

ALAMEDA COUNTY
HEALTH CARE SERVICES



AGENCY

DAVID J. KEARS, Agency Director

Alameda County CC4580
Environmental Health Services
1131 Harbor Bay Pkwy., #250
Alameda CA 94502-6577
(510)567-6700 FAX(510)337-9335

June 18, 1996

STID 3837

REMEDIAL ACTION COMPLETION CERTIFICATION

City of Alameda
2263 Santa Clara Ave.
Alameda, CA 94501
ATTN: Wesley Adams

Re: City of Alameda, 2263 Santa Clara Ave., Alameda, CA 94501

Dear Mr. Adams,

This letter confirms the completion of site investigation and remedial action for the 280-gallon and 1,000-gallon gasoline underground storage tanks and 1,500-gallon heating oil underground storage tank formerly located at the above described location. Enclosed is the Case Closure Summary for the referenced site for your records.

Based upon the available information, including the current land use, 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 storage tank release is required.

This notice is issued pursuant to a regulation contained in Title 23, California Code of Regulations, Division 3, Chapter 16, Section 2721(e). If a change in land use, structural configuration, or site activities are proposed such that more conservative exposure scenarios should be evaluated, the owner must promptly notify this agency.

Please telephone Juliet Shin at (510) 567-6700 if you have any questions regarding this matter.

Sincerely,

Mee Ling Tung
Director of Environmental Health Services

enclosure

c: Acting Chief, Hazardous Materials Division - files
Juliet Shin, ACDEH
Kevin Graves, RWQCB
Lori Casias, SWRCB

KG MAY 28 1996

ENVIRONMENTAL PROTECTION

95 JUN 18 PM 2:20

CONTROL BOARD

CASE CLOSURE SUMMARY

Leaking Underground Fuel Storage Tank Program

I. AGENCY INFORMATION

Date: 4/24/96

Agency name: Alameda County-HazMat Address: 1131 Harbor Bay Pkwy.
City/State/Zip: Alameda, CA 94502 Phone: (510) 567-6700
Responsible staff person: Juliet Shin Title: Senior HMS

II. CASE INFORMATION

Site facility name: City of Alameda
Site facility address: 2263 Santa Clara Ave., Alameda, CA 94501
RB LUSTIS Case No: N/A Local Case No./LOP Case No.: 3837
URF filing date: 3/30/95 SWEEPS No: N/A

<u>Responsible Parties:</u>	<u>Addresses:</u>	<u>Phone Numbers:</u>
City of Alameda	2263 Santa Clara Ave.	(510) 748-4510
Contact: Wesley Adams	Alameda, CA 94501	

<u>Tank No:</u>	<u>Size in gal.:</u>	<u>Contents:</u>	<u>Closed in-place or removed?:</u>	<u>Date:</u>
1	280	unleaded	removed	6/15/94
2	1,000	leaded	removed	6/15/94
3	1,500	heating oil	removed	6/21/94

III. RELEASE AND SITE CHARACTERIZATION INFORMATION

Cause and type of release: Unknown

Site characterization complete? YES

Date approved by oversight agency: 4/24/96

Monitoring Wells installed? Yes Number: three already existing monitoring wells on site.

Proper screened interval? ~5 to 18-feet below ground surface (bgs)

Highest GW depth below ground surface: ~8.15' bgs Lowest depth: 10.33' bgs

Flow direction: northeast to southeast

Most sensitive current use: On-site building currently occupied.

Leaking Underground Fuel Storage Tank Program

Are drinking water wells affected? NO Aquifer name: Unknown
Is surface water affected? NO Nearest affected SW name: None
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 (include units)</u>	<u>Action (Treatment or Disposal w/destination)</u>	<u>Date</u>
Tanks	three	Erickson, Inc. 255 Parr Blvd. Richmond, CA 94801	6/15 and 6/21/94
Product Residual	612 gallons	Transported to VCI's operations facility San Leandro, CA	6/94
Soil	~105 cubic yards	Vasco Rd. Sanitary Landfill Livermore, CA	7/19-21/94

III. RELEASE AND SITE CHARACTERIZATION INFORMATION (Continued)
Maximum Documented Contaminant Concentrations - - Before and After Cleanup

Contaminant	Soil (ppm)		Water (ppb)	
	<u>Before¹</u>	<u>After²</u>	<u>Before</u>	<u>After</u>
TPH (Gas)	4,700	100	ND	ND
TPH (Diesel)	ND	NA	70	ND
Benzene	8.4	0.63	ND	ND
Toluene	95	4.1	ND	ND
Xylene	340	8.9	ND	ND
Ethylbenzene	59	1.6	ND	ND
Lead	ND	ND	ND	ND

¹ - Initial soil sample collected from beneath Tank T-1
² - Soil sample S-3 collected from the south wall of the overexcavation of T-1.
³ - Sample from CH-MW1 collected on 11/14/95.

Leaking Underground Fuel Storage Tank Program

Does completed corrective action protect potential beneficial uses per the Regional Board Basin Plan? **Undetermined**

IV. CLOSURE

Does completed corrective action protect existing beneficial uses per the Regional Board Basin Plan? **Undetermined**

Does corrective action protect public health for current land use? **YES**

Site management requirements: Due to the residual soil contamination, the pavement at the site must be maintained. If the pavement is ever removed, this office must be notified to address any potential infiltration of contaminant vapors into the building/garage. If construction/excavation activities take place at the site, this office must be notified and a site safety plan must be prepared for the workers in case of exposure to contaminants, and excavated soil must be sampled and disposed of at the appropriate facility.

Should corrective action be reviewed if land use changes? **YES**

Monitoring wells Decommissioned: **NO** Will be decommissioned upon receipt of case closure.

Number Decommissioned:

Number Retained:

List enforcement actions taken: **None**

List enforcement actions rescinded:

V. LOCAL AGENCY REPRESENTATIVE DATA

Name: Juliet Shin
Signature: *Juliet Shin*

Title: Senior HMS
Date: *5/14/96*

Reviewed by
Name: Eva Chu
Signature: *Eva Chu*

Title: Hazardous Materials Specialist
Date: *5/15/96*

Name: Tom Peacock
Signature: *Tom Peacock*

Title: Supervising HMS
Date: *5-20-96*

VI. RWQCB NOTIFICATION

Date Submitted to RB:
RWQCB Staff Name: Kevin Graves

RB Response: *Approved*
Title: San. Engineering Asso. Date:

Kevin Graves

6/14/96

Leaking Underground Fuel Storage Tank Program

VII. ADDITIONAL COMMENTS, DATA, ETC.

Three underground storage tanks (USTs) in separate pits were removed from the site in June 1994: one 280-gallon unleaded gas (T-1), one 1,000-gallon leaded gas (T-2), and one 1,500-gallon heating oil tank (T-3). It appears that a total of 612 gallons of product residual was pumped from these three tanks and taken to the contractor's operation facility. Corrosion was noted on USTs T-1 and T-3, although no holes were noted in any of the three USTs. Groundwater was observed in the T-2 tank pit. One soil sample was collected from beneath T-1, two soil samples were collected from the soil/water interface at either end of T-2 at approximately 8.5 to 9.5-feet below ground surface (bgs), and one "grab" groundwater sample was collected from the T-2 tank pit. Due to the presence of untreated sewage in tank pit T-3 from a broken sewer line, two soil samples were collected from the sidewalls at each end of T-3 at 6.5 to 7.0-feet bgs. Soil and groundwater samples collected from T-1 and T-2 were analyzed for Total Petroleum Hydrocarbons as gasoline (TPHg), benzene, toluene, ethylbenzene, and xylenes (BTEX), and lead. Soil samples collected from T-3 were analyzed for TPH as diesel (TPHd) and BTEX. Analysis of the samples identified 4,700 parts per million (ppm) TPHg, 8.4 ppm benzene, 95ppm toluene, 340ppm total xylenes, and 59ppm ethylbenzene in a soil sample collected from T-1. All other sample results were Non Detect (refer to Attachments 1 through 5).

Due to the elevated contaminant levels identified in T-1, this tank pit was overexcavated below the water table to 12-feet bgs. Lateral excavation was limited by the garage building to the west, a monitoring well to the south, and utilities to the east. The final excavation was 10-feet wide by 20-feet long. Confirmatory soil samples, S-2 to S-7, were collected from the excavation sidewalls and bottom (refer to Attachments 2 and 5). Analysis of these soil samples identified up to 100ppm TPHg and 0.63ppm benzene along the sidewall adjacent to the garage building. A total of approximately 105 cubic yards of soil was removed and spread on site for aeration, and was subsequently disposed of at Vasco Road Sanitary Landfill in Livermore as non-hazardous.

In response to the soil contamination observed in tank pit T-1, the County required continued groundwater monitoring of two existing adjacent monitoring wells, CH-MW1 and CH-MW2, that were installed within 10-feet downgradient of T-2 and T-1, respectively, in June 1986 to detect any potential releases to groundwater from these tanks (refer to Attachments 6, 7, and 10). These wells have been sampled semi-annually since August 1987. The samples were consistently analyzed for TPHg and BTEX and were Non Detect for all the sampling events prior to the removal of USTs T-1 and T-2. Wells CH-MW1 and CH-MW2 appear to be screened and constructed properly (refer to Attachments 8 and 9). A third existing well, PS-MW1, was used in conjunction with CH-MW1 and CH-MW2 to primarily establish groundwater gradient directions, although groundwater samples have also been

Leaking Underground Fuel Storage Tank Program

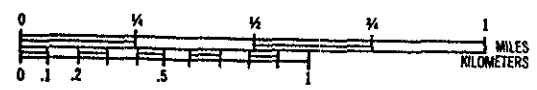
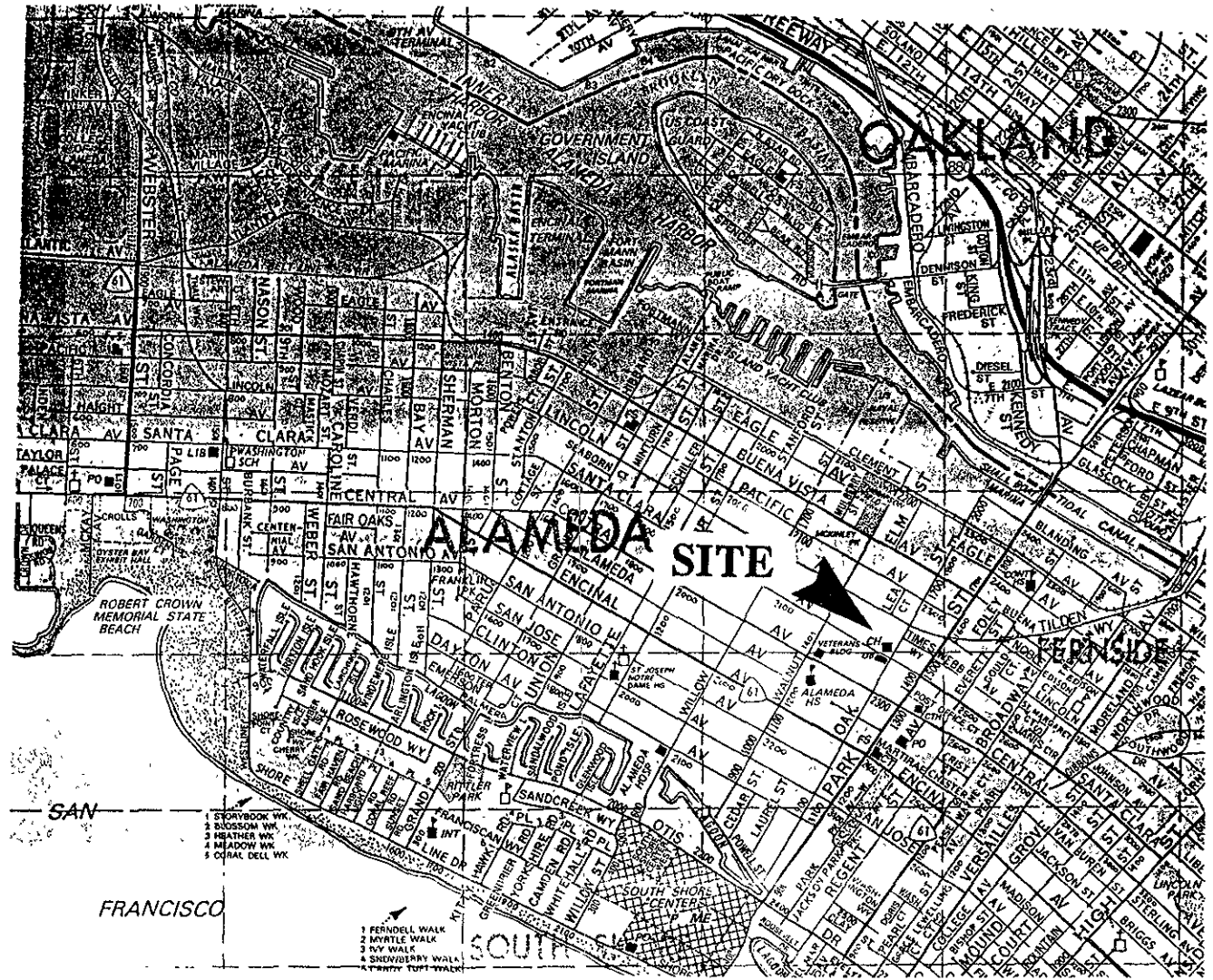
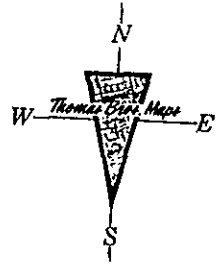
collected from this well as part of other ongoing investigations at this site (refer to Attachment 10).

Wells CH-MW1, CH-MW2, and PS-MW1 were sampled for two quarters since the removal of the USTs. Samples were analyzed for TPHg, TPHd, and BTEX. During these sampling periods, only 70 parts per billion (ppb) TPHd was identified from Well CH-MW1. Historically, low levels of TPHd have been identified in Well PS-MW1 since sampling of this well began in 1987, however, this well is located over 100-foot crossgradient of the former tanks and the contaminants identified in this well do not appear to be attributable to the former tanks, based on the Non Detect results in the closer downgradient Wells CH-MW1 and CH-MW2.

Although low levels of benzene (the highest concentration being 0.63ppm) remain in the site soils, the contamination appears to be limited in extent and the site is paved to retard any vaporization of this contamination into indoor air. Although the site is currently occupied, the City is planning to convert the use of this building into a storage facility, thus eliminating any potential human health risk due to indoor vapor inhalation.

If the pavement is ever removed from the site, this office must be notified to address any concerns for potential vapors emanating from the residual soil contamination. If construction/excavation activities ever take place at the site, this office must be notified and a site safety plan should be prepared for the construction workers to address any exposures to potential vapors. The excavated soil should be sampled and disposed of at an appropriate facility.

Based on the low levels of TPHg and benzene remaining in the soil at the site and the Non Detect levels identified in groundwater samples from near the former USTs, it appears that this site is ready for closure.



Approximate Scale

Base: Thomas Brothers Maps, 1991

LOCATION MAP	
Alameda City Hall	
2263 Santa Clara Street	
Alameda, California	
September, 1994	Figure 1

TABLE 2

CONFIRMATION SOIL SAMPLING - T-1 EXCAVATION
SUMMARY OF ANALYTICAL TEST DATA
ALAMEDA CITY HALL

(Results reported in parts per million, mg/kg) (1)

<u>Sample</u>	<u>Depth (ft)</u>	<u>TPH-G</u>	<u>Benzene</u>	<u>Toluene</u>	<u>Xylenes</u>	<u>Ethylbenzene</u>
T-1, S-2	9-10 (3)	ND	ND	ND	ND	ND
T-1, S-3	9.5-10.3 (3)	100	0.63	4.1	8.9	1.6
T-1, S-4	9-10 (3)	12	ND	0.059	0.087	0.026
T-1, S-5	9-10.5 (3)	1	0.051	0.039	0.15	0.055
T-1, S-6	8-9 (3)	ND	ND	ND	ND	ND
T-1, S-7	12.5 (4)	ND	ND	ND	ND	ND
Det. Limit	--	1	0.005	0.005	0.005	0.005

Notes:

- (1) ND = non-detect
- (2) --- = not-tested
- (3) Side-wall sample
- (4) Bottom sample

TABLE 1

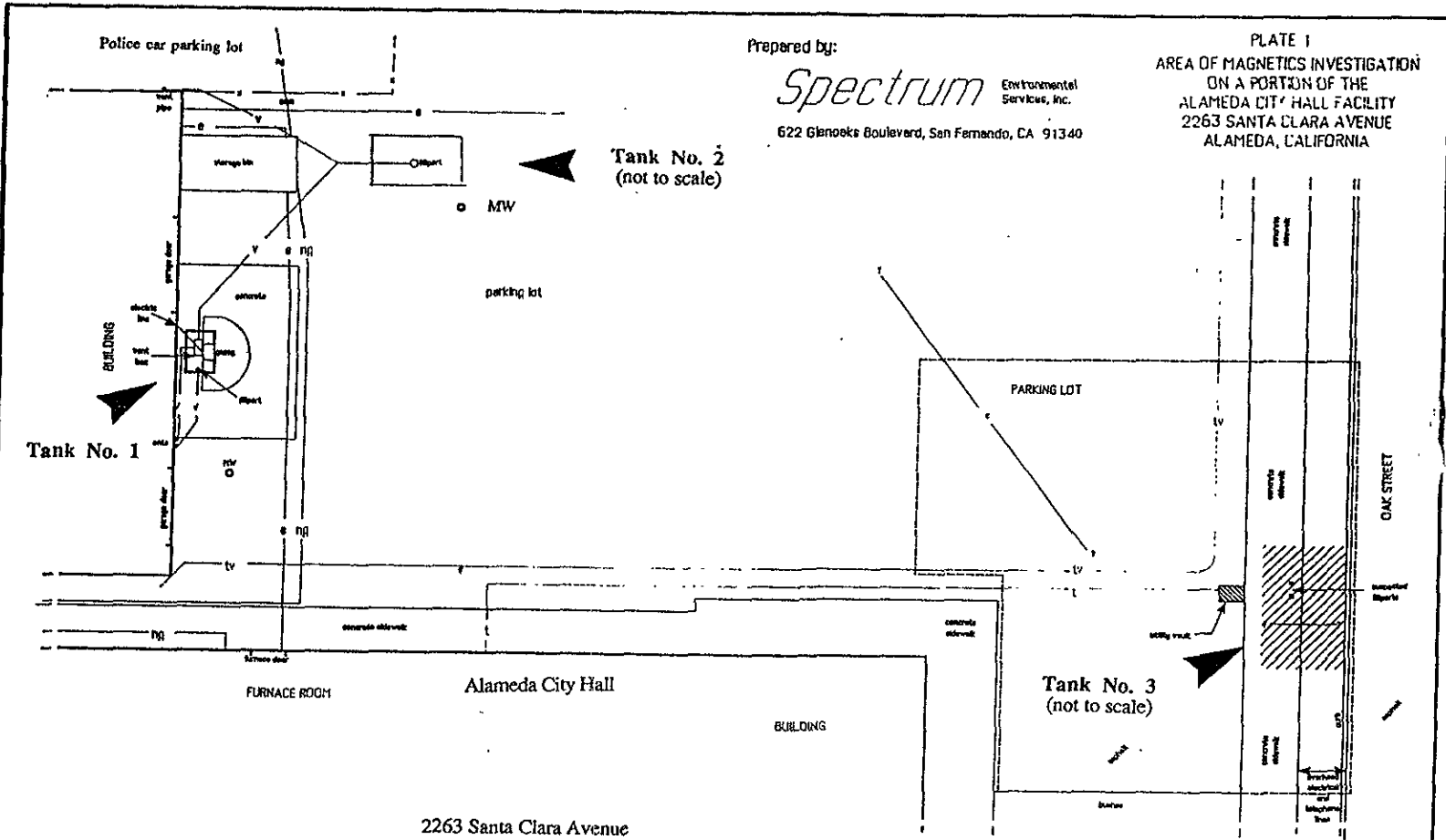
CONFIRMATION SOIL SAMPLING - UST REMOVALS
SUMMARY OF ANALYTICAL TEST DATA
ALAMEDA CITY HALL

(Results reported in parts per million, mg/kg) (1)

<u>Sample</u>	<u>TPH-G</u>	<u>Benzene</u>	<u>Toluene</u>	<u>Xylenes</u>	<u>Ethylbenzene</u>	<u>Lead</u>
T-1, S-1 (4)	4700	8.4	95	340	59	ND
T-2, S-1 (3)	ND	ND	ND	ND	ND	ND
T-2, S-2 (3)	ND	ND	ND	ND	ND	ND
T-2, S-3 (3)	ND	ND	ND	ND	ND	ND
T-2, S-4 (3)	ND	ND	ND	ND	ND	ND
Det. Limit	1	0.005	0.005	0.005	0.005	5
T-2 Water	ND	ND	ND	ND	ND	ND
Det. Limit	0.050	0.0005	0.0005	0.0005	0.0005	0.1
<u>TPH-D</u>						
T-3, S-1 (3)	ND	ND	ND	ND	ND	--
T-3, S-2 (3)	ND	ND	ND	ND	ND	--
Det. Limit	10	0.0005	0.0005	0.0005	0.0005	--

Notes:

- (1) ND = non-detect
- (2) --- = not-tested
- (3) Side-wall sample
- (4) Bottom sample



Prepared by:
Spectrum Environmental Services, Inc.
 622 Glenoaks Boulevard, San Fernando, CA 91340

PLATE I
 AREA OF MAGNETICS INVESTIGATION
 ON A PORTION OF THE
 ALAMEDA CITY HALL FACILITY
 2263 SANTA CLARA AVENUE
 ALAMEDA, CALIFORNIA

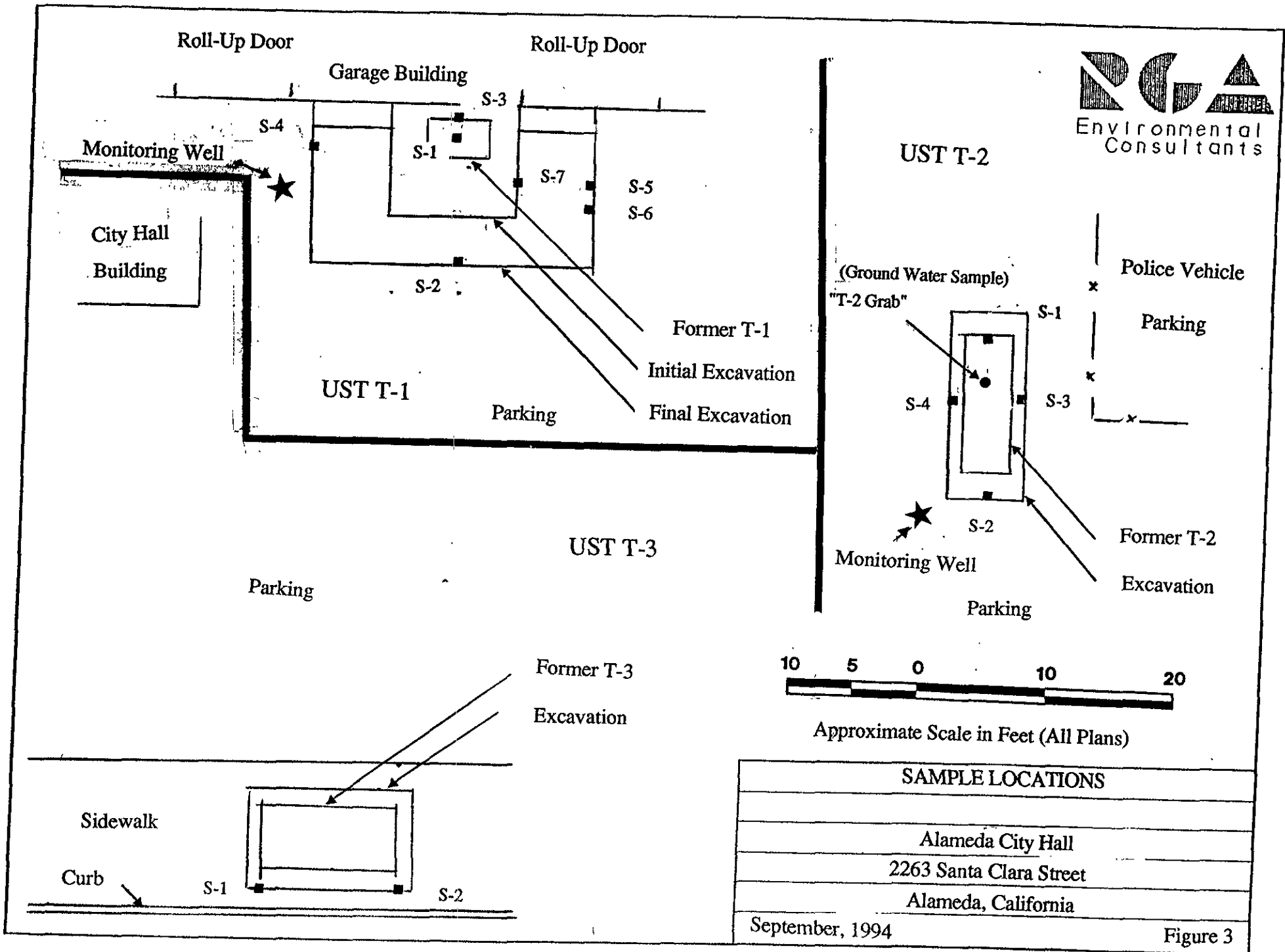


EXPLANATION Surface trace of underground storage tank Extent of magnetics investigation Magnetics anomaly Existing monitoring well Fence MW - monitoring well		CONDUITS Conduit Electrical Vent line Water Natural gas Telephone Cable TV		conduit continues continued trend undetermined 		 Scale: Project Number: 89312161U Date of Investigation: December 16, 1993 Map by T. Harth
--	--	--	--	---	--	---

Not all below ground facilities may be represented on this map.

SITE PLAN	
Alameda City Hall	
2263 Santa Clara Street	
Alameda, California	
September, 1994	Figure 2

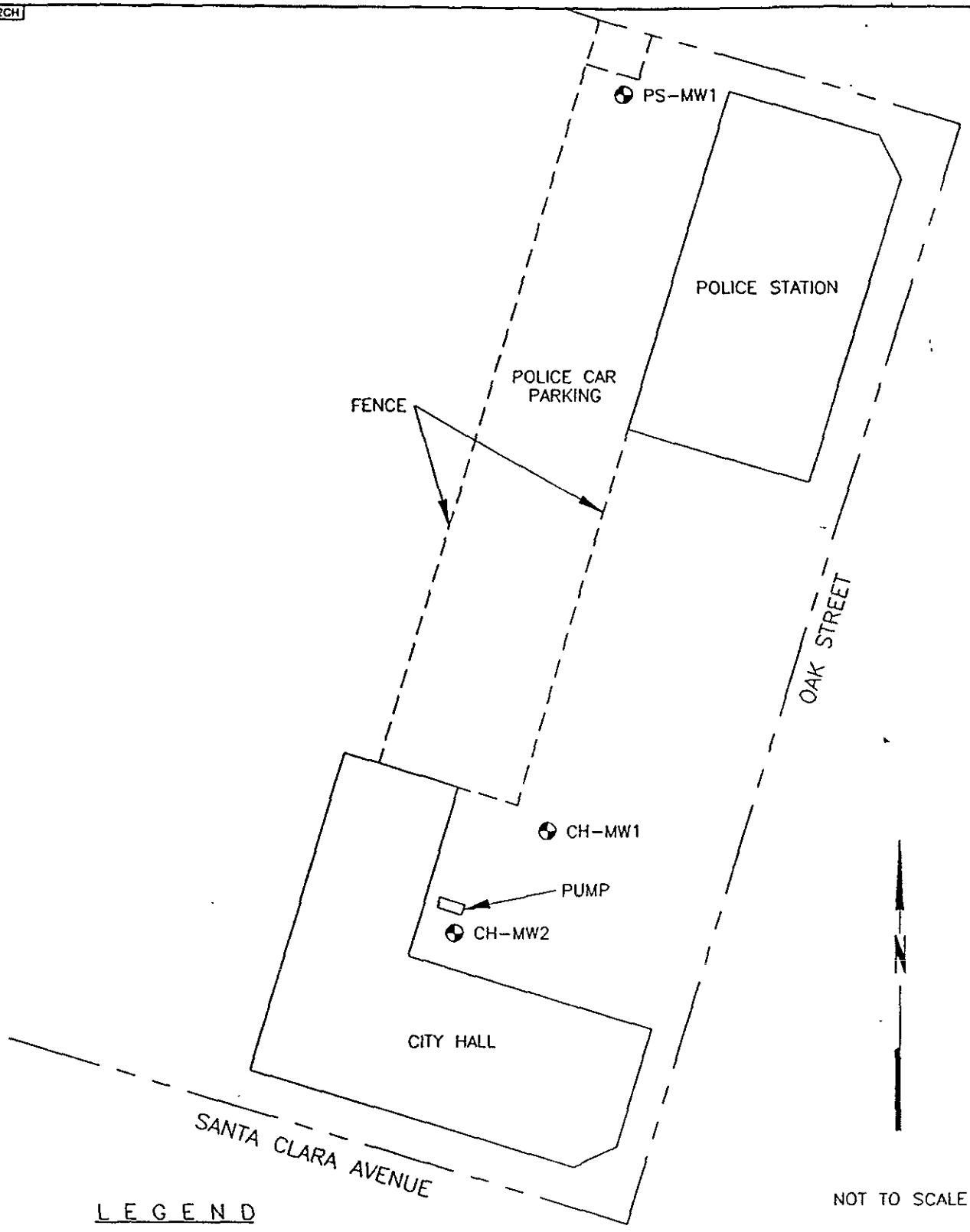
Base: Spectrum Environmental Services, January, 1994, modified



SAMPLE LOCATIONS	
Alameda City Hall	
2263 Santa Clara Street	
Alameda, California	
September, 1994	Figure 3

5

110102CH



LEGEND

CH-MW2 ● GROUNDWATER MONITORING WELL


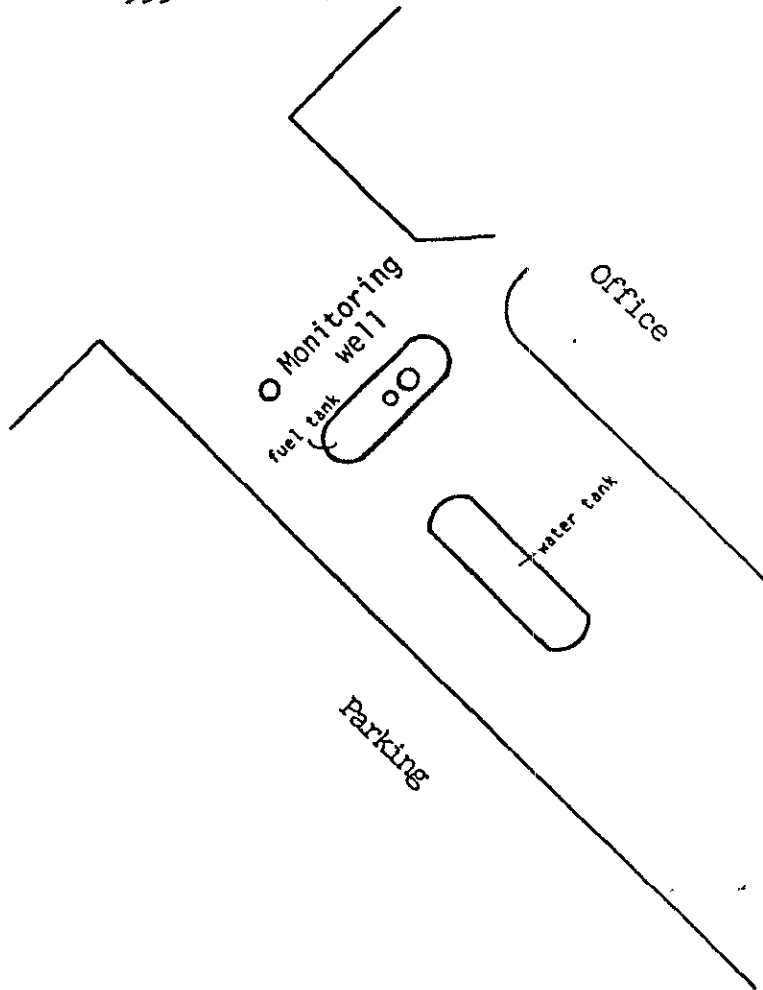
	<p style="text-align: center;">SITE PLAN City Hall and Police Station 2263 Santa Clara Avenue Alameda, California</p>	<p>PLATE 3</p>
<p>PROJECT 11010.02</p>		

Figure 1

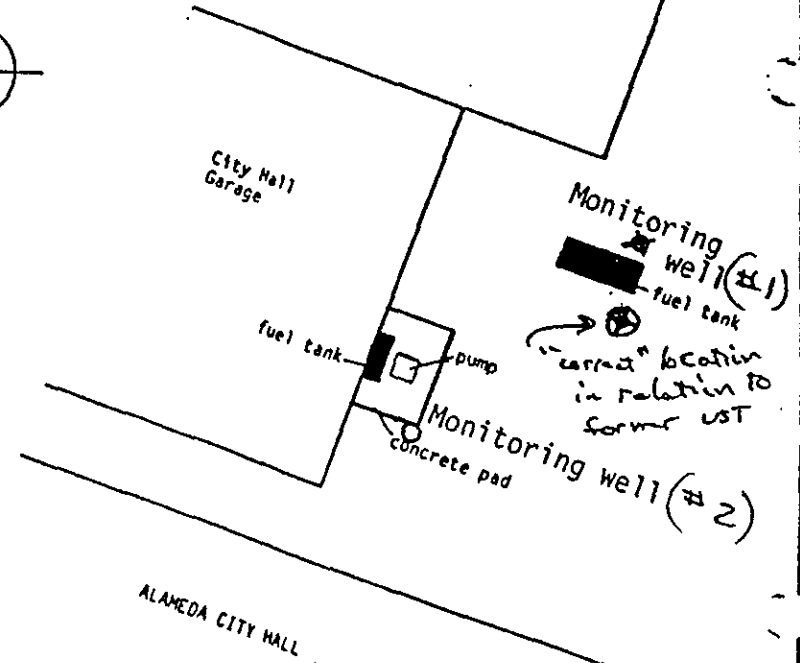
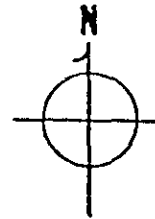
POLICE DEPARTMENT
1555 Oak Street



1 inch = 22 ft.

Figure 2

CITY HALL
2263 Santa Clara



- Corrected well location
- transformed well ID from RESNA 6/2/94 report
1 inch = 12 ft. JFH 2/23/95

CITY of ALAMEDA

SCALE	APPROVED BY	DRAWN BY
DATE 5-7-88		REVISED
Aqua Science Engineers		
		PROJECT NUMBER

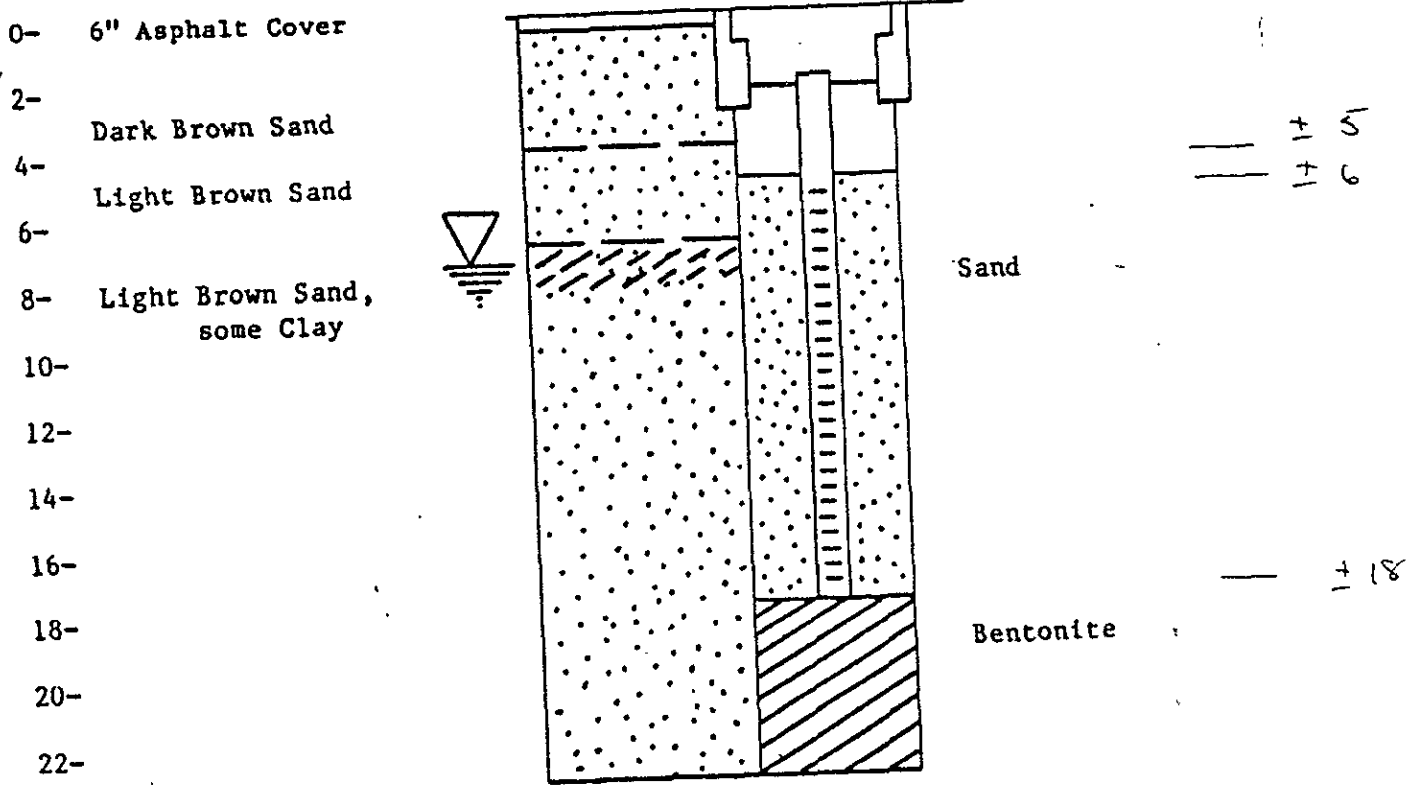
ASCE SCIENCE ENGINEERS WELL LOG

8

Casing: 2" PVC
 Well Depth: 18.0 ft.
 Logged By: D. Schultz, P.E.
 Water Depth: 7.5 ft.
 Driller: ASE

Alameda City Hall
 2263 Santa Clara Ave.
 Alameda, CA
 Boring # 2
 Date: 6-4-86

DEPTH (ft.)	SOIL DESCRIPTION	WELL CONSTRUCTION DETAILS
-------------	------------------	---------------------------



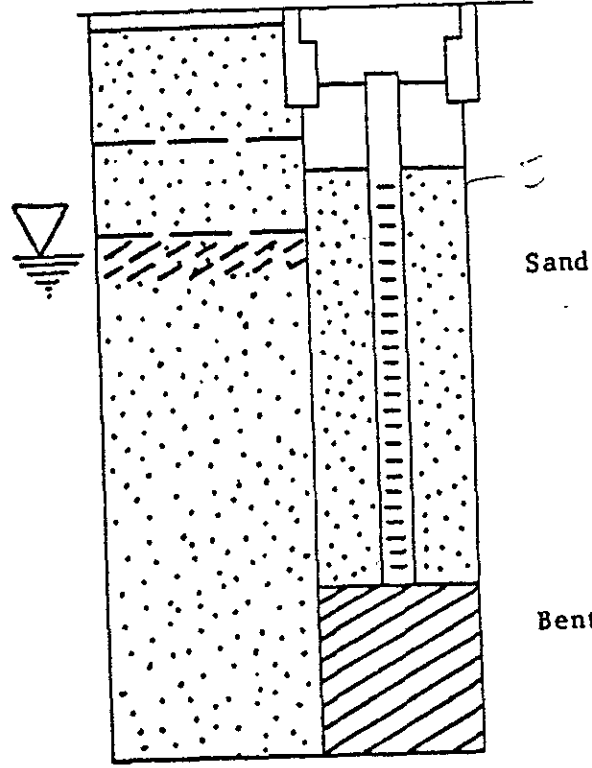
Bottom of Boring 22.5 ft.

Casing: 2" PVC
 Well Depth: 18.0 ft.
 Logged By: D. Schultz, P.E.
 Water Depth: 7.5 ft.
 Driller: ASE

Alameda City Hall
 2263 Santa Clara Ave.
 Alameda, CA
 Boring # 1
 Date: 6-4-86

DEPTH (ft.)	SOIL DESCRIPTION	WELL CONSTRUCTION DETAILS
-------------	------------------	---------------------------

0-	6" Asphalt Cover	
2-	Dark Brown Sand	
4-	Light Brown Sand	
6-	Light Brown Sand, some Clay	
8-		
10-		
12-		
14-		
16-		
18-		
20-		
22-		



0-5 cement
 5 ± Sand
 6 ± Screen

Sand

Bentonite

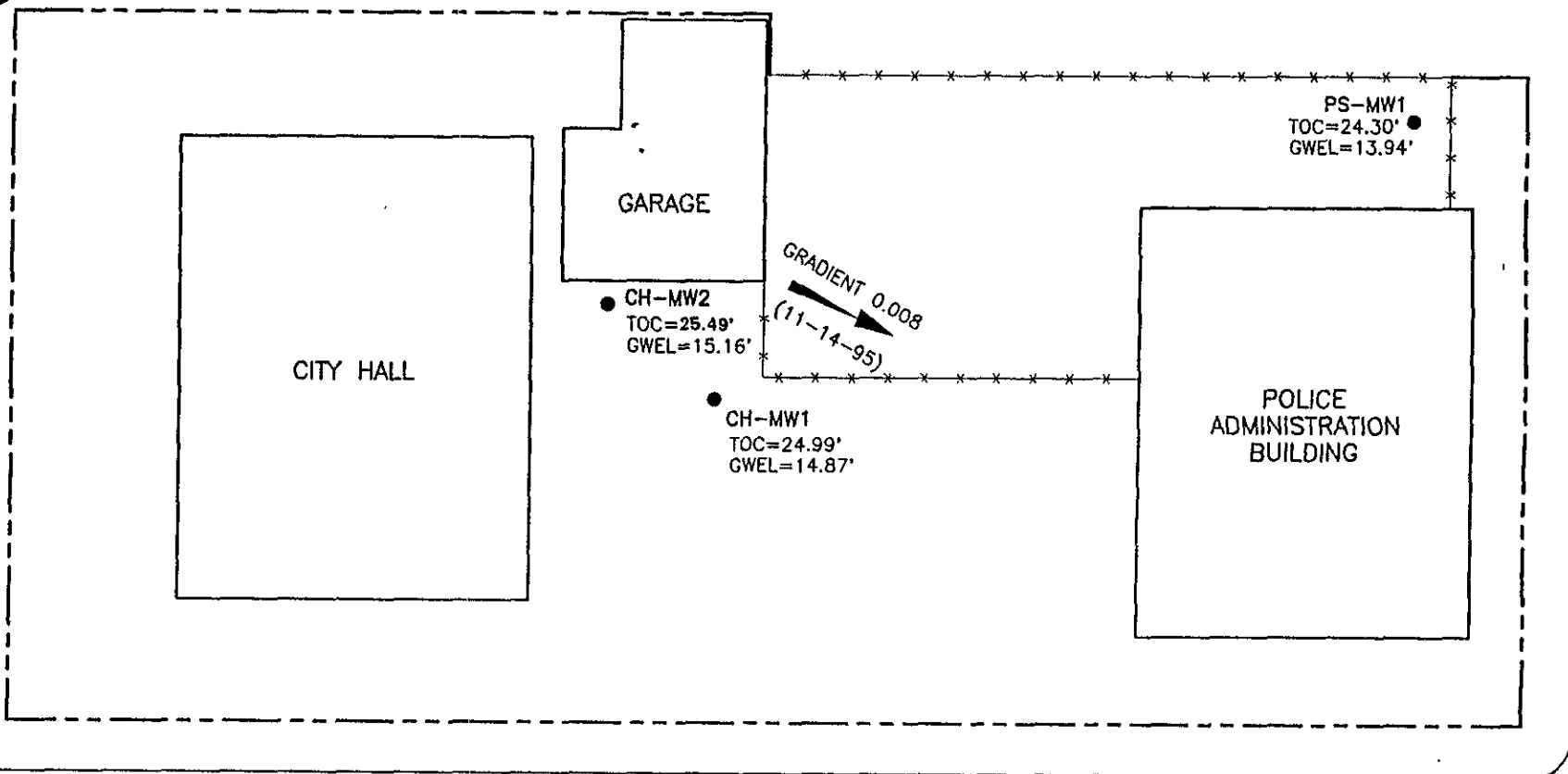
18 +

Bottom of Boring 22.5 ft.

- locking of well

DRAWING NUMBER 4356-A3

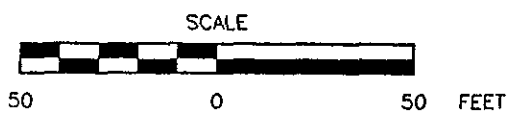
SANTA CLARA AVE.



OAK STREET

LEGEND:

- x-x-x- SECURITY FENCE
- - - - - PROPERTY LINE
- CH-MW2 GROUND WATER MONITORING WELL
- TOC TOP OF CASING ELEVATION (FEET)
- GWEL GROUND WATER ELEVATION (FEET)
- GRADIENT DIRECTION



GROUND WATER ELEVATIONS AND GRADIENT
CITY HALL AND POLICE STATION
2263 SANTA CLARA AVENUE
ALAMEDA, CALIFORNIA

No.	DATE	ISSUED FOR REPORT	VZC		
		ISSUE / REVISION	OWN. BY	CK'D BY	AP'D BY

DATE: 12-26-95
 SCALE: AS SHOWN

SMITH

FIGURE 3

DRAWING NUMBER 4356-A3



Table 1
SUMMARY OF GROUND WATER ANALYTICAL RESULTS
CITY OF ALAMEDA WELLS
ALAMEDA, CALIFORNIA

Well	Date Sampled	TPHg (ppb)	TPHd (ppb)	Benzene (ppb)	Toluene (ppb)	Ethylbenzene (ppb)	Total Xylenes (ppb)
CH-MW1	8/5/87	<20	NA	<0.4	<0.4	NA	<0.4
	2/16/88	<50	NA	<0.5	<0.5	NA	<0.5
	8/24/88	<7	NA	<0.1	<0.1	<0.1	<0.2
	2/8/89	<50	NA	<0.5	<0.5	<0.5	<0.5
	8/7/89	<30	NA	<0.3	<0.3	<0.3	<0.3
	2/9/90	<30	NA	<0.3	<0.3	<0.3	<0.3
	8/28/90	<30	NA	<0.3	<0.3	<0.3	<0.3
	2/8/91	<30	NA	<0.3	<0.3	<0.3	<0.3
	3/4/92	<50	NA	<0.5	<0.5	<0.5	<0.5
	9/8/92	<50	NA	NA	NA	NA	NA
	3/11/93	<50	NA	<0.5	<0.5	<0.5	<0.5
	9/29/93	<50	NA	<0.5	<0.5	<0.5	<0.5
	3/30/94	<50	NA	<0.5	<0.5	<0.5	<0.5
	9/20/94	<50	NA	<0.5	<0.5	<0.5	<0.5
	3/31/95	<50	NA	<0.5	<0.5	<0.5	<0.5
	11/14/95	<50	70	<0.5	<0.5	<0.5	<2
	2/14/96	<50	<50	<0.5	<0.5	<0.5	<2
CH-MW2	8/5/87	<20	NA	<0.4	<0.4	NA	0.4
	2/16/88	<50	NA	<0.5	<0.5	NA	<0.5
	8/24/88	36	NA	<0.1	<0.1	<0.1	<0.2
	2/8/89	<50	NA	0.55	<0.5	<0.5	<0.5
	8/7/89	<30	NA	<0.3	<0.3	<0.3	<0.3
	2/9/90	<30	NA	<0.3	<0.3	<0.3	<0.3
	8/28/90	<30	NA	<0.3	<0.3	<0.3	<0.3
	2/8/91	<30	NA	<0.3	<0.3	<0.3	<0.3
	3/4/92	<50	<50	<0.5	<0.5	<0.5	<0.5
	9/8/92	<50	NA	NA	NA	NA	NA
	3/11/93	<50	<50	<0.5	<0.5	<0.5	<0.5
	9/29/93	<50	<50	<0.5	<0.5	<0.5	<0.5
	3/30/94	<50	<50	<0.5	<0.5	<0.5	<0.5
	9/20/94	<50	<50	<0.5	<0.5	<0.5	<0.5
	3/31/95	<50	NA	<0.5	<0.5	<0.5	<0.5
	11/14/95	<50	<50	<0.5	<0.5	<0.5	<2
	2/14/96	<50	<50	<0.5	<0.5	<0.5	<2

Post-it Fax Note	7671	Date	3/5/96	# of pages	1
To	Joliet SHILIN	From	Wesley Adams		
Co./Dept.	ACHRS	Co.	CITY OF ALAMEDA		
Phone #		Phone #	748-4512		
Fax #	337-9335	Fax #	748-4697		

April 18, 1996

Ms. Juliet Shin
Alameda County Health Care Services Agency
1131 Harbor Bay Parkway
Alameda, CA 94502-6577

RE: Potential Human Health Threat
Alameda City Hall, 2263 Santa Clara Avenue, Alameda, California
ACC Job No. 96-6209-3.1

Dear Ms. Shin:

ACC Environmental Consultants, Inc., (ACC) is pleased to provide this letter in response to your letter dated March 5, 1996, regarding the above referenced site.

BACKGROUND

Three underground storage tanks were removed from the site in June 1994 by RGA Environmental, Inc. Overexcavation was performed around tank T-1 to remove impacted soil detected in verification sampling. Because of utilities, a groundwater monitoring well, and the garage building in the vicinity of the tank, overexcavation was limited. However, analytical results indicated nondetectable to minor concentrations of petroleum hydrocarbons in the soil samples collected from the tank T-1 excavation pit. A concentration of 0.63 parts per million (ppm) benzene was detected in one sample (T1-S3) collected from the tank pit excavation at a depth of 9.5 to 10.3 feet below ground surface (bgs). Smith Environmental recommended site closure based on groundwater monitoring at the site since 1987 and nondetectable results since 1989.

REGULATORY RESPONSE

According to your letter, "it appears that the residual concentrations of benzene identified in former tank pit T-1, adjacent to the actively used garage building, may potentially pose a threat to human health through the intrusion of vapors into the building." According to Tier 1 of the American Society for Testing and Materials (ASTM) Risk-Based Corrective Action (RBCA) guidelines, the potential for vapor intrusion into buildings in a commercial/residential area is 0.005 ppm benzene for a 10^{-6} cancer risk and 0.49 ppm for a 10^{-4} cancer risk.

DISCUSSION

ACC feels that, because the concentrations detected on site were minimal, the Tier 1 guidelines are too stringent. The Tier 1 guidelines assume that there is homogeneous soil type, impact within a depth of 3.3 feet bgs, concrete foundation with limited integrity, homogeneous topsoil, and air exchange of 1 exchange per 20 days.

wrong, ~ 9' bgs.

ENVIRONMENTAL PROTECTION

Based on ACC's site reconnaissance, the following specific site conditions were noted:

- A 4-inch-thick concrete foundation with good integrity;
- Soil impact was reported at a depth of 9.5 feet bgs, which is 6.2 feet deeper than Tier 1 assumptions;
- The garage is occupied from 8 a.m. to 5 p.m., Monday through Thursday and work is conducted in an open office located within the garage. The office floor is covered with floor tile, which would further restrict vapor intrusion; and
- During regular work hours, the garage is open, allowing for continual air exchange.

ACC evaluated site specific facts by determining the overall risk of leaving TPHg residues in soil at a depth of 6 to 9 feet bgs at the subject site. This was determined by calculating the Area-Weighted Average concentration for benzene of 0.071 to 0.073 mg/kg at the site, which is much less than the single high value of 0.63 mg/kg reported in sidewall sample T1-S3. This average was determined using the Thiessen Polygon Method (Table 1 and Figure 1 attached) (Fetter, C.W. *Applied Hydrogeology*, 3rd edition, 1994, pp 40-44, Macmillan College Publishing Co., New York, New York).

← how was this calculated?

Without further discussion, this average concentration of 0.071 to 0.073 mg/kg is less than the 10^{-4} cancer risk value of 0.49 mg/kg and just above the 10^{-5} cancer risk value of 0.049 mg/kg for benzene (the conservative but most widely used risk goal).

Due to the volatile nature of benzene, some portion of the benzene reported in soil sample T1-S3 may volatilize into soil vapor and migrate upward. Unfortunately, it is extremely hard to quantify this number. Common sense tells us soil vapor seeks preferential pathways and the subsurface preferential direction would be toward the 90 cubic yard excavation backfilled with pea gravel and away from the clayey sand under the structure. Multiple retardation factors, including the 4-inch-thick concrete floor and relatively impermeable tile flooring, indicate the actual concentration of benzene that theoretically could volatilize into air space within the building are on the orders of magnitude less than the Area-Weighted Average benzene concentration in soil.

RBCA Tier 2 levels represent a minimal increase in site-specificity and less conservative screening levels. Tier 2 assumes that no mobile free-phase product is present, the dissolved plume is stable, concentrations of constituents in groundwater are decreasing with time, and the movement of the groundwater is slow. The degradation rate for benzene is 0.6% per day (Baker, et al); however, rates may be slower for concentrations below 2.0 ppm.

The shallow aquifer is impacted; however, based on quarterly monitoring conducted at the site, the dissolved plume appears to be stable and groundwater movement is very slow.

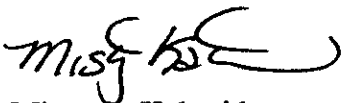
Excavation of soils to meet Tier 1 criteria would be expensive due to the relatively low residual concentration in the soil. Active remediation is not cost effective at this site considering the overall cost versus resulting goal. It would be too costly to achieve the maximum contaminant level goal.

The allowances in the Tier 1 guidelines are too conservative to be used as preliminary remediation goals (PRGs) at this site. According to EPA Region IX Preliminary Remediation Goals Second Half dated September 1, 1995, the PRG for benzene concentrations in surface residential soil is 1.4 mg/kg and in surface industrial soil is 3.2 mg/kg. Based on site usage, these are more realistic goals.

Based on the calculated Area-Weighted Averages and the PRGs noted in the EPA document, there is minimal risk to the subject site or its occupants from the residual amount of impact reported within the soils. Therefore, ACC requests that this case be evaluated for "no further action."

If you require additional information, please feel free to call me at (510) 638-8400.

Sincerely,



Misty C. Kaltreider
Project Geologist



David R. DeMent
Senior Geologist

MCK/mcr

Attachments

cc: Mr. Wesley Adams, City of Alameda

TABLE 1 - AREA-WEIGHTED AVERAGE CONCENTRATION
(calculated using the Thiessen Polygon Method)*

Polygon Element**	Mean Soil Concentration (C _{avg}) mg/kg	Area of Element (A) m ²	A x C _{avg}
I	0.0025	4.83	0.0120
II	0.63	1.86	1.1710
III	0.0025	5.11	0.0127
IV	0.051	1.39	0.0708
V	0.0025	1.67	0.0041
VI	0.0025	2.50	0.0062
TOTALS		17.36 m²	1.276

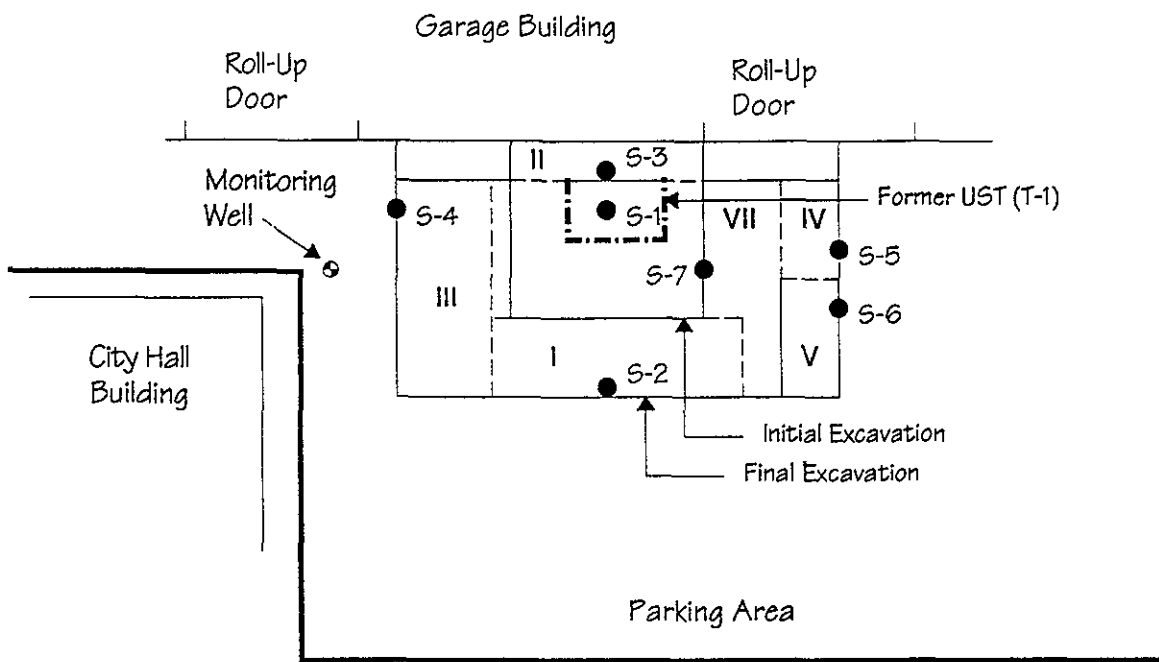
*Fetter, C.W., *Applied Hydrogeology*, 3rd edition, 1994, pp 40-44, Macmillan College Publishing Co., New York, New York

**Attached Site Plan illustrates polygon areas.

0.115

$$\begin{aligned} \text{Area-Weighted Average Concentration} &= \frac{(\sum A \times C_{avg})}{A_{total}} \\ \text{using 0.0025 mg/kg for ND results} & \\ &= \frac{1.276}{17.36} = 0.073 \text{ mg/kg} \end{aligned}$$

$$\begin{aligned} \text{Area-Weighted Average Concentration} &= \frac{(\sum A \times C_{avg})}{A_{total}} \\ \text{using 0.0 mg/kg for ND results} & \\ &= \frac{1.242}{17.36} = 0.071 \text{ mg/kg} \end{aligned}$$



LEGEND

- S-1 - Sample Locations
- III - Polygon Area

Title: Site Map 2263 Santa Clara Street Alameda, California	
Figure Number: 1.0	Scale: 1" = 10'
Project Number: 96-6209-3.1	Drawn By: SP6
A · C · C ENVIRONMENTAL CONSULTANTS	Date: 4/17/96
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