ALAMEDA COUNTY

HEALTH CARE SERVICES





DAVID J. KEARS, Agency Director

STID 1724

October 31, 1996

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

REMEDIAL ACTION COMPLETION CERTIFICATION

Unocal Corporation 2000 Crow Canyon Place, Suite 400, P.O. Box 5155 San Ramon, California 94583 Attn: Adadu Yemane

RE: FORMER UNOCAL SS #3844, 1903 DOOLITTLE DRIVE, SAN LEANDRO, CA

Dear Mr. Yemane:

This letter confirms the completion of site investigation and remedial action for the one 260-gallon waste oil and the two (one 5000-gallon and one 7500-gallon) gasoline underground storage tanks (USTs) at the above described location. Enclosed is the Case Closure Summary for the referenced site for your records.

Based upon the available information and with provision that the information provided to this agency was accurate and representative of site conditions, no further action related to the underground tank release is required.

This notice is issued pursuant to the regulation contained in Title 23, Division 3, Chapter 16, Section 2721 (e) of the California Code of Regulations. If a change in land use is proposed, the owner must promptly notify this agency.

Please contact Dale Klettke at (510) 567-6880 if you have any questions regarding this matter.

Sincerely,

Mee Ling Tung

Director, Department of Environmental Health

enclosure

c: Thomas Peacock, LOP Manager--files Lori Casias, SWRCB, w/enclosure

Mike Bakaldin, San Leandro Hazardous Materials Program, w/enclosure

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01-1579

CASE CLOSURE SUMMARY Leaking Underground Fuel Storage Tank Program

I. AGENCY INFORMATION

Date: June 10, 1996

Agency name: Alameda County-HazMat Address: 1131 Harbor Bay Pkwy

City/State/Zip: Alameda, CA 94502 Phone: (510) 567-6700

Responsible staff person: D. Klettke Title: Hazardous Materials Spec.

II. CASE INFORMATION

Site facility name: Former Unocal Station #3844

Site facility address: 1903 Doolittle Drive, San Leandro, CA 94577

RB LUSTIS Case No: N/A Local Case No./LOP Case No.: 1724

URF filing date: 3/15/93 SWEEPS No: N/A

Responsible Parties:

Addresses:

Phone Numbers:

Mr. Bob Boust, c/o Unocal Corporation

(510)277-2334

P.O. Box 5155, San Ramon, CA 94583

Tank No:	Size in gal.:	Contents:	<pre>Closed in-place or removed?:</pre>	<u>Date:</u>
1	5000	UL gasoline	removed	12/27/91
2	7500	UL gasoline	removed	12/27/91
3	260	waste oil	removed	12/27/91

III. RELEASE AND SITE CHARACTERIZATION INFORMATION

Cause and type of release: Unknown

Site characterization complete? YES

Date approved by oversight agency: RAP work plan approved 9/6/94

Monitoring Wells installed? YES Number: five (5)

Proper screened interval? YES, wells screened approximately 8' to 32' bgs

Highest GW depth below ground surface: 15.61' (MW-2 on 4/11/96)

Lowest depth: 17.52' (MW-4 on 9/12/94)

Flow direction: predominantly north, with northeast and northwest

variations

Most sensitive current use: commercial/industrial

Are drinking water wells affected? NO Aquifer name: San Leandro Cone

Is surface water affected? NO Nearest affected SW name: N/A

Off-site beneficial use impacts (addresses/locations): N/A

Report(s) on file? YES Where is report(s) filed? Alameda County

1131 Harbor Bay Pkwy

Alameda, CA 94502

Treatment and Disposal of Affected Material:

<u>Material</u>	Amount (include units)	Action (Treatment or Disposal w/destination)	<u>Date</u>
Tank & Piping	1 x 7500-gallon, 1 and 1 x 260-gallon	x 5000-gallon H & H Environmental Services S. San Francisco, CA	12/27/91
Free Product Soil	162 cubic yards	disposed/BFI-Vasco Landfill Livermore, CA	11/17/92
	330 cubic yards 2 cubic yards	aerated/reused on site disposed/Forward Landfill Stockton, CA	6/95 6/7/93

Groundwater

Maximum Documented Contaminant Concentrations - - Before and After Cleanup
Contaminant Soil (npm) Water (nph)

Soil	(ppm)	Water (pp	(d.
<u>Before¹</u>	After ²	Before ³	After ⁴
5,300	<1.0	29,000	140
<1	NA	ND	NA
2.2	<0.005	883	<0.5
250	<0.005	1300	0.62
68	<0.005	520	8.7
430	<0.005	3900	16
<50	NA	ND	NA
	5,300 <1 2.2 250 68 430	Before After ² 5,300 <1.0 <1 NA 2.2 <0.005 250 <0.005 68 <0.005 430 <0.005	Before ¹ After ² Before ³ 5,300 <1.0

NA=Not analyzed

ND=Represents initial groundwater sample collected from well MW-4 on 6/21/88. Detection limits for TPHd and TOG were 50 ppb and 10,000 ppb, respectively.

Comments (Depth of Remediation, etc.):

On December 27, 1991, two (2) underground steel gasoline storage tanks (USTs) and an underground steel waste oil tank were removed from the site (See Plate 2).

¹"Before" results represent soil sample S-13-B9, collected at a depth of 13' below grade (bg), from soil boring B9 (western service island).

²"After" results represent analyses of sidewall samples collected at a depth of approximately fourteen (14) feet bg after over excavation of the western service island.

 $^{^3}$ "Before" results represent water samples collected from MW-1 [benzene(9/19/88), toluene(3/27/92) and ethyl benzene(3/26/93)] and MW-5 (TPHg and total xylenes sampled 3/26/93).

⁴"After" results represent groundwater samples collected on 4/11/96 from wells MW-1 (TPHg and toluene) and MW-5 (ethyl benzene and xylenes). Benzene was non-detectable in the four wells sampled (MW-1, MW-2, MW-4 and MW-5).

⁵The metals cadmium, chromium, nickel, lead and zinc were detected in soil sample WO1, at concentrations of 1.2, 51, 62, 7.0 and 56 ppm, respectively, collected at a depth of approximately six (6) feet bg from the waste oil excavation.

Neither of the fuel tanks appeared to contain holes or cracks. The waste oil UST was punctured during excavation activities. A slight brown discoloration of soil was noticed in the east wall of the waste oil tank excavation at a depth of approximately 3 feet. Green soil discoloration was noted on several sides and a portion of the bottom of the fuel tank excavation after the removal of backfill and soil.

Soil samples were collected from the two tank excavations approximately two (2) feet below the bottom end of each fuel tank. An additional soil was collected from the waste oil pit on January 24, 1992, and analyzed to contain non-detectable concentrations of PCBs.

Soil samples were collected from the product line trenches on January 3, 1992, and resampled again on February 10, 1992, since the San Leandro Fire Department personnel had not witnessed the January 3, 1992 soil samplings.

TPHg and BTEX were detected in three (3) of the ten (10) samples from the tank and product line excavations. Maximum concentrations of TPHg, benzene, toluene, total xylenes and lead were detected in soil sample S-4-D3, at 3.3 ppm, 0.095 ppm, 0.18 ppm, 0.38 ppm, and 40 ppm, respectively, from the product pipe excavation. Maximum concentrations of ethyl benzene (0.023 ppm) were detected in soil sample TP5W, collected from the gasoline tank excavation (See Plate 3). The analytical results of soil samples collected from the tank and product line excavations are summarized in Table 1.

No detectable concentrations of TOG, TPHd, TPHg, and VOCs were found in the soil sample (WO1) collected from the waste oil excavation. No PCBs were detected in the soil sample (S-3-WO1) collected on 1/24/92, at the laboratory detection limit of 0.50 ppm.

Approximately 140 cubic yards of soil was excavated from around the gasoline tanks and the product lines, and approximately 16 cubic yards of soil was excavated from around the waste oil tank. The stockpiled soil (approximately 162 cubic yards) was aerated on site and disposed at BFI Vasco Road Landfill on November 17, 1992, by Dillard Trucking.

Two hydraulic auto hoist casings and the service bay clarifier were removed from the subject site on October 16, 1992. The removed casing and concrete appeared to be in good condition, with no visible holes or cracks. Samples from the clarifier and hoist excavations were collected on October 16, 1992.

The laboratory analytical results from the sample collected beneath the clarifier did not indicate detectable concentrations of TPHg, TOG, BTEX, VOCs, ethylene glycol, cadmium and lead. Chromium, nickel and zinc were detected in the soil sample collected from beneath the clarifier, at concentrations of 29 ppm, 34 ppm and 37 ppm, respectively. The analytical results from soil samples collected from beneath the auto hoists did not contain detectable levels of total oil and grease (TOG).

On March 11, 1993, a supplemental subsurface investigation was performed by RESNA which included the advancement of six (6) soil borings to depths ranging from 13.5 to 33 feet below ground surface (bgs), with boring B-5 being subsequently converted to groundwater monitoring well MW-5 (See Plate 4). This phase of the investigation was to further delineate the lateral and vertical extent and severity of the soil and groundwater contamination.

Laboratory analytical results of soil samples collected from borings MW-5, B-6, B-7 and B-10 were found to contain non-detectable concentrations of TPHg and BTEX. Elevated concentrations of TPHg and BTEX were detected in soil sample S-13-B9, collected at a depth of approximately 13 feet bgs beneath the western service island. Results of soil samples collected from the supplemental subsurface investigation are summarized in Table 3.

On September 27 and 28, 1994, Environmental Resolutions, Inc., excavated hydrocarbon-impacted soil detected near the former western dispenser island. The excavation proceeded vertically to approximately sixteen (16) feet below grade (slightly below the groundwater surface), where soil samples were collected from each sidewall at approximately 14 feet below grade (See Plate 5). Analytical results of soil samples collected from the limits of the western service island excavation were below detection limits and are summarized in Table 4.

Approximately 330 cubic yards of soil were excavated and stockpiled at the site. Aeration of the stockpiled soil began on October 13, 1994. Sampling of the stockpiled soil occurred on May 31, 1995, with one discrete soil sample being collected for approximately every twenty (20) cubic yards of soil. Results of laboratory analyses of stockpiled soil samples detected maximum TPHg and BTEX concentrations of 1.1 ppm, 0.019 ppm, 0.038 ppm, 0.017 ppm and 0.10 ppm, respectively. Based on the results of laboratory analyses and with the authorization of Alameda County Health Care Services Agency, the excavation was backfilled with the aerated soil.

IV. CLOSURE

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

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

Does corrective action protect public health for current land use? YES Site management requirements: None

Should corrective action be reviewed if land use changes? YES

Monitoring wells Decommissioned: No, pending closure

Number Decommissioned: None Number Retained: five (5)

List enforcement actions taken: None List enforcement actions rescinded: N/A

v. LOCAL AGENCY REPRESENTATIVE DATA

Name: Dale Klettke

Title: Hazardous Materials Specialist

Signature: Dall KUM Date: 1/11/96

Reviewed by

Name: eva chu

Title: Hazardous Materials Specialist

Signature: (157)

Date: 7/10/91-

Name: Thomas Peacock

Signature: Date: 7-//-96

Title: LOP Manager

RWQCB NOTIFICATION

Date Submitted to RB:

RB Response: AWRCE

RWQCB Staff Name: Kevin Graves

Signature:

Date:

VII. ADDITIONAL COMMENTS, DATA, ETC.

When Unocal planned to remove the service station from its retail marketing system in June 1988, a subsurface investigation was conducted. soil boirngs, three around the gasoline USTs and one near the waste oil UST, were drilled and later converted to groundwater monitoring wells MW-1 to MW-4. The soil encountered consisted predominantly of medium-grained sand, sandy gravel, and gravel. Of the four (4) monitoring wells installed, the highest concentrations of petroleum hydrocarbons were detected in MW-1, closest to and down gradient of the service islands. USTs were not removed until December 1991.

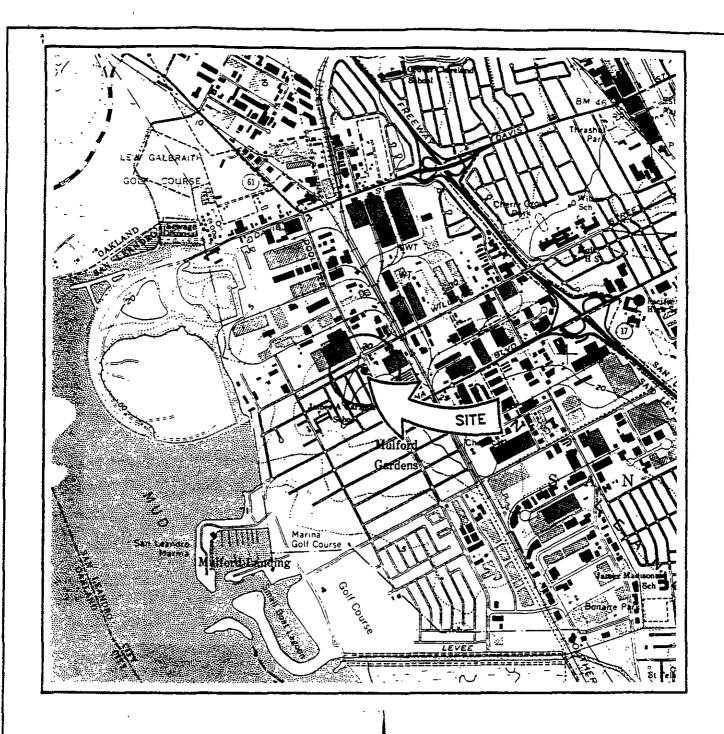
On March 11, 1993, a supplemental subsurface investigation was performed by RESNA, which consisted of the advancement of six (6) soil borings, of which one boring was converted to groundwater monitoring well MW-5.

Laboratory results of historical groundwater analyses from the five (5) onsite monitoring wells are summarized in Table 5.

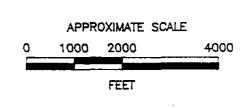
The subject site has conducted twenty-three (23) groundwater samplings for well MW-1 and nine (9) groundwater samplings for well MW-5. Low levels of petroleum hydrocarbons have been consistently been detected in wells MW-1 and MW-5, however, contaminant levels which have been detected since 12/14/93 (MW-1) and 9/12/94 (MW-5) have been at or below the maximum contaminant levels (MCLs) for primary drinking water standards (See Table 5).

Case closure is warranted for this site as a "Low-Risk Groundwater Case" for the following reasons.

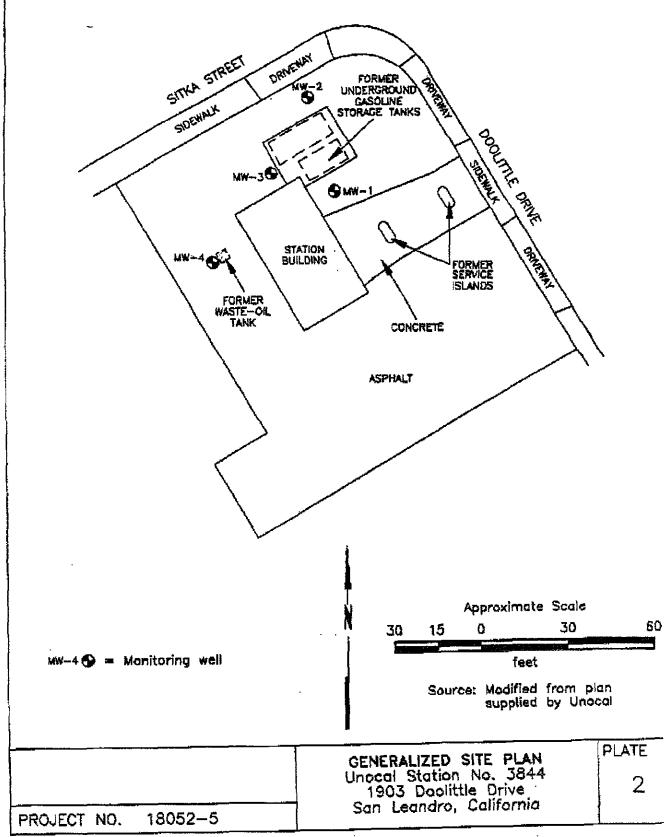
- The source has been sufficiently removed or has been remediated. a)
- The site has been adequately characterized. b)
- c) The dissolved hydrocarbon plume appears to be stable and is not migrating.
- No water walls, deeper drinking water wells, surface water or other d) sensitive receptors are likely to be impacted.
- e) The site presents no significant risk to human health or the environment.



SOURCE: U.S. GEOLOGICAL SURVEY 7.5-MINUTE QUADRANGLE SAN LEANDRO, CALIFORNIA PHOTOREVISED 1980



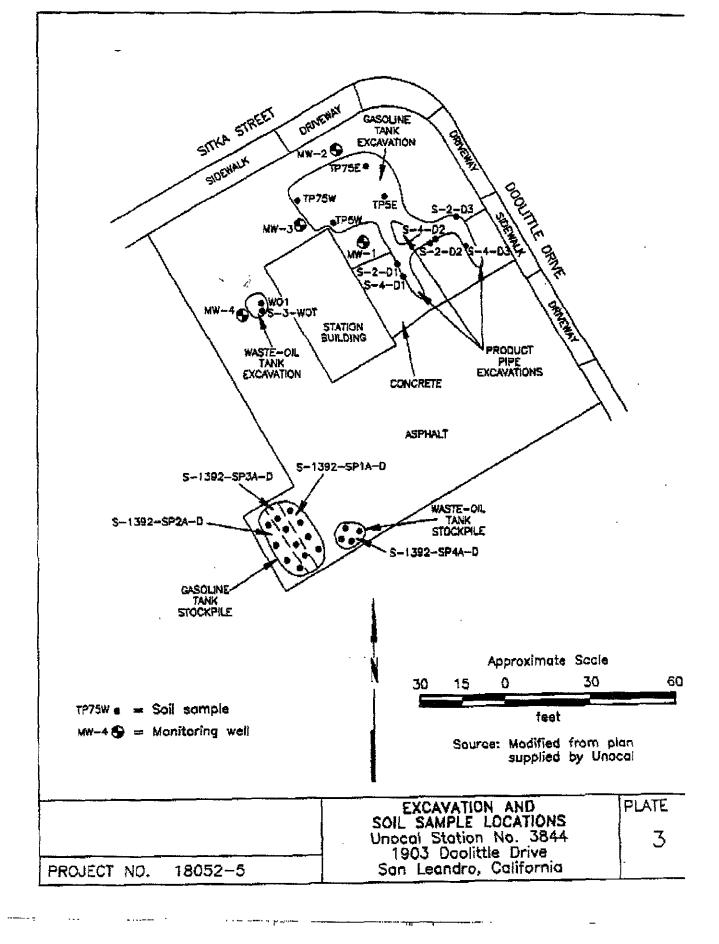
	SITE LOCATION MAP	PLATE
RESHA	UNOCAL STATION NO. 3844	
	1903 DOOLITTLE DRIVE	1
PROJECT NO. 18052.6B	SAN LEANDRO, CALIFORNIA	

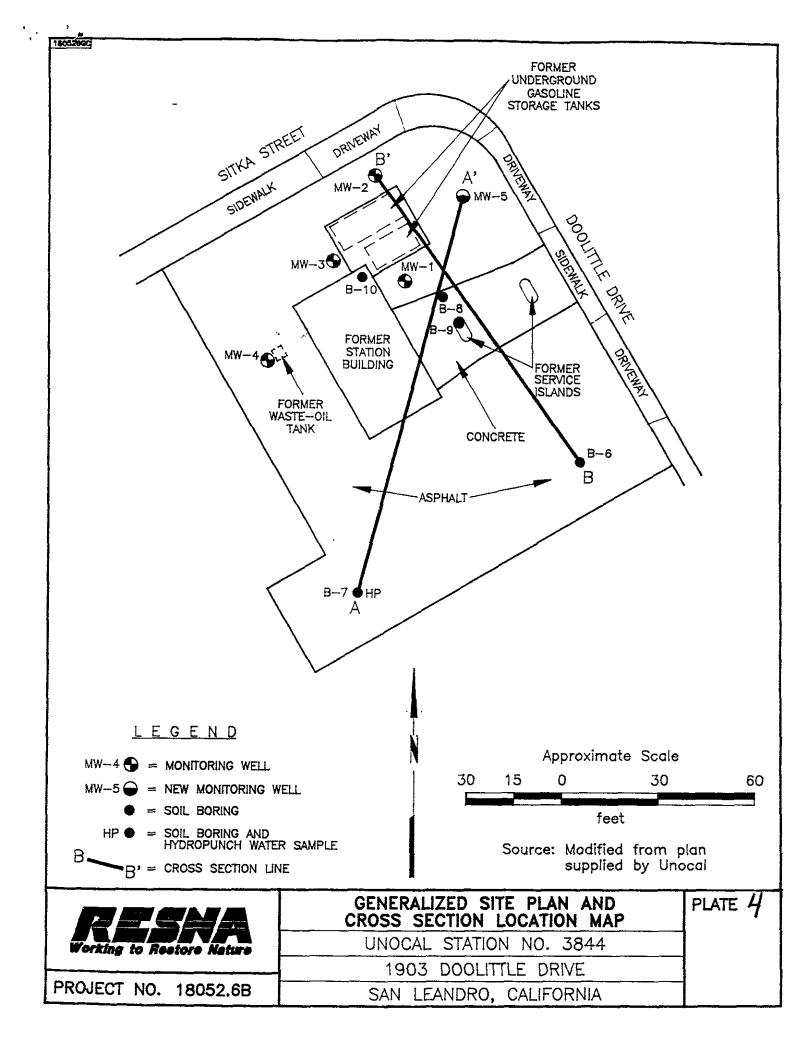


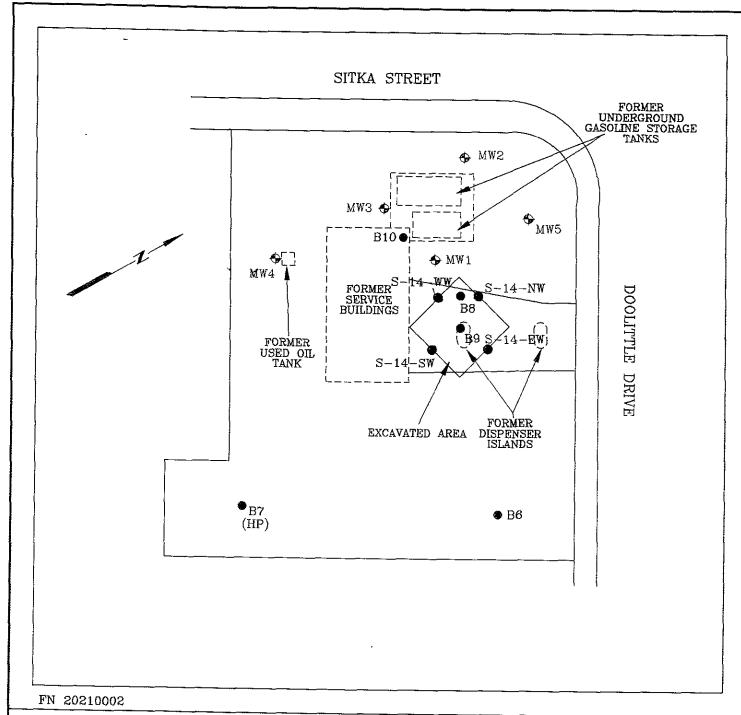
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EXPLANATION

♦ MW5 Groundwater Monitoring Well

B8 Soil Boring

B7 Soil Boring and Hydropunch
 (HP) Water Sample

● S-14-WW Soil Sample

APPROXIMATE SCALE



SOURCE: Modified from a map provided by Unocal



GENERALIZED SITE PLAN

Former Unocal Station 3844 1903 Doolittle Drive San Leandro, California PROJECT NO.

2021

PLATE

DATE: 7/18/95

			ANU	LYTICAL RE	TABLE 1 SULTS (EXCA	VATION	SAMPLES)			
			Ges:	oline UST E	asivation s	nd Pipe	Trenches			
Bample No.	Depth (ft)	198 (pp)		lenzane (ppm)	Toluen (ppm)	•	Ethyl benzene (ppm)	Yotal Xylene (ppm)	Pb (ppn)	PCB:
TPSU PSE	14 14	2. 41.	ō ·	40.005 40.005	0.039 0.010		0.023 40.005	0.16 0.022	40 10	
TP75U TP75E \$-2-D1	14 14 3	41. 41.	0	<0.005 <0.005 <0.009	<0.005 <0.005 <0.005		40.005 40.005 40.003	<0.005 <0.005 <0.005	7.£ 8.7	
5-2-D2 5-2-D3 5-4-D1	3	ধ. ধ.	.0	<0.005 <0.005 <0.005	<0.005 <0.005 <0.005		40.005 40.005 40.005	<0.005 <0.005 <0.005	<50	-
6-4-02 6-4-03	4	41	0 ;	0.095	<0.005 0.18		40.005 40.005	<0.005 0.38	6.t	
	- N. S			Vasto	OIL UST Ex	esvetia	0			
Sampl No.		Depth (12)	TFHd (pps)	TOG (ppm)	(ppm)	Cd (ppm)	Cr (ppm)	Hi Chedd)	Pb (ppm)	Zn (pps)
Wo1		6	<10	<50	-Ø.005	1.2	51	62	7.0	56
šampie No.	Dept (ft)		TPHg (pipin)	(ppm)	Telue (ppm		Ethyl benzene (ppm)	Xyl	tal ene pa}	PCHs (ppm)
401 2-3-401	6 3		41.0	<0.005	<0.0	5	<0.005		005	<0.05

TABLE 2 ANALYTICAL RESULTS (STOCKPILE SAMPLES)

Gasoline UST Stockpile

Sample No.	TPHg (ppm)	Benzene (ppm)	Toluene (ppm)	Ethlybenzene (ppm)	Total Xylene (ppm)
S-1392-SP1A-D	61 ¿	< 0.005	< 0.005	< 0,005	0.84
S-1392-SP2A-D	41 ~	< 0.005	0.011	< 0.005	0.48
S-1392-SP3A-D	380	< 0.005	< 0.005	< 0.005	20

	Sample No.	Reactivity	Corrosivity	Ignitability	
•	S1201069	NO	7,5	111 F	

Waste Oil UST Stockpile

Sample	TOG	VOCs	Cd	Cr	Ni	Pb	Zn	
No.	(ppm)	(ppm)	(ppm)	(ppm)	(ppm)	(ppm)	(ppm)	
S-1392-SP4A-	D 180	< 0.005	1,4	38	35	11	170	



Supplemental Subsurface Investigation Unocal Station No. 3844, San Leandro, California

August 3, 1993 18052.6B

TABLE SUMMARY OF SOIL SAMPLING AND ANALYTICAL DATA

Former Unocal Station No. 3844 San Leandro, California

Boring/ Well	Sample Type	Sample Number	Sample Date	ТРНд	В	Т	Е	x	ТРНа	Pb
MW-5	Soil	S-4-MW5	03/11/93	< 1.0	< 0.005	< 0.005	< 0.005	< 0.005	NA	NA
	Soil	S-9-MW5	03/11/93	< 1.0	< 0.005	< 0.005	< 0.005	< 0.005	NA	NA
	Soil	S-11.5-MW5	03/11/93	< 1.0	< 0.005	< 0.005	< 0.005	< 0.005	NA	NA
В6	Soil	S-12.5-B6	03/11/93	< 1.0	< 0.005	< 0.005	< 0.005	< 0.005	NA.	NA
B7	Soil	S-12.5-B7	03/11/93	<1.0	< 0.005	< 0.005	< 0.005	< 0.005	NA	NA
B8	Soil	S-9-B8	03/11/93	< 1.0	< 0.005	< 0.005	< 0.005	< 0.005	NA	NA
	Soil	S-13-B8	03/11/93	5.0**	0.015	0.21	0.049	0.42	<1.0**	NA
В9	Soil	S-4-B9	03/11/93	50	< 0.005	0.077	0.041	2.9	NA	NA
	Soil	S-9-B9	03/11/93	2.4	< 0.005	0.037	0.012	0.13	NA	NA
	Soil	S-13-B9	03/11/93	5,300	2.2	250	68	430	<1.0**	NA
B10	Soil	S-13-B10	03/11/93	< 1.0	< 0.005	< 0.005	< 0.005	< 0.005	NA	NA
Cuttings	Soil	S-Comp	03/11/93	220	< 0.005	0.069	0.64	5.9	NA	0.10

Results shown in parts per million (ppm).

B = Benzene, T = Toluene, E = Ethylbenzene, X = total Xylenes (following EPA Method 8020/602).

TPHg = Total petroleum hydrocarbons as gasoline (following EPA Method 8015 Modified).

TPHd = Total petroleum hydrocarbons as diesel (following EPA Method 8015 Modified).

Pb = STLC Lead following WET Extraction Method.

NA = Not analyzed.

* = Chromatogram contains a discrete peak that eludes before benzene

** = Chromatogram indicates gasoline.

Sample designation:

S - 13.5 - MW-5

Boring/Well Number

Sample Depth in Feet (comp=composite)

Sample Matrix (S=Soil)

TABLE 7 RESULTS OF ANALYSES OF SOIL SAMPLES FROM EXCAVATION

Former Unocal Station 3844 1903 Doolittle Drive San Leandro, California

Sample Designation	ТРНд		В	T	E	x
Dispenser Island Excavations		-				···
S-14-NW	<1.0	< 0.0050	< 0.0050	< 0.0050	< 0.0050	
S-14-SW	<1.0	< 0.0050	< 0.0050	< 0.0050	< 0.0050	
S-14-EW	<1.0	< 0.0050	< 0.0050	< 0.0050	< 0.0050	
S-14-WW	<1.0	< 0.0050	< 0.0050	< 0.0050	< 0.0050	

All results in parts per million (ppm)

TPHg = Total petroleum hydrocarbons as gasoline using EPA Method 8015 (modified)

Less than the analytical detection limits used by laboratory

BTEX = Benzene, Toluene, Ethylbenzene, total xylene isomers using EPA Method 8020.

Table 5
Summary of Laboratory Analyses
Water

		TPH as			Ethyl-		
Well#	Date	Gasolme	Benzene	Toluene	Benzene	Xylenes	MTBE
M (1)7 1	6/15/00	1.000		- · -			
MW-1	6/15/88	1,600	600	315	61	138	
	9/19/88	8,200	883	185	239	265	
	1/5/89	7,250	270	366	143	226	
	4/10/89	360	15	44	17	33	
	7/13/89	7,500	190	930	85	480	
	10/25/89	7,300	110	370	57	300	
	1/18/90	4,60Q	98	210	72	530	
	4/27/90	850	9.3	53	7.4	65	
	8/15/90	720	7.1	20	8.4	35	
	11/16/90	1,700	11	22	6.5	28	
	2/25/91	310	27	39	12	53	
	9/11/91	1,500	21	45	48	220	~ -
	3/27/92	18,000	95	1,300	310	1,900	
	9/25/92	ND*	ND	ND	1.1	4.8	
	3/26/93	22,000	9.3	790	520	3,000	
	6/24/93	3,000	ND	260	150	530	
	9/1/93	550	ND	ND	46	130	
	12/14/93	ND	ND	ND	ND	ND	
	3/17/94	ND	ND	ND	ND	ND	
	6/14/94	ND	0.52	1.2	ND	2.1	
	9/12/94	ND	ND	1.1	ND	3.6	
	1/3/96	ND	ND	1.4	0.79	4.9	
	4/11/96	92	ND	ND	8.7	16	ND
MW-2	6/15/88	580	5.0	7.1	1.6	5.2	
	9/19/88	80	ND	ND	ND	ND	
	1/5/89	70	ND	ND	ND	ND	~-
	4/10/89	ND	ND	ND	ND	ND	
	7/13/89	56	ND	ND	ND	ND	2-
	10/25/89	ND	ND	ND	ND	ND	
	1/18/90	37	0.88	2.1	0.59	3.7	
	4/27/90	ND	ND	ND	ND	ND	
	8/15/90	ND	ND	ND	ND	ND	
	11/16/90	ND	ND	ND	ND	ND	
	2/25/91	ND	ND	ND	ND	ND	
	9/11/91	ND	ND	ND	ND	ND	
	3/27/92	ND	ND	ND	ND	ND	- -
	9/25/92	ND	ND	ND	ND	ND	
	3/26/93	NOT SAMPLED		2.2	1413	747	
	6/24/93	ND	ND	ND	ND	ND	
	9/1/93	NOT SAMPLED	~ +345	232	1410	ND -	
	12/14/93	ND	ND	ND	ND	ND	

Table 5
Summary of Laboratory Analyses
Water

3.07 Vinia 77.100						or Colores			
Well#	Date	TPH as Gasolme	Benzene	Toluene	Ethyl- Benzene	Xylenes	MTBE		
		стажина	DCH2CIE.	10000000	DCHACHE	Ayicaes	WILDE.		
MW-2	3/17/94	ND	ND	ND	ND	ND			
(Cont.)	6/14/94	SAMPLED SEMI	-ANNU	ALLY					
	9/12/94	ND	0.62	2.1	ND	2.8			
	1/3/96	ND	ND	1.1	ND	3.1			
	4/11/96	ND	ND	ND	ND	ND	ND		
MW-3	6/15/88	30	3.2	ND	ND	ND			
	9/18/88	40 Č	ND	ND	ND	ND			
	1/5/89	ND	ND	ND	ND	ND			
	4/10/89	ND	ND	ND	ND	ND			
	7/13/89	ND	ND	ND	ND	ND			
	10/25/89	ND	ND	ND	ND	ND			
	1/18/90	ND	ND	ND	ND	ND			
	4/27/90	ND	ND	ND	ND	ND			
	8/15/90	ND	ND	ND	ND	ND			
	11/16/90	ND	ND	ND	ND	ND			
	2/25/91	ND	ND	ND	ND	ND			
	9/11/91	ND	ND	ND	ND	ND			
	3/27/92	ND	ND	ND	ND	ND			
	9/25/92	ND	ND	ND	ND	ND			
	3/26/93	NOT SAMPLED							
	6/24/93	ND	ND	ND	ND	ND			
	9/1/93	NOT SAMPLED							
	12/14/93	ND	ND	ND	ND	ND			
	3/17/94	ND	ND	ND	ND	ND			
	6/14/94	SAMPLED SEMI-ANNUALLY							
	9/12/94	ND	ND	ND	ND	ND			
	1/3/96	ND	ND	ND	ND	ND			
	4/11/96	NOT SAMPLED		- •					
MW-4	6/21/88	NOT SAMPLED							
	9/19/88	NOT SAMPLED							
	1/5/89	NOT SAMPLED							
	4/10/89	NOT SAMPLED							
	7/27/89	NOT SAMPLED							
	10/25/89	NOT SAMPLED							
	1/18/90	NOT SAMPLED							
	4/27/90	ND	ND	ND	ND	ND			
	8/15/90	ND	ND	ND	ND	ND			
	11/16/90	ND	ND	ND	ND	ND	. 		
	2/25/91	ND	ND	ND	ND	ND			
	9/11/91	ND	ND	ND	ND	ND			

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Table 5
Summary of Laboratory Analyses
Water

		TPHas			Ethyl-		
Well#	Date	Gasoline	Benzene	Toluene	Benzene	Xylenes	MTBE
MW-4	3/27/92	ND	ND	ND	ND	ND	***
(Cont.)	9/25/92	ND	ND	ND	ND	ND	
	3/26/93	NOT SAMPLI	ED				
	6/24/93	ND	ND	ND	ND	ND	
	9/1/93	NOT SAMPLI	ED				
	12/14/93†	ND	ND	ND	ND	ND	
	3/17/94†	ND Â	ND	ND	ND	ND	
	6/14/94	SAMPLED SE	EMI-ANNUAI	LLY			
	9/12/94†	ND	ND	0.75	ND	0.77	
	1/3/96	ND	ND	ND	ND	1	
	4/11/96†	ND	ND	ND	ND	ND	ND
MW-5	3/26/93	29,000	44	1,100	460	3,900	
	6/24/93	4,400	ND	210	160	570	
	9/1/93	2,700	ND	<i>7</i> 9	84	520	
	12/14/93	1,400	5.1	67	63	370	
	3/17/94	ND	ND	ND	ND	ND	
	6/14/94	1,600	2.9	65	64	380	
	9/12/94	430	1.3	12	22	110	
	1/3/96	540	ND	0.86	17	87	
	4/11/96	140	ND	0.62	1.4	13	ND

^{*} Chromatogram also contains a discrete early-eluting peak.

ND = Non-detectable.

Results are in micrograms per liter (µg/L), unless otherwise indicated.

Note:

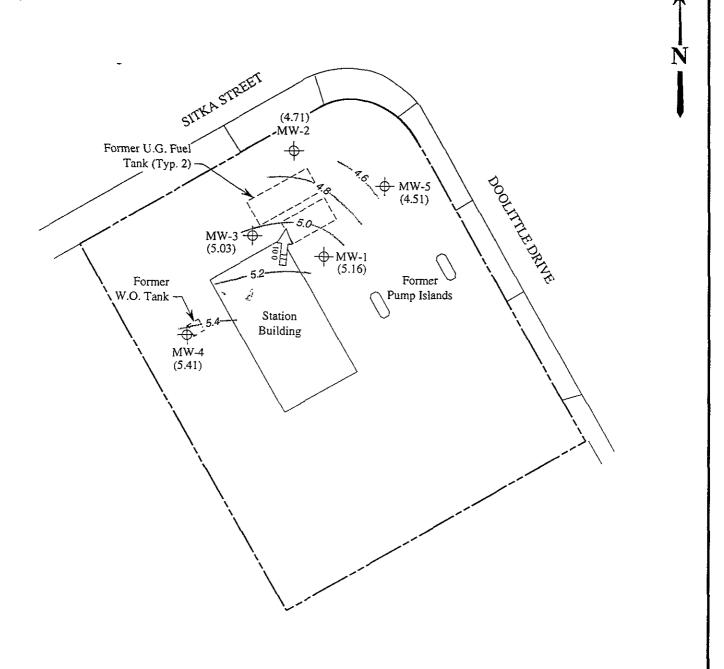
The detection limit for results reported as ND by Sequoia Analytical Laboratory is equal to the stated detection limit times the dilution factor indicated on the laboratory analytical sheets.

Prior to August 1, 1995, the total purgeable petroleum hydrocarbon (TPH as gasoline) quantification range used by Sequoia Analytical Laboratory was C4 - C12. Since August 1, 1995, the quantification range used by Sequoia Analytical Laboratory is C6 - C12.

Laboratory analyses data prior to December 14, 1993, were provided by RESNA.

^{**} Laboratory ran duplicate analysis on sample and received similar results.

[†] Total Oil and Grease (TOG) was non-detectable.



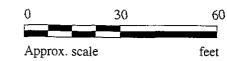
LEGEND

Monitoring well

() Ground water elevation in feet above Mean Sea Level

Direction of ground water flow with approximate hydraulic gradient

Contours of ground water elevation



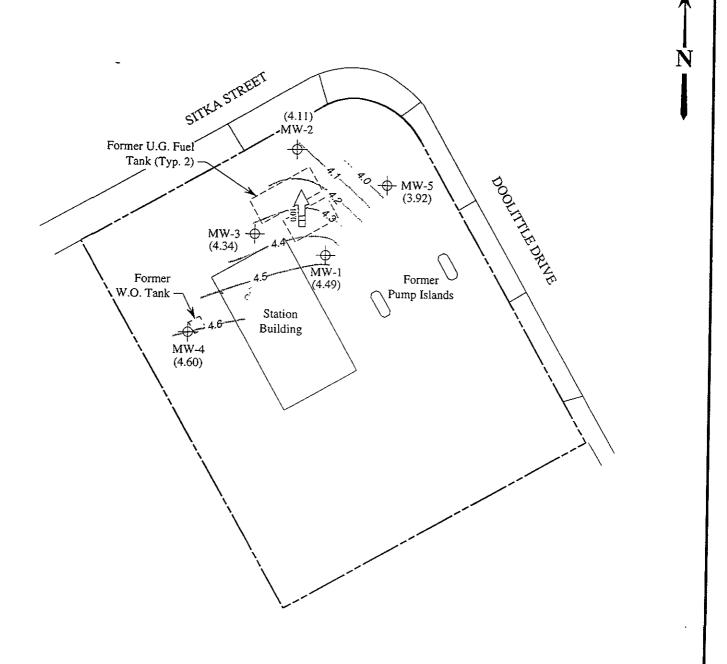
POTENTIOMETRIC SURFACE MAP FOR THE APRIL 11, 1996 MONITORING EVENT

SERVICES, INCORPORATED

FORMER UNOCAL S/S #3844 1903 DOOLITTLE DRIVE SAN LEANDRO, CALIFORNIA

FIGURE

1



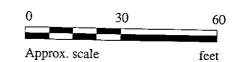
LEGEND

Monitoring well

() Ground water elevation in feet above Mean Sea Level

> Direction of ground water flow with approximate hydraulic gradient

Contours of ground water elevation



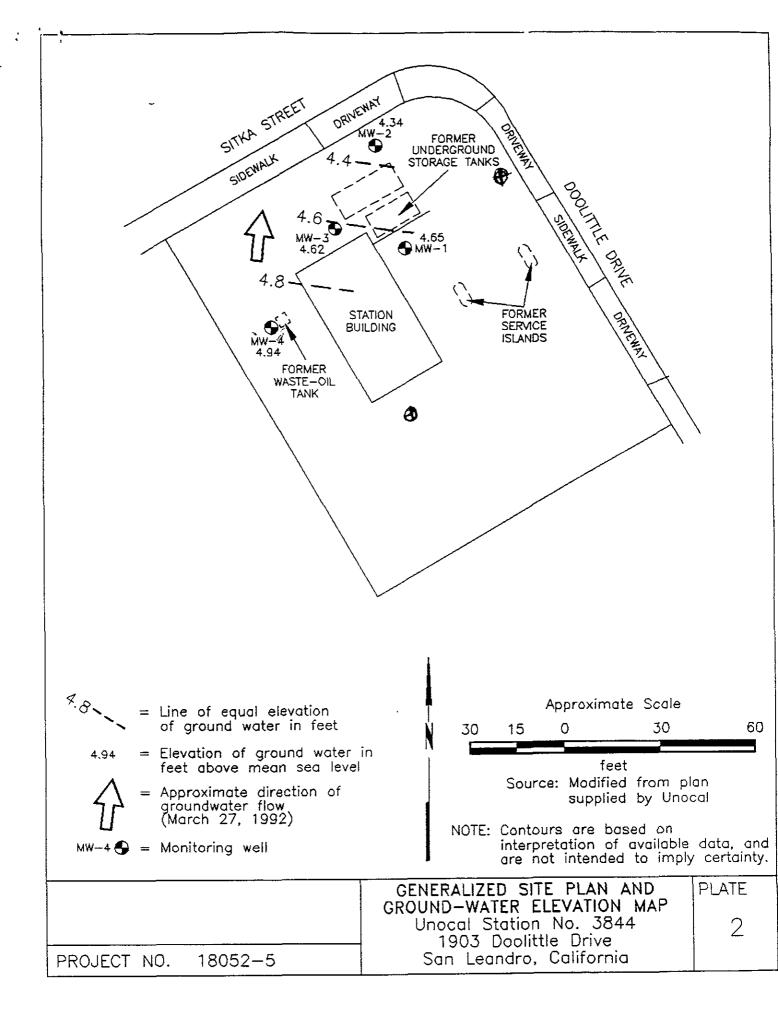
POTENTIOMETRIC SURFACE MAP FOR THE JANUARY 3, 1996 MONITORING EVENT

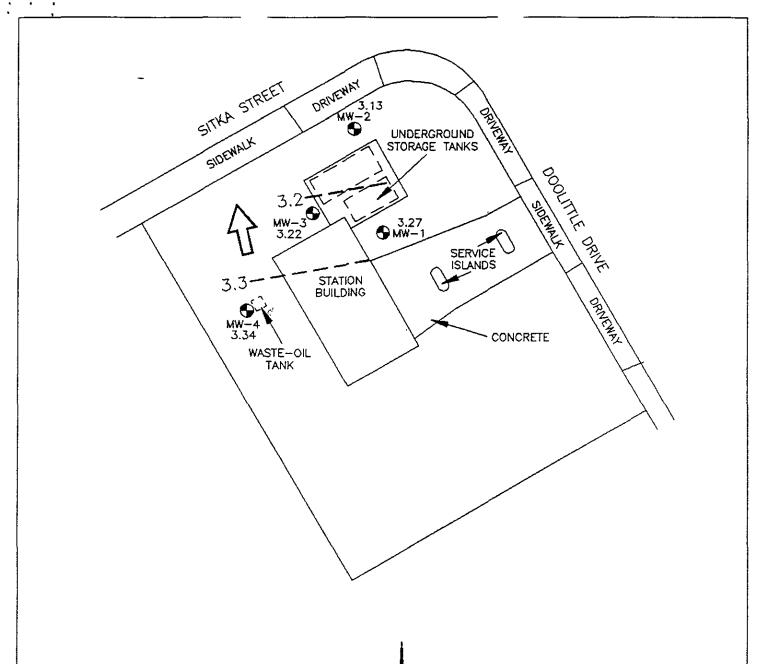


FORMER UNOCAL S/S #3844 1903 DOOLITTLE DRIVE SAN LEANDRO, CALIFORNIA

FIGURE

1





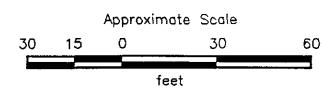
= Line of equal elevation of ground water in feet

3.34

= Elevation of ground water in feet above mean sea level

= Approximate direction of groundwater flow (September 11, 1991)

MW-4 = Monitoring well (Applied ĞeoSystems, May 1988)



Source: Modified from plan supplied by Unocal

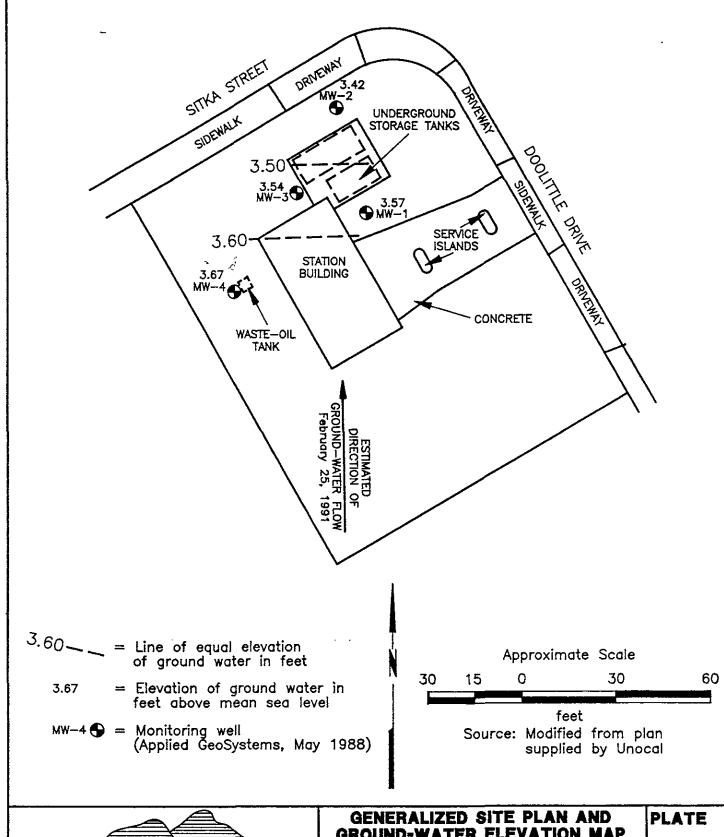
NOTE: Contours are based on interpretation of available data, and are not intended to imply certainty.

PROJECT NO. 18052 - 4

GENERALIZED SITE PLAN AND GROUND-WATER ELEVATION MAP Unocal Station No. 3844 1903 Doolittle Drive San Leandro, California

PLATE

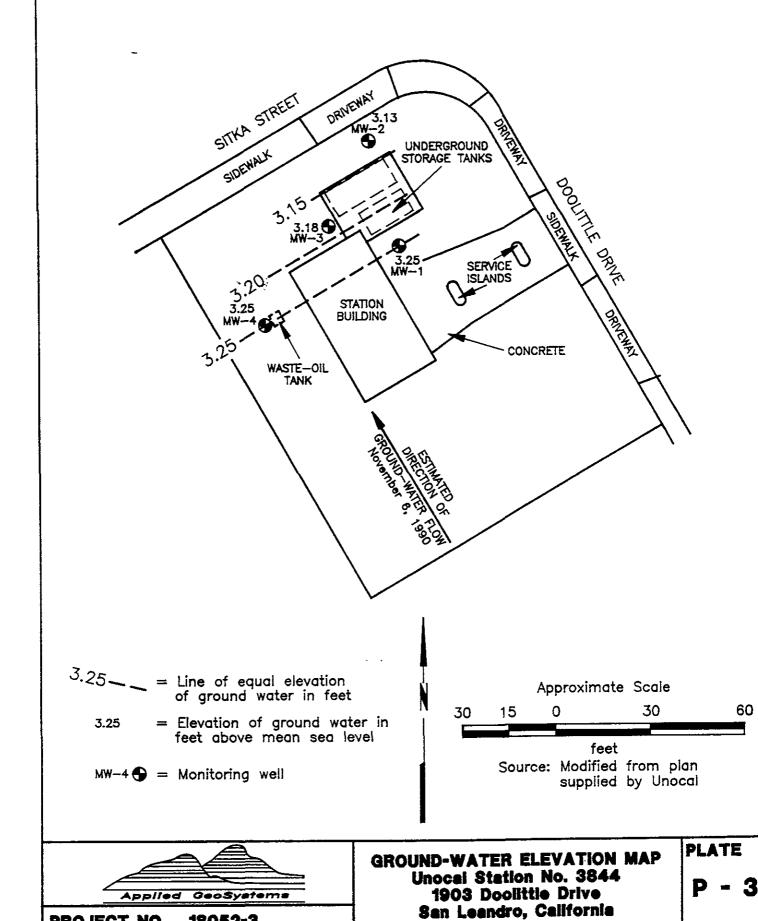
2



PROJECT NO. 18052-4

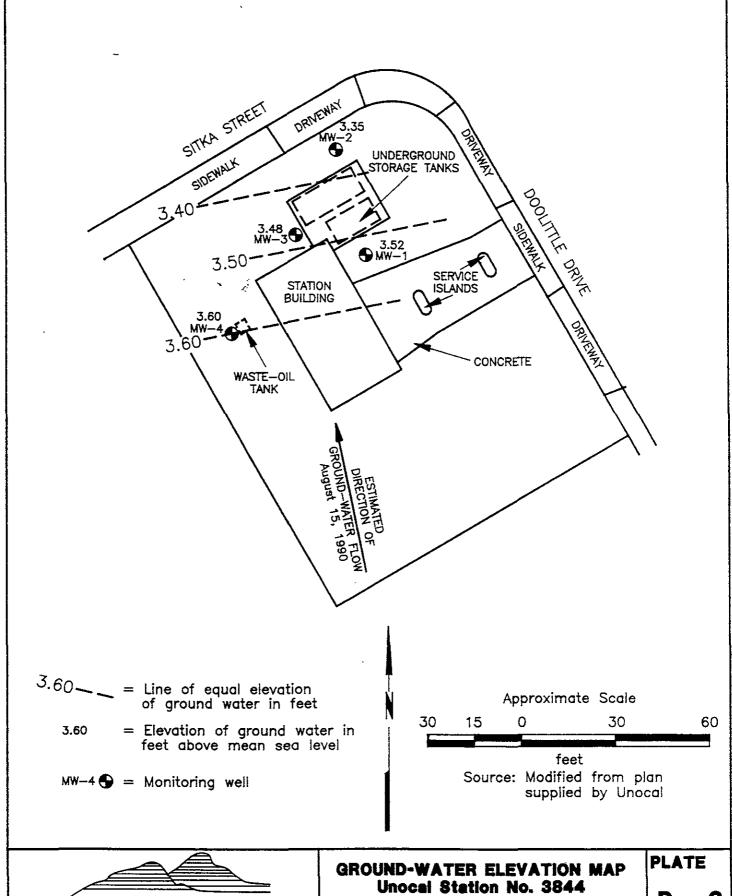
GENERALIZED SITE PLAN AND GROUND-WATER ELEVATION MAP Unocal Station No. 3844
1903 Doolittle Drive San Leandro, California

LATE



PROJECT NO.

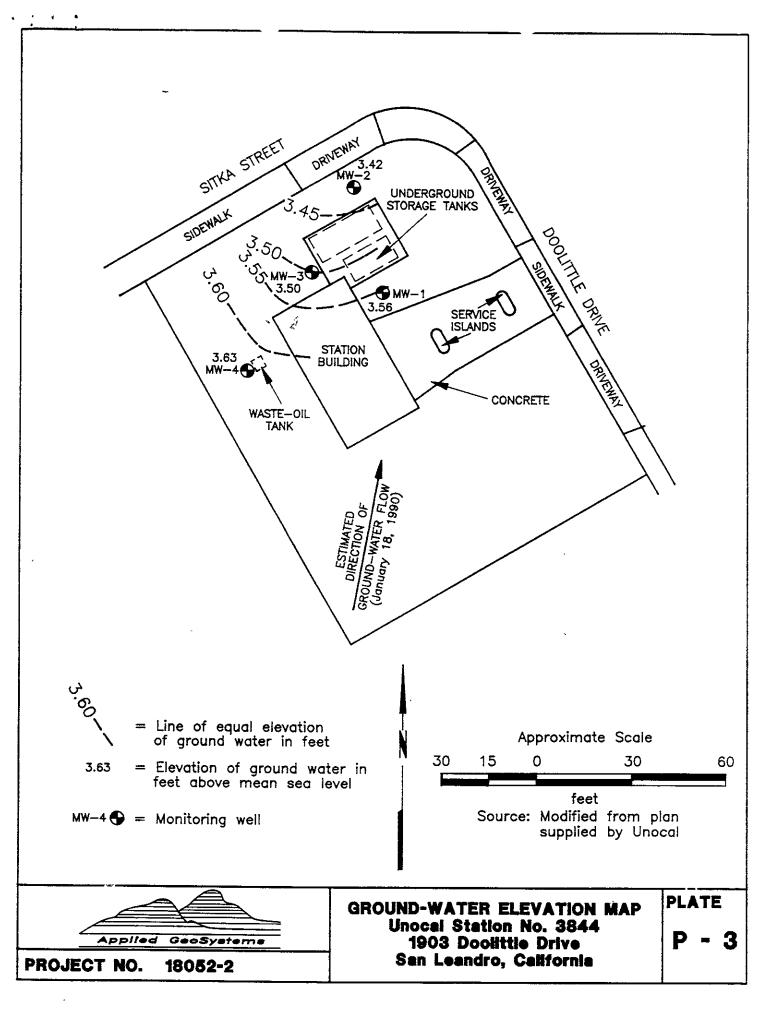
18052-3

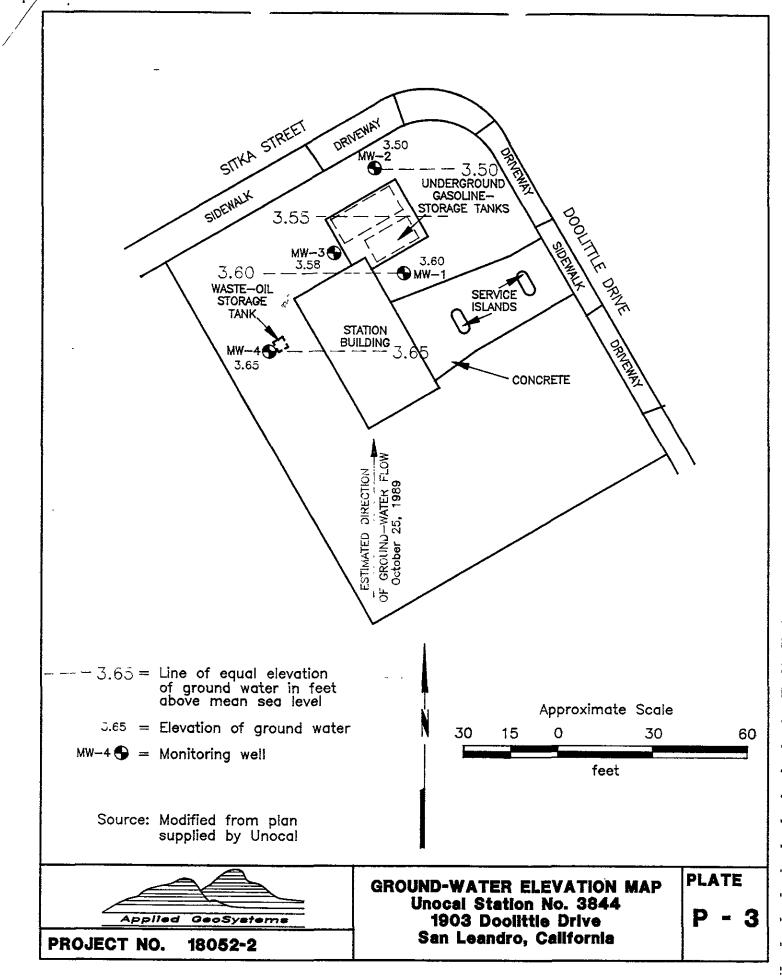


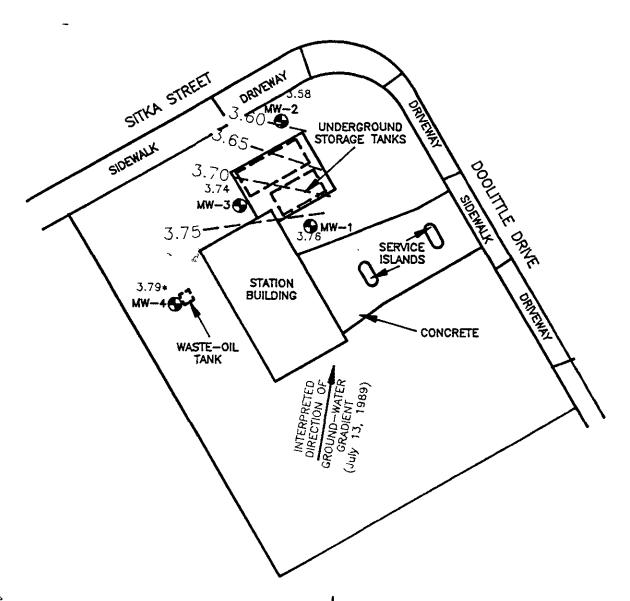
GeoSystems PROJECT NO. 18052-3

1903 Doolittle Drive San Leandro, California

P - 3







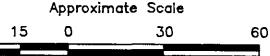
= Line of grou

= Line of equal elevation of ground water in feet

3.76 = Elevation of ground water in feet above mean sea level

3.79* = Measured on 7-27-89

MW-4 ■ Monitoring well



feet
Source: Modified from plan
supplied by Unocal

Elevations of well MW-1 - MW-3 surveyed by Ron Archer (July 13, 1989)



PROJECT NO. 18052-2

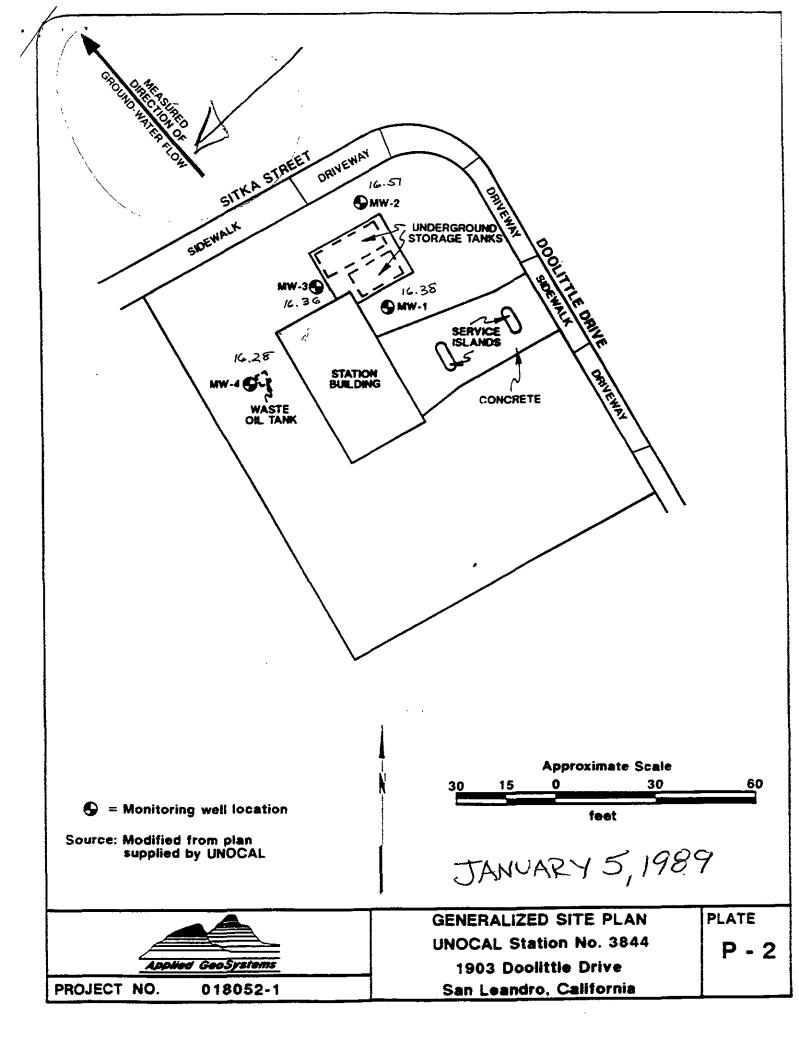
٦

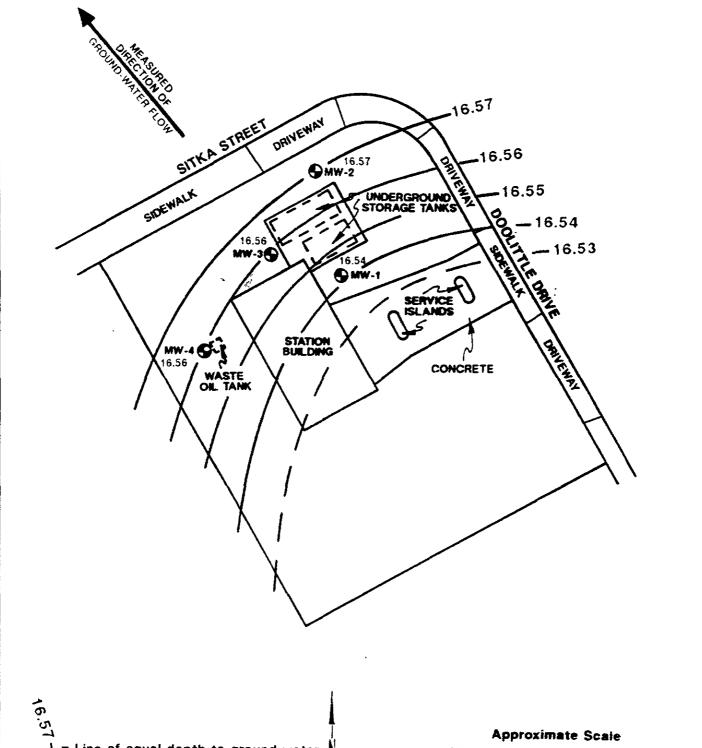
GROUND-WATER ELEVATION MAP Unocal Station No. 3844 1903 Doolittle Drive San Leandro, California

30

PLATE

P - 3



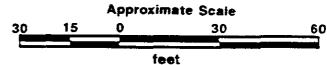


\(\frac{\sigma}{\rightarrow} = \text{Line of equal depth to ground water} \)

MW-4

■ Monitoring well location

Source: Modified from plan supplied by UNOCAL



SEPTEMBER 19,1988

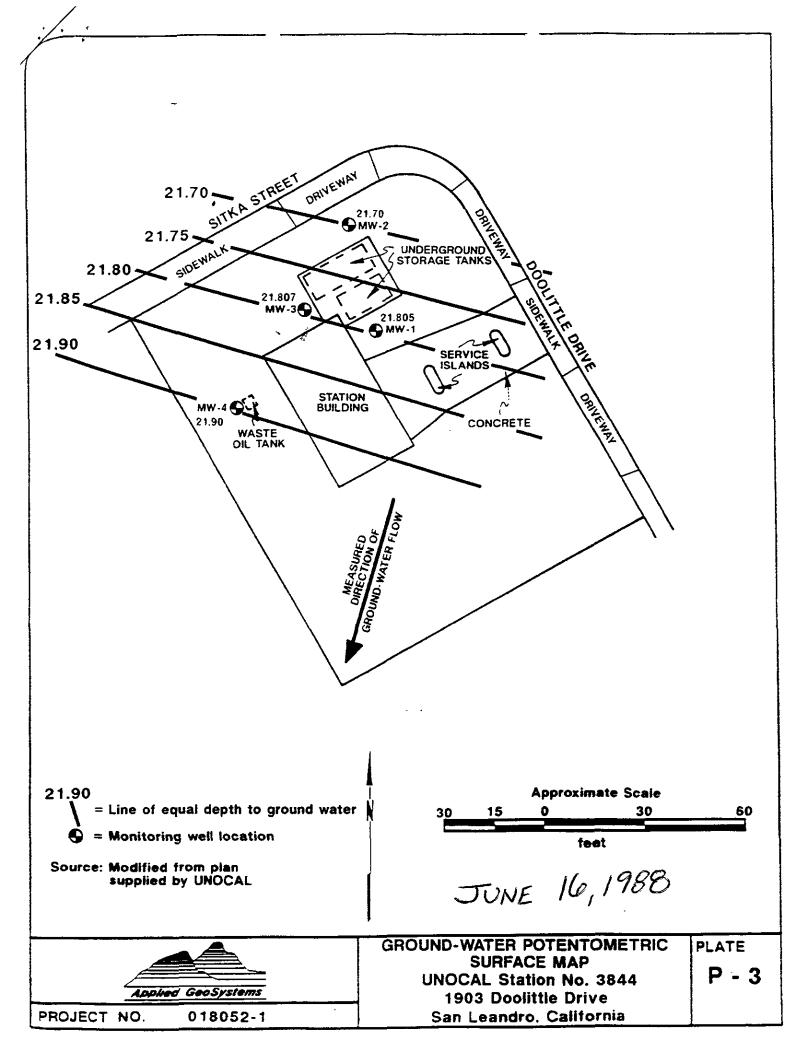


PROJECT NO. 018052-2

GROUND-WATER POTENTIOMETRIC SURFACE MAP UNOCAL Station No. 3844 1903 Doolittle Drive San Leandro, California

PLATE

P - 3



0 -	Blows/ Ft.	_Sampie No.	uscs	DESCRIPTION	WELI
				Asphalt (3 inches).	
2			SP	Sand, medium-grained, light brown, dry, medium dense.	
4	11	s-5		OVM = 2.7ppm.	
6 –					
8				· ki	
10 -	21	S-10		Some fine-grained gravel, slightly damp, OVM = 13.1ppm.	
12 –					
14 🗕	14	S-15		Damp, OVM = 372ppm.	 - 1
16			_		
18 🚽	7		<u>=</u>		
10 -	7	S-20	CL	Clay, dark brown, very moist, medium to high plasticity, stiff, OVM = 2.3ppm.	
2					
4		S-25		No sample recovered.	
6 -					
8 -					
				(Section continues downward	



LOG OF BORING B-1/MW-1

UNOCAL Station No. 3844 1903 Doolittle Drive

P - 5

PLATE

San Leandro. California

30 🗕	Blows/ Ft.	Sample No.	uscs	DESCRIPTION	WEL CONS
JU _	13	s-30	CL		
32 🗕					
34 🗕		-			
	15	s-35		Very stiff, OVM = 2.6ppm.	
36 🗕				Total Depth = 35½ feet.	
38 🗕					
+0				· ¿	
2 -					
.4 -					
.4					
6					
8			į		
0					
4	-				
				·	
1					
4					
1					·



LOG OF BORING B-1/MW-1

UNOCAL Station No. 3844

1903 Doollttle Drive

P - 6

PLATE

U .	Blows/ Ft.	Sample ~No.	uscs	DESCRIPTION	CONS
Ĭ				Asphalt (3 inches).	
2 –			ML	Silty sand, yellow-brown, fine-grained sand, damp, slight plasticity, medium dense.	
4 -	20	_{S-5}		OVM = 6.2ppm.	
6 –					
8 –					
10	15	s-10	GP	Sandy gravel, fine-grained, brown, damp, medium dense, OVM = 21.2ppm.	_
12					
14	32	S-15 I		Gravel, fine-grained, slightly sandy, gray-brown,	
16		S-16.5	_	very moist, dense, OVM = 2.1ppm. OVM = 19.3ppm.	
18			=		
20		S-20		Gravelly sand, some silt, brown-gray, wet, very loose.	
22					
24	75	s-25		Gravel, some fine-grained sand, gray-brown, wet,	
26		S-26.5		very loose, OVM = 7.2ppm. OVM = 22.2ppm.	
28 -					
30			CL	Silty clay, minor fine-grained gravel, dark gray- blue, wet, medium to high plasticity, hard.	



PROJECT NO.

LOG OF BORING B-2/MW-2

UNOCAL Station No.-3844
1903 Doolittle Drive

P - 7

PLATE

018052-1

San Leandro, California

	20	Blows/ Ft.	_Sample No.	uscs	DESCRIPTION	WELL CONST.
	30 -	45	S-30	CL	Silty clay, minor fine-grained gravel, dark gray- blue, wet, medium to high plasticity, hard, OVM = 9.1ppm.	
	34 _	40	S-35		OVM = 4.6ppm.	- 1 - 1
	36 🗕				Total Depth = 35½ feet.	
	38 –					
	40 -					
:I	-					
DEPTH IN FEET						
DEPTH	_					
	4					
	4					
	4					
	-					



LOG OF BORING B-2/MW-2

UNOCAL Station No. 3844
1903 Doolittle Drive
San Leandro. California

P - 8

PLATE

PROJECT NO.

018052-1

v 	Blows/ Ft.	_Sample No.	uscs	DESCRIPTION	WELL
<u> </u>				Asphalt (3 inches).	IT
2 -			SP	Sand, medium-grained, some fine-grained gravel, light brown, damp, loose.	
4 —	9	S-5		OVM = Oppm.	
6 –					
8 -			GP	Sandy fine-grained gravel, light brown, damp, medium	
10 –	25	S-10		OVM = Oppm.	
12 -					
14	19	s-15		With some clay, wet, OVM = Oppm.	
16			V		
18					
20	32	S-20			
24		s-25		OVM = Oppm.	
26			СН	Clay, gray, wet, high plasticity, medium stiff.	
28	6	s-29		OVM = Oppm.	
30					
	- 1			(Section continues downward)	上士



LOG OF BORING B-3/MW-3

UNOCAL Station No. 3844
1903 Doolittle Drive
San Leandro. California

P - 9

PLATE

PROJECT NO. 018052-1

• • •	Blows/ Ft.	_Sample No.	uscs	DESCRIPTION	WELL
0 _			СН	Clay, gray, wet, high plasticity, medium stiff.	
32 _	12	s-32			
4 _				Total Depth = 32½ feet. Boring terminated due to aquitard.	
, –				boring terminated due to additard.	
6 _					
-					
				· i	
-				· ·	
				-	
_					
٦					
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			-		
_					
7					
- 1	1		}		- {



LOG OF BORING B-3/MW-3

UNOCAL Station No. 3844 1903 Doolittle Drive

P - 10

PLATE

San Leandro. California

υ _	Blows/	Şample No.	uscs	DESCRIPTION	CON	LL IST
٦				Asphalt (3 inches).		7
2 -			GP	Sandy gravel, medium-grained sand, fine-grained gravel, light brown, damp, medium dense.		
÷ _	13	s-5 I				
6						1
8 _	\ <u>-</u>	 T		· A		
10	18	S-10		Some silt.	-	
12					-	1
14 -	40	S-15		Dense.		1
18						
20	55	S-20	₹	Wet, very dease.	-	+ + +
12 _						1 1 1
24	-		CL	Gravelly clay, gray, wet, medium plasticity, hard.		1
26 _	32	S-25				
28 🗕			CL.	Silty clay, gray, wet, medium plasticity, very stiff.		1
30 -		Ţ				
]		(Section continues downward)	-	4



LOG OF BORING B-4/MW-4

UNOCAL Station No. 3844
1903 Doolittle Drive
San Leandro California

P - 11

PLATE

PROJECT NO. 018052-1

30 _	Blows/ Ft.	Sample No.	uscs	DESCRIPTION	WELL CONST.
	27	S-30	CL	Silty clay, gray, wet, medium plasticity, very stiff.	
32 _	,				
34 _	20	S-35			
36 _				Total Depth = 35½ feet.	
38 _				· A	
40 _				7 4	
_					
- - - -					
מביות וא יהבי					
š -					
-					
-					
_					
_					
-					



LOG OF BORING B-4/MW-4

UNOCAL Station No. 3844 1903 Doolittle Drive

San Leandro. California

P - 12

PLATE

Total depth of boring: 33 feet

Diameter of boring: 8 inches

Date drilled: 3-11-93

Drilling Company: West Hazmat Drilling

Driller: Randy Wolfe

Drilling method: Hollow-Stem Auger

Field Geologist: Brian Worden

Casing diameter: 4 inches Casing material: Sch 40 PVC Slot size: 0.020-inch Sand size: No. 3 Sand Blank casing from 0 feet to 8 feet Perforated casing from 8 feet to 33 feet Annular seal from 0 feet 5 feet to Bentonite plug from 5 feet to 6 feet Sand pack from 6 feet 33 feet to

Depth	Sample No.	Blows	OVM	USCS Code	Description	Wei Cons
- 2 -		R		SW	Sand, well graded, light brown, medium dense, moist, 10% subrounded to angular gravel 1/2 to 1.5 inches in diameter.	V
- 4 -	S-4	8 9 7	4	` &		∇ ∇ ∇
- 6 -				sc/gc	Gravelly sand with clay, medium brown, moist. (20% fines, 40% sand and gravel.)	****
8 -	S-9	5 6 6	0.1	CL	Sandy clay with silt, medium brown, stiff, moist.	
· 10 -	, , , , , , , , , , , , , , , , , , ,	6	0.1	SM	Silty sand with gravel, medium brown, moist.	-
40	S-11.5	6	a	ML/CL	Silty clay/clayey silt, 10% fine-grained sand, gray with yellow-brown	
12 -	3=11.3	4 4	ď	<u></u>	mottling, stiff, moist.	
.	++-	5			Wet.	
16 -		3 4 4 7		<u>_</u>		
18						
20 -		3 4				
22 -	<u> </u>	5	İ	CL	Silty clay, medium gray with some black mottling, stiff, wet, low plasticity.	
24		_			Driller noted lithology change "stiffer material" at ~ 24'. With 10% fine-grained sand, dark brown, medium to high plasticity, wet.	
26		7 17 21 12 18]	L	Clay is moist but rootholes have free water and red oxidation.	
~]	用	12]		Clay with trace gravel, dark gray to black, dry to slightly moist.	
28 -	H	31			With sand and fine—grained gravel, medium gray. With fine—grained sand, white to very light gray, dry to wet. 5% dry hardened (Calcium Carbonate?) 1/4" nodules of clay.	
30 -				-		
32		7 9 15			Silty clay light gray with orange-brown and black mottling, stiff, slightly damp, to very moist. Soil in shoe feels very stiff and appears dry.	
34 -					Total Depth = 33 feet.	
36 -						
38 -						
40				- [

RESHA

PROJECT NO. 18052.6B

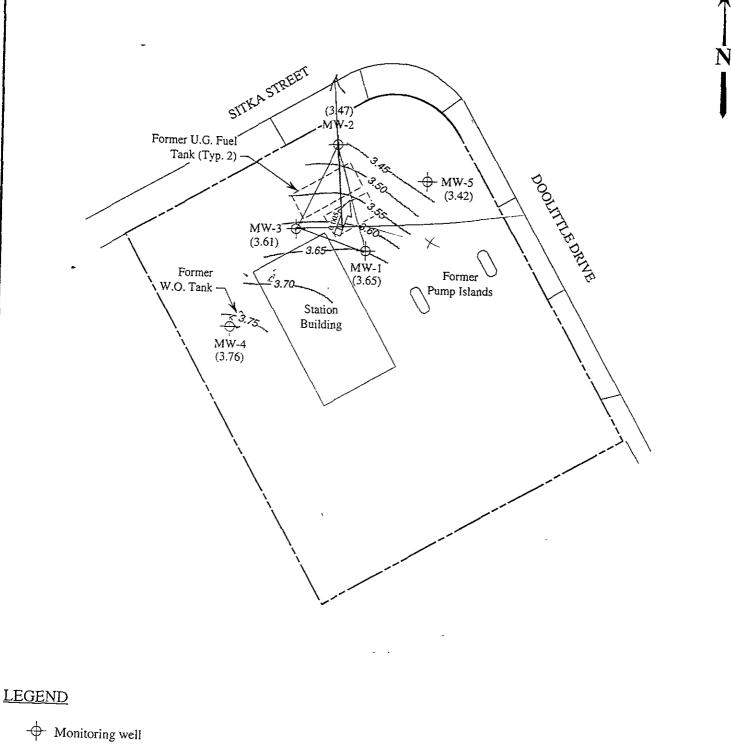
UNOCAL STATION NO. 3844

1903 DOOLITTLE DRIVE

SAN LEANDRO, CALIFORNIA

D-2

PLATE

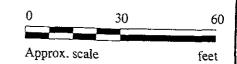


Monitoring well

() Ground water elevation in feet above Mean Sea Level

Direction of ground water flow with approximate hydraulic gradient

Contours of ground water elevation

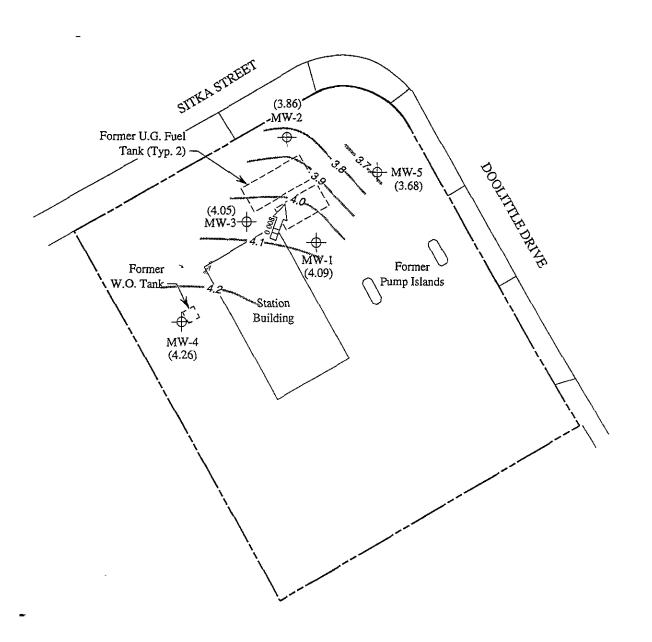


POTENTIOMETRIC SURFACE MAP FOR THE SEPTEMBER 12, 1994 MONITORING EVENT



FORMER UNOCAL S/S #3844 1903 DOOLITTLE DRIVE SAN LEANDRO, CALIFORNIA

FIGURE 1



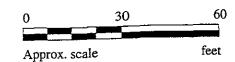
LEGEND

→ Monitoring well

() Ground water elevation in feet above Mean Sea Level

Direction of ground water flow with approximate hydraulic gradient

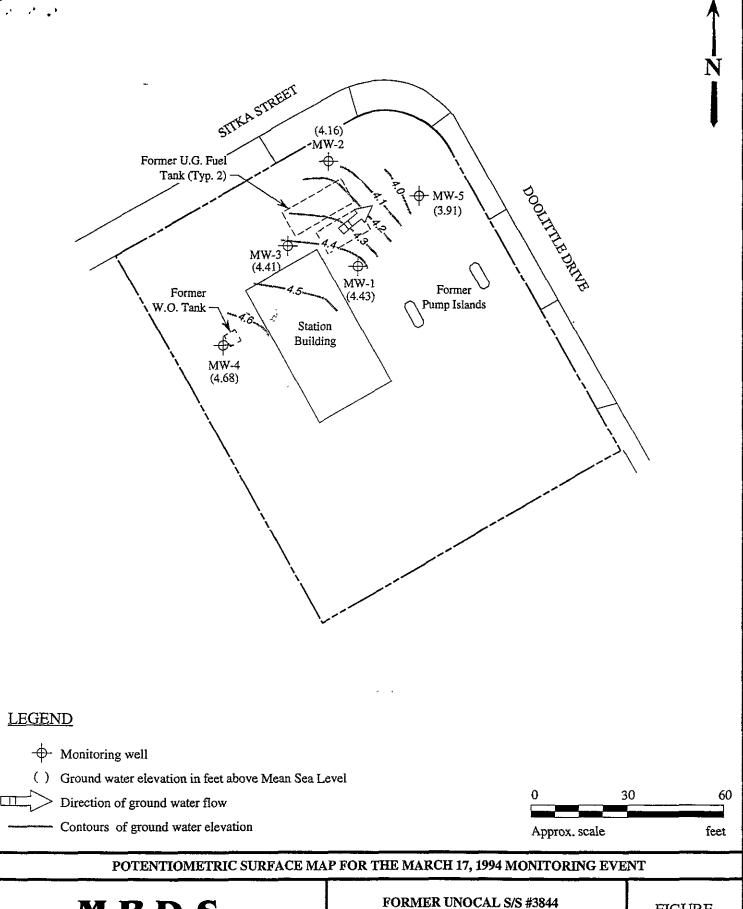
Contours of ground water elevation



POTENTIOMETRIC SURFACE MAP FOR THE JUNE 14, 1994 MONITORING EVENT



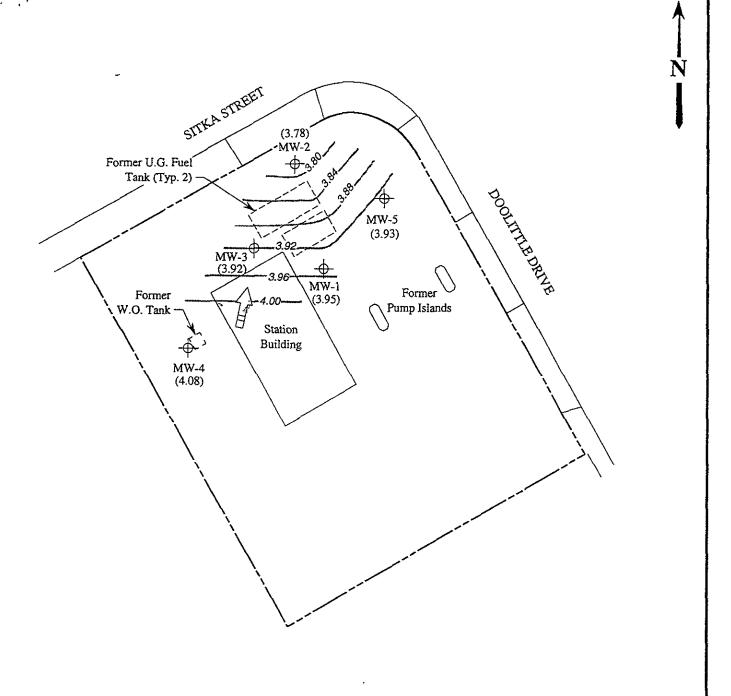
FORMER UNOCAL S/S #3844 1903 DOOLITTLE DRIVE SAN LEANDRO, CALIFORNIA FIGURE



MPDS SERVICES, INC. FORMER UNOCAL S/S #3844 1903 DOOLITTLE DRIVE SAN LEANDRO, CALIFORNIA

FIGURE

1



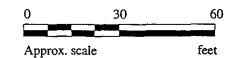
LEGEND

Monitoring well

() Ground water elevation in feet above Mean Sea Level

Direction of ground water flow

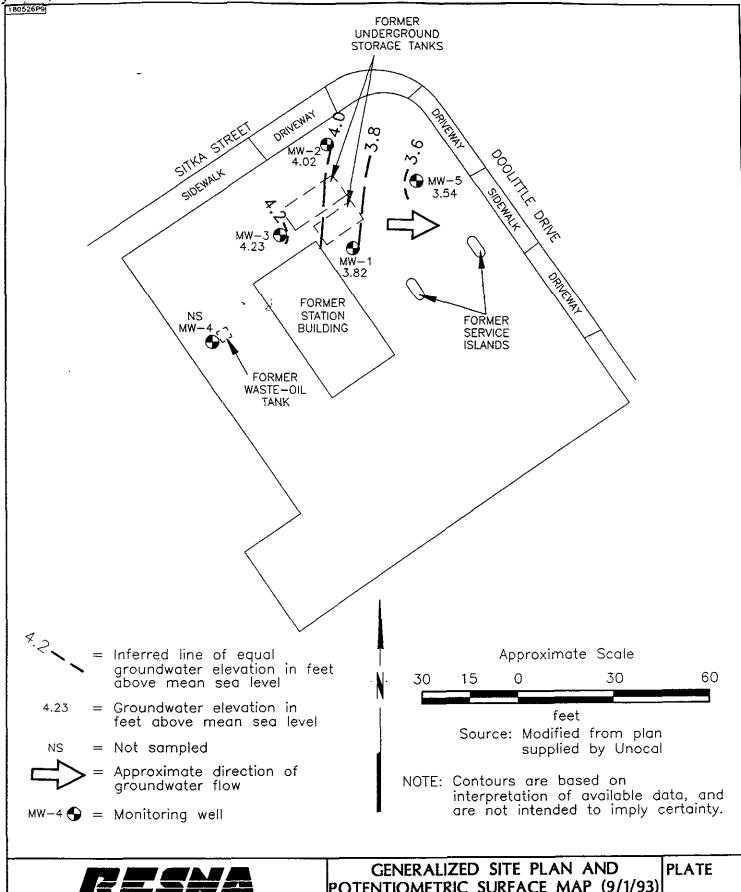
Contours of ground water elevation



POTENTIOMETRIC SURFACE MAP FOR THE DECEMBER 14, 1993 MONITORING EVENT

MPDS SERVICES, INC. FORMER UNOCAL S/S #3844 1903 DOOLITTLE DRIVE SAN LEANDRO, CALIFORNIA

FIGURE 1



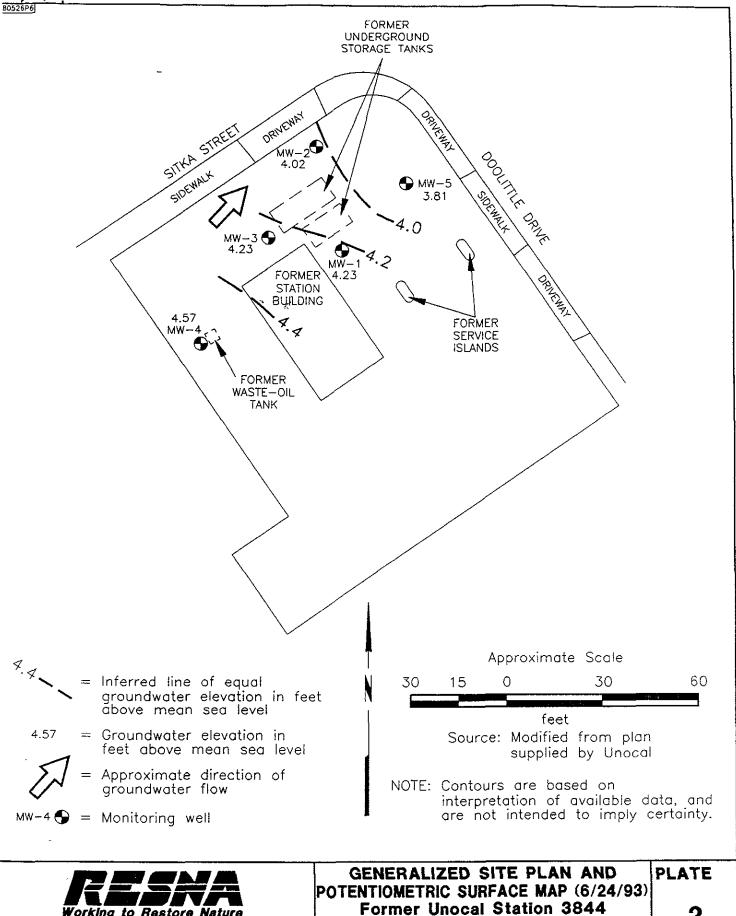
Working to Restore Nature

18052.6A

PROJECT

GENERALIZED SITE PLAN AND
POTENTIOMETRIC SURFACE MAP (9/1/93)
Former Unocal Station 3844
1903 Doolittle Drive
San Leandro, California

2



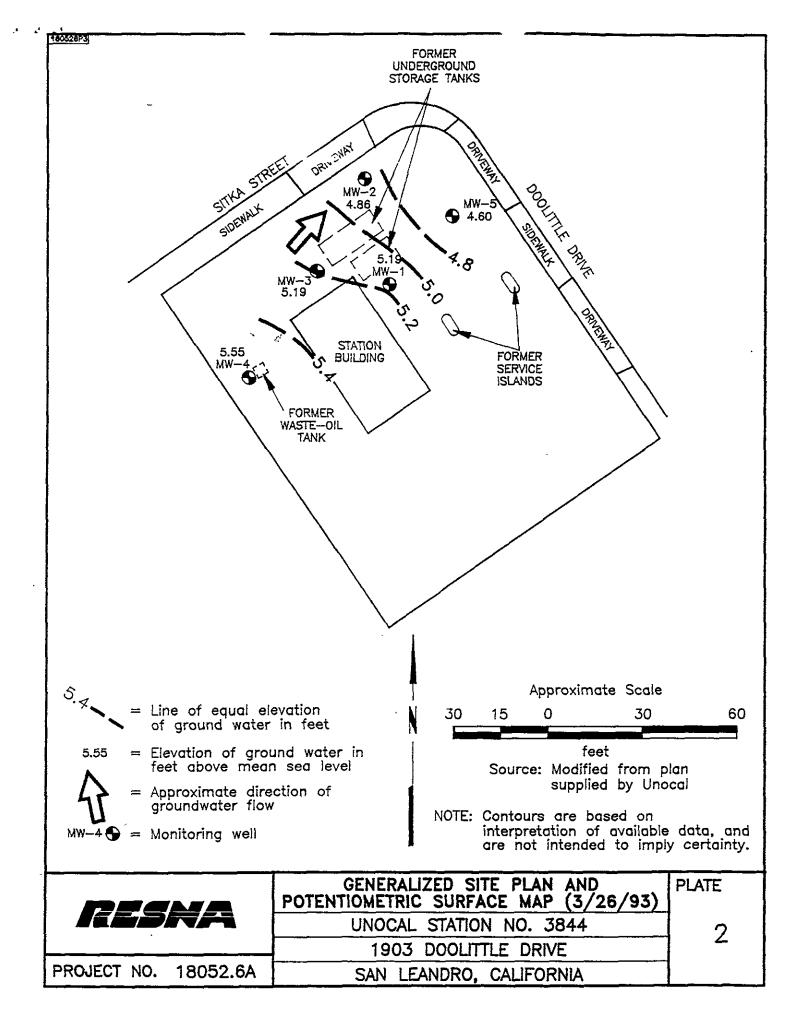
Working to Restore Nature

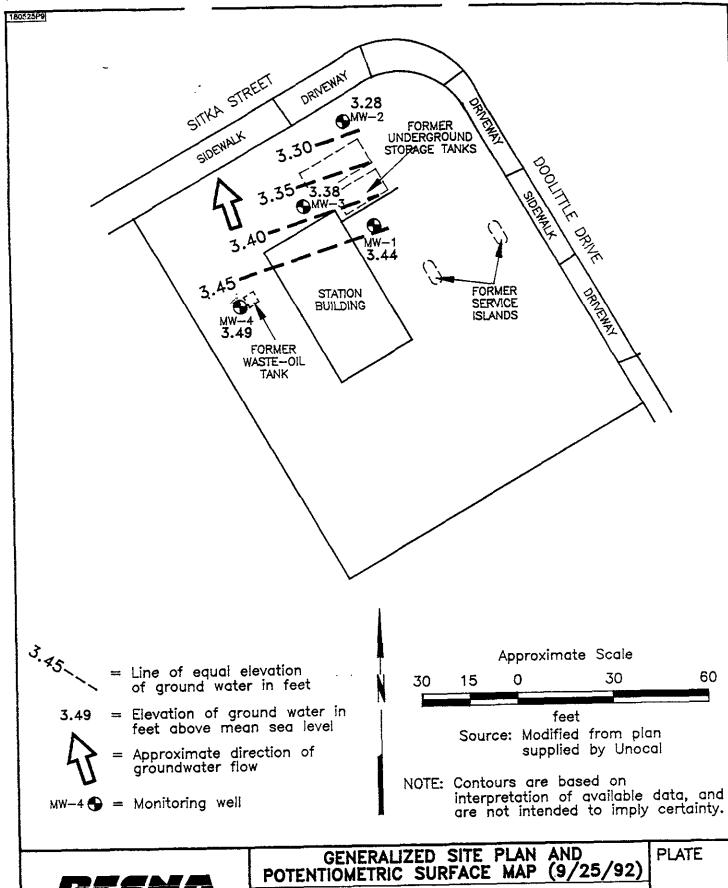
1903 Doolittle Drive San Leandro, California

2

PROJECT

18052.6A





	GENERALIZED SITE PLAN AND POTENTIOMETRIC SURFACE MAP (9/25/92)	PLATE
RESHA	UNOCAL STATION NO. 3844	2
	1903 DOOLITTLE DRIVE	_
PROJECT NO. 18052-5A	SAN LEANDRO, CALIFORNIA	