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**Work Plan for  
Preliminary Subsurface Assessment at  
ABE Petroleum**

**17715 Mission Boulevard  
Hayward, California 94544**

**Prepared for  
Mr. Paul Garg  
ABE Petroleum**

**Prepared by  
Sierra Environmental, Inc.**

**September 30, 1998  
Project 98-103.03**



**Sierra Environmental, Inc.**  
*Environmental Consultants*

**September 30, 1998**  
**Project 98-103.03**

**Mr. Paul Garg**  
**ABE Petroleum**  
**33090 Mission Boulevard**  
**Union City, CA 94587**

**Subject: Work Plan for Preliminary Subsurface Assessment at 17715**  
**Mission Boulevard, Hayward, California**

**Dear Mr. Garg:**

Sierra Environmental, Inc. (Sierra) is pleased to submit this work plan for preliminary subsurface assessment at the subject location hereafter referred to as Site shown in Figure 1. The work plan was requested by the Alameda County Health Care Services (ACHCS) as a result of unauthorized fuel leaks which have impacted soil beneath the former underground storage tanks (USTs) at the Site. The purpose of the preliminary subsurface assessment is to define the vertical extent of soil contamination at the Site, and determine whether groundwater beneath the Site has been impacted with gasoline constituents. Additionally, if groundwater impact is encountered, the scope of this work plan will enable us to obtain adequate groundwater data beneath the Site for water quality evaluations. Sierra was retained by ABE Petroleum LLC, and authorized by Mr. Paul Garg to prepare this work plan as defined in proposal P98-121.03 dated July 10, 1998.

## **BACKGROUND**

Balch Petroleum (Balch) of Milpitas, California removed one 2,000-gallon, two 6,000-gallon, one 10,000-gallon single-wall steel gasoline, and one 500-gallon single-wall steel waste oil USTs from the Site on September 16, 1997. Former UST locations are shown in Figure 2. No hole or damage were observed in the tanks. No groundwater was encountered in the tank excavations. After UST removal, Sierra collected soil samples from the tank excavations for chemical analysis. Up to 2,300 parts per million (ppm) total petroleum hydrocarbons as gasoline (TPHG) was detected in the soil samples collected from beneath the tanks at approximately 14 feet below ground surface (bgs). The soil sample locations are shown in Figure 2. The analytical results are presented in Appendix A.

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## **SCOPE OF WORK**

Sierra proposes to drill three 10-inch diameter soil borings down and cross-gradient of the former UST excavations, and convert the borings to 2-inch diameter groundwater monitoring wells. After completing the wells construction, Sierra will survey the well-heads, develop the wells, and collect groundwater samples for chemical analysis. Soil samples will be collected from the borings for chemical analysis at five-foot intervals, starting at 15 feet bgs (approximate depth representing bottom of the former USTs). Sierra will prepare a technical report summarizing the field observations, soil, groundwater, and analytical data, and recommendations.

Sierra proposes that the above work to be performed in accordance with the following tasks:

### **Task1 - PREFIELD ACTIVITIES**

After obtaining ACHCS's approval of this work plan, and before starting the field activities, Sierra will mark boring locations, coordinate with a state-licensed drilling contractor, a state-certified analytical laboratory, and the client. Sierra will obtain appropriate drilling and well construction permit from ACHCS, and notify Underground Services Alert (USA) to clear all the utilities. Sierra will prepare a Site specific health and safety plan. Sierra will obtain necessary equipment and material before starting the drilling activities.

### **Task2 - FIELD ACTIVITIES**

#### **Drilling and Sampling Activities**

Sierra will drill 3 boreholes down and cross-gradient of the former UST excavations, and convert them to groundwater monitoring wells. Over head high voltage power lines extend along Mission and Lewelling Boulevards. The boreholes, therefore, will be within safety clearance of the lines. Figure 3 shows the proposed groundwater monitoring well locations.

Sierra has reviewed historical groundwater data for few properties within 1 mile east/northeast of the Site. Shallow groundwater level at World Oil Station located at 22253 Foothill Boulevard was measured between 19 to 24 feet below ground surface (bgs). Shallow groundwater was measured at Chevron Service Station located at 21995 Foothill Boulevard at

approximately 8 to 19 feet bgs. Shallow groundwater in another property closer to the Site (former Mitsubishi dealership located on Mission Boulevard) was approximately 40 feet bgs.

The slopes of ground surface near the Site gently decrease toward San Francisco Bay (west). Groundwater flow direction at the Chevron property was toward west. The boreholes will be drilled west and south of the former tank excavations (Figure 3) until shallow groundwater is encountered (approximately 40 feet bgs). Clean hollow stem augers will be used for the drilling. Soil samples will be collected at 5-foot intervals using a California standard split spoon sampler lined with clean 6-inch long brass rings. After collection, the samples will be screened with PID, sealed with Teflon® tape and plastic end caps, placed in a cooler, and deliver to analytical laboratory with appropriate chain-of-custody documentation. Soil type and its physical appearance will be documented in a boring log.

Sierra will place the drill cuttings in 55-gallon drums in a designated location at the Site pending analytical results for the soil samples.

All drilling and sampling equipment will be washed with Liquinox® (a phosphate-free laboratory detergent) and rinsed with clean tap water and deionized water at each sampling interval. The wash and rinse water will be stored in a 55-gallon drum at a designated area at the Site.

Proposed soil boring and groundwater monitoring well locations are shown in Figure 3.

### **Groundwater Monitoring Well Construction**

Sierra will convert the boreholes into groundwater monitoring wells. The exact depth of the well will be determined in the field. 2-inch diameter slotted and solid PVC schedule 40 casing will be used in the construction of the wells. Before the drilling activities starts, Sierra will notify ACHCS representatives to observe the completion of the wells construction.

After construction, Sierra will assign a State-certified surveyor to survey the well-heads. Sierra will develop the wells to clean and stabilize the sand and aquifer material around the slotted section of the wells. Sierra will collect groundwater sample for chemical analysis.

The wells will be developed in accordance with the State and local requirements. The extracted water from the wells will be stored in 55-gallon drums located in a designated area at the Site.

Before sample collection, groundwater data (depth, temperature, pH, and electroconductivity) will be recorded. Groundwater samples will be collected using a clean bailer. After collection, the groundwater will be transferred into appropriate clean containers supplied by the laboratory. The containers will be sealed, labeled, and placed in a cooler to be delivered to the laboratory with the chain-of-custody documentation.

### **Task3 - CHEMICAL ANALYSIS**

The soil and groundwater samples will be analyzed for total petroleum hydrocarbons as gasoline (TPHG) using United State Environmental Protection Agency (EPA) modified method 8015, and for benzene, toluene, ethylbenzene, and xylenes (BTEX), and Methyl Tertiary Butyl Ether (MTBE) using EPA method 8020.

### **Task4 - REPORT PREPARATION AND SUBMITTAL**

Sierra will prepare a technical report documenting the field observations, soil boring logs, well construction diagrams, and the analytical results. The report will document the findings, and provide recommendations. Copies of the report will be submitted to the client, and ACHCS representative, Mr. Tom Peacock.

Please call if you have questions.

**Very Truly Yours,  
Sierra Environmental, Inc.**



**Reza Baradaran, PE, RGE  
Principal Environmental Engineer**

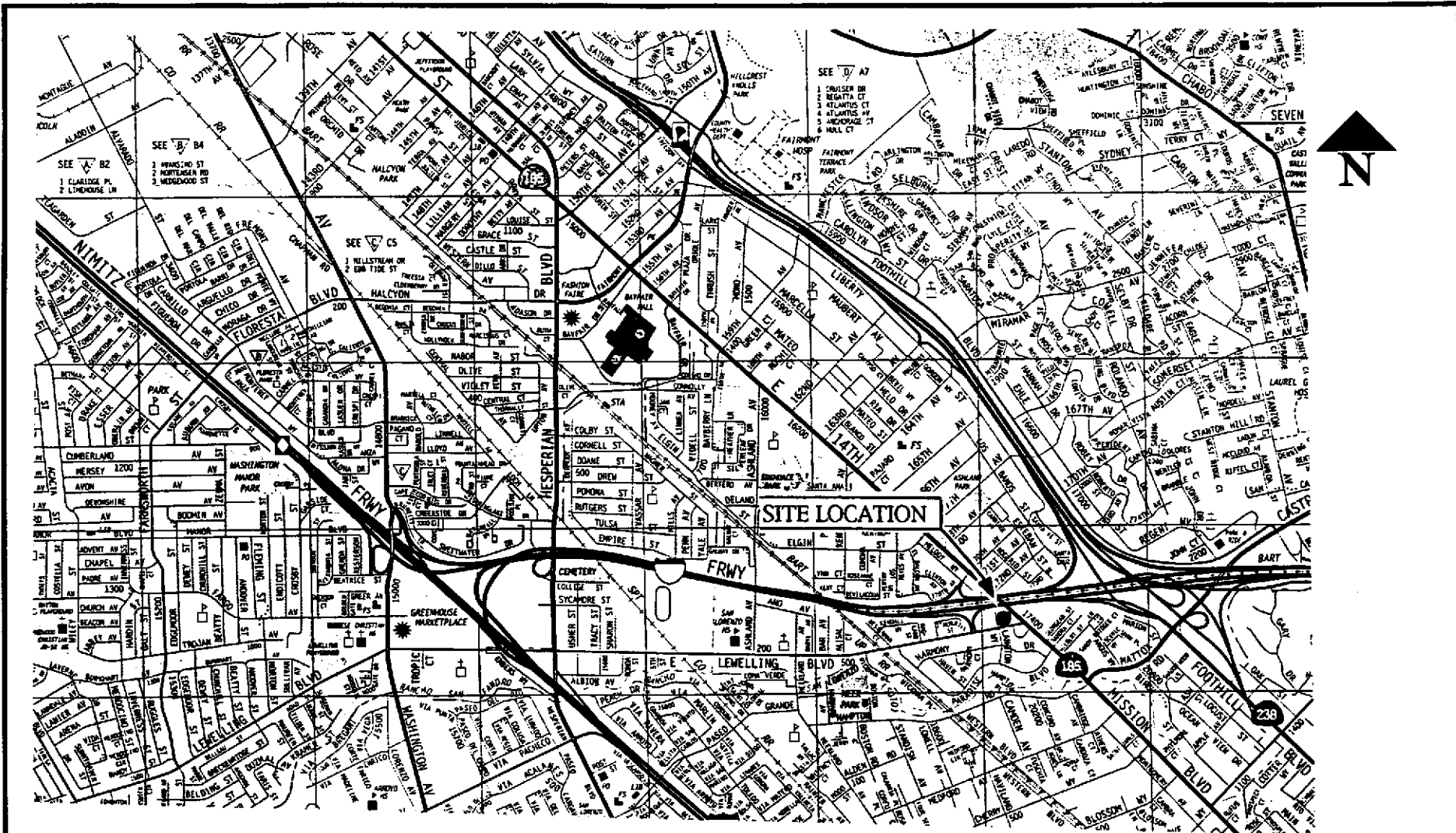


**Mitch Hajiaghaj, REA, CAC  
Principal Environmental Consultant**

Attachments: Figure 1 - Site Location Map  
Figure 2 - Former UST and Soil Sample Locations  
Figure 3 - Proposed Locations of the Monitoring wells  
Appendix A - Historical Analytical Results for Soil Samples

cc: Mr. Tom Peacock, ACHCS

W98-103.03VABE MH093098



Source: The Thomas Guide, 1997



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**SITE LOCATION MAP**

**Preliminary Subsurface Assessment**

**17715 Mission Boulevard • Hayward • California**

**FIGURE**

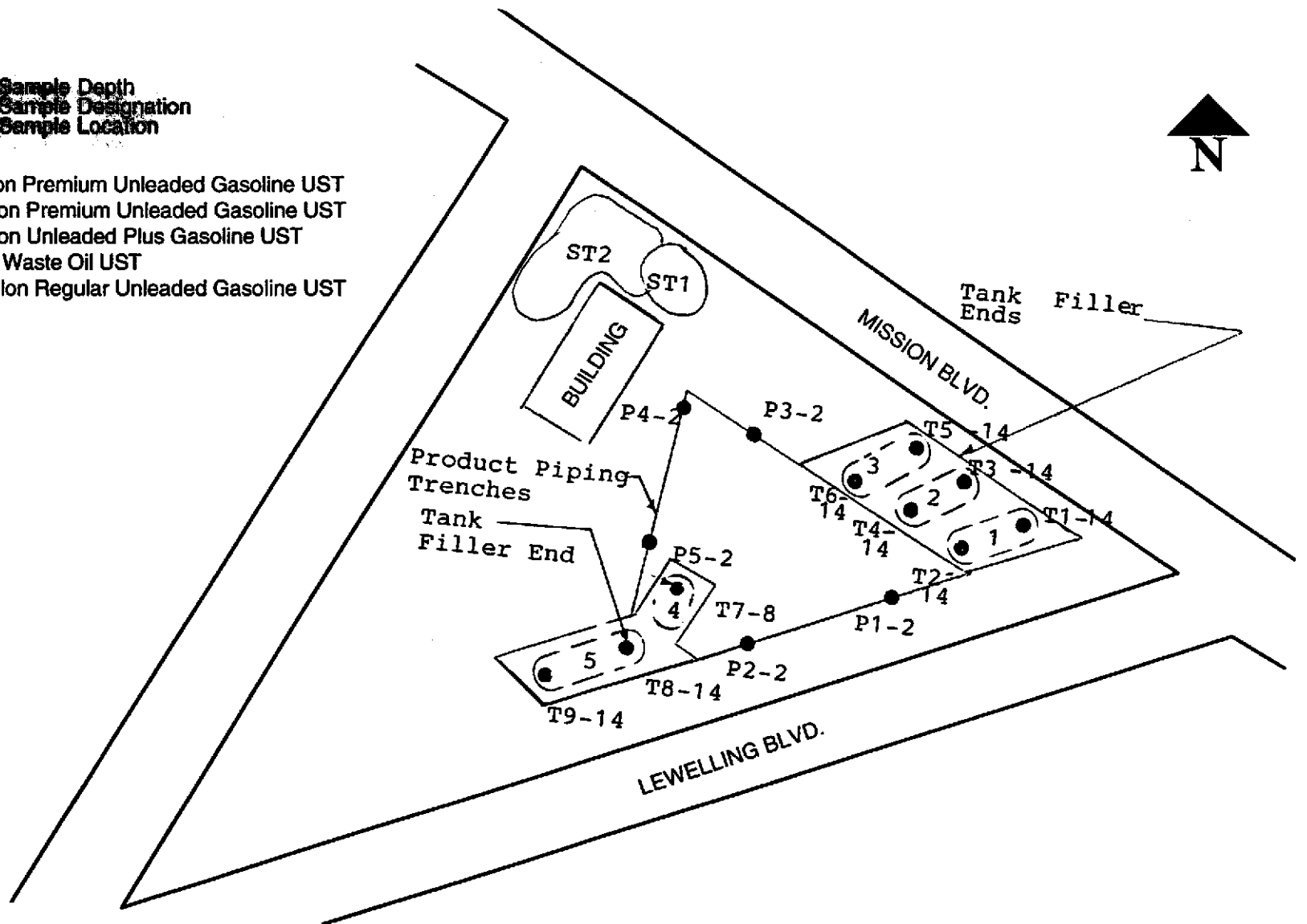
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September 1998  
 Project 98-103.03

**LEGEND**



- 1 = 2,000-gallon Premium Unleaded Gasoline UST
- 2 = 6,000-Gallon Premium Unleaded Gasoline UST
- 3 = 6,000-Gallon Unleaded Plus Gasoline UST
- 4 = 500-gallon Waste Oil UST
- 5 = 10,000-gallon Regular Unleaded Gasoline UST



Approximate Scale: 1"=30'



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Former UST and Soil Sample Locations

Preliminary Subsurface Assessment

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
**FIGURE**

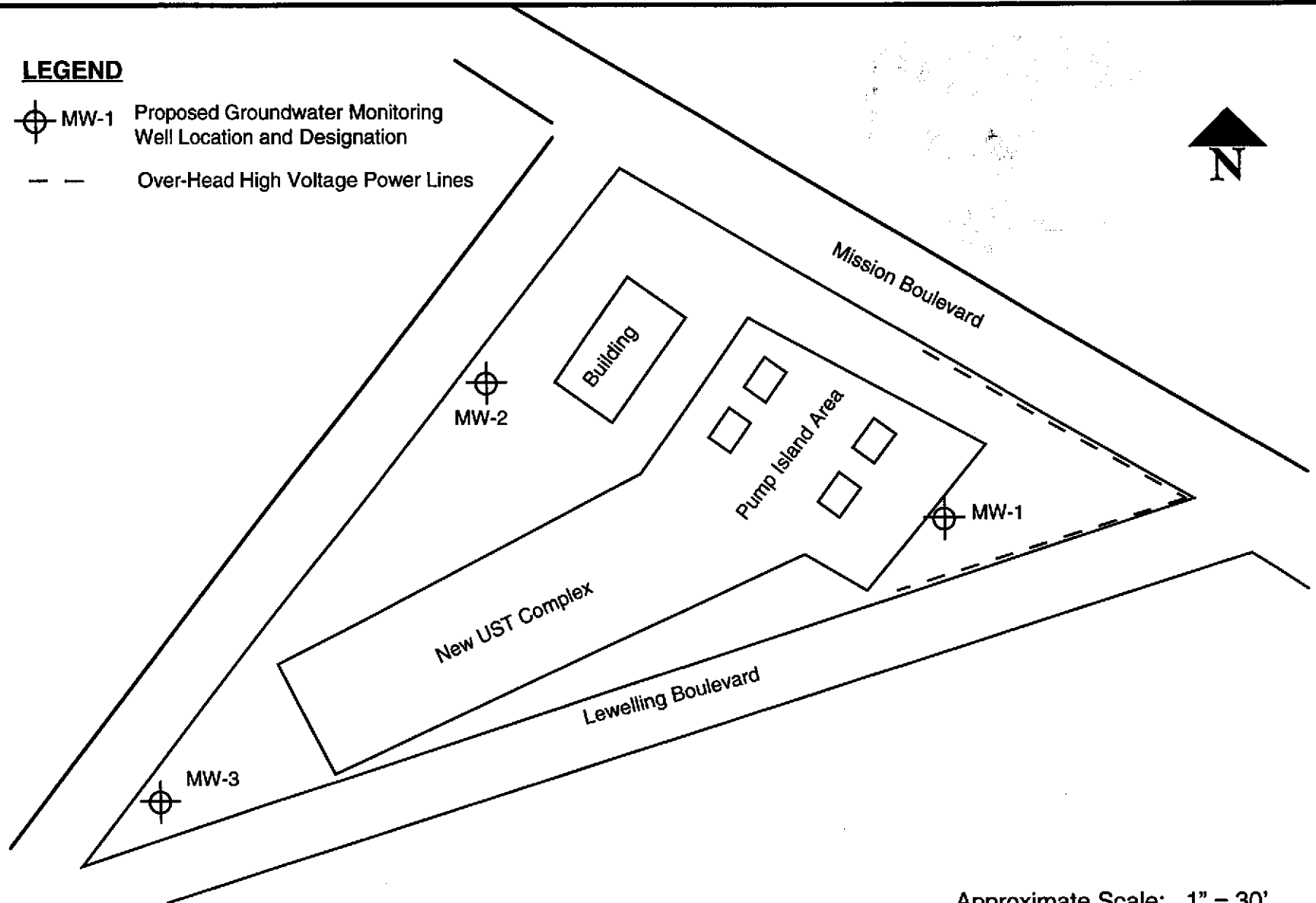
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September 1998  
Project 98-103.03



**LEGEND**

-  MW-1 Proposed Groundwater Monitoring Well Location and Designation
-  Over-Head High Voltage Power Lines



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**Proposed Groundwater Monitoring Well Locations**

**Preliminary Subsurface Assessment**

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**FIGURE**

**3**

September 1998  
Project 98-103.03

## **Appendix A**

**Historical Analytical Results for Soil Samples collected by Sierra**

**TABLE 1**  
**SOIL SAMPLE ANALYTICAL RESULTS, FUEL TANK EXCAVATIONS**

Sample	Date	Matrix	TPHG <sup>1</sup> ppm <sup>8</sup>	Lead <sup>2</sup> ppm	B <sup>3</sup> ppm	T <sup>4</sup> ppb	E <sup>5</sup> ppb	X <sup>6</sup> ppb	MTBE <sup>7</sup> ppb
T1-14	<del>9-16-97</del>	Soil	2300	5.6	230	4800	2200	6100	ND <sup>10</sup>
T2-14	9-16-97	Soil	28	4.1	22	92	40	180	ND
T3-14	9-16-97	Soil	2700	7.5	450	3100	2400	6500	ND
T4-14	9-16-97	Soil	1100	12	100	1900	1500	4800	ND
T5-14	9-16-97	Soil	64	6.1	48	100	110	380	ND
T6-14	9-16-97	Soil	66	7.1	48	270	120	560	ND
T8-14	9-16-97	Soil	260	7.1	200	93	310	330	ND
T9-14	9-16-97	Soil	1.1	9.3	ND	5.3	ND	8.8	ND

1. TPHG = Total petroleum hydrocarbons as gasoline
2. Lead = Analyzed as total lead
3. B = Benzene
4. T = Toluene
5. E = Ethylbenzene
6. X = Total xylenes
7. MTBE = Methyl tertiary butyl ether
8. ppm = Parts per million
9. ppb = Parts per billion
10. ND = Not Detected

**TABLE 2**  
**SOIL SAMPLE ANALYTICAL RESULTS, WASTE OIL TANK EXCAVATION**

Sample	Date	Matrix	TPHG <sup>1</sup> ppm <sup>8</sup>	TPHD <sup>2</sup> ppm	BTEX <sup>3</sup> ppm	TRPH <sup>4</sup> ppm	VOCs <sup>5</sup> ppm	SVOCs <sup>6</sup> ppm	Metals <sup>7</sup> ppm
T7-8	9-16-97	Soil	ND <sup>9</sup>	ND	ND	14	ND	ND	*

1. TPHG = Total petroleum hydrocarbons as gasoline
2. TPHD = Total petroleum hydrocarbons as diesel
3. BTEX = Benzene, Toluene, Ethylbenzene, Xylenes
4. TRPH = Total Recoverable Petroleum Hydrocarbons
5. VOCs = Volatile Organic Compounds
6. SVOCs = Semivolatile Organic Compounds
7. Metals = \* Cd @ 2.1 ppm, Cr @ 3.9 ppm, Pb @ 4.9 ppm, Ni @ 18 ppm, Zn @ 84 ppm
8. ppm = Parts per million
9. ND = Not Detected

**TABLE 3**  
**SOIL SAMPLE ANALYTICAL RESULTS, PIPING TRENCHES**

Sample	Date	Matrix	TPHG <sup>1</sup> ppm <sup>8</sup>	Lead <sup>2</sup> ppm	B <sup>3</sup> ppb <sup>9</sup>	T <sup>4</sup> ppb	E <sup>5</sup> ppb	X <sup>6</sup> ppb	MTBE <sup>7</sup> ppb
P1-2	9-16-97	Soil	ND <sup>10</sup>	5.6	ND	ND	ND	ND	ND
P2-2	9-16-97	Soil	ND	11	ND	ND	ND	ND	ND
P3-2	9-16-97	Soil	ND	9.3	ND	ND	ND	ND	ND
P4-2	9-16-97	Soil	ND	5.5	ND	ND	ND	ND	ND
P5-2	9-16-97	Soil	ND	6.9	ND	ND	ND	ND	ND

1. TPHG = Total petroleum hydrocarbons as gasoline
2. Lead = Analyzed as total lead
3. B = Benzene
4. T = Toluene
5. E = Ethylbenzene
6. X = Total xylenes
7. MTBE = Methyl tertiary butyl ether
8. ppm = Parts per million
9. ppb = Parts Per Billion
10. ND = Not Detected

**TABLE 4**  
**SOIL SAMPLE ANALYTICAL RESULTS, SOIL STOCKPILES**

Sample	Date	Matrix	TPHG <sup>1</sup> ppm <sup>8</sup>	Lead <sup>2</sup> ppm	B <sup>3</sup> ppb <sup>9</sup>	T <sup>4</sup> ppb	E <sup>5</sup> ppb	X <sup>6</sup> ppb	MTBE <sup>7</sup> ppb
ST1 A,B,C,D	9-18-97	Soil	4.5	7.9	ND <sup>10</sup>	ND	ND	25	ND
ST2 A,B,C,D	9-18-97	Soil	ND	8.3	ND	ND	ND	ND	ND

1. TPHG = Total petroleum hydrocarbons as gasoline
2. Lead = Analyzed as total lead
3. B = Benzene
4. T = Toluene
5. E = Ethylbenzene
6. X = Total xylenes
7. MTBE = Methyl tertiary butyl ether
8. ppm = Parts per million
9. ppb = Parts Per Billion
10. ND = Not Detected