

HAGEMAN-AGUIAR, INC.

Underground Contamination Investigations, Groundwater Consultants, Environmental Engineering

**QUARTERLY
GROUNDWATER SAMPLING REPORT**

(Sampled August 12, 1996)

PACIFIC CRYOGENIC COMPANY
2311 Magnolia Street
Oakland, California

August 16, 1996

ENVIRONMENTAL
PROTECTION
86 NOV -5 PM 2 35

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I. INTRODUCTION

The subject site is the historical location of Pacific Cryogenic Company at 2311 Magnolia Street, Oakland, California. The location of the site is shown on Figure 1 (site location map).

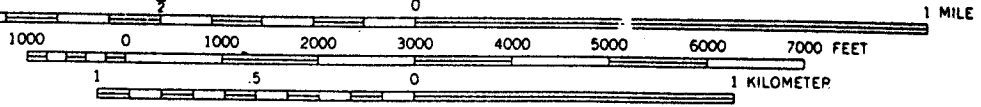
On June 30 and July 12, 1989, Geo-Environmental Technology removed three underground storage tanks from the subject site: one 8,000-gallon underground Diesel tank, one 1,000-gallon underground Gasoline tank, and one 550-gallon underground Waste Oil tank.

Due to the detection of subsurface contamination in the vicinity of the Gasoline and Waste Oil tanks, shallow groundwater monitoring wells MW-1, MW-2 and MW-3 were installed.

On November 12, 1992, the underground piping running between the previous Gasoline and Waste Oil underground tanks and the previous dispenser pedestal were removed by Hageman-Aguiar, Inc. Subsequent to the piping removal, additional excavation was conducted on November 18, 1992. The excavation extended to a depth of approximately 15 feet below ground surface and was conducted in order to mitigate the apparent subsurface gasoline contamination. The three monitoring wells MW-4, MW-5 and MW-6 were installed within the excavation at the time of the backfilling operation.

On August 12, 1996, on-site monitoring wells MW-3 and MW-4 were sampled for the laboratory analysis for dissolved petroleum constituents.

SCALE 1:24,000



CONTOUR INTERVAL 20 FEET
 DOTTED LINES REPRESENT 5-FOOT CONTOURS
 NATIONAL GEODETIC VERTICAL DATUM OF 1929

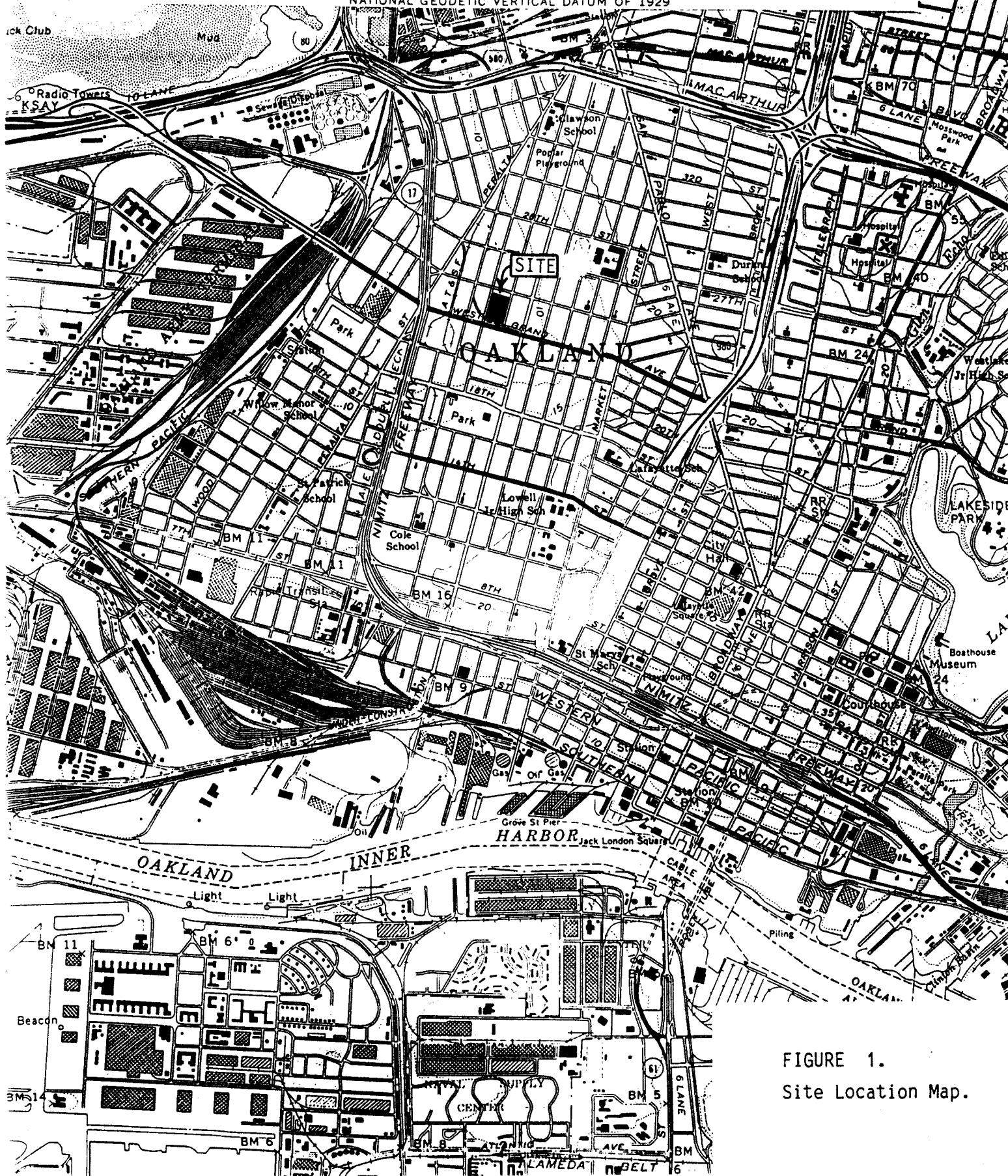


FIGURE 1.
Site Location Map.

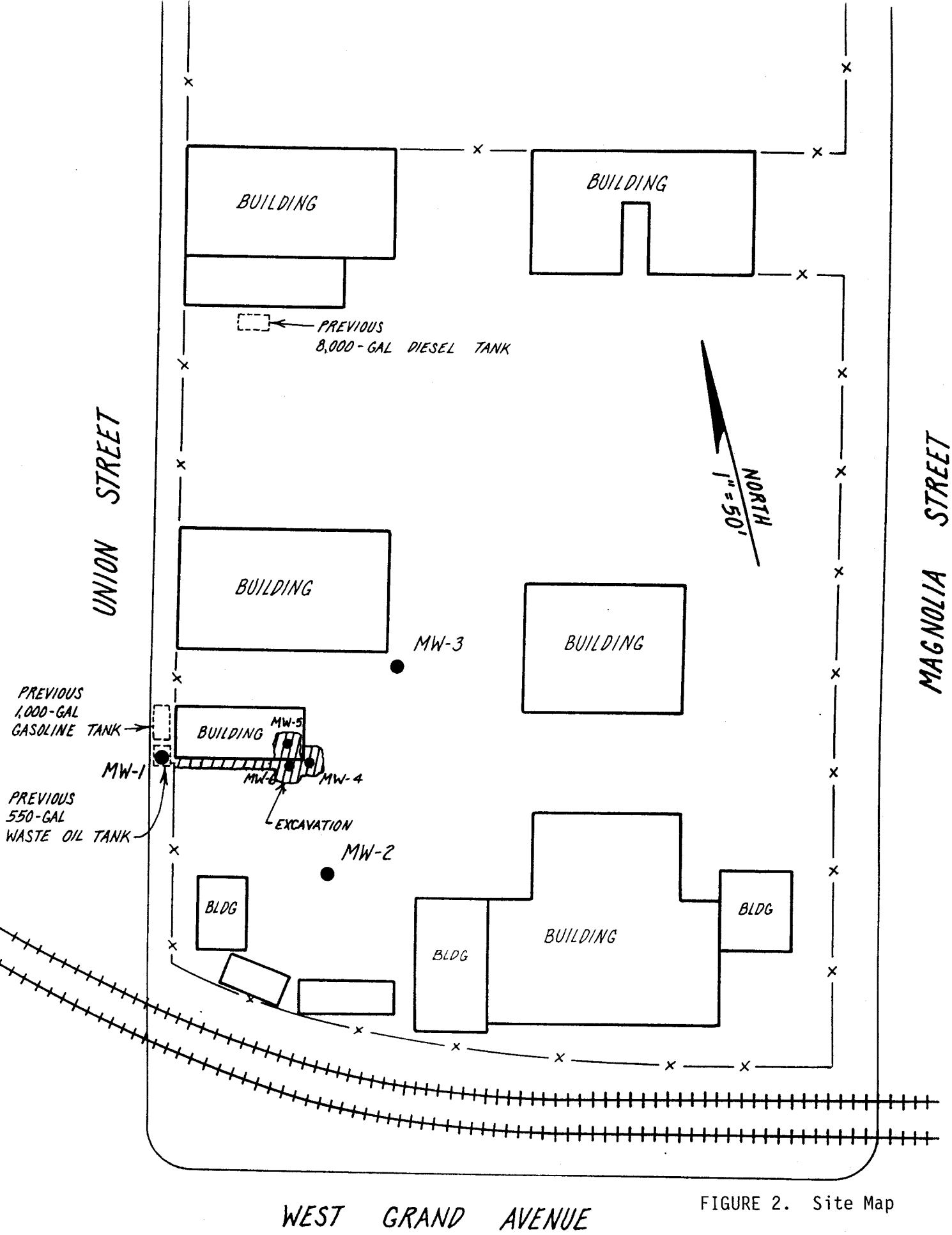


FIGURE 2. Site Map

This "round" of groundwater sampling has been conducted as part of the quarterly groundwater monitoring program at the site, as required by the Alameda County Environmental Health Department and the California Regional Water Quality Control Board (RWQCB), San Francisco Bay Region. Currently, wells MW-3 and MW-4 are sampled quarterly, well MW-1 is sampled semi-annually, and sampling at well MW-2 has been discontinued.

II. FIELD WORK

Monitoring Well Sampling

On August 12, 1996, groundwater samples were collected from monitoring wells MW-3 and MW-4. Prior to groundwater sampling, each well was purged by bailing approximately 7 to 10 casing volumes of water. Field conductivity, temperature, and pH meters were present on-site during the monitoring well sampling. As the purging process proceeded, the three parameters were monitored. Purging continued until readings appeared to have reasonably stabilized. After the water level in the well had attained 80% or more of the original static water level, a groundwater sample was collected using a clean teflon bailer. The water sample was placed inside appropriate 40 mL VOA vials free of any headspace. The samples were immediately placed on crushed ice, then transported under chain-of-custody to the laboratory at the end of the work day.

At the time each monitoring well was sampled, the following information was recorded in the field: 1) depth-to-water prior to purging, using an electrical well sounding tape, 2) identification of any floating product, sheen, or odor prior to purging, using a clear teflon bailer, 3) sample pH, 4) sample temperature, and 5) specific conductance of the sample.

Copies of the well sampling logs are included as Attachment A.

Wastewater Generation

All water removed from the wells during purging and sampling was drummed and stored on-site until the results of laboratory analyses were obtained. Based upon these results, the water should be transported as a hazardous liquid waste under proper manifest to an appropriate TSD facility for treatment and disposal.

The ultimate disposal of this waste water is the responsibility of the property owner (waste generator), and is beyond the scope of work as outlined in this report.

III. RESULTS OF WATER LEVEL MEASUREMENTS

Shallow Groundwater Flow Direction

Shallow water table elevations were measured on August 12, 1996. These measurements are shown in Table 1. Figure 3 presents a contour map for the shallow groundwater table beneath the site. As shown in this figure, the data from the four monitoring wells MW-1, MW-2, MW-3 and MW-4 indicate that the shallow groundwater flow was in the easterly direction during this round of groundwater sampling.

Shallow Water Table Hydraulic Gradient

Figure 3 presents the contour map for the shallow groundwater table beneath the site. As shown in this figure, the shallow groundwater table beneath the site appears to have a calculated hydraulic gradient of $dH/dL = 0.4'/47' = 0.0085$.

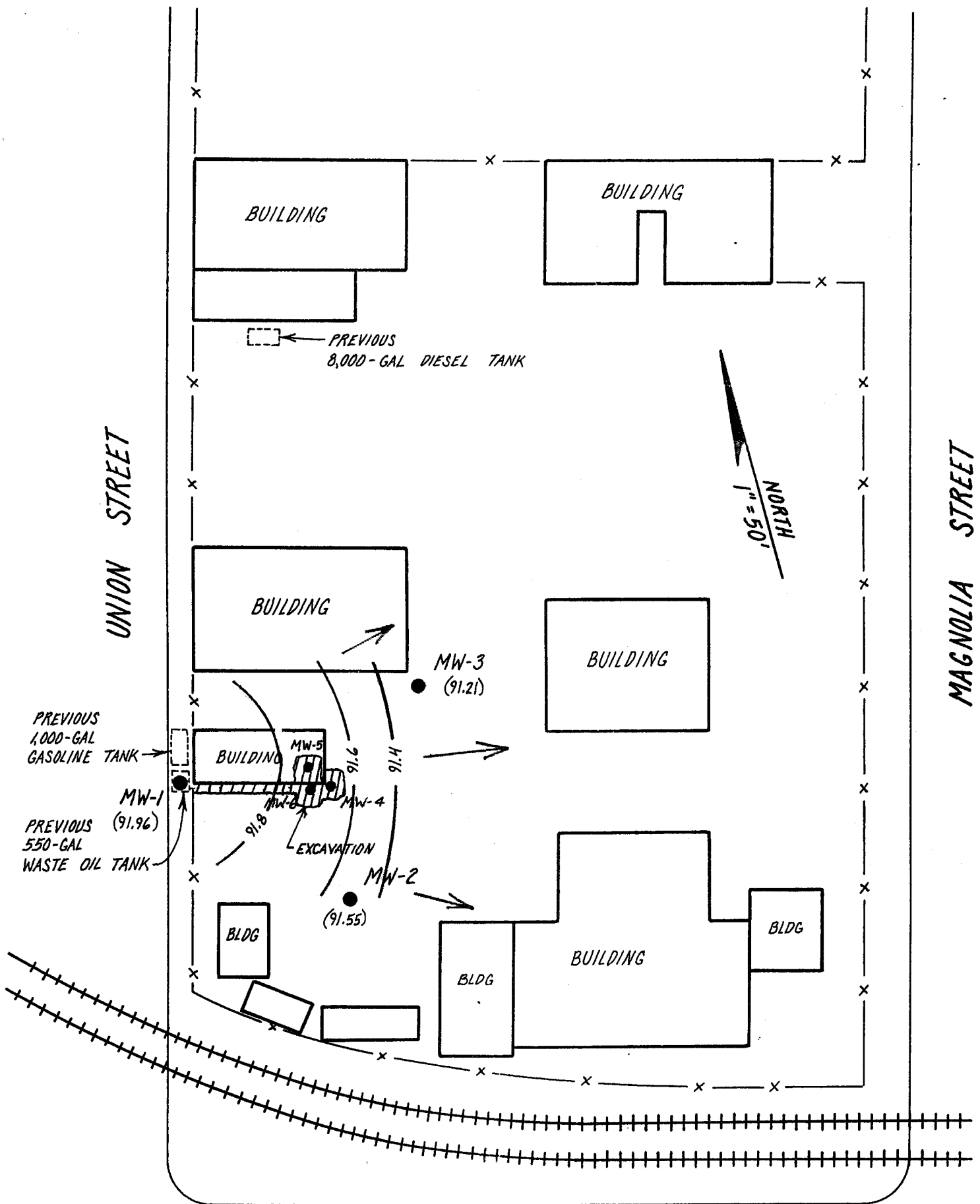
Historical Water Level Measurements

Table 2 presents the results of all water level measurements collected between April 3, 1992, and the present time.

TABLE 1.

**Shallow Water Table Elevations
August 12, 1996**

Well	Top of Casing Elevation (feet)	Depth to Water (feet)	Water Table Elevation (feet)
MW-1	99.27	7.31	91.96
MW-2	100.00	8.45	91.55
MW-3	100.02	8.81	91.21
MW-4	99.95	8.23	91.72



WEST GRAND AVENUE

FIGURE 3.

Shallow Groundwater Table Contour Map, measured 8-12-96.

TABLE 2.

**Historical Water Table Elevations
(feet)**

Well	Date of Measurement								
	4-3-92	6-16-92	10-8-92	1-7-93	4-23-93	7-16-93	11-8-93	2-2-94	5-2-94
MW-1	95.58	92.01	91.11	97.17	95.17	92.07	91.78	94.42	93.55
MW-2	93.25	91.60	90.83	94.24	92.69	91.46	91.04	92.55	92.19
MW-3	92.52	91.87	90.65	94.43	92.64	91.21	91.14	92.21	91.94
MW-4	---	---	---	---	---	91.48	91.16	92.67	92.37
Flow Direction	SE	SE	E	SE	SE	E	SE	E	E

Well	Date of Measurement								
	8-3-94	8-3-94	11-4-94	3-14-95	8-23-95	5-8-96	8-12-96		
MW-1	---	90.96	90.96	96.33	91.70	93.72	91.96		
MW-2	91.25	90.77	90.77	95.08	91.30	92.64	91.55		
MW-3	91.00	90.57	90.57	94.96	91.10	92.84	91.21		
MW-4	91.26	90.74	90.74	95.60	91.38	93.28	91.72		
Flow Direction	E	E	E	E	E	E	E		

IV. SHALLOW GROUNDWATER SAMPLING RESULTS

Laboratory Analysis

All analyses were conducted by a California State DOHS certified laboratory in accordance with EPA recommended procedures (Priority Environmental Labs, Milpitas, CA). All Groundwater samples were analyzed for Total Petroleum Hydrocarbons as Gasoline (EPA method 8015), and for Benzene, Toluene, Ethylbenzene, and Total Xylenes (EPA method 602).

Results of Groundwater Sampling

Tables 3 and 4 present the results of the laboratory analysis of the groundwater samples, as well as the results of all previous "rounds" of sampling from wells MW-1, MW-2, MW-3 and MW-4.

As shown in Table 3, for this round of sampling, Gasoline was detected in the groundwater sample collected from well MW-3 at a concentration of 8,900 $\mu\text{g/L}$ (ppb). In addition, Benzene was detected in the groundwater sample collected from well MW-3 at a concentration of 47 $\mu\text{g/L}$ (ppb).

No detectable concentration of either Gasoline, Benzene, Toluene, Ethylbenzene, or Total Xylenes was found in the shallow groundwater sample collected from well MW-4.

**TABLE 3.
Shallow Groundwater Sampling Results**

Well	Date	TPH as Gasoline (ug/L)	Benzene (ug/L)	Toluene (ug/L)	Ethyl-benzene (ug/L)	Total Xylenes (ug/L)
MW-1	10-26-90	---	1200	18	7.1	37
	03-04-92	460	120	9.0	16	44
	04-03-92	300	21	6.0	15	36
	06-16-92	220	54	17	29	73
	10-09-92	ND	ND	ND	ND	ND
	01-07-93	210	0.7	3.7	4.4	9.6
	04-23-93	280	0.9	1.3	2.9	6.2
	07-16-93	110	ND	ND	0.5	1.1
	11-08-93	ND	ND	ND	ND	ND
	01-28-94	190	5.7	4.9	6.7	21
	05-02-94	ND	ND	ND	ND	ND
	08-03-94	ND	ND	ND	ND	ND
	11-04-94	ND	ND	ND	ND	ND
	03-14-95	ND	ND	ND	ND	ND
	08-23-95	ND	ND	ND	ND	ND
	05-08-96	110	1.0	ND	ND	2.8
08-12-96	---	---	---	---	---	
Detection Limit		50	0.5	0.5	0.5	0.5

ND = Not Detected

**TABLE 3.
Shallow Groundwater Sampling Results**

Well	Date	TPH as Gasoline (ug/L)	Benzene (ug/L)	Toluene (ug/L)	Ethylbenzene (ug/L)	Total Xylenes (ug/L)
MW-2	03-04-92	ND	ND	ND	ND	ND
	04-03-92	ND	ND	ND	ND	ND
	06-16-92	ND	ND	ND	ND	ND
	10-09-92	ND	ND	ND	ND	ND
	01-07-93	ND	ND	ND	ND	ND
	04-23-93	ND	ND	ND	ND	ND
	07-16-93	ND	ND	ND	ND	ND
	11-08-93	ND	ND	ND	ND	ND
	01-28-94	ND	ND	ND	ND	ND
	05-02-94	ND	ND	ND	ND	ND
	08-03-94	ND	ND	ND	ND	ND
	11-04-94	ND	ND	ND	ND	ND
	03-14-95	ND	ND	ND	ND	ND
	08-23-95	ND	ND	ND	ND	ND
	05-08-96	ND	ND	ND	ND	ND
08-12-96	---	---	---	---	---	
Detection Limit		50	0.5	0.5	0.5	0.5

ann

ND = Not Detected

**TABLE 3. (continued)
Shallow Groundwater Sampling Results**

Well	Date	TPH as Gasoline (ug/L)	Benzene (ug/L)	Toluene (ug/L)	Ethyl-benzene (ug/L)	Total Xylenes (ug/L)
MW-3	03-04-92	14,000	6,200	60	110	740
	04-03-92	5,200	120	32	57	180
	06-16-92	6,000	180	45	82	190
	10-09-92	11,000	87	49	94	200
	01-07-93	4,200	3.3	13	44	92
	04-23-93	21,000	23	43	49	130
	07-16-93	16,000	19	21	25	78
	11-08-93	10,000	4.3	5.7	7.9	35
	01-28-94	7,500	8.5	10	50	95
	05-02-94	22,000	69	39	60	110
	08-03-94	2,500	35	12	27	25
	11-04-94	2,900	4.0	8.1	18	27
	03-14-95	2,500	9.5	3.0	4.6	8.3
	08-23-95	12,000	35	8.2	14	20
	05-08-96	19,000	57	17	32	56
	08-12-96	8,900	47	7.6	14	16
Detection Limit		50	0.5	0.5	0.5	0.5

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ND = Not Detected

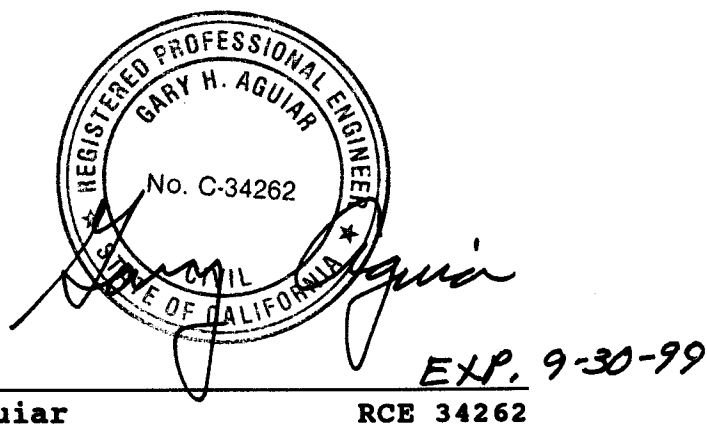
**TABLE 3. (continued)
Shallow Groundwater Sampling Results**

Well	Date	TPH as Gasoline (ug/L)	Benzene (ug/L)	Toluene (ug/L)	Ethyl-benzene (ug/L)	Total Xylenes (ug/L)
MW-4	01-07-93	4,800	6.4	25	60	110
	04-23-93	2,700	8.3	11	31	59
	07-16-93	3,000	3.7	4.2	4.9	15
	11-08-93	1,400	0.6	0.8	1.1	4.8
	01-28-94	830	8.5	10	12	27
	05-02-94	900	7.3	3.2	0.5	14
	08-03-94	1,000	22	0.7	8.0	7.4
	11-04-94	160	0.6	ND	1.9	2.9
	03-14-95	120	3.6	ND	ND	3.7
	08-23-95	ND	ND	ND	ND	ND
	05-08-96	ND	ND	ND	ND	ND
	08-12-96	ND	ND	ND	ND	ND
	Detection Limit		50	0.5	0.5	0.5

ND = Not Detected

QUARTERLY GROUNDWATER SAMPLING REPORT
PACIFIC CRYOGENIC COMPANY
2311 Magnolia Street, Oakland, CA

August 16, 1996



EXP. 9-30-99

Gary Aguiar

RCE 34262

ATTACHMENT A

Well Sampling Logs

WELL SAMPLING LOG

Project/No. PACIFIC CRYOGENICS

Page 1 of 2

Site Location OAKLAND, CA.

Date 8-12-96

Well No. MW-3

Time Began 11:00

Weather SUNNY MID 70's

Completed 12:56

Sampling Personnel J CONNORS

EVACUATION DATA

Description of Measuring Point (MP) WELL BOX @ GRADE

Total Sounded Depth of Well Below MP 22.36

- Depth to Water Below MP 8.81

Diameter of Casing 2"

= Water Column in Well 13.55

Gallons in Casing 21 + Annular Space x 4 = Total Gallons 85
(30% porosity) x 10

Gallons Pumped Prior to Sampling 155

Evacuation Method PVC HAND BAILER

SAMPLING DATA / FIELD PARAMETERS

Inspection for Free Product: NONE DETECTED
 (thickness to 0.1 inch, if any)

Time	<u>11:10</u>	<u>11:23</u>	<u>11:40</u>	<u>12:56</u>
Gals Removed	<u>5</u>	<u>10</u>	<u>13*</u>	<u>15.5</u>
Temperature	<u>78.7</u>	<u>73.8</u>	<u>72.3</u>	<u>70.2</u>
Conductivity	<u>750</u>	<u>740</u>	<u>730</u>	<u>690</u>
pH	<u>7.41</u>	<u>7.13</u>	<u>7.03</u>	<u>7.14</u>
Color / Odor	<u>CHALK WHITE</u> <u>FUEL ODOR</u>	<u>WHITE</u> <u>FUEL ODOR</u>	<u>WHITE</u> <u>FUEL ODOR</u>	<u>WHITE</u> <u>FUEL ODOR</u>
Turbidity	<u>HIGH</u>	<u>HIGH</u>	<u>HIGH</u>	<u>HIGH</u>

Comments: * DEWATERED @ 13 GAL.

WELL SAMPLING LOG

Project/No. PACIFIC CRYOGENICS Page 2 of 2
 Site Location OAKLAND, CA.
 Well No. MW-4 Date 8-12-96
 Weather SUNNY MID 70's Time Began 11:45
Completed _____
 Sampling Personnel J. CONNORS

EVACUATION DATA

Description of Measuring Point (MP) WELL BOX @ GRADE
 Total Sounded Depth of Well Below MP 13.47
 - Depth to Water Below MP 8.23 Diameter of Casing 4"
 = Water Column in Well 5.24
 Gallons in Casing 3.3 + Annular Space $\frac{x 4}{x 10}$ = Total Gallons 32.6
(30% porosity) 13.1
Gallons Pumped Prior to Sampling 35
 Evacuation Method PVC HAND BAILER

SAMPLING DATA / FIELD PARAMETERS

Inspection for Free Product: NONE DETECTED
 (thickness to 0.1 inch, if any)

Time	<u>11:52</u>	<u>12:13</u>	<u>12:28</u>	<u>12:43</u>
Gals Removed	<u>5</u>	<u>15</u>	<u>25</u>	<u>35</u>
Temperature	<u>71.1</u>	<u>70.2</u>	<u>69.5</u>	<u>69.1</u>
Conductivity	<u>420</u>	<u>410</u>	<u>400</u>	<u>400</u>
pH	<u>6.98</u>	<u>7.17</u>	<u>7.13</u>	<u>7.15</u>
Color / Odor	<u>CLEAR</u> <u>NO ODOR</u>	<u>CLEAR</u> <u>NO ODOR</u>	<u>CLEAR</u> <u>NO ODOR</u>	<u>CLEAR</u> <u>NO ODOR</u>
Turbidity	<u>LOW</u>	<u>LOW</u>	<u>LOW</u>	<u>LOW</u>

Comments: _____

ATTACHMENT B

Analytical Results: Groundwater



PRIORITY ENVIRONMENTAL LABS

Precision Environmental Analytical Laboratory

August 16, 1996

PEL # 9608026

HAGEMAN - AGUIAR, INC.

Attn: Gary Aguiar

Re: Two water samples for Gasoline/BTEX analysis.

Project name: Pacific Cryogenic Co.

Project location: 2311 Magnolia St., - Oakland, CA.

Date sampled: Aug 12, 1996

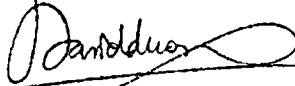
Date submitted: Aug 13, 1996

Date extracted: Aug 14-15, 1996

Date analyzed: Aug 14-15, 1996

RESULTS:

SAMPLE I.D.	Gasoline (ug/L)	Benzene (ug/L)	Toluene (ug/L)	Ethyl Benzene (ug/L)	Total Xylene (ug/L)
MW-3	8900	47	7.6	14	16
MW-4	N.D.	N.D.	N.D.	N.D.	N.D.
Blank	N.D.	N.D.	N.D.	N.D.	N.D.
Spiked Recovery	86.9%	82.0%	94.0%	106.8%	112.4%
Detection limit	50	0.5	0.5	0.5	0.5
Method of Analysis	5030 / 8015	602	602	602	602


David Duong
Laboratory Director

