENVIRONMENTAL TECHNOLOGIES, INC.

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1.0 INTRODUCTION

This report presents the results of quarterly ground water sampling conducted by Hydro-Environmental Technologies, Inc. (HETI) at former Mobil service station No. 10-L1X, located at 15884 Hesperian Boulevard in San Lorenzo, California. A site location map is attached as Figure 1. Ground water sampling was performed on November 19, 1993.

Work performed at the site by HETI included: (1) well gauging, (2) well purging, (3) collection of ground water samples from all monitoring wells on-site and (4) analysis of water samples for total petroleum hydrocarbons as gasoline (TPHg) using EPA Method 8015 (modified), and benzene, toluene, ethylbenzene and total xylenes (BTEX) using EPA Method 8020 (modified).

2.0 BACKGROUND

The site was previously a Mobil gasoline service station located at the northern corner of the intersection of Hesperian Boulevard and Post Office Street in San Lorenzo, California. It is presently a paved parking lot for a shopping mall. Figure 2 shows the vicinity of the site, and Figure 3 shows the layout of the site and the location of existing monitoring wells.

In July 1986, Kaprealian Engineering, Inc. (KEI) installed four two-inch diameter monitoring wells (MW-1 through MW-4) on-site. In December 1987, in preparation to abandon the site, the underground storage tanks were removed and the tank pit was over-excavated.

In October 1991, HETI continued with further subsurface investigation. After HETI's initial site inspection to locate the wells, the following conditions were observed: monitoring well MW-2 was found in good condition, the casing to MW-3 was broken off and debris had filled the well, and wells MW-1 and MW-4 could not be located and their existence/condition is unknown.

In January 1992, HETI installed three monitoring wells on-site (MW-5, MW-6 and MW-7) and properly abandoned monitoring well MW-3. Results of that phase of the investigation and a detailed project history were presented in HETI's *Phase I Report* dated May 7, 1992.

In August 1993, HETI installed one additional downgradient monitoring well (MW-8), off-site on the southwestern side of Hesperian Boulevard. Results of that phase of the investigation were presented in HETI's *Phase II Subsurface Investigation and Quarterly Monitoring Report* dated September 16, 1993. All monitoring well locations are shown on the Site Plan (Figure 3).

3.0 FIELD ACTIVITIES

HETI personnel collected ground water samples from all monitoring wells at the site on November 19, 1993. All sampling was performed according to HETI standard protocol, using methods which are consistent with guidelines established by the lead regulatory agencies. A copy of HETI's revised Ground Water Sampling Protocol is attached as Appendix A.

Prior to purging, the depth to water in each of the wells was gauged to the nearest hundredth of a foot using an electronic water sounder. Prior to sampling, the wells were purged of three well casing volumes or purged dry while the parameters of temperature, pH and conductivity were monitored for stabilization. Purging data is included in Appendix B.

Following recovery of the water level in the wells to at least 80 percent of their static level, ground water samples were collected with dedicated bailers. The samples were transferred to sample containers provided by the analytical laboratory. Sample containers were documented, labeled and placed in a cooler. A chain of custody was prepared and accompanied the samples to the laboratory; a copy is included in Appendix C. Ground water sample analysis was performed by Sequoia Analytical, a state DHS-certified laboratory located in Redwood City, California.

4.0 RESULTS

4.1 Ground Water Data

On November 19, 1993 depth to ground water in the wells ranged between 12.84 to 14.10 feet below grade. Depth to water measurements and calculated ground water elevations in the wells are presented on Table 1. The depth to water measurements and the wellhead elevation data were used to calculate ground water elevation contours. These contours are shown on Figure 4, the Ground Water Contour Map. Figure 4 shows ground water flow to be towards the southwest at an approximate gradient of 0.0025 ft/ft (0.25%).

4.2 Laboratory Analytical Results

Neither TPHg nor BTEX were detected in concentrations exceeding the method detection limits in the ground water samples collected from any of the monitoring wells except well MW-7. TPHg and ethylbenzene were detected in the ground water sample collected from well MW-7 at concentrations of 50 ppb and 1.5 ppb, respectively.

Analytical results are presented graphically on Figure 5, the Hydrocarbon Concentration Map. A summary of ground water analytical results is presented on Table 1. Copies of the laboratory reports and the chain-of-custody forms are attached in Appendix C.

5.0 SUMMARY

The results of the field activities and laboratory analyses of soil and ground water samples collected during this investigation are discussed below.

- Ground water levels measured in all the wells ranged from 12.84 to 14.10 feet below grade. The ground water gradient was calculated to be approximately 0.0025 ft/ft in a general southwesterly direction beneath the site.

- Separate phase petroleum was not detected in any of the monitoring wells.

- Neither TPHg nor BTEX were detected in the ground water samples collected from any of the monitoring wells except MW-7.

6.0 RECOMMENDATIONS

Since the dissolved hydrocarbon distribution at this site is well documented and does not change significantly from quarter to quarter, HETI recommends a revised sampling program. Because neither TPHg nor benzene have been detected in concentrations exceeding method detection limits in water samples collected from wells MW-5 and MW-6 for more than four consecutive quarters, HETI recommends that these wells be deleted from the quarterly monitoring program. HETI also recommends that MW-2 be deleted from the program if no benzene is detected in samples collected from that well next quarter.

In addition, if no benzene is detected in water samples collected from wells MW-7 and MW-8 for the next two consecutive quarters, HETI will apply for site closure.

These recommendations will be implemented commencing with the February, 1994 sampling event. HETI will confirm authorization with the Alameda County Department of Environmental Health prior to this sampling event.

7.0 CERTIFICATION

This report was prepared under the supervision of a registered professional engineer. All statements, conclusions and recommendations are based solely upon field observations and analytical analyses performed by a state-certified laboratory related to work performed by Hydro-Environmental Technologies, Inc.

It is possible that variations in soil or ground water conditions exist beyond the points explored in this investigation. Also, site conditions are subject to change at some time in the future due to variations in rainfall, temperature, regional water usage, or other factors.

The service performed by Hydro-Environmental Technologies, Inc. has been conducted in a manner consistent with the level of care and skill ordinarily exercised by members of our profession currently practicing under similar conditions in the area of the site. No other warranty, expressed or implied, is made.

Hydro-Environmental Technologies, Inc. includes in this report chemical analytical data from a state-certified laboratory. These analyses are performed according to procedures suggested by the U.S. EPA and the State of California. Hydro-Environmental Technologies, Inc. is not responsible for laboratory errors in procedure or result reporting.

HYDRO-ENVIRONMENTAL TECHNOLOGIES, INC.

Prepared by:

Ruary Allan
Staff Geologist

Reviewed by:

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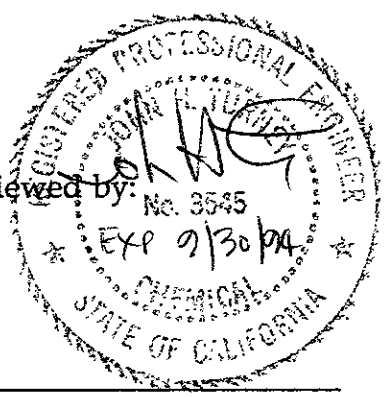
Project Manager

Reviewed by:



John Turney P.E.
Senior Engineer

TABLES

Table 1

GROUND WATER ELEVATIONS AND ANALYTICAL RESULTS

Former Mobil Station No. 10-L1X
15884 Hesperian Boulevard
San Lorenzo, California

MW-No.	Date	TOC (feet)	DTW (feet)	GWE (feet)	TPHd (ppb)	TPHg (ppb)	B (ppb)	T (ppb)	E (ppb)	X (ppb)
MW-2	2/12/92	31.81	12.74	19.07	NT	190	4.4	ND<0.3	4.7	3.8
	5/4/92	31.81	11.36	20.45	NT	480	9.1	1.4	4.4	2.3
	8/20/92	31.81	13.80	18.01	NT	ND<50	0.99	ND<0.5	ND<0.5	ND<0.5
	11/27/92	31.81	14.30	17.51	NT	56	3.2	ND<0.5	0.87	2.1
	2/24/93	31.81	9.73	22.08	NT	330	14	ND<0.5	ND<0.5	ND<0.5
	5/19/93	31.81	11.82	19.99	NT	100	ND<0.5	ND<0.5	ND<0.5	ND<0.5
	8/19/93	31.81	12.27	19.54	NT	ND<50	ND<0.5	ND<0.5	ND<0.5	ND<0.5
	11/19/93	31.81	12.91	18.90	NT	ND<50	ND<0.5	ND<0.5	ND<0.5	ND<0.5
MW-5	2/12/92	32.92	13.59	19.33	ND<50	0.3	ND<0.3	ND<0.3	ND<0.3	ND<0.3
	5/4/92	32.92	12.25	20.67	ND<50	ND<30	ND<0.3	ND<0.3	ND<0.3	ND<0.3
	8/20/92	32.92	14.62	18.30	NT	ND<50	ND<0.5	ND<0.5	ND<0.5	ND<0.5
	11/27/92	32.92	15.14	17.78	NT	ND<50	ND<0.5	ND<0.5	ND<0.5	ND<0.5
	2/24/93	32.92	10.57	22.35	NT	ND<50	ND<0.5	ND<0.5	ND<0.5	ND<0.5
	5/19/93	32.92	11.66	21.26	NT	ND<50	ND<0.5	ND<0.5	ND<0.5	ND<0.5
	8/19/93	32.92	13.01	19.91	NT	ND<50	ND<0.5	ND<0.5	ND<0.5	ND<0.5
	11/19/93	32.92	13.69	19.23	NT	ND<50	ND<0.5	ND<0.5	ND<0.5	ND<0.5
MW-6	2/12/92	32.68	13.57	19.11	NT	2700	14	3.5	27	39
	5/4/92	32.68	12.23	20.45	NT	ND<30	ND<0.3	ND<0.3	ND<0.3	ND<0.3
	8/20/92	32.68	14.64	18.04	NT	ND<50	ND<0.5	ND<0.5	ND<0.5	3.8
	11/27/92	32.68	15.14	17.54	NT	ND<50	ND<0.5	ND<0.5	ND<0.5	ND<0.5
	2/24/93	32.68	10.62	22.06	NT	ND<50	ND<0.5	ND<0.5	ND<0.5	ND<0.5
	5/19/93	32.68	11.66	21.02	NT	ND<50	ND<0.5	ND<0.5	ND<0.5	ND<0.5
	8/19/93	32.68	13.06	19.62	NT	ND<50	ND<0.5	ND<0.5	ND<0.5	ND<0.5
	11/19/93	32.68	13.73	18.95	NT	ND<50	ND<0.5	ND<0.5	ND<0.5	ND<0.5
MW-7	2/12/92	33.08	13.90	19.18	NT	ND<30	ND<0.3	ND<0.3	ND<0.3	ND<0.3
	5/4/92	33.08	12.60	20.48	NT	640	4.5	ND<0.6	11	14
	8/20/92	33.08	14.96	18.12	NT	220	1.2	ND<0.5	3.8	4.3

Table 1

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15884 Hesperian Boulevard
San Lorenzo, California

MW-No.	Date	TOC (feet)	DTW (feet)	GWE (feet)	TPHd (ppb)	TPHg (ppb)	B (ppb)	T (ppb)	E (ppb)	X (ppb)
MW-7	11/27/92	33.08	15.49	17.59	NT	82	1.6	ND<0.5	4.3	3.6
	2/24/93	33.08	10.97	22.11	NT	82	1.5	ND<0.5	6.0	4.0
	5/19/93	33.08	12.09	20.99	NT	67	0.85	ND<0.5	6.4	3.8
	8/19/93	33.08	13.48	19.60	NT	88	1.7	ND<0.5	9.0	4.8
	11/19/93	33.08	14.10	18.98	NT	50	ND<0.5	ND<0.5	1.5	ND<0.5
MW-8	8/19/93	31.31	12.21	19.10	NT	ND<50	ND<0.5	ND<0.5	ND<0.5	ND<0.5
	11/19/93	31.31	12.84	18.47	NT	ND<50	ND<0.5	ND<0.5	ND<0.5	ND<0.5

MW-No.	Date	TOG (ppm)	HVO (ppb)	SVO (ppb)	PCB (ppb)	Cd (ppm)	Cr (ppm)	Ni (ppm)	Zn (ppm)	O-Pb (ppm)
MW-5	2/12/92	ND<1.0	ND<0.5-5.0	NT	NT	ND<0.010	ND<0.010	ND<0.050	ND<0.010	ND<0.050
	5/4/92	ND<1.0	ND<0.5-5.0	NT	NT	ND<0.010	ND<0.010	ND<0.050	ND<0.010	ND<0.050
	8/20/92	ND<1.0	ND<0.5-5.0	ND<2-10	ND<0.5-2.0	ND<0.010	ND<0.010	ND<0.050	0.012	ND<0.050

Table 1

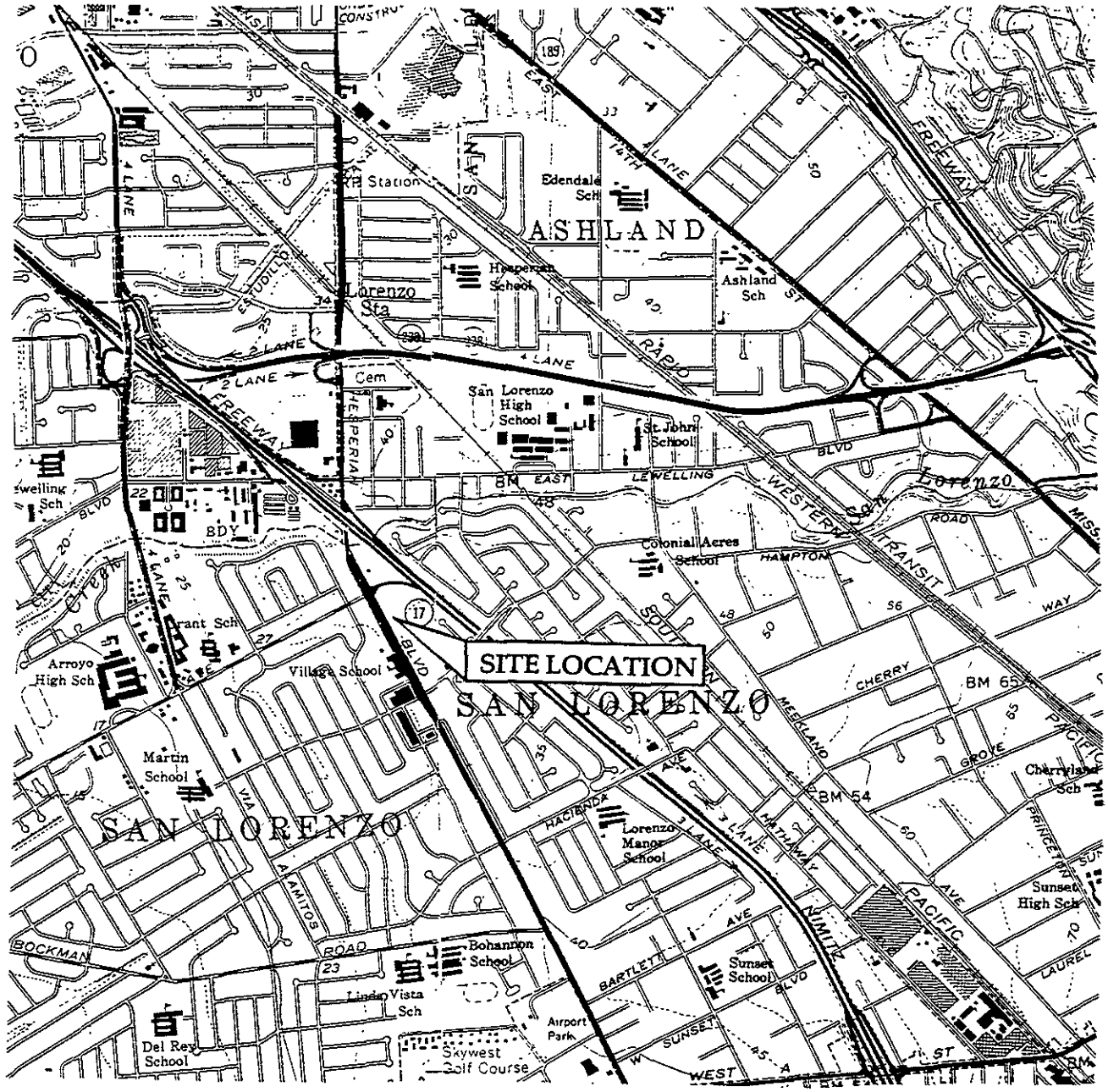
GROUND WATER ELEVATIONS AND ANALYTICAL RESULTS

Former Mobil Station No. 10-L1X
15884 Hesperian Boulevard
San Lorenzo, California

Notes:

MW No. :	Monitoring well number
Date :	Ground water sample collection date
TOC :	Elevation at the north side of the top of the well casing referenced to approximate mean sea level
DTW :	Depth to water
GWE :	Ground water elevation
TPHd :	Total petroleum hydrocarbons as diesel by EPA Method 8015
TPHg :	Total petroleum hydrocarbons as gasoline by EPA Method 8015
BTEX :	Benzene, Toluene, Ethylbenzene and total Xylenes by EPA Method 8020
TOG :	Total oil and grease by EPA Method 413.2 (I.R.)
HVO :	Halogenated volatile organics by EPA Method 8010
SVO:	Semi-volatile organics by EPA Method 8270 GC/MS
PCB:	Polychlorinated biphenyls by EPA Method 8080
Cd, Cr, Ni, Zn :	Cadmium, chromium, nickel and zinc by EPA Method 6000
O-Pb	Organic lead by California LUFT Manual (revised)
ppb :	Parts per billion (µg/L)
ppm :	Parts per million (mg/L)
ND :	Not detected in concentrations exceeding the indicated laboratory method detection limit
NT :	Not tested

FIGURES



SCALE 1:24 000

1 0 1/2 1 MILE

1000 0 1000 2000 3000 4000 5000 6000 7000 FEET

1 5 0 1 KILOMETER

NORTH

QUADRANGLE LOCATION

SOURCE: U.S. GEOLOGICAL SURVEY
7.5 MINUTE QUADRANGLE MAPS
ENTITLED: "SAN LEANDRO, CALIFORNIA"
AND "HAYWARD, CALIFORNIA"
PHOTOREVISED 1980

HYDRO-ENVIRONMENTAL TECHNOLOGIES, INC.

SITE LOCATION MAP

Former Mobil Service Station No. 10-L1X
15884 Hesperian Boulevard
San Lorenzo, California

Figure 1

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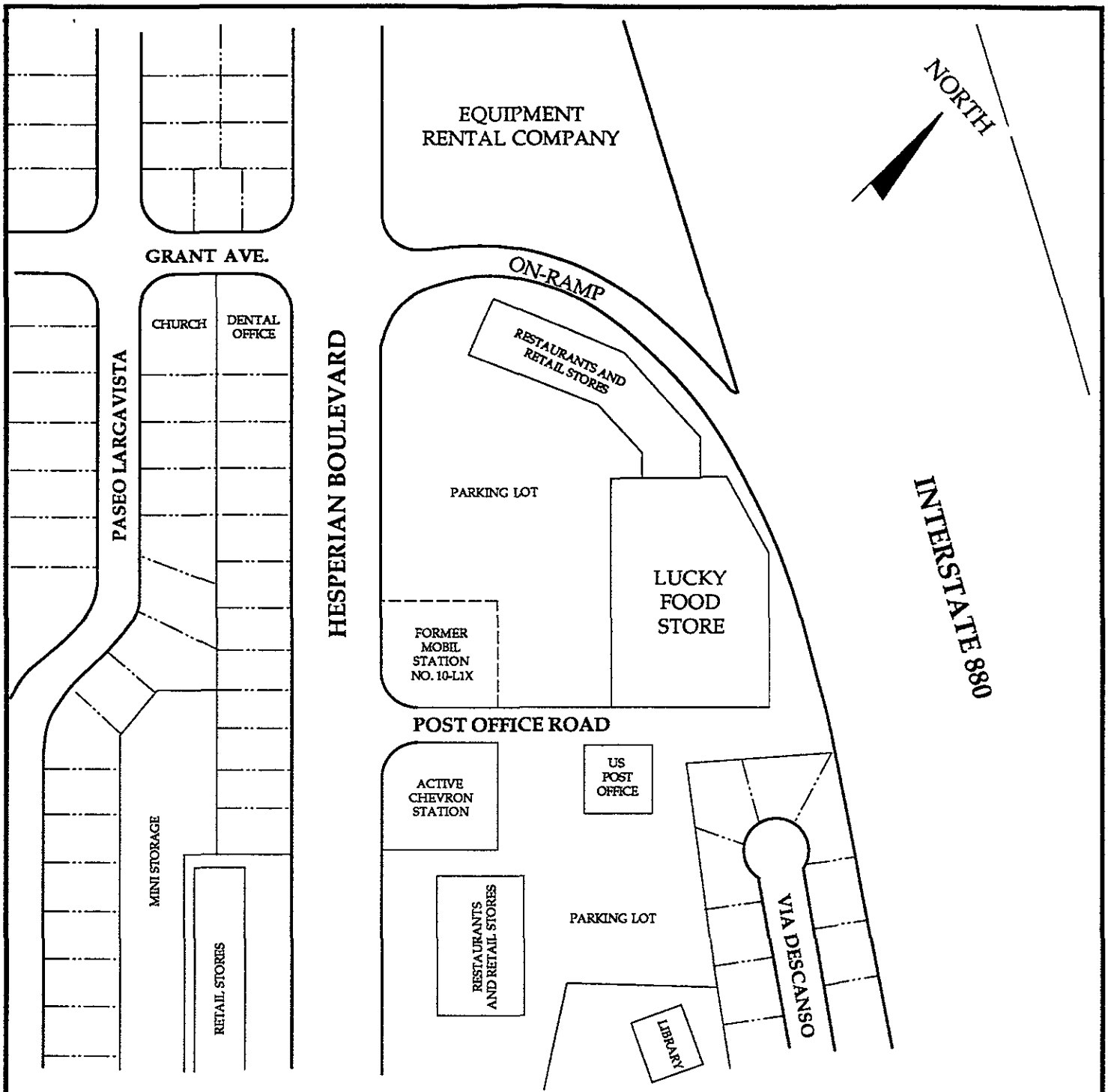
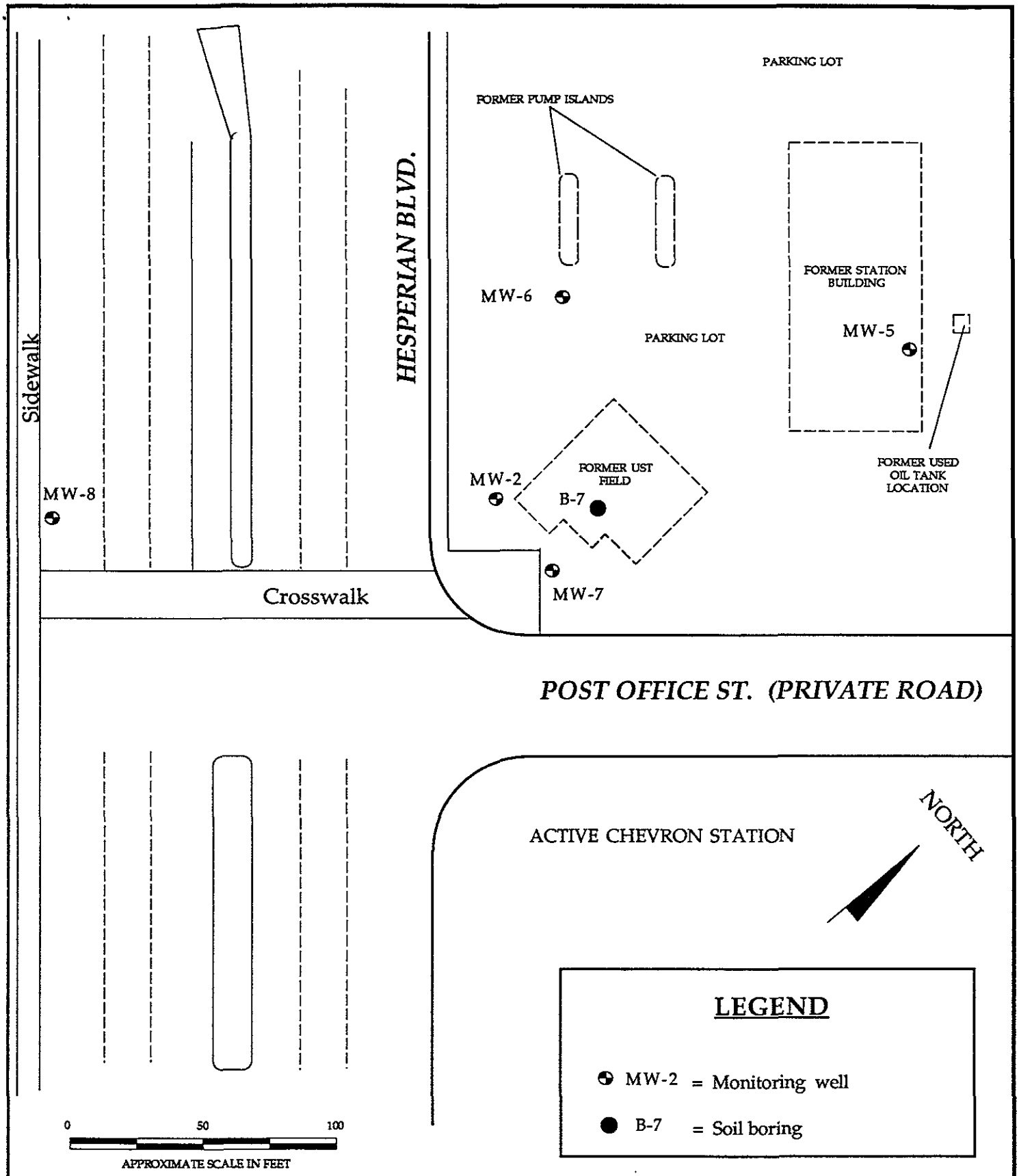


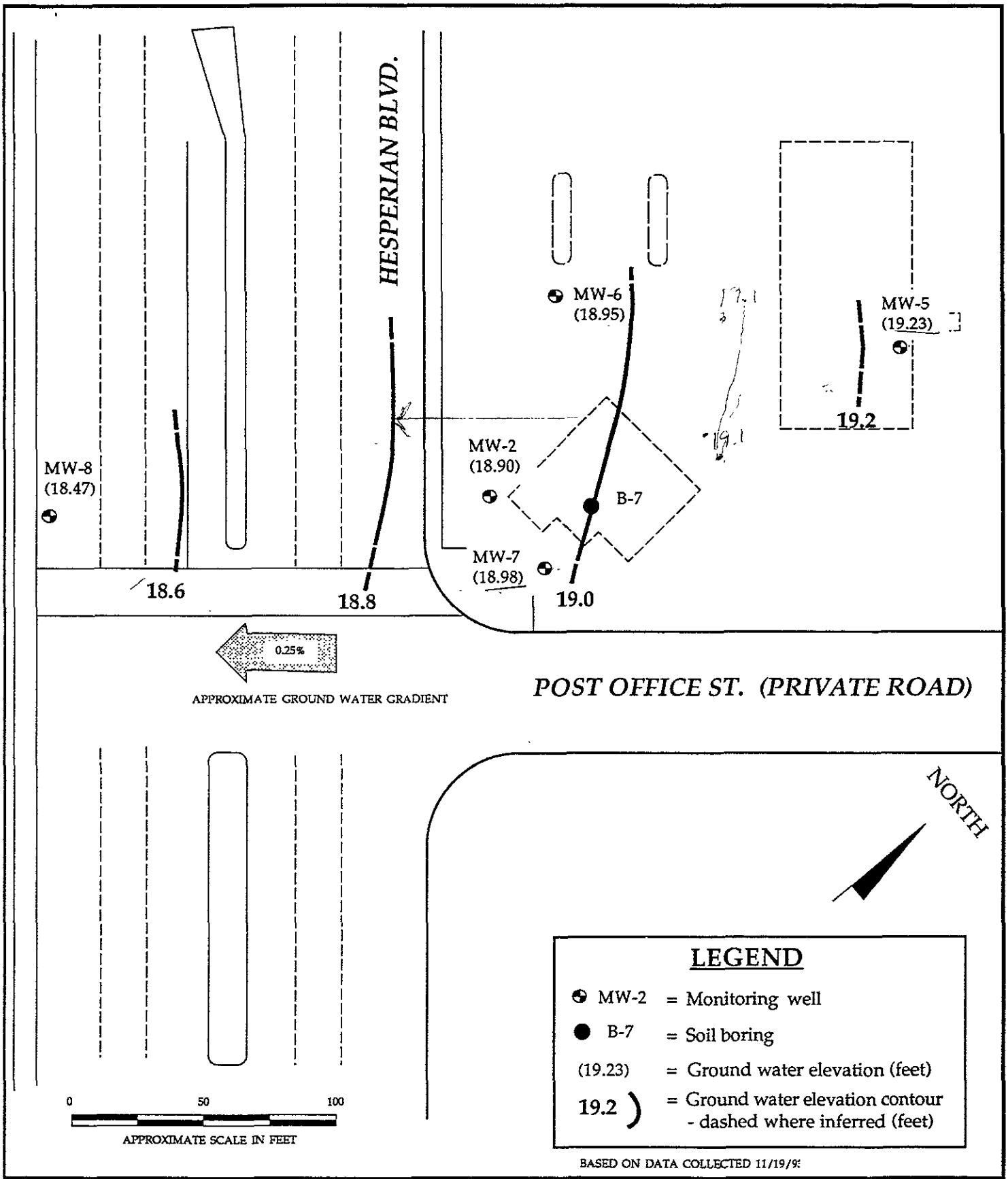
LEGEND

——·——·—— = Residential Property Line

HYDR◆- ENVIR◆NMENTAL TECHN◆LOGIES, INC.	**SITE VICINITY MAP** Former Mobil Service Station No. 10-L1X 15884 Hesperian Boulevard San Lorenzo, California	Figure **2** 8-019 9/93



HYDRO-ENVIRONMENTAL TECHNOLOGIES, INC.	**SITE PLAN** Former Mobil Service Station No. 10-L1X 15884 Hesperian Blvd. San Lorenzo, California	Figure 3 8-019 9/93



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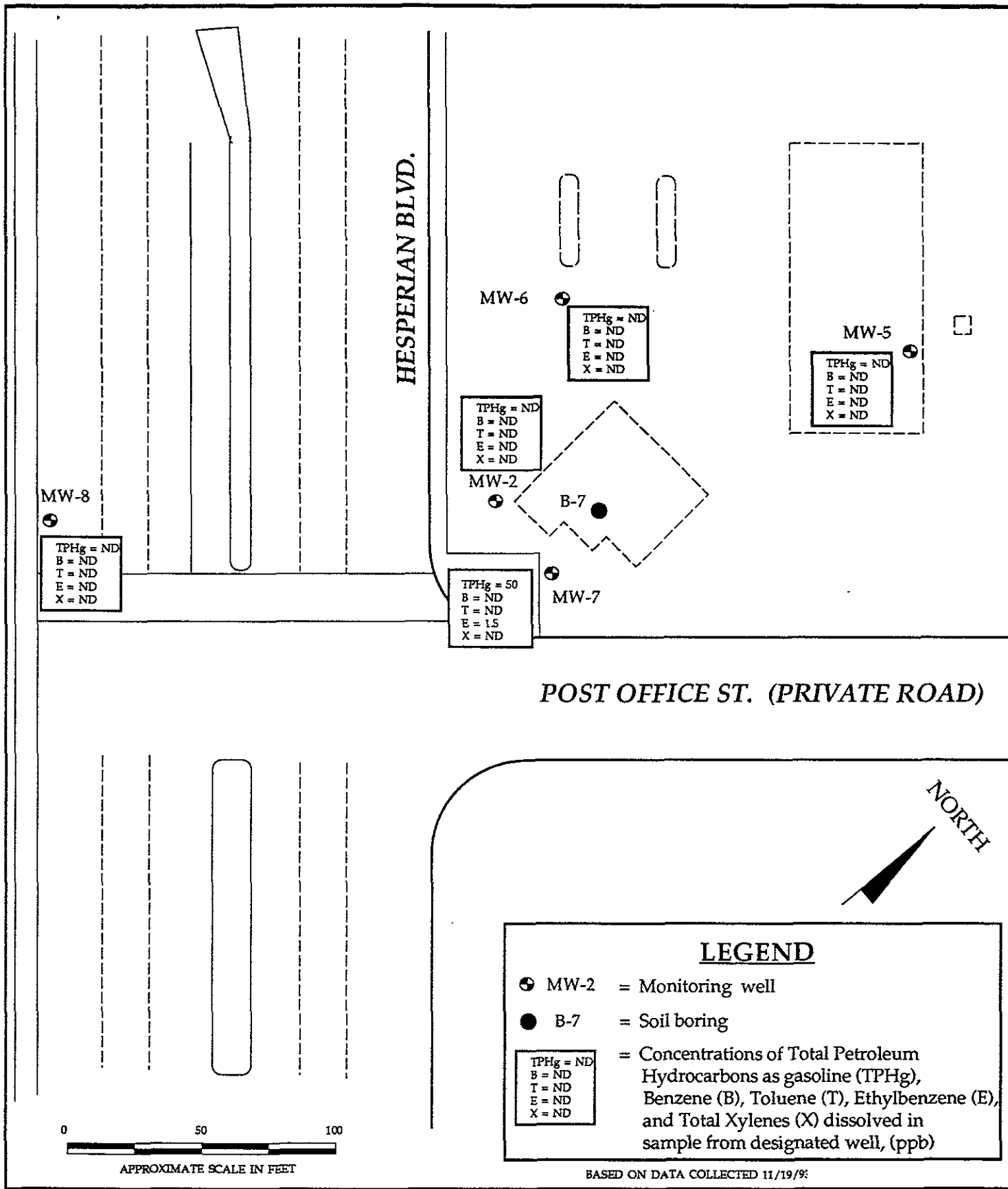
GROUND WATER CONTOUR MAP
Former Mobil Service Station No. 10-L1X
15884 Hesperian Blvd.
San Lorenzo, California

Figure 4

8-019 11/93



HYDRO-ENVIRONMENTAL TECHNOLOGIES, INC.	HYDROCARBON CONCENTRATION MAP Former Mobil Service Station No. 10-L1X 15884 Hesperian Blvd. San Lorenzo, California	Figure 5 8-019 11/93

APPENDIX A

HYDRO-ENVIRONMENTAL TECHNOLOGIES, INC.
CALIFORNIA

GROUND WATER
SAMPLING PROTOCOLS

December 1993

GROUNDWATER SAMPLING AND ANALYSIS

Quality Assurance/Quality Control Objectives

The sampling and analysis procedures employed by HETI for groundwater sampling and monitoring follow specific Quality Assurance/Quality Control (QA/QC) guidelines. Quality Assurance (QA) objectives have been established by HETI to develop and implement procedures for obtaining field data and evaluating water quality in an accurate, precise and complete manner so that sampling procedures and field measurements provide information that is comparable and representative of the actual field conditions. Quality Control (QC) is maintained by HETI by using specific field protocols and requiring the analytical laboratory to perform internal and external QC checks. It is the goal of HETI to provide data that are accurate, precise, complete, comparable, and representative. The definitions for accuracy, precision, completeness, comparability, and representativeness are as follows:

1. Accuracy - the degree of agreement of a measurement with an accepted reference or true value.

2. Precision - a measure of agreement among individual measurements under similar conditions. Usually expressed in terms of standard deviation.

3. Completeness - the amount of valid data obtained from a measurement system compared to the amount that was expected to meet the project data goals.

4. Comparability - the confidence with which one data set can be compared with another.

5. Representativeness - the degree to which a sample or group of samples reflect the characteristics of a media at a given sampling point. Also includes the degree to which a sampling point represents the actual parameter variations which are under study.

As part of the HETI QA/QC program, applicable federal, state and local reference documents are to be followed. The procedures outlined in these regulations, manuals, handbooks, guidance documents and journals are incorporated into the HETI sampling procedures to assure that: (1) groundwater samples are properly collected, (2) groundwater samples are identified, preserved, and transported in a manner such that they are representative of field conditions, and (3) chemical analyses of samples are accurate and reproducible.

GUIDANCE AND REFERENCE DOCUMENTS USED TO DEVELOP PROTOCOL

U.S.E.P.A. - 339/9-51-002	NEIC Manual for Groundwater/ Subsurface Investigation at Hazardous Waste Sites
U.S.E.P.A. - 503/SW611	Procedures Manual for Groundwater Monitoring at Solid Waste Disposal Facilities (August, 1977)
U.S.E.P.A. - 600/4-79-020	Methods for Chemical Analysis of Water and Wastes (1983)
U.S.E.P.A. - 600/4-82-029	Handbook for Sampling and Sample Preservation of Water and Wastewater (1982)
U.S.E.P.A. - SW-846#, 3rd Edition	Test Methods for Evaluating Solid Waste - Physical/Chemical Methods (November, 1986) and latter additions
40 CFR 136.3e Table II	Required Containers, Preservation Techniques, and Holding Times
Resources Conservation and Recovery Act (OSWER 9950.1)	Groundwater Monitoring Technical Enforcement Guidance Document (September, 1986)
California Regional Water Quality Control Board (Central Valley Region)	A Compilation of Water Quality Goals (September, 1988); Updates (October, 1988)
California Regional Water Quality Control Board (North Coast, San Francisco Bay, and Central Valley)	Regional Board Staff Recommendations for Initial Evaluations and Investigation of Underground Tanks: Tri-Regional Recommendations (June, 1988)
California Regional Water Quality Control Board (Central Valley Region)	Memorandum: Disposal, Treatment, and Refuse of Soils Contaminated with Petroleum Fractions (August, 1986)
State of California Department of Health Services	Hazardous Waste Testing Laboratory Certification List (March, 1987)
State of California Water Resources Board	Leaking Underground Fuel Tank Control (LUFT) Field Manual (May, 1988), and LUFT Field Manual Revision (April, 1989)

State of California Water Resources Control Board	Title 23 (Register #85.#33-8-17-85), Subchapter 16: Underground Tank Regulations; Article 3, Sections 2632 and 2634; Article 4, Section 2647 (October, 1986)
Santa Clara Valley Water District	Guidelines for Investigating Fuel Leaks (March, 1989)
Santa Clara Valley Water District	Guidelines for Preparing or Reviewing Sampling Plans for Soil and Groundwater Investigation of Fuel Contamination Sites (January, 1989)
Alameda County Water District	Groundwater Protection Program: Guidelines for Groundwater and Soil Investigations at Leaking Underground Fuel Tank Sites (most recent revision)
American Public Health Association	Standard Methods for the Examination of Water and Wastewaters, 16th Edition
Analytical Chemistry (journal)	Principles of Environmental Analysis Volume 55, pages 2212-18,December, 1983
American Petroleum Institute Environmental Affairs Dept., June, 1983	Groundwater Monitoring & Sample Bias
The Bay Area Air Quality Management District	Regulation 8 - Rule 40 & Rule 48

Because groundwater samples collected by HETI are analyzed in the parts per billion (ppb) range for many analytes, care is exercised to prevent contamination of samples. When volatile or semivolatile organic compounds are included for analysis, HETI sampling crew members will adhere to the following precautions in the field:

1. A new pair of clean, disposable, latex (or comparable material) gloves are to be worn for each well to be sampled.

2. When possible, samples will first be collected from wells known or suspected to contain the fewest contaminants, followed by wells in increasing order of degree of contamination.

3. All sample bottles and equipment are to be kept away from fuels and solvents. When possible, gasoline (used in generators and water pumps) is to be shipped to the project site in separate compartments of the same vehicle or in a separate vehicle as that in which sample bottles are shipped.

4. Sampling bailers are to be composed of polyethylene (when dedicated to the well), Teflon or stainless steel. Other materials, such as acrylic, may contain phthalate esters which can interfere with gas chromatography (GC) analyses. Well purging may be performed with PVC bailers.

5. Volatile organic groundwater samples are collected so that air passage through the sample does not occur or is minimal (to prevent volatiles from being stripped from the samples). Sample bottles are filled by slowly running the sample down the side of the bottle until there is a positive convex meniscus over the neck of the bottle. The Teflon side of the septum (in cap) is positioned against the meniscus and the cap is screwed on tightly. The sample is then inverted and lightly tapped while the sampler inspects the contents of the bottle for an air bubble. The absence of an air bubble indicates a successful seal. If a bubble is evident, the cap is removed and more water is added to the sample. The inspection procedure is repeated and if bubbles persist, the vial is discarded in a container designated for used and broken vials and bottles and the sample filling procedure is repeated with another vial.

6. Extra vials shall be available for use in the event of dropped bottles and/or caps. Any bottle which has come in contact with the ground shall be considered contaminated and shall not be used. When replacing septa, or if septa become inverted, care shall be taken to assure that the Teflon seal faces the interior of the bottle.

7. All preservatives shall be provided by the contract analytical laboratory.

Laboratory and field handling procedures of samples may be monitored by including QC samples for analysis with sample lots from a project site. QC samples may include any combination of the following:

1. Trip Blank - Used for purgable organic compounds only; QC samples shall be collected in 40 milliliter (ml) sample vials filled in the analytical laboratory with organic free water. Trip blanks should be sent to the project site, and travel with the samples from the project site. Trip blanks are <u>not</u> opened, and are returned from the project site with the samples from the project site for analysis.

2 Field Blank - Prepared in the field using steam-distilled water. Field blank QC samples shall accompany project site samples to the laboratory and shall be analyzed for the same chemical parameters as those samples taken from the project site.

3. Equipment Blank - Equipment Blank QC samples shall be prepared in the field using field equipment rinsate between two different wells after the equipment has been washed and rinsed. The equipment blank will consist of deionized water retained in the sampling equipment. These QC samples will only be taken when a dedicated bailer is not used for sampling.

4. Duplicates - Duplicate QC samples shall be collected "second samples" from a selected well and project site. Duplicates shall be collected as either split samples or second-run samples (i.e. later date) from the same well.

The number and types of QC samples shall be determined by HETI on a site-specific basis.

GROUNDWATER SAMPLE COLLECTION

This section describes the routine procedures followed by HETI while collecting groundwater samples for chemical analysis. These procedures include decontamination, water level measurements, well purging, physical parameter measurements, sample collection, sample preservation, and sample handling. Critical sampling objectives for HETI are to:

1. Collect groundwater samples which are representative of the sampled matrix.

2. Maintain sample integrity from the time of sample collection to delivery to the analytical laboratory.

Sample analyses, methods, containers, preservation, and holding times are presented in Table A-1.

Decontamination Procedures

All physical parameter measuring and sampling equipment shall be decontaminated prior to measurement and sample collection using a trisodium phosphate or Alconox solution wash, followed by two separate rinses in tap water, followed by one rinse in steam-distilled water. Any sampling equipment surfaces or parts that might absorb specific contaminants, such as plastic pump valves, impellers, etc., are to be cleaned in the same manner.

Sample bottles, bottle caps, and septa used for sampling volatile organics are thoroughly pre-cleaned in either the laboratory or the factory. All appropriate measures shall be taken to assure continued sterility of the containers issued by the contract laboratory prior to usage at the project site.

During field sampling, equipment which has been placed in a well shall be decontaminated by washing with a trisodium-phosphate or Alconox solution followed by two rinses in tap water and one rinse in steam-distilled water.

Water Level Measurements

Prior to purging and sampling any wells, the static-water level shall be measured by use of an electronic sounder and/or calibrated portable oil-water interface probe. Both static water level and separate phase product thickness shall be measured and noted to the nearest $\pm$0.01 foot. Interface probe results shall be confirmed by sampling the top of the water column with a clear bailer and measuring any floating product thickness to the nearest $\pm$0.01 foot with an engineers scale tape. In all cases a clear bailer sample will be taken from each well to check for color, sheen and undetected floating product. If floating product of any measureable thickness is observed, no sampling will be performed for that well. If visible product sheen is observed, sampling may proceed under normal protocols at the project manager's discretion. .

The line used to lower the bailer shall be discarded after each use to preclude the possibility of cross contamination. Field observations (e.g., well integrity, product odor, turbidity, water color, odors, etc.) shall be recorded on the HETI Purge/Sample Sheet (Plate A-1). Before and after the use of the electric sounder, interface probe, non-dedicated bailer, or any other down well equipment, each will be decontaminated by washing in a trisodium phosphate or Alconox solution, followed by a double rinse with tap water, followed by a rinse with steam-distilled water.

Well Purging

Before sampling commences, well casing storage water and interstitial water in the artificial sand pack shall be purged from the well using: (1) a positive displacement bladder pump constructed of inert non-wetting Teflon and stainless steel; (2) a pneumatic-airlift pumping system; (3) a centrifugal pumping system; or (4) a PVC, Teflon or stainless steel bailer. Methods of purging will be assessed based on the well size, location, depth, accessibility, and known chemical conditions. Individual well purge volumes are calculated from the casing volumes. In general, a minimum of 3 casing volumes will be purged. Wells which dewater or demonstrate slow recharge capacities (i.e., low yield wells which only recover to 70 percent of initial water column height after 1 hour) during purging activities may be sampled after fewer than 3 to 5 purging cycles. If a low yield well is to be sampled, sampling shall not take place until at least 70 percent of the previously measured water column has been replaced by recharge. Monitoring wells shall be purged according to the protocol flowchart presented in Plate A-2. Physical parameters (pH, specific conductance, and temperature) will be monitored by HETI field crew during well purging operations. If necessary, purging will continue until all three physical parameters have stabilized, the well becomes dry or 10 well volumes have been purged. Stability shall be defined as a change of less than 0.2 pH units, less than 10 percent in conductivity, and less than 1.0 degree Centigrade. The pH meters shall be read to the nearest $\pm$ 0.1 pH units. Specific conductance meters shall be read to the nearest $\pm$ 10 micro-Siemens per centimeter. Both types of meters shall be calibrated daily to manufacturer's specifications. Temperature shall be read to the nearest $\pm$ 0.1 degree centigrade. Field data collected while developing, purging and sampling the wells will be entered onto the HETI Purge/Sample Sheet (Plate A-1). Copies of the Purge/Sample Sheets will be reviewed for accuracy and completeness for each well sampled and included in the monitoring or investigation report.

Water removed from the wells will either be properly disposed of in an on-site remediation system or stored in 55-gallon DOT drums for future disposal by the client. At the clients request, HETI will act as the client's agent by assisting in the disposal of the contained material. In no case will HETI personel sign a Hazardous Waste Manifest.

Sample Collection, Handling, Storage and Transport

All water samples will be collected in an order such that those parameters most sensitive to volatilization will be sampled first. A general order of collection for some common groundwater parameters is as follows:

- Volatile Organic Compounds (VOC's)
- Total Organic Halogens (TOH)
- Total Organic Carbon (TOC)
- Extractable Organics
- Total Metals
- Dissolved Metals
- Phenols
- Sulfate and Chloride
- Nitrate and Ammonia
- Turbidity

All samples from the same well shall be collected immediately after purging or when the well recovers to at least 70 percent of the original water column height. All samples from one sampling set from a single well should be collected on the same day.

All chemical sample handling and storage will be conducted under the direction of HETI's consulting analytical chemist. All laboratory chemical testing will be accomplished by a state approved analytical laboratory.

All water samples will be held at 4°C by packing them in a water-tight container inside an ice chest and covering with hard shelled "blue ice™". In no event shall the time between sample collection and delivery to the contract laboratory be greater than 72 hours. Preservatives will not be added to any sample by the sampling crew, unless instructed by the consulting analytical chemist. If added in the field, preservatives shall be supplied by the contract analytical laboratory. No one will open the samples other than laboratory personnel who will perform the specified chemical analyses.

If it is necessary for samples or sample ice chests to leave the immediate control of the sampling crew prior to delivery to the laboratory or laboratory courier, such as shipment by a common carrier (e.g., UPS™), a custody seal will be placed on each sample container and/or sample chest. Custody seals will be placed to ensure that the samples have not been tampered with during shipment and will contain the samplers signature, the date and time the seal was emplaced.

DOCUMENTATION

Sample Container Labels

Each sample container shall be labeled immediately after the sample is collected and sealed. The label shall include:

- Company Name (HETI)
- Source (i.e., well number or code)
- Sampler's identification
- Project number
- Date and time of collection
- Type of preservation (if any) used

Field Sampling Data Sheets

In the field, the HETI sampling crew will record the following information on the Purge/Sample Sheet (Plate A-1) for each well sampled:

- Project number
- Client
- Location
- Source (i.e., well number or code)
- Time and date of development, purging and sampling
- Well accessibility and integrity
- Pertinent well data (e.g., total depth, product thickness, static water level)
- Physical parameters (e.g., specific conductance, pH, temperature) - may be more than one reading
- Gallons and well casing volumes purged
- Purge method
- Sampling method
- Analyses required

Chain-of-Custody

A chain-of-custody record shall be completed and will accompany every shipment of samples to the analytical laboratory in order to establish documentation tracing sample possession from the time of collection until delivery to the laboratory. The record will contain the following information:

- Sample or station number or code (ID)
- Signature of the collector, sampler, or recorder
- Date and time of collection
- Place of collection (project address and name of business)
- Sample type (soil or water)
- Type of analysis requested
- Signatures of persons involved in chain of possession (in chronological order)
- Dates and times of individual possession (inclusive)
- Laboratory comments regarding the sample receipt conditions

Samples will always be accompanied by a Chain-of-Custody record. When transferring the samples, the individuals relinquishing and receiving the samples will sign, date and note the time on the Chain-of-Custody record.

For samples returned to the office prior to pick-up by the laboratory courier, the samples may be relinquished to the project manager, who will relinquish them to the courier.

TABLE A-1

SAMPLE ANALYSIS METHODS, CONTAINERS, PRESERVATIVES, AND HOLDING TIMES

Parameter	Analytical Method	Reporting Units	Container*	Preservation†	Maximum Holding Time
Total Petroleum Hydrocarbons (low to med. b.p. i.e. gasoline)	EPA 8015 (DHS modified)	ppb ug/l	40ml glass vial, Teflon lined septum	4°C HCl to pH<2**	14 days
Benzene Toluene Ethylbenzene Xylenes (BTEX)	EPA 8020	ppb ug/l	40ml glass vial, Teflon lined septum	4°C HCl to pH<2**	7 days(w/o preservative) 14 days (w/preservative)
Oil & Grease	SM 5520 E&F (soil) B&F (water)	ppb ug/l	1L glass jar, Teflon lined cap	4°C H2SO4 to pH<2	28 days
Total Petroleum Hydrocarbons (high. b.p. i.e. diesel)	EPA 8015 (DHS modified)	ppb ug/l	1L glass jar, Teflon lined cap	4°C	14 days
Halogenated Volatile Organics (chlorinated solvents)	EPA 8010	ppb ug/l	40ml glass vial, Teflon lined septum	4°C	14 days
Non-Chlorinated Solvents	EPA 8020	ppb ug/l	as above	4°C	14 days
Volatile Organics (GC/MS)	EPA 8240	ppb ug/l	as above	4°C	14 days
Semi-Volatile Organics (GC/MS)	EPA 8270	ppb ug/l	as above	4°C	14 days
Metals	ICP-EPA 200.7 or A.A.EPA-	ppb ug/l	100 ml	4°C HNO3 to pH<2	6 months

* Containers listed are for water - soil containers are to be brass or stainless steel tubes with plastic end caps.

† Applies only to liquid samples.

** May vary depending on lab requirements.

PURGED/SAMPLED BY: _____ DATE: _____

GAUGING DATA:

Depth to bottom: _____ ft.

Depth to water: _____ ft.

Saturated Thickness: _____ ft.

Conversion	
diam.	gals/ft.
2 in.	x 0.16
4 in.	x 0.65
6 in.	x 1.44

Well casing volume _____ gallons

volumes to purge x_____ vols.

*Total volume to purge = _____ gallons

* unless chemical parameters stabilize earlier

PURGING DATA:

Purge method: PVC bailer/ Submersible pump/ Suction lift pump/ _____
(circle one)

Time	Volume (gallons)	Temp. (°F)	Conductivity (mS/cm)	pH

Color: _____ Turbidity: _____

Recharge: _____ SPP_____ft.

SAMPLING DATA:

Sampling method: Dedicated bailer /_____

Sample for: (circle)

TPHg/BTEX	METALS	TOG	8010	
TPHd	O-Pb	TEL	8020	
TPH mo	Total Pb	EDB	8240	
601	602	Nitrates	8260	8270

Other: _____

HYDRO ENVIRONMENTAL TECHNOLOGIES, INC.

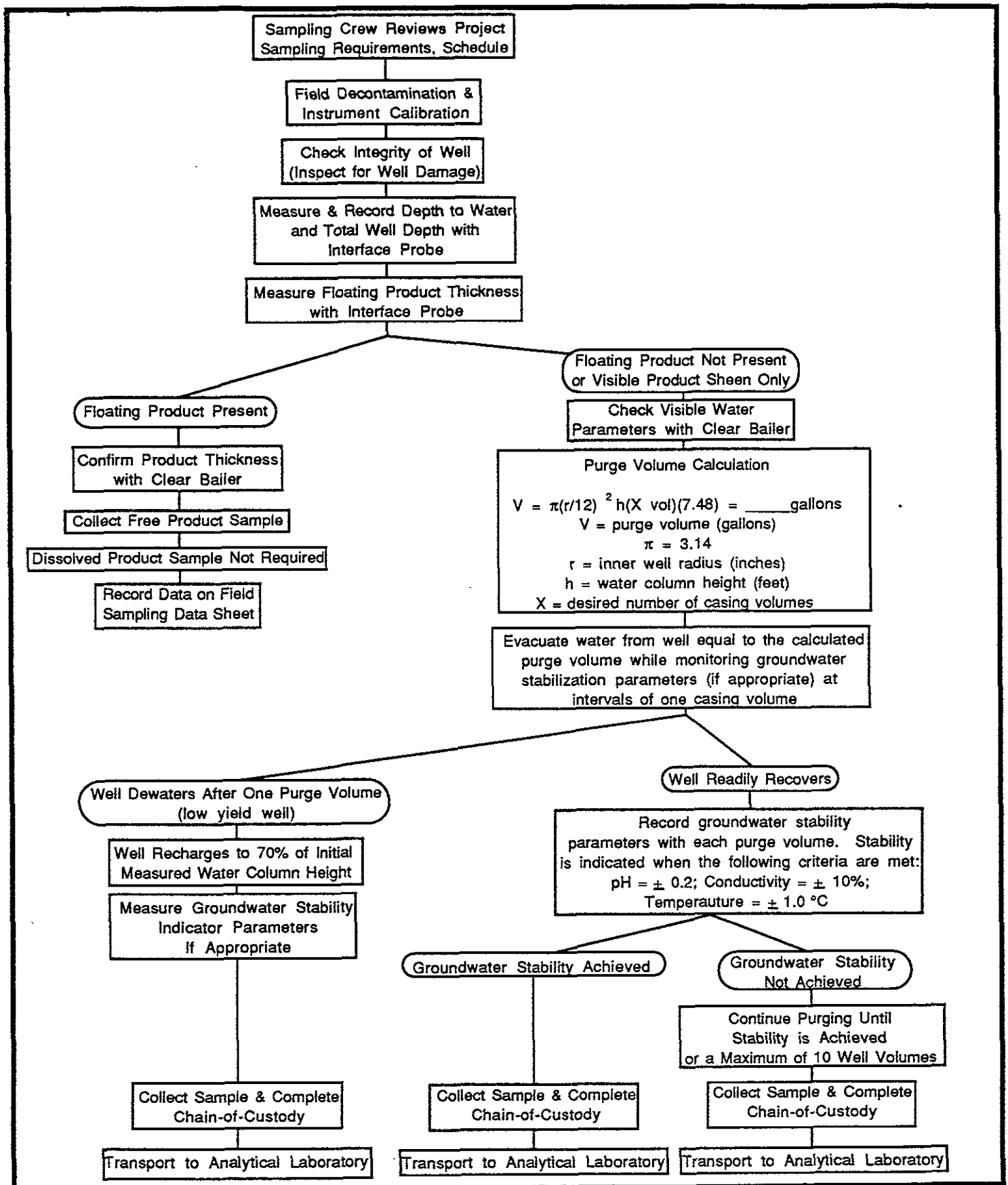
MONITORING WELL PURGE/SAMPLE SHEET

WELL # _____

LOCATION _____

PLATE A-1

12/9/93



HYDRO-ENVIRONMENTAL TECHNOLOGIES, INC.	GROUND WATER SAMPLING FLOW CHART	PLATE A-2 12/9/93

APPENDIX B

PURGED/SAMPLED BY: RA DATE: 11-19-93

GAUGING DATA:

Depth to bottom: 26.40 ft.

Depth to water: 12.91 ft.

Saturated Thickness: 13.49 ft.

Conversion	
diam.	gals/ft.
2 in.	x 0.16
4 in.	x 0.65
6 in.	x 1.44

Well casing volume 2.16 gallons

volumes to purge x 3 vols.

*Total volume to purge = 6 1/2 gallons

* unless chemical parameters stabilize earlier

PURGING DATA:

Purge method: PVC bailer / Submersible pump / Suction lift pump / _____
(circle one)

Time	Volume (gallons)	Temp. (°F)	Conductivity (mS/cm)	pH
12.12	0			
12.14	2	21.7	1.500	8.02
12.16	4	22.2	1.508	7.96
12.18	6½	22.3	1.625	7.93

Color: dark tan Turbidity: mod - high

Recharge: good SPP 0 ft.

SAMPLING DATA:

Sampling method: Dedicated bailer / _____

Sample for: (circle)

TPHg/BTEX	METALS	TOG	8010	
TPHd	O-Pb	TEL	8020	
TPH mo	Total Pb	EDB	8240	
601	602	Nitrates	8260	8270

Other: _____

HYDRO-ENVIRONMENTAL TECHNOLOGIES, INC.

MONITORING WELL PURGE/SAMPLE SHEET

WELL # MW-2

LOCATION Mobil, Hacienda Blvd. San Leandro

Job No. 8-019

SHEET 1 of 1

PURGED/SAMPLED BY: RA DATE: 11-19-93

GAUGING DATA:

Depth to bottom: 22.21 ft.

Depth to water: 13.69 ft.

Saturated Thickness: 8.52 ft.

Conversion	
diam.	gals/ft.
2 in.	x 0.16
4 in.	x 0.65
6 in.	x 1.44

Well casing volume 5.54 gallons

volumes to purge x 3 vols.

*Total volume to purge = 17 gallons

* unless chemical parameters stabilize earlier

PURGING DATA:

Purge method: PVC bailer/ Submersible pump/ Suction lift pump/ _____
(circle one)

Time	Volume (gallons)	Temp. (°F)	Conductivity (mS/cm)	pH
10.57	0			
10.59	5	22.7	1354	7.86
11.01	10	22.4	1.533	7.85
11.06	15	22.0	1.458	7.86
11.07	17	21.9	1.449	7.85
	Bail dry	17		

Color: tan Turbidity: mod

Recharge: Poor - Mod SPP ϕ ft.

SAMPLING DATA:

Sampling method: Dedicated bailer

Sample for: (circle)

TPHg/BTEX	METALS	TOG	8010
TPHd	O-Pb	TEL	8020
TPH mo	Total Pb	EDB	8240
601	602	Nitrates	8260 8270

Other: _____

HYDRO-ENVIRONMENTAL TECHNOLOGIES, INC.

MONITORING WELL PURGE/SAMPLE SHEET

WELL # MW-5

LOCATION Mobil, Hesp. Blvd San Lorenzo

Job No. 8-019

SHEET 1 of 1

PURGED/SAMPLED BY: RA DATE: 11-19-93

GAUGING DATA:

Depth to bottom: 22.25 ft.

Depth to water: 13.73 ft.

Saturated Thickness: 8.52 ft.

Conversion	
diam.	gals/ft.
2 in.	x 0.16
4 in.	x 0.65
6 in.	x 1.44

Well casing volume 5.54 gallons

volumes to purge x 3 vols.

*Total volume to purge = 17 gallons

* unless chemical parameters stabilize earlier

PURGING DATA:

Purge method: PVC bailer / Submersible pump/ Suction lift pump/ _____
(circle one)

Time	Volume (gallons)	Temp. (°F)	Conductivity (mS/cm)	pH
11.57	0			
11.59	5	24.1	1.501	8.05
12.02	10	23.6	1.512	8.00
12.03	13	23.5	1.406	7.98
12.05	17	22.8	1.404	7.98

Color: tan Turbidity: low-mod

Recharge: mod SPP ϕ ft.

SAMPLING DATA:

Sampling method: Dedicated bailer / _____

Sample for: (circle)

TPHg/BTEX	METALS	TOG	8010	
TPHd	O-Pb	TEL	8020	
TPH mo	Total Pb	EDB	8240	
601	602	Nitrates	8260	8270

Other: _____

HYDRO-ENVIRONMENTAL TECHNOLOGIES, INC.

MONITORING WELL PURGE/SAMPLE SHEET

WELL # MW-6

LOCATION Former Mobil Hesp. Blvd San Lorenzo

Job No. 8-019

SHEET 1 of 1

PURGED/SAMPLED BY: RA. DATE: 11-19-93

GAUGING DATA:

Depth to bottom: 23.84 ft.

Depth to water: 14.10 ft.

Saturated Thickness: 9.74 ft.

Conversion	
diam.	gals/ft.
2 in.	x 0.16
4 in.	x 0.65
6 in.	x 1.44

Well casing volume 6.331 gallons

volumes to purge x 3 vols.

*Total volume to purge = 19 gallons

* unless chemical parameters stabilize earlier

PURGING DATA:

Purge method: PVC bailer / Submersible pump / Suction lift pump / _____
(circle one)

Time	Volume (gallons)	Temp. (°F)	Conductivity (mS/cm)	pH
1.00	0			
1.02	5	22.9	1.108	8.57
1.05	9	22.0	1.054	8.49
1.09	14	21.5	1.370	8.44
1.10	15	21.4	1.269	8.35
	Well dry @ 15.			

Color: tan Turbidity: low - mod

Recharge: poor - mod SPP 0 ft.

SAMPLING DATA:

Sampling method: Dedicated bailer / _____

Sample for: (circle)

TPHg/BTEX	METALS	TOG	8010	
TPHd	O-Pb	TEL	8020	
TPH mo	Total Pb	EDB	8240	
601	602	Nitrates	8260	8270

Other: _____

HYDRO-ENVIRONMENTAL TECHNOLOGIES, INC.

MONITORING WELL PURGE/SAMPLE SHEET

WELL # MW-7

LOCATION Former Mobil Hwy 17 & San Lorenzo

Job No. 2-019

SHEET 1 of 1

PURGED/SAMPLED BY: RA DATE: 11-19-93

GAUGING DATA:

Depth to bottom: 22.43 ft.

Depth to water: 12.84 ft.

Saturated Thickness: 9.59 ft.

Conversion	
diam.	gals/ft.
2 in.	x 0.16
4 in.	x 0.65
6 in.	x 1.44

Well casing volume 1.53 gallons

volumes to purge x 3 vols.

*Total volume to purge = 5 gallons

* unless chemical parameters stabilize earlier

PURGING DATA:

Purge method: PVC bailer / Submersible pump/ Suction lift pump/ _____
(circle one)

Time	Volume (gallons)	Temp. (°F)	Conductivity (mS/cm)	pH
12.42	0			
12.43	2	19.9	1.292	8.05
12.45	4	20.1	1.346	8.03
12.46	5	19.8	1.256	7.99

Color: dark tan Turbidity: mod-high

Recharge: good SPP 4 ft.

SAMPLING DATA:

Sampling method: Dedicated bailer / _____

Sample for: (circle)

TPHg/BTEX METALS TOC 8010

TPHd O-Pb TEL 8020

TPH mo Total Pb EDB 8240

601 602 Nitrates 8260 8270

Other: _____

HYDRO-ENVIRONMENTAL TECHNOLOGIES, INC.

MONITORING WELL PURGE/SAMPLE SHEET

WELL # MW-8

LOCATION Former Mobil, Hesp Hwy San Lorenzo

Job No. 8-019

SHEET 1 of 1

APPENDIX C

RECEIVED DEC 1 4 1993

ANALYTICAL

SEQUOIA ANALYTICAL

680 Chesapeake Drive • Redwood City, CA 94063
(415) 364-9600 • FAX (415) 364-9233

Hydro Environmental	Client Project ID:	Mobil 10-L1X/San Lorenzo	Sampled:	Nov 19, 1993
2363 Mariner Square Dr., Bldg. 3, Ste 243	Sample Matrix:	Water	Received:	Nov 23, 1993
Alameda, CA 94501	Analysis Method:	EPA 5030/8015/8020	Reported:	Dec 9, 1993
Attention: Scott Kellstedt	First Sample #:	3KE6901		

TOTAL PURGEABLE PETROLEUM HYDROCARBONS with BTEX DISTINCTION

Analyte	Reporting Limit µg/L	Sample I.D. 3KE6901 MW-2	Sample I.D. 3KE6902 MW-5	Sample I.D. 3KE6903 MW-6	Sample I.D. 3KE6904 MW-7	Sample I.D. 3KE6905 MW-8
Purgeable Hydrocarbons	50	N.D.	N.D.	N.D.	50	N.D.
Benzene	0.50	N.D.	N.D.	N.D.	N.D.	N.D.
Toluene	0.50	N.D.	N.D.	N.D.	N.D.	N.D.
Ethyl Benzene	0.50	N.D.	N.D.	N.D.	1.5	N.D.
Total Xylenes	0.50	N.D.	N.D.	N.D.	N.D.	N.D.
Chromatogram Pattern:		--	--	--	Weathered Gas	--

Quality Control Data

Report Limit Multiplication Factor:	1.0	1.0	1.0	1.0	1.0
Date Analyzed:	11/29/93	11/24/93	11/29/93	11/29/93	11/24/93
Instrument Identification:	GCHP-17	GCHP-3	GCHP-17	GCHP-17	GCHP-3
Surrogate Recovery, %: (QC Limits = 70-130%)	97	81	102	99	83

Purgeable Hydrocarbons are quantitated against a fresh gasoline standard.
Analytes reported as N.D. were not detected above the stated reporting limit.

SEQUOIA ANALYTICAL

Nokowhat D. Herrera
Project Manager

3KE6901.HEN <1>

SEQUOIA ANALYTICAL

680 Chesapeake Drive • Redwood City, CA 94063
(415) 364-9600 • FAX (415) 364-9233

Hydro Environmental	Client Project ID:	Mobil 10-L1X/San Lorenzo
2363 Mariner Square Dr., Bldg. 3, Ste 243	Matrix:	Liquid
Alameda, CA 94501		
Attention: Scott Kellstedt	QC Sample Group: 3KE6901-05	Reported: Dec 9, 1993

QUALITY CONTROL DATA REPORT

ANALYTE	Benzene	Toluene	Ethyl Benzene	Xylenes
Method:	EPA 8020	EPA 8020	EPA 8020	EPA 8020
Analyst:	M. Nipp	M. Nipp	M. Nipp	M. Nipp
MS/MSD Batch#:	G3KC6502	G3KC6502	G3KC6502	G3KC6502
Date Prepared:	N/A	N/A	N/A	N/A
Date Analyzed:	11/24/93	11/24/93	11/24/93	11/24/93
Instrument I.D.#:	GCHP-3	GCHP-3	GCHP-3	GCHP-3
Conc. Spiked:	10 µg/L	10 µg/L	10 µg/L	30 µg/L
Matrix Spike % Recovery:	95	96	97	93
Matrix Spike Duplicate % Recovery:	86	86	87	87
Relative % Difference:	9.9	11	11	7.4
LCS Batch#:				
Date Prepared:				
Date Analyzed:				
Instrument I.D.#:				
LCS % Recovery:				
% Recovery Control Limits:	71-133	72-128	72-130	71-120

SEQUOIA ANALYTICAL

Nokowhat D. Herrera
Project Manager

Please Note:
The LCS is a control sample of known, interferent free matrix that is analyzed using the same reagents, preparation, and analytical methods employed for the samples. The matrix spike is an aliquot of sample fortified with known quantities of specific compounds and subjected to the entire analytical procedure. If the recovery of analytes from the matrix spike does not fall within specified control limits due to matrix interference, the LCS recovery is to be used to validate the batch.

Mobil Chain of Custody

SEQUOIA ANALYTICAL

Redwood City: (415) 364-9600
Concord: (510) 686-9600
Sacramento: (916) 921-9600

Consulting Firm Name: HETI.
Address: 2363 MARINER SQ DR. #243
City: ALAMEDA State: CA Zip Code: 94501
Telephone: (510) 521-2684 FAX #: 521-5078
Project Contact: SCOTT KELSTED Sampled by: RUARY ALLAN

Site SS #: 10-L1X / SAN LORENZO
Mobil Site Address: 15884 HESPERIAN BLVD
Mobil Engineer: S. PAO
Consultant Project #: 8-019
Sequoia's Work Order Release #:

Phase of Work:
- ☐ A. Emrg. Response
- ☐ B. Site Assessment
- ☐ C. Remediation
- ☑ D. Monitoring
- ☐ E. OGC/Claims

Turnaround Time: ☑ Standard TAT (5 - 10 Working Days)
☐ Other _____

Analyses Requested

Client Sample I.D.	Date/Time Sampled	Matrix Description	# of Containers	Sequoia's Sample #	TPH Gas/BTEX	TPH Diesel	TRPH by I.R. EPA 418.1	Oil & Grease EPA 413.2	Comments
1. MW-2	11-19-93 2PM	H_2O	2		X				9311E69-01
2. MW-5									-02
3. MW-6									-03
4. MW-7									-04
5. MW-8									-05
6.									
7.									
8.									
9.									
10.									

Relinquished By: Ruary Allan	Date: 11-19-93	Time: 4 PM	Received By: [illegible]	Date: 11/22/93	Time: 8 AM
Relinquished By: [illegible]	Date:	Time:	Received By: [illegible]	Date: 11/22/93	Time: 1040
Relinquished By: [illegible]	Date: 11/23/93	Time: 1520	Received By: [illegible]	Date: 11-23-93	Time: 1520