gettler — ryan inc.
general contractors

April 14, 1989

Mr. Steven R. Ritchie
Regional Water Quality Control Board
San Francisco Bay Region
1111 Jackson Street, Room 6040
Oakland, California 94607

Reference: Shell Service Station
15275 Washington Avenue
San Leandro, California

Gentlemen:

As requested by Ms. Diane Lundquist of Shell Oil Company, Gettler-Ryan Inc. is forwarding a copy of the Work Plan prepared by Woodward-Clyde Consultants, dated April 7, 1989, for the referenced location. The Quarterly Summary Reports (Shell Oil Company's CALWATER program) are also enclosed. The summary reports cover the first quarter of 1989 (January - March, 1989).

Please do not hesitate to call should you have any questions or comments.

Sincerely,

John P. Werfal
Project Manager

JPW/ns

enclosure

cc: Ms. Diane Lundquist, Shell Oil Company
Mr. Joe Ferreira, San Leandro Fire Department
Mr. Rafat Shahid, Alameda County Environmental Health

1992 national avenue • hayward, california 94545-1787 • 783-7500

R0372
EVA

Oakland City Center
500 12th Street
Suite 100
Oakland CA 94607-4014
(415) 893-3600

Woodward-Clyde Consultants

April 7, 1989
8820011A-0097

Mr. John Werfal
Gettler-Ryan
1992 National Avenue
Hayward, California 94545-1787

Subject: Proposed Work Plan
Shell Service Station
15275 Washington Avenue and Lewelling Boulevard
San Leandro, California

Dear Mr. Werfal:

Gettler-Ryan Inc., as acting agent for Shell Oil Company, requested Woodward-Clyde Consultants (WCC) to review the existing data for the subject site and propose a work plan to further define the extent of hydrocarbon contamination. In November 1988, WCC observed the most recent phase of field work at the site. The results of this phase of work at the site, including well logs, soil sample analytical results, the Gettler-Ryan Inc. groundwater sampling report, and the groundwater sample analytical report, are attached to this letter.

At this time, five additional monitoring wells are proposed in order to define the extent of contamination to the north, south and west of the site. These wells are labeled A through E on the attached figures 1 through 4.

The location of the proposed monitoring wells are based on November 1988 groundwater levels, November 1988 groundwater sampling chemical analyses, and on an October 1988 soil gas survey. The groundwater elevations from all of the wells measured on November 22, 1988 (Table 1) were utilized to construct the groundwater contour map shown on Figure 2. The contour orientations indicate an approximately south to southwestward groundwater flow direction. A water sample from each well was collected on November 17, 1988 and analyzed for low boiling hydrocarbons (gasoline), benzene, toluene, ethyl benzene and xylenes (BTEX). The data in Table 2 were utilized to construct contour maps showing the dissolved concentrations of gasoline (Figure 3) and benzene (Figure 4) in groundwater. Additionally, soil gas survey data collected in October 1988 summarized in Table 3, was utilized to construct a soil gas concentration contour map shown in Figure 5. Figure 6 shows a cross section of soils encountered in Wells S-9, S-8 and S-12 across the down groundwater gradient direction.

As shown on Figures 3, 4, and 5, the aerial extent of contamination remains for the most part undetermined in all directions. The proposed well locations, A through E, were chosen as general locations to further define the extent of contamination. Well A is the proposed upgradient well. Wells B and E are intended to assess the lateral extent of contamination. Wells C and D are located downgradient from the existing plume. Proposed Well D was also chosen to coincide with an area of high soil gas concentrations shown on Figure 5. If contamination is detected in any of these wells, additional monitoring wells will need to be installed until the extent of contamination has been defined.

The soil borings will be drilled to depths of approximately 20 feet using 8-inch diameter hollow-stem, continuous flight augers. Soil samples will be collected at depth intervals of not more than 5 feet, starting from the surface. The samples will be collected using a modified California sampler driven through the hollow stem of the augers. One sample from each drive will be preserved for laboratory analysis, one sample will be used for a field head-space analysis, and all the samples will be described by a geologist working under the supervision of a California state certified engineering geologist. The sample will be decontaminated between each drive and the augers will be steam cleaned between each boring.

The well casing will consist of a lower section of 0.020-inch slotted casing with a 6-inch long screw cap on bottom from the base of the boring to approximately 4 feet below grade, with blank casing to near surface grade. Number 2/12 Lonestar sand will be poured in the annulus between the borehole wall and the well casing from the bottom of the well to approximately 2 feet above the well screen. One foot of bentonite pellets will be added on top of the sand, then water from a municipal supply will be poured into the annulus to hydrate the pellets. The well will then be sealed by filling the remaining annulus with cement grout. A locking cap will be placed on the casing, which will be secured beneath a traffic-rated vault box. The well will later be developed and sampled.

At least one soil sample from each of the borings drilled for installation of the existing wells had detected gasoline and/or BTEX except Well S-10. No soil analyses were performed on soils sampled from Wells S-1 or S-5. Therefore, soil samples should be saved for chemical analysis from each of the proposed well locations at the sampling interval just above the water table. Additional soil samples will be selected for laboratory analysis based on the results from the field head-space analysis.

Groundwater samples should also be collected from all monitoring wells. All groundwater and selected soil samples should be analyzed for low boiling point hydrocarbons and BTEX by EPA Methods 8015, 8020, and 5030, and for high boiling point hydrocarbons by EPA Method 3510. Selected samples should also be analyzed for volatile halocarbons by EPA Method 624 in wells near the old waste oil tank.

We appreciate the opportunity to provide consulting services on this project. Please call if we can be of additional assistance.

Sincerely,

WOODWARD-CLYDE CONSULTANTS

Richard W. Ely

Richard Ely, RG No. 4137
Project Geologist

Helen M. Nuckolls

Helen M. Nuckolls
Assistant Project Geologist

HMN/wp
8820011A1t

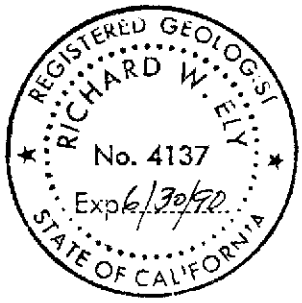


Table 1. ELEVATION OF MEASURING POINTS AND ELEVATION OF LIQUID DATA, FORMER SHELL SERVICE STATION, 15275 WASHINGTON AVENUE, SAN LEANDRO, CALIFORNIA

Well Number	Measuring Point Elevation (Project Dataum, feet)	Elevation of Liquid (feet) November, 22, 1988
S-1	21.55	13.54
S-3	21.14	13.38
S-5	—	—
S-6	22.02	13.44
S-7	21.47	13.23
S-8	20.72	12.96
S-9	20.96	13.18
S-10	20.86	12.95
S-11	21.26	12.64
S-12	21.05	12.71

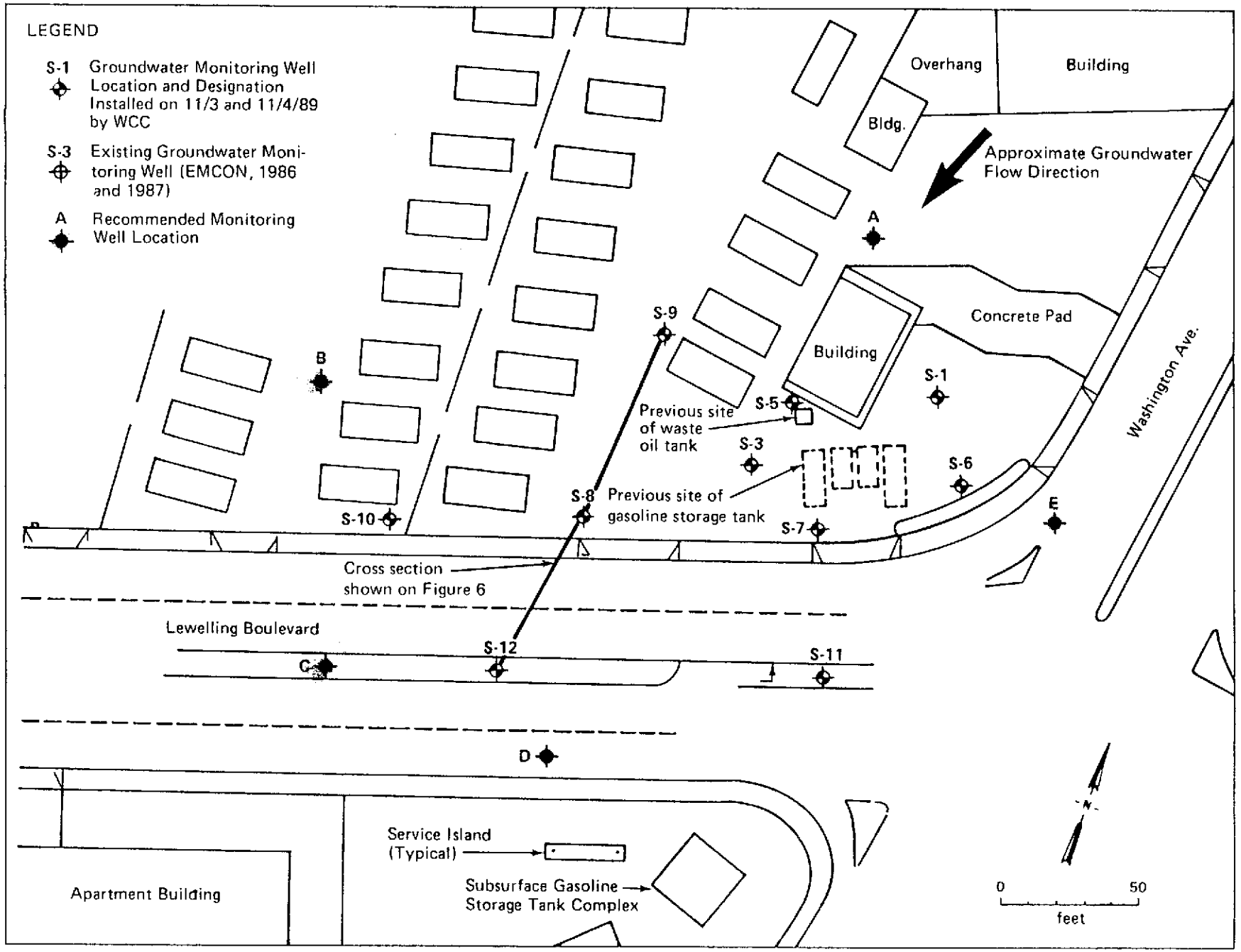
Table 2. SUMMARY OF GROUNDWATER SAMPLE ANALYTICAL RESULTS, NOVEMBER 17, 1988, FORMER SHELL SERVICE STATION, 15275 WASHINGTON AVENUE, SAN LEANDRO, CALIFORNIA

Well Number	Milligrams per Liter (mg/L) Low Boiling Point Hydrocarbon (Gasoline)	Benzene	Toluene	Ethyl Benzene	Xylenes
S-1	ND	ND	ND	ND	ND
S-3	70.	4.6	8.4	2.5	13.
S-5	3.	0.66	0.06	0.12	0.22
S-6	0.05	0.0007	ND	ND	ND
S-7	0.10	0.0051	0.015	0.002	0.013
S-8	0.21	0.0050	ND	0.001	0.005
S-9	1.4	0.069	0.003	0.052	0.18
S-10	0.33	0.0005	ND	0.001	0.011
S-11	ND	ND	ND	ND	ND
S-12	0.05	0.0035	ND	ND	ND
Detection Limits:					
S-1, and S-6 through S-12	0.05	0.0005	0.001	0.001	0.003
S-3	10	0.1	0.2	0.2	0.8
S-5	1	0.01	0.02	0.02	0.08

Table 3. SUMMARY OF SOIL GAS SURVEY RESULTS, OCTOBER, 1988, FORMER SHELL SERVICE STATION, 15275 WASHINGTON AVENUE, SAN LEANDRO, CALIFORNIA

Sample Number	Depth	Benzene	Toluene	Ethyl Benzene	Xylene	Total Hydrocarbon
SG-01	6'	25	110	65	36	460
SG-02	6'	4.4	25	16	5.6	90
SG-03	6'	0.68	16	14	16	45
SG-04	6'	220	300	33	12	2,400
SG-05	6'	140	440	33	12	1,800
SG-06	6'	41	140	26	8.9	820
SG-07	6'	460	180	48	<0.059	690
SG-08	6'	750	260	100	<0.59	5,800
SG-09	6'	1,000	460	140	<0.59	3,700
SG-10	6'	840	290	120	<0.59	5,600
SG-11	6'	4.8	*I	0.098	<0.006	22
SG-12	6'	260	72	1.3	1.2	810
SG-13	6'	120	68	45	<0.059	1,100
SG-14	6'	0.070	0.2	0.2	0.015	0.63
SG-15	6'	720	200	3.3	3.0	2,000
Air	Surface	<0.3	<0.3	<0.3	<0.3	<0.3

*I = Interference with adjacent peaks.



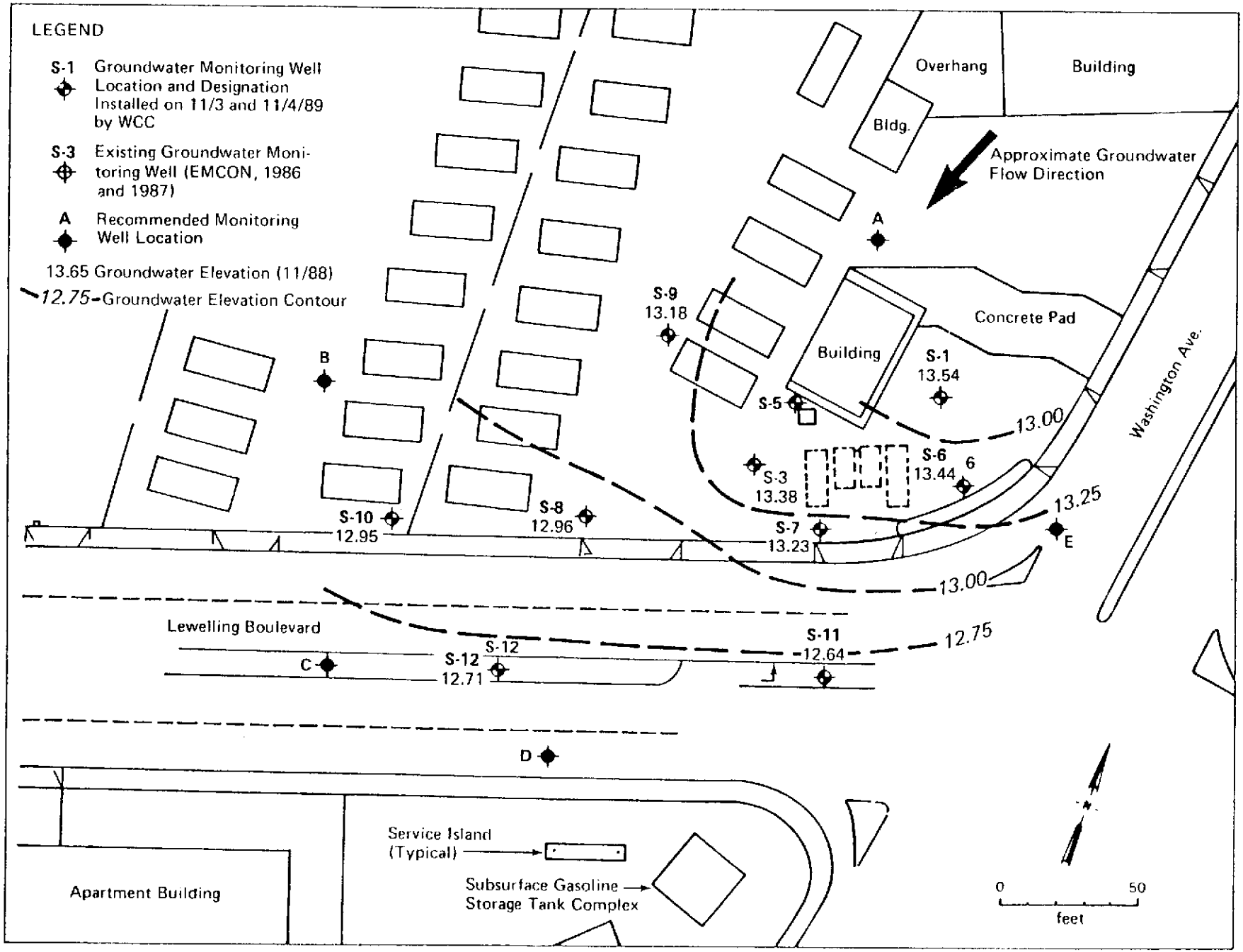
Project No. 8820011A

Gettler Ryan

Woodward-Clyde Consultants

GROUNDWATER MONITORING WELL LOCATIONS
SHELL SERVICE STATION
LEWELLING BLVD. AND WASHINGTON AVE.
SAN LEANDRO, CALIFORNIA

Figure 1



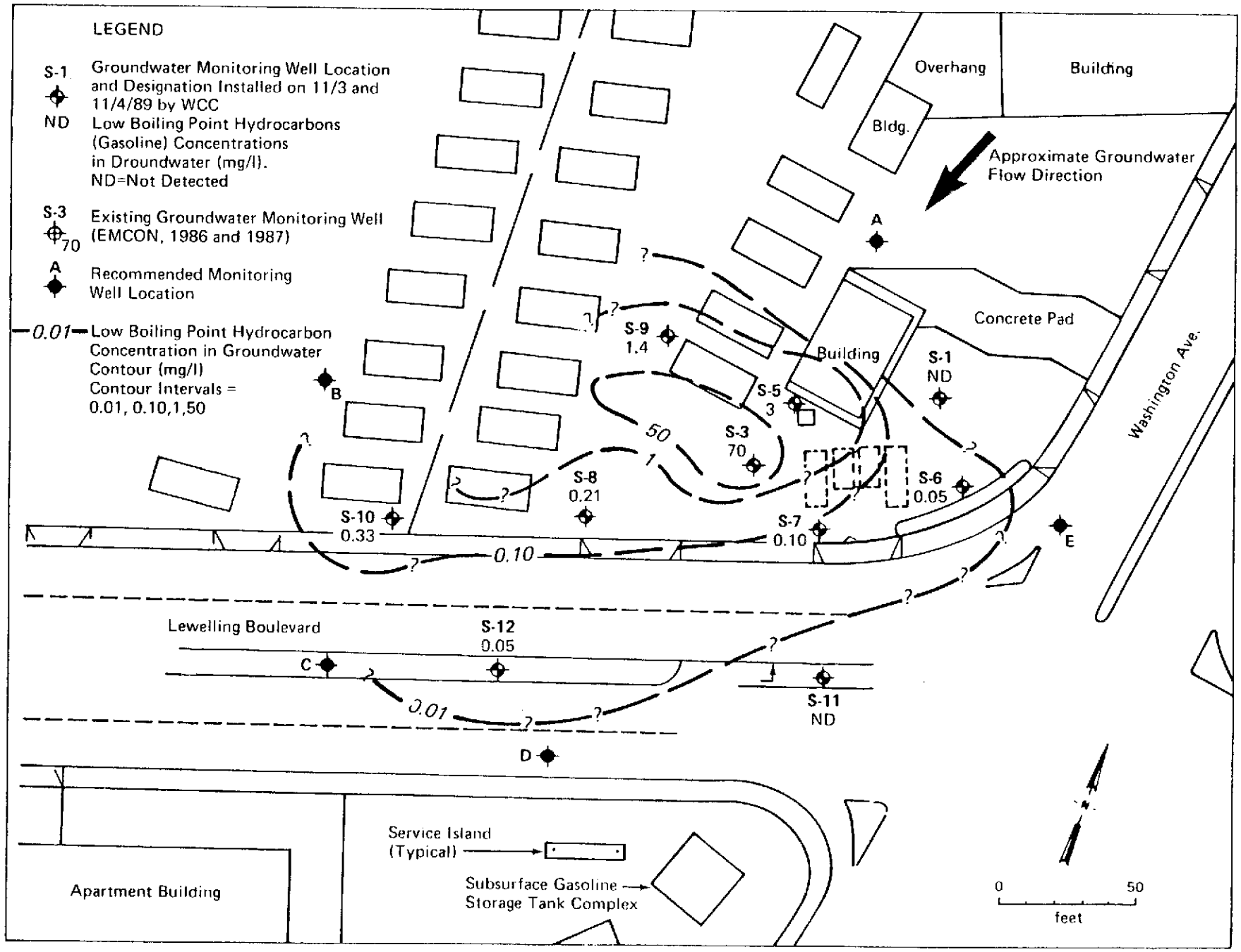
Project No. 8820011A

Gettler - Ryan

Woodward-Clyde Consultants

GROUNDWATER ELEVATION CONTOURS 11/88
SHELL SERVICE STATION
LEWELLING BOULEVARD AND WASHINGTON AVENUE
SAN LEANDRO, CALIFORNIA

Figure 2



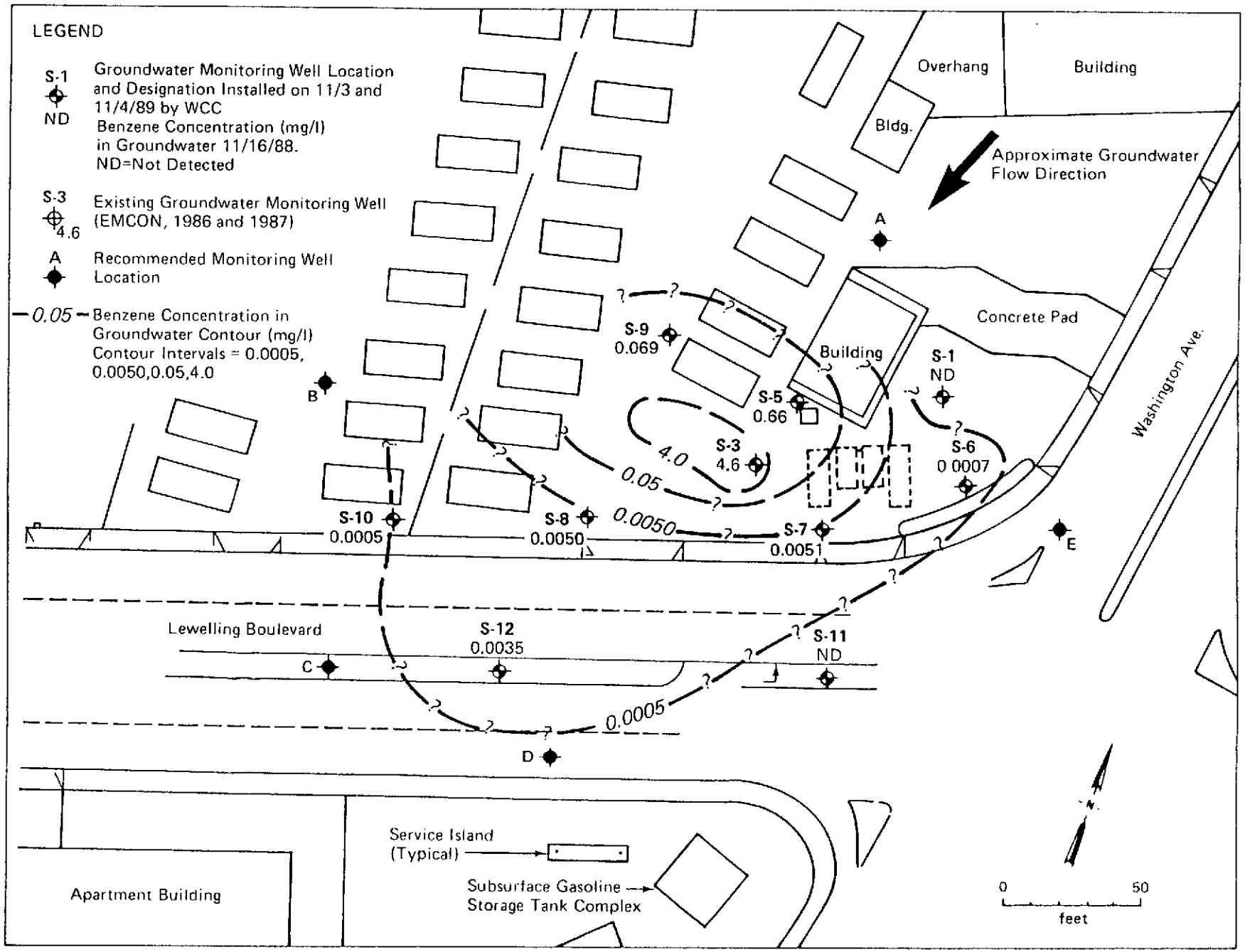
LOW BOILING POINT HYDROCARBONS (GASOLINE) CONCENTRATION IN GROUNDWATER CONTOUR MAP
NOVEMBER1988
SHELL SERVICE STATION, LEWELLING BLVD. AND WASHINGTON AVE., SAN LEANDRO, CA

Figure 3

Project No. 8820011A

Gettler - Ryan

Woodward-Clyde Consultants



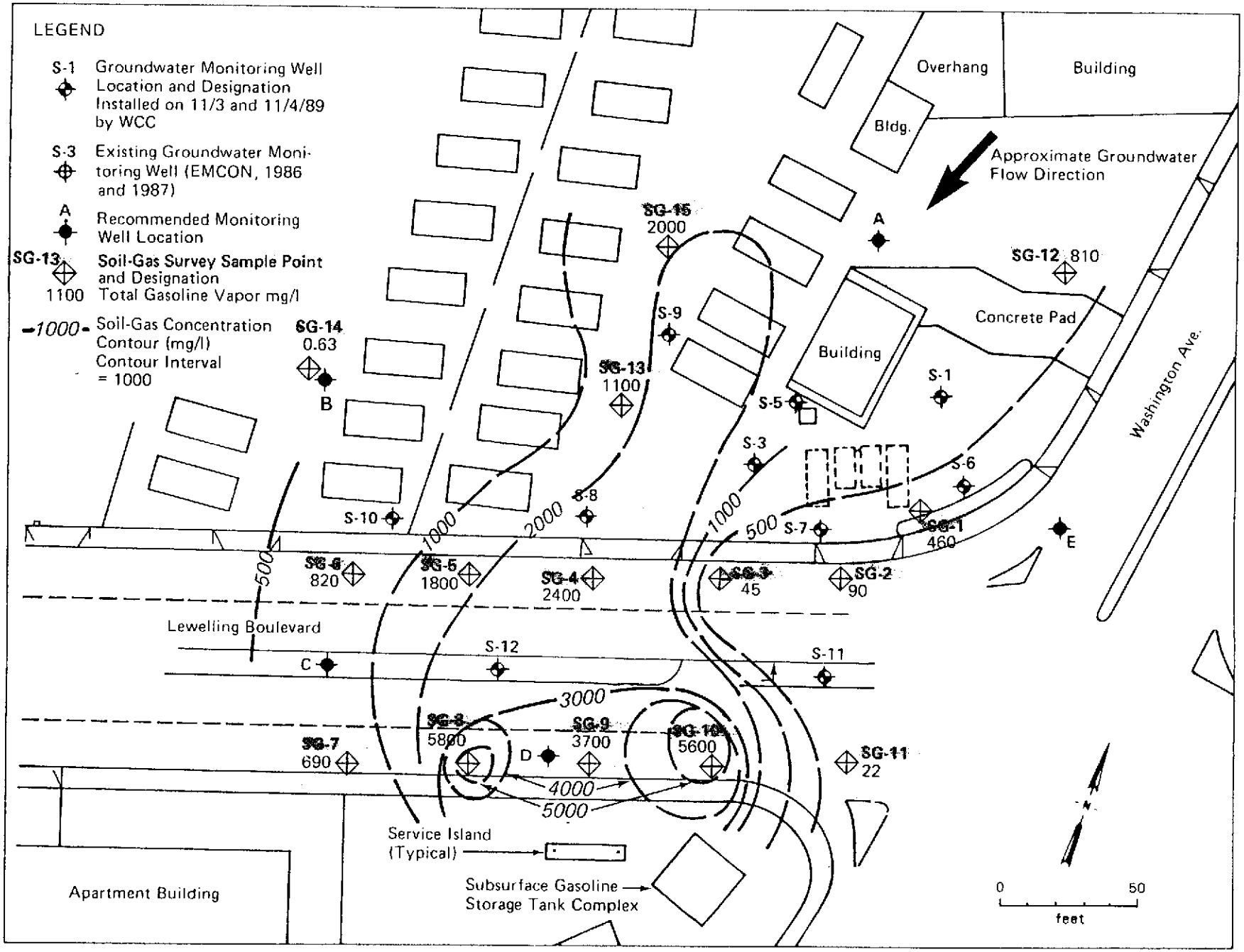
Project No. 8820011A

Gettler - Ryan

Woodward-Clyde Consultants

BENZENE CONCENTRATIONS IN GROUNDWATER CONTOUR MAP
SHELL SERVICE STATION
LEWELLING BOULEVARD AND WASHINGTON AVENUE
SAN LEANDRO, CALIFORNIA

Figure 4



Project No. 8820011A

Gettler - Ryan

Woodward-Clyde Consultants

SOIL-GAS SURVEY CONTOUR MAP
SHELL SERVICE STATION
LEWELLING BLVD. AND WASHINGTON AVE.
SAN LEANDRO, CALIFORNIA

Figure 5

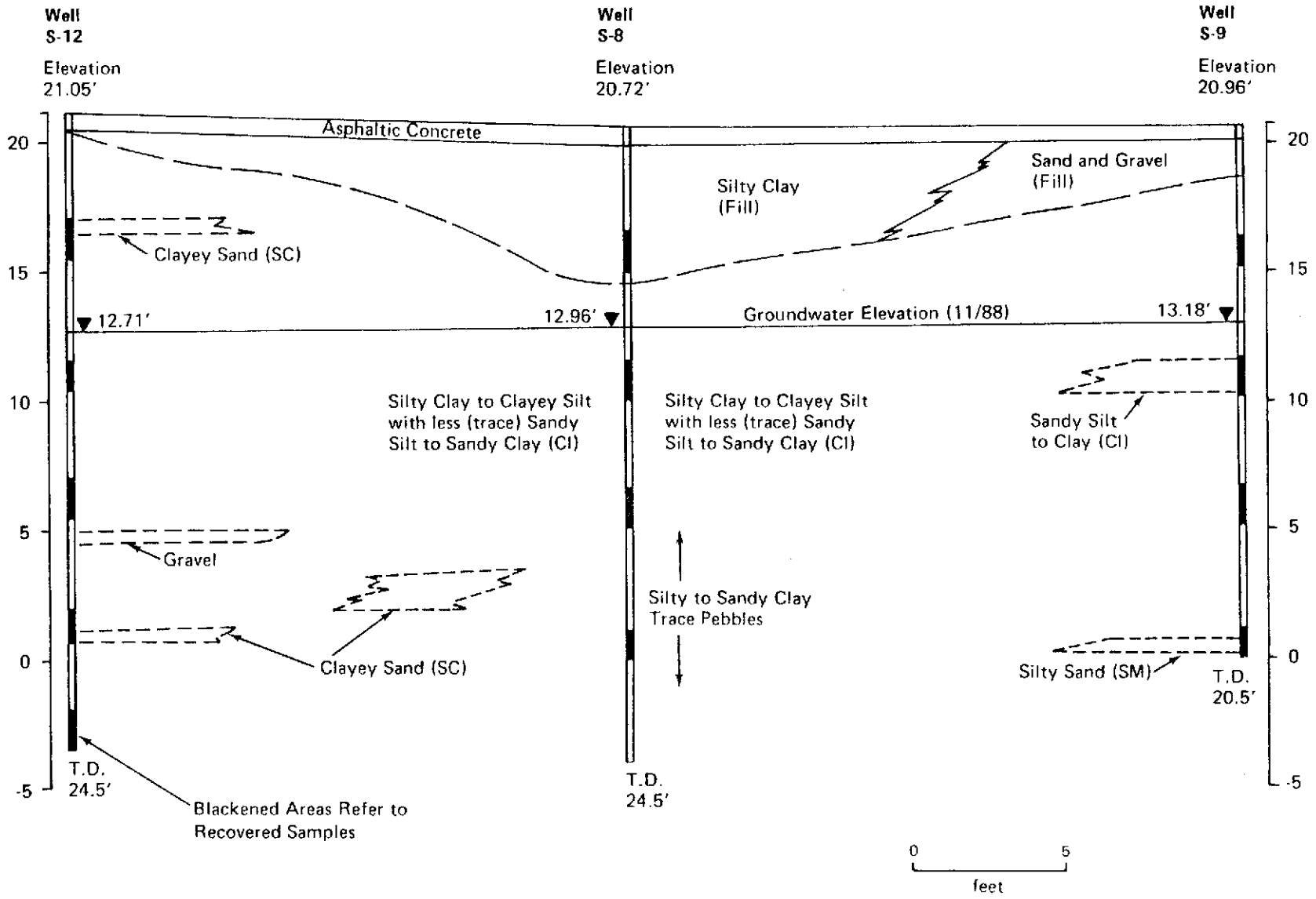
Project No. 8820011A

Gettler Ryan

Woodward-Clyde Consultants

CROSS SECTION
SHELL SERVICE STATION
LEWELLING BLVD. AND WASHINGTON AVE.
SAN LEANDRO, CALIFORNIA

Figure 6



ATTACHMENTS

WCC Well Logs S-6 through S-12
WCC Chain of Custody Record
Lid Elevations Surveyed on 11/18/88
Gettler Ryan Water Levels Measured on 11/22/88
I.T. Corporation's Certified Soil Sample Analytical Report
Gettler Ryan Groundwater Sampling Report
I.T. Corporation's Certified Groundwater Sample Analytical Report

Woodward-Clyde Consultants PROJECT NAME GETTLER-RYAN NO. 8820011A

MONITORING WELL LOCATION 15275 Washington Ave., San Leandro, CA (S-5)			ELEVATION AND DATUM
DRILLING AGENCY Bay Land Drilling	DRILLER Tom/Mack		DATE STARTED / DATE FINISHED 11/3/88
DRILLING EQUIPMENT CME - 55			COMPLETION DEPTH 24.5' / SAMPLER Modified California
DRILLING METHOD 8" Hollow stem auger	DRILL BIT CME Carbide		NO. OF SAMPLES: DIST. 5 / UNDIST. 5
SIZE AND TYPE OF CASING Sch 40 3" PVC	FROM 24.0 TO 0.5 FT.		WATER LEVEL: FIRST 8' / COMPL. — / 24 HRS. —
TYPE OF PERFORATION 0.02"	FROM 24.0 TO 4.0 FT.		LOGGED BY: R. Siegel / CHECKED BY: M. Bonkowski
SIZE AND TYPE OF PACK 2/12 Monterey Sand	FROM 24.5 TO 3.0 FT.		
TYPE OF SEAL NO. 1 1/2" Bentonite Pellets	FROM 3 TO 2.5 FT.		
NO. 2 Cement grout	FROM 2.5 TO 0.5 FT.		

Depth (feet)	Samples	Blows	MATERIAL DESCRIPTION		USCS	Well Construction
			Asphaltic Concrete			
			FILL black, pebbly clay, moist			
5	1*	pushed @ 150 lbs	**SILTY CLAY** gray black, low plasticity, moist to dry, moderately cohesive, some vegetative debris with iron - oxide staining	OVM = 482 ppm Hydrocarbon odor	CL	
10	2*	5 7 9	**SANDY to SILTY CLAY** mottled brown and black, fine to medium sand with 5% pebbles up to 1/4", moist to dry, low cohesiveness - grades in B and A sample tubes to clay, black, dry, very dense and cohesive, 5% silt	OVM = 1.3 ppm	CL	
15	3	5 9 14	**CLAY** mottled black and brown, very stiff, dry, cohesive	OVM = 26.5 ppm	CL	
			B and C tubes - same as sample 3			
20	4	5 11 15	**SANDY to SILTY CLAY** light brown with some black mottling, moderate cohesion, some vegetative debris with iron oxide staining	OVM = 0.8 ppm	CL	
	5	5 7 8	**CLAY** black to mottled brown and black, minor silt (<5%), very stiff, dry, cohesive			
25			**SILTY to SANDY CLAY** light brown, fine sand, moist to dry, moderate cohesion, based on drilling resistance, probably a number of alternating clay and sandy clay layers from 15' to bottom of hole	OVM = 2.6 ppm	CL	
			Total Depth = 24.5 feet			
30			* = Laboratory Sample			
35						

LOG OF MONITORING WELL NO. S-5 SHEET 1 OF 1

Woodward-Clyde Consultants PROJECT NAME GETTLER-RYAN NO. 8820011A

MONITORING WELL LOCATION 15275 Washington Ave., San Leandro, CA [redacted]		ELEVATION AND DATUM	
DRILLING AGENCY Bay Land Drilling	DRILLER Tom/Mack	DATE STARTED / DATE FINISHED 11/3/88	
DRILLING EQUIPMENT CME - 55		COMPLETION DEPTH 24.5'	SAMPLER Modified California
DRILLING METHOD 8" Hollow stem auger	DRILL BIT CME Carbide	NO. OF SAMPLES DIST. 5	UNDIST. 5
SIZE AND TYPE OF CASING Sch 40 3" PVC	FROM 24.0 TO 0.5 FT.	WATER LEVEL FIRST ~8'	COMPL. — 24 HRS. —
TYPE OF PERFORATION 0.02"	FROM 24.0 TO 4.0 FT.	LOGGED BY: R. Siegel	CHECKED BY: M. Bonkowski
SIZE AND TYPE OF PACK 2/12 Monterey Sand	FROM 24.5 TO 3.0 FT.		
TYPE OF SEAL NO. 1 Bentonite	FROM 3 TO 2.5 FT.		
NO. 2 Cement grout	FROM 2.5 TO 0.5 FT.		

Depth (feet)	Samples	Blows	MATERIAL DESCRIPTION		USCS	Well Construction
			Asphaltic Concrete			
5	1*	pushed @ 200 lbs	FILL - [redacted] silty sandy clay with large pebbles to 2" diameter, plastic, moist to wet, cohesive, Note: pipe encountered at ~5', moved auger over slightly	OVM = 9.0 ppm	CL	
10	2*	5 8 10	[redacted] black mottled with green, low plastiviey, stiff, dry, moderate cohesion	OVM = 32 ppm	CL	
15	3	6 9 12	[redacted] mottled black and brown, gravelly clay present in top, stiff, dry, moderate cohesion	OVM = 2.2 ppm	CL	
20	4	7 7 9	same as Silty Clay above	OVM = 1.8 ppm	CL	
	5	5 5 4	same as Silty Clay above but some fine sands present	OVM = 0.6 ppm		
25			Total Depth = 24.5 feet * = Laboratory Sample			
30						
35						

Woodward-Clyde Consultants PROJECT NAME GETTLER-RYAN NO. 8820011A

MONITORING WELL LOCATION 15275 Washington Ave., San Leandro, CA			ELEVATION AND DATUM
DRILLING AGENCY Bay Land Drilling	DRILLER Tom/Mack		DATE STARTED 11/3/88 DATE FINISHED
DRILLING EQUIPMENT CME - 55			COMPLETION DEPTH 24.5' / SAMPLER Modified California
DRILLING METHOD 8" Hollow stem auger	DRILL BIT CME Carbide		NO. OF SAMPLES DIST. 5 / UNDIST. 5
SIZE AND TYPE OF CASING Sch 40 3" PVC	FROM 24.0 TO 0.5 FT.		WATER LEVEL FIRST ~8' / COMPL. — / 24 HRS. —
TYPE OF PERFORATION 0.02"	FROM 24.0 TO 4.0 FT.		LOGGED BY: R. Siegel / CHECKED BY: M. Bonkowski
SIZE AND TYPE OF PACK 2/12 Monterey Sand	FROM 24.5 TO 3.0 FT.		
TYPE OF SEAL NO. 1 1/2" Bentonite Pellets	FROM 3 TO 2.5 FT.		
NO. 2 Cement grout	FROM 2.5 TO 0.5 FT.		

Depth (feet)	Samples	Blows	MATERIAL DESCRIPTION		USCS	Well Construction
			Asphaltic Concrete			
5	1*	5 7 9	SILTY CLAY some pebbles to 1", low plasticity, moist, low cohesion	OVM = 43 ppm Very strong Hydrocarbon odor	CL	
10	2*	5 7 14	SILTY to SANDY CLAY mottled black and brown, fine to medium sand, a few pebbles to 1/4" diameter, poorly sorted, dry to moist	OVM = 1.4 ppm	CL	
15	3*	5 9 14	as above, poor recovery, resampled from same depth gravels and pebbles present in clay, pebbles to 1/8", increased moisture, decreased cohesion	OVM = 453 ppm	CL	
20	4*	3 5 7	as above then goes to (A tube), Silty to Sandy Clay, light brown, fine sand, moist to dry, moderate cohesion	OVM = 4.8 ppm	CL	
	5*	5 6 10	No recovery after 2 attempts			
25			Total Depth = 24.5 feet * = Laboratory Sample			
30						
35						

LOG OF MONITORING WELL NO. S-8 SHEET 1 OF 1

Woodward-Clyde Consultants PROJECT NAME GETTLER-RYAN NO. 8820011A

MONITORING WELL LOCATION 15275 Washington Ave., San Leandro, CA			ELEVATION AND DATUM
DRILLING AGENCY Bay Land Drilling	DRILLER Tom/Mack		DATE STARTED 11/4/88 DATE FINISHED
DRILLING EQUIPMENT CME - 55			COMPLETION DEPTH 18' / SAMPLER Modified California
DRILLING METHOD 8" Hollow stem auger	DRILL BIT CME Carbide		NO. OF SAMPLES 4 / DIST. / UNDIST. —
SIZE AND TYPE OF CASING Sch 40 3" PVC	FROM 18.0 TO 0.5 FT.		WATER LEVEL FIRST 8' +/- / COMPL. 8.2' / 24 HRS. —
TYPE OF PERFORATION 0.02"	FROM 17.5 TO 4.0 FT.		LOGGED BY: G. Heyman / CHECKED BY: M. Bonkowski
SIZE AND TYPE OF PACK 2/12 Monterey Sand	FROM 18 TO 3.0 FT.		
TYPE OF SEAL NO. 1 1/2" Bentonite Pellets	FROM 3 TO 2.5 FT.		
NO. 2 Cement grout	FROM 2.5 TO surface FT.		

Depth (feet)	Samples	Blows	MATERIAL DESCRIPTION	USCS	Well Construction
			Asphaltic Concrete		
			FILL - SAND and GRAVEL		
			SILTY CLAY to CLAYEY SILT (cuttings) dark gray, little to some very fine sand, low to medium plasticity, moist to wet — Moderate Hydrocarbon odor		
5	1*	pushed @ 150 lbs	SILTY CLAY to CLAYEY SILT dark gray, some very fine sand, low plasticity, soft, moist, homogeneous — OVM = 540 ppm, Strong Hydrocarbon odor	CL	
			▼		
10	2*	3 4 5	SANDY SILT to SANDY CLAY medium gray grading down to medium brown, very fine sand, low plasticity, wet, few vesicles less than 1 mm diameter, few root traces — OVM = 27 ppm, Weak Hydrocarbon odor	CL	
15	3	6 8 12	CLAY to SILTY CLAY medium gray brown to green brown, occasionally little very fine sand, little to some silt, medium plasticity, moist with wet to saturated areas adjacent to vesicles, few root fragments, few vesicles — OVM = 8 ppm, No Hydrocarbon odor	CL-CH	
20	4		CLAYEY SILT to SILTY CLAY medium gray brown, medium plasticity, firm, wet — OVM = 5 ppm, No Hydrocarbon odor	CL-ML-SM	
			SANDY SILT to SILTY SAND light yellow brown, very fine sand, little to some clay, wet to saturated		
			Total Depth = 20.5 feet		
			* = Laboratory Sample		
25					
30					
35					

Woodward-Clyde Consultants PROJECT NAME GETTLER-RYAN NO. 8820011A

MONITORING WELL LOCATION 15275 Washington Ave., San Leandro, CA (S-10)		ELEVATION AND DATUM	
DRILLING AGENCY Bay Land Drilling	DRILLER Tom/Mack	DATE STARTED / DATE FINISHED 11/4/88	
DRILLING EQUIPMENT CME - 55		COMPLETION DEPTH 18'	SAMPLER Modified California
DRILLING METHOD 8" Hollow stem auger	DRILL BIT CME Carbide	NO. OF SAMPLES DIST. 4	UNDIST. —
SIZE AND TYPE OF CASING Sch 40 3" PVC	FROM 18.0 TO 0.5 FT.	WATER LEVEL FIRST 8' +/-	COMPL. 7.1' 24 HRS. —
TYPE OF PERFORATION 0.02"	FROM 17.5 TO 4.0 FT.	LOGGED BY: G. Heyman	CHECKED BY: M. Bonkowski
SIZE AND TYPE OF PACK 2/12 Monterey Sand	FROM 18 TO 3.0 FT.		
TYPE OF SEAL NO. 1 1/2" Bentonite Pellets	FROM 3 TO 2.5 FT.		
NO. 2 Cement grout	FROM 2.5 TO surface FT.		

Depth (feet)	Samples	Blows	MATERIAL DESCRIPTION		USCS	Well Construction
			Asphaltic Concrete			
5	1*	pushed @ 100 lbs	**SILTY to SANDY SILT** dark gray, very fine sand, low plasticity, soft, moist, homogeneous	OVM = 0 ppm No Hydrocarbon odor	CL	
10	2*	3 4 7	**Interlayered SILTY CLAY and CLAYEY SAND** dark greenish gray, little very fine sand in clay, low plasticity, moist, wet with few saturated areas	OVM = 3.7 ppm No Hydrocarbon odor Weak Hydrocarbon odor in 20 minutes	CL-SC	
15	3	5 8 9	**CLAY to SILTY CLAY** light to medium brown, low to medium plasticity, moist, few off-white brittle veinlets 2 - 3 mm thick	OVM = 0 ppm No Hydrocarbon odor	CL-CH	
20	4	4 5 7	**SILTY CLAY** medium gray brown, some very fine sand, trace fine gravel, medium plasticity, wet to occasionally saturated	No Hydrocarbon odor	CL-CH	
25			Total Depth = feet * = Laboratory Sample			
30						
35						

Woodward-Clyde Consultants PROJECT NAME GETTLER-RYAN NO. 8820011A

MONITORING WELL LOCATION 15275 Washington Ave., San Leandro, CA (S-11)		ELEVATION AND DATUM	
DRILLING AGENCY Bay Land Drilling	DRILLER Tom/Mack	DATE STARTED / DATE FINISHED 11/4/88	
DRILLING EQUIPMENT CME - 55		COMPLETION DEPTH 24.5'	SAMPLER Modified California
DRILLING METHOD 8" Hollow stem auger	DRILL BIT CME Carbide	NO. OF SAMPLES DIST. 5	UNDIST. 5
SIZE AND TYPE OF CASING Sch 40 3" PVC	FROM 24.5 TO 0.5 FT.	WATER LEVEL FIRST 8'	COMPL 7.8' 24 HRS. ___
TYPE OF PERFORATION 0.02"	FROM 24.0 TO 4.0 FT.	LOGGED BY: G. Heyman	CHECKED BY: M. Bonkowski
SIZE AND TYPE OF PACK 2/12 Monterey Sand	FROM 24.5 TO 3.5 FT.		
TYPE OF SEAL NO. 1 1/2" Bentonite Pellets	FROM 3.5 TO 3.0 FT.		
NO. 2 Cement grout	FROM 3.0 TO 0.5 FT.		

Depth (feet)	Samples	Blows	MATERIAL DESCRIPTION		USCS	Well Construction
			Asphaltic Concrete and base rock			
5	1	pushed @ 175 lbs	**SILTY to SANDY CLAY** greenish gray, silt and very fine grained sand, content varies vertically, low plasticity, firm, moist, numerous vesicles less than 1 mm diameter	OVM = 110 ppm **Moderate Hydrocarbon** odor	CL	
				Strong Hydrocarbon odor in cuttings at 8' ▼		
10	2	4 7 9	**SILTY CLAY to CLAYEY SILT** dark brown, little to some very fine sand, low plasticity, moist to wet, few vesicles	OVM = 0 ppm No Hydrocarbon odor	CL-ML	
15	3	5 9 11	**SILTY CLAY** greenish brown, little to some very fine sand, medium plasticity, wet with saturated areas, gravel layers 1 - 2" thick from 16 - 18' (driller)	OVM = 0 ppm No Hydrocarbon odor	CL	
20	4*	3 4 4	**SILTY CLAY** with Interbedded CLAYEY SAND to SANDY CLAY Clay is grayish brown, medium plasticity, wet with saturated areas, sand is light yellow brown, very fine grained, loose, wet to saturated, up to 3" thick	OVM = 0.5 ppm No Hydrocarbon odor	CL-SC	
25	5	4 7 8	**SANDY CLAY to CLAYEY SAND** layers are up to 5" thick, as above	No Hydrocarbon odor	CL	
			Total Depth = 24.5 feet			
			* = Laboratory Sample			
30						
35						

LOG OF MONITORING WELL NO. S-11 SHEET 1 OF 1

Woodward-Clyde Consultants

PROJECT NAME GETTLER-RYAN NO. 8820011A

MONITORING WELL LOCATION 15275 Washington Ave., San Leandro, CA (S-12)			ELEVATION AND DATUM
DRILLING AGENCY Bay Land Drilling	DRILLER Tom/Mack		DATE STARTED 11/4 DATE FINISHED
DRILLING EQUIPMENT CME - 55			COMPLETION DEPTH 24.5' / SAMPLER Modified California
DRILLING METHOD 8" Hollow stem auger	DRILL BIT CME Carbide		NO. OF SAMPLES: DIST. 5 / UNDIST. 5
SIZE AND TYPE OF CASING Sch 40 3" PVC	FROM 24.0 TO 0.5 FT.		WATER LEVEL: FIRST 8' / COMPL. — / 24 HRS. —
TYPE OF PERFORATION 0.02"	FROM 23.5 TO 3.5 FT.		LOGGED BY: G. Heyman / CHECKED BY: M. Bonkowski
SIZE AND TYPE OF PACK 2/12 Monterey Sand	FROM 24.0 TO 3.0 FT.		
TYPE OF SEAL NO. 1 1/2" Bentonite Pellets	FROM 3 TO 2.5 FT.		
NO. 2 Cement grout	FROM 2.5 TO surface FT.		

Depth (feet)	Samples	Blows	MATERIAL DESCRIPTION	USCS	Well Construction
			Asphaltic Concrete		
5	1	pushed @ 200 lbs	CLAYEY SAND to SANDY CLAY grading down to SILTY CLAY TO CLAYEY SILT greenish gray at top with gray mottling in middle and bottom of sample, very fine sand, low plasticity, moist, generally homogeneous OVM jumped to 190 ppm then settled at 120 ppm Weak Hydrocarbon odor	CL	
10	2	4 5 7	SILTY CLAY dark brownish gray, some very fine sand, low plasticity, firm, moist to wet, few beds of clay, sand to 1/4" thick OVM = 20 ppm Weak Hydrocarbon odor	CL	
15	3	5 8 11	CLAY to SILTY CLAY medium grayish brown, some silt grading to silty clay, medium plasticity, wet homogeneous Driller indiccates drilling through a series of 2 - 4" gravel layers from 16 - 19' OVM = 0 ppm No Hydrocarbon odor	CL	
20	4	3 4 5	CLAY to SANDY CLAY medium grayish brown, little to some very fine sand occasionally grading to sandy clay, low to medium plasticity, firm saturated No Hydrocarbon odor	CL	
	5	4 5 7	CLAYEY SAND to SANDY CLAY medium yellow brown, very fine sand, saturated OVM = 1 ppm No Hydrocarbon odor SILTY CLAY to CLAYEY SILT medium yellow brown, up to some very fine sand, low to medium plasticity, saturated OVM = 0 ppm No Hydrocarbon odor	CL	
25			Total Depth = 24.5 feet * = Laboratory Sample		
30					
35					

Woodward-Clyde Consultants

500 12th Street, Suite 100, Oakland, CA 94607-4041
(415) 893-3600

Chain of Custody Record

PROJECT NO. 8820011A-0097

SAMPLERS: (Signature) G. Heymann / R. Siegel

ANALYSES: ~~General Mineral~~, Priority Pollutant Metals, ~~EPA Method 624~~, ~~EPA Method 625~~, ~~EPA Method 608~~, Gas/BTEX

DATE	TIME	SAMPLE NUMBER	Gas/BTEX	Number of Containers	REMARKS (Sample preservation, handling procedures, etc.)
11/3/88		S-6/1-GR-89831/Shell (Wash-Levelling) San Mateo/0097/4-5.5A	✓	1	Normal TAT
11/3/88		S-6/2-GR-89831/Shell (Wash-Levelling) San Mateo/0097/9-10.5A	✓	1	
11/3/88		S-7/1-GR-89831/Shell (Wash-Levelling) San Mateo/0097/4-5.5A	✓	1	
11/3/88		S-7/2-GR-89831/Shell (Wash-Levelling) San Mateo/0097/9-10.5A	✓	1	Please Return the Tubes.
11/3/88		S-8/1-GR-89831/Shell (Wash-Levelling) San Mateo/0097/4-5.5A	✓	1	
11/3/88		S-8/2-GR-89831/Shell (Wash-Levelling) San Mateo/0097/9-10.5A	✓	1	Thanks
11/3/88		S-8/3-GR-89831/Shell (Wash-Levelling) San Mateo/0097/14-15.5A	✓	1	
11/3/88		S-8/4-GR-89831/Shell (Wash-Levelling) San Mateo/0097/19-20.5A	✓	1	
~~11/3/88~~		~~S-8/4-GR-89831/Shell (Wash-Levelling) San Mateo/0097~~			

TOTAL NUMBER OF CONTAINERS: 8

RELINQUISHED BY: (Signature)	DATE/TIME	RECEIVED BY: (Signature)	RELINQUISHED BY: (Signature)	DATE/TIME	RECEIVED BY: (Signature)
[signature]	11/4/88 1315 hrs				

METHOD OF SHIPMENT:	SHIPPED BY: (Signature)	COURIER: (Signature)	RECEIVED FOR LAB BY: (Signature)	DATE/TIME
	[signature]	[signature]		

Woodward-Clyde Consultants

500 12th Street, Suite 100, Oakland, CA 94607-4041
(415) 893-3600

Chain of Custody Record

PROJECT NO. S870011A-0097

SAMPLERS: (Signature) G Heyman

DATE	TIME	SAMPLE NUMBER	General Mineral	Priority Pollutant Metals	EPA Method 624	EPA Method 625	EPA Method 608	TPH/BTEX	Number of Containers	REMARKS (Sample preservation, handling procedures, etc.)
11/4/88		S-9/1-GR-89831/Shell (Wash-Levelling) San Mateo/0097/4-5.5A						✓	1	Normal TAT
11/4/88		S-9/2-GR-89831/Shell (Wash-Levelling) San Mateo/0097/9-10.5A						✓	1	
11/4/88		S-10/1-GR-89831/Shell (Wash-Levelling) San Mateo/0097/4-5.5A						✓	1	
11/4/88		S-10/2-GR-89831/Shell (Wash-Levelling) San Mateo/0097/4-10.5A						✓	1	
11/4/88		S-11/1-GR-89831/Shell (Wash-Levelling) San Mateo/0097/4-5.5A						✓	1	
11/4/88		S-11/2-GR-89831/Shell (Wash-Levelling) San Mateo/0097/9-10.5A						✓	1	
11/4/88		S-12/1-GR-89831/Shell (Wash-Levelling) San Mateo/0097/4-5.5A						✓	1	
11/4/88		S-12/2-GR-89831/Shell (Wash-Levelling) San Mateo/0097/4-10.5A						✓	1	

TOTAL NUMBER OF CONTAINERS: 8

RELINQUISHED BY: (Signature)	DATE/TIME	RECEIVED BY: (Signature)	RELINQUISHED BY: (Signature)	DATE/TIME	RECEIVED BY: (Signature)
G Heyman	11/7/88 10:15 AM		[signature]		

METHOD OF SHIPMENT:	SHIPPED BY: (Signature)	COURIER: (Signature)	RECEIVED FOR LAB BY: (Signature)	DATE/TIME
	[signature]	[signature]		

November 21, 1988

Surveyed 11-18-88

Gettler-Ryan
Shell Service Station Site
15275 Washington Ave.
San Leandro, California

TABLE OF ELEVATIONS

WELL NO.	ELEVATION @ PUNCH MARK N. SIDE CHRISTY BOX
S-1	21.55
S-3	21.14
S-5	Unable to Shoot (Under Vehicle)
S-6	22.02
S-7	21.47
S-8	20.72
S-9	20.96
S-10	20.86
S-11	21.26
S-12	21.05

Shell Service Station
15275 Washington Avenue
San Leandro

Well Designation	Depth to Water (feet)
S-1	8.01
S-3	7.76
S-5	8.28
S-6	8.58
S-7	8.24
S-8	7.76
S-9	7.78
S-10	7.91
S-11	8.62
S-12	8.34

(Water levels were measured on November 22, 1988)

INTERNATIONAL TECHNOLOGY CORPORATION

Gettler-Ryan
1992 National Avenue
Hayward, CA 94545

December 6, 1988

ATTN: John Werfal

Following are the results of analyses on the samples described below.

Project:	G-R #89831/WCC #8820011A-0097, Shell Washington and Lewelling, San Leandro, CA, CORRECTED REPORT
Lab Numbers:	SB-11-098-01 thru SB-11-098-16
Number of Samples:	16
Sample Type:	Soil
Date Received:	11/7/88
Analyses Requested:	Low Boiling Hydrocarbons

The method of analysis for low boiling hydrocarbons is taken from EPA Methods 8015, 8020 and 5030. The sample is examined using the purge and trap technique. Final detection is by gas chromatography using a flame ionization detector as well as a photoionization detector. The result for total low boiling hydrocarbons is calculated as gasoline and includes benzene, toluene, ethyl benzene and xylenes.

Fred Rouse

FR/mlh

2 Pages Following - Tables of Results

IT Santa Clara Valley Lab to Gettler-Ryan
ATTN: John Werfal

December 6, 1988

Project: G-R #89831/WCC #8820011A-0097, Shell,
Washington & Lewelling, San Leandro, CA, CORRECTED REPORT

ND = None Detected

Summary of Results
Parts per Million - (Dry Soil Basis)

Lab Number	Sample Identification	Low Boiling Hydrocarbons (calculated as gasoline)	Benzene	Toluene	Ethyl Benzene	Xylenes
SB-11-098-01	S-6/1 4-5.5A	510.	3.	ND	11.	20.
Detection Limit		300.	3.	5.	5.	20.
SB-11-098-02	S-6/2 9-10.5A	ND	ND	ND	ND	ND
Detection Limit		5.	0.05	0.1	0.1	0.3
SB-11-098-03	S-7/1 4-5.5A	55.	ND	0.1	0.1	1.4
Detection Limit		5.	0.05	0.1	0.1	0.3
SB-11-098-04	S-7/2 9-10.5A	12.	0.06	ND	0.1	0.5
Detection Limit		5.	0.05	0.1	0.1	0.3
SB-11-098-05	S-8/1 4-5.5A	5,600.	31.	1.5	100.	230.
Detection Limit		700.	7.	0.1	10.	40.
SB-11-098-06	S-8/2 9-10.5A	26.	0.24	0.1	0.7	2.1
Detection Limit		5.	0.05	0.1	0.1	0.3
SB-11-098-07	S-8/3 14-15.5A	ND	0.10	ND	ND	ND
Detection Limit		5.	0.05	0.1	0.1	0.3
SB-11-098-08	S-8/4 19-20.5A	5.	0.11	ND	0.1	0.3
Detection Limit		5.	0.05	0.1	0.1	0.3
SB-11-098-09	S-9/1 4-5.5A	2,200.	17.	ND	40.	170.
Detection Limit		500.	5.	10.	10.	30.
SB-11-098-10	S-9/2 9-10.5A	5.	0.06	0.1	0.1	0.4
Detection Limit		5.	0.05	0.1	0.1	0.3
SB-11-098-11	S-10/1 4-5.5A	ND	ND	ND	ND	ND
Detection Limit		5.	0.05	0.1	0.1	0.3
SB-11-098-12	S-10/2 9-10.5A	ND	ND	0.1	ND	ND
Detection Limit		5.	0.05	0.1	0.1	0.3

IT Santa Clara Valley Lab to Gettler-Ryan
ATTN: John Werfal

December 6, 1988

Project: G-R #89831/WCC #8820011A-0097, Shell,
Washington & Lewelling, San Leandro, CA, CORRECTED REPORT

ND = None Detected

Summary of Results
Parts per Million - (Dry Soil Basis)

Lab Number	Sample Identification	Low Boiling Hydrocarbons (calculated as gasoline)	Benzene	Toluene	Ethyl Benzene	Xylenes
S8-11-098-13	S-11/1 4-5.5A	10.	ND	ND	ND	0.3
Detection Limit		5.	0.05	0.1	0.1	0.3
S8-11-098-14	S-11/1 9-10.5A	ND	ND	ND	ND	ND
Detection Limit		5.	0.05	0.1	0.1	0.3
S8-11-098-15	S-12/1 4-5.5A	35.	0.49	0.2	0.8	0.8
Detection Limit		5.	0.05	0.1	0.1	0.3
S8-11-098-16	S-12/2 9-10.5A	5.	0.05	0.1	ND	ND
Detection Limit		5.	0.05	0.1	0.1	0.3

gettler — ryan inc.

January 4, 1989

GROUNDWATER SAMPLING REPORT

Shell Oil Company
Post Office Box 4023
Concord, California 94520

Referenced Site: Former Shell Service Station
15275 Washington/Lewelling
San Leandro, California

Sampling Date: November 16, 1988

This report presents the results of the quarterly groundwater sampling and analytical program conducted by Gettler-Ryan Inc. on November 16, 1988, at the referenced location. The site is occupied by a former operating service station located on the northwest corner of Lewelling and Washington. The former service station had underground storage tanks containing Regular Leaded, Unleaded and Super Unleaded gasoline products.

There are currently ten groundwater monitoring wells on site, five of which were recently installed. These wells are indicated on the attached site map. Prior to sampling, all wells were inspected for total well depth, water levels, and presence of separate phase product using an electronic interface probe. A clean acrylic bailer was used to visually confirm the presence and thickness of separate phase product. Groundwater depths ranged from 15 to 25 feet below grade.

Wells that did not contain separate phase product were purged and sampled. Standard sampling procedure calls for a minimum of four case volumes to be purged from each well. Each well was purged while pH, temperature, and conductivity measurements were monitored for stability. In cases where a well dewatered or less than four case volumes were purged, groundwater samples were obtained after the physical parameters had stabilized. Details of the final well purging results are presented on the attached Table of Monitoring Data.

Samples were collected, using a teflon bailer, in properly cleaned and laboratory prepared containers. All sampling equipment was thoroughly cleaned after each well was sampled and steam cleaned upon completion of work at the site. The samples were labeled, stored on blue ice, and transported to the laboratory for analysis. Chain of custody records were established noting sample identification numbers, time, date, and custody signatures.

1992 national avenue • hayward, california 94545-1787 • (415) 783-7500

The samples were analyzed at International Technology Corporation - Santa Clara Valley Laboratory located at 2055 Junction Avenue, San Jose, California. The laboratory is assigned a California DHS-HMTL Certification number of 137. The results are presented as a Certificd Analytical Report, a copy of which is attached to this report.

Tom Paulson
Sampling Manager

attachments

TABLE OF MONITORING DATA
GROUNDWATER WELL SAMPLING REPORT

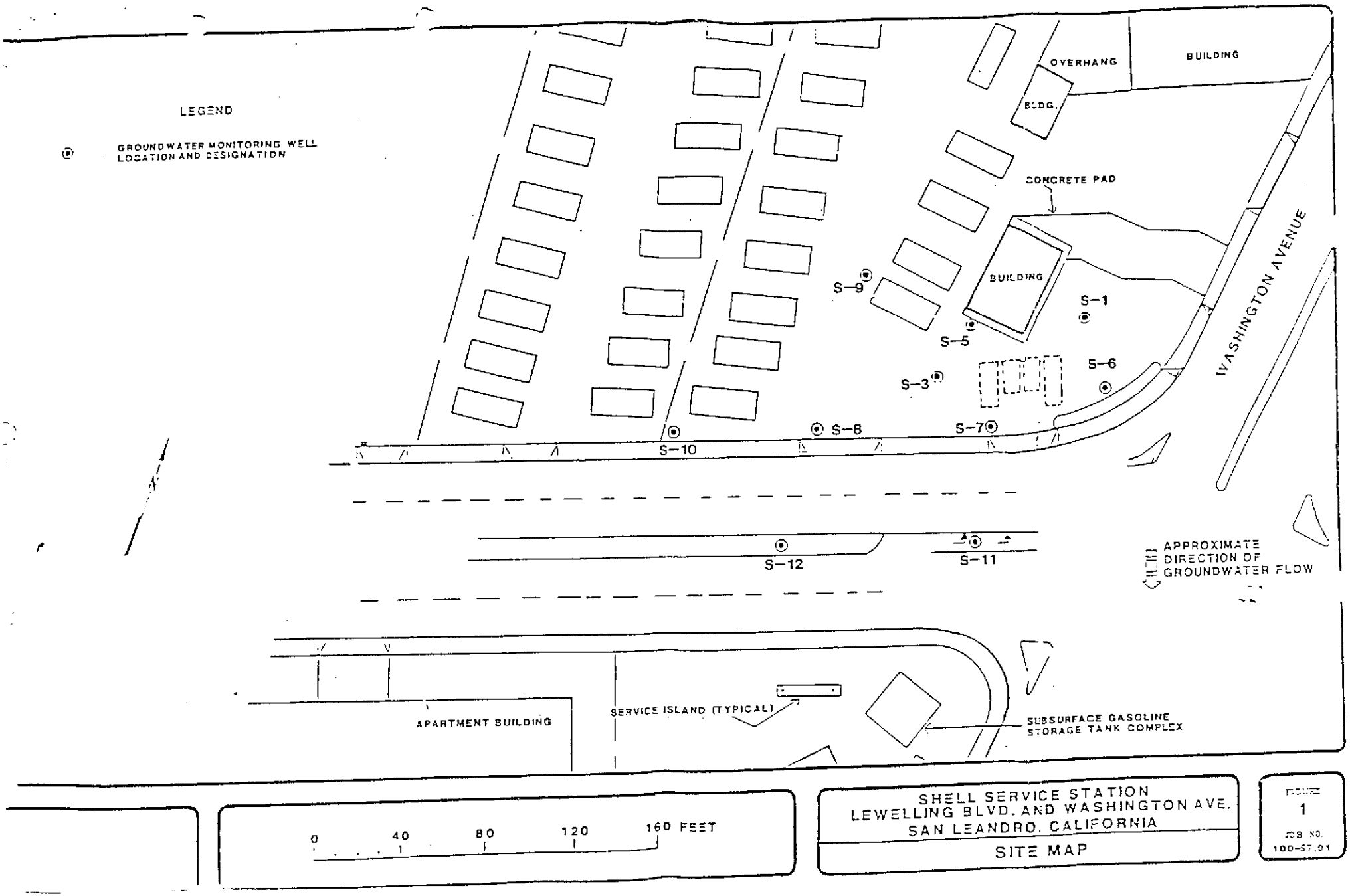
WELL I.D.	S-1	S-3	S-5	S-6	S-7	S-8
Casing Diameter (inches)	3	3	4	3	3	3
Total Well Depth (feet)	20.0	15.0	18.5	25.0	18.0	23.0
Depth to Water (feet)	8.22	8.11	8.59	8.29	8.46	8.13
Free Product (feet)	none	none	none	none	none	none
Reason Not Sampled	----	----	----	----	----	----
Ideal 5 Case Vol.(gallons)	22.5	13	33	32	18	24.5
Did Well Dewater?	no	yes	no	yes	yes	yes
Volume Evacuated (gallons)	26	11	33	37	30	30
Purging Device	Suction	Suction	Suction	Suction	Suction	Suction
Sampling Device	Bailer	Bailer	Bailer	Bailer	Bailer	Bailer
Time	17:32	16:00	16:35	17:12	18:10	11:25
Temperature (F)*	70.0	68.3	69.7	68.3	68.0	68.0
pH*	7.17	6.74	6.92	7.18	7.43	7.28
Conductivity (umhos/cm)*	1202	1280	1706	1271	1489	1820

* Indicates Stabilized Value

TABLE OF MONITORING DATA
GROUNDWATER WELL SAMPLING REPORT

WELL I.D.	S-9	S-10	S-11	S-12
Casing Diameter (inches)	3	3	3	3
Total Well Depth (feet)	18.0	17.0	23.0	23.0
Depth to Water (feet)	8.17	8.29	8.96	8.62
Free Product (feet)	none	none	none	none
Reason Not Sampled	----	----	----	----
Ideal 5 Case Vol.(gallons)	19	16	27	27
Did Well Dewater?	yes	yes	no	yes
Volume Evacuated (gallons)	24	19	36	42
Purging Device	Suction	Suction	Suction	Suction
Sampling Device	Bailer	Bailer	Bailer	Bailer
Time	12:08	10:41	9:56	9:10
Temperature (F)*	69.8	64.5	70.0	69.8
pH*	7.28	6.65	7.03	7.16
Conductivity (umhos/cm)*	1670	1145	1328	1390

* Indicates Stabilized Value



SHELL SERVICE STATION
LEWELLING BLVD. AND WASHINGTON AVE.
SAN LEANDRO, CALIFORNIA

SITE MAP

ROUTE
1

JOB NO.
100-57.01

INTERNATIONAL TECHNOLOGY CORPORATION

December 5, 1988

Gettler-Ryan
1992 National Avenue
Hayward, CA 94545

ATTN: John Werfal

Following are the results of analyses on the samples described below.

Project:	G-R #83128, Shell, 15275 Washington Avenue and Lewelling, San Leandro, CA
Lab Numbers:	S8-11-193-01 thru S8-11-193-10
Number of Samples:	10
Sample Type:	Water
Date Received:	11/17/88
Analyses Requested:	Low Boiling Hydrocarbons

The method of analysis for low boiling hydrocarbons is taken from EPA Methods 8015, 8020 and 5030. The sample is examined using the purge and trap technique. Final detection is by gas chromatography using a flame ionization detector as well as a photoionization detector. The result for total low boiling hydrocarbons is calculated as gasoline and includes benzene, toluene, ethyl benzene and xylenes.

Fred Rouse

FR/gg

1 Page Following - Table of Results

IT/Santa Clara Valley Lab to Gettler-Ryan
ATTN: John Werfal

December 5, 1988
Page 1 of 1

Project: G-R #83128, Shell, 15275 Washington and Lewelling, San Leandro, CA

ND = None Detected

Summary of Results
Milligrams per Liter

Lab Number	Sample Identification	Low Boiling Hydrocarbons (calculated as gasoline)	Benzene	Toluene	Ethyl Benzene	Xylenes
S8-11-193-01	S-1	ND	ND	ND	ND	ND
Detection Limit		0.05	0.0005	0.001	0.001	0.003
S8-11-193-02	S-3	70.	4.6	8.4	2.5	13.
Detection Limit		10.	0.1	0.2	0.2	0.8
S8-11-193-03	S-5	3.	0.66	0.06	0.12	0.22
Detection Limit		1.	0.01	0.02	0.02	0.08
S8-11-193-04	S-6	0.05	0.0007	ND	ND	ND
Detection Limit		0.05	0.0005	0.001	0.001	0.003
S8-11-193-05	S-7	0.10	0.0051	0.015	0.002	0.013
Detection Limit		0.05	0.0005	0.001	0.001	0.003
S8-11-193-06	S-8	0.21	0.0050	ND	0.001	0.005
Detection Limit		0.05	0.0005	0.001	0.001	0.003
S8-11-193-07	S-9	1.4	0.069	0.003	0.052	0.18
Detection Limit		0.1	0.001	0.001	0.002	0.008
S8-11-193-08	S-10	0.33	0.0005	ND	0.001	0.011
Detection Limit		0.05	0.0005	0.001	0.001	0.003
S8-11-193-09	S-11	ND	ND	ND	ND	ND
Detection Limit		0.05	0.0005	0.001	0.001	0.003
S8-11-193-10	S-12	0.05	0.0035	ND	ND	ND
Detection Limit		0.05	0.0005	0.001	0.001	0.003

Geffler - Ryan Inc. ENVIRONMENTAL DIVISION — 88-11-193 — **Chain of Custody**

COMPANY Shell Oil Company — JOB NO. 0011

JOB LOCATION 15275 Washington Ave / Lewelling

CITY San Leandro CA — PHONE NO

AUTHORIZED John Wevtal — DATE 11-16-88 — P.O. NO 83128

SAMPLE ID	NO OF CONTAINERS	SAMPLE MATRIX	DATE/TIME SAMPLED	ANALYSIS REQUIRED	SAMPLE CONDITION LAB ID
S-1	3	Liquid	11-16/17:32	THC (Gas) BTXE	OK (RJ)
S-3	3		16:09		
S-5	3		16:35		
S-6	3		~~18:10~~ 17:12		
S-7	3		~~17:12~~ 18:10		
S-8	3		11:23		
S-9	3		12:18		
S-10	3		10:41		
S-11	3		9:56		
S-12	3		9:10		
~~F~~					

Normal Turnaround Report due 12-5-88

RELINQUISHED BY: 11-17-88 8:25am — RECEIVED BY:

RELINQUISHED BY: — RECEIVED BY: ITSCY 11/17/88 0825

RELINQUISHED BY: — RECEIVED BY LAB:

DESIGNATED LABORATORY: IT/SCY — DHS #: 137

REMARKS:

DATE COMPLETED 11-16-88 — FOREMAN

ORIGINAL