REMEDIATION SERVICE, INT'L.
2060 KNOLL DRIVE, SUITE 200, VENTURA, CALIFORNIA 93003
(805) 644-5892 • FAX (805) 654-0720

January 4, 1994

Ms. Eva Chu Haz. Mat. Specialist
Alameda County Health Care Service
Department of Environmental Health
80 Swan Way, Rm. 200
Oakland, CA 94621

Subject: Soil & Groundwater Investigation Workplan for
Desert Petroleum Station #795
located at 2008 First Street, Livermore, CA 94550

Dear Mr. West:

As per request from the your office in a letter dated May 7, 1993, enclosed is a Site Assessment Workplan to characterize soil and groundwater conditions at Desert Petroleum's Station No. 795, located in Livermore, California.

Remediation Service, Int'l (RSI) prepared this report and is under contract to Desert Petroleum to provide environmental services.

Please call Mr. Rick Pilat at RSI if you have any questions regarding this workplan.

Sincerely,

Heather Davis
Remediation Service, Int'l.

cc: Mr. John Rutherford
Desert Petroleum, Inc.

Mr. Sumadhu Arigala
RWQCB, San Francisco Bay Area
2101 Webster St., Suite 500
Oakland, CA 94612

enclosure

RSI REMEDIATION SERVICE, INT'L.
2060 KNOLL DRIVE, SUITE 200, VENTURA, CALIFORNIA 93003
(805) 644-5892 • FAX (805) 654-0720

SOIL & GROUNDWATER INVESTIGATION WORKPLAN

DESERT PETROLEUM STATION NO. 795
2008 First Street
Livermore, California 94550

Prepared for:
DESERT PETROLEUM, INC.
P.O. Box 1601
Oxnard, California 93032

Prepared by:
RSI - REMEDIATION SERVICE, INT'L.
2060 Knoll Drive
Suite #200
Ventura, California 93003

January 3, 1994

TABLE OF CONTENTS

1.0 INTRODUCTION

This report presents a workplan for further site assessment for Desert Petroleum's former Station Number 795. The site is located at 2008 First Street, Livermore, Alameda County, California 94550 (Figure 1). Remediation Service, Int'l. (RSI) is under contract to Desert Petroleum, Inc. to provide environmental services.

A preliminary site assessment conducted in February, 1988 indicated that both soil and groundwater contained elevated concentrations of petroleum hydrocarbons. Analytical results from groundwater monitoring well installation confirmed that soil and groundwater had been impacted by an unauthorized release. In May, 1993 Alameda County requested further soil and groundwater investigation to delineate the extent of impact.

2.0 SITE DESCRIPTION

Desert Petroleum Station Number 795 is an operating retail gasoline service station located within a commercial/residential area at the corner of First street and South "L" street in Livermore (Figures 1). Site improvements include a storage/garage building, three underground storage tanks, two pump islands and one groundwater monitoring well. The three underground storage tanks have holding capacities of 10,000 gallons (Tanks 1 & 2) and 8,000 gallons (Tank 3) and are used for the storage of various grades of unleaded gasoline.

The site is flat, level and topped with asphalt.

3.0 BACKGROUND

The following is a summary of the previous work conducted at the site. The analytical results of the soil and groundwater samples collected at the site are presented in Tables 1 & 2.

On February 23, 1988, Geonomics Inc., installed four vapor monitoring probes around the tank area (DPL-1, -2, -3 & -4, Figure 3). On site field screening with a gastechtor meter indicated elevated TPH concentrations as vapor in wells DPL-1 and DPL-2. Analysis of a soil sample collected from DPL-1 at 14.5 feet below ground surface (bgs) reported a TPH as gasoline concentration of 400 mg/Kg and a benzene concentration of 7,500 ug/Kg (Table 1). Soil samples from DPL-3 and DPL-4 did not contain detectable levels of TPH or BTEX. A map of boring locations is included as Figure 3.

On September 22, 1988, On-Site Technologies Inc. conducted further subsurface investigation with two soil borings and the completion of one monitoring well (GX-136, later renamed MW-1). Depth to groundwater was measured at 55.8 feet bgs. Analytical results of soil collected from the three borings reported no detectable TPH concentrations above 26 feet bgs and concentrations ranging from 0.8 mg/Kg (DPL-5 at 41 feet) to 1,600 mg/Kg (DPL-6 at 36 feet) below 26 feet bgs. Groundwater was analyzed for TPH as gasoline and BTEX; no hydrocarbon compounds were detected in the groundwater. Figure 3 includes boring locations; the well log for GX-136 (MW-1) from On-Site Technologies report is included in Appendix A.

On August 2, 1990, monitoring well GX-136 was sampled for TPH as gasoline and BTEX. Analytical results reported a TPH concentration of 24 mg/l and a benzene concentration of 1,300 ug/l (Table 2).

A Work Plan for Further Site Assessment was prepare by RSI and submitted to Alameda County Department of Environmental Health (ACDEH) on August 15, 1990. Due to Financial constraints, the proposed work was not initiated.

Groundwater has been monitored on a regular basis since 1990. The most recent measurement and sampling on September 21, 1993 reported groundwater at 38.7 feet bgs. Analysis of groundwater reported a TPH as gasoline concentration of 1.9 mg/l and a benzene concentration of 311 ug/l. Table 2 summarizes historic groundwater analytical results at the site.

4.0 GEOLOGY AND HYDROGEOLOGY

The site is located on the floor of the Livermore Valley at an elevation of approximately 480 feet above mean sea level with a slight regional gradient towards the west. The subject property lies approximately one mile south of the Arroyo Las Positas Creek and one half mile north of the Arroyo Mocho Creek.

According to Mr. Craig Mayfield at Alameda County Flood Control (personal conversation 10/91), groundwater under the site is at an approximate elevation of 400 feet above mean sea level.

Soils encountered during soil boring in September 1988 were reported to consist of gravel and sand to a depth of three feet below ground surface (bgs)

and intermittent layers of fine, silty sand with granules and pebbles and layers of gravel with clayey silt and silty clay from three feet bgs to 33 feet bgs. A layer of silty clay was found between 33 and 38 feet bgs. Gravel with silty clay reportedly extended from 38 feet to 54 feet bgs. Sand and clayey sand with pebbles and gravel extended from 54 feet bgs to total depth of 77 feet bgs. A copy of the boring log for GX-136 (MW-1) is included in appendix A.

Depth to groundwater was measured at approximately 60.5 feet bgs during drilling of GX-136 and 55.8 feet bgs after well completion in September 1988. Recent groundwater monitoring on September 21, 1993 reported groundwater at 38.7 feet bgs.

Because only one groundwater monitoring well is present at the site, the direction of groundwater gradient has not yet been determined. According to Mr. Arigala at the Regional Water Quality Control Board (personal conversation 12/10/93), the local groundwater gradient varies; a nearby site on First street has reported the gradient as towards the west and northwest.

5.0 PROPOSED WORK DESCRIPTION

The proposed work will characterize groundwater conditions at this site. This will be accomplished by the installation and sampling of two groundwater monitoring wells. The wells will be installed at the approximate locations shown on Figure 2.

5.1 Monitoring Well Installation Protocol

The monitoring wells will be drilled using a hollow-stem auger drilling rig supplied and operated by a licensed drilling contractor. During drilling operations, soil samples will be collected at five foot intervals from the surface to the top of the water table, at changes in soil lithology and at depths of field screen detected contamination. Samples will be collected by driving a split-spoon sampler containing brass tubes into undisturbed soil beneath the augers. The soil samples will be sealed, labeled and placed on ice for transportation to a state certified laboratory using standard chain of custody procedures. The soil sample nearest the capillary zone from each boring will be analyzed for total lead, TPH as gasoline and BTEX using EPA Methods 7420, 8015M and 8020, respectively.

Drilling and soil sampling will be performed by a qualified professional under the supervision of Noel Plutchak, a California Registered Geologist (No.

5761). A log of each boring will be prepared and soil will be classified based on the USCS classification system. Soil samples will be screened with a photoionization detector for hydrocarbons. All soil cuttings will be stored onsite in DOT approved (17H) 55-gallon drums which will be labeled as pending laboratory analysis. The soil will be disposed of in an appropriate manner based on analytical results.

The wells will be drilled to a depth of 20 feet beneath the groundwater table (unless an aquitard with a thickness of more than five feet is encountered). The borings will have a minimum outside diameter of 11 inches and will be completed as groundwater monitoring wells with four inch schedule 40 PVC casing. As shown of Figure 4, the wells will be screened with slotted 4-inch PVC casing from approximately 10 feet above the water table to total depth. Slot size will be 0.02 inches unless significant silt or clay beds are encountered. If such conditions are encountered, slot size will be 0.01 inch.

The annulus will be filled with clean sand from total depth to two feet above the top of the screen. Sand size will be #3 for 0.02 inch slots and #2/12 for 0.01 inch slots. A two foot thick bentonite plug will be set on top of the sand. The remainder of the annulus will be filled with bentonite. The wellhead will be secured and protected by a locking cap and traffic well box set approximately one inch higher than the surrounding pavement in a minimum five foot concrete surface seal.

After the filter pack has been placed and the annular seal to surface has set, the well will be properly developed to set the filter pack and remove any fine sediments. After completion, the well will be further developed by bailing or pumping until the produced water is free of sediment or a minimum of 4 casing volumes have been removed. All produced water and soil cuttings will be stored onsite in DOT approved 55 gallon drums which will be labeled as pending lab analysis. The water will be disposed of in an appropriate manner based on laboratory analytical results.

Prior to initiation of drilling operations, monitoring well permits will be obtained from Alameda County Environmental Management Department. Underground Service Alert will be notified a minimum of two working days before drilling in order to avoid damaging underground utilities.

5.2 Groundwater Sampling Protocol

After the monitoring wells have been completed, the wellheads will be surveyed to determine their relative elevation. Depth to water and depth to

any floating product will be measured to an accuracy of 0.01 feet If no free product is found, the wells will then be purged with a clean pump or bailer until dry or a minimum of four well volumes have been removed. Purged water will be monitored for temperature, pH and conductivity and all information will be recorded on water sample logs.

After the groundwater in the wells has returned to at least 80 percent of its initial level, water samples will be taken. The samples will be collected by lowering a new disposable bailer into each well. The water will be transferred into appropriate containers which will then be sealed, labeled and placed on ice for transportation under standard chain of custody to a state certified laboratory for analysis. Groundwater samples will be tested for the same constituents listed in the soil sampling protocol. The groundwater samples from each well will be analyzed for total lead, TPH as gasoline and BTEX.

6.0 HEALTH AND SAFETY PLAN

See Appendix B for the health and safety plan.

7.0 TIME SCHEDULE

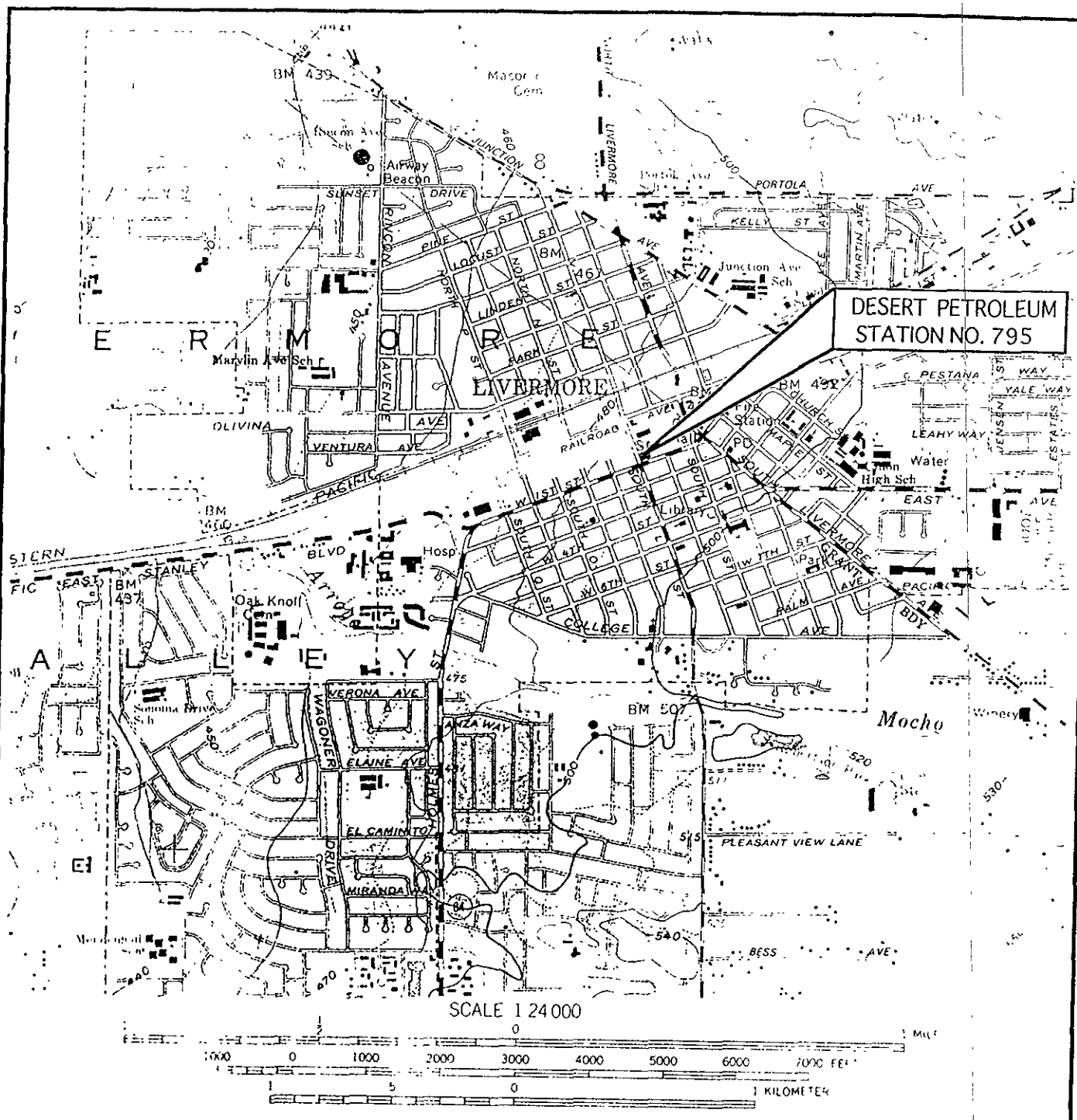
Site assessment work will begin within forty-five days after approval of this workplan by the ACEMD. The ACEMD will be notified 48 hours prior to beginning work at the site. After assessment work at the site has been completed, a full report will be submitted to the ACEMD within forty-five days.

Respectfully Submitted,

RWP

Richard W. Pilat
Senior Engineer
Program Director
Remediation Service, Int'l.

FIGURES



FROM U.S.G.S. 7.5' TOPOGRAPHIC QUADRANGLE "LIVERMORE, CALIFORNIA," 1961, PHOTOREVISED 1980

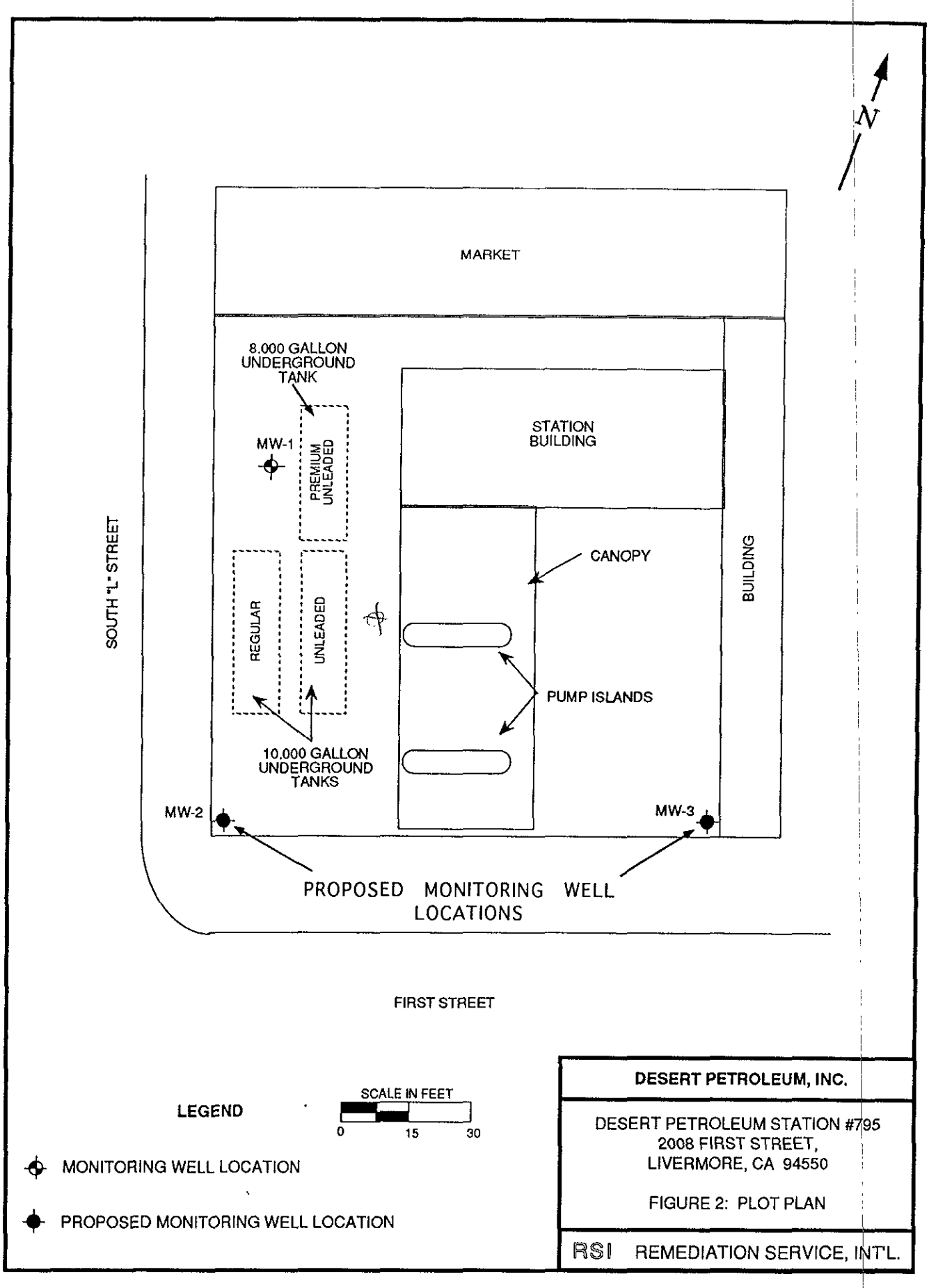
N

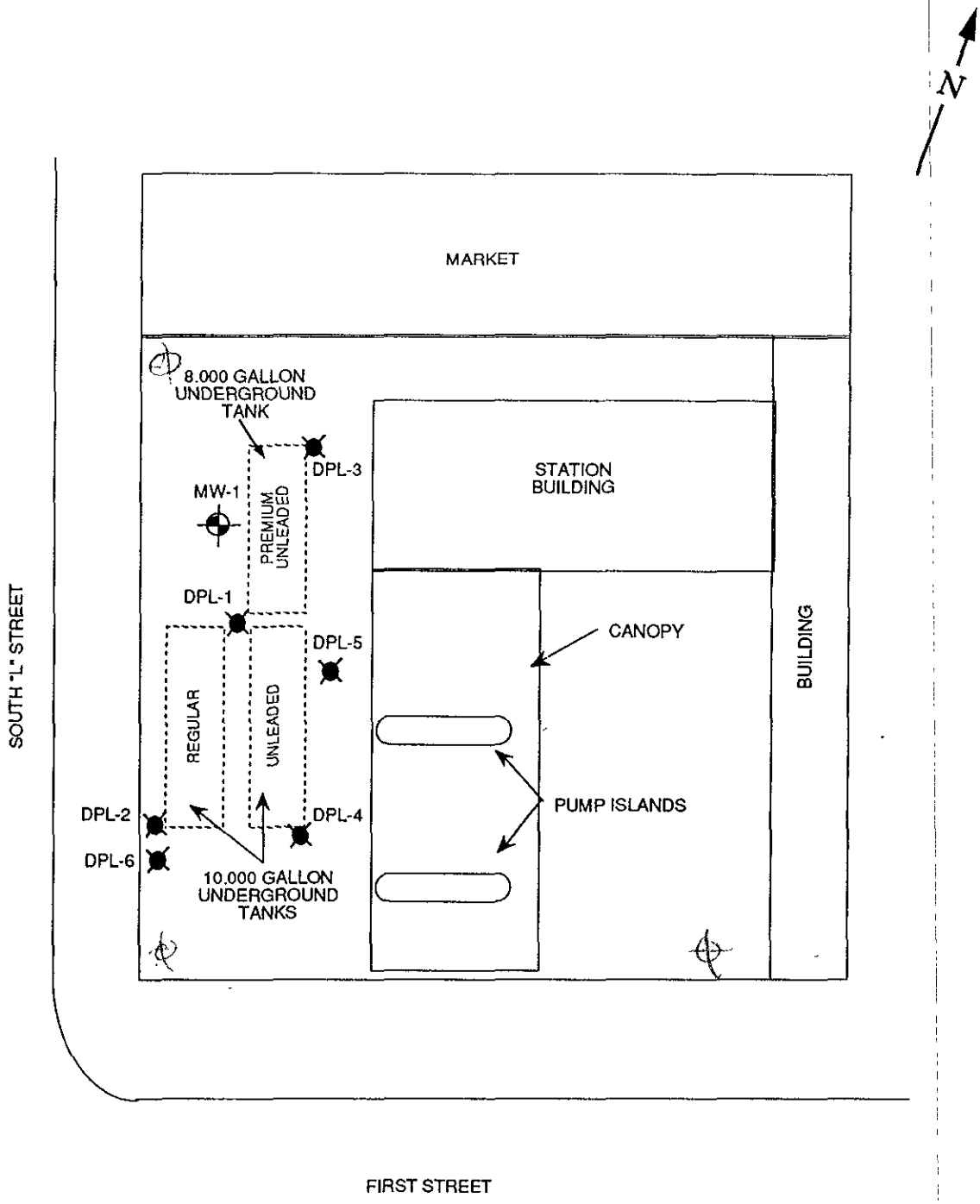
DESERT PETROLEUM, INC.

DESERT PETROLEUM STATION #795
2008 FIRST STREET,
LIVERMORE, CA

FIGURE 1 - LOCATION MAP

RSI - REMEDIATION SERVICE, INT'L


N
MARKET
8,000 GALLON UNDERGROUND TANK
MW-1
PREMIUM UNLEADED
STATION BUILDING
CANOPY
BUILDING
SOUTH "L" STREET
REGULAR
UNLEADED
PUMP ISLANDS
10,000 GALLON UNDERGROUND TANKS
MW-2
MW-3
PROPOSED MONITORING WELL LOCATIONS
FIRST STREET
LEGEND
SCALE IN FEET
0
15
30
MONITORING WELL LOCATION
PROPOSED MONITORING WELL LOCATION
DESERT PETROLEUM, INC.
DESERT PETROLEUM STATION #795
2008 FIRST STREET,
LIVERMORE, CA 94550
FIGURE 2: PLOT PLAN
RSI REMEDIATION SERVICE, INT'L.



LEGEND

SCALE IN FEET

0 15 30

MONITORING WELL LOCATION

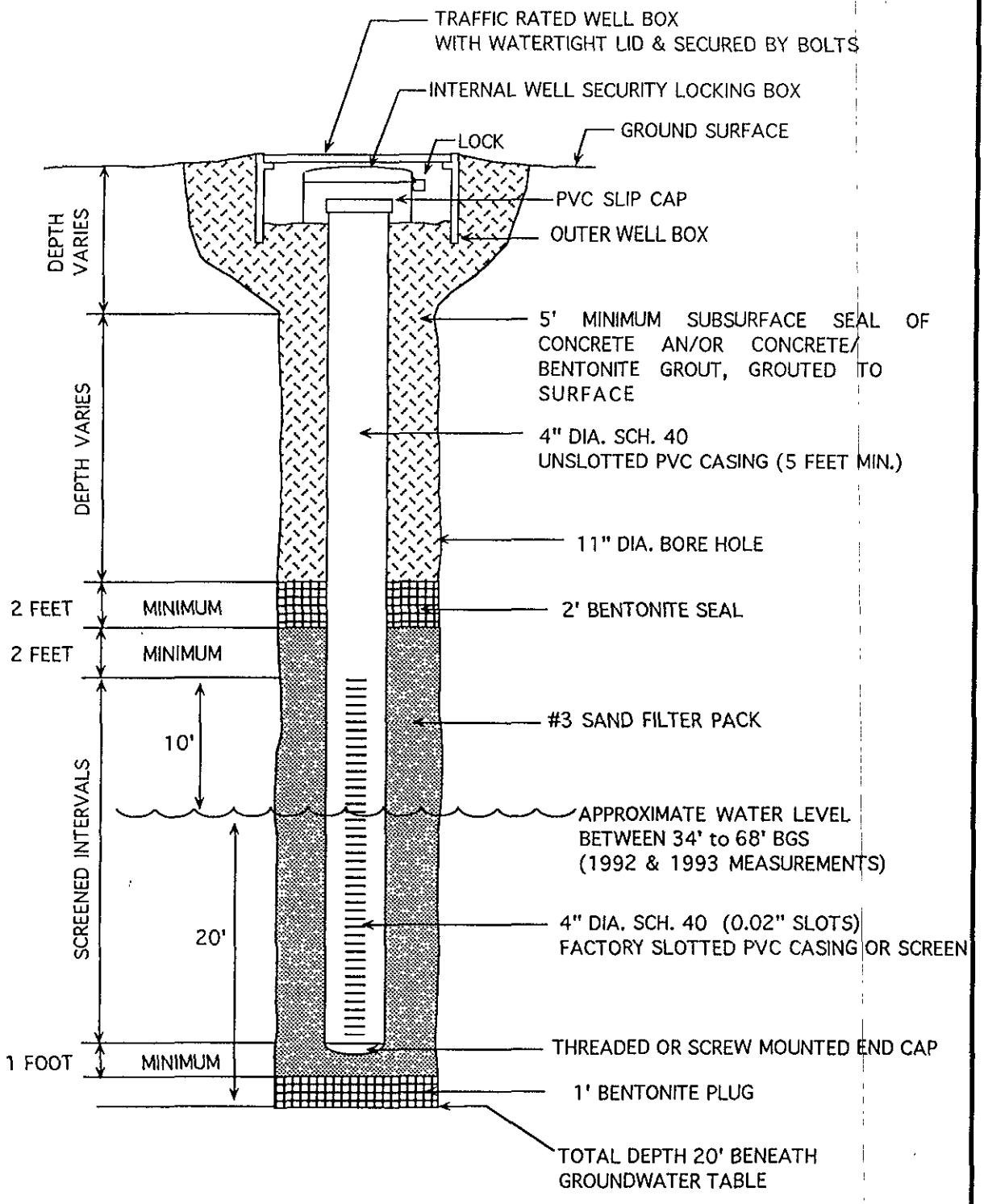
GEONOMICS AND ON-SITE TECHNOLOGIES BOREHOLE LOCATIONS

DESERT PETROLEUM, INC.

DESERT PETROLEUM STATION #795
2008 FIRST STREET,
LIVERMORE, CA 94550

FIGURE 3: BOREHOLE LOCATIONS FROM 2/88 & 9/88 ASSESSMENTS

RSI REMEDIATION SERVICE, INT'L.



DESERT PETROLUEM, INC

FIGURE 4: TYPICAL MONITORING WELL CONSTRUCTION.

RSI - REMEDIATION SERVICE, INT'L

TABLES

TABLE 1
SUMMARY OF ANALYTICAL RESULTS FROM SOIL SAMPLES COLLECTED DURING SOIL BORING

DESERT PETROLEUM STATION NO. 795
2008 FIRST STREET
LIVERMORE, CA

TPH results are in mg/Kg
BTEX results are in µg/Kg

SAMPLE DATE	SAMPLE ID	SAMPLE LOCATION	TPH	BENZENE	TOLUENE	ETHYL-BENZENE	TOTAL XYLENES
2/24/88	DPL288-1	DPL-1 @ 14.5'	400	7,500	9,500	NA	27,000
2/24/88	DPL288-3	DPL-3 @ 15'	ND	ND	ND	NA	ND
2/24/88	DPL288-4	DPL -4 @ 16.5'	ND	ND	ND	NA	ND
9/22/88	GX136-1	MW-1 @ 16'	ND	ND	ND	ND	ND
9/22/88	GX136-2A	MW-1 @ 23.5'	ND	ND	ND	ND	ND
9/22/88	GX136-3	MW-1 @ 28.5'	ND	ND	ND	ND	ND
9/22/88	GX136-4	MW-1 @ 33.5'	31	140	870	740	4,700
9/22/88	GX136-5	MW-1 @ 38.5'	72	ND	ND	ND	4,000
9/22/88	GX136-6	MW-1 @ 43.5'	10	140	130	180	720
9/22/88	GX136-7	MW-1 @ 48.5'	0.51	ND	ND	ND	ND
9/22/88	GX136-8	MW-1 @ 53.5'	1.7	120	110	49	290
9/22/88	GX136-9	MW-1 @ 58.5	54	ND	ND	ND	4,400
9/23/88	DPL5-1	DPL-5 @ 16'	ND	ND	ND	ND	ND
9/23/88	DPL5-2	DPL-5 @ 21'	ND	ND	ND	ND	ND
9/23/88	DPL5-3	DPL-5 @ 26'	ND	ND	ND	ND	ND
9/23/88	DPL5-4	DPL-5 @ 31'	33	710	1,700	770	6,200
9/23/88	DPL5-5	DPL-5 @ 36'	8.5	54	1,100	230	2,000
9/23/88	DPL5-6	DPL-5 @ 41'	0.8	97	100	ND	130
9/23/88	DPL5-7	DPL-5 @ 46'	ND	ND	ND	ND	ND
9/23/88	DPL6-1A	DPL-6 @ 17.5'	ND	ND	ND	ND	ND
9/23/88	DPL6-2	DPL-6 @ 21'	ND	ND	ND	ND	ND
9/23/88	DPL6-3	DPL-6 @ 26'	2.5	ND	ND	ND	ND
9/23/88	DPL6-4	DPL-6 @ 31'	12	140	83	310	1,400
9/23/88	DPL6-5	DPL-6 @ 36'	1,600	ND	3,700	5,300	32,000
9/23/88	DPL6-6	DPL-6 @ 41'	11	35	ND	ND	ND
9/23/88	DPL6-7	DPL-6 @ 46'	100	ND	ND	ND	4,800

2/88 Sampling results from Geonomics Inc. report
9/88 Sampling results from On-Site Technologies Inc. report
TPH = Total petroleum hydrocarbons as gasoline

TABLE 2
SUMMARY OF LABORATORY ANALYSIS OF GROUNDWATER

DESERT PETROLEUM STATION #795
2008 FIRST STREET
LIVERMORE, CA 94550

TPH results are in mg/l
BTEX results are in µg/l

WELL #	DATE SAMPLED	TPH	BENZENE	TOLUENE	ETHYL-BENZENE	TOTAL XYLENES
MW-1	9/27/88	ND	ND	ND	ND	ND
	8/2/90	24	1,300	1,300	400	2,700
	10/10/91	2.2	430	170	100	290
	1/8/92	1.2	200	120	30	150
	5/11/93	0.96	66	8	41	90
	9/21/93	1.9	311	118	33.8	112
Title 22 CCR MCL		—	1	—	680	1750

9/88 Sampling results from On-Site Technologies Inc. report
TPH = Total petroleum hydrocarbons (gasoline)

APPENDICES

APPENDIX A

ON-SITE TECHNOLOGIES INC.
GX-136 (MW-1) BORING LOG

Well Installation Report

Well Owner: Desert Petroleum, Inc. Permit #: 88438
Address: 2008 First Street City: Livermore, CA
Well #: GX-136 Well Type: Water monitoring well Date installed: 9/22/88

Gravel Pack:
Type: 3 Aqua sand From: 77.0 ft to: 25.0 ft Diameter of bore: 8.0 in.

Casing Installed:
Type: Plastic From: 0.0 ft to: 77.0 ft Diameter: 2.0 in.

Perforations:
Slot size: 0.020 in. From: 77.0 ft to: 27.0 ft

Surface Seal:
From: 0.0 ft to: 25.0ft Method of sealing: 3.0 ft bentonite at base followed by bentonite/cement grout to surface.

Bottom Seal: From: None

Water Levels: Depth to first water: 60.5 ft Level after completion: 55.8 ft

Well Log

Total depth: 77.0 ft Completed depth: 77.0 ft

	Description
0.0 - 1.0	Asphalt (4") and basefill (8')
1.0 - 3.0	Sand and gravel, silty
3.0 - 7.0	Sand, silty, fine (SM), 10YR6/2 & 10YR5/4, with scattered granules and pebbles.
7.0 -15.0	Gravel (GC) with clay silt matrix. Clasts to 2". Decrease in size to 0.5" at 9' and 0.25" at 12'.
15.0 -18.0	Sand, silty, fine with scattered pebbles (SM), 10YR4/4 & 10YR3/4. Sample GX136-1 taken at 16.0' (5/.5, 4/.5, 5/.5).
18.0 -22.5	Gravel (GC) with a silty clay matrix, 10YR4/4, clasts to 1". Sample GX136-2 taken at 21.0' (26/.5, 25/.5, 28/.5). Rock only, no recovery.
22.5 -26.0	Sand and Gravel (GP), Wet on rock surfaces with sewage odor. Sample GX136-2A at 23.5' (9/.5, 18/.5, 30/.5).
26.0 -33.0	Gravel with silty clay matrix (GC), 10YR4/4, clasts to 1.5". Sample GX136-3 at 28.5' (7/.5, 20/.5, 34/.5). Matrix is 10YR6/2 at 28'. Unit predominatly sand (SM) between 31 and 33'.

(cont. next page)

33.0 -38.0	Clay, silty with pebbles (CL), 10YR4/2.
38.0 -54.0	Gravel with silty clay matrix (GC), 5Y6/1, clasts <0.5". Sample GX136-5 taken at 38.5' (16/.5, 17/.5, 19/.5). Sample GX136-6 taken at 43.5' (10/.5, 13/.5,32/.5). Unit color is 10YR4/2 at 46'. Sample GX136-7 taken at 48.5' (19/.5, 44/.5, 46/.5). Unit color is 5Y6/1 at 48'. Sample GX136-8 taken at 53.5' (19/.5, 24/.5, 27/.5).
54.0 -60.5	Sand, Clayey with pebbles (SC), 10YR6/1 & 10YR5/6. Sample GX136-9 taken at 58.5 (5/.5, 7/.5, 12/.5). Water at 60.5'.
60.5 -77.0	Sand and gravels, no cuttings returned to surface.

Note - Well developed and water sample GX136-1W taken at 55.8' (standing level of water after well completion). Hydrocarbon odors detected in drill cuttings from approximately 26' to 60'.

APPENDIX B

HEALTH & SAFETY PLAN

INTRODUCTION

The following Health and Safety Plan has been developed to protect persons in contact with the equipment and to ensure a safe operation during drilling.

1. Facility Background:

Desert Petroleum Station #795 an operating gasoline service station located at 2008 First Street, Livermore, California. A garage/office building and two pump islands are located on the site and asphalt/concrete covers the rest of the property. Potential hydrocarbon contamination is being assessed. Contamination could exist in both the liquid and/or gaseous states as a result of inadvertent releases during handling and storage of gasoline.

Soils Samples collected during soil boring in February and September 1988 revealed TPH concentrations ranging from ND to 1,600,000 parts per billion (ppb). The highest BTEX concentrations in the soil were 7,500 parts per billion (ppb) Benzene, 9,500 ppb Toluene, 5,300 ppb Ethyl Benzene and 32,000 ppb Total Xylenes.

Analytical results of groundwater samples collected in September 1993 reported a TPH concentration of 1,900 ppb and a benzene concentration of 311 ppb.

2. Key Personnel and Responsibilities:

Richard W. Pilat is the Project Manager.
Remediation Service, Int'l. (RSI) Telephone no. (805) 644-5892
8:00 AM to 5:00 PM, Monday - Friday.

The designated Safety Officer will be the Project Manager onsite. The Safety Officer has full authority to correct any problems or shut down the operation, if required, to maintain safety.

Supervising Geologist: Mr. Noel B. Plutchak,
Registered Geologist #5761, State of California
Telephone no. (805) 644-5892

3. Proposed Work:

The proposed work will characterize groundwater conditions at this site. This will be accomplished by the installation and sampling of two groundwater monitoring wells at the approximate locations shown on Figure 2.

4. **Hazardous Materials and Other Job Hazards:**

A. Hydrocarbons from waste oil are the greatest potential known chemical hazard.

These hydrocarbons are usually identified as:

a. Total Petroleum Hydrocarbons (TPH)
b. Benzene
c. Ethyl-benzene
d. Toluene
e. Xylenes

Chemical concentrations may very from zero to free product. ACGIH Gasoline TLV 300 ppm, STEL 500 ppm.

B. Benzene has been designated as a human carcinogen by the International Agency for Research on Cancer and presents the greatest health hazard. Benzene is highly toxic when it is inhaled or ingested. Exposure to high levels of benzene can result in damage to a person's liver, kidney's, central nervous system, and/or blood cells. The concentration of benzene in most commercial grades of gasoline is two percent by volume. ACGIH TLV 1 ppm, STEL 5 ppm

C. Toluene can cause damage to a person's liver, kidneys and/or central nervous system if inhaled or ingested. ACGIH TLV 100 ppm, STEL 150 ppm

D. Xylenes can cause damage to a human's liver, kidneys, central nervous system and/or blood cells when it is inhaled or ingested. ACGIH TLV 100 ppm, STEL 150 ppm

E. Drilling operations will be conducted within a designated "restricted entry" area. Only persons directly involved with the drilling will be authorized to enter this area. The standard machinery safety practices will be followed. Underground Service Alert will be notified at least two working days before starting work. The drill rig mast will be spaced at least 10 feet from all overhead power lines or a safe distance as indicated by the drillers.

F. All work will stop if an unknown substance is encountered onsite. If possible, a sample will be collected. A laboratory analytical scan will be done to identify the unknown substance and safety measures will be taken as necessary.

G. Heat stress is not expected to be a problem for personnel. Temperatures could range from approximately 60 degrees to 80 degrees Fahrenheit for the duration of the project. However, the following precautions will be taken:

a. All employees are trained in recognition of the health hazards and symptoms of heat stress.

b. Employees will take frequent breaks in a shady area with protective clothing removed. Decontamination procedures will be followed before leaving the work area.

c. Employees should drink liquids at each break.

4. **Risk Assessment Summary:**

The potential risk of exposure to gasoline range hydrocarbons at this site is considered low. The site is completely paved with no open areas for potential volatilization of hydrocarbons.

5. **Exposure Monitoring Plan:**

Onsite monitoring will be conducted with a HNU photoionization meter. The designated Safety Officer onsite will take regular ambient air readings within the breathing zone.

A wind direction indicator will also be present on site.

6. **Personal Protection Equipment:**

The most probable chemical exposure pathways are dermal contact and/or inhalation; ingestion is considered extremely unlikely.

The following protection equipment is to be utilized during drilling, sampling, or emergencies.

A. Personnel will wear safety glasses during sampling.

B. Nitrile gloves will be worn when there is a potential for contact with hazardous chemicals. Nitrile is the best material to use for dermal protection when dealing with a gasoline and water mixture.

C. Gasoline has an ACGIH TLV of 300 ppm and STEL 500 ppm. The potential to exceed these levels is possible. The odor threshold of gasoline is 10 ppm, which provides a safety

margin to warn personnel before any TLV has been exceeded. Half-mask respirators with organic vapor cartridges (MSHA-NIOSH TC-23C-40 or equivalent) will be available and should be used if the odor becomes more noticeable.

If vapor concentrations exceed PID readings of 300 ppm over a 5 minute period, field activity will be terminated and the boring will be abandoned.

D. Tyveks (or equivalent) and PVC/nitrile boots are available if dermal exposure to air borne vapors/particulate or saturated soils increases. PID readings of 300 ppm for over 5 minutes and the presence of visible air borne dust will merit termination of field activity.

E. Hard hats will be worn when working around operating heavy machinery such as a drill rig.

F. Hearing protection will be available when heavy machinery is being operated.

7. **Work Zones and Security Measures:**

The area immediately surrounding the sample processing location and the drilling rig will be off limits to all unauthorized personnel. Traffic cones or plastic flagging tape will be used to delineate the restricted area as necessary.

8. **Decontamination Procedures:**

In the case of a small spill, the spilled product will be absorbed with clay absorbent or any other available and appropriate material. Upon completion of cleanup this material will be placed in a sealed labeled container compatible with the waste. The appropriate disposal method will be followed depending on the concentration of the contaminant. The Fire Department will be notified in event of a large spill.

All reusable equipment (gloves, boots, respirators) will be decontaminated by washing in a soapy solution. The drill augers will be decontaminated within an area set up to contain all effluent. The rinse waters will be disposed of in a method compatible with the contaminant concentrations. Disposable clothing and equipment, such as Tyveks and disposable gloves, will be placed in appropriate containers.

9. **Work Practices:**

A brief summary of safety precautions:

A. All employees will be trained in health and safety as per 29 CFR 1910.120

B. No eating, drinking, smoking or gum chewing in the work area.

C. All personnel have been instructed to wash hands and face, even if no direct contact occurs, before eating, drinking, smoking and leaving work.

10. **Standard Operating Procedures:**

A. **Instrument Calibration**
Prior to beginning work each day, the HNU photoionization detector will be calibrated with the cylinder of calibration gas supplied by the manufacturer. The detector will be calibrated according to the manufacturers' instructions.

B. **Fit Testing**
Each person working in a potentially contaminated zone should have his/her respirator fit-tested to assure that vapors cannot infiltrate past the edges of the respirator. A simple and readily available field test is to have the worker, wearing the respirator, inhale while cigarette smoke is blown toward the respirator; the worker should not be able to detect the odor of the smoke.

C. **"Buddy" System**
In situations where there is possible exposure to elevated levels of hydrocarbons, each team member will be instructed to be alert to behavior of other members which may indicate accidental overexposure.

12. **Emergency Procedures:**

A. If dermal contact occurs, the affected area should be flushed with tap water; distilled water should be used for flushing the eyes.

B. If vapors or fumes are inhaled, the affected person will be removed from the work area. If the person continues to feel dizzy or ill, she/he will be driven to the local hospital.

Emergency Responders:

A. **Local Hospital:** Valley Memorial Hospital
1111 E. Stanley Blvd.
Livermore, CA
(415) 447-7000
West on 1st Street approximately 1/2 mile, rt. on Stanley Blvd. (at Hansen Park), Hospital on left.

B. **Fire Department:** 911

C. **Local Environmental Health, Haz. Waste:**
Alameda County Health Care Services
Ms. Eva Chu, Haz. Mat. Specialist
(510) 271-4530

12. **Training Requirements:**

Our employees have received the 40 hour safety training as required under 29 CFR 1910.120 regulations.

13. **Record keeping:**

A. Training - A record will be maintained on each employee's training and respirator fit testing.
B. Employee Exposure - Potential exposures will be recorded and will include the location, time, potential contaminants and the concentrations.
C. Medical Records - These include field injuries and illness.
D. RSI periodically reviews the Health and Safety Plan for adequacy, and changes are made as necessary.

RWRP

Mr. Richard W. Pilat,
Program Director/Site Safety Officer
Remediation Service, Int'l.
(Please refer to attached page for qualifications.)

STATEMENT OF QUALIFICATIONS

SITE SAFETY OFFICER

RICHARD W. PILAT

Relevant Experience: Mr. Pilat has managed over one hundred soil and groundwater investigations in Southern California with direct responsibility for field safety. Previously he was the Petroleum Laboratory Manager at Southern University, and was responsible for oversight of hazardous materials handling, testing and storage. He has participated in independent safety audits for oilfield drilling contractors and instructed 40 Hour Health and Safety classes for State Licensed hazardous materials contractors currently participating in projects for Federal, State, and Local Governmental agencies. He has directly overseen field site safety involving the following activities and materials.

- 99% PCB contaminated materials handling, transportation, and disposal.
- Asbestos handling, transportation, disposal, and disposal.
- Site audit, assessment and remediation of liquid chemical TSDF.
- Pesticide manufacturing RCRA and CERCLA compliance. Subsurface investigation and remediation in explosive environment.
- Subsurface investigation and remediation in refineries.
- Underground tank removals, assessment and remediation of halogenated and non-halogenated solvents and fuels. Confined space entry.
- Site safety audits of hospitals and wastewater treatment facilities. Sampling and testing for biohazards.
- Subsurface investigation and remediation of soil and groundwater contaminated with various Title 22 metals including lead recycling, weapons and aerospace manufacturing, industrial plating, machine shops and tool and die/metal fabrication facilities.

Relevant Education:

Industrial Safety, Southern University in New Orleans
H2S Training, Union Pacific Resources, Golden West Refinery
Emergency Response Training, Chemical Waste Management
40 Hour Health and Safety 29CFR 1910.120 (exp. 10/94)
HM 126 F Certificate