

ALAMEDA COUNTY
HEALTH CARE SERVICES

AGENCY
DAVID J. KEARS, Agency Director



ENVIRONMENTAL HEALTH SERVICES
ENVIRONMENTAL PROTECTION (LOP)
1131 Harbor Bay Parkway, Suite 250
Alameda, CA 94502-6577
(510) 567-6700
FAX (510) 337-9335

REMEDIAL ACTION COMPLETION CERTIFICATION

StID 220 - 901 Embarcadero, Oakland, CA

January 24, 1997

Mr. John Edwards
Liquid Carbonic
810 Jorie Blvd
Oak Brook, IL 60521

Ms. Cordelia Clark, Plant Manager
Liquid Carbonic
901 Embarcadero
Oakland, CA 94606

Mr. Neil Werner
Port of Oakland
530 Water Street
Oakland, CA 94607

Dear Messrs. Edwards and Werner, and Ms. Clark:

This letter confirms the completion of site investigation and remedial action for the four former underground storage tanks removed from the above site on September 13, 1989 and February 6, 1990. Thank you for your cooperation throughout this investigation. Your willingness and promptness in responding to our inquiries concerning the former underground storage tanks are greatly appreciated.

Based on information in the above-referenced file and with the provision that the information provided to this agency was accurate and representative of site conditions, no further action related to the underground tank release is required.

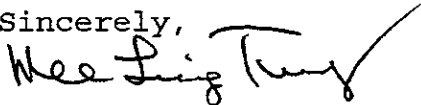
This notice is issued pursuant to a regulation contained in Title 23, Section 2721(e) of the California Code of Regulations.

Edwards, Clark, Werner
re: RACC at 901 Embarcadero
January 25, 1997

Page2

Please contact our office if you have any questions regarding
this matter.

Sincerely,



Mee Ling Tung, Director

cc: Chief, Division of Environmental Protection
Kevin Graves, RWQCB
Lori Casias, SWRCB (with attachment)
Cheryl Gordon, UST Cleanup Fund
files (liqcarb.5) ML

61-0919

ENVIRONMENTAL PROTECTION
96 NOV 15 PM 3:51

CASE CLOSURE SUMMARY
Leaking Underground Fuel Storage Tank Program

I. AGENCY INFORMATION

Date: October 4, 1996

Agency name: Alameda County-HazMat Address: 1131 Harbor Bay Pkwy
City/State/Zip: Alameda, CA 94502 Phone: (510) 567-6700
Responsible staff person: Eva Chu Title: Hazardous Materials Spec.

II. CASE INFORMATION

Site facility name: Liquid Carbonic Corp.
Site facility address: 901 Embarcadero, Oakland, CA 94606
RB LUSTIS Case No: N/A Local Case No./LOP Case No.: 220
URF filing date: 12/12/89 SWEEPS No: N/A

<u>Responsible Parties:</u>	<u>Addresses:</u>	<u>Phone Numbers:</u>
1. John Edwards Liquid Carbonic	810 Jorie Blvd Oak Brook, IL 60521	(708) 572-7343
2. Cordelia Clark, Plant Mgr Liquid Carbonic	901 Embarcadero, Oakland, CA	94606 451-4100
3. Neil Werner Port of Oakland	530 Water Street Oakland, CA 94607	

<u>Tank No:</u>	<u>Size in gal.:</u>	<u>Contents:</u>	<u>Closed in-place or removed?:</u>	<u>Date:</u>
1	8,000	Gasoline	Removed	9/13/89
2	2,000	Diesel	Removed	"
3	2,000	Acetone	Removed	"
4	6,000	Diesel	Removed	2/6/90

III. RELEASE AND SITE CHARACTERIZATION INFORMATION

Cause and type of release: Unknown
Site characterization complete? YES
Date approved by oversight agency:
Monitoring Wells installed? Yes Number: 3
Proper screened interval? Yes, 5 to 20' bgs
Highest GW depth below ground surface: 4.42' Lowest depth: 4.81' in MW-1
Flow direction: NE
Most sensitive current use: Alameda Inner Harbor, ~400' away
Are drinking water wells affected? No Aquifer name:
Is surface water affected? No Nearest affected SW name:
Off-site beneficial use impacts (addresses/locations): None

Report(s) on file? YES Where is report(s) filed? Alameda County
1131 Harbor Bay Pkwy
Alameda, CA 94502

Treatment and Disposal of Affected Material:

<u>Material</u>	<u>Amount</u> (include units)	<u>Action (Treatment</u> <u>or Disposal w/destination)</u>	<u>Date</u>
Tank	1 UST	H & H, in San Francisco	2/6/90
	3 USTs	H & H, in San Francisco	9/13/89
Rinseate	500 gallon	H & H, in San Francisco	9/12/89
Soil	7 drums	Chem Waste Mgmt, Kettleman City	9/12/89
	4 drums	Anderson Solid Waste, Anderson	8/31/89
	220 cy	Redwood L.F., in Novato	10/19/90
	324 cy	Vasco Rd L.F., in Livermore	12/4/90
Groundwater	8,400 gallon	H & H, in San Francisco	2/5-6/90

Maximum Documented Contaminant Concentrations - - Before and After Cleanup

Contaminant	Soil (ppm)		Water (ppb)	
	Before ¹	After ²	Before ³	After ⁵
TPH (Gas)	8,300	150	2,300,000	570
TPH (Diesel)	110,000 ⁴	42	66,000	300
Benzene	36	0.56	ND	36
Toluene	140	1.5	ND	9
Ethylbenzene	81	0.50	2	9
Xylenes	95	1.9	90	150
Acetone	ND		ND	

- NOTE 1 Soil sample collected during overexcavation of gasoline pit.
 2 Soil sample collected at G-27, at 5' bgs
 3 "Grab" groundwater sample
 4 Soil sample DS2 from diesel pump island excavation, at 4' bgs.
 5 water samples from well MW-1

IV. CLOSURE

Does completed corrective action protect existing beneficial uses per the Regional Board Basin Plan? **Undetermined**
 Does completed corrective action protect potential beneficial uses per the Regional Board Basin Plan? **Undetermined**
 Does corrective action protect public health for current land use? **YES**
 Site management requirements: **None**
 Should corrective action be reviewed if land use changes? **YES**
 Monitoring wells Decommissioned: **None, pending site closure**
 Number Decommissioned: 0 Number Retained: 3
 List enforcement actions taken: **None**
 List enforcement actions rescinded: **NA**

V. LOCAL AGENCY REPRESENTATIVE DATA

Name: Eva Chu Title: Haz Mat Specialist

Signature:  Date: 11/4/96

Reviewed by

Name: Barney Chan Title: Haz Mat Specialist

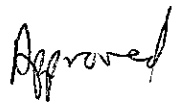
Signature:  Date: 10/4/96

Name: Thomas Peacock Title: Supervisor

Signature:  Date: 10-4-96

VI. RWQCB NOTIFICATION

Date Submitted to RB:

RB Response: 

RWQCB Staff Name: Kevin Graves

Title: AWRCE

Signature: 

Date: 11/14/96

VII. ADDITIONAL COMMENTS, DATA, ETC.

The site is occupied by Liquid Carbonic with several buildings used as gas cylinder filling areas. The buildings occupy ~10% of the site. And paved parking and storage areas occupy the balance.

Three USTs (1-8K diesel, 1-2K gasoline, and 1-2K acetone) in separate pits were removed on September 13, 1989. Soil and "grab" groundwater samples collected from beneath the acetone UST did not identify contamination. Soil collected from the diesel fuel pump island exhibited up to 39,000 ppm TPH-D, and ND, 0.075, 4.7, and 0.91 ppm BTXE, respectively. Soil collected from the diesel tank pit did not contain TPH-D or BTEX. A "grab" water sample collected from the diesel pit contained elevated levels of TPH-D. Contaminants were not detected in soil from the gasoline pit, but the stockpiled soil contained elevated levels of TPH-G and BTEX. (See Figs 1 and 2)

A 6K diesel UST was later located near the former 8K diesel UST and was removed on February 6, 1990. A number of test pits were dug around the gasoline and diesel tank areas to determine if additional excavation was required. Based on the analytical results of soil samples collected, the gasoline and diesel tank excavations were extended until petroleum hydrocarbon concentrations did not exceed 100 ppm. The two test pits along Embarcadero Road did not contain TPHd. A total of about 200 cy and 300 cy of diesel- and gasoline-impacted soil, respectively, were removed. (See Fig 3 and 4, Tables 1 and 2)

Following overexcavation, groundwater was again collected from the gasoline and diesel pits. No diesel was detected in the "grab" groundwater sample from the diesel tank pit. However, groundwater from the gasoline tank pit contained 2,300 ppm TPH-G and trace levels of BTEX. Groundwater was pumped from the gasoline excavation, while disturbed, loose soil was removed. The excavations were then backfilled with pea gravel. A concrete slab and asphalt pavement was constructed above the backfill at the former gasoline and diesel tank sites, respectively.

Three monitoring wells were installed on September 16, 1992, one well each was located near the former gasoline, diesel, and acetone USTs. Prior to development (72 hours after wells were installed) of the wells, groundwater elevation was measured at 18.2, 6.7, and 3.2' bgs in wells MW-1, MW-2, and MW-3, respectively. When the wells were purged, in preparation for sampling, the recharge rate was noted to be at 0.04 gal/min. Because there was insufficient water in well MW-2, this well was not purged. (See Figs 5 and 6, and boring logs). Groundwater collected was only analyzed for TDS. TDS concentrations were 19,000 ppm in MW-1, 6,200 ppm in MW-2, and 1,700 ppm in MW-3. (A ruptured water pipe or the nearby below grade recycle water storage tank may support findings of lower TDS and relatively higher groundwater elevation in well MW-3). It appears that groundwater beneath the site is not suitable for domestic or municipal use based on elevated TDS concentrations.

Groundwater sampling of the wells for petroleum hydrocarbons was initiated in June 1995. After four sampling events hydrocarbon concentrations appear to have decreased since the initial sampling event. Concentrations in well MW-1 have stabilized at ~300 ppb TPHd, ~500 ppb TPHg, and ~50 ppb benzene in well MW-1. Wells MW-2 and MW-3 have not identified hydrocarbons in the last two sampling events. (See Table 3)

Groundwater (as measured in four events) flows to the northeast, away from the Alameda Inner Harbor, at a gradient of ~ 0.004 ft/ft. (See figs 5 and 6). Thus wells MW-1 and MW-2 are in a cross-gradient direction to the former diesel and gasoline tank excavations. Even though there are no downgradient monitoring wells, the relatively flat gradient would suggest groundwater samples collected to date are representative of water quality beneath the site. Such levels should pose no risk human health based on ASTM's RBCA Tier 1 Look-up Table for both soil and groundwater volatilization to outdoor air exposure pathways. Embarcadero Road, railroad yards, and the Nimitz Freeway are immediately northeast of the site.

In summary, case closure is recommended because:

- o the leak and ongoing sources have been removed;
- o the site has been adequately characterized;
- o the dissolved plume is not migrating;
- o no water wells, surface water, or other sensitive receptors are likely to be impacted; and,
- o the site presents no significant risk to human health or the environment.

11qcarb.3

901 Embarcadero
Oakland, CA

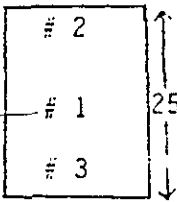
Pile # 10



diesel

Fill End
← 10' →

ND/ND @ 9'



Water: 66,000 ppb TPH-D

ND/ND @ 9'

#4

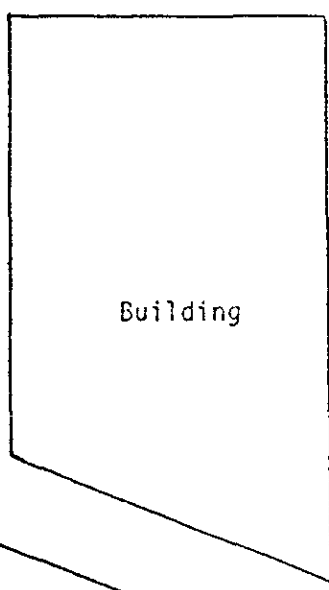
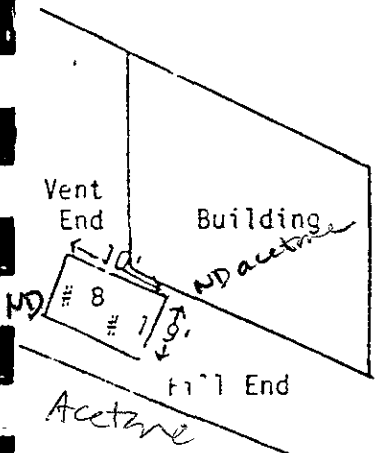
Vent End

Soil: 39,000 TPH-D

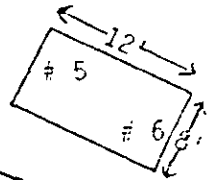
pump island
@ 3' bgs

Chain Link
Fence

Gate



ND/ND



Fill/Vent End

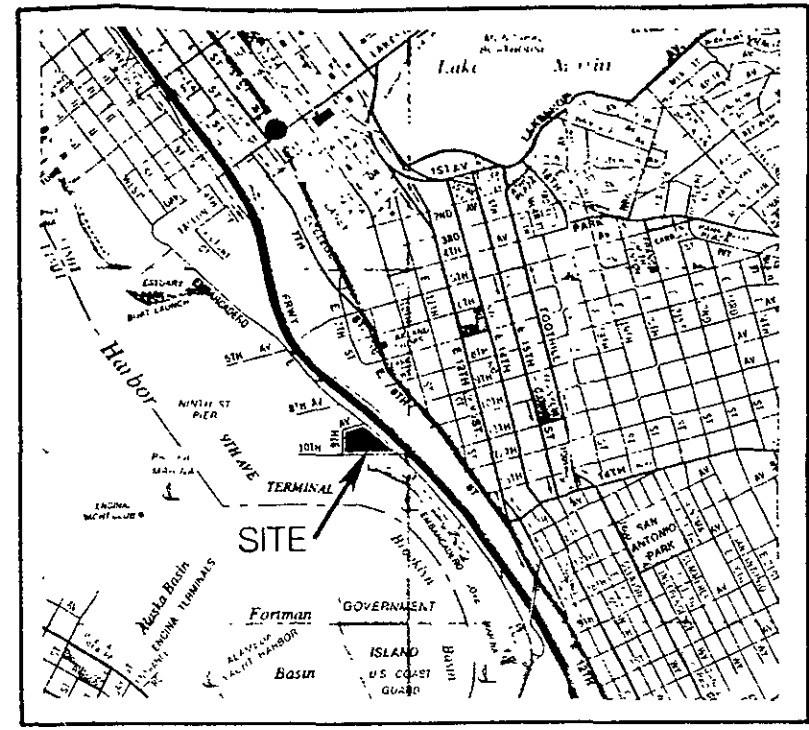
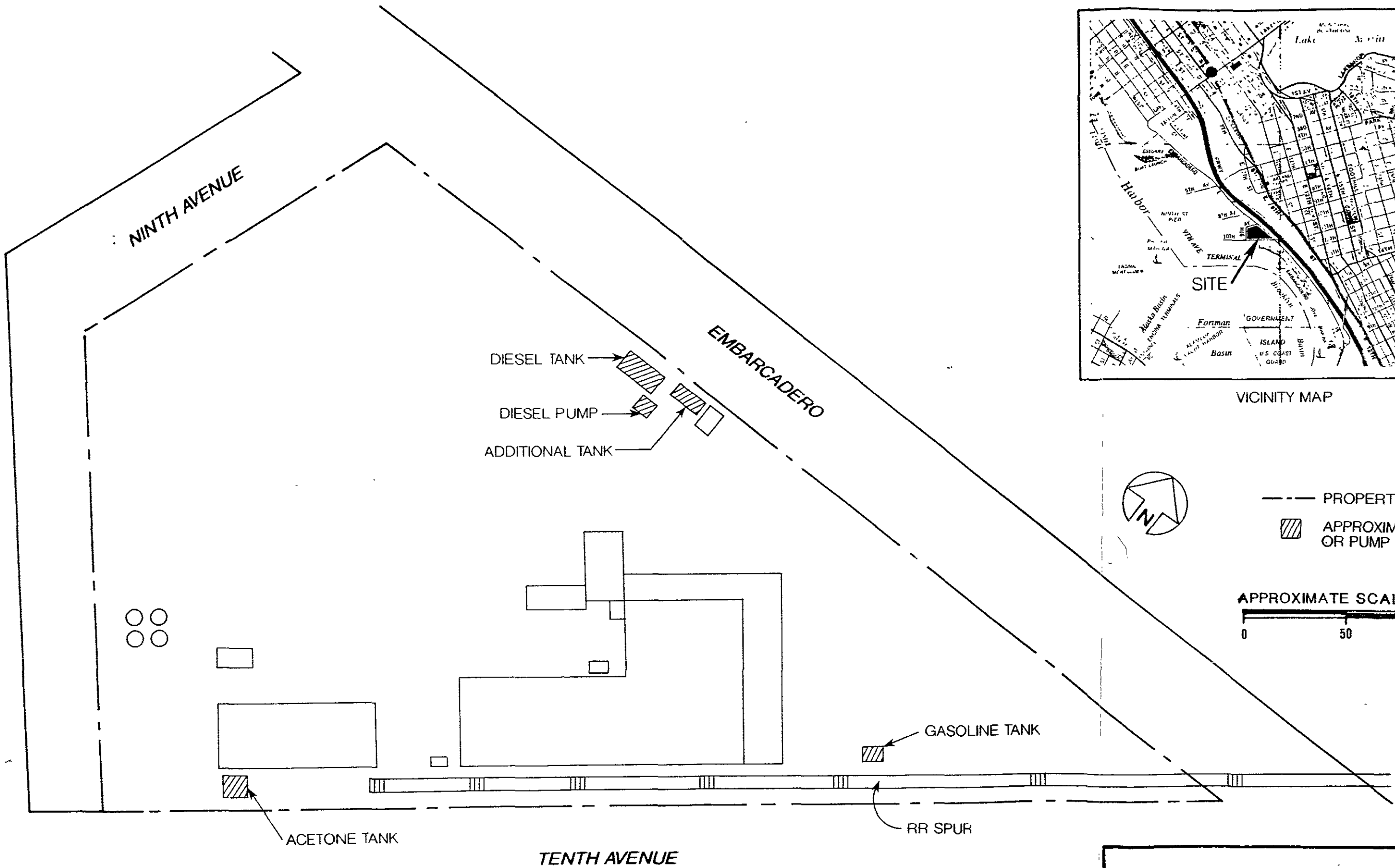
ND/ND

Pile # 9

gasoline

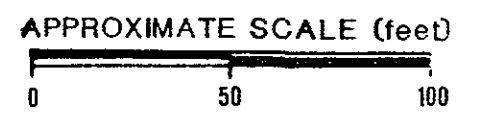
1,300 ppm

FIG 1



VICINITY MAP

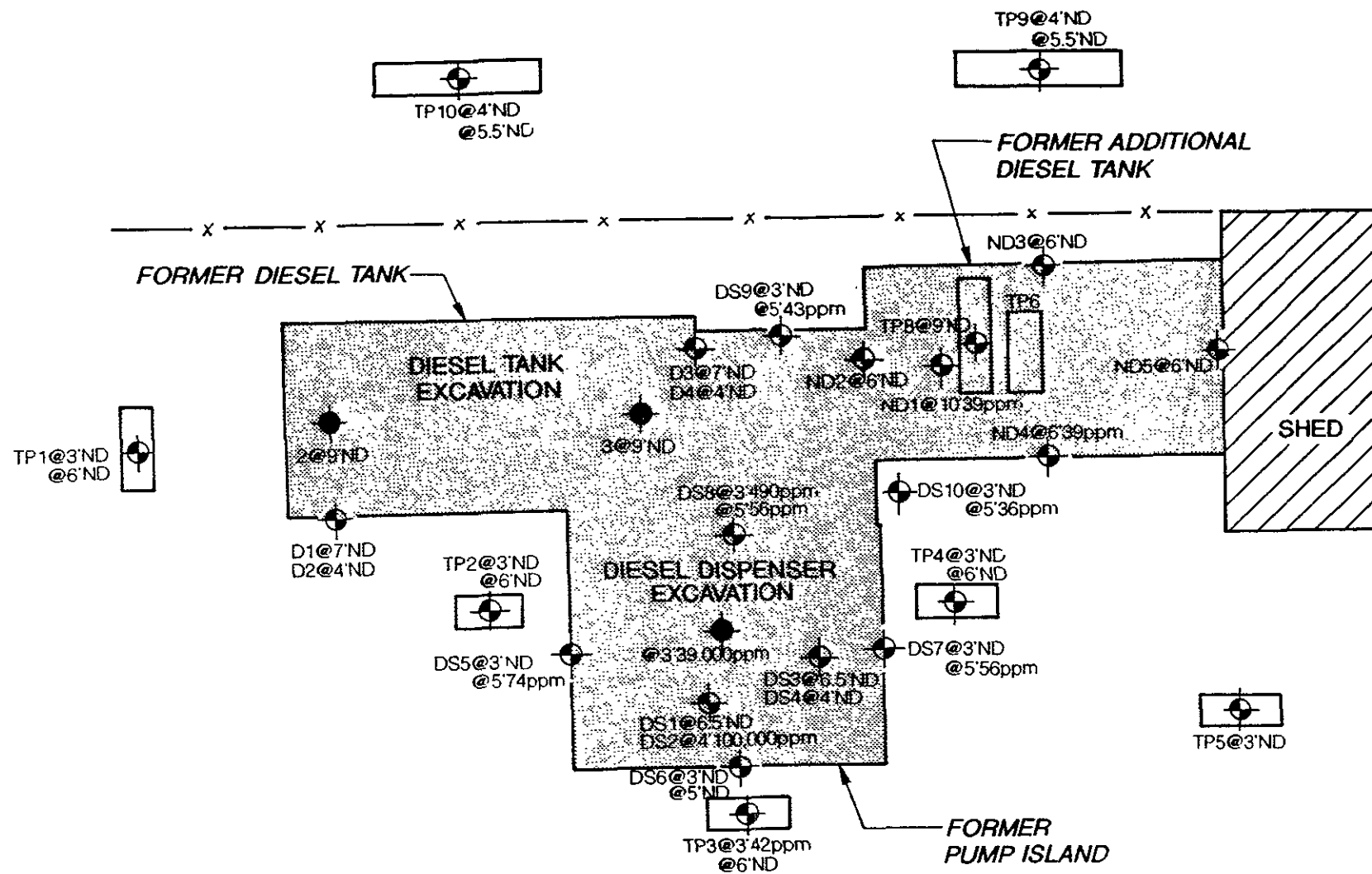
- PROPERTY BOUNDARY
- ▨ APPROXIMATE TANK OR PUMP LOCATIONS



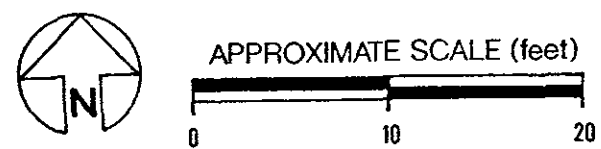
SITE PLAN FIG 2			
LIQUID CARBONIC - OAKLAND, CA			
JOB NUMBER	DATE	APPROVED	PLATE
364.019	1/4/90	<i>[Signature]</i>	1

Subsurface Consultants

EMBARCADERO ROAD



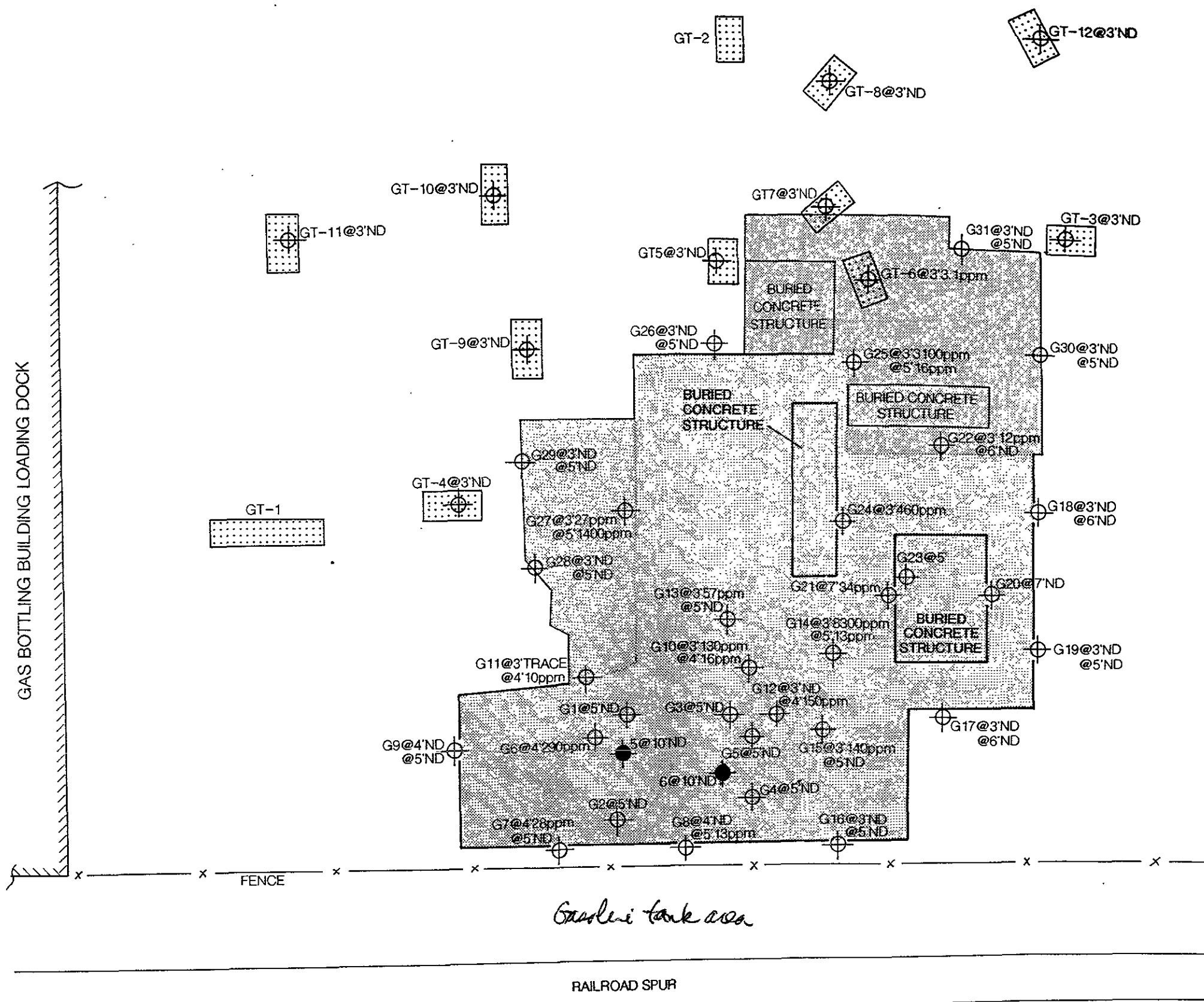
- APPROXIMATE SAMPLED LOCATION (BY OTHERS)
- ⊙ SAMPLED LOCATION BY SCI
- ▨ APPROXIMATE EXCAVATION LIMITS
- TEST PIT LOCATION



SITE PLAN FIG 3		
FORMER DIESEL TANKS AND PUMP ISLAND		
LIQUID CARBONIC - OAKLAND, CA		
JOB NUMBER	DATE	APPROVED
364.019	4/25/90	

Subsurface Consultants

PLATE **2**



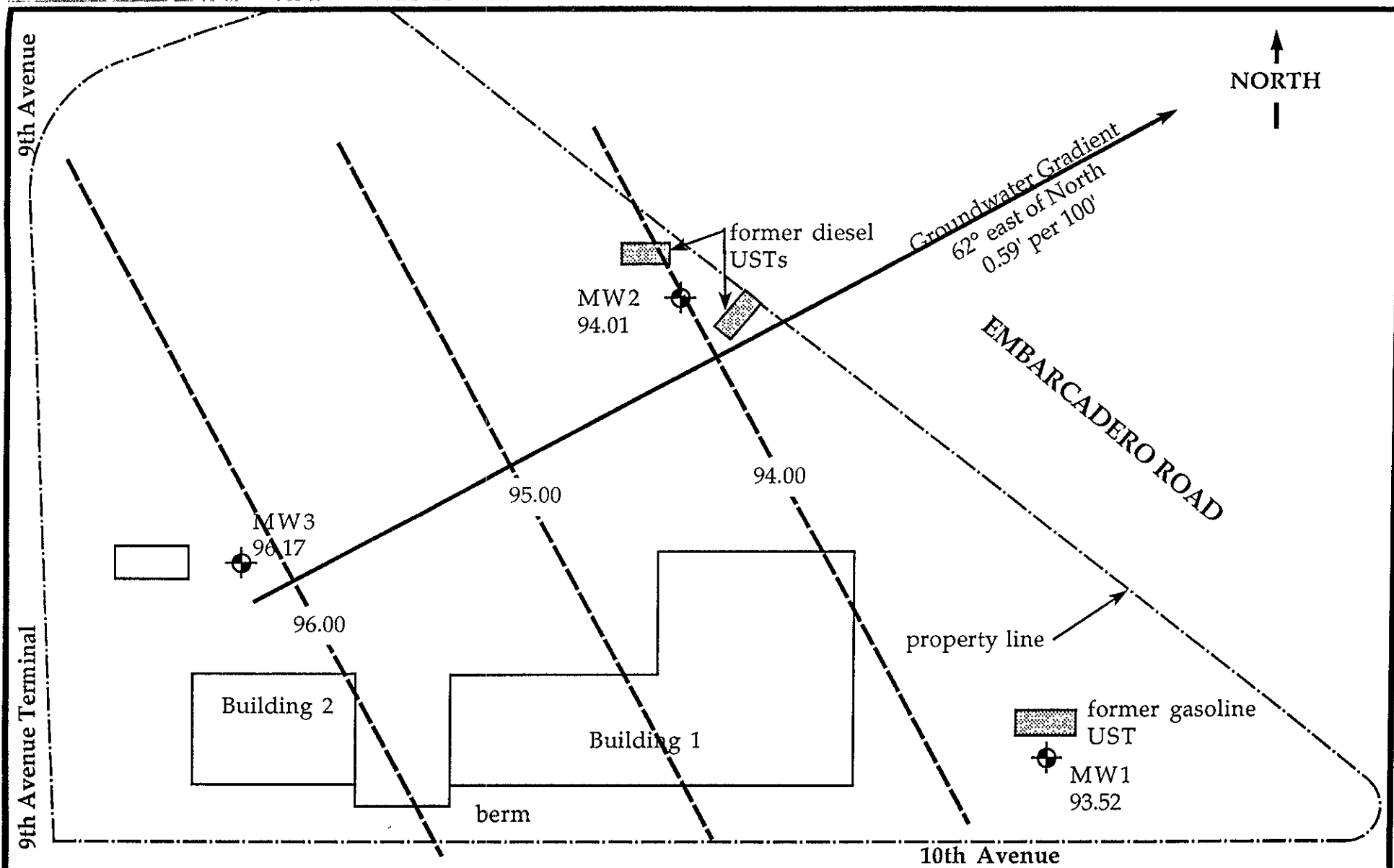
- APPROXIMATE SAMPLED LOCATION (BY OTHERS)
- ⊕ SAMPLED LOCATION BY SCI (SHOWING TVH CONCENTRATION, ND = NONE DETECTED)
- ▨ APPROXIMATE EXCAVATION LIMITS
- ▤ TEST PIT





FORMER GASOLINE TANK AREA Fig 4		
LIQUID CARBONIC - OAKLAND, CA		PLATE 2
JOB NUMBER 364.019	DATE 4/25/90	APPROVED <i>[Signature]</i>

Subsurface Consultants

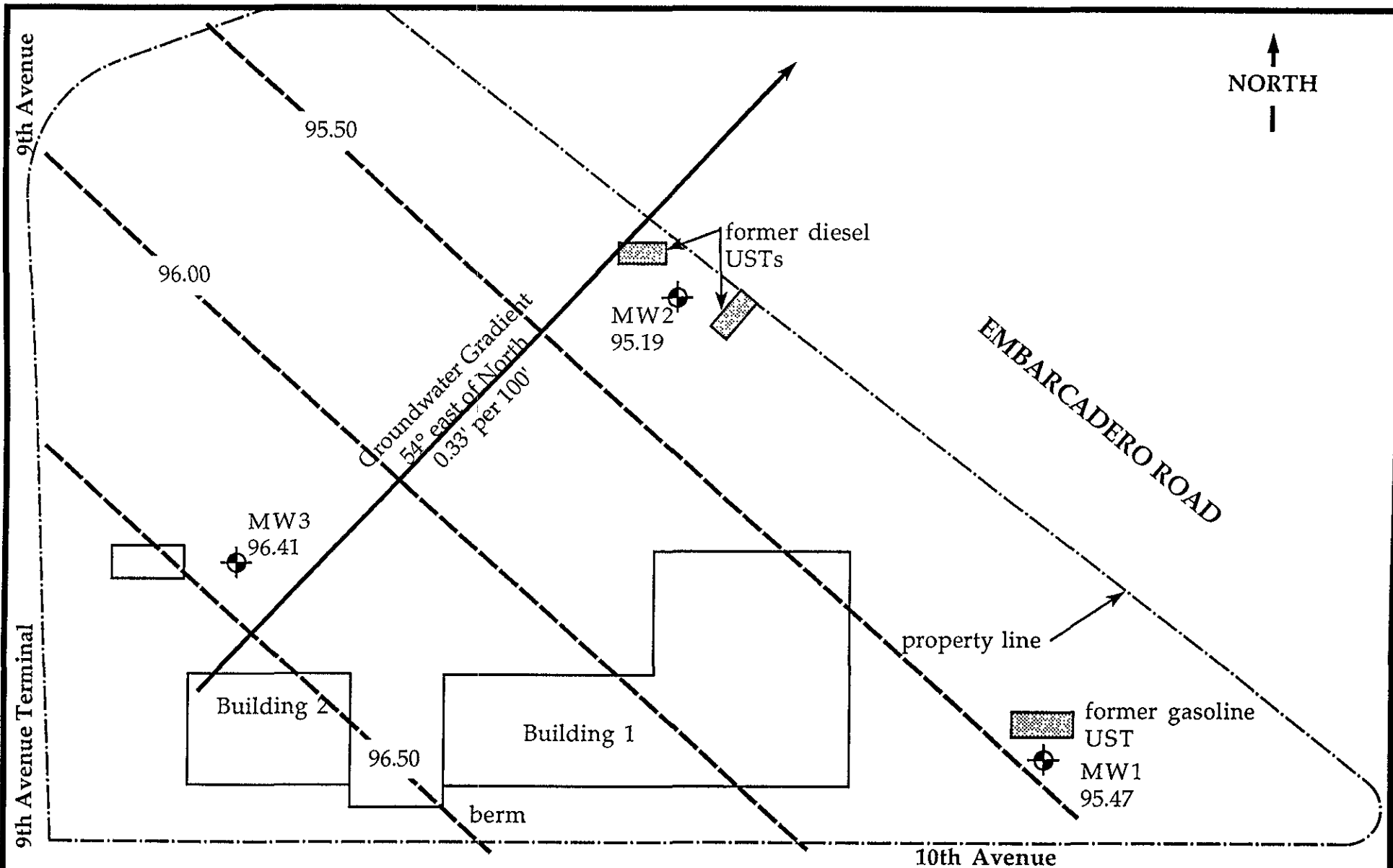
RAILROAD SPUR
TENTH AVENUE





KEY
 Monitoring well location
 Contours of Groundwater Surface

GOLDEN GATE TANK REMOVAL
 255 Shipley Street • San Francisco, CA 94107 • (415) 512-1555

Groundwater Gradient
 07/31/96
 Liquid Carbonic
 901 Embarcadero Road
 Oakland, California



 KEY
 Monitoring well location
 Contours of Groundwater Surface

GOLDEN GATE TANK REMOVAL

255 Shipley Street • San Francisco, CA 94107 • (415) 512-1555

Groundwater Gradient
 07/03/96
 Liquid Carbonic
 901 Embarcadero Road
 Oakland, California

Table 1. | Summary of Analytical Tests of Samples from the Former Diesel Tank and Pump Island Excavations

<u>Sample</u>	<u>Sample Type</u>	<u>TEH¹ (ppm)²</u>	<u>Benzene (ppb)³</u>	<u>Toluene (ppb)</u>	<u>Total Xylenes (ppb)</u>	<u>Ethylbenzene (ppb)</u>
<u>Diesel Tank Excavation:</u>						
DD	Water	ND	-- ⁴	--	--	--
D1@7'	Soil	ND ⁵	ND	ND	ND	ND
D2@4'	Soil	ND	ND	ND	ND	ND
D3@7'	Soil	ND	ND	ND	ND	ND
D4@4'	Soil	ND	ND	ND	ND	ND
<u>Diesel Pump Island Excavation:</u>						
DS1@6.5'	Soil	ND	ND	6.0	19	ND
DS2@4'	Soil	110,000	ND	17	95	ND
DS3@6.5'	Soil	ND	ND	90	ND	ND
DS4@4'	Soil	ND	ND	23	7.0	5.0
DS5@3'	Soil	ND	ND	ND	ND	ND
DS5@5'	Soil	74	ND	ND	ND	ND
DS6@3'	Soil	ND	ND	ND	ND	ND
DS6@5'	Soil	ND	ND	ND	ND	ND
DS7@3'	Soil	ND	ND	ND	ND	ND
DS7@5'	Soil	56	ND	ND	ND	ND
DS8@3'	Soil	522 ⁶	ND	ND	ND	ND
DS8@5'	Soil	56	ND	ND	ND	ND
DS9@3'	Soil	ND	--	--	--	ND
DS9@5'	Soil	43	--	--	--	--
DS10@3'	Soil	ND	--	--	--	--
DS10@5'	Soil	36	--	--	--	--
<u>Additional Diesel Tank Excavation:</u>						
D(2/6/90)	Water	ND	ND	ND	ND	ND
ND1@10'	Soil	39	ND	ND	ND	ND
ND2@6'	Soil	ND	ND	ND	ND	ND
ND3@6'	Soil	ND	ND	ND	ND	ND
ND4@6'	Soil	39	ND	ND	ND	ND
ND5@6'	Soil	ND	ND	ND	ND	ND

Table (Cont.)

<u>Sample</u>	<u>Sample Type</u>	<u>TEH¹ (ppm)²</u>	<u>Benzene (ppb)³</u>	<u>Toluene (ppb)</u>	<u>Total Xylenes (ppb)</u>	<u>Ethyl- benzene (ppb)</u>
Test pits around the diesel tank and pump island excavations:						
TP1@3'	Soil	ND	--	--	--	--
TP1@6'	Soil	ND	--	--	--	--
TP2@3'	Soil	ND	--	--	--	--
TP2@6'	Soil	ND	--	--	--	--
TP3@3'	Soil	42	--	--	--	--
TP3@6'	Soil	ND	--	--	--	--
TP4@3'	Soil	ND	--	--	--	--
TP4@6'	Soil	ND	--	--	--	--
TP5@3'	Soil	ND	--	--	--	--
TP7@3'	Soil	ND	--	--	--	--
TP7@6'	Soil	ND	--	--	--	--
TP8@9'	Soil	ND	--	--	--	--
TP9@4'	Soil	ND	--	--	--	--
TP9@5.5'	Soil	ND	--	--	--	--
TP10@4'	Soil	ND	--	--	--	--
TP10@5.5'	Soil	ND	--	--	--	--

Stockpiled soil from above diesel tanks:

SD1-SD4	Soil composite	ND	--	--	--	--
SD5-SD8	Soil composite	ND	--	--	--	--

-
- 1 Total extractable hydrocarbons, or total petroleum hydrocarbons as diesel
 - 2 Parts per million (mg/kg or mg/L)
 - 3 Parts per billion (ug/kg or ug/L)
 - 4 Not tested for the material listed
 - 5 None detected, see test data reports in Appendix B for detection limits
 - 6 Including 32 ppm as gasoline and 490 ppm as diesel

Is cleanup required to No detectable BTEX or not?

* Apparently some soil w/ detectable BTEX not found

Table 2 Summary of Analytical Tests of Samples from the Former Gasoline Tank Excavation

Sample	TVH ¹ (ppm) ²	Benzene (ppb) ³	Toluene (ppb)	Total Xylenes (ppb)	Ethyl- benzene (ppb)	Notes
GT ⁴	2.3	ND ⁵	ND	90	2.0	removed
G1@5'	ND	ND	9.5	7.5	ND	bottom ✕
G2@5'	ND	15	15	21	ND	bottom ✕
G3@5'	ND	ND	ND	7.5	ND	bottom
G4@5'	ND	ND	16	22	ND	bottom
G5@5'	ND	ND	ND	36	21	bottom
G6@4'	290	410	ND	2,600	400	removed
G7@4'	28	21	20	100	11	side ✕
G7@5'	ND	43	Trace ⁶	21	9.0	side/bottom ✕
G8@4'	ND	ND	14	130	8.0	side
G8@5'	13	110	53	320	260	side/bottom ✕
G9@4'	ND	ND	19	20	ND	removed
G9@5'	ND	ND	10	25	ND	bottom
G10@3'	130	110	ND	1,700	100	side
G10@4'	16	80	19	110	480	side ✕
G11@3'	Trace	ND	ND	19	21	removed
G11@4'	10	150	7.0	67	73	removed ✕
G12@3'	ND	ND	ND	ND	ND	removed
G12@4'	150	ND	ND	580	290	bottom ✕
G13@3'	57	ND	ND	890	510	removed
G13@5'	ND	6.1	ND	7.6	ND	bottom ✕
G14@3'	8,300	ND	140,000	390,000	81,000	removed
G14@5'	13	43	140	480	81	bottom ✕
G15@3'	140	ND	580	620	320	removed ✕
G15@5'	ND	ND	8.6	21	8.9	bottom ✕
G16@3'	ND	ND	ND	ND	ND	side
G16@5'	ND	ND	ND	ND	ND	side/bottom
G17@3'	ND	ND	ND	ND	ND	side
G17@6'	ND	20	6.5	ND	ND	side/bottom ✕
G18@3'	ND	29	34	16	5.3	side ✕
G18@6'	ND	6.5	ND	ND	ND	side/bottom
G19@3'	ND	15	ND	29	ND	side ✕
G19@5'	ND	5	ND	ND	ND	side/bottom
G20@7'	ND	21	13	ND	ND	bottom ✕
G21@7'	34	560	1,500	1,900	500	bottom ✕
G22@3'	12	25	140	450	94	removed
G22@6'	ND	6.2	ND	7.0	ND	bottom ✕
G24@3'	460	770	3,600	21,000	3,500	removed

**GROUNDWATER MONITORING RESULTS
PROJECT 7183**

TABLE 3

**Page 1 of 2
September 11, 1996**

Monitoring Well Number	Date of Sampling	Casing Elevation	Depth to Groundwater (feet)	Groundwater Elevation	Free Product or Sheen	TPH-D ppb	TPH-G ppb	BTEX ppb
MW1	06/02/95	NA	NA	NA	NA	2,400	2,700	220/120/51/350
	09/21/95	NA	4.78	NA	NA	1,400	220	20/6.2/1.3/23
	05/31/96	100.00	4.42	95.58	NONE	400	300	95/4/5/80
	07/03/96	100.00	4.53	95.47		MEASURED ONLY		
	07/31/96	100.00	4.68	95.32		MEASURED ONLY		
	09/03/96	100.00	4.81	95.19	NONE	300	570	36/9/9/150
MW2	06/02/95	NA	NA	NA	NA	1,600	ND	ND/ND/ND/ND
	09/21/95	NA	6.7	NA	NA	490	ND	ND/ND/ND/ND
	05/31/96	100.79	4.81	95.98	NONE	ND	ND	ND/ND/ND/ND
	07/03/96	100.79	5.60	95.19		MEASURED ONLY		
	07/31/96	100.79	5.99	94.80		MEASURED ONLY		
	09/03/96	100.79	6.35	94.44	NONE	ND	ND	ND/ND/ND/ND
MW3	06/08/95	NA	NA	NA	NA	570	ND	ND/ND/ND/ND
	09/21/95	NA	NA	NA	NA	1,800	ND	ND/ND/ND/ND
	05/31/96	99.91	2.96	96.95	NONE	ND	ND	ND/ND/ND/ND
	07/03/96	99.91	3.50	96.41		MEASURED ONLY		
	07/31/96	99.91	3.74	96.17		MEASURED ONLY		
	09/03/96	99.91	4.07	95.84	NONE	ND	ND	ND/ND/ND/ND

NOTES: on sheet 2

LOG OF EXPLORATORY BORING						Project No.: 41899.03	Date: 9/16/92	BORING MW-1	
Field Location of Boring:						Client: Liquid Carbonic	Driller:		Sheet 1 of 1
Ground Elevation: Datum:						Location: 901 Embarcadero, Oakland			
						Logged By: D. Dastmalchi			
Blow Count	PID OVA (ppm)	D F P T H	S A M P L E	Soil Group Symbol (uses)	Litho-graphic Symbol	Drilling Method: 10-inch hollow stem			
						Hole Diameter: 10"			
						Casing Installation Data: 15' screen casing (PVC 0.01), 5' blank casing, 16' sealant, 1.5' bentonite			
						Water Level	18.2' bgs		
						Time	12:35		
						Date	9/21/92		
DESCRIPTION									
		1		GM		Silty gravel, dry, light brown			
		2							
		3							
		4				Coarse, silty gravel, moist			
4	0	5				Sample refused			
4		6							
3	342	6				Gravel with silt and clay (sample refusal)			
4		7	X	CL		Silty clay, gasoline odor, moist, green			
7	644	7	X						
		8							
		9							
		10							
		11	X			Sandy clay, green, very stiff, wet			
		12							
		13							
		14							
		15				Bay mud, sulfur odor, dark green, sandy clay, shell fragments			
3	0	15							
3		16	X						
5		16							
		17							
		18			Bay mud, wet, dark green, moist, no free water				

LOG OF EXPLORATORY BORING						Project No.: 41899.03	Date: 9/16/92	BORING NO. MW-2	
Field Location of Boring: Ground Elevation: Datum:						Drilling Method: 10-inch hollow stem Hole Diameter: 10" Casing Installation Data: 15' screen casing (PVC 0.01), 5' blank casing, 16' sand, 1.5' bentonite			
						Water Level	6.73' bgs		
						Time	12:55		
						Date	9/21/92		
Blow Count	PID OVA (ppm)	D E P T H	S A M P L E	Soil Group Symbol (uses)	Litho- graphic Symbol	DESCRIPTION			
		1		SM		Silty sand with gravel dry, light brown			
		2							
		3							
		4							
4	0	5							
7		6	X	CL		Sandy clay, green, moist			
5		7							
		8							
		9							
3	0	10	X			Silty clay, green, moist			
4		11	X						
4		12							
		13				Bay mud, dark green, shell fragments			
		14							
	0	15	X						
		16	X		Bay mud, shell fragment, dark green				
		17							
		18							

