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SOIL AND GROUND WATER INVESTIGATION FOR:

ARATEX SERVICES
FACILITY #516 LOCATED AT
330 CHESTNUT STREET
OAKLAND, CALIFORNIA

AUG 1989

PREPARED BY:
RMT INC.

AUGUST 1989

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ARA services
ARATEX SERVICES, Inc.

1834 WALDEN OFFICE SQUARE SUITE #450 SCHAUMBURG, IL 60173-4299 / 312-397-9500

October 23, 1989

Mr. Dennis Byrne
Hazardous Materials Specialist
Alameda County Health Agency
Department of Environmental Health
80 Swan Way, Room 200
Oakland, California 94621

Subject: Report Describing a Site Investigation at Aratex Services, Inc.
330 Chestnut Street, Oakland, California

Dear Mr. Byrne:

Enclosed is the Site Investigation report for the Aratex Services facility in Oakland, California. The report, prepared by RMT, was completed as required by the Alameda County Health Agency to address residual concentrations of diesel fuel remaining in the subsurface following removal of a 2,000 gallon diesel fuel tank.

An update to the report is needed in reference to the statement (page 2) that "Floating product was noted in well RAO-3, but the thickness was not measurable on June 9." Product thickness was subsequently measured on September 13, 1989 and found to be 0.58 feet in this well. The thickness was measured using a clear PVC bailer.

RMT is currently preparing a proposal and work plan for Aratex for the remediation of this floating product. The plan will be sent to you following Aratex approval.

Should you have any questions about the content of this report or any other matter related to this site, please call me at (312) 397-9500.

Sincerely,

Rebecca J Whitsett

Rebecca J. Whitsett
Environmental Engineer

Mark Lyverse

Mark Lyverse
RMT, Project Manager

RJW:uz\ACHADB.516
Encl.

cc: F. Pfizenmayer

10/30/89

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1.0 INTRODUCTION

what about the piping?

A subsurface investigation into potential diesel contamination of soils and ground water at the Aratex facility at 330 Chestnut Street, Oakland, California, was required by the Alameda County Health Care Services Agency (HCSA). The source of potential contamination was a 2,000 gallon diesel tank that was removed on December 16, 1988. RMT, Inc. (RMT) was retained by Aratex to conduct the subsurface investigation and prepare this documentation report upon completion of initial field activities. A total of four ground water monitoring wells were installed on June 7 and 8, 1989. Ground water levels were measured and water samples were taken on June 9.

1.1 Background

A previous investigation at this site included the collection of two soil samples during removal of the 2,000 gallon tank. Laboratory analyses concluded that one sample, taken from the vent end of the tank contained 6,900 mg/kg Total Petroleum Hydrocarbons as diesel (TPH-D) and 3,000 mg/kg oil and grease (O&G). The second sample, taken from the fill end of the tank contained 8,100 mg/kg of TPH-D and 3,700 mg/kg O&G.

Ground water monitoring and additional soil sampling was allowed by the HCSA in recognition that the tank site was in close proximity to an existing building (Aratex's facility), gas lines, and a sidewalk and that substantive soil removal might result in collapse or damage to these features.

1.2 Purpose and Scope

The purpose of the investigation and this report is to assess and describe the lateral and vertical extent of contamination in the area of the removed underground storage tank and to meet requirements of the HSCA that the investigation be implemented and documented.

RMT's documentation is based on the following:

- Telephone and in-person conversations with the HCSA.
- On-site supervision of drilling activities, geologic logging of the drilled boreholes, collection of soil samples and performing all activities related to ground water monitoring.
- Copies of permits, chain-of-custodies and laboratory results.

2.0 FINDINGS AND CONCLUSIONS

1. The site appears to be located in the Merritt Sand Unit of the East Bay Plain Area. Hickenbottom and Muir (1988) describe this unit as being permeable and comprised of loose, well-sorted, fine to medium grained sand and silt with lenses of sandy clay and clay. The Unit supports an unconfined aquifer, but is not considered a primary source of drinking water by these authors because of its limited area distribution and thickness.

2. Soils encountered during drilling and sampling were predominantly fine to medium grained clayey sands with some clay stringers.

3. Ground water was detected at levels from 8 to 9 feet below ground surface. Ground water elevations may fluctuate in response to seasonal and tidal influences.

4. The local ground water flow direction was found to be to the south or towards the San Francisco Bay Area. Ground water gradients at the time of measurement were in the order of 0.004, southward, towards the Oakland Inner Harbor.

5. All soil samples from borings RAO-1, RAO-2 and RAO-4 showed nondetectable concentrations of diesel fuel range hydrocarbons (TPH-D) and oil and grease (at detection limits of 100 mg/kg). Diesel contamination of 22,529 mg/kg was found in boring RAO-3 at a depth of 8 ft, which was advanced through the former tank pit. The same soil sample from this borehole also showed concentrations of toluene to be 75 ppb, ethylbenzene 840 ppb, and xylene 2700 ppb. Benzene was not detected at a detection limit of 10 mg/kg. Concentrations of oil and grease in soil at 8 ft from RAO-3 were measured at 8200 mg/kg.

   The contaminants appear to be localized to the area where the underground storage tank was located. Samples from boring RAO-3 suggest that concentrations of hydrocarbons, BTX&E and oil and grease in the soil decrease substantially with depth and that these contaminants are not detectable in the soils upgradient (ROA-2) or downgradient (RAO-1 and RAO-4) of the tank pit.

when?

132.8 ppm = 132,800 ppb TPH-d

6. Ground water samples obtained from monitoring wells RAO-1, RAO-2 and RAO-4 did not contain detectible levels of total petroleum hydrocarbons or benzene, toluene, ethylbenzene or xylenes. A concentration of 132.8 mg/l of TPH-D and 3.4 ppb of benzene, 0.9 ppb of toluene, 38 ppb ethylbenzene and 86 ppb xylenes was detected in ground water sampled from well RAO-3. (Floating product was noted in well RAO-3, but the thickness was not measurable on June 9.)

   Results indicate that ground water directly beneath the former tank pit has been impacted by diesel fuel contamination. Contaminants in the water sample from RAO-3 occur at the water table which is located approximately 1.5 to 2.0 ft. beneath the former pit bottom. As mentioned in the "Background" section, two soil samples collected from the bottom of the pit at the time the tank was removed were contaminated with diesel fuel as well. In reference to the hydraulic gradients and flow direction, discussed in a later section, ground water directly downgradient of the former tank pit has apparently not been impacted from the diesel fuel at the time measurements were made and samples were collected.

3.0 HYDROGEOLOGIC ASSESSMENT

3.1 Site Location and Setting

The Aratex facility is located in Western Alameda County at 330 Chestnut Street in Oakland, California (Figure 1). Topography across the site is generally flat. The facility is located about 2,000 feet north of the Oakland Inner Harbor and about 1 mile east of the San Francisco Bay. The area is generally industrial with some residential areas to the north and east.

3.2 Local Geology and Hydrogeology

The Aratex facility is located in the Merritt Sand Unit of the East Bay Plain Area. According to published information (Hickenbottom and Muir; 1988) the Merritt Sand is a loose well-sorted, fine to medium grained sand and silt with a maximum thickness of about 65 ft. It is permeable, with the permeability decreasing with increasing depth as a result of consolidation.

Ground water occurs in all geologic units in the East Bay Plain area. However, the Merritt Sand contains smaller amounts of ground water than the deeper, older, alluvium and generally only produces enough water for domestic use. Water from the Unit is not considered by the Alameda County Flood Control and Water Conservation District (ACFC) to be a source of drinking water because its relative shallowness and permeability makes it susceptible to surface or near surface sources of contamination (i.e., sewer systems, street, runoff, leaking underground tanks, etc.). ACFC suggests that water from this Unit be limited to use for only non-potable uses, such as lawn and garden irrigation.

3.3 Site Geology

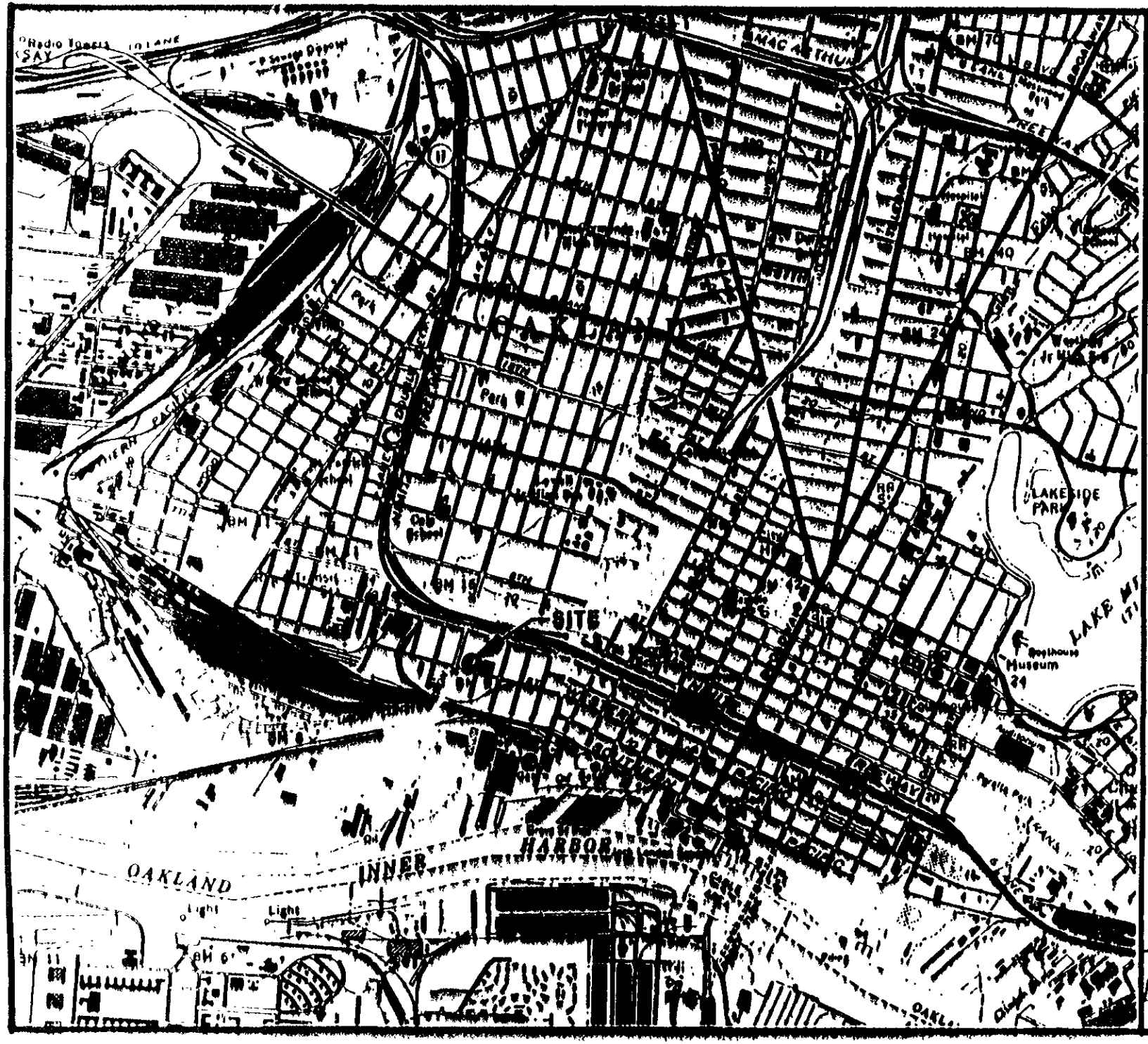
The site geology was evaluated by drilling four soil borings and collecting soil samples at 5-foot intervals. The drilling and soil sampling procedures are described in Appendix A. Holes were drilled using a B-34 Mobile Drill rig. The location of the monitoring wells are shown in Figure 2. The logs of each boring are presented in Appendix B.

Subsurface materials encountered in the soil borings generally consisted of fine-to-medium grained sand, silt, and clay. The sand component of the material encountered was generally well sorted and at times contained some fine gravel. These materials are consistent with the regional geologic information reviewed.

3.4 Site Hydrogeology

3.4.1 Ground Water Occurrence and Flow Direction

Four 2-inch PVC ground water monitoring wells were installed on the property in the locations shown on Figure 2, using the methodology described in Appendix A. Well construction diagrams are presented in Appendix B.
The water table occurs at a depth of approximately 8 to 9 feet below ground surface. Ground water levels were measured at the completion of drilling and well construction on June 9 and on June 16, 1989, and are summarized in Table 3-1. A water table map has been prepared and shows the ground water



QUADRANGLE LOCATION

FIGURE 1
LOCATION OF ARATEX FACILITY #516, OAKLAND, CAL.

SOURCE: USGS OAKLAND WEST QUADRANGLE MAP, 7.5 MIN. SERIES.

NORTH

SCALE: 1"=2000'

RMT, INC.

DWN BY:	SRC
DATE:	7/89
PROJ #:	1033.01

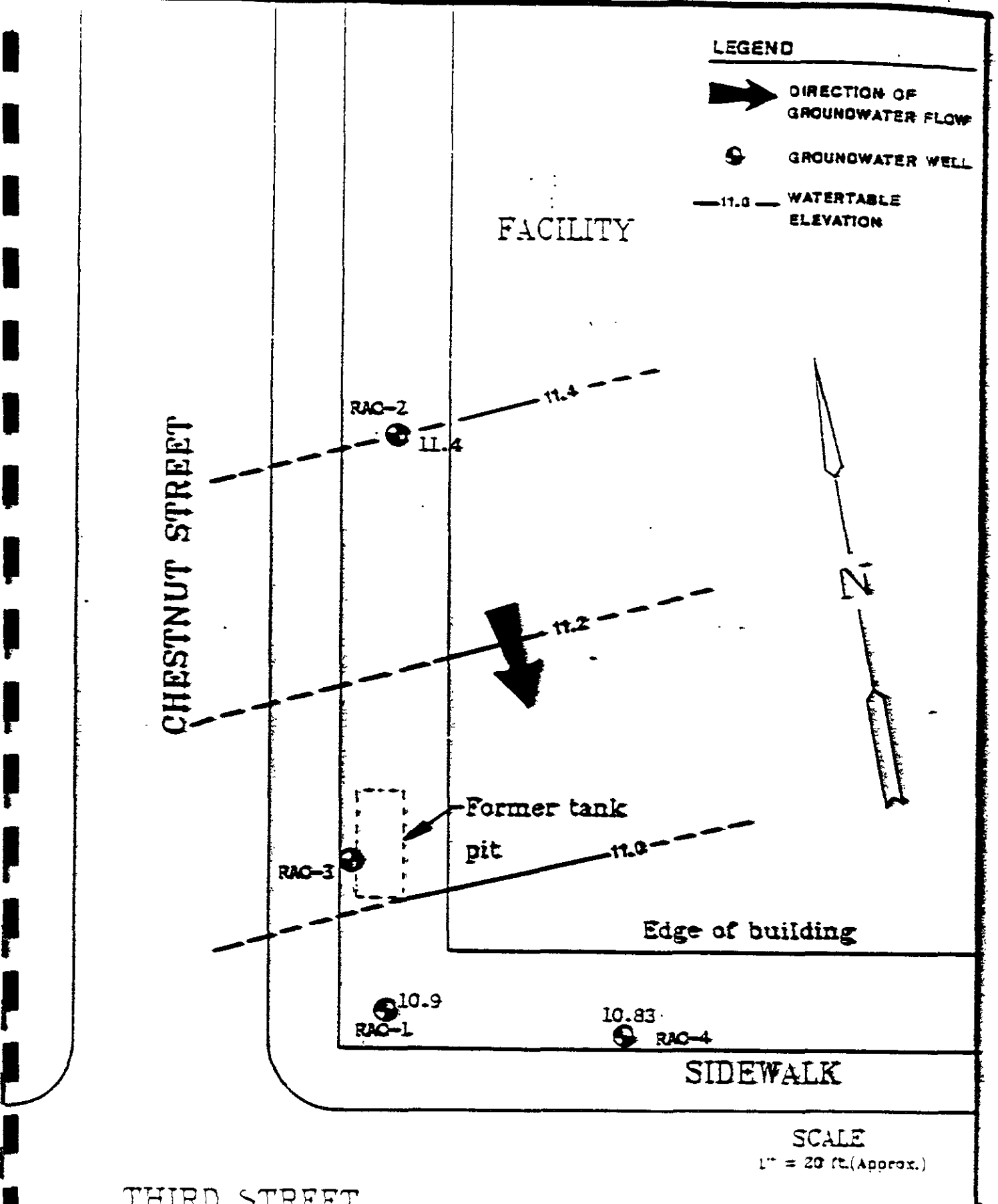


FIGURE 2. DIRECTION OF GROUNDWATER FLOW, JUNE 16, 1989, ARATEX #516 SITE, OAKLAND, CAL.

DWN BY: SRC
DATE: 7/89
PROJ. #: 1622.01

FIGURE 2

TABLE 3-1

WATER TABLE ALTITUDES

Well ID	*Reference Elevation	Depth (ft) 06/09/89	Water Table Elevation (ft) 06/09/89	Depth (ft) 06/16/89	Water Table Elevation (ft) 06/16/89
RAO-1	19.08	8.05	11.03	8.17	10.91
RAO-2	19.57	7.78	11.79	8.17	11.40
RAO-3	19.30	8.03	11.27	8.16	11.14
RAO-4	19.30	8.31	10.99	8.47	10.83

* Reference elevation is arbitrary and not related to mean sea level.

beneath the site flows to the south toward the Oakland Inner Harbor of San Francisco Bay. Based on water level measurements obtained on June 16, 1989, a hydraulic gradient of approximately 0.004 existed across the site.

3.5 Area of Ground Water Use

According to published information (Hickenbottom and Muir, 1988), approximately 13 wells exist within a 1 mile radius of the Aratex site. It is not known whether these wells are domestic, industrial, or monitoring wells. Screened intervals for the wells are also unknown.

3.6 Laboratory Analyses of Soil Samples

A total of 12 soil samples were collected for laboratory analyses. All soil samples were obtained from the four soil borings shown on Figure 2. Only one soil sample was collected above the water table from each borehole because the water table was relatively shallow (8 or 9 feet below ground surface). Soil samples were also collected at depths below the ground water table to provide additional information about:

1. Contamination at deeper depths in the aquifer that may have been the result of fluctuating water levels, and

2. Off-site sources that may be or have been contributing to contamination in the tank pit area.

The results of sample analyses for TPH-D and BTX&E are summarized in Table 3-2, and laboratory reports and chain-of-custodian are included in Appendix C. In general, the following conditions were observed:

- Diesel range hydrocarbons, toluene, ethylbenzene, xylene, and oil and grease were detected in samples from boring RAO-3. This boring is located near the center of the tank pit.

- No hydrocarbons, BTX&E or oil and grease were detected in soil samples from borings RAO-1, RAO-2 or RAO-4 (see Table 3-2 for detection limits).

3.7 Ground Water Quality

All four soil borings were completed as ground water monitoring wells. Well permits are shown in Appendix D. Ground water samples were collected from each of the four wells and were analyzed for TPH-D by EPA Method 8015M (modified) and BTX&E by EPA Method 8020. The monitoring wells were sampled in accordance with the procedures outlined in Appendix A. The results of the analyses are summarized below and in Table 3-3; and the original laboratory data sheets are included in Appendix C. In general, the following conditions were observed:

- TPH-D were detected in a ground water sample collected from monitoring well RAO-3. No hydrocarbons were detected in ground water samples from wells RAO-1, RAO-2 and RAO-4.

TABLE 3-2

ANALYTICAL RESULTS OF SOIL SAMPLES

Boring Number	Sample Depth (Feet)	TPH-D[1] Diesel Range (mg/kg)	Aromatic Volatile Hydrocarbons[2] (ug/kg)				Oil[3] and Grease (mg/kg)
			Benzene	Toluene	Ethylbenzene	Xylenes	
RAO-1	5	ND	ND	ND	ND	ND	ND
RAO-1	10	ND	ND	ND	ND	ND	ND
RAO-1	20	ND	ND	ND	ND	ND	ND
RAO-2	5	ND	ND	ND	ND	ND	ND
RAO-2	10	ND	ND	ND	ND	ND	ND
RAO-2	15	ND	ND	ND	ND	ND	ND
RAO-2	20	ND	ND	ND	ND	ND	ND
RAO-3	8	22,529	ND	75	840	2,700	8,200
RAO-3	15	ND	ND	ND	ND	ND	ND
RAO-3	20	3	ND	ND	ND	ND	ND
RAO-4	5	ND	ND	ND	ND	ND	ND
RAO-4	10	ND	ND	ND	ND	ND	ND

1 TPH-D - Total Petroleum Hydrocarbons as diesel; analyses performed by EPA Method 8015M (modified). Detection limits of 2 mg/kg.

ND - Not detected at the limit of detection.

2 Aromatic Volatile Hydrocarbons (BTX&E) analyses performed by EPA Method 8020. Detection limits of 0.3 ug/kg.

3 Oil and grease analyses performed by EPA Method 503. Detection limits of 100 mg/kg.

TABLE 3-3

SUMMARY OF LABORATORY RESULTS ON GROUND WATER

Parameter	Sample Point RAO-1	RAO-2	RAO-3	RAO-4
Total Petroleum Hydrocarbons - as Diesel (mg/l)	ND	ND	132.8	ND
Benzene (ug/l)	ND	ND	3.4	ND
Toluene (ug/l)	ND	ND	0.9	ND
Ethylbenzene (ug/l)	ND	ND	38.0	ND
Xylenes (ug/l)	ND	ND	86.0	ND

ND - Not detected at the limit of detection.

TPH analyses performed by EPA Method 8015M. Minimum detection limits of 0.04 mg/l except for RAO-4 which had a minimum detection limit of 0.57 mg/l.

Benzene, toluene, ethylbenzene and xylenes analyses performed by EPA method 8020. Minimum detection limits of 0.3 ug/l.

- Benzene, toluene, ethybenze and xylenes were detected in a ground water sample collected from monitoring well RAO-3.

- No BTX&E was detected in ground water samples collected from monitoring wells RAO-1, RAO-2, and RAO-4 (detection limits of 0.3 ug/l).

4.0 OVERALL ASSESSMENT

This investigation has shown that both the subsurface soils and ground water in the immediate vicinity of the former underground diesel fuel storage tank contain hydrocarbons in excess of DOHS limits. At the time of this report, it does not appear that ground water approximately 16 feet downgradient from the former tank pit has been impacted by the diesel contamination. Also, ground water upgradient of the pit showed no detectable concentrations of TPH-D or BTX&E. Contamination concentrations in the soils from boring RAO-3 directly beneath the tank pit decreases to non-detectable levels between 8 and 15 ft. below ground surface. This observation indicates that fluctuations in water level that result from nearby tidal changes or seasonal effects or vertical migration of ground water, have not resulted in contamination being transported to deeper soils.

5.0 REFERENCES

Hickenbottom, K., and Muir, Kenneth, 1988, Geohydrology and Ground Water Quality Overview, of the East Bay Plain Area, Alameda County, California, 205(j) Report, Alameda County Flood Control and Water Conservation District, 83 p.

United States Geological Survey, 1980, Oakland West Quadrangle - California, 7.5 minute series topographical map; United States Department of the Interior.

APPENDIX A

FIELD METHODOLOGY

Soil Borings

The soil borings were drilled using hollow-stem augers to avoid introducing drilling fluids into the formation and to minimize intraborehole cross-contamination. Logs of each borehole were prepared at the time of drilling and amended later, as necessary. All soil cuttings were drummed in 55-gallon drums and left on-site.

Precautions were taken to minimize cross-contamination between borings. Special cleaning procedures were followed to clean the drill equipment, and split-spoon soil samplers. The drilling equipment was steam-cleaned prior to drilling. In addition, the drilling equipment was steam-cleaned between borings. Water generated from steam cleaning the contaminated borehole was contained as best as possible in 55-gallon drums and left on-site.

The split-spoon soil sampler was cleaned prior to its first use on-site and between samples. Cleaning procedures involved:

- Scraping away soil material with a soils knife;
- Washing with hot water and tri-sodium phosphate (TSP); and
- Rinsing with de-ionized water (twice).

Soil samples were collected at 5-foot intervals during the drilling operation with a split-spoon sampler lined with brass rings. The rings were cleaned in the same manner as described for the sampler. The soil samples were visually examined to classify the subsurface materials.

The monitoring wells were developed by using a bailer as a surge mechanism. Water and sediments were then removed from the wells using the bailer. Water was removed from the well until the turbidity of the water being removed from the well had visually stabilized to a constant relatively turbid free sample. A minimum of 50 gallons of water was removed from each well. Purged water was stored in 55-gallon drums on-site.

The elevation of all the site monitoring wells were vertically surveyed to the nearest 0.01 foot and are referenced to a temporary benchmark. Horizontal locations were determined by taping distances from the building.

Well Installation

Ground water monitoring wells were installed in all four of the borings drilled at the site. The wells were constructed of 2-inch diameter threaded coupling PVC screens and pipe.

The pipe and screens were assembled and lowered into the borehole. The wells had either 17.5 or a 20 foot long screens with 0.010-inch slots. A medium to coarse sand pack was placed approximately 1 foot below to 1 foot above the top of the screen. A 1- to 2-foot bentonite seal was then installed above the sand layer, and the monitoring wells were grouted to within 2 feet of the ground surface. Flush-mount Christy boxes were installed over the wells for protection. These boxes were set in concrete. Diagrams illustrating the completed well installation details are presented in Appendix B.

Ground Water Sampling

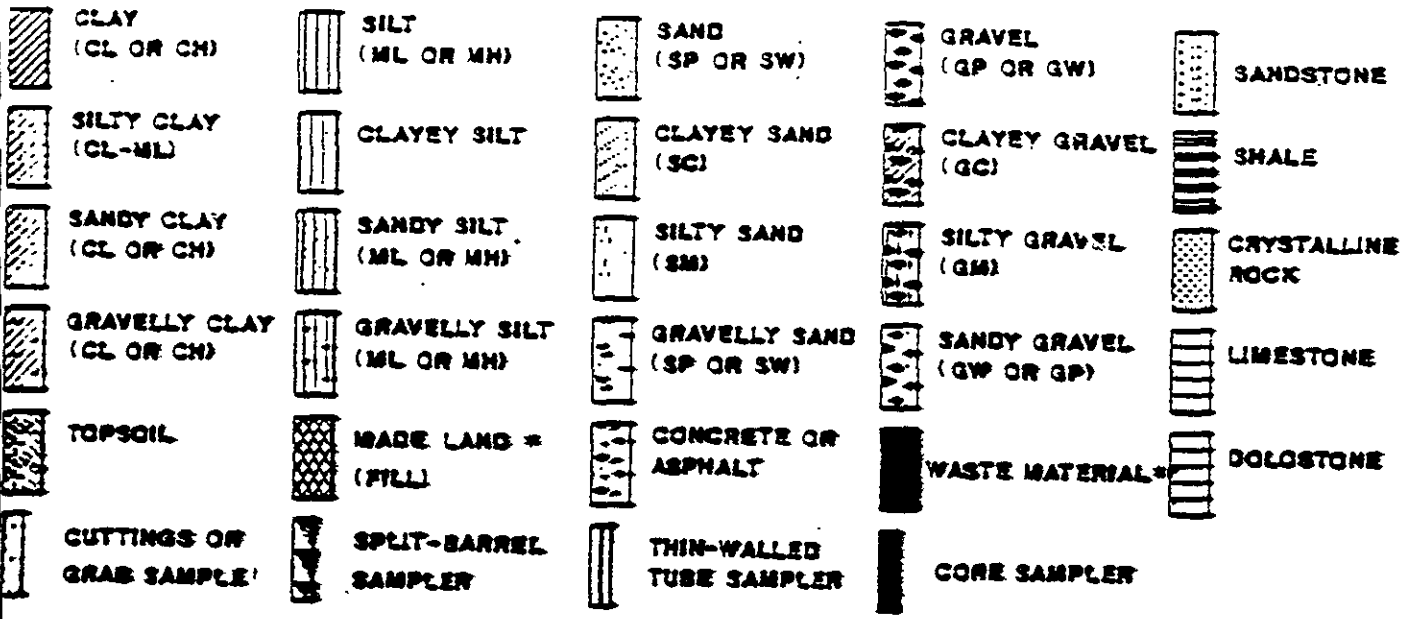
Ground water samples were collected from the site monitoring wells by an RMT hydrogeologist and ground water sampling technician. The monitoring wells were sampled several hours following the development of each well. The wells were sampled with a teflon or stainless steel bailer.

APPENDIX B

LOG OF TEST BORINGS AND WELL CONSTRUCTION

EXPLANATORY NOTES FOR BORING LOGS

LEGEND FOR GRAPHIC LOG:



* DETAILS INCLUDED UNDER VISUAL CLASSIFICATION AND GENERAL OBSERVATIONS.

LEGEND FOR WELL CONSTRUCTION:

* SEE RMT FORM F-17, MONITORING WELL DIAGRAM, FOR CONSTRUCTION DETAILS.

ABBREVIATIONS:

HSA – HOLLOW STEM AUGER
SSA – SOLID STEM AUGER
CR – CLEAR WATER ROTARY
MR – MUD ROTARY
AR – AIR ROTARY
DC – DRIVE CASING
SC – SPIN CASING
SS – 2" SPLIT-BARREL SAMPLER
SS3 – 3" SPLIT-BARREL SAMPLER
ST – 2" THIN-WALLED TUBE SAMPLER
PS – PISTON SAMPLER
AS – AUGER CUTTINGS SAMPLE
RS – ROTARY CUTINGS SAMPLE

tr. – TRACE
ltl. – LITTLE
f. – FINE
m. – MEDIUM
c. – COARSE
v. – VERY
Lt. – LIGHT
Dk. – DARK
Br. – BROWN
Gr. – GREY
Yl. – YELLOW
Gn. – GREEN

LOG OF TEST BORING

F-203 (R 01-87)

BORING NO. RA01
SHEET NO. 1 OF 1
PROJECT NO. 1622.01
INSTALLATION 6/7/89
SURFACE ELEV.
BOREHOLE DIA. 8 IN.

PROJECT NAME ARATEX - OAKLAND
LOCATION 3RD&CHESTNUT ST.OAKLAND,CA
CONTRACTOR ANDERSON GEOTECH.
DRILLING METHOD HSA

SAMPLING NOTES					VISUAL CLASSIFICATION AND GENERAL OBSERVATIONS	GENERAL WELL CONSTRUCT.
INTERVAL NO.	TYPE	RECOVERY N	IN	MOISTURE DEPTH		
					Fill material, (peat), organic, loose, dark brown.	
					Very fine to fine SAND, moderate brown, moist.	
5	SS	49	11	5		
					Medium Clayey SAND, moderate yellowish brown, trace organics, moist.	
10	SS	48	12	10		
					Medium SAND, dark-yellowish brown.	
				15		
					CLAY.	
					Medium Clayey SAND, dark-yellowish brown, trace organics, soft.	
20	SS	95	12	20		
				25	EOB at about 25.0 ft.	
				30		
				35		

GENERAL NOTES

DATE STARTED 7 JUN 89
DATE COMPLETED 7 JUN 89
RIG MOBILE B-34
CREW CHIEF SWARTOUT
LOGGED LYVERSE CHECKED

WATER LEVEL OBSERVATIONS

WHILE DRILLING ▽ 9.0 FT.
AT COMPLETION ▽ 8.1 FT.
AFTER DRILLING
CAVE-IN: DATE/TIME _____ DEPTH _____
WATER: DATE/TIME 6/8/89@07:45 DEPTH 7.90 FT.

LOG OF TEST BORING

F-203 (R 01-87)

BORING NO. RA02
SHEET NO. 1 OF 1
PROJECT NO. 1622.01
INSTALLATION 6/8/89
SURFACE ELEV.
BOREHOLE DIA. 8 IN.

PROJECT NAME ARATEX - OAKLAND
LOCATION 3RD&CHESTNUT ST.OAKLAND,CA
CONTRACTOR ANDERSON GEOTECH.
DRILLING METHOD HSA

SAMPLING NOTES					VISUAL CLASSIFICATION AND GENERAL OBSERVATIONS	GENERAL WELL CONSTRUCT.
INTERVAL NO.	TYPE	RECOVERY/MOISTURE N	IN	DEPTH		
					Organic (peat) FILL material, dusky brown.	
5	SS	57	12	5	Fine to medium SAND, moderate yellowish brown, some fine gravel (5mm).	
10	SS	58	12	10	Same as above, but with some clay. Clayey SAND, moderate brown, some iron stain.	
15	SS	36	12	15		
20	SS	100	10	20	Above grades to CLAY and SAND, grayish, stiff.	
				25	Same as above.	
					EOB at 27 ft.	
				30		
				35		

GENERAL NOTES

DATE STARTED 7 JUN 89
DATE COMPLETED 7 JUN 89
RIG MOBILE B-34
CREW CHIEF SWARTOUT
LOGGED LYVERSE CHECKED

WATER LEVEL OBSERVATIONS

WHILE DRILLING ▽ 9.0 FT.
AT COMPLETION ▽ 8.1 FT.
AFTER DRILLING
CAVE-IN: DATE/TIME DEPTH
WATER: DATE/TIME 6/8/89 07:45 DEPTH 8.00 FT.

LOG OF TEST BORING

F-203 (R 01-87)

RMT

PROJECT NAME ARATEX - OAKLAND
LOCATION 3RD&CHESTNUT ST.OAKLAND,CA
CONTRACTOR ANDERSON GEOTECH.
DRILLING METHOD HSA

BORING NO. RA03
SHEET NO. 1 OF 1
PROJECT NO. 1622.01
INSTALLATION 6/8/89
SURFACE ELEV.
BOREHOLE DIA. 8 IN.

SAMPLING NOTES INTERVAL NO.	TYPE	RECOVERY N	IN	MOISTURE	DEPTH	VISUAL CLASSIFICATION AND GENERAL OBSERVATIONS	GENERAL WELL CONSTRUCT.
					0	FILL material (tank pit). Medium to coarse SAND, brownish to black, little gravel.	
					5		
8	SS	67	10			Estimated bottom of tank pit (change in auger rotation).	
					10	Clayey SAND, gray, hydrocarbon odor and staining.	
					15		
15	SS	35	8			Same as above, but pale yellowish brown, less clay than above.	
					20	Medium Clayey SAND, dark yellowish brown, some organic streaks, soft.	
20	SS	42	5				
					25	Boring terminiated at 24.0 ft.	
					30		
					35		

GENERAL NOTES

DATE STARTED 8 JUN 89
DATE COMPLETED 8 JUN 89
RIG MOBILE B-34
CREW CHIEF SWARTOUT
LOGGED LYVERSE CHECKED

WATER LEVEL OBSERVATIONS

WHILE DRILLING ▽ 10.0 FT.
AT COMPLETION ▼
AFTER DRILLING
CAVE-IN: DATE/TIME DEPTH
WATER: DATE/TIME 6/8/89 12:20 DEPTH 8.35 FT.

LOG OF TEST BORING

F-203 (R 01-87)

BORING NO. RA04
SHEET NO. 1 OF 1
PROJECT NO. 1622.01
INSTALLATION 6/8/89
SURFACE ELEV.
BOREHOLE DIA. 8 IN.

PROJECT NAME ARATEX - OAKLAND
LOCATION 3RD&CHESTNUT ST.OAKLAND.CA
CONTRACTOR ANDERSON GEOTECH.
DRILLING METHOD HSA

SAMPLING NOTES					VISUAL CLASSIFICATION AND GENERAL OBSERVATIONS	GENERAL WELL CONSTRUCT.
INTERVAL NO.	TYPE	RECOVERY N	IN	DEPTH		
				0	FILL material, peat, loose, dark brown.	
5	SS	74	10	5	Very fine to fine SAND, moderate brown.	
10	SS	37	8	10	Medium SAND, moderate yellowish brown, some clay. CLAY, stiff, moist.	
				15	Medium SAND, dark yellowish brown.	
				20		
				25		
				27	EOB at 27 ft.	
				30		
				35		

GENERAL NOTES

DATE STARTED 8 JUN 89
DATE COMPLETED 8 JUN 89
RIG MOBILE B-34
CREW CHIEF SWARTOUT
LOGGED LYVERSE CHECKED

WATER LEVEL OBSERVATIONS

WHILE DRILLING ▽ 10.0 FT.
AT COMPLETION ▼
AFTER DRILLING
CAVE-IN: DATE/TIME DEPTH
WATER: DATE/TIME 6/8/89 15:20 DEPTH 8.36 FT.

APPENDIX C

LABORATORY DATA

ANALYTICAL RESULTS REPORT

RMT, INC.
3250 Ocean Park Blvd.
Suite 370
Santa Monica, Ca. 90405

Attention: Mark Lyverse

July 3, 1989
Client Reference: 1622.01
TMA Reference: 6607-2
Sampling Date 6-9-89

TMA ID	Client ID		Oil & Grease	
-5	F.BLANK	—	<100 mg/kg	—
-6	RA01-5	—	<100 mg/kg	—
-7	RA01-10	—	<100 mg/kg	—
-8	RA01-20	—	<100 mg/kg	—
-9	RA02-5	—	<100 mg/kg	—
-10	RA02-10	—	<100 mg/kg	—
-11	RA02-15	—	<100 mg/kg	—
-12	RA02-20	—	<100 mg/kg	—
-13	RA03-8	—	8200 mg/kg	—
-14	RA03-15	—	<100 mg/kg	—
-15	RA03-20	—	<100 mg/kg	—
-16	RA04-5	—	<100 mg/kg	—
-17	RA04-10	—	<100 mg/kg	—

EPA METHOD 8020
TARGET ANALYTE RESULTS

Client: RMT, INC
Client Sample ID: RA01
TMA/Norcal SAMPLE ID: 6607-2-1

Date Received: 6/09/89
Date Analyzed: 6/20/89

CAS. No	COMPOUND	RESULTS (ug/L)	DETECTION LIMITS (ug/L)
71-43-2	benzene	< 0.3	0.3
108-88-3	toluene	< 0.3	0.3
100-41-4	ethylbenzene	< 0.3	0.3
108-38-3	xylenes	< 0.3	0.3

C S Smith
Analyst

Data Release Authorized By

JUL 0 6

EPA METHOD 8020
TARGET ANALYTE RESULTS

Client: RMT, INC
Client Sample ID: RA02
TMA/Norcal SAMPLE ID: 6607-2-2

Date Received: 6/09/89
Date Analyzed: 6/20/89

CAS. No	COMPOUND	RESULTS (ug/L)	DETECTION LIMITS (ug/L)
71-43-2	benzene	< 0.3	0.3
108-88-3	toluene	< 0.3	0.3
100-41-4	ethylbenzene	< 0.3	0.3
108-38-3	xylenes	< 0.3	0.3

C. Adams
Analyst

Data Release Authorized By

EPA METHOD 8020
TARGET ANALYTE RESULTS

Client: RMT, INC
Client Sample ID: RA03
TMA/Norcal SAMPLE ID: 6607-2-3

Date Received: 6/09/89
Date Analyzed: 6/20/89

CAS. No	COMPOUND	RESULTS (ug/L)	DETECTION LIMITS (ug/L)
71-43-2	benzene	3.4	0.3
108-88-3	toluene	0.9	0.3
100-41-4	ethylbenzene	38.	0.3
108-38-3	xylenes	86.	0.3

Analyst

Data Release Authorized By

EPA METHOD 8020
TARGET ANALYTE RESULTS

Client: RMT, INC
Client Sample ID: RA04
TMA/Norcal SAMPLE ID: 6607-2-4

Date Received: 6/09/89
Date Analyzed: 6/20/89

CAS. No	COMPOUND	RESULTS (ug/L)	DETECTION LIMITS (ug/L)
71-43-2	benzene	< 0.3	0.3
108-88-3	toluene	< 0.3	0.3
100-41-4	ethylbenzene	< 0.3	0.3
108-38-3	xylenes	< 0.3	0.3

C.D Smith
Analyst

Data Release Authorized By

JUL 0 5

EPA METHOD 8020
TARGET ANALYTE RESULTS

Client: RMT, INC
Client Sample ID: FIELD BLANK
TMA/Norcal SAMPLE ID: 6607-3-5

Date Received: 6/09/89
Date Analyzed: 6/20/89

CAS. No	COMPOUND	RESULTS (ug/L)	DETECTION LIMITS (ug/L)
71-43-2	benzene	< 0.3	0.3
108-88-3	toluene	< 0.3	0.3
100-41-4	ethylbenzene	< 0.3	0.3
108-38-3	xylenes	< 0.3	0.3

C.D. Smith
Analyst

Data Release Authorized By

JUL 0 5

EPA METHOD 8020
TARGET ANALYTE RESULTS

Client: RMT, INC
Client Sample ID: RA01-5
TMA/Norcal SAMPLE ID: 8607-2-2

Date Received: 6/09/89
Date Analyzed: 6/20/89

CAS. No	COMPOUND	RESULTS (ug/kg)	DETECTION LIMITS (ug/kg)
71-43-2	benzene	< 10	10
108-88-3	toluene	< 10	10
100-41-4	ethylbenzene	< 10	10
108-38-3	xylenes	< 10	10

C.S. Smith
Analyst

Data Release Authorized By

EPA METHOD 8020
TARGET ANALYTE RESULTS

Client: RMT, INC
Client Sample ID: RA01-10
TMA/Norcal SAMPLE ID: 6607-2-7

Date Received: 6/09/89
Date Analyzed: 6/20/89

CAS. No	COMPOUND	RESULTS (ug/kg)	DETECTION LIMITS (ug/kg)
71-43-2	benzene	< 10	10
108-88-3	toluene	< 10	10
100-41-4	ethylbenzene	< 10	10
108-38-3	xylenes	< 10	10

C. S Smith
Analyst

Data Release Authorized By

JUL 0 6

EPA METHOD 8020
TARGET ANALYTE RESULTS

Client: RMT, INC
Client Sample ID: RA01-20
TMA/Norcal SAMPLE ID: 6607-2-8

Date Received: 6/09/89
Date Analyzed: 6/20/89

CAS. No	COMPOUND	RESULTS (ug/kg)	DETECTION LIMITS (ug/kg)
71-43-2	benzene	< 10	10
108-88-3	toluene	< 10	10
100-41-4	ethylbenzene	< 10	10
108-38-3	xylenes	< 10	10

C. O'Sullivan
Analyst

Data Release Authorized By

JUL 0 5

EPA METHOD 8020
TARGET ANALYTE RESULTS

Client: RMT, INC
Client Sample ID: RA02-5
TMA/Norcal SAMPLE ID: 6607-2-9

Date Received: 6/09/89
Date Analyzed: 6/20/89

CAS. No	COMPOUND	RESULTS (ug/kg)	DETECTION LIMITS (ug/kg)
71-43-2	benzene	< 10	10
108-88-3	toluene	< 10	10
100-41-4	ethylbenzene	< 10	10
108-38-3	xylenes	< 10	10

Analyst

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EPA METHOD 8020
TARGET ANALYTE RESULTS

Client: RMT, INC
Client Sample ID: RA02-10
TMA/Norcal SAMPLE ID: 6607-2-10

Date Received: 6/09/89
Date Analyzed: 6/20/89

CAS. No	COMPOUND	RESULTS (ug/kg)	DETECTION LIMITS (ug/kg)
71-43-2	benzene	< 10.	10
108-88-3	toluene	< 10.	10
100-41-4	ethylbenzene	< 10.	10
108-38-3	xylenes	< 10.	10

G.S. Spill
Analyst

Data Release Authorized By

EPA METHOD 8020
TARGET ANALYTE RESULTS

Client: RMT, INC
Client Sample ID: RA02-15
TMA/Normal SAMPLE ID: 5607-2-11

Date Received: 6/09/89
Date Analyzed: 6/20/89

CAS. No	COMPOUND	RESULTS (ug/kg)	DETECTION LIMITS (ug/kg)
71-43-2	benzene	< 10.	10
108-88-3	toluene	< 10.	10
100-41-4	ethylbenzene	< 10.	10
108-38-3	xylenes	< 10.	10

Analyst

Data Release Authorized By

EPA METHOD 8020
TARGET ANALYTE RESULTS

Client: RMT, INC
Client Sample ID: RA02-20
TMA/Norcal SAMPLE ID: 6607-2-12

Date Received: 6/09/89
Date Analyzed: 6/21/89

CAS. No	COMPOUND	RESULTS (ug/kg)	DETECTION LIMITS (ug/kg)
71-43-2	benzene	< 10.	10
108-88-3	toluene	< 10.	10
100-41-4	ethylbenzene	< 10.	10
108-38-3	xylenes	< 10.	10

C.W. Smith
Analyst

Data Release Authorized By

JUL 0 5

EPA METHOD 8020
TARGET ANALYTE RESULTS

Client: RMT, INC
Client Sample ID: RA03-8
TMA/Norcal SAMPLE ID: 6607-2-13

Date Received: 6/09/89
Date Analyzed: 6/21/89

CAS. No	COMPOUND	RESULTS (ug/kg)	DETECTION LIMITS (ug/kg)
71-43-2	benzene	< 10.	10
108-88-3	toluene	75.	10
100-41-4	ethylbenzene	840.	10
108-38-3	xylenes	2700.	10

Analyst

Data Release Authorized By

EPA METHOD 8020
TARGET ANALYTE RESULTS

Client: RMT, INC
Client Sample ID: RA03-15
TMA/Norcal SAMPLE ID: 6607-2-14

Date Received: 6/09/89
Date Analyzed: 6/21/89

CAS. No	COMPOUND	RESULTS (ug/kg)	DETECTION LIMITS (ug/kg)
71-43-2	benzene	< 10.	10
108-88-3	toluene	< 10.	10
100-41-4	ethylbenzene	< 10.	10
108-38-3	xylenes	< 10.	10

Analyst

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Page 1 of 1

EPA METHOD 8020
TARGET ANALYTE RESULTS

Client: RMT, INC
Client Sample ID: RA03-20
TMA/Norcal SAMPLE ID: 6607-2-15

Date Received: 6/09/89
Date Analyzed: 6/21/89

CAS. No	COMPOUND	RESULTS (ug/kg)	DETECTION LIMITS (ug/kg)
71-43-2	benzene	< 10.	10
108-88-3	toluene	< 10.	10
100-41-4	ethylbenzene	< 10.	10
108-38-3	xylenes	< 10.	10

G. D Smith
Analyst

Data Release Authorized By

EPA METHOD 8020
TARGET ANALYTE RESULTS

Client: RMT, INC
Client Sample ID: RA04-5
TMA/Norcal SAMPLE ID: 6607-2-16

Date Received: 6/09/89
Date Analyzed: 6/21/89

CAS. No	COMPOUND	RESULTS (ug/kg)	DETECTION LIMITS (ug/kg)
71-43-2	benzene	< 10.	10
108-88-3	toluene	< 10.	10
100-41-4	ethylbenzene	< 10.	10
108-38-3	xylenes	< 10.	10

Analyst

Data Release Authorized By

EPA METHOD 8020
TARGET ANALYTE RESULTS

Client: RMT, INC
Client Sample ID: RA04-10
TMA/Normal SAMPLE ID: 8607-2-17

Date Received: 6/09/89
Date Analyzed: 6/21/89

CAS. No	COMPOUND	RESULTS (ug/kg)	DETECTION LIMITS (ug/kg)
71-43-2	benzene	< 10.	10
108-88-3	toluene	< 10.	10
100-41-4	ethylbenzene	< 10.	10
108-38-3	xylenes	< 10.	10

C. D Smith
Analyst

Data Release Authorized By

date sampled
6-14-89?

lab?

METHOD: 8015 FID METHOD BLK

FUEL CALCULATED AS DIESEL

TMA/NORCAL I.D.	CUSTOMER I.D.	COMPOUND	RESULTS	MDL
8807-I-1	RA01	DIESEL	0.04 mg/L	0.04 mg/L
8807-I-2	RA02	DIESEL	0.04 mg/L	0.04 mg/L
8807-I-3	RA03	DIESEL	132.8 mg/L	0.04 mg/L
8807-I-4	RA04	DIESEL	0.57 mg/L	0.57 mg/L
8807-I-5	FIELD BLANK	DIESEL	0.04 mg/L	0.04 mg/L
8807-I-6	RA01-5	DIESEL	2 mg/kg	2 mg/kg
8807-I-7	RA01-10	DIESEL	2 mg/kg	2 mg/kg
8807-I-8	RA01-20	DIESEL	2 mg/kg	2 mg/kg
8807-I-9	RA02-5	DIESEL	2 mg/kg	2 mg/kg
8807-I-10	RA02-10	DIESEL	2 mg/kg	2 mg/kg
8807-I-11	RA02-15	DIESEL	2 mg/kg	2 mg/kg
8807-I-12	RA01-20	DIESEL	2 mg/kg	2 mg/kg
8807-I-13	RA03-5	DIESEL	12309 mg/kg	2 mg/kg

[illegible]	[illegible]	DIESEL	[illegible]	[illegible]
[illegible]	[illegible]	DIESEL	[illegible]	[illegible]
[illegible]	[illegible]	DIESEL	[illegible]	[illegible]
[illegible]	[illegible]	DIESEL	[illegible]	[illegible]

** SAMPLE # [illegible] CONTAINED ONLY 4ML OF WATER.
DETECTION LIMITS ARE HIGHER BECAUSE OF THE LOW VOLUME.

RAW DATA IN CHROMATOGRAM FILE.

ANALYZED BY: _____

DATA RELEASED BY: Victoria Taylor 6-22-87

JUL 0 5

[redacted] RMT INC [redacted] Madison, WI 53717 [redacted] Washington DC [redacted] S[redacted]Mon[redacted]CA [redacted] [redacted]d La[redacted]MI [redacted] [redacted]ville [redacted]
744 Heartland Trail
Phone (608)831-4444
FAX (608)831-3334

F-268 (R2/88)
(Use Black Ink Only)

CHAIN OF CUSTODY RECORD

Sample Type: (GW) WW, SW, Soil, Other) 005260

Bottles Prepared by:	Date/Time	Office Code: (State)
RMT, INC	6/1/89 1100	

Project No.	Client:
[illegible]	(Chinese Allied) RMT, INC

Container Inventory: BTX E | TPH - Diesel | Oil & Grease

Filtered (Yes/No)
Preserved (Code)
Refrigerated (Yes/No)

Code: A - None
B - HNO_3
C - H_2SO_4
D - NaOH
E - ______

RMT Lab NO	Yr. 89 Date	Time	Sample Station ID	Total Number Of Containers	BTX E	TPH - Diesel	Oil & Grease					Comments:
	6/8	1035	RA01-5		X	X	X					
	"	1100	RA01-10		X	X	X					
	"	1300	RA01-20		X	X	X					
	"		RA02-5		X	X	X					[illegible]
	"		RA02-10		X	X	X					[illegible]
	"		RA02-15		X	X	X					[illegible]
	"	355	RA02-20		X	X	X					[illegible]
	6/9	0915	RA03-8		X	X	X					[illegible]
	6/9	1110	RA03-15		X	X	X					[illegible]
	6/9	1130	RA0?-20		X	X	X					
	6/9	1145	RA04-5		X	X	X					
	6/9	1205	RA04-10		X	X	X					#1 (213) 452 5078

SAMPLER Relinquished by (Sig)	Date/Time	Received by (Sig.)	Date/Time
① [signature]	6/9/89 1440	② Shipper Name & # [signature]	6/9/89 1440
Relinquished by (Sig) ③	Date/Time	Received by (Sig.) ④ Shipper Name & #	Date/Time
Relinquished by (Sig) ⑤	Date/Time	Received by (Sig.) ⑥ Shipper Name & #	Date/Time

HAZARDS ASSOCIATED WITH SAMPLES
[illegible]

(For Lab Use Only)

Receipt Temp ______ Receipt pH ______
Client P.O. Number ______
Subsequent Analysis: ______ (Check)
Date Resubmitted ______

Seal Att'chd by ◯ Recvd. Intact by ◯ Seal # Att'chd by ◯ Recvd. Intact by ◯

[redacted] RMT® [redacted] Washington DC [redacted] S[redacted]Mon[redacted]A [redacted] l Le[redacted]MI [redacted] ville [redacted]

744 Heartland Trail
Phone (608)831-4444
FAX (608)831-3334

page 2 of 2

F-268 (R2/88)
(Use Black Ink Only)

CHAIN OF CUSTODY RECORD

Sample Type: (GW) WW, SW, Soil, Other) No. 005261

Bottles Prepared by:	Date/Time	Office Code: (State)
RMT	6/9/89 1420	

Project No	Client:
10221	(RMT) Norton Garland #516

Container Inventory: BTX & G 8020; TPH-DRO 8015 M; Oil & Grease 503A

Filtered (Yes/No)
Preserved (Code)
Refrigerated (Yes/No)

Code: A - None
B - HNO_3
C - H_2SO_4
D - NaOH
E - ______

RMT Lab NO	Yr 89 Date	Time	Sample Station ID	Total Number Of Containers	BTX & G 8020	TPH-DRO 8015 M	Oil & Grease 503A	Comments
	6/9		RA01		X	X	X	
	6/9		RA02		X	X	X	
	6/9		RA03		X	X	X	
	6/9		RA04		X	X	X	
	6/9		Field Blank		X	X	X	

Comments: Please run pH, sp. conductivity for each well [illegible]

[illegible] RA01 [illegible] 2 [illegible]

[illegible]

SAMPLER Relinquished by (Sig)	Date/Time	Received by (Sig.) Shipper Name & #	Date/Time
① [illegible signature]	6/9/89 1440	② [illegible signature]	6/9/89 1440
Relinquished by (Sig) ③	Date/Time	Received by (Sig.) ④ Shipper Name & #	Date/Time
Relinquished by (Sig) ⑤	Date/Time	Received by (Sig.) ⑥ Shipper Name & #	Date/Time

Seal # ____ at'chd by ◯ Recvd. Intact by ◯ Seal # ____ at'chd by ◯ Recvd. Intact by ◯

HAZARDS ASSOCIATED WITH SAMPLES
RA03 - strong diesel odor

(For Lab Use Only)

Receipt Temp ______ Receipt pH ______
Client P.O. Number ______
Subsequent Analysis: ______ (Check)
Date Resubmitted ______

APPENDIX D

WELL PERMITS

ZONE 7

ALAMEDA COUNTY FLOOD CONTROL AND WATER CONSERVATION DISTRICT

5997 PARKSIDE DRIVE, PLEASANTON, CALIFORNIA 94566, (415) 484-2600

GROUNDWATER PROTECTION ORDINANCE PERMIT APPLICATION

FOR APPLICANT TO COMPLETE

FOR OFFICE USE

PERMIT NUMBER 89242

LOCATION NUMBER

(1) LOCATION OF PROJECT 330 Chestnut street
Oakland, California

(2) CLIENT
Name Ararex Services, Inc.
Address 1834 Walden Office Sq Phone (312) 397-9500
City Suite 450 Zip 60173-4299
Schaumburg, Ill.

(3) APPLICANT
Name RMT, Inc.
Suite 370
Address 3250 Ocean Park Blvd Phone (213) 452-5078
City Santa Monica, CA. Zip 90405

(4) DESCRIPTION OF PROJECT

Water Well Construction	X	Geotechnical Investigation	
Cathodic Protection		General	
Well Destruction		Contamination	

(5) PROPOSED WATER WELL USE

Domestic		Industrial		Irrigation	
Municipal		Monitoring	X	Other	

(6) PROPOSED CONSTRUCTION
Drilling Method:

Mud Rotary		Air Rotary		Auger	X
Cable		Other			

DRILLER'S LICENSE NO. C57554979

WELL PROJECTS

Drill Hole Diameter	6 3/4 in.	Maximum	
Casing Diameter	2 in.	Depth	40 ft.
Surface Seal Depth	5 ft.	Number	4

GEOTECHNICAL PROJECTS

Number of Borings	2	Maximum	
Hole Diameter	6 3/4 in.	Depth	20 ft.

ESTIMATED STARTING DATE May 1, 1989
ESTIMATED COMPLETION DATE June 15, 1989

I hereby agree to comply with all requirements of this permit and Alameda County Ordinance No. 73-68.

APPLICANT'S SIGNATURE [signature] Date April 20, 1989

PERMIT CONDITIONS

Circled Permit Requirements Apply

(A.) GENERAL
1. A permit application should be submitted so as to arrive at the Zone 7 office five days prior to proposed starting date.
2. Submit to Zone 7 within 60 days after completion of permitted work the original Department of Water Resources Water Well Drillers Report or equivalent for well projects, or drilling logs and location sketch for geotechnical projects.
3. Permit is void if project not begun within 90 days of approval date.

(B.) WATER WELLS, INCLUDING PIEZOMETERS
1. Minimum surface seal thickness is two inches of cement grout placed by tremie.
2. Minimum seal depth is 50 feet for municipal and industrial wells or 20 feet for domestic, irrigation, and monitoring wells unless a lesser depth is specially approved.

(C.) GEOTECHNICAL. Backfill bore hole with compacted cuttings or heavy bentonite and upper two feet with compacted material. In areas of known or suspected contamination, tremied cement grout shall be used in place of compacted cuttings.

D. CATHODIC. Fill hole above anode zone with concrete placed by tremie.

E. WELL DESTRUCTION. See attached.

Approved [signature] Date 24 Apr 89
Wyman Hong

21989