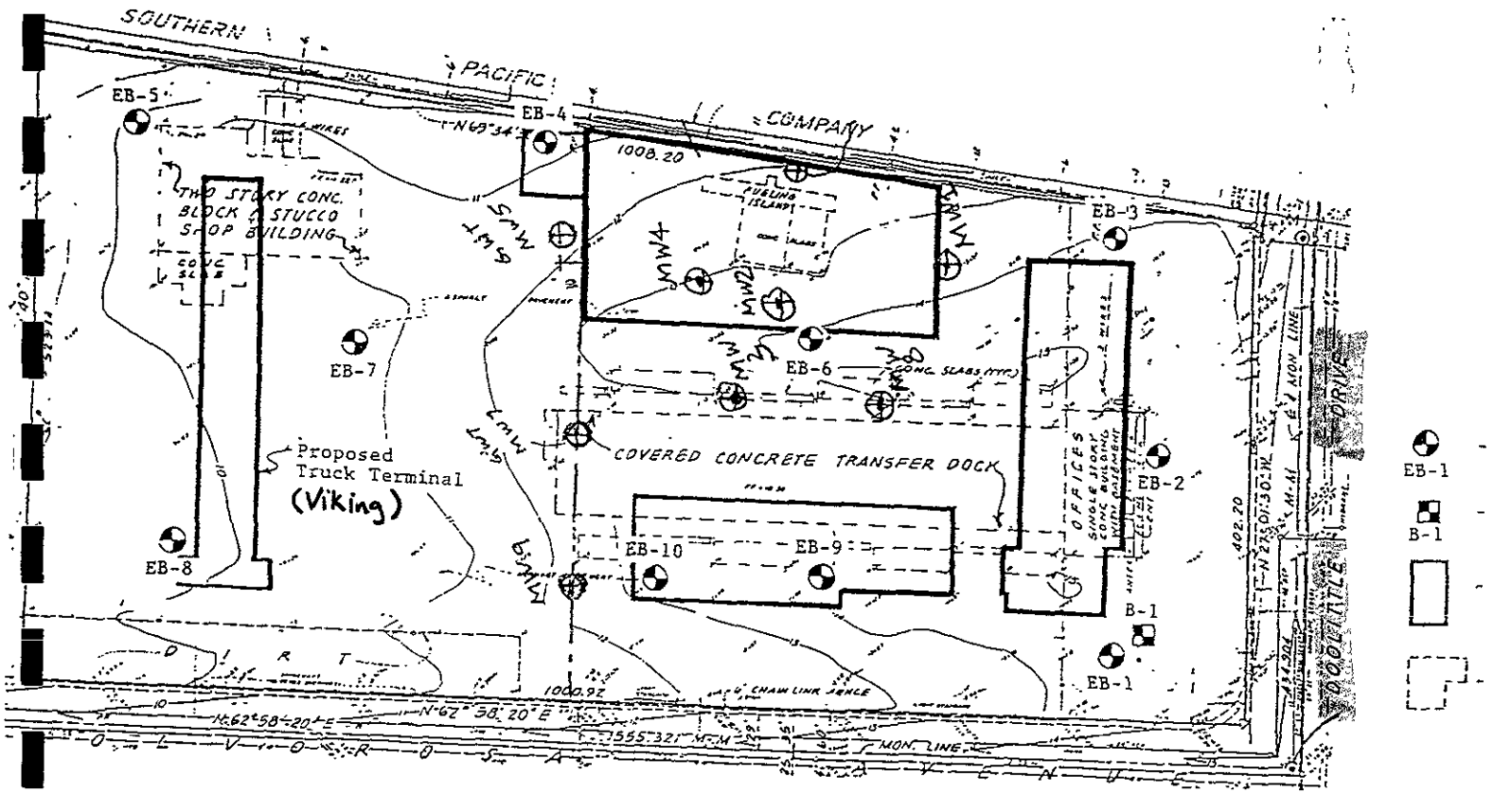
Polvorosa Business Park
1555 Doolittle Park
San Leandro, California

October 31, 1994
1204.00-001

Field Investigation Reports

1986 - 1988



Greiner Engineering, print titled "Topographic Survey, 1555 Doolittle Drive, City of San), Alameda County, California," Sheet 1, dated July 1986.

Donald E. Banta & Associates
Consulting Geotechnical Engineers

INDUSTRIAL DI
Sa

PROJECT NO
370-3A

DRILL RIG	Continuous Flight Auger	SURFACE ELEVATION	14 feet ±	LOGGED BY	GC
DEPTH TO GROUNDWATER	11.4 feet	BORING DIAMETER	6 inches	DATE DRILLED	7/16/86

DESCRIPTION AND REMARKS	COLOR	CONSIST.	SOIL TYPE	DEPTH (FEET)	SAMPLER	PENETRATION RESISTANCE (BLOWS/FT.)	WATER CONTENT (%)	DRY DENSITY (PCF)	SHEAR STRENGTH BY TORVANE (KSF)
1½ inches of Asphaltic Concrete									
SANDY CLAY - CLAYEY SAND, with rock fragments FILL	yellow brown	medium dense-v.stiff	SC-CL	1		38	13		
SILTY CLAY, with sand 1* - Plasticity Index = 30% Liquid Limit = 48% Passing #200 Sieve = 89%	black / dark brown	very stiff	CL-CH	2 3 4	1*	35	26	93	2.5
SANDY CLAY 2* - Passing #200 Sieve = 74%	brown	very stiff	CL	5 6 7 8	2*	29	18		2.7
SILTY SAND, clayey, fine-grained 3* - Passing #200 Sieve = 49% (gravelly below 10 feet)	gray brown mottled rust	medium dense	SM-SC	9 10 11 12 13	3*	10	25		
4* - Passing #200 Sieve = 19%				14 15 16	4*	13	18		
SILTY CLAY	gray	firm	CH	17 18 19 20		8	(no recovery)		

▽ ATD and 6½ hrs. AD

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EXPLORATORY BORING LOG

INDUSTRIAL DEVELOPMENT - 1555 DOOLITTLE DRIVE
San Leandro, California

PROJECT NO.	DATE	BORING NO.
370-3A	August 1986	EB-1

DRILL RIG	Continuous Flight Auger	SURFACE ELEVATION	14 feet ±	LOGGED BY	GC
DEPTH TO GROUNDWATER	11.4 feet	BORING DIAMETER	6 inches	DATE DRILLED	7/16/86

DESCRIPTION AND CLASSIFICATION				DEPTH (FEET)	SAMPLER	PENETRATION RESISTANCE (BLOWS/FT.)	WATER CONTENT (%)	DRY DENSITY (PCF)	SHEAR STRENGTH BY TORVANE (KSF)
DESCRIPTION AND REMARKS	COLOR	CONSIST	SOIL TYPE						
SILTY CLAY, with wood fragments	gray	firm	CH	21	x		49		
				22					
SILTY CLAY	gray-green	stiff	CL-CH	23					
				24		19	23		1.4
Bottom of Boring = 24.5 feet				25					
				26					
Note: "x" indicates location of disturbed auger sample				27					
				28					
				29					
				30					
				31					
				32					
				33					
				34					
				35					
				36					
				37					
				38					
				39					
				40					

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EXPLORATORY BORING LOG

INDUSTRIAL DEVELOPMENT - 1555 DOOLITTLE DRIVE
San Leandro, California

PROJECT NO.	DATE	BORING NO.
370-3A	August 1986	EB-1 (contd.)

DRILL RIG	Continuous Flight Auger	SURFACE ELEVATION	15 feet ±	LOGGED BY	GC
DEPTH TO GROUNDWATER	12.0 feet	BORING DIAMETER	6 inches	DATE DRILLED	7/16/86

DESCRIPTION AND REMARKS	COLOR	CONSIST.	SOIL TYPE	DEPTH (FEET)	SAMPLER	PENETRATION RESISTANCE (BLOWS/FT)	WATER CONTENT (%)	DRY DENSITY (PCF)	SHEAR STRENGTH BY TORVANE (KSF)
3 inches of Asphaltic Concrete									
CLAYEY SAND, with gravel-sized rock fragments 1* - Passing #200 Sieve = 38% FILL	yellow brown & green	medium dense	SC	1–2	1*	29	14		
SILTY CLAY	black	very stiff	CL-CH	3		16	25		
	dark brown			4–5		22	19	101	3.1
SANDY CLAY	brown	very stiff	CL	6–7					
CLAYEY SAND	brown	medium dense	SC	8–9			26		
CLAYEY SAND, with seashell fragments 2* - Passing #200 Sieve = 29%	dark brown	medium dense	SC	10	2*	11	18		
CLAYEY SAND	yellow brown	medium dense	SC	11–12			▽ 6 hrs. AD		
SILTY CLAY	gray with brown and green	stiff-very stiff	CL-CH	13–14		17	22		2.1
Bottom of Boring = 15.0 feet				15–20					

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EXPLORATORY BORING LOG

INDUSTRIAL DEVELOPMENT - 1555 DOOLITTLE DRIVE
San Leandro, California

PROJECT NO.	DATE	BORING NO.
370-3A	August 1986	EB-2

DRILL RIG	Continuous Flight Auger	SURFACE ELEVATION	14 feet ±	LOGGED BY	GC
DEPTH TO GROUNDWATER	10.8 feet	BORING DIAMETER	6 inches	DATE DRILLED	7/16/86

DESCRIPTION AND CLASSIFICATION				DEPTH (FEET)	SAMPLER	PENETRATION RESISTANCE (BLOWS/FT.)	WATER CONTENT (%)	DRY DENSITY (PCF)	SHEAR STRENGTH BY TORVANE (KSF)
DESCRIPTION AND REMARKS	COLOR	CONSIST.	SOIL TYPE						
2½ inches of Asphaltic Concrete									
CLAYEY SAND, very clayey 1* - Passing #200 Sieve = 47% FILL	orange brown & green	medium dense	SC (CL)	1	1*	24	16		
SILTY CLAY	black	very stiff	CL-CH	2					
				3		25	23		
	brown			4					
				5		26	23		2.2
SILTY CLAY, with fine sand	light brown	very stiff	CL	6					
				7					
				8					
CLAYEY SAND, with seashells	brown and dk. brn.	medium dense	SC	9		13	22	103	
CLAYEY SAND - SANDY CLAY	brown with gray	medium dense-stiff	SC-CL	10					1.5
				11			▽ 5½ hrs. AD		
				12					
				13					
SILTY CLAY, with fine sand	dark gray to gray	very stiff	CL	14		18	▽ ATD 21		2.1
				15					
				16					
SILTY CLAY, with very fine sand	gray-green with brown	stiff to very stiff	CL	17					
				18					
				19		18	23		2.0
				20					
Bottom of Boring = 20.0 feet									

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EXPLORATORY BORING LOG

INDUSTRIAL DEVELOPMENT - 1555 DOOLITTLE DRIVE
San Leandro, California

PROJECT NO.	DATE	BORING NO.
370-3A	August 1986	EB-3

DRILL RIG	Continuous Flight Auger	SURFACE ELEVATION	10 feet ±	LOGGED BY	GC
DEPTH TO GROUNDWATER	8.2 feet	BORING DIAMETER	6 inches	DATE DRILLED	7/16/86

DESCRIPTION AND REMARKS	COLOR	CONSIST.	SOIL TYPE	DEPTH (FEET)	SAMPLER	PENETRATION RESISTANCE (BLOWS/FT.)	WATER CONTENT (%)	DRY DENSITY (PCF)	SHEAR STRENGTH BY TORVANE (KSF)
2½ inches of Asphaltic Concrete									
CLAYEY SAND, with rock fragments FILL	yellow-brown / gray	dense	SC	1		37	11		
SILTY CLAY, sandy	black	very stiff	CL-CH	2 3		34	27	88	
CLAYEY SAND, gravelly 1* - Passing #200 Sieve = 19%	brown	medium dense	SC	4 5	1*	17	10		
CLAYEY SAND, fine-grained 2* - Passing #200 Sieve = 42% (gasoline/diesel odor) (saturated)	green / dark brown	loose	SC	6 7 8 9	2*	7	5 hrs. AD 24		
SANDY CLAY	brown	stiff	CL	10 11			31		
SILTY CLAY, with sand	dark gray to gray	stiff	CL-CH	12 13 14 15		22	22		1.5
Bottom of Boring = 15.0 feet				16 17 18 19 20					

Donald E. Banta & Associates
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EXPLORATORY BORING LOG

INDUSTRIAL DEVELOPMENT - 1555 DOOLITTLE DRIVE
San Leandro, California

PROJECT NO.	DATE	BORING NO.
370-3A	August 1986	EB-4

DRILL RIG	Continuous Flight Auger	SURFACE ELEVATION	10 feet ±	LOGGED BY	GC
DEPTH TO GROUNDWATER	7.5 feet	BORING DIAMETER	6 inches	DATE DRILLED	7/16/86

DESCRIPTION AND REMARKS	COLOR	CONSIST.	SOIL TYPE	DEPTH (FEET)	SAMPLER	PENETRATION RESISTANCE (BLOWS/FT)	WATER CONTENT (%)	DRY DENSITY (PCF)	SHEAR STRENGTH BY TORVANE (KSF)
2½ inches of Asphaltic Concrete									
SANDY CLAY, with rock fragments FILL 1* - Passing #200 Sieve = 70%	orange brown and gray	very stiff	CL	1	1*	28	16		
				2			16		
SILTY CLAY	black	very stiff	CL-CH	3		13			3.0
SANDY CLAY, silty	gray	stiff	CL	4		32	23	100	2.0
				5					
				6					
				7					
	gray with brown			8			▽ 5 hrs. AD		
				9					
2* - Passing #200 Sieve = 84%				10	2*	9	29		1.5
CLAYEY SAND	brown	medium dense	SC	11					
				12					
SILTY CLAY	dark gray to gray	stiff	CL-CH	13					
				14		24	25		2.1
				15					
				16					
				17					
SILTY CLAY	light gray with brown	firm	CL-CH	18					
				19		16	31		1.5
				20					
Bottom of Boring = 20.0 feet									

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EXPLORATORY BORING LOG

INDUSTRIAL DEVELOPMENT - 1555 DOOLITTLE DRIVE
San Leandro, California

PROJECT NO.	DATE	BORING NO.
370-3A	August 1986	EB-5

DRILL RIG	Continuous Flight Auger	SURFACE ELEVATION	14 feet ±	LOGGED BY	GC
DEPTH TO GROUNDWATER	11.0 feet	BORING DIAMETER	6 inches	DATE DRILLED	7/16/86

DESCRIPTION AND REMARKS	COLOR	CONSIST.	SOIL TYPE	DEPTH (FEET)	SAMPLER	PENETRATION RESISTANCE (BLOWS/FT.)	WATER CONTENT (%)	DRY DENSITY (PCF)	SHEAR STRENGTH BY TORVANE (KSF)
3½ inches of Asphaltic Concrete									
CLAYEY SAND - SANDY CLAY, with rock fragments 1* - Passing #200 Sieve = 51% FILL	orange brown and gray	medium dense	SC-CL	1 2	1*	31	17		
SILTY CLAY	black	very stiff	CL-CH	3		28	22 26	98	3.5
SILTY CLAY, with fine sand	brown	very stiff	CL	4 5		19			
SANDY CLAY	gray	stiff	CL	6 7 8					
SILTY AND CLAYEY SAND, interbedded (strong diesel odor) (hole caved at 11.5 feet)	gray	loose	SM-SC	9 10 11 12		5	18 13 ▽ 3 hrs. AD		
SILTY CLAY	dark gray	stiff	CL-CH	13 14		18	21		1.8
Bottom of Boring = 15.0 feet				15 16 17 18 19 20					

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EXPLORATORY BORING LOG

INDUSTRIAL DEVELOPMENT - 1555 DOOLITTLE DRIVE
San Leandro, California

PROJECT NO.	DATE	BORING NO	EB-6
370-3A	August 1986		

DRILL RIG	Continuous Flight Auger	SURFACE ELEVATION	11 feet ±	LOGGED BY	GC
DEPTH TO GROUNDWATER	7.8 feet	BORING DIAMETER	6 inches	DATE DRILLED	7/16/86

DESCRIPTION AND REMARKS	COLOR	CONSIST.	SOIL TYPE	DEPTH (FEET)	SAMPLER	PENETRATION RESISTANCE (BLOWS/FT.)	WATER CONTENT (%)	DRY DENSITY (PCF)	SHEAR STRENGTH BY TORVANE (KSF)
6 inches of Asphaltic Concrete									
SANDY CLAY - CLAYEY SAND, with rock fragments FILL	orange brown and gray	medium dense	CL-SC	1		21	12		
				2					
SILTY CLAY, with seashells	black	very stiff	CL-CH	3		24	28		2.0
				4			27	88	
				5		20			
SANDY CLAY	gray and brown	stiff to firm	CL	6					
				7					
				8			▽ 3 hrs. AD		
	brown			9			35		0.6
(with clayey sand lenses)				10		7	23		
	gray			11					
SILTY CLAY	dark gray to gray	stiff to very stiff	CL-CH	12					
				13					
				14		25	24		2.2
Bottom of Boring = 15.0 feet				15					
				16					
				17					
				18					
				19					
				20					

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EXPLORATORY BORING LOG

INDUSTRIAL DEVELOPMENT - 1555 DOOLITTLE DRIVE
San Leandro, California

PROJECT NO.	DATE	BORING NO.
370-3A	August 1986	EB-7

DRILL RIG	Continuous Flight Auger	SURFACE ELEVATION	10 feet ±	LOGGED BY	GC
DEPTH TO GROUNDWATER	7.0 feet	BORING DIAMETER	6 inches	DATE DRILLED	7/16/86

DESCRIPTION AND REMARKS	COLOR	CONSIST.	SOIL TYPE	DEPTH (FEET)	SAMPLER	PENETRATION RESISTANCE (BLOWS/FT.)	WATER CONTENT (%)	DRY DENSITY (PCF)	SHEAR STRENGTH BY TORVANE (KSF)
3½ inches of Asphaltic Concrete									
CLAYEY SAND, with rock fragments FILL	brown and gray	medium dense	SC	1					
				2		45	13	114	
SILTY CLAY	black	very stiff	CL-CH	3	1*	23	24		2.2
1* - Plasticity Index = 33% Liquid Limit = 49% Passing #200 Sieve = 85%	gray with brown			4					
				5		14	30		2.2
				6					
				7			▽ 2 hrs. AD		
SANDY CLAY, very fine-grained	brown	firm	CL	8					
				9			31		0.6
SILTY SAND 2* - Passing #200 Sieve = 28%	gray	loose	SM	10	2*	7	20		
SANDY CLAY	gray	firm	CL	11					
SILTY SAND	gray	loose	SM	12					
SILTY CLAY	dark gray	very stiff	CL-CH	13					
				14					
				15		28	26		2.2
				16					
				17					
SANDY CLAY	light gray	stiff	CL	18					
CLAYEY SAND, with gravel 3* - Passing #200 Sieve = 20%	gray	medium dense-dense	SC	19					
				20	3*	31	17		
Bottom of Boring = 20.0 feet									

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Consulting Geotechnical Engineers

EXPLORATORY BORING LOG

INDUSTRIAL DEVELOPMENT - 1555 DOOLITTLE DRIVE
San Leandro, California

PROJECT NO.	DATE	BORING NO.
370-3A	August 1986	EB-8

DRILL RIG	Continuous Flight Auger	SURFACE ELEVATION	14 ± feet	LOGGED BY	GC
DEPTH TO GROUNDWATER	10.8 feet	BORING DIAMETER	6 inches	DATE DRILLED	7/16/86

DESCRIPTION AND REMARKS	COLOR	CONSIST.	SOIL TYPE	DEPTH (FEET)	SAMPLER	PENETRATION RESISTANCE (BLOWS/FT.)	WATER CONTENT (%)	DRY DENSITY (PCF)	SHEAR STRENGTH BY TORVANE (KSF)
3 inches of Asphaltic Concrete									
SANDY CLAY 1* - Passing #200 Sieve = 76%	yellow brown	very stiff	CL	1	1*	36	16		
CLAYEY SAND - SANDY CLAY FILL 2* - Passing #200 Sieve = 49%	gray	medium dense	SC-CL	2	2*	25	12		
SILTY CLAY, with scattered sea-shells	black	stiff	CL-CH	3 4 5		25	23	92	2.0
SANDY CLAY (with clayey sand lenses)	gray	firm	CL	6 7 8 9 10		8	24		0.8
CLAYEY SAND 3* - Passing #200 Sieve = 26%	gray brown	loose	SC	11 12	x 3*		▽ 1 hr. AD 19		
SILTY CLAY	dark gray	stiff	CL-CH	13 14 15		22	30		1.5
Bottom of Boring = 15.0 feet Note: "x" indicates location of disturbed auger sample				16 17 18 19 20					

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Consulting Geotechnical Engineers

EXPLORATORY BORING LOG

INDUSTRIAL DEVELOPMENT - 1555 DOOLITTLE DRIVE
San Leandro, California

PROJECT NO.	DATE	BORING NO.
370-3A	August 1986	EB-9

DRILL RIG	Continuous Flight Auger	SURFACE ELEVATION	13 feet ±	LOGGED BY	GC
DEPTH TO GROUNDWATER	12.0 feet	BORING DIAMETER	6 inches	DATE DRILLED	7/16/86

DESCRIPTION AND REMARKS	COLOR	CONSIST.	SOIL TYPE	DEPTH (FEET)	SAMPLER	PENETRATION RESISTANCE (BLOWS/FT.)	WATER CONTENT (%)	DRY DENSITY (PCF)	SHEAR STRENGTH BY TORVANE (KSF)
4 inches of Asphaltic Concrete									
SANDY CLAY - CLAYEY SAND, with rock fragments FILL	brown and gray	medium dense-very stiff	CL-SC	1		47	19	110	
				2					
SILTY CLAY	black	very stiff	CL-CH	3		26	11		
				4		19	26		2.2
SILTY CLAY, with very fine sand	gray and brown	stiff to firm	CL	5					
				6					
				7					
				8					
1* - Passing #200 Sieve = 91%				9	1*	8	26		1.0
				10					
				11					
CLAYEY SAND - SANDY CLAY	brown	loose-firm	SC-CL	12			▽ ½ hr. AD		
2* - Passing #200 Sieve = 51%				13	x2*		24		
SILTY CLAY	dark gray	stiff	CL-CH	14					
				15		18	26		2.2
Note: "x" indicates location of disturbed auger sample				16					
				17					
				18					
				19		18	29		2.2
				20					
Bottom of Boring = 20.0 feet									

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Consulting Geotechnical Engineers

EXPLORATORY BORING LOG

INDUSTRIAL DEVELOPMENT - 1555 DOOLITTLE DRIVE
San Leandro, California

PROJECT NO.	DATE	BORING NO.
370-3A	August 1986	EB-10

BLAINE
TECH SERVICES

P.O. BOX 5745
SAN JOSE, CA 95150
(408) 723-3974

September 22, 1986

Pearson Equipment Company
614 West Julian
San Jose, CA 95126

Attention: Dale Doshack

Re: Field sampling at 1555 Doolittle Drive
San Leandro, CA
on
September 19, 1986

SAMPLING REPORT

Sampling was performed in accordance with approved methodology at the locations shown on the accompanying site diagram. The lab numbers assigned to the samples are given on the site diagram. Samples were collected in appropriate containers, which were sealed, chilled and transported to the laboratory for analysis. Analytical services were provided by Sequoia Analytical Laboratory and Soil And Water Laboratory with a separate reports referencing their lab numbers.

Tanks

age -- unspecified

type -- ~~four 10,000 gallon diesel~~ 2 x 3000 gal. x 5000 mtr a

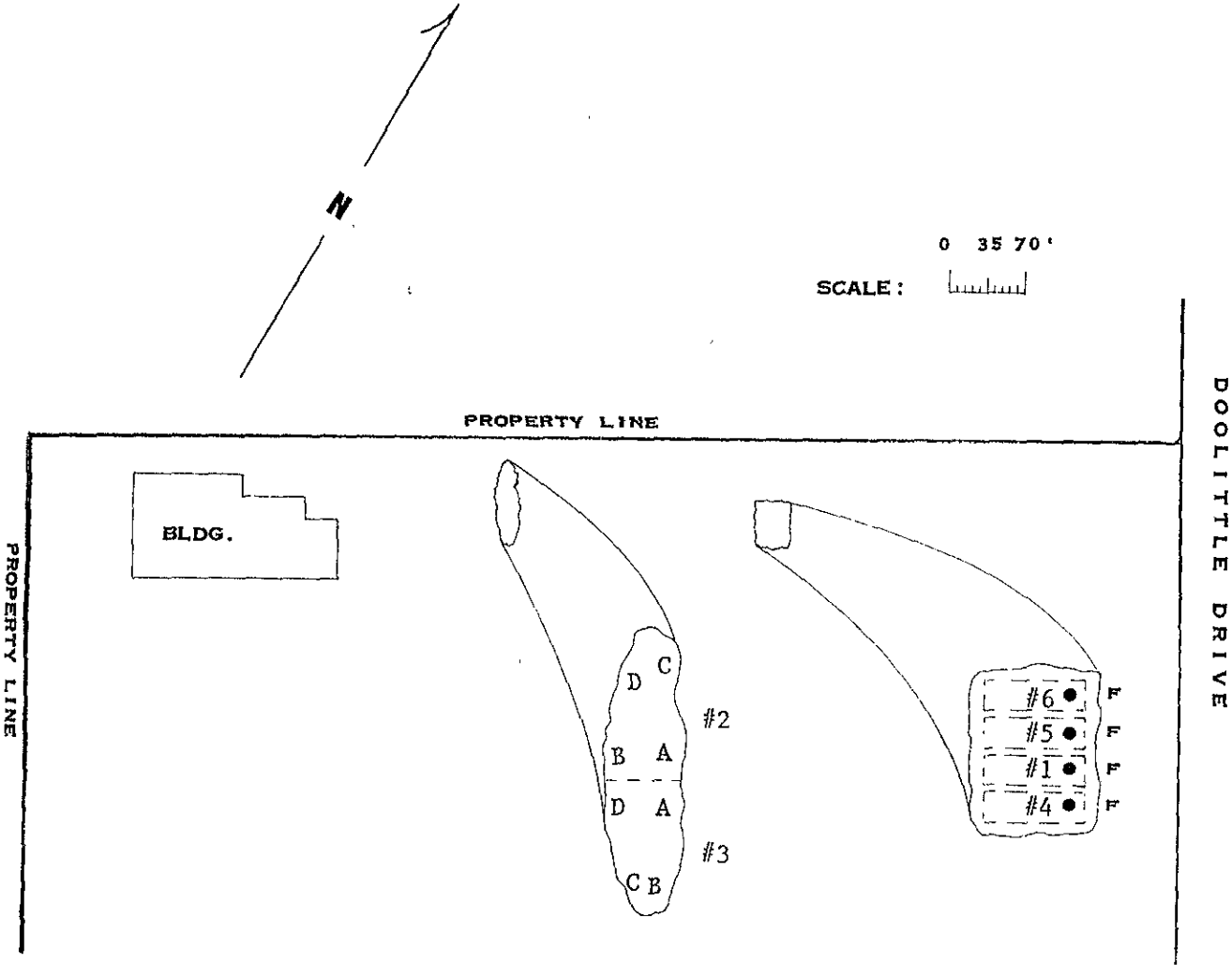
reason for removal -- discontinuation of on site storage

Reportage

Submission to the Regional Water Quality Control Board and the Fire Department should include copies of both the sampling report and the laboratory reports. The property owner should attach a cover letter and submit all documents together in a package.

BLAINE
TECH SERVICES

SAMPLING REPORT 86262F2 9-19-86 PEARSON EQUIPMENT, 1555 DOOLITTLE DRIVE, SAN LEANDRO, CA



MAP REF: THOMAS BROS.
CONTRA COSTA
P. 24 E-1

LEGEND: F = FILL END

#1 RECHARGE WATER SAMPLE FROM 11'6" BELOW SURFACE ANALYSIS FOR DIESEL, BENZENE, TOLUENE AND XYLENE AT SEQUOIA ANALYTICAL LABORATORY
SEQUOIA LAB NO. 6091332

#2 STOCKPILE SOIL COMPOSITE FROM SAMPLE POINTS A-D AT 6-8" BELOW SURFACE
ANALYSIS FOR DIESEL AT SOIL AND WATER LABORATORY
S & W LAB NO. 262B6-9

#3 STOCKPILE SOIL COMPOSITE FROM SAMPLE POINTS A-D AT 6-8" BELOW SURFACE
ANALYSIS FOR DIESEL AT SOIL AND WATER LABORATORY
S & W LAB NO. 262B6-10

#4 RECHARGE WATER SAMPLE FROM 11'6" BELOW SURFACE
ANALYSIS FOR DIESEL, BENZENE TOLUENE AND XYLENE AT SEQUOIA ANALYTICAL LABORATORY
SEQUOIA LAB NO. 6091333

#5 RECHARGE WATER SAMPLE FROM 11'6" BELOW SURFACE
ANALYSIS FOR DIESEL, BENZENE TOLUENE AND XYLENE AT SEQUOIA ANALYTICAL LABORATORY
SEQUOIA LAB NO. 6091334

#6 RECHARGE WATER SAMPLE FROM 11'6" BELOW SURFACE
ANALYSIS FOR DIESEL, BENZENE TOLUENE AND XYLENE AT SEQUOIA ANALYTICAL LABORATORY
SEQUOIA LAB NO. 6091335

SAMPLING PERFORMED BY
FRANK A. CLINE

DIAGRAM PREPARED BY
TAMMIE STALLINGS

Tammie Stallings

The following addresses have been listed here for your convenience:

Water Quality Control Board
San Francisco Bay Region
1111 Jackson Street
Room 6040
Oakland, CA 94607
ATTN: Dale Bowyer

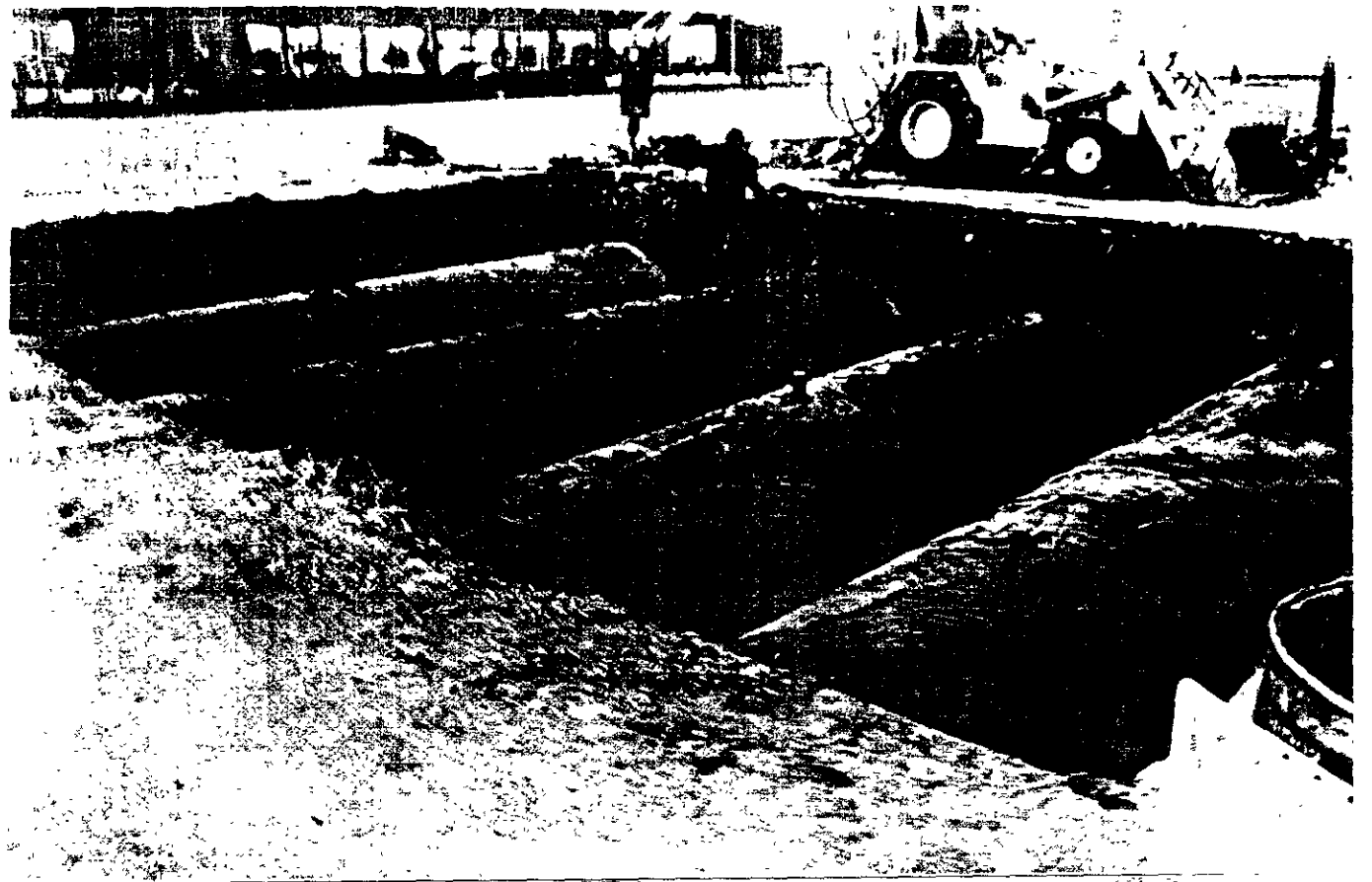
Alameda County Health
Hazardous Materials Management
Oakland, Ca 94612
Attn: Edgar Howell

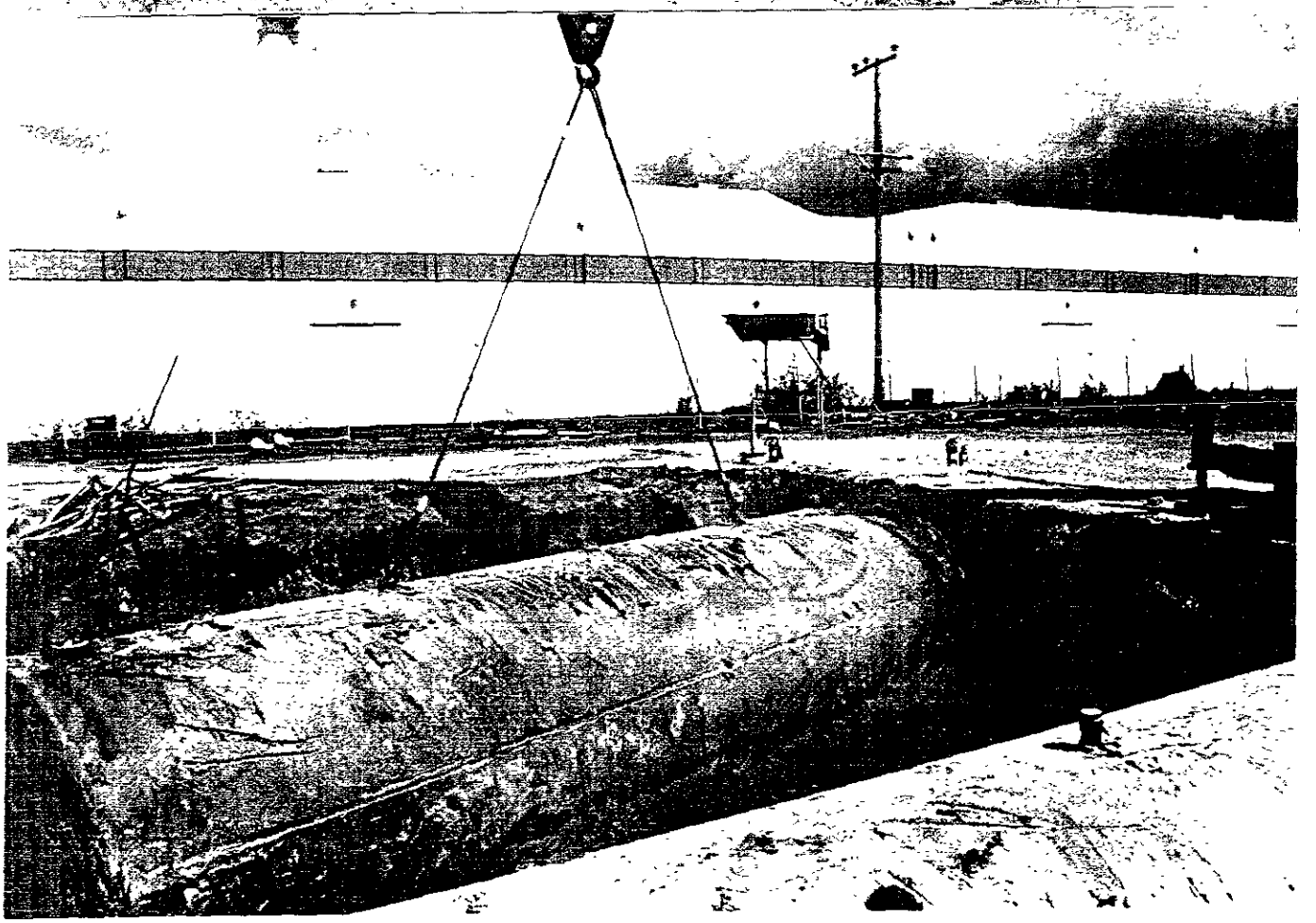
San Leandro Fire Department
835 East 14th St.
San Leandro, Ca 94577
ATTN: Richard Soloman

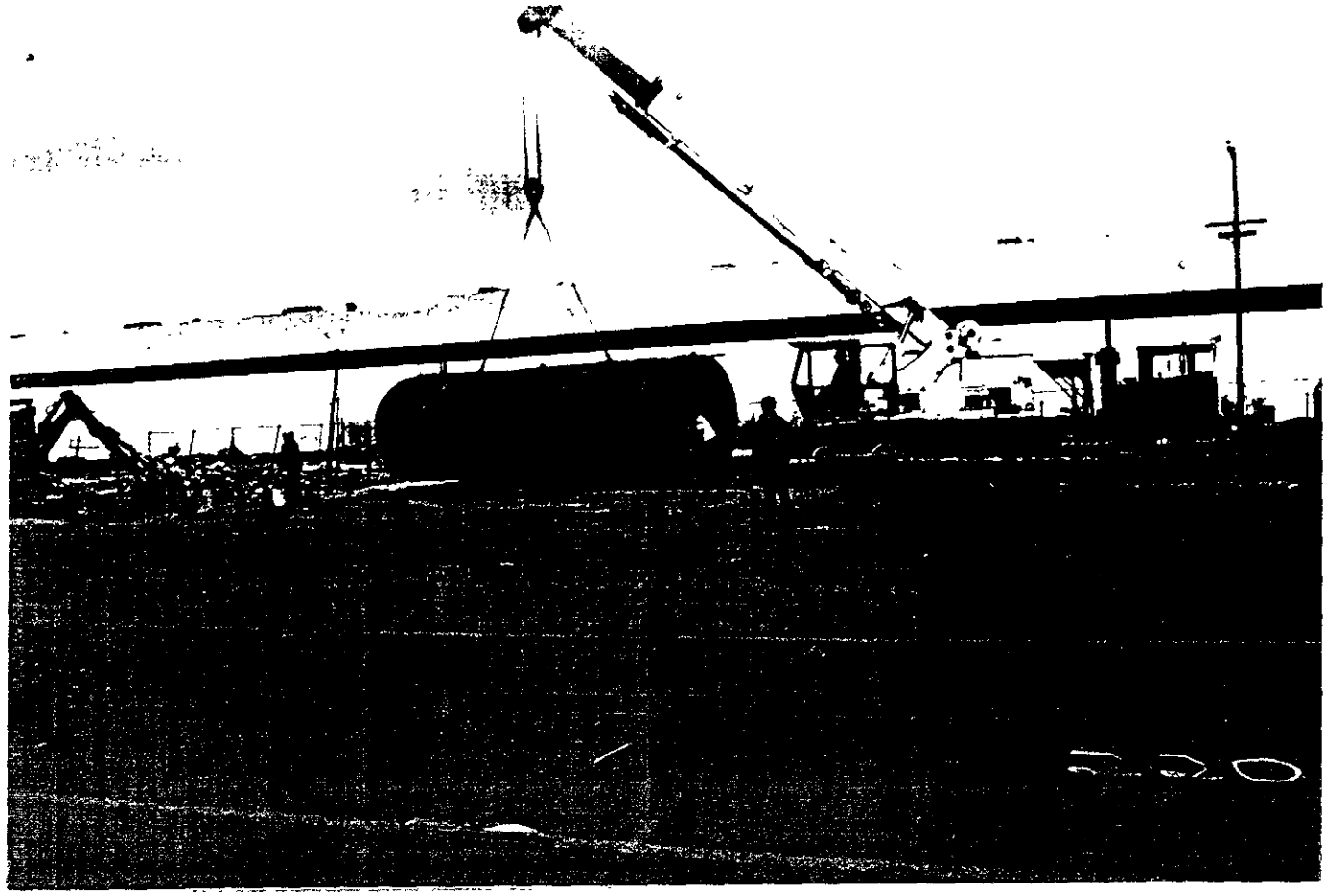
If I can be of any further assistance, please call.

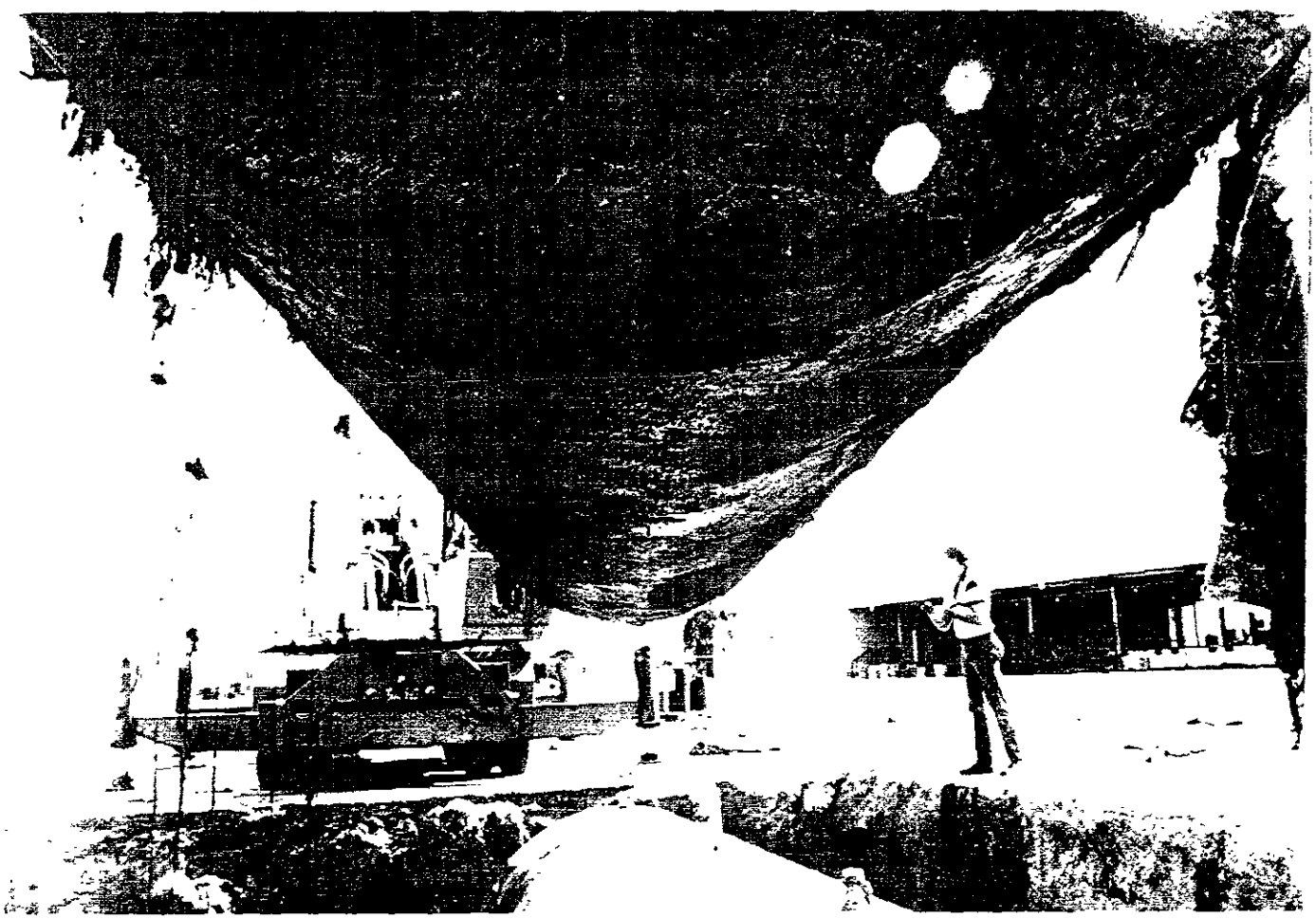
Richard C. Blaine

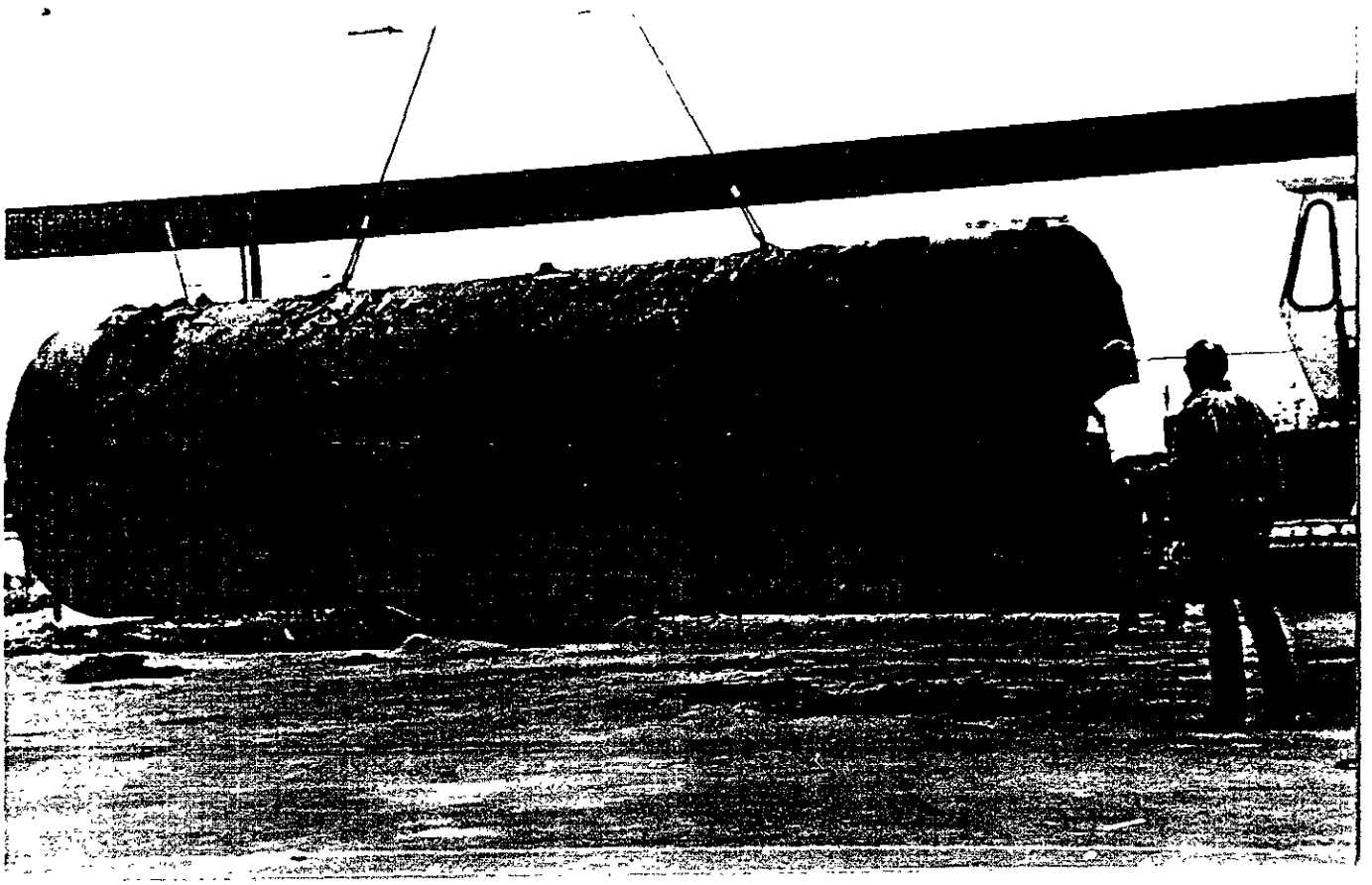
RCB/tls

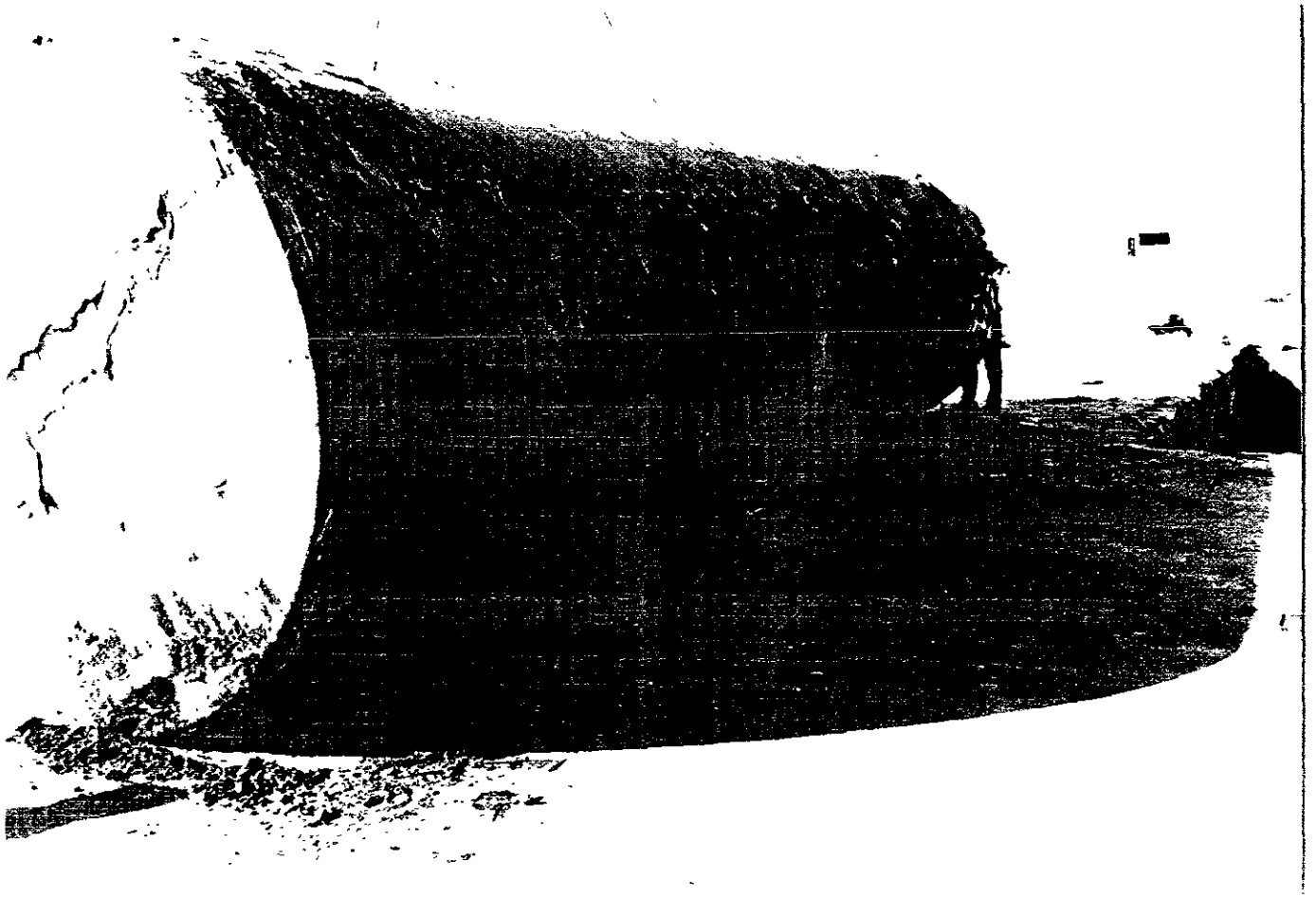


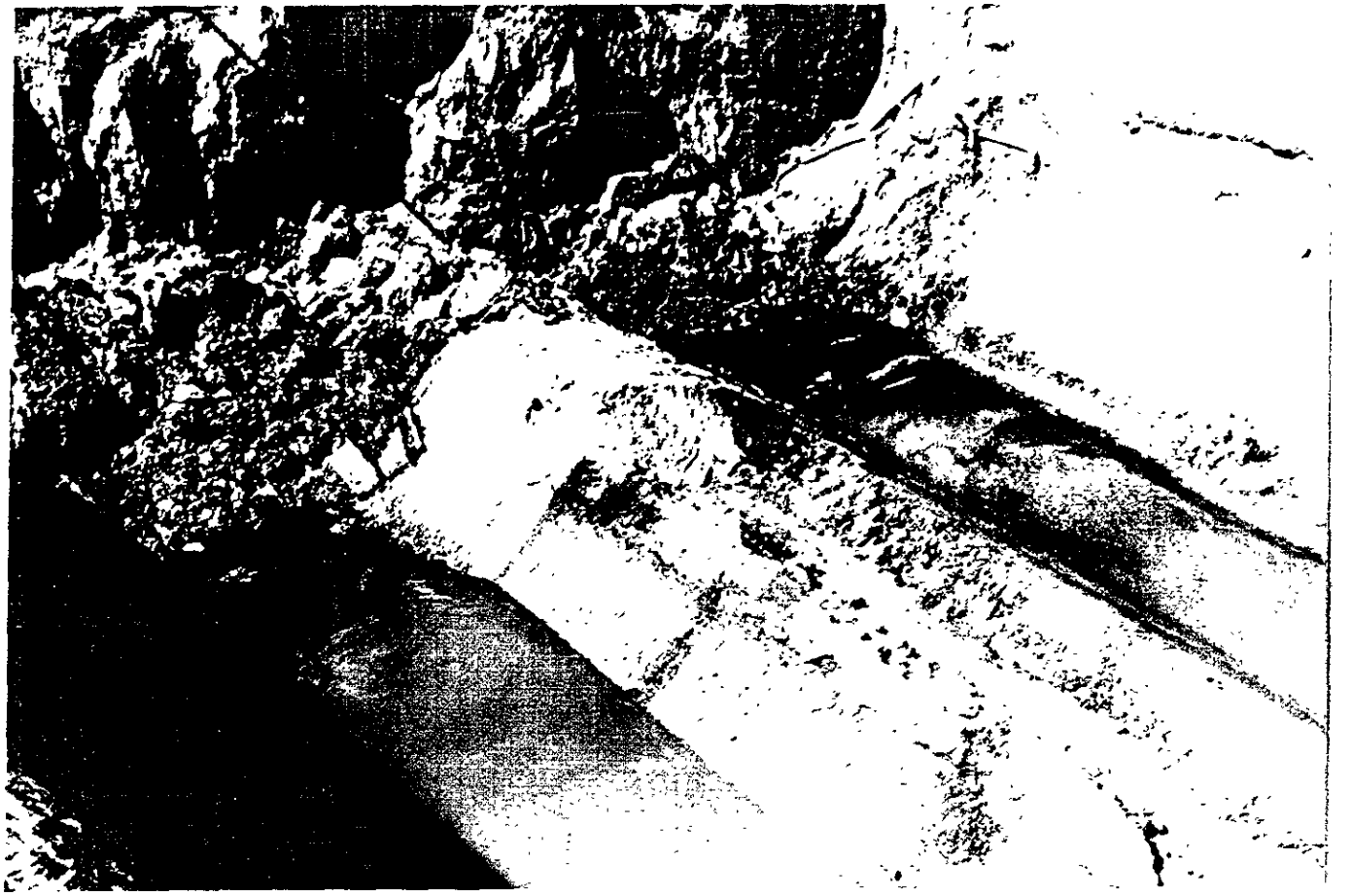


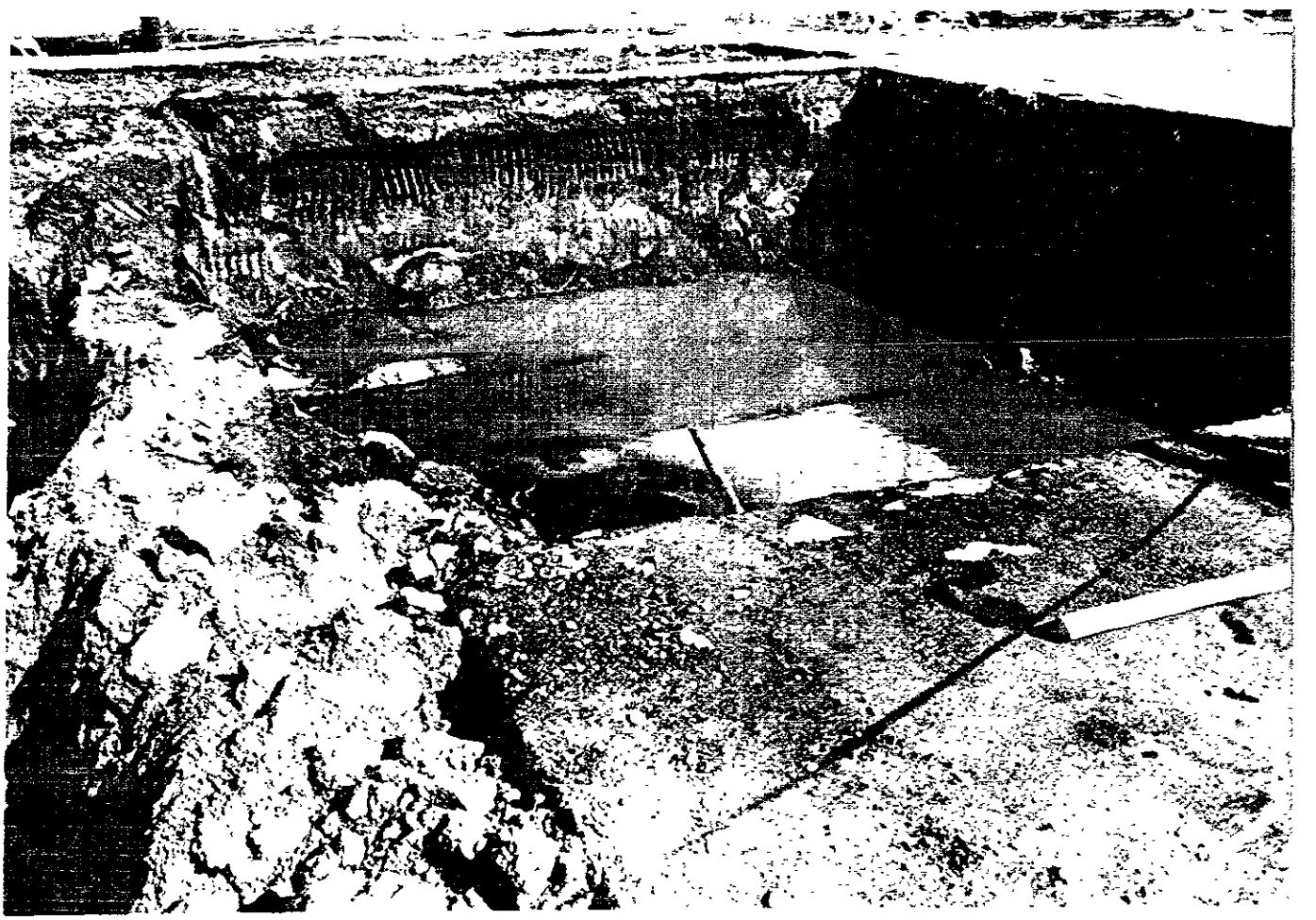












SEQ

BLAINE TECH SERVICES

P.O. BOX 5745
SAN JOSE, CA 95150
(408) 723-3974

Include ALL of the following designation in lab reports and invoices

86262 F2

Pearson Equip
1555 Doolittle
San Leandro

EVERYTHING written above this line is the project designation

Field sampling completed 11:45 hrs. 9-19-86 performed by [signature]

RELEASED BY		ACCEPTED BY	
1:45 hrs. 9-19-86	[signature]	1:45 hrs. 9-19-86	[signature]
2:33 hrs. 9-19-86	[signature]	2:35 hrs. - -86	[signature]
: hrs. - -86		: hrs. - -86	
: hrs. - -86		: hrs. - -86	

I.D.	TYPE	ANALYSIS	LAB #	PRELIMS	FINAL
#1	Liquid	Diesel/BTX	6091332		
#4	"	"	6091333		
#5	"	"	6091334		
#6	"	"	6091335		

TURN AROUND Routine

REPORT TO: Blaine Tech Services

Attn

Phone

BILLING INVOICE TO:

Attn

Verbal/Ref PO From:

cc BLAINE TECH SERVICES (always)
cc OTHER:

SPECIAL INSTRUCTIONS

( ) Phone results to BTS
( ) Phone results to client direct

BLAINE TECH SERVICES

P.O. BOX 6745
SAN JOSE, CA 95150
(408) 723-8974

Include ALL of the following designation in lab reports and invoices

86262F2 PEARSON EQUIP. AT 1555 DOOLITTLE SAN LEANDRO

EVERYTHING written above this line is the project designation

Field sampling completed 11:45 hrs. 9-19-86 performed by

RELEASED BY		ACCEPTED BY	
1:46 hrs. 9-19-86		1:47 hrs. 9-19-86	
5:25 hrs. 9-19-86		5:25 hrs. 9-19-86	
: hrs. - -86		: hrs. - -86	
: hrs. - -86		: hrs. - -86	

Stack p. 165

I.D.	TYPE	ANALYSIS	LAB #	PRELIMS	FINAL
COMPOSITE #2 A THROUGH D	SOIL	DIESEL	262B6-9		
COMPOSITE #3 A THROUGH D	SOIL	DIESEL	262B6-10		

TURN AROUND ROUTINE (10 DAYS)

REPORT TO: BLAINE TECH SERVICES

Attn
Phone

BILLING INVOICE TO: SAME

Attn
Verbal/Ref PO From:

cc BLAINE TECH SERVICES (always)
cc OTHER:

SPECIAL INSTRUCTIONS COMPOSITE #2 A, #2B, #2D AND RUN ONE ANALYSIS #3A, #3B, #3D AND RUN ONE ANALYSIS

( ) Phone results to BTS
( ) Phone results to client direct

SEQUOIA Analytical Laboratory
2549 Middlefield Road
Redwood City, CA 94063 • (415) 364-9222

Blaine Tech Services
P.O. Box 5745
San Jose, CA 95150
Attn: Richard Blaine

Date Sampled: 09/19/86
Date Received: 09/19/86
Date Reported: 10/03/86

Sample Number
6091332

Sample Description
BTS #86262F2, Liquid #1 - Pearson Equip. at 1555 Dolittle in San Leandro

ANALYSIS

Diesel, ppm	19

NOTE: Analysis was performed using EPA methods 3510 and 8015.

SEQUOIA ANALYTICAL LABORATORY

Arthur G. Burton
Laboratory Director

sls

SEQUOIA Analytical Laboratory
2549 Middlefield Road
Redwood City, CA 94063 • (415) 364-9222

Blaine Tech Services
P.O. Box 5745
San Jose, CA 95150
Attn: Richard Blaine

Date Sampled: 09/19/86
Date Received: 09/19/86
Date Reported: 10/03/86

Sample Number	Sample Description
6091332	BTS #86262F2, Liquid #1 - Pearson Equip. at 1555 Dolittle in San Leandro

ANALYSIS

Benzene, ppm	< 0.001
Toluene, ppm	< 0.001
Xylenes, ppm	< 0.001

NOTE: Analysis was performed using EPA methods 3510 and 8015.

SEQUOIA ANALYTICAL LABORATORY

Arthur G. Burton
Laboratory Director

sls

SEQUOIA Analytical Laboratory
2549 Middlefield Road
Redwood City, CA 94063 • (415) 364-9222

Blaine Tech Services
P.O. Box 5745
San Jose, CA 95150
Attn: Richard Blaine

Date Sampled: 09/19/86
Date Received: 09/19/86
Date Reported: 10/03/86

Sample Number	Sample Description
6091333	BTS #86262F2, Liquid #2 - Pearson Equip. at 1555 Dolittle in San Leandro

ANALYSIS

Diesel, ppm	12

NOTE: Analysis was performed using EPA methods 3510 and 8015.

SEQUOIA ANALYTICAL LABORATORY

Arthur G. Burton
Laboratory Director

sls

SEQUOIA Analytical Laboratory
2549 Middlefield Road
Redwood City, CA 94063 • (415) 364-9222

Blaine Tech Services
P.O. Box 5745
San Jose, CA 95150
Attn: Richard Blaine

Date Sampled: 09/19/86
Date Received: 09/19/86
Date Reported: 10/03/86

Sample Number	Sample Description
6091333	BTS #86262F2, Liquid #2 - Pearson Equip. at 1555 Dolittle in San Leandro

ANALYSIS

Benzene, ppm	< 0.001
Toluene, ppm	< 0.001
Xylenes, ppm	< 0.001

NOTE: Analysis was performed using EPA methods 3510 and 8015.

SEQUOIA ANALYTICAL LABORATORY

Arthur G. Burton
Laboratory Director

sls

SEQUOIA Analytical Laboratory
2549 Middlefield Road
Redwood City, CA 94063 • (415) 364-9222

Blaine Tech Services
P.O. Box 5745
San Jose, CA 95150
Attn: Richard Blaine

Date Sampled: 09/19/86
Date Received: 09/19/86
Date Reported: 10/03/86

Sample Number	Sample Description
6091334	BTS #86262F2, Liquid #3 - Pearson Equip. at 1555 Dolittle in San Leandro

ANALYSIS

Diesel, ppm	34

NOTE: Analysis was performed using EPA methods 3510 and 8015.

SEQUOIA ANALYTICAL LABORATORY

Arthur G. Burton
Laboratory Director

sls

SEQUOIA Analytical Laboratory
2549 Middlefield Road
Redwood City, CA 94063 • (415) 364-9222

Blaine Tech Services
P.O. Box 5745
San Jose, CA 95150
Attn: Richard Blaine

Date Sampled: 09/19/86
Date Received: 09/19/86
Date Reported: 10/03/86

Sample Number	Sample Description
6091334	BTS #86262F2, Liquid #3 - Pearson Equip. at 1555 Dolittle in San Leandro

ANALYSIS

Benzene, ppm	< 0.001
Toluene, ppm	< 0.001
Xylenes, ppm	< 0.001

NOTE: Analysis was performed using EPA methods 3510 and 8015.

SEQUOIA ANALYTICAL LABORATORY

Arthur G. Burton
Laboratory Director

sls

SEQUOIA Analytical Laboratory
2549 Middlefield Road
Redwood City, CA 94063 • (415) 364-9222

Blaine Tech Services
P.O. Box 5745
San Jose, CA 95150
Attn: Richard Blaine

Date Sampled: 09/19/86
Date Received: 09/19/86
Date Reported: 10/03/86

Sample Number	Sample Description
6091335	BTS #86262F2, Liquid #4 - Pearson Equip. at 1555 Dolittle in San Leandro

ANALYSIS

Diesel, ppm	7.7

NOTE: Analysis was performed using EPA methods 3510 and 8015.

SEQUOIA ANALYTICAL LABORATORY

Arthur G. Burton
Laboratory Director

sls

SEQUOIA Analytical Laboratory
2549 Middlefield Road
Redwood City, CA 94063 • (415) 364-9222

Blaine Tech Services
P.O. Box 5745
San Jose, CA 95150
Attn: Richard Blaine

Date Sampled: 09/19/86
Date Received: 09/19/86
Date Reported: 10/03/86

Sample Number	Sample Description
6091335	BTS #86262F2, Liquid #4 - Pearson Equip. at 1555 Dolittle in San Leandro

ANALYSIS

Benzene, ppm	< 0.001
Toluene, ppm	< 0.001
Xylenes, ppm	< 0.001

NOTE: Analysis was performed using EPA methods 3510 and 8015.

SEQUOIA ANALYTICAL LABORATORY

Arthur G. Burton
Laboratory Director

sls

S&W
SOIL AND WATER
LABORATORY
Soil Fertility—Plant Tissue
Pollution and Residue Control
Drinking Water

14072 W. Park Avenue
Boulder Creek, CA 95006

(408) 338-3053

September 29, 1986

stock pile

Blaine Tech Services
P.O. Box 5745
San Jose, California 95150

Pearson Equip.
1555 Doolittle
San Leandro, CA

LABORATORY REPORT

Total Hydrocarbon Analysis Diesel Fuel

Procedure: EPA Method 3550 with modifications

Detection Limit: 1 ppm

Received: September 19, 1986

Analyzed: September 29, 1986

S&W ID	Client ID	Concentration ppm
262B6-9	86262F2 2 soil, diesel	7179
262B6-10	86262F2 3 soil, diesel	17,544

Analyst

R. A. Lemon

R.A. Lemon

BLAINE
TECH SERVICES

P.O. BOX 5745
SAN JOSE, CA 95150
(408) 723-3974

September 26, 1986

Pearson Equipment Company
614 West Julian
San Jose, CA 95126

Attention: Dale Doshack

Re: Field sampling at 1555 Doolittle Drive
San Leandro, CA
on
September 22, 1986

SAMPLING REPORT

Sampling was performed in accordance with approved methodology at the locations shown on the accompanying site diagram. The lab numbers assigned to the samples are given on the site diagram. Samples were collected in appropriate containers, which were sealed, chilled and transported to the laboratory for analysis. Analytical services were provided by Sequoia Analytical Laboratory with a separate report referencing their lab numbers.

Tanks

age -- unspecified

type -- ~~four 10,000 gallon diesel~~ 2 x 10,000 gal gas
1 x 5000 " mtr oil
2 x 3000 " w.o.

reason for removal -- discontinuation of on site storage

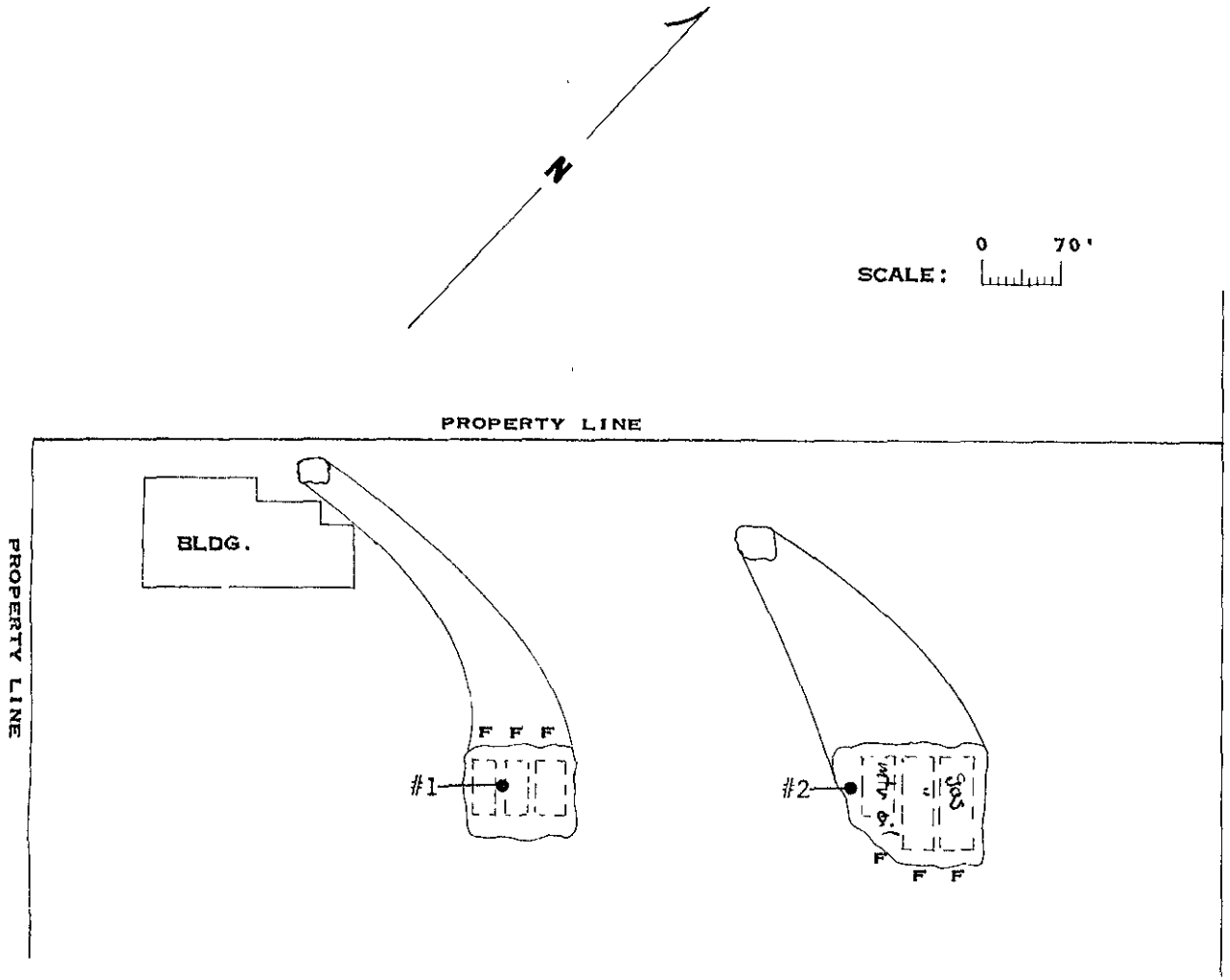
1 x (unk) mtr oil

Reportage

Submission to the Regional Water Quality Control Board and the Fire Department should include copies of both the sampling report and the laboratory report. The property owner should attach a cover letter and submit all documents together in a package.

BLAINE
TECH SERVICES

SAMPLING REPORT 86265B1 9-22-86 PEARSON EQUIPMENT, 1555 DOOLITTLE DR., SAN LEANDRO, CA



MAP REF: THOMAS BROS. CONTRA COSTA COUNTY P. 24 E-1

LEGEND: F = FILL END

#1 SUBSURFACE WATER SAMPLE ANALYSIS FOR WASTE OIL (GRAVIMETRIC) AT SEQUOIA ANALYTICAL LABORATORY SEQUOIA LAB NO. 6091383

#2 SUBSURFACE WATER SAMPLE ANALYSIS FOR MOTOR OIL (GRAVIMETRIC) AND BTX (P.I.D./602) SEQUOIA LAB NO. 6091384

SAMPLING PERFORMED BY RICHARD C. BLAINE

DIAGRAM PREPARED BY TAMMIE STALLINGS

Tammie Stallings

The following addresses have been listed here for your convenience:

Water Quality Control Board
San Francisco Bay Region
1111 Jackson Street
Room 6040
Oakland, CA 94607
ATTN: Dale Bowyer

Alameda County Health
Hazardous Materials Management
Oakland, Ca 94612
Attn: Edgar Howell

San Leandro Fire Department
835 East 14th St.
San Leandro, Ca 94577
ATTN: Richard Soloman

If I can be of any further assistance, please call.

Richard C. Blaine

RCB/tls

SEQ

BLAINE TECH SERVICES

P.O BOX 5745
SAN JOSE, CA 95150
(408) 723-3974

Include ALL of the following designation in lab reports and invoices
#86265B1
PEARSON EQUIPMENT AT 1555 DOLITTLE DR SAN LEANDRO, CA
EVERYTHING written above this line is the project designation

Field sampling completed 19:10 hrs. 9-22-86 performed by

RELEASED BY		ACCEPTED BY	
20:30 hrs. 9-22-86	BTS Trailer	12:50 hrs. 9-23-86	
12:50 hrs. 9-23-86		12:50 hrs. 9-23-86	
14:30 hrs. 9-23-86		14:30 hrs. 9-23-86	
: hrs. - -86		: hrs. - -86	

	I.D.	TYPE	ANALYSIS	LAB #	PRELIMS	FINAL
#1		WATER	WASTE OIL (GRAVIMETRIC)	609383		3%
#2		WATER	MOTOR OIL (G-RAV.) BTX (8010/602)	609384		180 ppm
				B. .34		
				T. .096		
				X <0.001		

TURN AROUND ROUTINE 24 HR

REPORT TO:
BLAINE TECH SERVICES

Attn
Phone

BILLING INVOICE TO:
SAME

Attn
Verbal/Ref PO From:

cc BLAINE TECH SERVICES (always)
cc OTHER:

SPECIAL INSTRUCTIONS

( ) Phone results to BTS
( ) Phone results to client direct

SEQUOIA Analytical Laboratory

2549 Middlefield Road
Redwood City, CA 94063 • (415) 364-9222

Blaine Tech Services
P.O. Box 5745
San Jose, CA 95150
Attn: Richard Blaine

Date Sampled: 09/22/86
Date Received: 09/23/86
Date Reported: 09/25/86

Sample Number
6091383

Sample Description
BTS #86265B1, Water #1 - Pearson Equipment at 1555 Dolittle Dr. in San Leandro

ANALYSIS

Waste Oil, ppm	36

NOTE: Analysis was performed using EPA extraction method 3550. The extracting solvent was 1,1,2-Trichloro-1,2,2-trifluoromethane. Residue oil was measured gravimetrically.

SEQUOIA ANALYTICAL LABORATORY

Arthur G. Burton
Laboratory Director

sls

SEQUOIA Analytical Laboratory

2549 Middlefield Road
Redwood City, CA 94063 • (415) 364-9222

Blaine Tech Services
P.O. Box 5745
San Jose, CA 95150
Attn: Richard Blaine

Date Sampled: 09/22/86
Date Received: 09/23/86
Date Reported: 09/25/86

Sample Number
6091384

Sample Description
BTS #86265B1, Water #2 - Pearson Equipment at 1555 Dolittle Dr. in San Leandro

ANALYSIS

Motor Oil, ppm	180

SEQUOIA ANALYTICAL LABORATORY

Arthur G. Burton
Laboratory Director

sls

SEQUOIA Analytical Laboratory

2549 Middlefield Road
Redwood City, CA 94063 • (415) 364-9222

Blaine Tech Services
P.O. Box 5745
San Jose, CA 95150
Attn: Richard Blaine

Date Sampled: 09/22/86
Date Received: 09/23/86
Date Reported: 09/25/86

Sample Number
6091384

Sample Description
BTS #86265B1, Water #2
Pearson Equipment at 1555
Dolittle Dr. in San Leandro

ANALYSIS

Benzene, ppm	0.34
Toluene, ppm	0.096
Xylenes, ppm	< 0.001

NOTE: Analysis was performed using EPA methods 5030 and 602.

SEQUOIA ANALYTICAL LABORATORY

Arthur G. Burton
Laboratory Director

gls

BLAINE
TECH SERVICES

P.O. BOX 5745
SAN JOSE, CA 95150
(408) 723-3974

September 30, 1986

Pearson Equipment Company
614 West Julian
San Jose, CA 95126

Attention: Dale Doshack

Re: Field ~~sampling~~ resampling at 1555 Doolittle Drive
San Leandro, CA
on
September 24, 1986

SAMPLING REPORT

Sampling was performed in accordance with approved methodology at the location shown on the accompanying site diagram. The lab number assigned to the sample is given on the site diagram. The sample was collected in the appropriate container, which was sealed, chilled and transported to the laboratory for analysis. Analytical services were provided by Sequoia Analytical Laboratory with a separate report referencing their lab number.

Tanks

age -- unspecified

type -- ~~four 10,000 gallon diesel~~

reason for removal -- discontinuation of on site storage

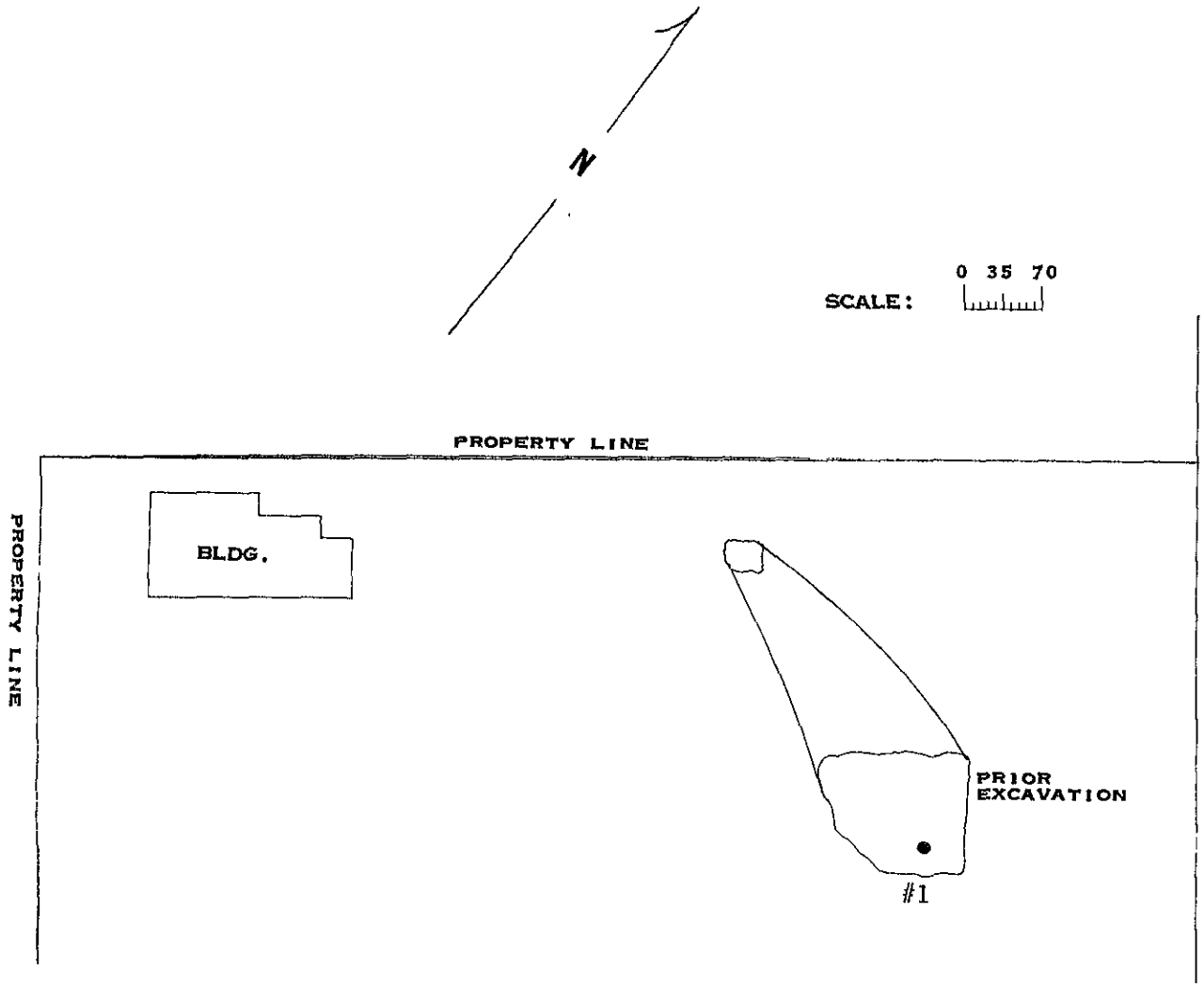
Reportage

Submission to the Regional Water Quality Control Board and the Fire Department should include copies of both the sampling report and the laboratory report. The property owner should attach a cover letter and submit all documents together in a package.

BLAINE
TECH SERVICES

SAMPLING REPORT 86267F2 9-24-86 PEARSON EQUIPMENT, 1555 DOOLITTLE DRIVE, SAN LEANDRO, CA

MAP REF: THOMAS BROS.
CONTRA COSTA COUNTY
P. 24 E-1



#1 SUBSURFACE WATER SAMPLE
ANALYSIS FOR BENZENE,
TOLUENE, XYLENE AND GRAVIMETRIC
OIL AT SEQUOIA ANALYTICAL
LABORATORY
SEQUOIA LAB NO. 6091393

SAMPLING PERFORMED BY
FRANK A. CLINE

DIAGRAM PREPARED BY
TAMMIE STALLINGS

Tammie Stallings

The following addresses have been listed here for your convenience:

Water Quality Control Board
San Francisco Bay Region
1111 Jackson Street
Room 6040
Oakland, CA 94607
ATTN: Dale Bowyer

Alameda County Health
Hazardous Materials Management
Oakland, Ca 94612
Attn: Edgar Howell

San Leandro Fire Department
835 East 14th St.
San Leandro, Ca 94577
ATTN: Richard Soloman

If I can be of any further assistance, please call.

Richard C. Blaine

RCB/tls

BLAINE TECH SERVICES

P.O. BOX 5745
SAN JOSE, CA 95150
(408) 723-3974

Include ALL of the following designation in lab reports and invoices

86267F2 Delta Terminal 1561 Doolittle San Leandro

EVERYTHING written above this line is the project designation

Field sampling completed 10:25 hrs. 9-24-86 performed by Mach

RELEASED BY		ACCEPTED BY	
13:10 hrs. 9-24-86	Mach	13:10 hrs. 9-24-86	Sheri R. Seals
___:___ hrs. - -86		___:___ hrs. - -86	
___:___ hrs. - -86		___:___ hrs. - -86	
___:___ hrs. - -86		___:___ hrs. - -86	

I.D.	TYPE	ANALYSIS	LAB #	PRELIMS	FINAL
#1 (5)	Liquid	BTX Gravimetric Oil	6091393		

TURN AROUND 24 hrs

REPORT TO: Blaine Tech Services

Attn

Phone

BILLING INVOICE TO: Same

Attn

Verbal/Ref PO From:

cc BLAINE TECH SERVICES (always)
cc OTHER:

SPECIAL INSTRUCTIONS

( ) Phone results to BTS
( ) Phone results to client direct

SEQUOIA Analytical Laboratory

2549 Middlefield Road
Redwood City, CA 94063 • (415) 364-9222

Blaine Tech Services
P.O. Box 5745
San Jose, CA 95150
Attn: Richard Blaine

Date Sampled: 09/24/86
Date Received: 09/24/86
Date Reported: 09/25/86

Sample Number
6091393

Sample Description
BTS #86267F2, Liquid #1,
Delta Terminal at 1561
Dolittle in San Leandro

ANALYSIS

Oil, ppm	17

NOTE: Analysis was performed using EPA methods 3510 and 8015.

SEQUOIA ANALYTICAL LABORATORY

Arthur G. Burton
Laboratory Director

sls

SEQUOIA Analytical Laboratory

2549 Middlefield Road
Redwood City, CA 94063 • (415) 364-9222

Blaine Tech Services
P.O. Box 5745
San Jose, CA 95150
Attn: Richard Blaine

Date Sampled: 09/24/86
Date Received: 09/24/86
Date Reported: 09/25/86

Sample Number
6091393

Sample Description
BTS #86267F2, Liquid #1,
Delta Terminal at 1561
Dolittle in San Leandro

ANALYSIS

Benzene, ppm	< 0.1
Toluene, ppm	0.40
Xylenes, ppm	0.50

NOTE: Analysis was performed using EPA methods 5030 and 602.

SEQUOIA ANALYTICAL LABORATORY

Arthur G. Burton
Laboratory Director

sls

BLYMYER & SONS engineers, inc.

December 10, 1986
BSE Job No. 8664

Mr. Dale Bowyer
REGIONAL WATER QUALITY CONTROL
BOARD
1111 Jackson Street
Oakland, CA. 94607

RECEIVED
DEC 15 1986
Ans'd.....

SUBJECT: 1555 DOOLITTLE DRIVE
SAN LEANDRO, CALIFORNIA

Dear Mr. Bowyer:

On September 19, 1986, seven (7) underground diesel tanks were removed as well as all buildings located on the site by the property developers, Rouse & Associates. A portion of the property is to be developed into a business park while the other portion is to be developed into a Viking Freight Truck Terminal.

Although all the tanks tested tight according to a precision tank test performed earlier in the year, it became evident upon removal that a past contamination problem existed. Enclosed is a copy of the original Soil And Water Samples Report provided by Blaine Technical Services. At this time water samples were within acceptable levels for diesel and BTX. Soil samples were taken and were not within acceptable levels. Soil was removed from the excavations and stockpiled alongside the pit area. The general contractor, J. M. O'Neill, Inc., backfilled the excavations to limit the liability and hazard of the open pits.

In early October, Rouse & Associates contacted Blymyer & Sons Engineers' office to help develop a plan for treating the soil. At that time, we recommended that soil borings be drilled around the tank pits to insure that groundwater had definitely not been contaminated.

Seven (7) bores were drilled by Groundwater Technology down to the water-table. Soil samples were collected at 5' and 10'. Water samples were taken at this time but the laboratory could not run them due to too much silt. Enclosed are copies of the lab analyses. (See Attachment "A"). Five (5) of the bores were grouted with Betonite. Two of the bores were made into 2" monitoring wells according to local requirements.

The ten (10) various stockpiles of soil were analyzed to determine whether or not the soil was within acceptable levels of 1,000 ppm's, Total Hydrocarbons. Two of the piles were under 1,000 ppm's. These two piles were graded into the pit area. The remaining seven (7) soil piles were combined and moved onto a plastic sheet in order to get the soil out of contractor's way. Enclosed is a copy of lab results for these piles. (See Attachment "B"). Also in this report are the analyses for the water samples from the monitoring wells drilled.

"total responsibility engineering"

1829 Clement Avenue, Alameda, California 94501-1396 • Phone (415) 521-3773 • TLX 364412 INTR

Groundwater Technology was asked to drill an additional seven (7) monitoring wells. During drilling free product was evident. Free product levels have not yet been accurately determined in all the wells. (See Attachment "C" and "D"). Please note the ppm water sample discrepancy in MW-3 and MW-4 on Attachments "B" and "C". The site grading subcontractors have since destroyed seven (7) of the wells. These wells will be properly abandoned (i.e., re-bored and grouted) and new wells installed. A concrete pad has been poured over the old tank pit area. We estimate that the well work will begin within the next couple of weeks. A report will be submitted containing the new well data including water and soil samples and product thickness if applicable.

Because gasoline has showed up in trace amounts in some of the analyses, we had the contractor spread the soil pile into a thin layer over plastic to aerate for a couple of weeks. Groundwater Technology was asked to take soil samples two weeks ago to check contaminate levels of the pile after it had been spread out for 2-1/2 weeks. Groundwater Technology discovered that much of the plastic has been destroyed in the process of thinly spreading the dirt. Samples were taken from the spreadings. Lab results will be submitted when they are completed. We will dig up the pile and place it on plastic in a more protected area of the property.

Once the new wells are installed and the soil/water data is available, we will proceed with developing a groundwater clean-up/treatment plan for RWQCB's review and approval. The soil pile will be included in the plan.

If you have any questions, or should need additional information, please give me a call at (415) 521-3773.

Cordially yours,

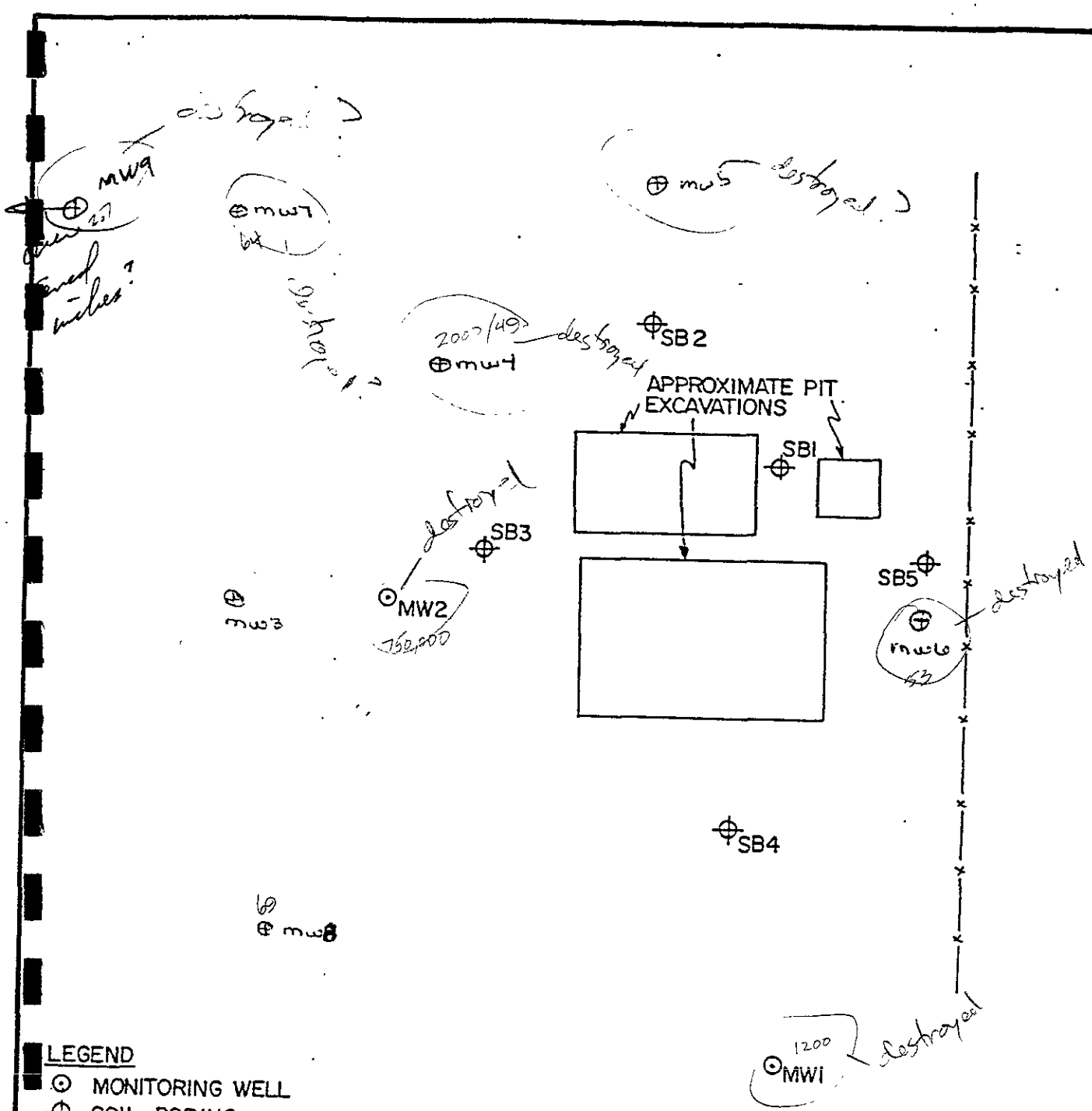
BLYMYER & SONS ENGINEERS, INC.

Sue Black

SB/ds

Attachments

cc: Mr. Bob Malin - ROUSE & ASSOCIATES



FIELD SKETCH

BLYMYRE / DOOLITTLE
SAN LEANDRO, CALIFORNIA

NO SCALE

GROUNDWATER TECHNOLOGY

WESCO Laboratories

Date: October 17, 1986

Client: Groundwater Technology

Submitted by: Dennis Bane

Report to: Dennis Bane

WESCO Job #: GWT 8629

Client Job/P.O. #: Blymyer/Doolittle 0801

Date collected: 10-14-86

Date submitted: 10-14-86

& type of sample(s): 1 Water 14 Soil

Lab No.	Client ID	Motor Fuels (mg/l)	Benzene (mg/l)	Toluene (mg/l)	Xylene (mg/l)	Fuel Type	
5701	Water Pit 10/13	17	0.002	0.004	0.001	Diesel	
	Detection Limit	0.050	0.001	0.001	0.001		

Lab No.	Client ID	Motor Fuels (mg/kg)	Benzene (mg/kg)	Toluene (mg/kg)	Xylene (mg/kg)	Fuel Type	
5702	Soil 1A @ 5-1/2'	400	0.18	0.18	1.2	Gasoline	
5703	Soil 1B @ 10-1/2'	2800	0.77	0.27	0.97	Diesel	
5704	Soil 2A @ 5-1/2'	2.0	0.002	0.006	0.014	Diesel	
5705	Soil 2B @ 11'	160	0.047	0.042	0.038	Diesel	
5706	Soil 3A @ 5-1/2'	1.6	0.008	0.004	0.076	Gasoline	
5707	Soil 3B @ 10-1/2'	1500	0.088	0.058	0.074	Diesel	
5708	Soil 4A @ 5-1/2'	0.83	0.046	0.003	0.013	Gasoline	
5709	Soil 4B @ ( )'	980	0.50	0.27	0.65	Diesel	
5710	Soil 5A @ 5-1/2'	0.26	0.003	0.006	0.018	Gasoline	
5711	Soil 5B @ 10-1/2'	93	0.025	0.025	0.032	Diesel	
5712	Soil MW 1A @ ( )'	0.13	0.001	0.002	0.052	Gasoline	
5713	Soil MW 1B @ 10-1/2'	< 0.050	0.001	0.002	0.006	Gasoline	
5714	Soil MW 2A @ 5-1/2'	1.5	0.002	0.001	0.010	Gasoline	
5715	Soil MW 2B @ 10-1/2'	290	0.20	0.079	0.22	Diesel	
	Detection Limit	0.050	0.001	0.001	0.001		
	METHOD(S):	Note 1					

NOTES:

Note 1 - EPA Method 5020/8015/8020.

Analytical Supervisor

ATTACHMENT "A"

14 Galli Drive, Suite A
Novato, California 94947 415 883-6425
A Division of Western Ecological Services Company

WESCO Laboratories

Date: November 07, 1986

Client: Groundwater Technology

Submitted by: Dennis Bane

Report to: Robert Juncal

WESCO Job #: GWT 8639

Client Job/P.O. #: Blymyer/Doolittle

Date collected: 10-21-86

Date submitted: 10-21-86

& type of sample(s): 4 Water
9 Soil

Lab No.	Client ID	Motor Fuel (mg/l)	Benzene (mg/l)	Toluene (mg/l)	Xylene (mg/l)	Fuel Type	
5794	Water MW-1	1200	< 0.10	< 0.010	< 0.020	Diesel	
5795	Water MW-2 Free Product	750000*	-----	-----	-----	Diesel	
5796	Water MW-3	11600	< 0.050	0.64	0.51	Diesel	
5797	Water MW-4	2000	< 0.050	< 0.010	< 0.020	Diesel	

Lab No.	Client ID Soil Piles	Motor Fuel (mg/kg)	Benzene (mg/kg)	Toluene (mg/kg)	Xylene (mg/kg)	Fuel Type	
5798	Soil #100	70000	0.006	0.017	< 0.001	Diesel	
5799	Soil #101	2300	0.008	0.032	< 0.001	Diesel	
5800	Soil #102	8700	0.008	0.015	< 0.001	Diesel	
5801	Soil #103	130	0.004	0.059	0.014	Gasoline	
5802	Soil #104	8800	< 0.001	0.006	< 0.001	Diesel	
5803	Soil #105	3100	0.004	0.003	0.030	Diesel	
5804	Soil #106	2900	0.013	0.097	0.27	Diesel	
5805	Soil #107	660	0.010	0.035	0.014	Diesel	
5806	Soil #108	4700	0.003	0.022	0.025	Diesel	
	METHOD(S):	Note 1					

NOTES:

Note 1 - EPA Method 5020/8015/8020; 3550/8015.
* Volumetric Measurement

Analytical Supervisor

14 Galli Drive, Suite A 6100
Novato, California 94947 415 883-6425
A Division of Western Ecological Services Company

ATTACHMENT "B"

WESCO Laboratories

Date: November 13, 1986

Client: Groundwater Technology /8

Submitted by: Joyce Miley

Report to: Robert Juncal

WESCO Job #: GWT 8648

Client Job/P.O. #: Blymer/Doolittle
I.D.# 20-8183

Date collected: 10-28-86

Date submitted: 10-29-86

& type of sample(s): 7 Water

Lab No.	Client ID	Motor Fuel (mg/l)	Benzene (mg/l)	Toluene (mg/l)	Xylene (mg/l)	Fuel Type	
5919	Water MW-3	120	0.033	<0.010	<0.010	Diesel	
5920	Water MW-4	49	0.004	0.011	0.017	Diesel	
5921	Water MW-5	15	0.004	0.023	0.018	Diesel	
5922	Water MW-6	53	<0.001	0.023	0.010	Diesel	
5923	Water MW-7	64	0.016	<0.003	0.028	Diesel	
5924	Water MW-8	69	<0.006	<0.006	<0.006	Diesel	
5925	Water MW-9	2.7	0.002	0.011	0.004	Diesel	
	Detection Limit	0.50	0.010	0.010	0.010		
	METHOD(S):	Note 1					

NOTES:

Note 1 - EPA Method 5020/8015/8020.

Analytical Supervisor

ATTACHMENT "C"

14 Galli Drive, Suite A
Novato California 94947 415 883-6425
A Division of Western Ecological Services Company

WESCO Laboratories

Date: November 07, 1986

Client: Groundwater Technology

Submitted by: Joyce Miley

Report to: Robert Juncal

WESCO Job #: GWT 8647

Client Job/P.O. #: Blymyer, Doolittle
I.D.# 20-8183

Date collected: 10-28-86

Date submitted: 10-29-86

& type of sample(s): 7 Soil

Lab No.	Client ID	Diesel Fuel (mg/kg)
5912	Soil MW-3B @ 10.5'	17
5913	Soil MW-4B @ 10.5'	130
5914	Soil MW-5B @ 10.5'	< 5
5915	Soil MW-6B @ 10.5'	150
5916	Soil MW-7B @ 10.5'	< 5
5917	Soil MW-8B @ 10.5'	1600
5918	Soil MW-9B @ 10.5'	< 5
	METHOD(S):	Note 1

NOTES:

Note 1 - EPA Method 3550/8015.

Analytical Supervisor

14 Galli Drive Suite A
Novato California 94947 415 883-6425
A Division of Western Ecological Services Company

ATTACHMENT 1

GROUNDWATER TECHNOLOGY, INC.
OIL RECOVERY SYSTEMS

DOD Meller / 8669
(084)

Drilling

Monitoring Well MW - 1

Project Blymyer Doolittle Owner Rouse and Associates

Location San Leandro Project Number 20-8183

Date Drilled 10-13-86 Total Depth of Hole 20 ft Diameter 7.5 inch

Surface Elevation ____ Water Level, Initial 10 ft 24-hrs. 11.12 ft

Screen: Dia. 2 in. Length 15 ft. Slot Size 0.020 in.

Casing: Dia. 2 in. Length 6 ft. Type PVC

Drilling Company Kvilhaug Drilling Method Hollow Stem Auger

Driller C. Pruner Log by D. Bane

Sketch Map

Notes

Depth (Feet)	Well Construction	PID (ppm) Notes	Sample Number / Blows	Graphic Log	Description/Soil Classification
0					Asphalt.
2				SM	Brown silty sand with gravel, (moist, no odor.)
4		10	MW1A		Brown - black silty clay with sand, (stif
6			6 3 8	CL	moist, no odor.)
8					Green - brown silty clay with sand, (stif
10			MW1B		moist, no odor.)
12		35	6 2 2		▽ Green sandy silts, (soft, wet, no odor.)
14				CL	
16					
18					
20					
22					
24					

021CO144

GROUNDWATER TECHNOLOGY, INC.
OIL RECOVERY SYSTEMS

Monitoring Well MW - 2

Drilling

Project Blymyer Doolittle Owner Rouse and Associates

Location San Leandro Project Number 20-8183

Date Drilled 10-13-86 Total Depth of Hole 20 ft Diameter 7.5 inch

Surface Elevation ____ Water Level, Initial 10 ft 24-hrs. 11.61 ft

Screen: Dia. 2 in. Length 15 ft. Slot Size 0.020 in.

Casing: Dia. 2 in. Length 6 ft. Type PVC

Drilling Company Kvilhaug Drilling Method Hollow Stem Auger

Driller C. Pruner Log by D. Bane

Sketch Map

Notes

Depth (Feet)	Well Construction	Photos PID (ppm)	Sample Number / Blows	Graphic Log	Description/Soil Classification
0					Asphalt.
2					
4			MW2A		
6		279	9 6	OL	Green- brown silty clay with sand, (very stiff, moist, slight diesel odor.)
8			MW2B		
10		290	5 9	SM	Green silty sand medium to coarse, (medi dense, wet, strong diesel odor.)
12					
14					
16					
18					
20					
22					
24					

GROUNDWATER TECHNOLOGY, INC.
OIL RECOVERY SYSTEMS

Monitoring Well 3

Drilling

Project Blymyer/Doolittle Owner Rouse & Associates

Location San Leandro Project Number 20 8183

Date Drilled 10/27 Total Depth of Hole 20 ft. Diameter 7.5 in.

Surface Elevation ____ Water Level Initial ____ 24-hrs 10.48

Screen: Dia. 2 in. Length 15 ft. Slot Size 0.02 in.

Casing: Dia. 2 in. Length 5 ft. Type PVC

Drilling Company D. Kvilhaug Drilling Method hollow stem auger

Driller D. Kvilhaug Log by J. Mibey

Sketch Map

Notes

Depth (Feet)	Well Construction	Notes PID	Sample Number	Graphic Log	Description/Soil Classification
0				GW	Brown, gravel and crushed asphalt (disturbed, dry no odor)
2					
4				CH	Black, organic clay, some shell fragments (pliabl moist, slight hydrocarbon odor)
6		25	3 5 7	SP	Green, gravelly sand (loose, moist, slight diesel odor)
8					(Increasing gravel)
10		12	6 7 6	CL	Green gray, silty clay (stiff, moist, slight dies odor)
12					
14				SP	Green brown, medium sand (moist, moderate diesel odor)
16					Gray green, silty clay (pliable, moist, moderate hydrocarbon odor)
18				CL	
20					
22					
24					

GROUNDWATER TECHNOLOGY, INC.
OIL RECOVERY SYSTEMS

Monitoring Well 4

Drilling

Project: Blymyer/Doolittle Owner Bruce & Associates

Location San Leandro Project Number 20 8183

Date Drilled 10/27 Total Depth of Hole 20 ft. Diameter 7.5 in.

Surface Elevation ____ Water Level, Initial ____ 24-hrs. 11.28 ft.

Screen: Dia. 2 in. Length 15 ft. Slot Size 0.02 in.

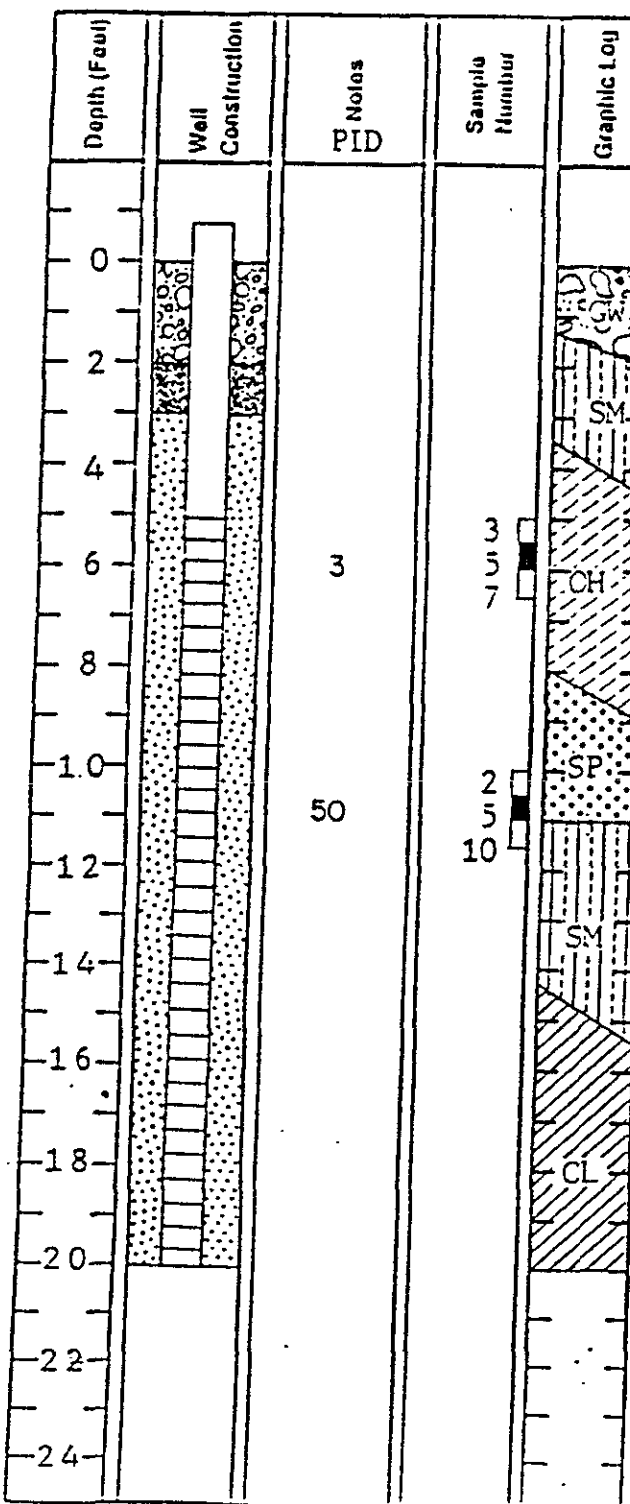
Casing: Dia. 2 in. Length 5 ft. Type PVC

Drilling Company D. Kvilhaug Drilling Method hollow stem auger

Driller D. Kvilhaug Log by J. Mibey

Sketch Map

Notes



Description/Soil Classification

Brown, gravel and crushed asphalt (disturbed, dry no odor)

Green brown, silty sand, some clay (moist, slight hydrocarbon odor)

Black, organic clay, some shells (pliable, moist, slight hydrocarbon odor)

(Increasing gravel)

Dark gray, gravelly sand (loose, moist, moderate hydrocarbon odor)

Gray green, silty sand, some gravel (medium dense moist, strong hydrocarbon odor)

Gray green, silty clay (pliable, moist, slight hydrocarbon odor)

GROUNDWATER TECHNOLOGY, INC.
OIL RECOVERY SYSTEMS

Monitoring Well 5

Drilling

Project: Blumver/Doolittle Owner: Rouse & Associates

Location: San Leandro Project Number: 20 8183

Date Drilled: 10/27 Total Depth of Hole: 20 ft. Diameter: 7.5 in.

Surface Elevation: Water Level Initial: 24-hrs: 9.08 ft.

Screen: Dia. 2 in. Length: 15 ft. Slot Size: 0.02 in.

Casing: Dia. 2 in. Length: 5 ft. Type: PVC

Drilling Company: D. Kvilhaug Drilling Method: hollow stem auger

Driller: D. Kvilhaug Log by: J. Miley

Sketch Map

Notes

Depth (Feet)	Well Construction	Notes	Sample Number	Graphic Log	Description/Soil Classification
0				GW	Brown gravel and crushed asphalt (disturbed, dry, no odor)
2					
4				SM	Green gray, silty sand, some gravel (moist, no od
6			4 7 9	OH	Black, organic clay, some shells and silt (stiff, moist, very slight hydrocarbon odor)
8				SP	Gray, gravelly sands, some silt (well graded, medium dense, moist, no odor)
10			2		(Increasing gravels)
12			4 5	SM	Brown, silty sands (loose, moist, no odor)
14					(Decreasing grain size)
16					
18				CL	Gray green, silty clay (pliable, moist, slight hydrocarbon odor)
20					
22					
24					

GROUNDWATER TECHNOLOGY, INC.
OIL RECOVERY SYSTEMS

Monitoring Well 6

Drilling

Project: Blymyer/Dolittle Owner Rouse & Associates

Location San Leandro Project Number 20 8183

Date Drilled 10/27 Total Depth of Hole 20 ft. Diameter 7.5 in.

Surface Elevation ____ Water Level Initial ____ 24-hrs. 9.93 ft.

Screen: Dia. 2 in. Length 15 ft. Slot Size 0.02 in.

Casing: Dia. 2 in. Length 5 ft. Type PVC

Drilling Company D. Kvilhaug Drilling Method hollow stem auger

Driller D. Kvilhaug Log by J. Miley

Sketch Map

Notes

Depth (Feet)	Well Construction	Notes	Sample Number	Graphic Log	Description/Soil Classification
0					Brown gravel and crushed asphalt (disturbed, dry, no odor)
2				GW	
4				GM	Gray brown, silty gravel (moist, no odor)
6			5 7 7	SM	Gray green, silty fine sand (medium dense, moist, very slight odor)
8					
10			3 3 3	CL	Gray green, sandy clay (pliable, moist, moderate hydrocarbon odor)
12					
14					Gray green, silty clay, some sand (pliable, moist moderate hydrocarbon odor)
16					
18				CL	
20					
22					
24					

GROUNDWATER TECHNOLOGY, INC.
OIL RECOVERY SYSTEMS

Monitoring Well 7

Drillin

Project: Blymyer/Doolittle Owner: Rouse & Associates

Location: San Leandro Project Number: 20 8183

Date Drilled: 10/28 Total Depth of Hole: 20 ft. Diameter: 7.5 in.

Surface Elevation: ____ Water Level, Initial: ____ 24-hrs.: 9.66 ft.

Screen: Dia. 2 in. Length: 15 ft. Slot Size: 0.02 in.

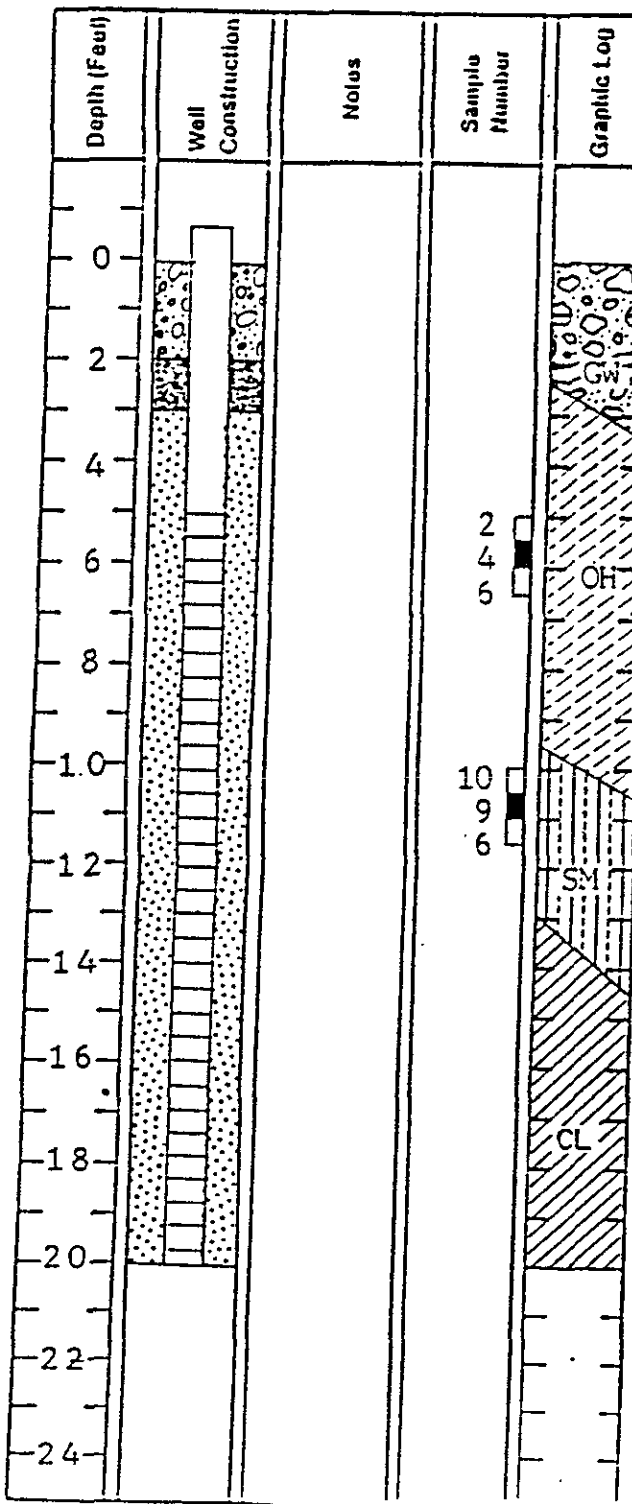
Casing: Dia. 2 in. Length: 5 ft. Type: PVC

Drilling Company: D. Kvilhaug Drilling Method: hollow stem auger

Driller: D. Kvilhaug Log by: J. Mibey

Sketch Map

Notes



Description/Soil Classification
Brown gravel and crushed asphalt (disturbed, dry no odor)
Black, organic silty clay (pliable, moist, no od
(Increasing clay)
Green gray, silty fine sands (medium dense, mois slight hydrocarbon odor)
Gray green, silty clay (pliable, wet, moderate hydrocarbon odor)
(Increasing clay)

GROUNDWATER TECHNOLOGY, INC.
OIL RECOVERY SYSTEMS

Monitoring Well 8

Drillin

Project: Blymyer/Doolittle Owner: Rouse & Associates

Location: San Leandro Project Number: 20 8183

Date Drilled: 10/28 Total Depth of Hole: 20 ft. Diameter: 7.5 in.

Surface Elevation: ____ Water Level, Initial: ____ 24-hrs: 11 3/4 ft.

Screen: Dia. 2 in. Length: 15 ft. Slot Size: 0.02 in.

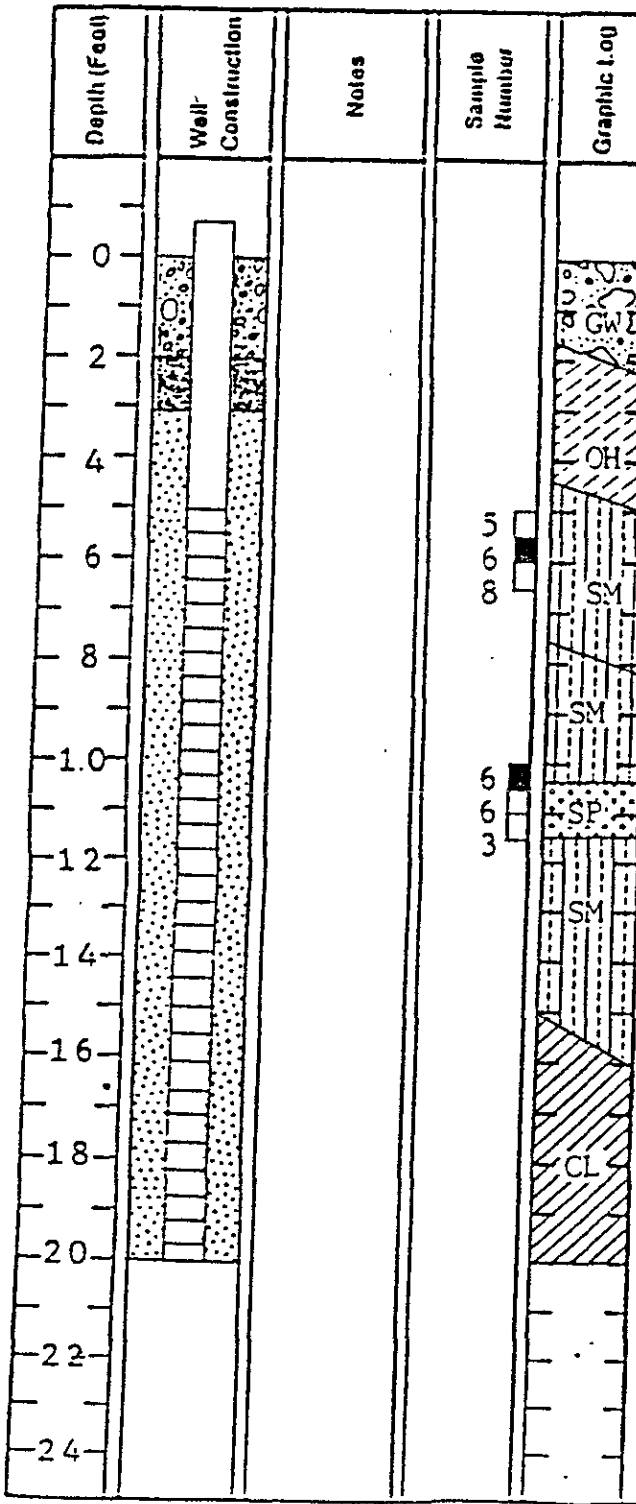
Casing: Dia. 2 in. Length: 5 ft. Type: PVC

Drilling Company: D. Kvilhaug Drilling Method: hollow stem auger.

Driller: D. Kvilhaug Log by: J. Mibey

Sketch Map

Notes



Description/Soil Classification

Brown gravel and cursched asphalt (disturbed, dry no odor)

Black, organic silty clay, some shells (pliable, moist, no odor)

Green gray, silty fine sands (medium dense, mois very slight hydrocarbon odor)

Gray, silty sands (moist, slight hydrocarbon odo

Gray green, coarse sands and gravel (loose, wet, moderate hydrocarbon odor)

Green gray, silty sands (moist, strong hydrocarb odor)

Gray green, silty clays (pliable, moist, strong hydrocarbon odor)

GROUNDWATER TECHNOLOGY, INC.
OIL RECOVERY SYSTEMS

Monitoring Well 9

Drilling

Project: Blymyer/Doolittle Owner Rouse & Associates

Location San Leandro Project Number 20 8183

Date Drilled 10/28 Total Depth of Hole 20 ft. Diameter 7.5 in.

Surface Elevation ____ Water Level Initial ____ 24-hrs 9.39 ft.

Screen: Dia. 2 in. Length 15 ft. Slot Size 0.02 in.

Casing: Dia. 2 in. Length 5 ft. Type PVC

Drilling Company D. Kvilhaug Drilling Method hollow stem auger

Driller D. Kvilhaug Log by J. Mikey

Sketch Map

Notes

Depth (Feet)	Well Construction	Notes	Sample Number	Graphic Log	Description/Soil Classification
0				GW	Brown gravel and crushed asphalt (disturbed, dry, no odor)
2					
4				OH	Black, organic clay, some silt and shells (soft, moist, no odor)
6			2 1 2		(Increasing moisture and organics)
8				CL	Green gray, silty clay (pliable, moist, slight hydrocarbon odor)
10			3 7		
12			6	SM	Green brown, silty sand (medium dense, moist, sli hydrocarbon odor)
14					Tan, silty clay (pliable, moist, slight hydrocarb odor)
16					
18				CL	(Grades green gray, increasing moisture)
20					
22					
24					

HAZARDOUS
MATERIALS
MITIGATION
PROFESSIONALS
INCORPORATED

August 11, 1987 Project No. H223-01

Mr. Craig Mayfield
Alameda County Flood Control and
Water Conservation District
5997 Parkside Drive
Pleasanton, CA 94566

RE: CONTAMINATION STUDY
1555 DOOLITTLE DRIVE
SAN LEANDRO, CALIFORNIA

well MW-10
MW-11

Dear Mr. Mayfield:

In accordance with your Permit No. 87155, condition A-3, I am enclosing the available data that has been generated from the above referenced project. Subsurface descriptions for seven exploratory borings and two ground-water monitoring wells, along with the construction details for each well are included on the attached Exploratory Boring Logs. The Site Plan, Figure 1 presents the locations of the borings and wells. Please advise me if you will require a copy of the final report once it is completed.

If you have any questions regarding this project, please do not hesitate to call.

Very truly yours,

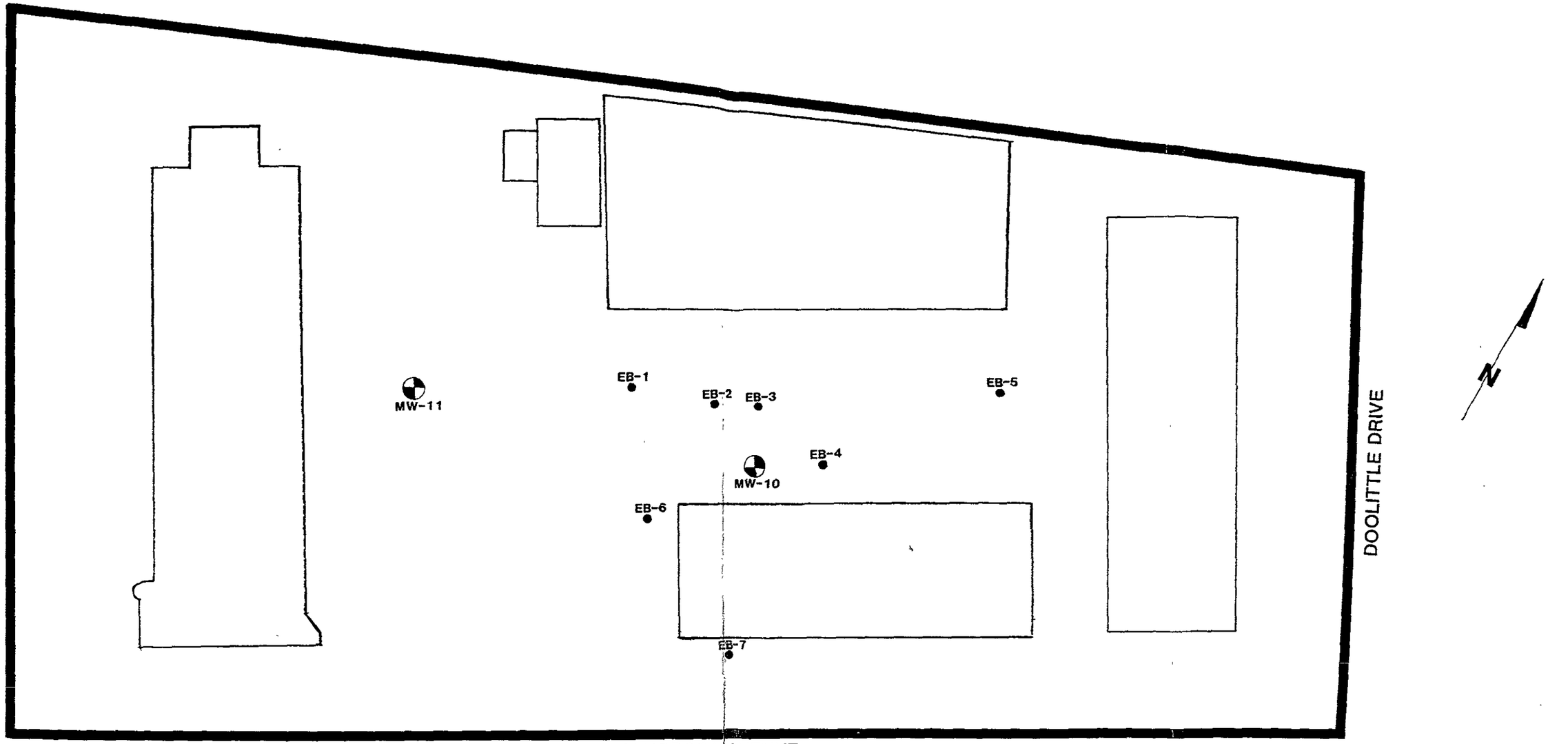
HMMP, INC.

John K. Hofer
Engineering Geologist, EG-1065

JKH:sng

(H223-01.1)

1450 Koll Circle, Suite 114, San Jose, CA 95112
Telephone: (408) 286-7868



• EB – Exploratory Boring

MW – Monitoring Well

Not to scale

SITE PLAN

HAZARDOUS MATERIALS MITIGATION PROFESSIONALS INCORPORATED
1450 Koll Circle, Suite 114
San Jose, California 95112
Telephone: (408) 286-7868

H223-01

8/87

FIGURE 1

DRILL RIG	Hollow Stem	SURFACE ELEVATION	- - - -	LOGGED BY	JKH
DEPTH TO GROUNDWATER	As Noted	BORING DIAMETER	8"	DATE DRILLED	7/20/87

DESCRIPTION AND REMARKS	COLOR	CONSIST	SOIL TYPE	DEPTH (FEET)	SAMPLER	UNCONFINED COMPRESSIVE STRENGTH (KSF)	WATER CONTENT (%)	DRY DENSITY (PCF)	PENETRATION RESISTANCE (BLOWS/FT.)
ASPHALT AND BASE ROCK									
CLAYEY, SILTY GRAVEL	brown	medium dense	GC						
	green-gray			5					
SILTY CLAY, damp	black	stiff	CL						
Shell fragments									
Product odor Softer	blue-gray			10			▽		
				15					
TOTAL DEPTH = 15.0 feet Product sheen on water									

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Telephone: (408) 286-7868

EXPLORATORY BORING LOG

ROUSE AND ASSOCIATES

PROJECT NO.	DATE	BORING NO.
H223-01	8/87	EB-1

DRILL RIG	Hollow Stem	SURFACE ELEVATION	-----	LOGGED BY	JKH
DEPTH TO GROUNDWATER	As Noted	BORING DIAMETER	8"	DATE DRILLED	7/20/87

DESCRIPTION AND REMARKS	COLOR	CONSIST.	SOIL TYPE	DEPTH (FEET)	SAMPLER	UNCONFINED COMPRESSIVE STRENGTH (KSF)	WATER CONTENT (%)	DRY DENSITY (PCF)	PENETRATION RESISTANCE (BLOWS/FT.)
ASPHALT AND BASE ROCK									
CLAYEY, SILTY GRAVEL	dark brown	medium dense	GC						
				5					
SILTY CLAY, damp	black	stiff	CL						
Product odor Softer	blue-gray						▽		
				10					
				15					
TOTAL DEPTH = 15.0 feet									
Product sheen on water									

HAZARDOUS MATERIALS MITIGATION PROFESSIONALS, INC.

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Telephone: (408) 286-7868

EXPLORATORY BORING LOG

ROUSE AND ASSOCIATES

PROJECT NO.	DATE	BORING NO.
H223-01	8/87	EB-2

DRILL RIG Hollow Stem	SURFACE ELEVATION ----	LOGGED BY JKH
DEPTH TO GROUNDWATER As Noted	BORING DIAMETER 8"	DATE DRILLED 7/20/87

DESCRIPTION AND CLASSIFICATION				DEPTH (FEET)	SAMPLER	UNCONFINED COMPRESSIVE STRENGTH (KSF)	WATER CONTENT (%)	DRY DENSITY (PCF)	PENETRATION RESISTANCE (BLOWS/FT.)
DESCRIPTION AND REMARKS	COLOR	CONSIST.	SOIL TYPE						
ASPHALT AND BASE ROCK									
CLAYEY, SILTY GRAVEL, damp	dark brown	medium dense	GC	5					
SILTY CLAY, moist	black	stiff	CL				▽		
Very moist, strong product odor, softer	blue-gray			10					
				15					
TOTAL DEPTH = 15.0 feet Product sheen on water									

HAZARDOUS MATERIALS MITIGATION PROFESSIONALS, INC.
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Telephone: (408) 286-7868

EXPLORATORY BORING LOG

ROUSE AND ASSOCIATES

PROJECT NO.	DATE	BORING NO.
H223-01	8/87	EB-3

DRILL RIG Hollow Stem	SURFACE ELEVATION ------	LOGGED BY JKH
DEPTH TO GROUNDWATER As Noted	BORING DIAMETER 8"	DATE DRILLED 7/20/87

DESCRIPTION AND CLASSIFICATION				DEPTH (FEET)	SAMPLER	UNCONFINED COMPRESSIVE STRENGTH (KSF)	WATER CONTENT (%)	DRY DENSITY (PCF)	PENETRATION RESISTANCE (BLOWS/FT.)
DESCRIPTION AND REMARKS	COLOR	CONSIST.	SOIL TYPE						
ASPHALT AND BASE ROCK									
CLAYEY, SILTY GRAVEL, damp	brown	medium dense	GC						
SILTY CLAY, moist	black	stiff	CL	5					
Softer, very moist, strong product odor	blue-gray								
Free product on augers				10			▽		
				15					
TOTAL DEPTH = 15.0 feet Water level at 10.5 feet. Product sheen on water.									

HAZARDOUS MATERIALS MITIGATION PROFESSIONALS, INC.
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Telephone: (408) 286-7868

EXPLORATORY BORING LOG

ROUSE AND ASSOCIATES

PROJECT NO.	DATE	BORING NO.
H223-01	8/87	EB-4

DRILL RIG Hollow Stem	SURFACE ELEVATION -----	LOGGED BY JKH
DEPTH TO GROUNDWATER As Noted	BORING DIAMETER 8"	DATE DRILLED 7/20/87

DESCRIPTION AND REMARKS	COLOR	CONSIST.	SOIL TYPE	DEPTH (FEET)	SAMPLER	UNCONFINED COMPRESSIVE STRENGTH (KSF)	WATER CONTENT (%)	DRY DENSITY (PCF)	PENETRATION RESISTANCE (BLOWS/FT.)
ASPHALT AND BASE ROCK									
CLAYEY, SILTY GRAVEL, damp	brown	medium dense	GC						
SILTY CLAY, moist	black	stiff	CL	5					
Product odor	light brown								
Softer, no visible product on augers	blue-gray			10			▽		
				15					
TOTAL DEPTH = 15.0 feet									
No product sheen on water									

HAZARDOUS MATERIALS MITIGATION PROFESSIONALS, INC.
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Telephone: (408) 286-7868

EXPLORATORY BORING LOG

ROUSE AND ASSOCIATES

PROJECT NO.	DATE	BORING NO.
H223-01	8/87	EB-5

DRILL RIG Hollow Stem	SURFACE ELEVATION ----	LOGGED BY JKH
DEPTH TO GROUNDWATER As Noted	BORING DIAMETER 8"	DATE DRILLED 7/20/87

DESCRIPTION AND REMARKS	COLOR	CONSIST.	SOIL TYPE	DEPTH (FEET)	SAMPLER	UNCONFINED COMPRESSIVE STRENGTH (KSF)	WATER CONTENT (%)	DRY DENSITY (PCF)	PENETRATION RESISTANCE (BLOWS/FT.)
ASPHALT AND BASE ROCK									
CLAYEY, SILTY GRAVEL, damp	brown	medium dense	GC						
				5					
				10					
SILTY CLAY, moist	black	stiff	CL						
Softer	blue-gray						▽		
				15					
TOTAL DEPTH = 15.0 feet									
No product sheen on water.									

HAZARDOUS MATERIALS MITIGATION PROFESSIONALS, INC.

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Telephone: (408) 286-7868

EXPLORATORY BORING LOG

ROUSE AND ASSOCIATES

PROJECT NO.	DATE	BORING NO.
H223-01	8/87	EB-6

DRILL RIG Hollow Stem	SURFACE ELEVATION -----	LOGGED BY JKH
DEPTH TO GROUNDWATER As Noted	BORING DIAMETER 8"	DATE DRILLED 7/20/87

DESCRIPTION AND CLASSIFICATION				DEPTH (FEET)	SAMPLER	UNCONFINED COMPRESSIVE STRENGTH (KSF)	WATER CONTENT (%)	DRY DENSITY (PCF)	PENETRATION RESISTANCE (BLOWS/FT.)
DESCRIPTION AND REMARKS	COLOR	CONSIST.	SOIL TYPE						
ASPHALT AND BASE ROCK									
CLAYEY, SILTY GRAVEL, damp	brown	medium dense	GC						
SILTY CLAY, damp, no product odor	black	stiff	CL	5					
Softer	blue-gray			10					
				15					
TOTAL DEPTH = 15.0 feet									
No product sheen on water.									

HAZARDOUS MATERIALS MITIGATION PROFESSIONALS, INC.

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Telephone: (408) 286-7868

EXPLORATORY BORING LOG

ROUSE AND ASSOCIATES

PROJECT NO.	DATE	BORING NO.
H223-01	8/87	EB-7

DRILL RIG Hollow Stem	SURFACE ELEVATION ----	LOGGED BY JKH
DEPTH TO GROUNDWATER As Noted	BORING DIAMETER 8"	DATE DRILLED 7/20/87

DESCRIPTION AND REMARKS	COLOR	CONSIST.	SOIL TYPE	DEPTH (FEET)	SAMPLER	UNCONFINED COMPRESSIVE STRENGTH (KSF)	WATER CONTENT (%)	DRY DENSITY (PCF)	PENETRATION RESISTANCE (BLOWS/FT.)
ASPHALT AND BASE ROCK									
CLAYEY, SILTY GRAVEL, damp	brown	medium dense	GC						
SILTY CLAY, moist	black	stiff	CL	5					
	light brown								
Softer Strong product odor	blue-gray			10			▽		
Stiffer				15					
		soft		20					

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Telephone: (408) 286-7868

EXPLORATORY BORING LOG

ROUSE AND ASSOCIATES

PROJECT NO.	DATE	BORING NO.
H223-01	8/87	MW-10

DRILL RIG Hollow Stem	SURFACE ELEVATION ----	LOGGED BY JKH
DEPTH TO GROUNDWATER As Noted	BORING DIAMETER 8"	DATE DRILLED 7/20/87

DESCRIPTION AND CLASSIFICATION				DEPTH (FEET)	SAMPLER	UNCONFINED COMPRESSIVE STRENGTH (KSF)	WATER CONTENT (%)	DRY DENSITY (PCF)	PENETRATION RESISTANCE (BLOWS/FT.)
DESCRIPTION AND REMARKS	COLOR	CONSIST.	SOIL TYPE						
SILTY CLAY, CONT'D.		soft	CL	25					
TOTAL DEPTH = 25.0 feet Water level at 12.0 feet following well completion. Product sheen on water.									

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EXPLORATORY BORING LOG

ROUSE AND ASSOCIATES

PROJECT NO.	DATE	BORING NO.
H223-01	8/87	MW-10

1555 DOOLITTLE DRIVE

SAN LEANDRO, CALIFORNIA

MW-10

Well completed to 25.0 feet in depth with 2-inch Class 160 PVC casing, flush-threaded joints. Screen (.020-inch slot) set from 7.0 to 25.0 feet. 12 X 20 Monterey sand placed from 5.0 to 25.0 feet, bentonite pellets placed from 3.0 to 5.0 feet, and concrete seal placed from 0 to 3.0 feet.

18' of screen!!

DRILL RIG	Hollow Stem	SURFACE ELEVATION	-----	LOGGED BY	JKH
DEPTH TO GROUNDWATER	As Noted	BORING DIAMETER	8"	DATE DRILLED	7/20/87

DESCRIPTION AND CLASSIFICATION				DEPTH (FEET)	SAMPLER	UNCONFINED COMPRESSIVE STRENGTH (KSF)	WATER CONTENT (%)	DRY DENSITY (PCF)	PENETRATION RESISTANCE (BLOWS/FT.)
DESCRIPTION AND REMARKS	COLOR	CONSIST.	SOIL TYPE						
ASPHALT AND BASE ROCK									
CLAYEY, SILTY GRAVEL, damp	brown	medium dense	GC						
SILTY CLAY, moist	black	stiff	CL	5					
Some gravel									
SILTY SAND, medium grained, no product odor	gray brown	medium dense	SM	10			▽		
				15					
				20					

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EXPLORATORY BORING LOG

ROUSE AND ASSOCIATES

PROJECT NO.	DATE	BORING NO.
H223-01	8/87	MW-11

DRILL RIG	Hollow Stem	SURFACE ELEVATION	----	LOGGED BY	JKH
DEPTH TO GROUNDWATER	As Noted	BORING DIAMETER	8"	DATE DRILLED	7/20/87

DESCRIPTION AND CLASSIFICATION				DEPTH (FEET)	SAMPLER	UNCONFINED COMPRESSIVE STRENGTH (KSF)	WATER CONTENT (%)	DRY DENSITY (PCF)	PENETRATION RESISTANCE (BLOWS/FT.)
DESCRIPTION AND REMARKS	COLOR	CONSIST.	SOIL TYPE						
SILTY SAND, CONT'D. Increasing gravel	gray brown	medium dense	SM						
				25					
TOTAL DEPTH = 25.0 feet Water level at 9.0 feet following well completion. No product sheen on water									

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EXPLORATORY BORING LOG

ROUSE AND ASSOCIATES

PROJECT NO.	DATE	BORING NO.
H223-01	8/87	MW-11

1555 DOOLITTLE DRIVE

SAN LEANDRO, CALIFORNIA

MW-11

Well completed to 25.0 feet in depth with 2-inch Class 160 PVC casing, flush threaded joints. Screen (.020-inch slot) set from 7.0 to 25.0 feet. 12 X 20 Monterey sand placed from 5.0 to 25.0 feet, bentonite pellets placed from 3.0 to 5.0 feet, and concrete seal placed from 0 to 3.0 feet.

18' of screen!!

HAZARDOUS
MATERIALS
MITIGATION
PROFESSIONALS
INCORPORATED

September 30, 1987 Project No. H223-01

Mr. Bob Malin
Rouse and Associates
32990 Alvarado-Niles Road, Suite 990
Union City, CA 94587

RE: MONITORING WELL INSTALLATION AND
EXPLORATORY DRILLING
POLVOROSA BUSINESS PARK
1555 DOOLITTLE DRIVE
SAN LEANDRO, CALIFORNIA

Dear Mr. Malin:

In accordance with your authorization of July 1, 1987, we have completed the construction of two ground-water monitoring wells and seven exploratory borings at the subject site. In September of 1986, four 10,000-gallon diesel fuel tanks were removed from the site under the supervision of Blaine Tech Services, Inc. with contamination being encountered within the native soils and water beneath the tanks.

A preliminary evaluation of contamination was performed at the site by Groundwater Technology in 1986. This study consisted of the drilling and sampling of 7 exploratory borings and the installation of 9 ground-water monitoring wells. The initial sampling of the water from MW-1 through MW-4 exhibited excessive levels of diesel hydrocarbons, including free product in MW-2. However, week later, laboratory analyses from MW-3 and MW-4 were significantly lower. At that time contamination levels in MW-5 through MW-9 were all less than 70 parts per billion. Apparently MW-1 and MW-2 were not resammpled. During building construction, 7 of the wells were distroyed. At the present time, only MW-3 and MW-8 remain.

The purpose of our study was to define the current contamination conditions at the site and recommend measures to monitor the contamination levels, and/or clean the ground water beneath the

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site to acceptable levels if deemed necessary. The scope of work outlined below conforms to the guidelines of the California Regional Water Quality Control Board (CRWQCB) and was verbally approved by Mr. Greg Zentner of that office. The Regional Map, Figure 1, shows the general location of the site. The Site Plan, Figure 2, presents the locations of the exploratory borings and monitoring wells along with pertinent site features. Descriptions of the subsurface materials encountered during the drilling operations and details of the well construction are presented in the attached Exploratory Boring Logs. In addition, the boring logs prepared by Groundwater Technology for MW-3 and MW-8 are attached. Surface elevations, and subsequent water table elevations, were determined from the grading plan prepared for the site development.

Initially, seven exploratory borings, designated EB-1 through EB-7, were drilled to the south of the original tank farm location in order to provide information on the subsurface materials and to determine if diesel product existed within the soils or was floating on the water. Each of the borings was extended to a total depth of 15.0 feet. Because of the distance from the source of contamination and the relatively shallow water table, no soil samples were retained for chemical analyses. Samples of the ground water were obtained from each boring with a teflon bailer and checked for the presence of floating diesel product or product sheen.

EB-1 was located in the western portion of the property, south of the southwestern corner of Building C. The surface elevation is 13.6 feet. Free ground water was encountered at a depth of 10.5 feet (elevation 3.1 feet) and remained at this level following drilling operations. Product odor was encountered at the water table and a minor product sheen was noted.

EB-2 and EB-3 were located in the parking lot south of the former tank farm, between Buildings B and C. Surface elevations are 13.2 and 13.3 feet respectively. Ground water was found at a depth of 9.5 feet in both borings (elevation 3.7 feet for EB-2 and 3.8 feet for EB-3) and remained at these levels following drilling operations. Diesel product odor and product sheen were encountered at the water table in both borings.

EB-4 was located on the south side of the parking lot between Buildings B and C. The surface elevation is 14.5 feet. Free ground water was first encountered at a depth of 10.5 feet (elevation 4.0 feet) and remained at this level following completion of drilling. Strong diesel product odor was found between 7.5 and 10.5 feet in depth (elevations 7.0 to 4.0 feet). Free product was noted on the augers and a product sheen was

observed on the water.

EB-5 was located in the parking lot south of the southeast corner of Buildings C. The surface elevation is 14.0 feet. Free ground water was first encountered at a depth of 10.5 feet (elevation 3.5 feet) and remained at this level following completion of drilling. Diesel product odor was found between 8.0 and 10.5 feet in depth (elevations 6.0 to 3.5 feet). No evidence of free product or product sheen was observed on the water.

EB-6 was located west of the northwest corner of Building B. The surface elevation is 15.3 feet. Free ground water was first encountered at a depth of 13.5 feet (elevation 1.8 feet) and remained at this level following completion of drilling. No evidence of diesel product odor in the soils, or product sheen on the water was observed.

EB-7 was located in the parking lot south of Building B. The surface elevation is 14.9 feet. Free ground water was first encountered at a depth of 14.0 feet (elevation 0.9 feet) and remained at this level following completion of drilling. No evidence of diesel product odor in the soils, or product sheen on the water was observed.

As was stated previously, two ground-water monitoring wells installed during Groundwater Technology's study (MW-3 and MW-8) remain operable at the site. In order to determine the direction of ground-water flow, two additional wells, designated MW-10 and MW-11 in order to maintain the numbering sequence, were installed as part of this study. Each of the wells was constructed to a total depth of 25.0 feet. Because of the distance from the source of contamination and the relatively shallow water table, no soil samples were retained for chemical analyses. The wells were constructed in accordance with the guidelines of the CRWQCB and the Alameda County Flood Control and Water Conservation District, Zone 7, under conditions of Permit 87155, a copy of which is attached. The wells were completed with locking caps and the key (P812) is enclosed with this submittal.

Monitoring well MW-10 was located on the south side of the parking lot between Buildings B and C. The surface elevation is 14.5 feet. Ground water was initially found at a depth of 12.0 feet (elevation 2.5 feet) and remained at this level following well completion. At the time of sampling, the water level had risen to a depth 10.75 feet (elevation 3.75 feet). Strong product odor was noted between 10.0 and the water table at 12.0 feet (elevations 4.5 to 2.5 feet). A product sheen was noted on the water following well completion but was not observed during sampling operations.

Monitoring well MW-11 was located on the Viking Freight property in the parking lot east of the Terminal Building. The surface elevation is 11.5 feet. Ground water was initially found at a depth of 10.5 feet (elevation 1.0 feet) and rose to 9.0 feet (elevation 2.5 feet) following well completion. At the time of sampling, the water level had raised to a depth 7.95 feet (elevation 3.55 feet). No evidence of product odor in the soils or product sheen on the water was noted.

The four existing wells were monitored by Blaine Tech Services, Inc. At that time, 7.5 inches and 0.25 inches of free diesel product were encountered in MW-3 and MW-8 respectively. Because of the high levels of product found, no laboratory analyses were attempted on these wells. No free product was encountered in MW-10 and MW-11, so water samples were obtained from these wells and analyzed by Sequoia Analytical Laboratory for total diesel hydrocarbons, benzene, toluene, and xylenes. Copies of the analytical reports are enclosed for your review. The following table presents the results of these analyses.

WATER ANALYSES

Well No.	Total Diesel Hydrocarbons (parts per billion)	Benzene (ppb)	Toluene (ppb)	Xylenes (ppb)
MW-3	7.5 in. free product	-	-	-
MW-8	0.25 in. free product	-	-	-
MW-10	< 1,000	< 0.5	1.9	0.93
MW-11	< 1,000	< 0.5	0.51	0.69

Based on the results of the well monitoring, it is apparent that hydrocarbon contamination has extended to the ground water. The maximum area affected by diesel contamination, as delinated by the presence of free product or product sheen, is outlined on the Site Plan, Figure 2. It appears that the free product zone (also outlined on Figure 2) is relatively localized in the vicinity of MW-3 and MW-8. However, the presence of extensive free product at least 100 feet down-gradient from the contamination source and product sheen initially encountered in EB-1 through EB-4 and MW-10 would seem to indi- cate that the contamination has, and is continuing, to move down-gradient to the south at a relatively slow rate of speed. The hydrogeologic cross-sections presented on

Figures 3 and 4, show the extent of contamination within the subsurface materials.

We conclude that remedial measures to eliminate the free product zone and decrease consitituant levels in the ground water are necessary. The results of this study have been discussed with Mr. Greg Zentner of the CRWQCB and several remediation measures were discussed at that time. Because of the impermeable nature of the subsurface soils, the most efficient and cost effective method appears to be the installation of a fluidized-bed aerobic bioreactor system. This system is capable of decreasing contaminant levels to drinking water standards in many cases.

We recommend that remediation measures be undertaken as soon as possible to assure that the contaminated water does not move offsite. A copy of this report has been sent to Mr. Greg Zentner of the CRWQCB. After he has had a chance to review the data, we will discuss with him the various remediation alternatives and choose the most cost-effective approach.

HMMP, Inc. has provided its findings, recommendations, specifications, or professional advice after preparing such information in a manner consistent with that level of care and skill ordinarily exercised by members of the profession currently practicing under similar conditions in the fields of engineering geology and hydrogeology. This acknowledgment is in lieu of all warranties either express or implied.

It has been a pleasure performing this service for you. If you have any questions regarding this project, please call.

Very truly yours,

HMMP, INC.

John K. Hofer
Engineering Geologist, EG-1065

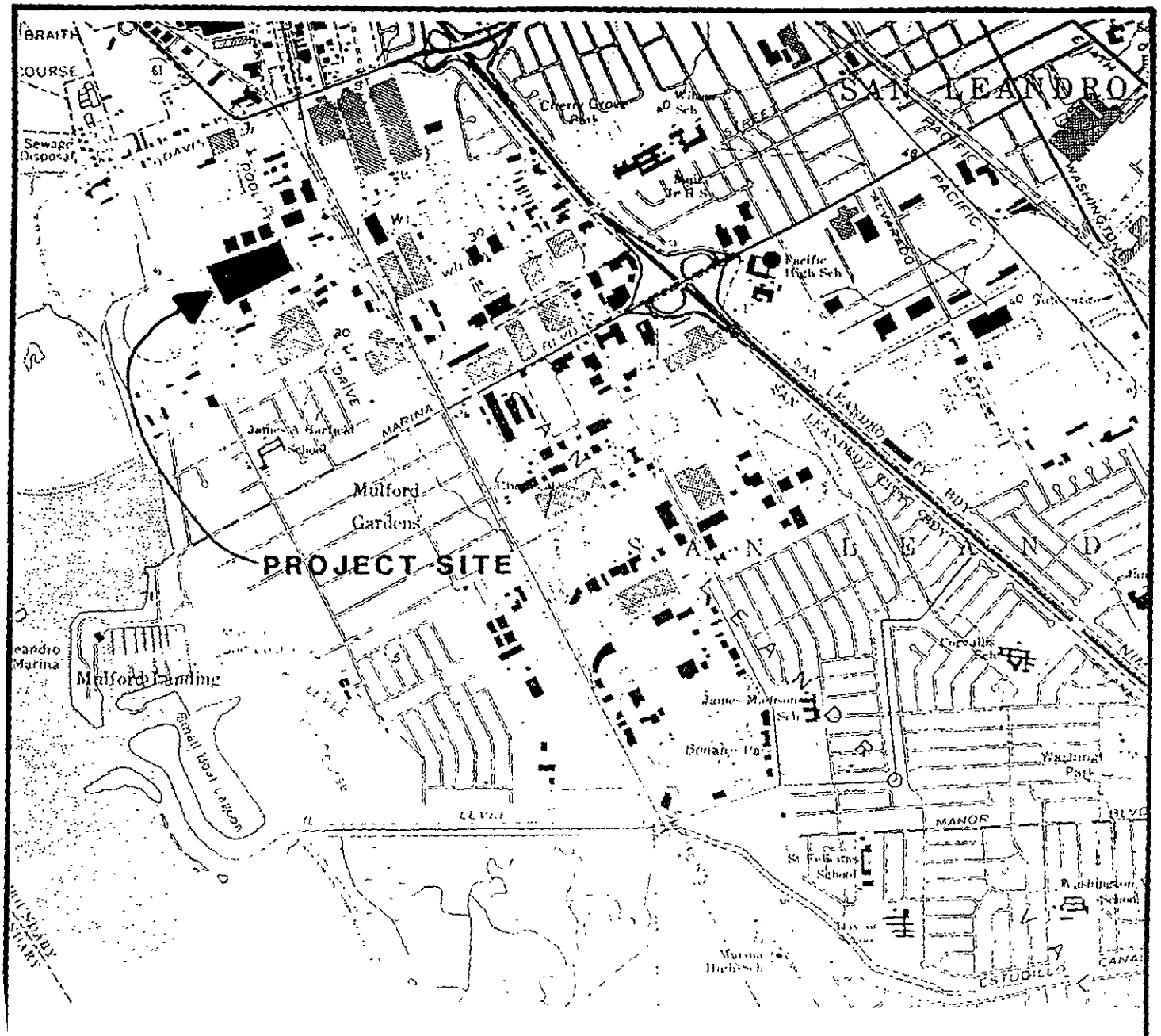
JKH:sng

cc. Mr. Greg Zentner
CRWQCB

Mr. Richard C. Blaine
Blaine Tech Services, Inc.

Attachments

(H223-01.2)



N

REGIONAL MAP

SCALE:

0 1000' 2000'

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9/87

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FIGURE 1

SCALE:
0 40' 80'

Former Fuel Tanks

B

Building C

?

?

Viking Freight Terminal Building

3.5

3.6

3.7

3.8

3.9

A

EB-1

EB-2

EB-3

MW-3

EB-5

A'

MW-11

MW-8

EB-4

MW-10

EB-6

Building B

EB-7

B

Building A

DOOLITTLE DRIVE

POLVOROSA AVENUE

LEGEND

B B' — Line of Hydrogeologic Cross-Section

3.5 — Ground-Water Elevation Contour

Approximate Limits of Free Product on Water

Approximate Limits of Initially Encountered Product Sheen on Water

• EB-7 – Exploratory Boring

MW-11 – Monitoring Well

MW-8 – Monitoring Well by Groundwater Technology

SITE PLAN

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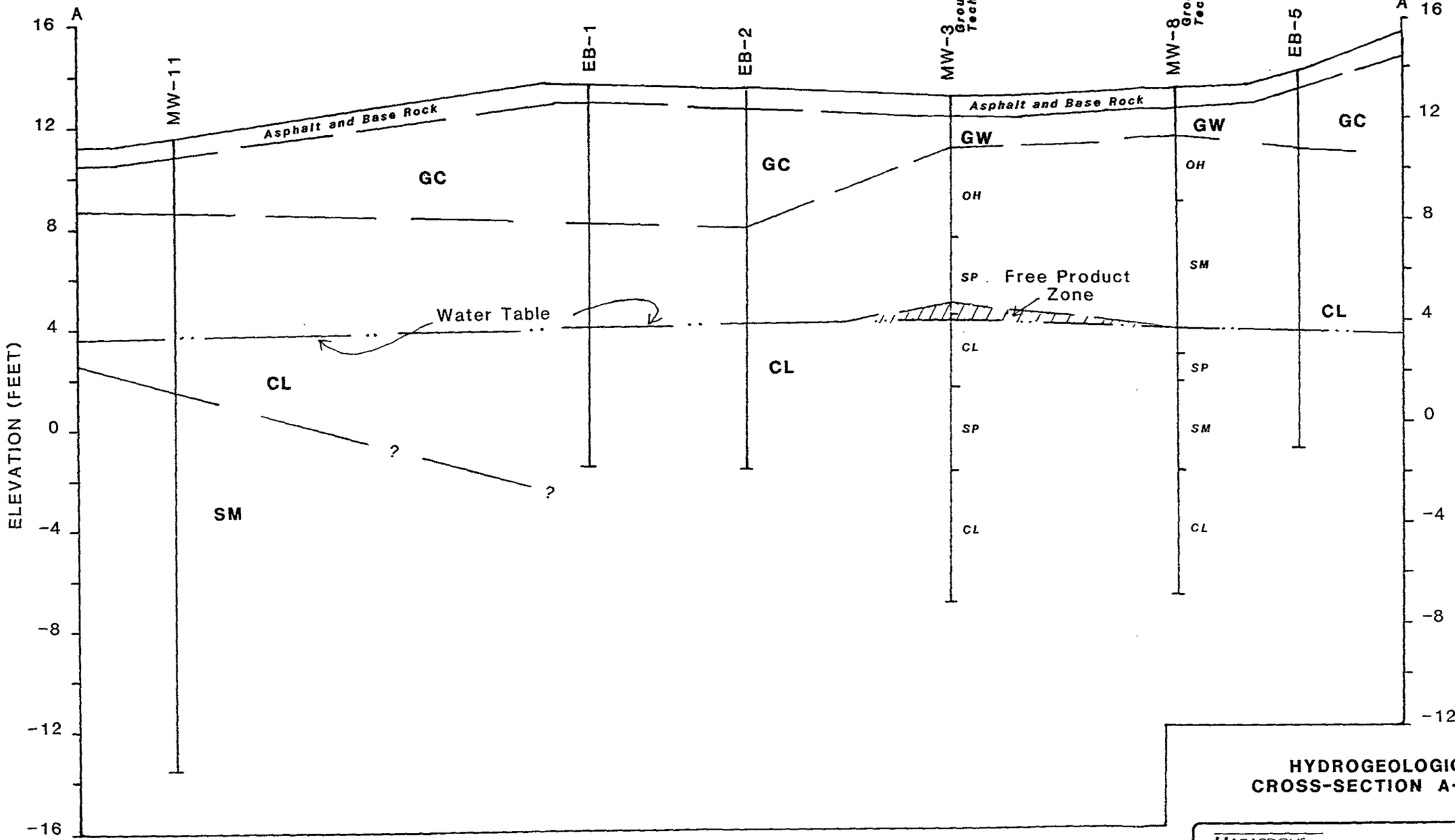
FIGURE



HYDROGEOLOGIC CROSS-SECTION A-A'

SCALE:

Horizontal: 1" = 40'
Vertical: 1" = 4'

See Figure 2 for Cross-Section Location
See Exploratory Boring Logs for Lithologic Description

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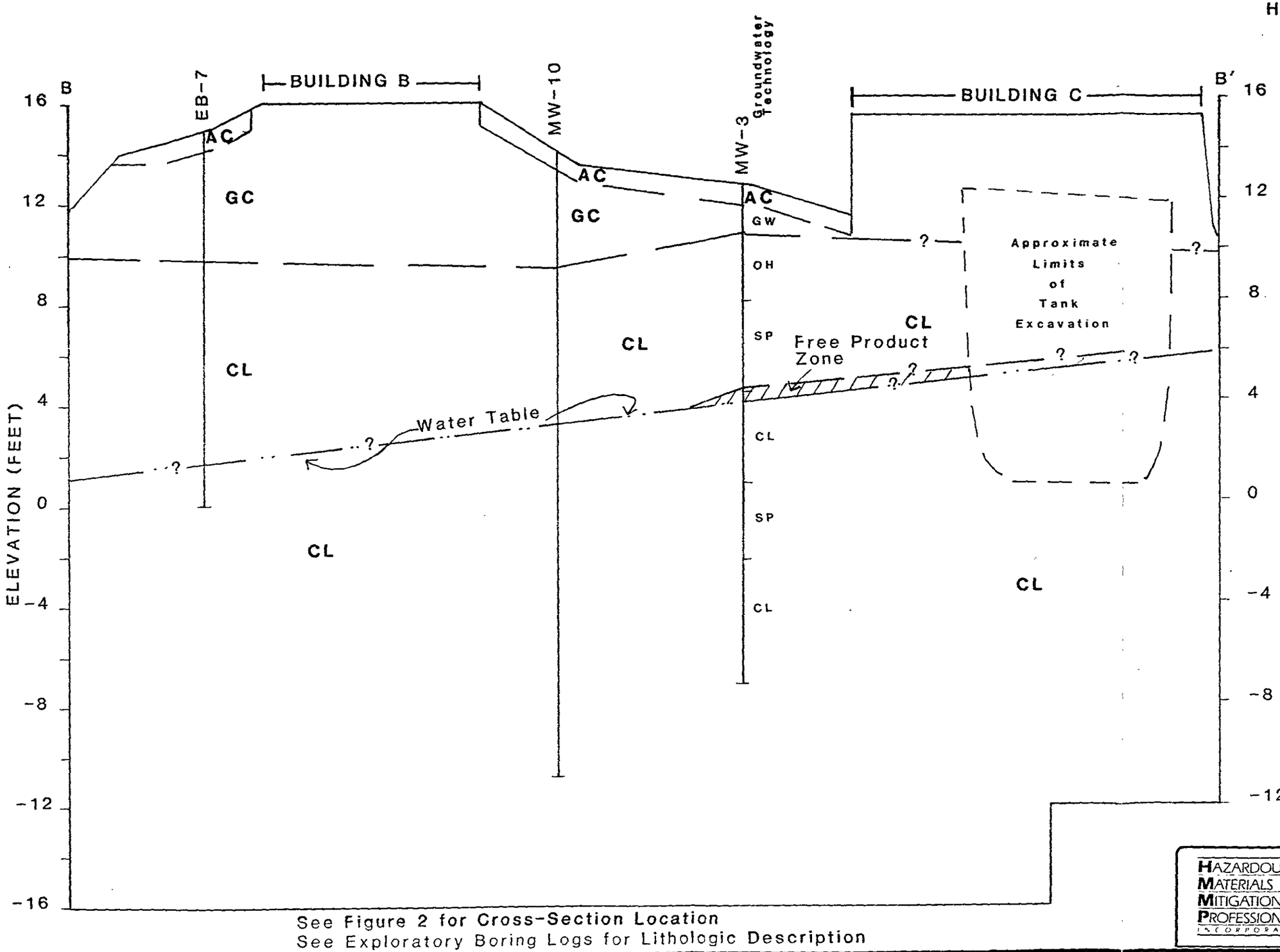
9/87

FIGURE 3

SCALE:
Horizontal: 1" = 40'
Vertical: 1" = 4'



See Figure 2 for Cross-Section Location
See Exploratory Boring Logs for Lithologic Description

HYDRO-GEOLOGIC CROSS-SECTION B-B'

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9/87
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FIGURE

DRILL RIG Hollow Stem	SURFACE ELEVATION ----	LOGGED BY JKH
DEPTH TO GROUNDWATER As Noted	BORING DIAMETER 8"	DATE DRILLED 7/20/87

DESCRIPTION AND REMARKS	COLOR	CONSIST	SOIL TYPE	DEPTH (FEET)	SAMPLER	UNCONFINED COMPRESSIVE STRENGTH (KSF)	WATER CONTENT (%)	DRY DENSITY (PCF)	PENETRATION RESISTANCE (BLOWS/FT)
ASPHALT AND BASE ROCK									
CLAYEY, SILTY GRAVEL	brown	medium dense	GC						
	green-gray			5					
SILTY CLAY, damp	black	stiff	CL						
Shell fragments									
Product odor Softer	blue-gray			10			▽		
				15					
TOTAL DEPTH = 15.0 feet									
Product sheen on water									

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EXPLORATORY BORING LOG

ROUSE AND ASSOCIATES

PROJECT NO.	DATE	BORING NO.
H223-01	8/87	ER-1

DRILL RIG Hollow Stem	SURFACE ELEVATION _ _ _ _ _	LOGGED BY JKH
DEPTH TO GROUNDWATER As Noted	BORING DIAMETER 8"	DATE DRILLED 7/20/87

DESCRIPTION AND CLASSIFICATION				DEPTH (FEET)	SAMPLER	UNCONFINED COMPRESSIVE STRENGTH (KSF)	WATER CONTENT (%)	DRY DENSITY (PCF)	PENETRATION RESISTANCE (BLOWS/FT)
DESCRIPTION AND REMARKS	COLOR	CONSIST.	SOIL TYPE						
ASPHALT AND BASE ROCK									
CLAYEY, SILTY GRAVEL	dark brown	medium dense	GC						
				5					
SILTY CLAY, damp	black	stiff	CL						
Product odor Softer	blue-gray						▽		
				10					
				15					
TOTAL DEPTH = 15.0 feet Product sheen on water									

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EXPLORATORY BORING LOG

ROUSE AND ASSOCIATES

PROJECT NO	DATE	BORING NO.
H223-01	8/87	EB-2

DRILL RIG	Hollow Stem	SURFACE ELEVATION	- - - -	LOGGED BY	JKH
DEPTH TO GROUNDWATER	As Noted	BORING DIAMETER	8"	DATE DRILLED	7/20/87

DESCRIPTION AND REMARKS	COLOR	CONSIST.	SOIL TYPE	DEPTH (FEET)	SAMPLER	UNCONFINED COMPRESSIVE STRENGTH (KSF)	WATER CONTENT (%)	DRY DENSITY (PCF)	PENETRATION RESISTANCE (BLOWS/FT.)
ASPHALT AND BASE ROCK									
CLAYEY, SILTY GRAVEL, damp	dark brown	medium dense	GC	5					
SILTY CLAY, moist	black	stiff	CL				▽		
Very moist, strong product odor, softer	blue-gray			10					
				15					
TOTAL DEPTH = 15.0 feet Product sheen on water									

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EXPLORATORY BORING LOG

ROUSE AND ASSOCIATES

PROJECT NO.	DATE	BORING NO.
H223-01	8/87	EB-3

DRILL RIG	Hollow Stem	SURFACE ELEVATION	------	LOGGED BY	JKH
DEPTH TO GROUNDWATER	As Noted	BORING DIAMETER	8"	DATE DRILLED	7/20/87

DESCRIPTION AND REMARKS	COLOR	CONSIST.	SOIL TYPE	DEPTH (FEET)	SAMPLER	UNCONFINED COMPRESSIVE STRENGTH (KSF)	WATER CONTENT (%)	DRY DENSITY (PCF)	PENETRATION RESISTANCE (BLOWS/FT.)
ASPHALT AND BASE ROCK									
CLAYEY, SILTY GRAVEL, damp	brown	medium dense	GC						
SILTY CLAY, moist	black	stiff	CL	5					
Softer, very moist, strong product odor	blue-gray								
Free product on augers				10					
				15					
TOTAL DEPTH = 15.0 feet									
Product sheen on water.									

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EXPLORATORY BORING LOG

ROUSE AND ASSOCIATES

PROJECT NO.	DATE	BORING NO.
11223-01	8/87	EB-4

DRILL RIG	Hollow Stem	SURFACE ELEVATION	-----	LOGGED BY	JKH
DEPTH TO GROUNDWATER	As Noted	BORING DIAMETER	8"	DATE DRILLED	7/20/87

DESCRIPTION AND CLASSIFICATION				DEPTH (FEET)	SAMPLER	UNCONFINED COMPRESSIVE STRENGTH (KSF)	WATER CONTENT (%)	DRY DENSITY (PCF)	PENETRATION RESISTANCE (BLOWS/FT.)
DESCRIPTION AND REMARKS	COLOR	CONSIST.	SOIL TYPE						
ASPHALT AND BASE ROCK									
CLAYEY, SILTY GRAVEL, damp	brown	medium dense	GC						
SILTY CLAY, moist	black	stiff	CL	5					
Product odor	light brown								
Softer, no visible product on augers	blue-gray			10			▽		
				15					
TOTAL DEPTH = 15.0 feet									
No product sheen on water									

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EXPLORATORY BORING LOG

ROUSE AND ASSOCIATES

PROJECT NO.	DATE	BORING NO.
H223-01	8/87	EB-5

DRILL RIG	Hollow Stem	SURFACE ELEVATION	----	LOGGED BY	JKH
DEPTH TO GROUNDWATER	As Noted	BORING DIAMETER	8"	DATE DRILLED	7/20/87

DESCRIPTION AND CLASSIFICATION				DEPTH (FEET)	SAMPLER	UNCONFINED COMPRESSIVE STRENGTH (KSF)	WATER CONTENT (%)	DRY DENSITY (PCF)	PENETRATION RESISTANCE (BLOWS/FT.)
DESCRIPTION AND REMARKS	COLOR	CONSIST.	SOIL TYPE						
ASPHALT AND BASE ROCK									
CLAYEY, SILTY GRAVEL, damp	brown	medium dense	GC						
				5					
				10					
SILTY CLAY, moist	black	stiff	CL						
Softer	blue-gray						▽		
				15					
TOTAL DEPTH = 15.0 feet									
No product sheen on water.									

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EXPLORATORY BORING LOG

ROUSE AND ASSOCIATES

PROJECT NO.	DATE	BORING NO.
H223-01	8/87	EB-6

DRILL RIG Hollow Stem	SURFACE ELEVATION -----	LOGGED BY JKH
DEPTH TO GROUNDWATER As Noted	BORING DIAMETER 8"	DATE DRILLED 7/20/87

DESCRIPTION AND CLASSIFICATION				DEPTH (FEET)	SAMPLER	UNCONFINED COMPRESSIVE STRENGTH (KSF)	WATER CONTENT (%)	DRY DENSITY (PCF)	PENETRATION RESISTANCE (BLOWS/FT.)
DESCRIPTION AND REMARKS	COLOR	CONSIST.	SOIL TYPE						
ASPHALT AND BASE ROCK									
CLAYEY, SILTY GRAVEL, damp	brown	medium dense	GC						
				5					
SILTY CLAY, damp, no product odor	black	stiff	CL						
				10					
Softer	blue-gray						▽		
				15					
TOTAL DEPTH = 15.0 feet									
No product sheen on water.									

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EXPLORATORY BORING LOG

ROUSE AND ASSOCIATES

PROJECT NO.	DATE	BORING NO.
H223-01	8/87	EB-7

DRILL RIG Hollow Stem	SURFACE ELEVATION ----	LOGGED BY JKH
DEPTH TO GROUNDWATER As Noted	BORING DIAMETER 8"	DATE DRILLED 7/20/87

DESCRIPTION AND REMARKS	COLOR	CONSIST.	SOIL TYPE	DEPTH (FEET)	SAMPLER	UNCONFINED COMPRESSIVE STRENGTH (KSF)	WATER CONTENT (%)	DRY DENSITY (PCF)	PENETRATION RESISTANCE (BLOWS/FT.)
ASPHALT AND BASE ROCK									
CLAYEY, SILTY GRAVEL, damp	brown	medium dense	GC						
SILTY CLAY, moist	black	stiff	CL	5					
	light brown								
Softer Strong product odor	blue-gray			10			▽		
Stiffer				15					
		soft		20					

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EXPLORATORY BORING LOG

ROUSE AND ASSOCIATES

PROJECT NO.	DATE	BORING NO.
1223-01	8/87	MW-10

DRILL RIG Hollow Stem	SURFACE ELEVATION - - - -	LOGGED BY JKH
DEPTH TO GROUNDWATER As Noted	BORING DIAMETER 8"	DATE DRILLED 7/20/87

DESCRIPTION AND CLASSIFICATION				DEPTH (FEET)	SAMPLER	UNCONFINED COMPRESSIVE STRENGTH (KSF)	WATER CONTENT (%)	DRY DENSITY (PCF)	PENETRATION RESISTANCE (BLOWS/FT.)
DESCRIPTION AND REMARKS	COLOR	CONSIST.	SOIL TYPE						
SILTY CLAY, CONT'D.		soft	CL	15					
TOTAL DEPTH = 25.0 feet Water level at 12.0 feet following well completion. Product sheen on water.									

HAZARDOUS MATERIALS MITIGATION PROFESSIONALS, INC.

1450 Koll Circle, Suite 114, San Jose, CA 95112
Telephone: (408) 286-7868

EXPLORATORY BORING LOG

ROUSE AND ASSOCIATES

PROJECT NO.	DATE	BORING NO.
H223-01	8/87	MW-10

1555 DOOLITTLE DRIVE

SAN LEANDRO, CALIFORNIA

MW-10

Well completed to 25.0 feet in depth with 2-inch Class 160 PVC casing, flush-threaded joints. Screen (.020-inch slot) set from 7.0 to 25.0 feet. 12 X 20 Monterey sand placed from 5.0 to 25.0 feet, bentonite pellets placed from 3.0 to 5.0 feet, and concrete seal placed from 0 to 3.0 feet.

DRILL RIG Hollow Stem	SURFACE ELEVATION -----	LOGGED BY JKH
DEPTH TO GROUNDWATER As NOted	BORING DIAMETER 8"	DATE DRILLED 7/20/87

DESCRIPTION AND CLASSIFICATION				DEPTH (FEET)	SAMPLER	UNCONFINED COMPRESSIVE STRENGTH (KSF)	WATER CONTENT (%)	DRY DENSITY (PCF)	PENETRATION RESISTANCE (BLOWS/FT.)
DESCRIPTION AND REMARKS	COLOR	CONSIST.	SOIL TYPE						
ASPHALT AND BASE ROCK									
CLAYEY, SILTY GRAVEL, damp	brown	medium dense	GC						
SILTY CLAY, moist	black	stiff	CL	5					
Some gravel									
SILTY SAND, medium grained, no product odor	gray brown	medium dense	SM	10			▽		
				15					
				20					

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Telephone: (408) 286-7868

EXPLORATORY BORING LOG

ROUSE AND ASSOCIATES

PROJECT NO.	DATE	BORING NO.
1223-01	8/87	MW-11

DRILL RIG Hollow Stem	SURFACE ELEVATION ----	LOGGED BY JKH
DEPTH TO GROUNDWATER As Noted	BORING DIAMETER 8"	DATE DRILLED 7/20/87

DESCRIPTION AND REMARKS	COLOR	CONSIST.	SOIL TYPE	DEPTH (FEET)	SAMPLER	UNCONFINED COMPRESSIVE STRENGTH (KSF)	WATER CONTENT (%)	DRY DENSITY (PCF)	PENETRATION RESISTANCE (BLOWS/FT.)
SILTY SAND, CONT'D. Increasing gravel	gray brown	medium dense	SM	25					
TOTAL DEPTH = 25.0 feet Water level at 9.0 feet following well completion. No product sheen on water									

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Telephone: (408) 286-7868

EXPLORATORY BORING LOG

ROUSE AND ASSOCIATES

PROJECT NO.	DATE	BORING NO.
H223-01	8/87	MW-11

1555 DOOLITTLE DRIVE

SAN LEANDRO, CALIFORNIA

MW-11

Well completed to 25.0 feet in depth with 2-inch Class 160 PVC casing, flush threaded joints. Screen (.020-inch slot) set from 7.0 to 25.0 feet. 12 X 20 Monterey sand placed from 5.0 to 25.0 feet, bentonite pellets placed from 3.0 to 5.0 feet, and concrete seal placed from 0 to 3.0 feet.

GROUNDWATER TECHNOLOGY, INC.
OIL RECOVERY SYSTEMS

Monitoring Well 3

Drilling

Project: Blumver/Doolittle Owner: Rouse & Associates

Location: San Leandro Project Number: 20 8183

Date Drilled: 10/27 Total Depth of Hole: 20 ft. Diameter: 7.5 in.

Surface Elevation: ____ Water Level Initial: ____ 24-hrs: 10.48

Screen: Dia. 2 in. Length: 15 ft. Slot Size: 0.02 in.

Casing: Dia. 2 in. Length: 5 ft. Type: PVC

Drilling Company: D. Kvilhaug Drilling Method: hollow stem auger

Driller: D. Kvilhaug Log by: J. Mibey

Sketch Map

Notes

Depth (Feet)	Well Construction	Holus PID	Sample Number	Graphic Log	Description/Soil Classification
0				GW	Brown, gravel and crushed asphalt (disturbed, dry, no odor)
2					
4				CH	Black, organic clay, some shell fragments (pliable moist, slight hydrocarbon odor)
6		25	3 5 7	SP	Green, gravelly sand (loose, moist, slight diesel odor)
8					(Increasing gravel)
10		12	6 7 6	CL	Green gray, silty clay (stiff, moist, slight diesel odor)
12					
14				SP	Green brown, medium sand (moist, moderate diesel odor)
16					
18				CL	Gray green, silty clay (pliable, moist, moderate hydrocarbon odor)
20					
22					
24					

GROUNDWATER TECHNOLOGY, INC.
OIL RECOVERY SYSTEMS

Monitoring Well 8

Drillin

Project Blumver/Doolittle Owner Rouse & Associates

Location San Leandro Project Number 20 8183

Date Drilled 10/28 Total Depth of Hole 20 ft. Diameter 7.5 in.

Surface Elevation ____ Water Level Initial ____ 24-hrs. 11.34 ft.

Screen Dia. 2 in. Length 15 ft. Slot Size 0.02 in.

Casing Dia. 2 in. Length 5 ft. Type PVC

Drilling Company D. Kvilhaug Drilling Method hollow stem auger

Driller D. Kvilhaug Log by J. Mibey

Sketch Map

Notes

Depth (Feet)	Well Construction	Notes	Sample Number	Graphic Log	Description/Soil Classification
0				GW	Brown gravel and crushed asphalt (disturbed, dry no odor)
2					
4				OH	Black, organic silty clay, some shells (pliable, moist, no odor)
6			5 6 8	SM	Green gray, silty fine sands (medium dense, mois very slight hydrocarbon odor)
8				SM	Gray, silty sands (moist, slight hydrocarbon odo
10			6 6 3	SP	Gray green, coarse sands and gravel (loose, wet, moderate hydrocarbon odor)
12				SM	Green gray, silty sands (moist, strong hydrocarb odor)
14					
16					
18				CL	Gray green, silty clays (pliable, moist, strong hydrocarbon odor)
20					
22					
24					

BLAINE
TECH SERVICES INC.

1370 TULLY RD., SUITE 505
SAN JOSE, CA 9512
(408) 995-553

August 25, 1987

HMMP
1450 Koll Circle, Suite 114
San Jose, CA 95112

Attention: John Hofer

Re: MONITORING OF FOUR WELLS AT
1555 DOOLITTLE
SAN LEANDRO, CA.

AUGUST 11, 1987

SAMPLING REPORT

Sampling was performed in accordance with approved methodology which included repeated evacuation of the wells. Samples were collected in containers appropriate for the analysis to be performed and were chilled during transport to the laboratory. Chain of custody records were maintained.

The following wells were investigated and/or sampled:

Well Designation	Well Diameter	Depth to Water Surface	Well Depth	Volume purged (gallons)
MW-10	2"	10.75'	24.5'	14
MW-11	2"	7.95'	24'	14

Data collection during well evacuation:

Well Designation	Time	Electrical Conductivity (micromhos/cm)	pH	Temperature (Celsius)
MW-10	12:13	210	7.0	19
MW-11	11:39	220	7.0	19

Samples obtained from these wells were delivered to Sequoia Analytical Laboratory to be tested for diesel and benzene, toluene, and xylenes (btx).

BLAINE TECH SERVICES INC.

P.O. BOX 574
SAN JOSE, CA 9515
(408) 723-397

PROJECT NUMBER

872231

SITE ADDRESS

HMMP @
~~1255~~ 1200 Doolittle
San Leandro, CA

PLEASE INCLUDE PROJECT NUMBER AND SITE ADDRESS ON LAB REPORTS AND INVOICES

TURN-AROUND Routine RESULTS BY 8/25 LAB USED SBQ

BILLING

(X) Bill Blaine Tech Services
( ) BILL

SPECIAL INSTRUCTIONS

I.D.	TYPE	ANALYSIS TO DETECT	LAB #	LAB RESULTS
MW-10	Liquid	Diesel & BTX		
MW-11	"	"	"	

Field sampling completed 12:30 AM/PM 8-11-87 performed by

RELEASED BY

2:45 AM/PM 8-11-87

:___ AM/PM - -87

:___ AM/PM - -87

ACCEPTED BY

2:45 AM/PM 8-11-87

:___ AM/PM - -87

:___ AM/PM - -87

SEQUOIA Analytical Laboratory
2549 Middlefield Road
Redwood City, CA 94063 • (415) 364-9222

Blaine Tech Services
P.O. Box 5745
San Jose, CA 95150
Attn: Richard Blaine

Date Sampled: 08/11/87
Date Received: 08/11/87
Date Reported: 09/02/87
BTS #87223F1

Sample Number
7080665

Sample Description
HMMP at 1555 Doolittle in San Leandro, CA - MW-10, Water Sample

ANALYSIS

	Detection Limit ppb	Sample Results ppb
Benzene	0.5	< 0.5
Toluene	0.5	1.9
Xylenes	0.5	0.93

NOTE: Analysis was performed using EPA method 602.

SEQUOIA ANALYTICAL LABORATORY

Arthur G. Burton
Laboratory Director

sls

SEQUOIA Analytical Laboratory
2549 Middlefield Road
Redwood City, CA 94063 • (415) 364-9222

Blaine Tech Services
P.O. Box 5745
San Jose, CA 95150
Attn: Richard Blaine

Date Sampled: 08/11/87
Date Received: 08/11/87
Date Reported: 09/02/87
BTS #87223F1

Sample Number

7080666

Sample Description

HMMP at 1555 Doolittle in San Leandro, CA - MW-11, Water Sample

ANALYSIS

	Detection Limit ppb	Sample Results ppb
Benzene	0.5	< 0.5
Toluene	0.5	0.51
Xylenes	0.5	0.69

NOTE: Analysis was performed using EPA method 602.

SEQUOIA ANALYTICAL LABORATORY

Arthur G. Burton
Laboratory Director

sls

SEQUOIA Analytical Laboratory
2549 Middlefield Road
Redwood City, CA 94063 • (415) 364-9222

Blaine Tech Services
P.O. Box 5745
San Jose, CA 95150
Attn: Richard Blaine

Date Sampled: 08/11/87
Date Received: 08/11/87
Date Reported: 09/02/87
BTS #87223F1

Sample Number	Sample Description	Detection Limit ppm	Total Hydrocarbons as Diesel ppm
	HMMP at 1555 Doolittle in San Leandro, CA		
7080665	MW-10, Water	1.0	< 1.0
7080666	MW-11, Water	1.0	< 1.0

NOTE: Analysis was performed using EPA methods 3510 and 8015.

SEQUOIA ANALYTICAL LABORATORY

Arthur G. Burton
Laboratory Director

sls

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INCORPORATED

March 16. 1988 Proposal No. HP-851

Mr. Bob Malin
Rouse and Associates
32990 Alvarado-Niles Road, Suite 990
Union City, CA 94587

RE: AQUIFER TESTING
POLVOROSA BUSINESS PARK
1555 DOOLITTLE DRIVE
SAN LEANDRO, CALIFORNIA

Dear Mr. Malin:

In accordance with our telephone conversation of March 8, 1988, the following presents our proposed scope of work and cost for an aquifer test to be performed at the subject site. Since our initial water sampling, outlined in our report of September 30, 1987, two additional samplings have been performed. The second sampling, on November 11, 1987, was performed following the extraction of roughly 150 gallons of water from MW-3 The third sampling was performed on December 31, 1987 following the extraction of roughly 500 gallons of water from MW-3.

We had hoped to extract enough effluent during the pumping to significantly reduce the levels of contamination in the four monitoring wells. The second sampling was somewhat inconclusive due to the small amount of water removed. Therefore, the third sampling was programed to remove a greater amount of water in an attempt to create a cone of depression, thereby drawing contaminants to MW-3. During this operation levels of high boiling point hydrocarbons in the pumped well rose abruptly, indicating that diesel product was being drawn to the pumping well. However, it was also noted that levels of low to medium boiling point hydrocarbons and benzene, associated with the presence of gasoline rather than diesel fuel. also rose abruptly, indicating that heretofore undiscovered gasoline contamination might be present on the site. The following table summarizes the results of all water samplings performed to date, including an analysis of the water that was extracted from MW-3 and placed in a storage tank for removal.

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Telephone: (408) 286-7868

WATER ANALYSES

Well No.	Date	Total Diesel Hydro-carbons (ppb)	Total Gas Hydro-carbons (ppb)	Benzene (ppb)	Toluene (ppb)	Xylenes (ppb)
MW-3	8/11/87		7.50 inches free product			
MW-8	8/11/87		0.25 inches free product			
MW-10	8/11/87	< 1.000	-	< 0.5	1.9	0.93
MW-11	8/11/87	< 1,000	-	< 0.5	0.51	0.69
MW-3	11/23/87	10.000	-	< 0.5	< 0.5	5.3
MW-8	11/23/87	330	-	13	1.3	8.6
MW-10	11/23/87	< 50	-	0.61	1.4	16
MW-11	11/23/87	1,200	-	< 0.5	1.5	11
MW-3	12/31/87	84,000	7,400	2.200	1,800	1,500
MW-8	12/32/87	7,500	370	< 0.5	< 0.5	14
MW-10	12/31/87	390	100	< 0.5	< 0.5	< 0.5
Tank	12/31/87	-	110,000	6,100	19,000	17,000

In order to evaluate the shallow aquifer characteristics, we propose to conduct a pilot program of aquifer testing at the subject site. The primary purpose of these tests is to determine the transmissivity (permeability) of the shallow aquifer, and to assess the effects of the local tidal patterns. Once this has been determined, we can confirm the presence of gasoline contamination and better analyze ground-water remediation alternatives, if deemed necessary.

We hope to perform all of the tasks outlined below as part of this study. However, it is important to note that the possibility exists that all or some of these tasks may have to be eliminated if it is determined that the aquifer cannot support such a pumping program.

SCOPE OF WORK

1. We will attempt to pump MW-3 at a relatively high flow rate until the casing has been evacuated. Recovery measurements will then be made for the first 30 minutes following the conclusion of pumping.

2. An attempt will be made to pump MW-3 at a constant rate for at least an 8-hour period in order to determine the long-term pumping capabilities of the well.

3. If possible, a second 8-hour pump test will be performed on MW-3 roughly 16 hours following the conclusion of the initial pumping period.

4. The ground-water levels will be measured in MW-3, MW-8, and MW-10 during both pumping and recovery periods. This information will help to determine cones of depression and long-term pumping effects on the water levels of the adjacent wells. At the same time, the effect of flucuating tides on the water levels will be evaluated.

5. Water samples from MW-3 will be collected at the midpoint and at the conclusion of the initial 8-hour pumping program, and at the beginning and the end of the second 8-hour test. These samples will be analyzed for total hydrocarbons due to diesel and gasoline, benzene, toluene, and xylenes.

Following receipt of all analytical results, a brief report will be prepared summarizing the methods used and the results obtained during this study. This report will provide suitable information as to the shallow aquifer characteristics so as to better evaluate site hydrogeologic conditions, and, as necessary, select a remediation alternative which will be best suited to this site.

COST

Providing that all of the above scope of work is completed, we estimate that the total cost will not exceed $6,800.00. It is important to note, however, that should some of the tasks be eliminated due to the aquifer conditions, that the cost will be decreased accordingly. In order to cover outside expenses, we require an initial payment of $2,000.00. The balance will be invoiced following the completion of the project. If the proposed scope and cost are satisfactory, please sign one copy of the attached Work Agreement and send it along with your check to our office.

SCHEDULING

We estimate that this proposed study will require 8 to 10 weeks to complete from the date of project authorization. Verbal reports on the progress of the study will be provided as desired.

LIMITATIONS

HMMP, Inc. shall provide its findings, recommendations, specifications, or professional advice after preparing such information in a manner consistent with that level of care and skill ordinarily exercised by members of the profession currently practicing under similar conditions in the fields of engineering geology and hydrogeology. This acknowledgment is in lieu of all warranties either express or implied.

We believe that the information derived from this study is vital in order to prepare an efficient, cost-effective remedial solution to this problem. If you wish to discuss this proposed study or if you have any questions, please do not hesitate to call.

Very truly yours,

HMMP, INC.

John K. Hofer
Engineering Geologist, EG-1065

JKH:sng

enclosures

cc: Blaine Tech Services, Inc.

(HP-851.1)

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INCORPORATED

May 20, 1988

Project No. H223-01B

State Employee Retirement System
Harrisburg, PA

RE: CHRONOLOGY OF EVENTS
POLVOROSA BUSINESS PARK
1555 DOOLITTLE DRIVE
SAN LEANDRO, CALIFORNIA

Gentlemen:

In accordance with your request, the following presents a chronologic list of events relating to the subject property to date. The information presented below has been supplied by Mr. Bob Malin of Rouse and Associates, the current property owner, Blaine Tech Services, Inc., Groundwater Technology, and HMMP, Inc. All information has been referenced as to source.

INTRODUCTION

The project site is a portion of an 11.6 acre parcel purchased by Rouse and Associates in March of 1986. The parcel was previously owned by Merchants, Incorporated of Abilene, Texas and prior to that McLeans Trucking Company of North Carolina. McLeans received title when it merged with Delta Lines who had bought the property from Consolidated Freightways who had built the terminal. The property had been used as a truck terminal since its original development in 1959. Prior to development, the land was used for the planting of row crops. In September of 1986 Rouse and Associates completely demolished all of the then existing improvements on the site, removed all existing underground tanks and associated plumbing and began the construction of a 92,250 square foot development known as the Polvorosa Business Park on the easterly 5.6 acre portion of the site and a build to suit truck terminal for Viking Freight Lines on the westerly five acre portion of the site. The only fill imported to the site was "base rock" used as sub-base and base for the new buildings, driveways and parking areas.

The Polvorosa Business Park site is bordered on the north by a

1450 Koll Circle, Suite 114, San Jose, CA 95112
Telephone: (408) 286-7868

Pacific Railway Line, on the East by Doolittle Drive, on the south by Polvorosa Avenue and on the west by property owned by Rouse and Associates. The site is relatively flat with no abrupt changes in elevation and slopes very gently from the east to the west.

CHRONOLOGY

DATE	EVENT
Sept. 19, 1986	Four 10,000-gallon diesel tanks were removed from a common excavation due to discontinuation of on-site storage.*
Sept. 19, 1986	Since the water table was above the bottom of the tanks, only samples of the water were obtained by Blaine Tech Services, Inc. for analysis.*
Sept. 22, 1986	Two 3,000-gallon waste oil and one 5,000-gallon motor oil tank were removed from a common excavation. In addition, two 10,000-gallon gasoline tanks and one motor oil tank of unknown size were removed from a common excavation.*
Sept. 22, 1986	A water sample was collected from each of the excavations by Blaine Tech Services, Inc.*
Sept. 24, 1986	An additional sample of the ground water was collected by Blaine Tech Services, Inc. from the gasoline and motor oil tank excavation.*
Sept. 25, 1986	Results of analysis of water sample from the waste oil and motor oil tank excavation (analysis performed by Sequoia Analytical Laboratory).*

SAMPLE NUMBER	CONSTITUENT	PARTS PER MILLION
6091383	Waste Oil	36

Sept. 25, 1986	Results of analyses of water samples from the gasoline and motor oil tank excavation

DATE — EVENT

(analyses performed by Sequoia Analytical Laboratory).*

Sept. 25, 1986

SAMPLE NUMBER	CONSTITUENT	PARTS PER MILLION
6091384	Motor Oil	180
	Benzene	0.34
	Toluene	0.096
	Xylenes	< 0.001
6091393	Oil	17
	Benzene	< 0.1
	Toluene	0.40
	Xylenes	0.50

Oct. 3, 1986

Results of analyses of water samples from the four 10,000-gallon diesel tank excavation (analyses performed by Sequoia Analytical Laboratory).*

SAMPLE NUMBER	CONSTITUENT	PARTS PER MILLION
6091332	Diesel	19
	Benzene	< 0.001
	Toluene	< 0.001
	Xylenes	< 0.001
6091333	Diesel	12
	Benzene	< 0.001
	Toluene	< 0.001
	Xylenes	< 0.001
6091334	Diesel	34
	Benzene	< 0.001
	Toluene	< 0.001
	Xylenes	< 0.001
6091335	Diesel	7.7
	Benzene	< 0.001
	Toluene	< 0.001
	Xylenes	< 0.001

Oct., 1986 — Blymyer and Sons Engineers, Inc. were contracted by Rouse and Associates to provide information as to the extent of product migration beneath the site.**

Oct., 1986 — Groundwater Technology, Inc. was contracted by Blymyer and Sons Engineers, Inc. to explore the

DATE	EVENT
	vicinity of the former tanks for possible product migration. As part of this study, seven exploratory borings were excavated and nine ground-water monitoring wells were constructed on the site. Soil and water samples were collected where possible.**
Oct. 17, 1986	Results of the laboratory analyses indicated extensive hydrocarbon compounds within the soils and ground water to distances at least 160 feet from the former tank excavations.**
1986-87	During construction of the Polvorosa Business Park, all but two of the ground-water monitoring wells were destroyed.***
June 18, 1987	HMMP, Inc. submitted a proposal to perform a study designed to evaluate the site with regard to hydrocarbon contamination. The scope of work was approved verbally by Mr. Greg Zentner of the California Regional Water Quality Control Board (CRWQCB), and a copy of the scope of work was submitted to him on July 2, 1988.****
July 7, 1987	Mr. J. Killingstad of the Alameda County Flood Control and Water Conservation District granted a permit (No. 87155) to install two ground-water monitoring wells at the site.****
July 20, 1987	HMMP, Inc. constructed two ground-water monitoring wells (MW-10 and MW-11), and seven exploratory borings at the site in order to determine the extent of hydrocarbon migration. At the time, product sheen was found on the water in four of the exploratory borings and in one of the monitoring wells.****
Aug. 11, 1987	Blaine Tech Services, Inc. sampled MW-10 and MW-11 along with the two wells remaining from the work performed by Groundwater Technology, Inc. (MW-3 and MW-8). Samples were not collected from the latter two wells due to the

DATE — EVENT

presence of "free product" on the water surface.*

Aug. 11, 1987 — Copies of the boring logs and well construction details, along with a site plan sent to Mr. Craig Mayfield of Alameda County Flood Control and Water Conservation District to satisfy their requirements.****

Sept. 2, 1987 — Results of analyses on water samples obtained from MW-10 and MW-11 (Analyses performed by Sequoia Analytical Laboratory).*

WELL NUMBER	CONSTITUENT	PARTS PER BILLION
MW-10	Diesel	< 1,000
	Benzene	< 0.5
	Toluene	1.9
	Xylenes	0.93
MW-11	Diesel	< 1,000
	Benzene	< 0.5
	Toluene	0.51
	Xylenes	0.69

Sept. 30, 1987 — A technical report was issued by HMMP, Inc. summarizing the results of our study and concluding that hydrocarbon contamination had occurred and that remediation measures would be necessary. A copy of the report was sent to Mr. Greg Zentner of the CRWQCB.****

Nov. 11, 1987 — MW-3, MW-8, MW-10, and MW-11 were sampled by Blaine Tech Services, Inc. following the extraction of roughly 150 gallons of water from MW-3 by Del Harlow Enterprises, Inc.*

Dec. 14, 1987 — Results of analyses on water samples obtained from MW-3, MW-8, MW-10, and MW-11 (Analyses performed by Sequoia Analytical Laboratory)*

DATE	EVENT		
	WELL NUMBER	CONSTITUENT	PARTS PER BILLION
	MW-3	Diesel	10,000
		Benzene	< 0.5
		Toluene	< 0.5
	MW-3	Xylenes	5.3
	MW-8	Diesel	330
		Benzene	13
		Toluene	1.3
		Xylenes	8.6
	MW-10	Diesel	< 50
		Benzene	0.61
		Toluene	1.4
		Xylenes	16
	MW-11	Diesel	1,200
		Benzene	< 0.5
		Toluene	1.5
		Xylenes	11
Dec. 31, 1987	MW-3, MW-8, and MW-10 were sampled by Blaine Tech Services, Inc. following the extraction of roughly 500 gallons of water from MW-3 by Del Harlow Enterprises, Inc.*		
Feb. 2, 1988	Results of analyses on water samples obtained from MW-3, MW-8, and MW-10 (Analyses performed by Sequoia Analytical Laboratory).*		
	WELL NUMBER	CONSTITUENT	PARTS PER BILLION
	MW-3	Diesel	84,000
		Gasoline	7,400
		Benzene	2,200
		Toluene	1,800
		Xylenes	1,500
	MW-8	Diesel	7,500
		Gasoline	370
		Benzene	< 0.5
		Toluene	< 0.5
		Xylenes	14
	MW-10	Diesel	390
		Gasoline	100
		Benzene	< 0.5
		Toluene	< 0.5
		Xylenes	< 0.5

DATE	EVENT
March 16, 1988	A letter submitted by HMMP, Inc. outlined the results of the previous two evacuation and sampling programs and recommended the performance of an aquifer production test in order to evaluate the aquifer characteristics such as transmissibility, storage, and cones of depression.****
April 21, 1988	HMMP, Inc.'s proposal to conduct the aquifer production test was accepted by Rouse and Associates. The project has been tentatively scheduled for the first week in June, 1988.****

* Information provided by Blaine Tech Services, Inc.
** Information provided by Blymyer and Sons Engineers, Inc.
*** Information provided by Rouse and Associates.
**** Information provided by HMMP, Inc.

LIMITATIONS

HMMP, Inc. has provided its findings, recommendations, specifications, and professional advice after preparing such information in a manner consistent with that level of care and skill ordinarily exercised by members of the profession currently practicing under similar conditions in the fields of engineering geology and hydrogeology. This acknowledgment is in lieu of all warranties either express or implied.

If you have any questions regarding this project, please do not hesitate to call.

Very truly yours,

HMMP, INC.

John K. Hofer
Engineering Geologist, EG-1065

JKH:sng

cc. Blaine Tech Services, Inc.

(H223-01B.1)

HAZARDOUS
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PROFESSIONALS
INCORPORATED

July 11, 1988 Project No. H223-01A

Mr. Robert E. Malin
Rouse and Associates
32990 Alvarado-Niles Road, Suite 990
Union City, CA 94587

RE: PRODUCTION TEST
SHALLOW WATER-BEARING ZONE
POLVOROSA BUSINESS PARK
1555 DOOLITTLE DRIVE
SAN LEANDRO, CALIFORNIA

Dear Mr. Malin:

In accordance with your authorization, we have completed our production test of the shallow water-bearing zone at the subject site. The scope of work for this project was outlined in our proposal dated March 16, 1988. The main purpose of the present study was to provide additional geohydrologic information on the shallow aquifer beneath the site.

SCOPE

Our scope of work included the performance of the following tasks:

1. A slug test was performed on Monitoring Well MW-3 on June 3, 1988. The well was pumped at 21 gallons per minute (gpm) until roughly 60 gallons were evacuated. Drawdown and recovery measurements were made in the pumping well and in Observation Wells MW-8 and MW-10.

2. Two additional short-term pumping tests were made on the same date in order to determine the minimum rate of flow that could cause drawdown in MW-8 and MW-10.

3. MW-3 was pumped again on June 4, 1988 for 2 hours at a constant rate of flow. During the pumping period and subsequent 1-hour recovery period, water levels were measured in the pumping well, MW-3, along with Observation Wells MW-8 and MW-10.

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Telephone: (408) 286-7868

The pumping of the well was performed by Blaine Tech Services, Inc. Details of the methodology, equipment used, and drawdown and recovery measurements are attached for your review.

PRODUCTION TEST

In order to define the hydrogeologic characteristics of the shallow water-bearing zone, and to determine what effects, if any, sustained pumping might have on the shallow zone, several pumping tests were performed on MW-3 on June 3, 1988. A slug test was initially performed, evacuating roughly 60 gallons at a pumping rate of 21 gpm. The water level recovered in less than four minutes, however, it appeared to "rebound" to roughly 0.3 feet above the original static water level. It was decided that the results obtained from this test were inconclusive and could not be used to generate the required information.

The well was then pumped for two short-term periods (130 and 77 minutes) at rates varying from 0.98 to 3.88 gpm. Since minimal drawdown was observed in either MW-8 or MW-10, it was decided to try and pump the well for a somewhat higher rate for a short period of time.

On June 4, 1988, MW-3 was pumped for a period of 2 hours at a constant rate of 4.5 gpm. Drawdown and recovery measurements were taken in MW-8 and MW-10. The static water level in MW-3 was 9.75 feet below the surface at the beginning of the test. Maximum drawdown was measured as 6.37 feet after 2 hours of pumping (see Figure 2). The water level in MW-8 declined 0.14 feet throughout the duration of the test, from a static water level of 9.98 feet below the surface (see Figure 3). The water level in MW-10 declined 0.41 feet from a static level of 10.90 feet below the surface (see Figure 4). Following pump shutdown, recovery was measured for a period of roughly 1 hour in MW-3, MW-8, and MW-10. When drawdown and recovery measurements are plotted on semilog-arithmic paper, the ensuing graphs appear as straight lines. From these graphs, the transmissivity (T) and the storativity (S) can be calculated. Because of the turbulent flow in the pumping well, MW-3, measurements obtained from observation wells during pumping periods are generally more accurate. Since the most reliable data was obtained from MW-10, this data was used for our calculations, rather than the pumping well, MW-3, or the other observation well, MW-8.

DISCUSSION

Analysis of the drawdown and recovery data from the June 4, 1988 pumping test was accomplished by use of the Jacob modification of the Theis non-equilibrium formula. Utilizing the plots of the

drawdown and recovery data for MW-10 (Figures 4 and 5), the transmissivity (T) ranges from 3,414 to 4,000 gallons per day per foot, and the storativity (S) is calculated as 0.0007. This would indicate that the shallow water-bearing materials exhibit moderate permeabilities and that the water-bearing zone is essentially confined. Upon further analysis, it can be shown that the maximum drawdown in MW-10 after pumping MW-3 for 1,000 days at 4.5 gpm would be on the order of 1.75 feet. In fact, a well 200 feet distant from MW-3, the assumed maximum extent of contamination, would exhibit 1.48 feet of drawdown under the same pumping conditions. Therefore, it appears that the cone of depression generated from the pumping of MW-3 would affect a relatively large area of the property.

When the static water table elevations were plotted on the Site Plan, Figure 1, it became clear that the ground-water gradient had changed from a southerly direction in August of 1987 to a northwesterly direction. This would seem to indicate that the gradient may be subject to fluctuations dependent on factors such as the time of year or tidal activity.

CONCLUSIONS

Based on the results of this study, the following conclusions are presented:

1. The shallow ground-water materials underlying the site are part of a confined aquifer exhibiting moderate transmissivity, resulting in a wide cone of depression around the pumping well.

2. The ground-water gradient at the site has changed appreciably during the preceding 10 months.

3. It would appear that long-term pumping in this area could create a radius of influence at least equal to the maximum extent of known contamination as outlined in our report of September 30, 1987.

4. It is our opinion that the use of extraction wells as a method of removing regulated compounds from the shallow ground-water zone may be effective. However, it is important to note that, although not directly observed during the pumping tests, the aquifer may be in hydraulic connection with San Francisco Bay, an arm of which is located only 1,600 feet to the west. Because of its close proximity, it may be argued that the shallow aquifer is in fact a non-beneficial water source and that the regulated compound levels encountered during previous studies may not be above action levels.

RECOMMENDATIONS

The results of this study have indicated that the following recommendations should be adhered to during the coming months.

1. MW-3, MW-8, MW-10, and MW-11 (located on the Viking Freight property) should be surveyed by a licensed land surveyor in order to provide horizontal and vertical control relative to Mean Sea Level.

2. Ground-water levels in each of the wells should be measured monthly in order to note changes in the gradient over time.

3. Samples of the ground water from each well should be collected quarterly and analyzed in a certified analytical laboratory for the presence of total hydrocarbons due to gasoline and diesel, benzene, toluene, xylenes, and ethyl benzene.

LIMITATIONS

HMMP, Inc. has provided its findings, recommendations, specifications, and professional advice after preparing such information in a manner consistent with that level of care and skill ordinarily exercised by members of the profession currently practicing under similar conditions in the fields of engineering geology and hydrogeology. This acknowledgment is in lieu of all warranties either express or implied.

It has been a pleasure performing this service for you. If you have any questions regarding the data, conclusions, or recommendations, please do not hesitate to call.

Very truly yours,

HMMP, INC.

John K. Hofer
Engineering Geologist, EG-1065

JKH:rls

cc: Addressee (2)
Blaine Tech Services, Inc. (1)

(H223-01A.1)

SCALE:
0 40' 80'

Former Fuel Tanks

Viking Freight Terminal Building

Building C

MW-11

MW-3

MW-8

MW-10

2.9
3.0
3.1
3.2

Building A

Building B

DOOLITTLE DRIVE

POLVOROSA AVENUE

LEGEND

MW-11 — MW – Monitoring Well by HMMP, Inc.

MW-8 — MW – Monitoring Well by Groundwater Technology

3.2 — Ground-Water Elevation Contour 6/4/88

Direction of Ground-Water Flow 6/4/88

SITE PLAN

HAZARDOUS MATERIALS MITIGATION PROFESSIONALS INCORPORATED

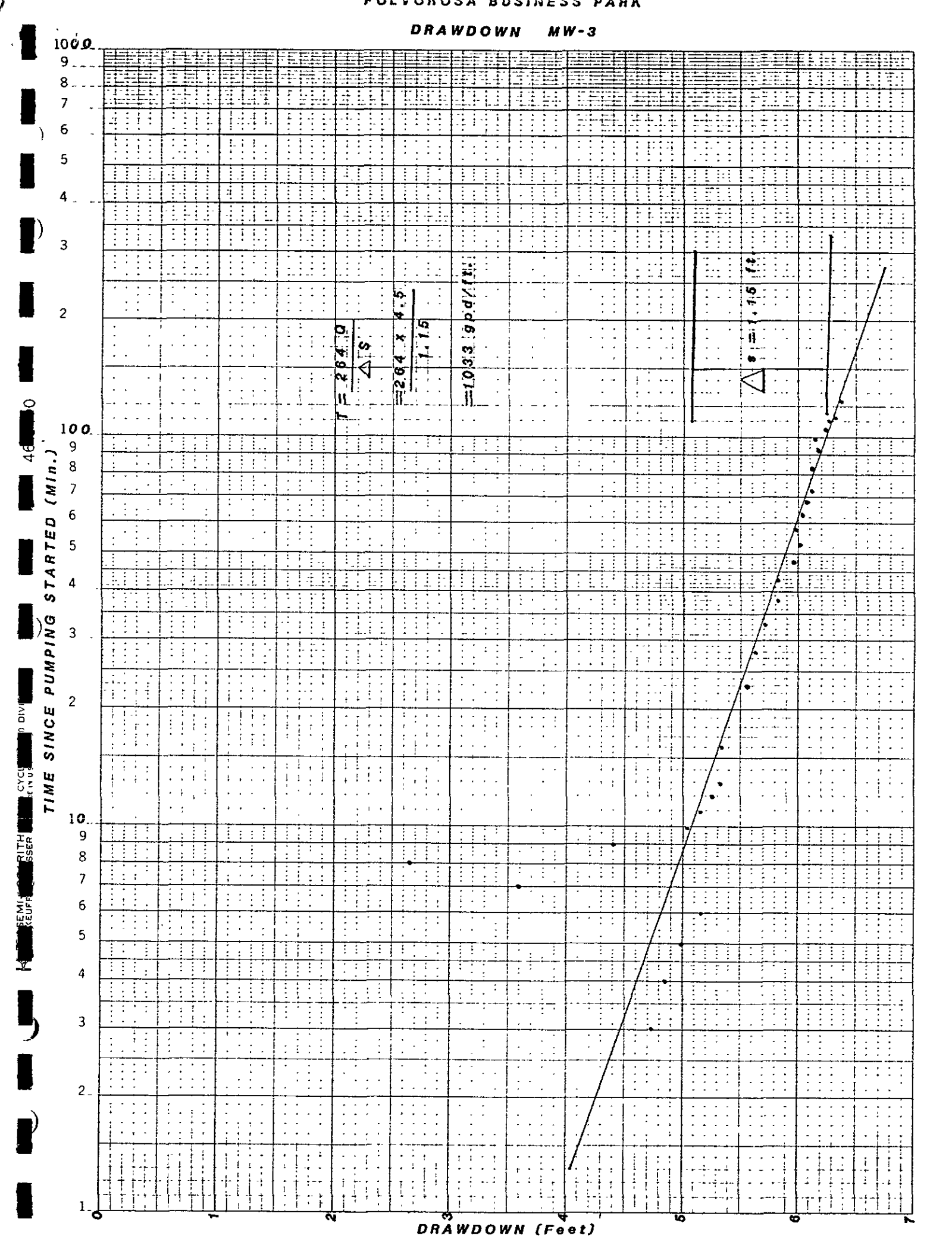
H223-01A

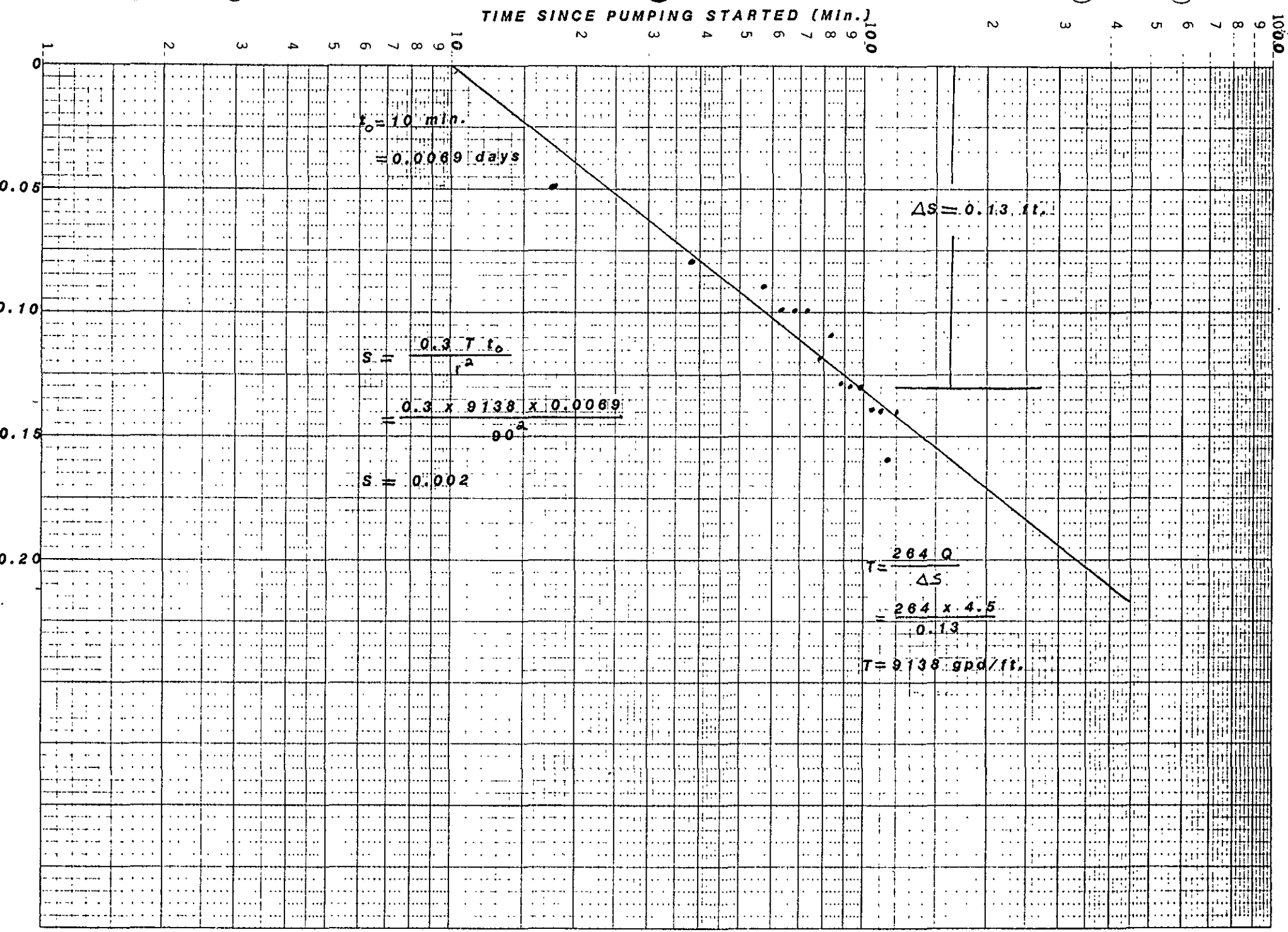
1450 Koll Circle, Suite 114
San Jose, California 95112
Telephone: (408) 286-7868

7/88

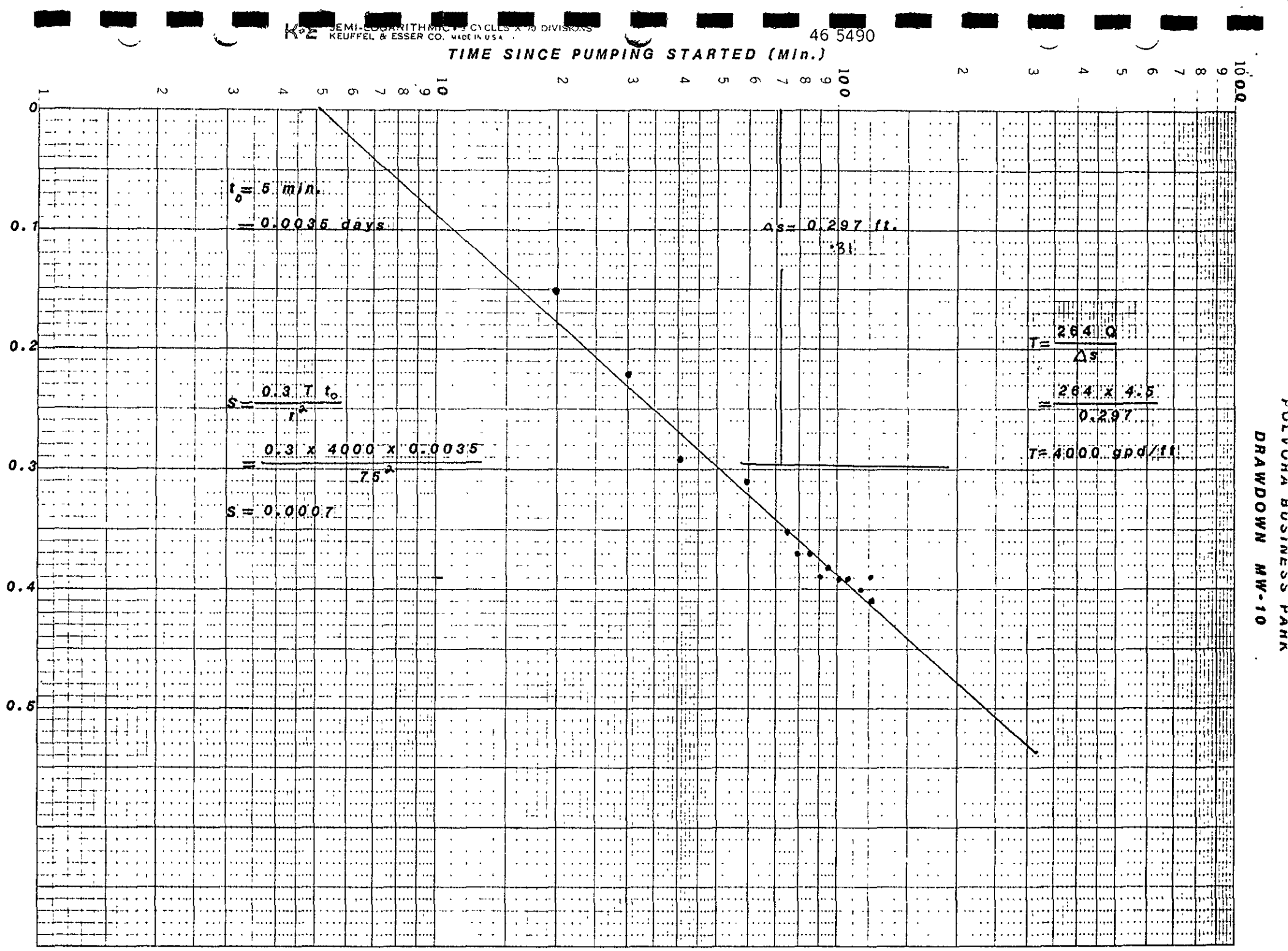
FIGURE 1

POLVOROSA BUSINESS PARK



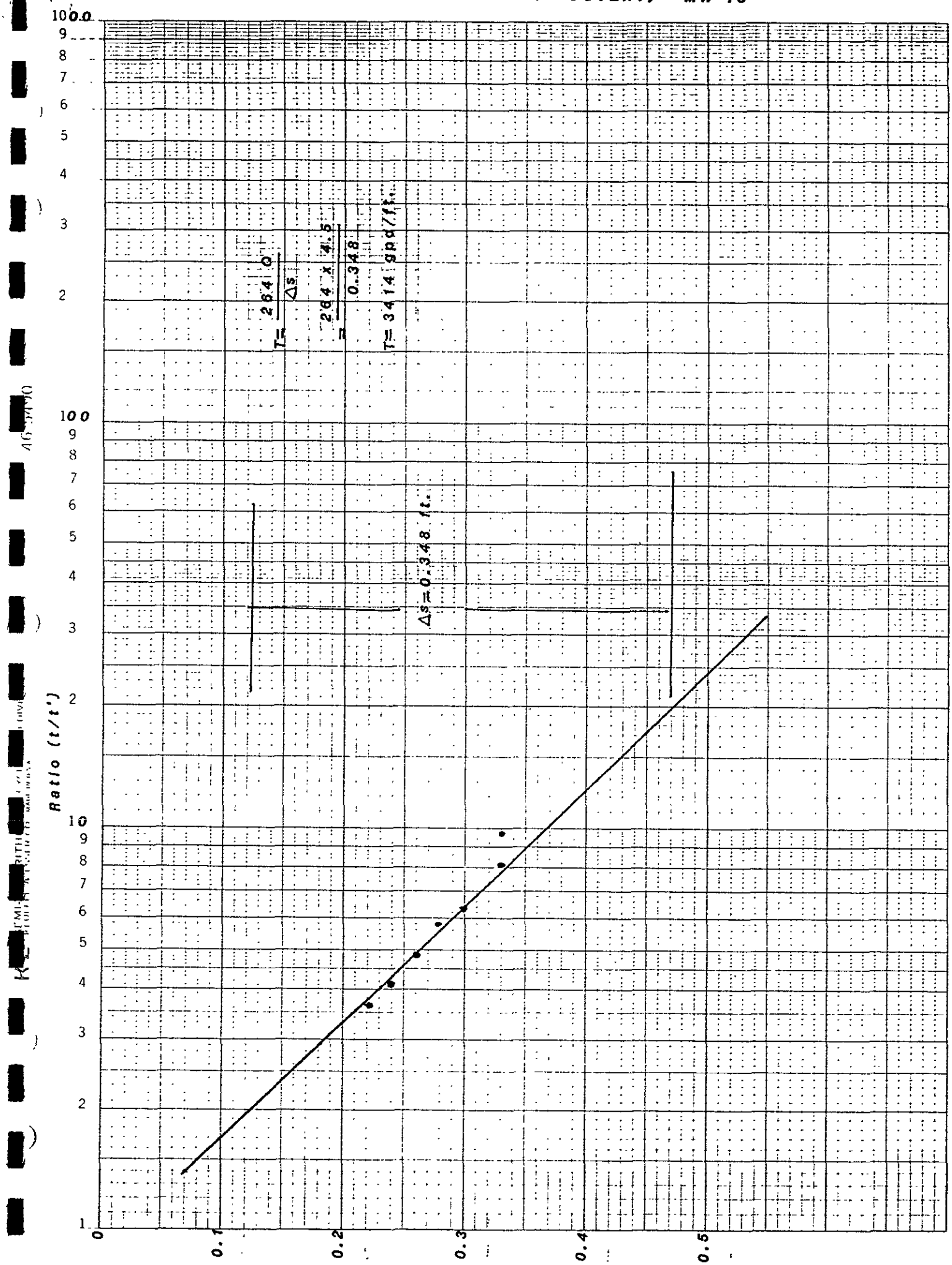


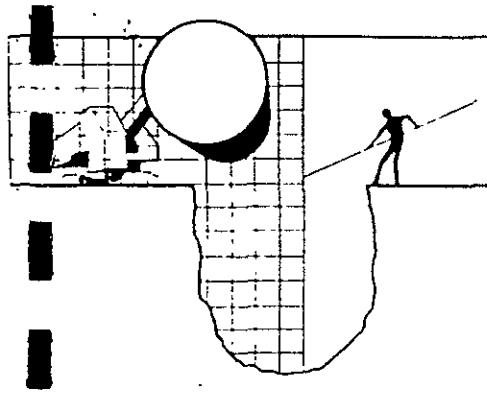
POLYCHLORINATED BIPHENYLS (PCBs)
DRAWDOWN MW-8


SEMI-LOGARITHMIC 3 CYCLES X 70 DIVISIONS
KEUFFEL & ESSER CO. MADE IN U.S.A.
46 5490
TIME SINCE PUMPING STARTED (Min.)
1
2
3
4
5
6
7
8
9
10
100
0
0.1
0.2
0.3
0.4
0.5
t_o = 5 min.
= 0.0035 days
Δs = 0.297 ft.
.31
$S = \frac{0.3\ T\ t_o}{r^2}$
$= \frac{0.3 \times 4000 \times 0.0035}{75^2}$
S = 0.0007
$T = \frac{264\ Q}{\Delta s}$
$= \frac{264 \times 4.5}{0.297}$
T = 4000 gpd/ft
POLYCHA BUSINESS PARK
DRAWDOWN MW-10

POLVOROSA BUSINESS PARK

RESIDUAL DRAWDOWN (RECOVERY) - MW-10





BLAINE TECH SERVICES INC.

1370 TULLY RD., SUITE 505
SAN JOSE, CA 95122
(408) 995-5535

July 5, 1988

H.M.M.P., Inc.
1450 Koll Circle
Suite 114
San Jose, CA 95112

ATTN: Mr. John Hofer

RE:

PROJECT:
MONITORING WELL DRAWDOWN TESTS
AND SAMPLE COLLECTION

SITE:
POLVOROSA BUSINESS PARK
1555 DOOLITTLE DRIVE
SAN LEANDRO, CALIFORNIA

TESTS AND GROUNDWATER SAMPLING
JUNE 3, 1988 AND
JUNE 4, 1988

DRAWDOWN TEST DOCUMENTATION AND SAMPLING REPORT 88156-F-1

SCOPE OF SERVICES

This report deals with the data collected during drawdown tests conducted at the subject site in accordance with your request. Specifications for the actions performed by our field personnel were contained in HMMP, Inc. proposal No. HP-851 of March 16, 1988. Additional actions were selected by HMMP, Inc. personnel during the field work performed on June 3, 1988 and June 4, 1988.

Personnel from our office brought several types of evacuation and EPA approved sampling pumps to the site for use in the monitoring well drawdown testing. Field instruments, specialized vehicles, cleaning apparatus and Department of transportation (DOT) drums to contain the effluent water were also brought to the site.

EXECUTION OF TESTS AND SAMPLING

Our personnel operated the pumping apparatus according to instructions given by HMMP, Inc. personnel, maintained records of the instrument readings obtained during the various drawdown and recovery phases of each test, drew standard water samples according to established monitoring procedures, and saw to the delivery of the samples to a Department of Health Services certified Hazardous Materials Testing Laboratory for analyses.

Three separate drawdown tests were undertaken on June 3, 1988 and a fourth test on June 4, 1988. The tests may be characterized as follows:

3-3-88	rapid drawdown slug test	21.0	gpm	suction pump
3-3-88	sustained low flow test	0.98	gpm	USGS/Middleburg
3-3-88	drawdown/recovery test	3.88	gpm	suction pump
6-4-88	constant rate flow test	4.5	gpm	suction pump

Data from the test logs is presented in numbered tables which correspond to each of the four tests. An additional table has also be added in the interest of clarity. TABLE FIVE contains a brief SUMMARY OF THE CERTIFIED ANALYTICAL REPORT RESULTS. As indicated by the title, the source documents for the data in the table are the laboratory's certified analytical reports. These certified analytical reports (CARs) are generated by the laboratory as the sole official document in which they issue their findings. Any discrepancy between a CAR and a tabular or text presentation of analytical values must be decided in favor of the CAR on the grounds that the CAR is the authoritative legal document.

The so called "slug" test is misnamed in that no volume of additional water was introduced into any of the wells at the site and the test was conducted with only a high output suction pump which was operated at a rate of 21 gallons per minute to effect a drawdown of MW-3.

T A B L E O N E

6-3-88 SLUG TEST

TIME	MW-3	MW-8	MW-10	
0820	9.95			
0829			10.86	
0830		9.96		
				suction pump at 21 gpm used to draw down MW-3 as shown
0930	13.00			pump shutdown
0930	11.95			recovery data collection
0931	10.98			
0932	10.49			
0933	9.98			
0934	9.85			
0938	9.63			
0943	9.64			

TABLE TWO (beginning on the next page), presents drawdown information obtained during a sustained low flow test. The sustained low flow test was executed with a USGS/Middleburg sampling pump. The Middleburg pump is an EPA approved sampling device which is specifically designed for the evacuation and sampling of small diameter wells.
METHODOLOGY section of this report and in EPA SW-846.

It should be noted that a while the flow rate of a Middleburg pump can be readily adjusted to any pumping rate within its range of operation, there are limitations on how the evacuation rate should be observed and calculated. The pump's functional accuracy cannot be properly calculated unless the Middleburg's cyclic operation is understood and taken into consideration in evaluating the data. The pump cycles on and off as part of its normal operation. This occurs several times each minute. During each cycle the pump goes through two distinct phases of operation in which the pump's Teflon bladder is, first, allowed to fill with water, and then, forced to discharge that water up the conductor pipe toward the surface. Because it is not practical to collect and compare readings from precisely the same point in the pump's cycle, it is best to average readings over a period of several minutes or longer,

T A B L E T W O

6-3-88 SUSTAINED LOW FLOW TEST

TIME	MW-3	MW-8	MW-10	
0955	9.64			
1002	10.09			
1007	10.36			
1015	10.44			
1021		9.96		
1023			10.91	
1024	10.34			
1041	10.43			
1043	9.97			
1046			10.95	
1055	10.64			
1100	10.41			
1123			11.00	
1124	10.41			
1125		10.01		
1148	10.45		10.48	
1149		10.02		
1200	10.66			
1207		10.03		
1208			10.95	
1210	10.75			pump shutdown

T A B L E T H R E E

6-3-88 DRAWDOWN/RECOVERY TEST

TIME	MW-3	MW-8	MW-10	
1237	9.70			
1308	14.08			
1310			11.08	
1312	14.21	10.02		
1321		10.06		
1326	12.65			
1330			11.08	
1334	12.63			
1354	13.35			
1357		10.07		
1359	13.18			
1400	13.13		11.18	pump shutdown
1401	10.75			recovery
1402	10.49			
1403	10.33			
1404	10.28			
1405	10.14			
1406	10.09			
1407	10.04			
1408	10.00			
1409	9.96			
1410	9.95			
1412		10.09		
1413			11.11	
1415	9.86			
1420	9.79			
1425	9.78			
1426		10.03		
1427			11.07	
1430	9.72			
1435	9.69			
1436		10.05		
1438			11.05	
1440	9.70			
1450	9.67			
1500	9.66			
1502		10.02		
1503			11.04	
1505	9.66			
				end of tests 6-3-88

T A B L E F O U R

6-4-88 CONSTANT RATE FLOW TEST

TIME	MW-3		MW-8	MW-10
Initial				
0825	9.75			
0840	9.59			
0842	starting			
0843	12.42	2.82		
0843	13.41	3.81		
0844	14.04	4.44		
0844	14.44	4.84		
0845	14.48	4.88		
0845	14.53	4.93		
0846	14.60	5.00		
0846	14.66	5.06		
0847	14.75	5.15		
0847	14.84	5.24		
0848	14.92	5.32		
0849	13.35			
0850	12.41			
0851	14.15			
0851	14.58			
0852	14.78			
0852	14.89			
0853	14.92			
0854	14.99	5.39		
0855	15.07	5.47		
0855	15.09	5.49		
0855	15.03			
0856	14.99			
0856	15.05			
0857	15.04			
0857	15.06			
0858	15.08			
0900			10.03	
0902				11.05
0905	15.30	5.20		
0910	15.37	5.17		
0911			10.04	
0912				11.12
0915	15.46	5.86		
0920	15.58	5.98		
0921			10.06	
0923				11.19
0925	15.58			

6-4-88 CONSTANT RATE FLOW TEST

TIME	MW-3	MW-8	MW-10	
0930	15.72 6.12			
0932		10.07		
0933			11.20	
0935	15.76 6.16			
0940	15.73	10.07		
0941			11.21	
0945	15.78 6.18			
0946		10.08		
0947			11.23	
0950	15.83 6.23			
0951		10.08		
0952			11.24	
0955	15.87 6.27			
0956		10.08		
0957			11.25	
1000	15.86			
1001		10.10		
1002			11.27	
1005	15.86			
1006		10.09		
1007			11.27	
1010	15.93 6.34			
1011		10.11		
1012			11.29	
1015	15.93			
1016		10.11		
1017			11.28	
1021	15.90			
1022		10.11		
1023			11.29	
1026	15.99 6.40			
1027		10.12		
1028			11.29	
1032	16.04 6.45			
1033		10.12		
1034			11.30	
1035	16.06 6.47			
1036		10.12		
1037			11.30	
1040	sample taken			
1042	16.08 6.48			
1043		10.12		
1044			11.31	
1045	16.12 6.52			pump shut down

6-4-88 CONSTANT RATE FLOW TEST

TIME	MW-3	MW-8	MW-10	
1046	13.98			begin recovery
1047	13.14			
1047	11.95			
1048	11.49			
1048	11.19			
1049	11.00			
1049	10.84			
1050	10.75			
1050	10.67			
1051	10.59			
1051	10.56			
1052	10.52			
1052	10.49			
1053	10.43			
1053	10.40			
1054	10.37			
1054	10.34			
1055	10.32			
1055	10.30			
1056	10.26			
1056	10.25			
1057	10.22			
1058		10.12		
1059			11.23	
1100	10.08			
1101		10.12		
1102			11.23	
1105	9.96			
1107		10.11		
1108			11.20	
1109	9.92			
1110		10.11		
1111			11.18	
1115	9.87			
1116		10.10		
1117			11.16	
1122	9.83			
1123		10.10		
1124			11.14	
1130	9.80	10.09		
1131			11.12	
1140	9.77			

6-4-88 CONSTANT RATE FLOW TEST

TIME	MW-3	MW-8	MW-10
1141		10.07	
1142			11.09
1151	9.73		
1152		10.06	
1154			11.07
1156	9.72		

end of tests 6-4-88

CERTIFIED ANALYTICAL REPORT

On completion of the requested analytical procedures, the laboratory issued their results in the form of a certified analytical report for each of the primary analytical procedures requested. These reports contain the results of analysis for both the TPH gasoline and TPH-HBF diesel analytical procedures. These documents are included as an attachment at the close of this report.

Please call if we can be of any further assistance.

Richard C. Blaine

RCB/ral

attachments: chain of custody
certified analytical reports

BLAINE
TECH SERVICES INC

1370 TULLY ROAD, SUITE 505
SAN JOSE, CA 95122
(408) 995 5535

CHAIN OF CUSTODY # 88156F1

SITE SPECIFICATION Hydro C
Polvorosa Business Park
1555 Doolittle
San Leandro, CA

(X) Bill BLAINE TECH SERVICES, Inc.
( ) Bill _____

SPECIAL INSTRUCTIONS

SAMPLE I.D.	QUANTITY	TYPE	OK	ANALYSIS TO DETECT	STATUS	RESULTS	LAB NUMBER
MW-3	(3)	L		THC(GAS) BTXE	Routine	6-27	
				TPH(Diesel)			

Field sampling was performed by _____

Sampling was completed at 12:00 AM/PM 6/5 -1988

RELEASE OF SAMPLES FROM (name,time,date) ---->>>>> INTO THE CUSTODY OF (name,time,date)

from _____ @ 7:15 AM/PM 6/6 -88 -> to _____ @ 7:15 AM/PM 6-6-88

from _____ @ 8:45 AM/PM 6-6 -88 -> to _____ @ 8:45 AM/PM 6/6 -88

from _____ @ : AM/PM -88 -> to _____ @ : AM/PM -88

The laboratory designated to perform these analyses is: SEQ DHS #ML # 154
NOTE: Procedures and detection limits must confrom to RWQCB Region II specifications.
Please include chain of custody number and site specification on reports and invoices.

SEQUOIA Analytical Laboratory
2549 Middlefield Road
Redwood City, CA 94063 • (415) 364-9222 • FAX (415) 364-9233

Blaine Tech Services
P.O. Box 5745
San Jose, CA 95150
Attn: Richard Blaine

Date Sampled: 06/05/88
Date Received: 06/06/88
Date Analyzed: 06/24/88
Date Reported: 06/24/88

Project: BTS #88156F1, HMMP @ Polvorosa Business Park, San Leandro

TOTAL PETROLEUM HYDROCARBONS

Sample Number	Sample Description	Detection Limit	High Boiling Point Hydrocarbons
	Water	ppb	ppb
8060303	MW-3	50	N.D.

Method of Analysis: EPA 3510/8015

Analytes reported as N.D. were not present above the stated limit of detection.

SEQUOIA ANALYTICAL LABORATORY

Arthur G. Burton
Laboratory Director

SEQUOIA Analytical Laboratory
2549 Middlefield Road
Redwood City, CA 94063 • (415) 364-9222 • FAX (415) 364-9233

Blaine Tech Services
P.O. Box 5745
San Jose, CA 95150
Attn: Richard Blaine

Date Sampled: 06/05/88
Date Received: 06/06/88
Date Analyzed: 06/24/88
Date Reported: 06/24/88

Project: BTS #88156F1, HMMP @ Polvorosa Business Park, San Leandro

TOTAL PETROLEUM FUEL HYDROCARBONS WITH BTEX DISTINCTION

Sample Number: 8060303

Sample Description: Water, MW-3

	Detection Limit ppb	Sample Results ppb
Low to Medium Boiling Point Hydrocarbons	50	170
Benzene	0.5	5.1
Toluene	0.5	5.1
Ethyl Benzene	0.5	4.7
Xylenes	0.5	15

Method of Analysis: EPA 5030/8015/8020

Analytes reported as N.D. were not present above the stated limit of detection.

SEQUOIA ANALYTICAL LABORATORY

Arthur G. Burton
Laboratory Director

TABLE FIVE : WELL MONITORING DATA

Well I.D.	MW-3
Sample I.D.	MW-3 LIQUID
Date Sampled	6-5-88
Time Sampled	1200
Well Diameter (in.)	2
Total Well Depth (ft.)	20
Purging Device	SUCTION PUMP
Sampling Device	SUCTION PUMP
BTS Chain of Custody	88156-F-1
BTS Sample I.D.	MW-3 LIQUID
DOHS HMTL Laboratory	SEQUOIA
Laboratory Sample I.D.	8060303
EPA Analytical procedure	5030/8015/8020

SUMMARY OF CERTIFIED ANALYTICAL REPORT RESULTS in Parts Per Billion

TPH as Gasoline.....	170
Benzene.....	5.1
Toluene.....	5.1
Ethylbenzene.....	4.7
Total Xylenes.....	15
TPH-HBP as Diesel.....	ND

SAMPLING

Samples were obtained by standardized sampling procedures that follow an evacuation and sample collection protocol which conforms with State and Regional Water Quality Control Board standards and specifically adheres to EPA requirements for apparatus, sample containers and sample handling as specified in publication SW 846.

SUCTION PUMP used in the testing of well drawdown characteristics

High volume suction pumps are frequently selected because of their low cost and simplicity of operation. The pump is located at the well head and draws water up through pipes or tubing lowered into the well and attached to the pump. The lowest section of pipe is fitted with a checkvalve to preclude water which has entered the pipe from re-entering the monitoring well. Well evacuation is efficient down to the effective twenty five foot limit of suction evacuation, but the discharge stream is generally considered unsuitable for sampling when the precise level of volatile organic compounds is at issue.

In this instance, the suction pump had achieved and was maintaining a level of drawdown in the well which had been established over a period of many hours. Shutting down the pump and removing the pipe would enable a proper sampling device to be employed, but would lose the dynamic drawdown conditions being produced by the suction pump. The decision was made to obtain a sample that represented the drawdown conditions unique to this series of tests. Accordingly, a sample was obtained from the effluent stream being produced by the suction pump. Some degradation of the volatile organic compounds should be anticipated, but the TPH-HBF Diesel fuel fraction should be accurately represented in the sample.

USGS/MIDDLEBURG POSITIVE DISPLACEMENT SAMPLING PUMP

USGS/Middleburg positive displacement sampling pumps are EPA approved pumps appropriate for use in wells down to two inches in diameter and depths up to several hundred feet. The pump contains a flexible Teflon bladder which is alternately allowed to fill with well water and then collapsed. Actuation of the pump is accomplished with compressed air supplied by a single hose to one side of the Teflon membrane. Water on the other side of the Teflon bladder membrane is squeezed out of the pump and up a Teflon conductor pipe to the surface. Evacuation and sampling are accomplished as a continuum. The rate of water removal is relatively slow and loss of volatiles thought to be almost non-existent. There is only positive pressure on the water being sampled and there is no impeller cavitation or suction. The pumps can be placed at any location within the well, can draw water from the very bottom of the well case, and are virtually immune to the erosive effects of silt or lack of water which destroy other types of pumps.

SAMPLING METHODOLOGY

Our standard evacuation protocol calls for the removal of five case volumes of water. This is safely above accepted minimum evacuation levels and usually more than sufficient to insure the sampling of fresh formation water in all but truly oversized borings. However, as volumetric standards may not provide proper evacuation in some wells, field instrument readings are routinely obtained to verify that formation water is entering the well case.

Because of the large volume of water removed from MW-3 as part of the drawdown tests being conducted by HMMP, Inc., there was significant over-evacuation of MW-3 before sampling was undertaken.

Evacuation and sampling devices along with their associated lines and hoses were thoroughly cleaned between use in different monitoring wells. This has proven to be a far more effective safeguard against cross contamination than reliance on estimations of probable contamination.

SAMPLE HANDLING PROCEDURES

The water sample obtained from MW-3 was taken in accordance with standardized sampling procedures. According to those procedures, the sample material is collected in specially prepared containers appropriate to the type of analyses intended. Sample material for TPH-HBF analysis was collected in amber liter bottles. Sample material for TPH gasoline analysis was collected in 40 ml VOAs (volatile organic analysis) vials. The 40 ml VOAs contained HCL as an anti-microbial preservative. These vials are sealed without headspace. All sample containers were promptly placed in an ice chest containing pre-frozen blocks of an ice substitute for transport to the laboratory under our standard chain of custody.

CHAIN OF CUSTODY

The chain of custody form used by all representatives of our firm requires time, date, and signature entries by the person releasing the samples and corresponding time, date, and signature entries by the person accepting custody of the samples. These double notations are required at each transmittal.

HAZARDOUS MATERIALS TESTING LABORATORY

The samples obtained at this site were transported to Sequoia Analytical Laboratory in Redwood City, California. Specific instructions were made to indicate that the analytical procedures were to be those specified by the RWQCB region 2 staff. Analyses were to detect the presence of total petroleum hydrocarbons (TPH) calculated as gasoline with additional distinctions for benzene, toluene, xylenes and ethyl benzene. Total petroleum hydrocarbons of the high boiling fraction (TPH-HBF) calculated as diesel were also to be analyzed for.