

NATURAL RESOURCE AGENCY
DEPARTMENT OF CONSERVATION
DIVISION OF OIL, GAS, AND GEOTHERMAL RESOURCES

REPORT OF CANCELLATION

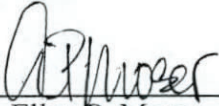
Cypress, California
March 29, 2010

J. W. Scott
6191 Point Loma
Huntington Beach, CA 92647

In accordance with **the expiration of Permit to Conduct Well Operations** the following change pertaining to your well **C.R.G. Properties Ltd/"Nwlbu" 8-7**,
API. No. **037-22512, Long Beach Field, Los Angeles County, Sec. 13, T. 4S, R. 13W**,
S.B. B. & M., is being made in our records:

Your notice to **abandon** dated **02/18/2009**, and our report No. **P 109-0096** issued in answer thereto, is hereby **cancelled** inasmuch as the work will not be done. If you have an individual bond on file covering this notice, it will be returned. No request for such return is necessary.

Elena M. Miller
State Oil and Gas Supervisor


By _____
Ellen P. Moser
Associate Engineer

cc: Update
City of Signal Hill
C.R.G. Properties, Ltd.

CANCELLATION/ CORRECTION made:	Date/Initial
Form 121 _____	3-29-2010
Form 177 _____	/
Form 140 _____	/
WELL Reports _____	3-29-2010
RECORDS: Log Fid _____	4-1-10 VM
EDP _____	/
BOND _____	/
FIELD MAP _____	/
MAP BOOK _____	/

PERMIT TO CONDUCT WELL OPERATIONS

J. W. Scott
6191 Point Loma
Huntington Beach, CA 92647

Cypress, California
March 4, 2009

Your proposal to **abandon** well **C.R.G. Properties, Ltd./"Nwlbu" 8-7**, A.P.I. No. **037-22512**, Section **13**, T. **4S**, R. **13W**, **S.B. B. & M., Long Beach Field, Northwest Extension** area, -- pool, **Los Angeles County**, dated **2/18/2009**, received **2/19/2009** has been examined in conjunction with records filed in this office.

THE PROPOSAL IS APPROVED PROVIDED:

1. Blowout prevention equipment with hydraulic controls, equivalent to this Division's Class **II3M** requirements, or better, shall be installed and maintained in operating condition.
2. All portions of the well not plugged with cement shall be filled with clay base mud having a minimum density of 72 lb/cu ft and a minimum gel-shear strength of 25 lb/100 sq ft.
3. The well shall be plugged with cement from **2600'** to **2500'**, and **2330'** to **2230'**.
4. All uncemented casing annuli shall be cemented from **30'** to **5'**.
5. This Division shall be consulted and a Supplementary Notice may be required before making any changes in the proposed program.
6. **THIS DIVISION SHALL BE NOTIFIED TO:**
 - a. Inspect the installed blowout prevention equipment prior to commencing downhole operations.
 - b. Witness the clean-out depth
 - c. Witness the location and hardness of the cement plug at **2835'**.
 - d. Witness the mudding of the well.
 - e. Witness the placing, location and hardness of the cement plug from **2600'** to **2500'**.
 - f. Witness the placing, location and hardness of the cement plug from **2330'** to **2230'**.
 - g. Witness the placing, location and hardness of the cement plug from **100'** to **5'**.
 - h. Inspect and approve the cleanup of the well site within 60 days after placement of the surface plug.

NOTE:

1. A crew drill may be required at the time of the blowout prevention equipment inspection.
2. The proposed surface plug shall not contain rock or gravel.
3. The base of freshwater sands is at **2270' ±**.
4. This division does not pass upon your right to enter the property, but merely approves the proposal as conforming to our requirements.

JCH:jch

cc: Update
City of Signal Hill
C.R.G. Properties, Ltd.

BLANKET BOND

Engineer: John Huff

Phone: 714/816-6847

Cancelled 3-29-2010

Hal Bopp

State Oil and Gas Supervisor

By 

For William E. Brannon, Deputy Supervisor

A copy of this permit and the proposal must be posted at the well site prior to commencing operations. Records for work done under this permit are due within 60 days after the work has been completed or the operations have been suspended.

CRITICAL WELL

As defined in the California Administrative Code, Title 14, Section 1720 (a), "Critical well" means a well within:

- (1) 300 feet of the following:
 - (A) Any building intended for human occupancy that is not necessary to the operation of the well; or
 - (B) Any airport runway.

- (2) 100 feet of the following:
 - (A) Any dedicated public street, highway, or nearest rail of an operating railway that is in general use;
 - (B) Any navigable body of water or watercourse perennially covered by water;
 - (C) Any public recreational facility such as a golf course, amusement park, picnic ground, campground, or any other area of periodic high-density population; or
 - (D) Any officially recognized wildlife preserve.

Exceptions or additions to this definition may be established by the supervisor upon his own judgment or upon written request of an operator. This written request shall contain justification for such an exception.

ABANDONMENT PROGRAM
Well NWLBU (A)

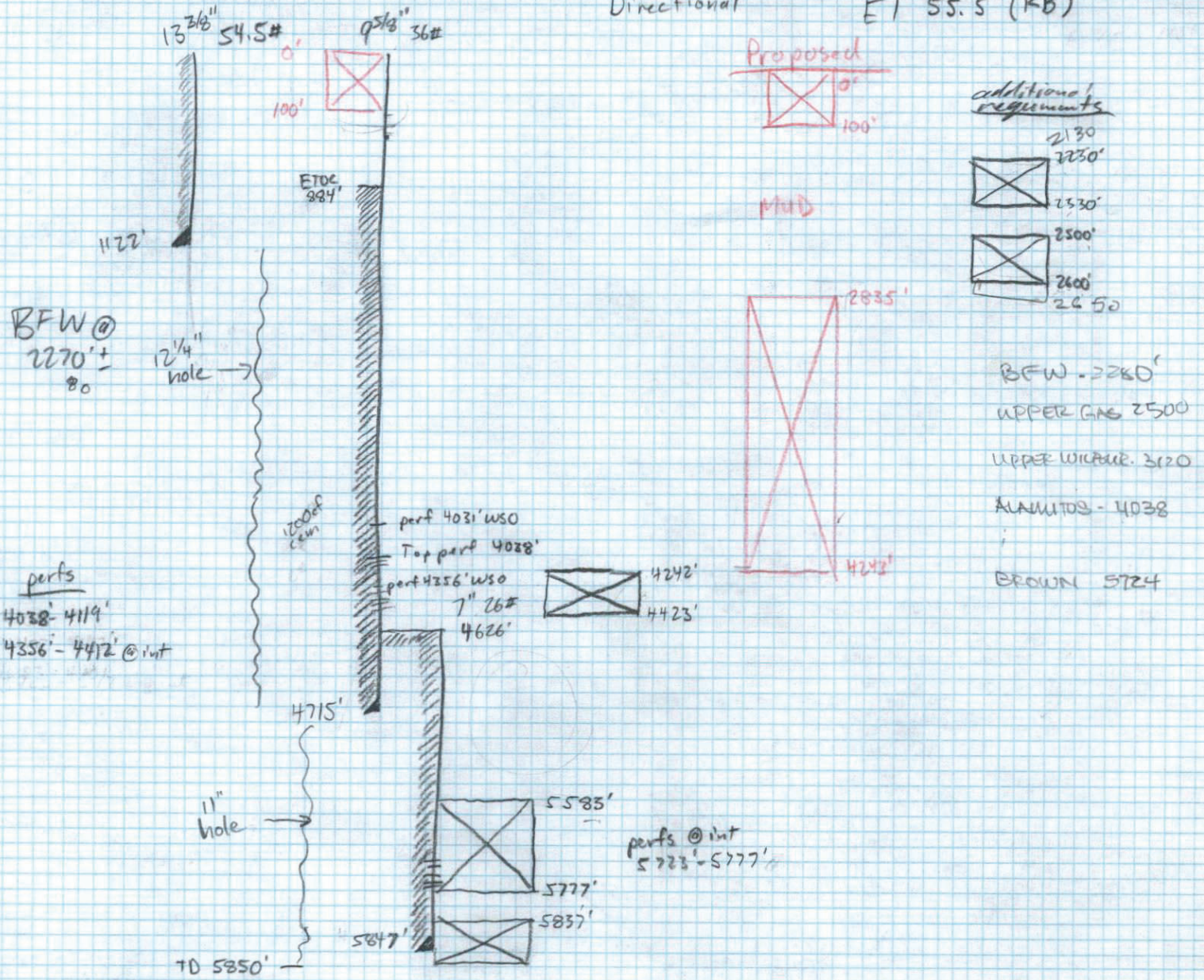
A 8-7

1. MIRU. Install and test class III 3 M BOPE.
2. PU and RIH with 2 7/8" workstring and cleanout to 4243'(TD). POOH.
3. MU and RIH with cementers. Cement from TD to 2835' to 611 cf class G cement. PU.
4. .RIH and tag for top of cement.
5. Mud well from TOC to surface @ 219 bbls of 72 pcf cude.
6. RIH with tbq and cement 7" casing and 7" x 10 3/34" annulus from 100' to surface with 80 cf of class G cement. RDMO.
7. Cut recover csqs 8' below surface. Weld or plate on largest diameter csq.
8. Remove cellar. Cleanup well site.

wlbu 8-7 (037-22512)

Directional

EI 55.5' (KB)



9 5/8" csg cem w/ 1276 cf cem w/ 76 cf cem left in shoe ± 1200 cf cem in 9 5/8" x 12 1/4" annulus

SCA
3/2/2004

WELL TRANSFER NOTICE

EFFEC MAY 9, 1994, PETRO RESOURCES, INC.

TRANS LONG BEACH NWLBU WELLS

TO PACIFIC ENERGY ~~CORP~~ *Resources*

SEE OGD156 DATED 5-13-94

RESOURCES AGENCY OF CALIFORNIA
DEPARTMENT OF CONSERVATION
DIVISION OF OIL AND GAS

REPORT OF PROPERTY AND WELL TRANSFER

Field or county <p style="text-align:center;">Long Beach</p>	District <p style="text-align:center;">1</p>
Former owner <p style="text-align:center;">Sun Exploration & Production Co.</p>	Date <p style="text-align:center;">June 15, 1983</p>
Name and location of well(s) <p style="text-align:center;">Sec. 13-4S-13W S.B.B.&M.</p>	
NWLBU 5-1 (037-09795)	NWLBU 8-1 (037-09792)
NWLBU 5-2 (037-00397)	NWLBU 8-2 (037-09793)
NWLBU 5-3 (037-09796)	NWLBU 8-3 (037-06496)
NWLBU 5-4 (037-09797)	NWLBU 8-4 (037-06415)
NWLBU 6-1 (037-09788)	NWLBU 8-7 (037-22512)
NWLBU 6-2 (037-09789)	NWLBU 9-2 (037-13525)
NWLBU 9-3 (037-09791)	NWLBU 9-4 (037-00392)
NWLBU 9-5 (037-00142)	NWLBU 9-6 (037-00393)

Description of the land upon which the well(s) is (are) located

Date of transfer, sale, assignment, conveyance, or exchange <p style="text-align:center;">May 1, 1983</p>	New owner <p style="text-align:center;">Petro Resources, Inc.</p>	Type of organization <p style="text-align:center;">Corp.</p>
	Address <p style="text-align:center;">4200 Easton Drive, Suite 16 Bakersfield, CA 94309</p>	

Reported by
Letter from Sun Exploration & Production Co. dated 5-16-83.

Confirmed by
Letter form Petro Resources, Inc., dated 5-18-83.

New operator new status (status abbreviation) <p style="text-align:center;">PA</p>	Request designation of agent <p style="text-align:center;">Joe D. Rose, same address.</p>
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Old operator new status (status abbreviation) <p style="text-align:center;">PA</p>	Remarks
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OPERATOR STATUS ABBREVIATIONS	Deputy Supervisor <p style="text-align:center;">V. F. Gaede</p>	Signature
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	FORM AND RECORD CHECK LIST					
	Form or record	Initials	Date	Form or record	Initials	Date
PA - Producing Active						
NPA - No Potential, Active	Form OGD121	CP	7-7-83	Map and book	137	7/12/83
PI - Potential Inactive	Form OGD140	NONE		Notice to be cancelled		
NPI - No Potential, Inactive	New well cards	CP	7-7-83	Bond status		
Ab - Abandoned or No More Wells	Well records	CP	7-7-83	EDP files Update		
	Electric logs	CP	7-7-83	Conservation Committee		
	Production reports			L. A. Assessors		

DIVISION OF OIL AND GAS

CHECK LIST - RECORDS RECEIVED AND WELL STATUS

Company Sun Oil Company Well No. NEW BU 8-7
 API No. 037 22512 Sec. 13, T. 4S, R. 13W, S.B. B.&M.
 County _____ Field Long Beach

RECORDS RECEIVED	DATE	
Well Summary (Form OGI00)	<u>11/2/82</u>	<u>(2)</u>
History (Form OGI03)	<u>11/2/82</u>	<u>(2)</u>
Core Record (Form OGI01)		
Directional Survey	<u>5/19/83</u>	<u>(2)</u>
Sidewall Samples		
Other		
Date final records received		
Electric logs:		
<u>Dipmeter (cluster)</u>	<u>10-21-81</u>	<u>(2)</u>
<u>Arrow Plot (cluster)</u>	<u>10-21-81</u>	<u>(2)</u>
<u>Dual log</u>	<u>5/27/83</u>	<u>(2)</u>
<u>Comp Neutron</u>	<u>5/27/83</u>	<u>(2)</u>
<u>Dual log</u>	<u>5/27/83</u>	<u>(2)</u>
<u>Cement Bond</u>	<u>5/27/83</u>	<u>(2)</u>

STATUS	STATUS
Producing - Oil	Water Disposal
Idle - Oil	Water Flood
Abandoned - Oil	Steam Flood
Drilling - Idle	Fire Flood
Abandoned - Dry Hole	Air Injection
Producing - Gas	Gas Injection
Idle - Gas	CO2 Injection
Abandoned - Gas	LPG Injection
Gas-Open to Oil Zone	Observation
Water Flood Source	
DATE	<u>5-14-82</u>
RECOMPLETED	
REMARKS	

ENGINEER'S CHECK LIST

- Summary, History, & Core record (dupl.) ✓✓
- Electric Log ✓
- Operator's Name _____
- Signature _____
- Well Designation _____
- Location _____
- Elevation _____
- Notices ✓
- "T" Reports ✓
- Casing Record _____
- Plugs _____
- Surface Inspection _____
- Production _____
- E Well on Prod. Dir. Sur. ✓

Dipmeter ✓
" ✓

R. Manuel/Vicky Grupp 5-18-83
will send D.S. & E-log
right away.

CLERICAL CHECK LIST

- Location change (F-OGD165) _____
- Elevation change (F-OGD165) _____
- Form OGD121 _____
- Form OGI59 (Final Letter) _____
- Form OGD150b (Release of Bond) _____
- Duplicate logs to archives _____
- Notice of Records due (F-OGD170) _____

No. P 182-109

Cont. Dipmeter 5/27/83 (2)

Hold for rest of records 10/23/81

BPB
UPDATE CENTER 6/7/83

RECORDS NOT APPROVED

Reason: Need E-log, dir survey 12-2-82

RECORDS APPROVED

RELEASE BOND

Date Eligible _____
 (Use date last needed records were received.)

MAP AND MAP BOOK

137
6/7/83

WELL SUMMARY REPORT

Operator SUN EXPLORATION AND PRODUCTION COMPANY		Well NWLBU #8-7				
Field LONG BEACH		County LOS ANGELES	Sec. 13	T. 4S	R. 13W	B.&M. SB
Location (Give surface location from property or section corner, street center line and/or California coordinates) 487.44' N & 778.80' W OF SAN ANTONIO DRIVE & DEL MAR AVENUE					Elevation of ground above sea level 45.5	
Commenced drilling (date) 8/25/81	Total depth			Depth measurements taken from top of:		
Completed drilling (date) TA 5/14/82	(1st hole) 5837'	(2nd)	(3rd)	<input type="checkbox"/> Derrick Floor <input type="checkbox"/> Rotary Table <input checked="" type="checkbox"/> Kelly Bushing Which is 10± feet above ground		
Commenced producing (date) N/A	Present effective depth 4243'			GEOLOGICAL MARKERS DEPTH UPPER ALAMITOS I ₁ 4038' I ₂ 4080' LOWER ALAMITOS K ₁ 4367' BROWN ZONE V 5724'		
<input type="checkbox"/> Flowing <input type="checkbox"/> Pumping <input type="checkbox"/> Gas lift	Junk NONE					
Name of producing zone(s) LOWER ALAMITOS BROWN "I"		Formation and age at total depth LOWER ALAMITOS				

	Clean Oil (bbl per day)	Gravity Clean Oil	Percent Water including emulsion	Gas (Mcf per day)	Tubing Pressure	Casing Pressure
Initial Production	N/A					
Production After 30 days	N/A					

CASING RECORD (Present Hole)								
Size of Casing (API)	Top of Casing	Depth of Shoe	Weight of Casing	Grade and Type of Casing	New or Second Hand	Size of Hole Drilled	Number of Sacks or Cubic Feet of Cement	Depth of Cementing (if through perforations)
13 3/8"	SURFACE	1122'	54.5#	K-55, BT&C	NEW	17 1/2"	1456 CF POZ 100 CF CL	MIX "A" & "G"
9 5/8"	SURFACE	4715'	36.0#	K-55, LT&C S-80, ST&C	NEW	12 1/4"	1076 CF CL 200 CF CL	"G" & "G"
7"	4626'	5847'	26.0#	K-55, BT&C	NEW	8 3/4"	468 CF POZ 100 CF CL	MIZ "A" & "G"

PERFORATED CASING (Size, top, bottom, perforated intervals, size and spacing of perforation and method.)
 4- 1/2" HPF 4119'-4109': 143 SHOTS W/4-1/2" HPF 4412'-4402'; 4401'-4383': 4-1/2" H @ 4356';
 PERF'D 4-1/2" HPF 4412'-4402'; 4401'-4383': WSO 4-3/8" H @ 4031': 4-.43" HPF 5757'-5749',
 5748'-5738', 5736.5'-5734.5', 5733'-5723.5'

Was the well directionally drilled? If yes, show coordinates at total depth

Yes No **460' N & 82" W**

Electrical log depths

FDC-CNL-GR-CAL-TEN 4902'-3000': DLL-GR-TEN 5850'-4713': FDC-CNL-GR-CAL-TEN 5850'-4713'

Other surveys

GAMMA RAY 4500'-4000': GAMMA RAY CMT BOND LOG 4200'-3348': DIPMETER

In compliance with Sec. 3215, Division 3 of the Public Resources Code, the information given herewith is a complete and correct record of the present condition of the well and all work done thereon, so far as can be determined from all available records.

Name L. B. CARROLL, JR.		Title DISTRICT ENGINEER	
Address P O BOX 55060		City VALENCIA	Zip Code 91355-0560
Telephone Number 805/257-6200	Signature <i>L B Carroll Jr</i>	Date 10/28/82	

SUBMIT IN DUPLICATE
 RESOURCES AGENCY OF CALIFORNIA
 DEPARTMENT OF CONSERVATION
DIVISION OF OIL AND GAS

History of Oil or Gas Well

Sun Exploration & Production Co.

Operator Sun Production Division Field or County Long Beach
 Well Northwest Long Beach Unit #8-7 Sec. 13, T 4S, R 13W, SB. B. & M.
 A.P.I. No. 037-22512 Name L.B. Carroll, Jr. Title Agent
 Date October 28, 1982 19 (Person submitting report) (President, Secretary or Agent)

Signature *L.B. Carroll Jr.*

PO Box 55060, Valencia, CA 91355 0560
 (Address)

(805) 257-6200
 (Telephone Number)

History must be complete in all detail. Use this form to report all operations during drilling and testing of the well or during redrilling or altering the casing, plugging, or abandonment with the dates thereof. Include such items as hole size, formation test details, amounts of cement used, top and bottom of plugs, perforation details, sidetracked junk, bailing tests and initial production data.

Date	
1981	
8/25	5826 TVD/"V"/IR/ATLANTIC/LA CA/WI 1.00/SURF LOC: 487.44' N & 778.80' W OF SANTONIO DR & DEL MAR AVE/BHL: 463 N, 100' W OF SURF LOC/ 370' SD SH D (320) MXNG LCM/MIRU ATLANTIC OIL RIG #3/SPUD @ 2 PM 8-24-81/DRLG 17½" HOLE FRM 50-370, LOST COMPLETE RTNS/WRK TIGHT PIPE OUT OF HOLE/MW 68/VIS 45/
8/26	370 DRLG OUT CMT/MX & PMP 100 BBLs OF 18# PER BBL LCM, NO RTNS/w DP @ 240, PMP 8 YDS OF 3-1 MX CMT/DISP w 22 CF DRLG MUD/POH/WOC 12 HRS, TAG SOFT CMT @ 85/CO MED HRD CMT TO 105 w FULL RTNS/MW 66/VIS 38/
8/27	965 SD SH D (595) LOST CIRC/DRLG CMT & CLND OUT TO 370 w FULL RTNS/ DRLG 17½ HOLE FRM 370-965 LOST COMPLET RTNS/POH/MW 70/VIS 43/
8/28	1120 SD SH D (155) PREPNG TO RUN 13-3/8" CSG/MX LCM PILL, RIH TO 945 w OPN ENDED DP/PMP 100 BBLs OF 18# PER BBL LCM, REGAIN FULL CIRC/ TRIP FOR BIT, HAD 15' FILL, NO FLUID LOSS/DRLG 17½" HOLE FRM 965- 1120/CIRC & WIPE HOLE TO RUN CSG/MW 71/VIS 57/
8/31	8-29/1122 SD SH INST CSG HD/CIRC & COND MUD, POH/RAN 28 JTS (1125) 13-3/8" 54.5# K-55 BT&C CSG w SHOE @ 1122, FLOAT CLR @ 1076/B.J. PMPD 150 CF SODIUM SILICATE FOLLOWED BY 1456 CF POZ "A" 1-1 PERLITE w 4% GEL & 2% CaCl ₂ FOLOWD BY 100 CF CL "G" CMT w 2% CaCl ₂ /DISP w 940 CF DRLG MUD/BMPD ² PLUG w 1000 PSI, BLED TO 0/440 CF CMT RTNS/CIP @ 10:45 PM/WOC 4 HRS/LND CSG/MW 68/VIS 40/8-30/1122 SD SH RIH w 12¼" BIT/CUT OFF CONDUCTOR & CLN CELLAR/WELD ON 13-3/8" CSG HD/INST BOE/RIH w 12¼" BIT TO TST CSG & BOE/MW 68/VIS 35/8-31/1503 SD SH D (381) DD/TST CL III BOP & CK BY DOG/DRLG PLUGS, FLOAT CLR, CMT & SHOE @ 1122/DRLG 12P" HOLE FRM 1122-1503/SURV @ 1428, 2°45', N01W/TVD 1427.97/SEC. 3.45/N-3.22/W-1.44/MW 68/VIS 36/
9/1	2233 SD SH D (730) DRLG/DRLG 12¼" HOLE FRM 1503-2233/SURV @ 2173 13°15', N25°30'W/TVD 2159.14/SEC.137.22/N-129.80/W-49.32/MW 67/VIS 42/
9/2	2425 SD SH D (192) FISHING D.C. SLIPS OUT OF BOP/3 HRS DN TIME REPAIRNG HOOK/DRLG & DYNA DRLG 12¼" HOLE FRM 2233-2455/UNABL TO GET SURV/TRIP TO CHG ORIENTATION SUB/DROP D.C. SLIPS IN BOP/FISHING OUT SAME/SURV @ 2357, 12°30', N25°30'W/TVD 2338.47/SEC.176.81/N-166.17/ W-68.65/MW 69/VIS 38/

DIVISION OF OIL & GAS
History of Oil or Gas Well

NWLBU #8-7
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1981

- 9/3 2714 SD SH D (289) DRLG/FISHED SLIPS OUT OF BOP/DRLG 12 $\frac{1}{4}$ " HOLE FRM 2425-2714/RIG OFF DAY WORK FOR 7 $\frac{1}{2}$ HRS FISHING OUT SLIPS/SURV @ 2663, 13 $^{\circ}$, N02E/TVD 2637.37/SEC.245.62/N-234.85/W-76.00/MW 69/VIS 36/
- 9/4 2950 SD SH D (236) RIH/DRLG 12 $\frac{1}{4}$ " HOLE FRM 2714-2950/WIPE 12 $\frac{1}{4}$ " HOLE TO 1100, HOLE TIGHT/CIRC COND MUD/TRIP FOR 8-3/4" BHA/SURV @ 2938, 12 $^{\circ}$ 15', N05 $^{\circ}$ 30'E/TVD 2905.72/SEC.303.61/N-294.96/W-72.61/MW 70/VIS 37/
- 9/5 3495 SD SH D (545) TRIP FOR DD/DRLG 8-3/4" HOLE FRM 2950-3495/TRIP FOR DD/SURV @ 3495, 10 $^{\circ}$ 45', N5 $^{\circ}$ E/TVD 3451.05/SEC.412.36/N-408.54/W-63.83/MW 70/VIS 40/
- 9/6 3822 SD SH DD (327) TRIP FOR BHA/TRIP FOR DD/DD 8-3/4" HOLE FRM 3495-3822/POH/SURV @ 3758, 6 $^{\circ}$ 15', N43 $^{\circ}$ W/TVD 3709.13/SEC.460.58/N-453.93/W-79.69/MW 70/VIS 38/
- 9/7 3822 SD SH FISHING/POH & LAY DN DD/RIH w NEW BHA TO 3640/REAM 8-3/4" HOLE FRM 3640-3792/WRK ON PMP & POH LOOKNG FOR WASHOUT/LEFT DBL PIN X0, MONEL, & 8-3/4" BIT IN HOLE/WO FISHNG TOOLS 5 HRS/RIH w NEW DBL BOX X0 & ATTMPT TO SCREW INTO FISH/MW 69/VIS 38/
- 9/8 3996 SD SH D (174) DRLG/POH, REC ALL FISH/RIH, REAM DYNA DRL RUN FRM 3733-3822/DRLG 9-7/8" HOLE FRM 3822-3996/SURV @ 3955, 2 $^{\circ}$ 15', N41W/TVD 3905.66/SEC.471.79/N-463.97/W-88.40/MW 68/VIS 38/
- 9/9 4170 SD SH D (174) REPAIRNG SWIVEL/DRLG 8-3/4" HOLE FRM 3996-4095/REPAIR SWIVEL FOR 7 HRS/DRLG 8-3/4" HOLE FRM 4095-4170/REPAIR SWIVEL FOR 4 HRS/MW 68/VIS 45/SURV @ 4139, 1 $^{\circ}$ 15', N40W/TVD 4089.56/SEC.477.22/N-468.24/W-92.37/
- 9/10 4297 SD SH D (127) DRLG/REPAIR SWVL 1 HR/DRLG 8-3/4" HOLE FRM 4170-4235/TRIP FOR NEW BIT & TWO D.C./DRLG FRM 4235-4297/SURV @ 4235, 1 $^{\circ}$ 15', N69W/TVD 4185.59/SEC.478.76/N-496.46/W-94.08/MW 68/VIS 44/
- 9/11 4483 SD SH D (186) REPAIRNG PMP/DRLG 8-3/4" HOLE FRM 4297-4379/REPAIR SWIVEL 3 HRS/DRLG 8-3/4" HOLE FRM 4379-4483/REPAIR MUD PMP FOR 7 HRS/SURV @ 4427, 0 $^{\circ}$ 15', N34 $^{\circ}$ E/TVD 4377.52/SEC.480.69/N-471.08/W-95.71/MW 70/VIS 37/
- 9/12 4673 SD SH D (190) DRLG/REPAIR MUD PMP 1 $\frac{1}{2}$ HRS/DRLG 8-3/4" HOLE FRM 4483-4548/TRIP FOR NEW BIT/DRLG 8-3/4" HOLE FRM 4548-4673/SURV @ 4610, 0 $^{\circ}$ VERT/TVD 4560.52/SEC.480.14/N-470.68/W-94.94/MW 68/VIS 38/
- 9/13 4906 SD SH D (233) PREP TO LOG/DRLG 8-3/4" HOLE FRM 4673-4906/CIRC HOLE & COND MUD/WIPE HOLE FOR LOGS, NO FILL/POH FOR LOGS/SURV @ 4906 1 $^{\circ}$, S81 $^{\circ}$ E/TVD 4856.49/SEC.478.56/N-469.82/W-91.45/MW 69/VIS 40/

DIVISION OF OIL & GAS
History of Oil or Gas Well

NWLBU #8-7
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1981

- 9/14 4906 TD OH 3234 SD SH OH (284) OH/SCHLUM RAN DLL-GR-TEN FRM 4906-1122/FDC-CNL-GR-CAL-TEN FRM 4902-3000/DIPMETER FRM 4903-3000/ TOOK SWC FRM 4607-4006, SHOT 57, REC 42/OPN 8-3/4" HOLE TO 12 $\frac{1}{2}$ " FRM 2950-3234/MW 69/VIS 40/
- 9/15 4906 TD OH 4095 SD SH OH (861) OH/OPN 8-3/4" HOLE TO 12 $\frac{1}{2}$ " FRM 3234-3451/CIRC & COND HOLE FOR LOG/POH/SCHLUM RAN DIPMETER/UNABL TO GET LOG TOOL BELOW 3482/TRIP FOR DRLG ASSY/OPN 8-3/4" HOLE TO 12 $\frac{1}{2}$ " FRM 3451-4095/MW 70/VIS 43/
- 9/16 4905 TD OH 4406 SD SH OH (311) OH/OPN 8-3/4" HOLE TO 12 $\frac{1}{2}$ " FRM 4095-4406/MW 69/VIS 37/
- 9/17 4906 TD OH 4528 SD SH OH (122) OH/OPN 8-3/4" HOLE FRM 4406-4499/POH & REPAIR BRAKES FOR 4 $\frac{1}{2}$ HRS/OPN HOLE FRM 4499-4528/MW 69/VIS 39/
- 9/18 4906 TD OH 4685 SD SH OH (157) OH/OPN 8-3/4" HOLE TO 12 $\frac{1}{2}$ " FRM 4528-4685/MW 69/VIS 40/
- 9/19 4906 TD OH 4725 SD SH OH (40) RUNNING 9-5/8" CSG/OPN 8-3/4" HOLE TO 12 $\frac{1}{2}$ " FRM 4685-4725/COND HOLE FOR LOG/WO SCHLUM 3 $\frac{1}{2}$ HRS/SCHLUM RAN DIPMETER FRM 4725-3000/CIRC FOR CSG/RUNNING 9-5/8" CSG/MW 69/VIS 40/
- 9/20 4906 TD PRES TSTG WELL HD/RAN TOT OF 108 JTS (4718) w 56 JTS 9-5/8" 36# S-80 ST&C ON BTM & 52 JTS 9-5/8" 36# K-55 LT&C ON TOP/DFC @ 4670/DFS @ 4715/DOWELL PMPD 1076 CF CL 'G' CMT w 1-1 POZ, 0.5% CFR-2, 2% GEL, 3% KCL FOLLOWD BY 200 CF CL 'G' CMT w 0.75% CFR-2 & 3% KCL/DISP w 2060 CF DRLG MUD/DID NOT BMP PLUG/BLD TO 0/40 CF CMT RTNS TO SURF/CIP @ 2:23 PM/REM BOE/INST 9-5/8" PKNG/CUT OFF CSG & WELD ON CSG HD/WAIT ON HD TO COOL/TSTG HD/
- 9/21 4906 WSO TSTG/TST WELL HD TO 5000 PSI OK/INST CL III BOP & TST TO 1000 PSI OK/RIH, TAG PLUG @ 4540/TST PIPE RAMS & BAG, WITNESS BY D.O.G. OK/DRLG PLUGS, CMT & FLOAT CLR TO 4705/CIRC CLN/TRIP FOR WSO TOOL/SHOT 4 - $\frac{1}{2}$ " HOLES @ 4693, SET SLIPS & OPN TOOL @ 6:27 AM w LIGHT BLOW/MW 69/VIS 35/
- 9/22 5090 SD SH D (184) DRLG/REL PKR, POH w WSO & REC 30' DRLG MUD/ IH 2200 PSI, FH 2190, IF 57, FF 57/TST OK & WITNESS BY D.O.G./PU BHA RIH INST NEW RUBBERS ON EVERY JT OF DP/DRLG OUT SHOE & CLN OUT TO 4906/DRLG 8-3/8" HOLE FRM 4906-5090/SURV @ 5007, 1^o30', S89^oE/TVD 4957.81/SEC.477.81/N-469.31/W-89.27/MW 68/

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- 9/23 5200 SD SH D (110) DRLG/DRLG 8-3/4" HOLE FRM 5090-5164/
TRIP FOR LOCKED BHA/REAM FRM 4830-5164/DRLG FRM 5164-5200/SURV @
5200, 1^o, S65^oE/TVD 5150.44/SEC.475.87/N-468.23/W-85.74/MW 68/
VIS 40/
- 9/24 5360 SD SH D (160) DRLG/DRLG 8-3/4" HOLE FRM 5200-5360/SURV
@ 5290, 0^o45', S05E/TVD 5242.42/SEC.474.58/N-467.13/W-84.93/MW 68/
VIS 38/
- 9/25 5580 SD SH D (220) DRLG/LOST 50 BBLs MUD @ 5360/PULL TO SHOE,
MX 50 BBLs LCM/RIH TO 5360, SPOT LCM PILL/DRLG w FULL RTNS FRM
5360-5580/SURV @ 5447, 1^o15', S06E/TVD 5397.40/SEC.471.40/
N-464.44/W-84.68/MW 68/VIS 38/
- 9/26 5784 SD SH D (204) DRLG/DRLG 8-3/4" HOLE FRM 5580-5600/TRIP
FOR NEW BIT A PK SWIVEL/2 $\frac{1}{2}$ HRS DN TIME/DRLG FRM 5600-5784/SURV @
5754 3/4^o, S41E/TVD 5704.38/SEC.468.28/N-461.00/W-83.47/MW 69/VIS 41/
- 9/27 5850 SD SH D (66) LOGGING/DRLG 8-3/4" HOLE FRM 5784-5850/
WIPE HOLE TO 9-5/8" CSG/CIRC FOR LOGS/RU SCHLUM & STRTD LOGGNG/SURV
@ 5850, 1^o15', S70E/TVD 5800.35/SEC.467.22/N-460.00/W-82.26/MW 69/
VIS 41/
- 9/28 5850 TD HO 4730 SD-SH OH (15) OH/SCHLUM RAN DLL-GR-TEN FRM
5850-4713/FDC-CNL-GR-CAL-TEN FRM 5850-4713/DIPMETER FRM 5850-4713/TOOK
57 SWC FRM 4727-5845, REC 35/RD SCHLUM/RIH w 11" HO/OPN HOLE FRM 8-3/4"
TO 11" FRM 4715-4730/MW 69/VIS 39/
- 9/29 5850 TD OH 4999 SD-SH OH (269) OH/OPN 8-3/4" HOLE TO 11" FRM 4730-4999/
MW 68/VIS 42/
- 9/30 5850 TD OH 5450 SD-SH OH (460') REPAIRING SWIVEL/OPEN
8-3/4" HOLE TO 11" FRM 4999 TO 5459/PULL TO SHOE TO REPAIR
SWIVEL/4-1/2 HRS DOWNTIME/MW 68/VIS 38/
- 10/1 5850 TD OH 5725 SD SH OH (266) OH/REPLACE SWIVEL, 4 $\frac{1}{2}$ HRS
DN/OPN 8-3/4" HOLE TO 11" FRM 5459-5725/MW 67/VIS 40/
- 10/2 5850 TD, OH 5832 SD SH OH (107) OH/GAUGE 11" HOLE FRM
4715-5725/OPN 8-3/4" HOLE TO 11" FRM 5725-3832/MW 67/VIS 41/
- 10/3 5850 PREPNG TO CMT 7" CSG/OPN 8-3/4" HOLE TO 11" FRM
5832-5850/PULL TO SHOE, WAIT $\frac{1}{2}$ HR, RIH TO 5850 (NO FILL)/POH/RAN
30 JTS (1217) 7" 26# K-55 BT-C w SHOE @ 5847, FLOAT 5802/CIRC CSG
1 HR WRKNG CSG 40'/MW 67/VIS 41/

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- 10/4 5850 TD 5847 PBSD, CLNG OUT 7" LNR/PMP 468 CF POZ-MIX "A"
CMT 1-1 w .5% CFR-2, 2% GEL, 3% KCL FOLLOWD BY 100 CF CL "G" w
.75% CFR-2, 3% KCL/DISP w 640 CF MUD/BMP PLUG w 1400 PSI, BLEED TO
O/SET & REL FRM LNR/CIRC OUT 50 CF OF EXCESS CMT/POH, PU 8-3/4"
BIT w 9-5/8" 36# CSNG SCRPR/RIH, CO TO 4626 TOP OF LNR HANGER/
TRIP FOR 6-1/8" BIT, 4 - 4-3/4" DC ON 3 1/2" DP TO CO LNR/MW 67/VIS
40/
- 10/5 5850 TD, 5847 PBSD PREPNG TO PULL BOP/CO TO 5801/TST CSG
TO 1000 PSI FOR 15 MIN, OK/DRL PLUG, FLOAT CLR, CMT TO 5837, 10'
ABOV SHOE/CHG OVR TO 5% KCL WTR/LD 4 1/2" DP & TOOLS/PREP TO PULL
BOP/
- 10/6 5837 PBSD REL RIG @ 1:30 PM 10-5-81/PULL BOP/INST TBG HD/
REL RIG/DROP FRM REPORT PENDING COMPLETION/
- 10/10 5837 PBSD/RIG UP SCHLUM & RAN CBL FRM 5815-4000/RIG DN
SCHLUM & MOVE OUT/
- 10/16 5837 PBSD/MIRU ALLIED PROD RIG/INST BOP/PU BELL NIP ON BTM OF
9-5/8" 36# FB/RIH TO 3211/SET FB/RU & SWAB FLUID LEVL DN TO
700'/OPENING BYPASS EVERY OTHER RUN TO EQUALIZE FLUID IN
ANNULUS/SIFN/
- 10/17 5837 PBSD/CONT SWABNG FLUID FRM 700-2920/CLOSE IN WELL/
- 10/18 5837 PBSD/RU McCULLOUGH & SHOT 4 - 1/3" JHPF FRM 5777-
5764, HAD 25' FLUID RISE AFTR 1 HR/POH w FB/RAN SNKR BAR TAG BTM @
5837 (BTM)/RAN 500 KILL STG/SIFN/
- 10/19 5837 PBSD/PULL KILL STG/MAKE UP GAS ANCHOR & RIH ON 180 JTS OF
2-7/8" TBG w TAIL @ 5766/RAN 2 1/2x1 1/2x12'x15' PMP ON 123 3/4" RODS &
66 7/8" RODS/SIFN/
- 10/20 5837 PBSD/SPACD OUT BH PMP/FILLED TBG STG w LSE PROD WTR/CLND
LOCATN/RDMO/PUT WELL ON PROD/IN TST 17 HRS/O BO, 124 BW/TBG 32#,
CSG 0#/12.5 SPMx72" LOS/FL 4341, OP 1392/
- 10/21 7 HRS/O BO, 25 BW/TBG 32#/CSG 0#/12.5 SPMx72" LOS/FL
5733 @ PMP/NOTE! BH PMP SANDED UP, STUCK IN OPN POSSITION @
2:00 PM 10-21-81/SHUT PU DN/SHOT FL @ 5:00 AM 10-22-81, FL @
5733, NO FLUID ENTRY/
- 10/22 WELLTECK MIRU/FND BH PMP STUCK, UNABL TO WRK LOOSE/REL ON & OFF TOOL
POH w RODS/INSTLD BOE/REL BKR 7" 26# ANCHOR-CATCHER, LOWERD TBG TO
5837 (TD)/PULLING OUT HOLE w TBG WET/SIFN/

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- 10/23 CONTD PULLING TBG OUT OF HOLE, PULLING WET/FLUID ABOVE PMP SHOE WAS MUDDY WTR w NO SD/FLUID SAMPLE FRM PMP & MUD ANCHOR TSTD 40% SOLIDS & CLORIDES OF 3600 PPM+, OR EQUAL TO 5% KCL WTR, LEFT IN HOLE, NO FORMATION WTR IN EVIDENCE/SENT BH PMP TO SHOP, PMP PLGR STUCK IN PMP BARREL w BUILD UP OF A CARBON TYPE MATERIAL ON PLGR WHICH COULD BE REMOVD w KNIFE/RIH w 2-1/8" BAILER, BAILD UNSET & CONTAMINATD CMT FRM 5826-5841 (7" SHOE @ 5847)/RIH w 9-5/8 36# BKR FB ON 101 JTS 2-7/8" TBG TO 3211/PMPD 171 BBLs OF 5% KCL WTR DN TBG, SHOT FL TOP OF KCL WTR @ 2892/SET FB/SIFN/
- 10/24 RU SCHLUM, INSTLD LUBRICATR/RAN 2-1/8" DOMED SCALLOP THRU TBG GUN w 6.5 GM CHG, 0.32" EH, 0° PHASE, DECENTRALIZD, 13' 52 SHOTS, RIH, 1ST RUN CLR LOCATR SHORTD OUT/2ND & 3RD RUNS, FAULTY CLR LOCATR/REMOVD LUBRICATR/REL SCHLUM/SHUT WELL IN TILL AM 10/26/81/
- 10/26 RU SCHLUM & FULL LUBRICATOR/MU 2-1/8" OD DOMED SCALLOP THRU TBG GUN (6.5 GRM CHG, 0.32" EH); 0° PHASE; DECENTRALIZED; 13'-53 SHOTS w CLR LOCATR, RIH, LOCATD CLRS @ 5723, 5764 & 5810 (NOTE FL INSIDE TBG @ 2888) SHOT HOLES FRM 5764½ TO 5777½/WAITD 15 MIN & FND FL INSIDE TBG @ 2370 (518 FLUID RISE)/REL SCHLUM/REL FB PKR & POH w TBG/MEAS IN HOLE w TBG & BKR "B-2" 7" 26# ANCHOR CATCHER, REMOVD BOE & SET ANCHOR w TOP @ 5317.92, LANDED TBG w ST @ 5703.14/RAN 2½"x1-3/4"x25' 3 - TUBE PMP ON 123 - 3/4" & 65 - 7/8"x30' SUCKER RODS/SEATED & SPACD PMP/FILLED TBG w 16 BBLs WTR/PUT WELL ON PROD INTO BKR TANK/RDMO/NOTE: SHOT FL BEFORE PRODUCNG WELL @ 2770/NO TEST, FND PU DN THIS AM 10-27-81, MURPHY HI-LO FLOWLINE PRESSURE SWITCH, SHUT WELL DN/
- 10/27 14 HRS/0 BO, 165 BW/TBG 42# CSG 0#/12½ SPMx72" LOS/FL 5671, @ PMP/SHUT WELL IN 1 HR/FL 5589, OP 82'/POP WELL PMPD OFF IN 30 MIN/SHUT IN 9 HRS/FL 5589, OP 82'/POP, WELL PMPD OFF IN 30 MIN/SWI, POUNDING FLUID/FL 5671 @ PMP/
- 10/28 WELLTECK MIRU/SHOT FL @ 5637 (34' OVR PMP)/UNSEATD 3 TUBE PMP, EQUALIZD FLUID, SHOT FL @ 4847 (824' OVR PMP)/POH/INSTLD BOE/REL BKR ANCHOR CATCHER, LOWERD TBG, TAGGED BTM @ 5737 (NO FILL)/LD DN EXCESS TBG/SFT TBG ANCHOR CATCHER w TBG ST @ 5766.68', PMP SHOE @ 5734.33/RAN OILWELL 1 -½"x1-3/4"x25' 3 TUBE PMP & RODS/FILLED TBG w 21 BBLs PROD LSE WTR/POP @ 7:40 PM 10-28-81, IN TEST/SHOT FL PRIOR TO PRODUCNG FL 4809' (924' OVR PMP)/9 HRS/0 BO, 28 BW/TBG 25#, CSG 0#/11 SPMx72" LOS/FL 5733, @ PMP/SHUT WELL IN @ 5:00 AM 10-29-81/

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- 10/29 24 HR SI BUILD UP TST/TBO#/CSG 5#/FL 5637, OP 96/
10/30 ½ HR/1.2 BO, .3 BW/TBG 18#/CSG 0#/11 SPMx72" LOS/
FL 5650, OP 83'/
10/31 ½ HR/1.8 BO, .2 BW/TBG 16#/CSG 0#/11 SPMx72" LOS/
FL 5662, OP 71'/
11/1 ½ HR/1.8 BO, .2 BW/TBG 15#/CSG 0#/11 SPMx72" LOS/
FL 5656, OP 77'/
11/2 ½ HR/.96 BO, .04 BW/TBG 15/CSG 0/11 SPMx72# LOS/FL 5662, OP 71/
11/3 NO REPORT/WELL SHUT IN FOR STATIC BUILD UP TEST/
11/4 NO REPORT/WELL SHUT IN FOR STATIC BUILD-UP TEST/
11/5 NO REPORT/WELL SHUT IN FOR STATIC BUILD-UP TST/
11/6 NO REPORT/WELL SI FOR STATIC BUILD UP TST/
11/7 NO REPORT/WELL SI FOR STATIC BUILD UP TST/
11/8 NO REPORT/WELL SI FOR STATIC BUILD UP TST/
11/9 NO REPORT/WELL SI FOR STATIC BUILD UP TST/
11/10 CP 52/FL 5298, OP 435/
11/11 CP 60#/FL 5263, OP 470/
11/12 SICP 68#/STATIC FL 5212/OP 521/
11/13 SICP 73#/STATIC FL 5176, OP 557/
11/14 NO REPORT/
11/15 SICP 82#/WTATIC FL 5086', OP 647'/
11/16 SICP 92#/STATIC FL 5032, OP 701/
11/17 WELL TECK MIRU/INSTLD ROD REGAN/POH w 66 - 6/8" & 125 -
3/4" x 30' SUCKER RODS & 3 - TUBE PMP/UNLANDED TBG, REL BKR TBG
ANCHOR, INSTLD BOE/POH w 180 JTS 2-7/8" TBG/MU 1¼" SNKR BAR, RIH
ON SD LINE TO 5837, NO FILL/MU 2-3/8" x 1-3/4"x16'x28'x32' "THE"
PMP BARREL BELOW 7" - 26# BKR FB PKR ON 160 JTS 2-7/8" TBG, RIH TO
4560/SIFN/
11/18 CONTD IN HOLE w 7" 26# FB PKR & 2-7/8" TBG, SET FB @
5697, w BTM OF "THE" PMP BARREL @ 5737/RU DOWELL/FILLED ANNULUS
w 340 BBLs OF 65# 5% KCL WTR/PRESS ANNULUS TO 500 PSI/PMPD 1000
GALS "MSR" ACID w 40# FLAX 4 DIVERTING AGENT & 92 GALS 15% HCL
ACID w MUTUAL SOLVENT DN TBG/SQZD TOT 378 GALS ACID AWAY IN 4 HRS
w MAX PRESS OF 2000#, BLEEDING BK TO 1000 PSI IN 3 MIN, FORMATION
TIGHT/OPEND UNLOADR REV CIRC ACID OUT OF TBG w 35 BBLs OF 5% KCL
WTR/SIFN/

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- 11/19 REL FB/REV CIRC w 5% KCL, RECOVERD 10 BBLs CRUDE OIL FRM ANNULUS/LOWERD TBG FRM 5737-5835, REV CIRC 1 HR NO ACID IN RTNS/PU TO 5737/SHUT WELL IN TILL AM 11/20/81/
- 11/20 LOWERD TBG TO 5780 (3' BELOW PERFS)/DISPL TBG w 45 BBLs OF KCL WTR, RECOVERD 20 BBLs CRUDE OIL FRM ANNULUS/RU DOWELL, PMPD 100 GALS 12% HCL-3% HF ACID w INHIBITORS & SURFACTANT ADDED, FOLOWD w 1344 GALS 5% KCL WTR, SPOTTED ACID ACROSS PERFS (5764-5777½')/PU SET FB @ 5675 w BTM OF "THE" PMP BARREL @ 5716/TSTD ANNULUS TO 800 PSI, OK/OPEND UNLOADR, PMPD DN TBG w 150 GALS 12-3 MUD ACID, FOLOWD w 1000 GALS "MSR" ACID w 40# FLAX 4 DIVERTR, FOLOWD w 190 GALS 15% HCL ACID w 10% MUTUAL SOLVENT, CLOSD UNLOADER/PRESSURD ANNULUS TO 800 PSI/SQZD ACID AWAY w 810 GALS 15% HCL ACID, FOLOWD w 1450 GALS KCL WTR, PRESSURE & RATE STAYD CONSTANT THRUOUT SQZ 2750 PSI @ ¼ BBL PER MIN/ACID IN PLACE @ 3:00 PM, SHUT IN PRESS 2750#/BLED DN TO 500# IN 15 MIN, 0# IN 30 MIN, NO FLEED BK/MU & RAN STDG VALVE & PMP PLGR & RODS/STROKD PMP w RIG FOR 1½ HRS, RECOVERD 6 BBLs KCL WTR (APPARENT LOW FLUID ENTRY) LET SET 1 HR, STROKD AGAIN FOR 1 HR, RECOVERD 5 BBLs KCL WTR, PMPD OFF/PULLD STDG VALVE, PLGR & 150' OF ROD UP HOLE/DISPL 12 BBLs KCL WTR DN TBG @ 1000 PSI/SIFN/
- 11/21 SEATD STDG VALVE, FILLED TBG w 1½ BBLs 5% KCL WTR, STROKD PMP w RIG/WELL PMPD OFF AFTR 1½ BBLs RTNS/LET SET FOR 15 MIN, PMPD ½ BBL/PULLED STDG VALVE, POH w RODS & PMP PLGR/RELSD FB & LOWERD TBG TO 5830/FILLED HOLE w 8 BBLs 5% KCL WTR, REV CIRC, GOT pH OF 3 AFTR 30 BBLs, pH OF 7 AFTR 75 BBLs RTNS/PULLED TBG w TAIL TO 5500/SHUT WELL IN TILL AM 11-23-81/
- 11/23 LOWERD TBG FRM 5500-5837, NO FILL/POH w TBG, LD "THE" PMP BARREL/MU 2½" API T/L PMP SHOE ON 3½" OD MUD ANCHOR, RIH ON 11 JTS 2-7/8" TBB, ON BKR 7" ANCHOR CATCHER, ON 169 JTS 2-7/8" TBG/REMOVD BOE/SET ANCHOR @ 5383.84 & LANDED TBG w TBG ST @ 5766.68/RAN 2½"x1-3/4"x25 3-TUBE PMP ON 125 - 3/4 & 66 - 7/8"x30' SUCKER RODS/SEATED & SPACD PMP, HUNG WELL ON/RDMO/WELL SHUT IN/DROP FRM REPORT/

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- 12/1 CPS MIRU/POH w RODS & 3 TUBE PMP/REL BKR TENSION PKR/INSTLD BOE/SIFN/
12/2 POH w 180 JTS 2-7/8" TBG/MU BROWN 7" 26#, 4 CUP w 1' SPACING BETWN CUPS, RIH ON 2-7/8" TBG TO 4500/RU BJ HUGHES/LONG BEACH CITY INSPECTOR SHUT RIG DN DUE TO HIGH NOISE LEVEL IN AREA/MADE WELL SECURE/SIFN/
12/3 WITH 7" 26# BROWN 4 CUP PKR @ 4500 (IN 9-5/8 CSG) BJ HUGHES FILLED HOLE w 162 BBLS OF 5% KCL WTR/LOWERD PKR TO 5700, BLANKD TOOL IN 7" CSG @ 3500 PSI/ LOWERD TOOL TO 5777, PMPD 2 BPM IN PERFS @ 1000 PSI @ 5776' 2 BBLS PER MIN @ 1000#, 5775' 2 BPM @ 500#, 5774' 2 BPM @ 500#, 5773' 2 BPM @ 500#, 5772' 2 BPM @ 500#, 5771 2 BPM @ 400#, 5770'2 BPM @ 500#, 5769 - 2 BPM @ 600#, 5768' 2 BPM @ 600#, 5767' - 2 BPM @ 800#, 5766' - 1 BPM @ 1000#, 5765' - 2 BPM @ 1200#, 5764' - 2 BPM @ 1300 PSI/POH/RU DRESSER ATLAS, PERFORATED THE FOLOWNG INTERVLS w 4" O.D. CSG GUNS, 4 - .43" HOLES/FT, 22 - ½ GRAM JUMBO JET CHG, 15.07" PENETRATION, FRM 5757-5749, 5748-5738, 5736.5'-5734.5'/5733-5723.5'/ REL DRESSER ATLAS/RIH w 2-7/8" TBG, REMOVD BOE, SET BKR ANCHOR-CATCHER w 2500# TENSION, PMP SHOE @ 5737/SIFN/
12/4 20 HRS/0 BO, 224 BW/TBG 32#/CSG 0#/11 SPMx72" LOS/FL 3398, OP 2335/WELL OWES 130 BBLS OF KCL LOAD WTR/
12/5 24 HRS/0 BO, 153.5 BW, 1.5 BBLS MUD/TBG 30#/CSG 0#/11 SPMx72" LOS/FL 5478, OP 255/WELL PD BK ALL LOAD WTR PLUS 35 BBLS FRM WELL/
12/6 3.5 HRS/.2 BO, 10.3 BW/TBG 20#, CSG 0#/11 SPMx72" LOS/FL 5624, OP 109/WELL NOT PRODUCING/SHUT DN FOR STATIC BUILD UP, 13½ HRS, FL 5323, OP 510/
12/7 22 HRS/0 BO, 33 BW/TBG 9#/CSG 0# (VENTED TO BKR TANK)/11 SPMx72" LOS/FL 5695, OP 39/LOW FLUID ENTRY/
12/8 6.5 HRS/0 BO, 5 BW/TBG 9#/CSG 0# (VENTED TO BKR TANK)/11 SPMx72" LOS/WELL PMPD OFF @ 3:30 PM/SHUT DN PU/FLUID LEVEL AFTR 15 HRS WAS 5365, OP 368/ APPROX 11 BBLS ENTRY/
12/9 3 HRS/0 BO, 13 BW/TBG 9/CSG 0 (VENTED TO BKR TANK)/11 SPMx72" LOS/FL 5644, OP 89/WELL QUIT PMPNG (PMPD OFF)/SHUT WELL IN @ 10:30 AM 12-9-81 FOR FL BUILD UP TST/7:30 AM 12-10-81/21 HRS/FL 5282, OP 451/CSG 14#/
12/10 SHUT IN 24 HRS FOR FLUID LEVEL BUILD UP TST/CSG 24#/FL 4935, OP 798/
12/11 SHUT IN 24 HRS FOR FLUID LEVEL BUILD UP TST/CSG 32#/FL 4650, OP 1083/
12/12 SHUT IN 24 HRS FOR FLUID LEVEL BUILD UP TST/CSG 38#/FL 4490, OP 1243/DROP FRM REPORT UNTIL TST IS COMPLETE/
1/15 FLUID LEVEL BUILD UP TST COMPLETE/RESUME OPERATIONS TO ACIDZ PERFORATD INTERVLS 5724-5736 & 5738-5756 TO REMOV SUSPECTD CLAY SWELLING & EMULSION BLOCKAGE IN FORMATN/CPS MIRU/INSTLD SD PROOFNG SCRIN AROUND RIG & EQUIP/ STAKD OUT RODS FILLED TBG w LSE WTR, TBG OK/POH w 65 - 7/8, 123 - 3/4"x30' SUCKER RODS & PMP/RELSD BKR TENSION ANCHOR-CATCHER/INSTLD BOP/POH w 167 JTS 2-7/8" TBG & CATCHER/SIFN

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- 1/16 POH w KILL STG/MU BKR 7" 26# CSG SCRPR ON 2-7/8" TBG, HYDROTESTNG TBG IN HOLE @ 5000 PSI (NO LEAKS) TO 5780, NO RESTRICTNS/POH/MU BKR 7" 26# MOD "C" BRIDGE PLUG ON BKR 7" 26# FULLBORE PKR, ON 2-7/8" TBG, RIH TO 4500/CLOSD WELL IN TILL AM 1-18-82/
- 1/17 CONTD RIH w BKR BP & FB PKR/SET BP @ 5760/PU w FB @ 5755, FILLED HOLE w 277 BBLS PRODUCED WTR/RU BJ HUGHES, PMPD 33 BBLS OF 2% AM-CL WTR ON TBG/ PULLED FB UP & SET @ 5650/TSTD SURF LINES TO 4000 PSI/PMPD PRODUCED WTR IN ANNULUS, PRESSURE UP TO 1000 PSI/OBTAINED BRK DN w 20 FT³ OF AM-CL WTR @ 1 BBL PER MIN @ 2700 PSI/OPND UNLOADER & PMPD 600 GALS 15% HCL ACID w 2 GALS INHIBITOR & IRON CHELANT, PLUS 300 GALS OF 12% WTR, 3% HF ACID w ADDITIVES DN TBG/CLOSD UNLOADER, PRESS ANNULUS TO 800 PSI/SQZD w 600 GALS OF 12% HCL 3% HF ACID @ 1 BBL PER MIN @ 2500 PSI, AFTR PMPNG 1500 GALS PRESSURE DRPD FRM 2500# TO 1750 PSI @ 2.5 BBL PER MIN RATE REMAINING CONSTANT THRU OUT JOB/CONTD SQZNG AWAY w REMAINING 300 GALS OF 12-3 ACID FOLOWD w 600 GALS OF 15% HCL ACID & 1200 GALS OF DIESEL w 1% J-10 SURFACTANT/DISPL TBG w 25 BBLS 2% AM-CL WTR/ REL FB, LOWERD TBG & RETRIEVD BP/POH w TBG & TOOLS/RIH w 179 JTS TBG/SIFN/
- 1/19 COMPLETD RIH w 2-7/8" TBG/REMOVD BOE/SET BKR ANCHOR-CATCHER @ 5350 w 12,000# TENSION, PMP SHOE @ 5703 & BTM OF MUD ANCHOR @ 5734.82/RAN 2½"x1½"x 12'x13' RHA PMP ON 123 - 3/4" & 65 - 7/8"x30' SUCKER RODS/SEATED & SPACD PMP, FILLED TBG w WTR/REMOVD SOUND SCREEN/RDMO/POP/IN TST 15 HRS/O BO, 102 BW/ TBG 42#/CSG 0#/11 SPMx72" LOS/FL 2677, OP 3008/pH OF 7/WELL OWES 260 BBLS OF LOAD WTR & ACID/
- 1/20 24 HRS/O BO, 160 BW/TBG 40/CSG 39/11 SPMx72" LOS/FL 4431, OP 1254/ pH of 7/ WELL OWES 100 BBLS OF LOAD WTR & ACID/
- 1/21 9½ HRS/O BO, 56 BW/TBG 40/CSG 66/11 SPMx74" LOS/FL 5685, OP @ PMP/SHUT WELL DN @ 4:30 PM, PMPD OFF/WELL OWES 44 BBLS OF LOAD WTR & ACID/
- 1/22 POP @ 9:30 AM/TBG 65#/CSG 80#/FL 4928, OP 757/PRODUCED UNTIL PMP OFF/5½ HRS/14 BBLS OF DIESEL w TRACE OF OIL, 16 BBLS WTR w MUD TYPE SEDIMENT/11 SPMx72" LOS/FL 5685, OP @ PMP/SHUT IN UNTIL 7 AM 1-23-82/7:00 AM 1-23-82/ CSG 58#/FL 5054, OP 631/WELL OWES 14 BBLS OF LOAD WTR & ACID/
- 1/23 POP @ 9:30 AM/TBG 65#/CSG 58#/FL 5054/OP 631/PRODUCED UNTIL PMP-OFF 6 HRS/ O BO, 29 BW/TBG 63/CSG 63/11 SPMx72" LOS/FL 5685, OP @ PMP/SHUT IN TILL AM 1-24-82/WELL HAS PD BK 14 BBLS OF LOAD WTR & ACID, PLUS 15 BBLS FRM WELL/ 7:00 AM 1-24-82/CSG 90#/FL 5126, OP 559/
- 1/24 POP @ 7 AM/TBG 65/CSG 90/FL 5126, OP 559/PRODUCED UNTIL PMP-OFF/5 HRS/1 BO, 24 BW/TBG 65/CSG 90/11 SPMx72" LOS/FL 5685, OP @ PMP/SHUT IN TILL AM/8:00 AM 1-25082 CSG 80/FL 5001, OP 684/
- 1/25 5½ HRS/O BO, 31 BW/TBG 68/CSG 15/11 SPMx72" LOS/FL 5685 @ PMP/7:00 AM 1-26-82/STATIC BUILD UP/18½ HRS/CSG 15/FL 5102, OP 583/
- 1/26 4 HRS/O BO, 20 BW/TBG 58/CSG 16/11 SPMx72" LOS/FL 5685 W PMP/7:00 AM 1-27-82/STATIC BUILD UP/20 HRS/CSG 16/FL 5023, OP 662/DROP FRM REPORT/ AWAIT APPROVAL ON RECOMPLETION PROGRAM/

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- 2/2 RESUME w RECOMPLETION OF WELL AS RECOMMENDED & APPROVD TO PLUG EXISTING PERFORATIONS & RECOMPLETE WELL IN THE "K" SAND/
WELLTECK MIRU/POH w RODS & PMP/re1 tbg anchor-CATCHER, INSTLD BOE, POH w 2-7/8" TBG, PMP SHOE & MUD ANCHOR/RIH w 2-7/8" TBG, OPN ENDED TO 5777/RU HALIB, FILLED HOLE w 300 BBLS LSE WTR/(RECOVERD 8 BBLS OIL) HALIB MXD & PMPD 50 FT³ CL "G" CMT w 2% CaCl₂ ACROSS PERFS @ 5777-5724, DISPLACD w 178 FT³ LSE WTR/POH TO 4450, LEAVING EST TOC @ 5544/PLACING CMT PLUG FRM 5777, WITNESSED BY D.O.G. REP, MR. G. W. STACK/SIFN/
- 2/3 RIH, TAGD TOC PLUG @ 5583/POH/MEAS & PU LYNES 9-5/8" SHOOT & TST TOOL w 2'x4" JET PERF GUN, CONTAINING 4 - 1/2" CHARGES, RIH ON 4-3/4" D.C. ON 132 JTS OF 2-7/8" TBG TO 4356/ROTATD TBG TO ACTIVATE GUN, PU & SET PKR @ 4296, OPENED TOOL, HAD FAINT BLOW FOR 10 MIN, DEAD FOR REST OF 1 HR TST/POH w TBG & TOOLS, HAD 120' OF FLUID IN TBG/INSPECTION SHOWD THAT GUN HAD NOT FIRED/TORE DN TOOLS & SENT TO SHOP/RIH w KILL STG/(NOTE: D.O.G. REP, G.W. STARK WITNESSED TOP OF CMT PLUG @ 5583)/SIFN/
- 2/4 RIH w LYNES 9-5/8" SHOOT & TST TOOK, w 2'x4" GUN LOADED w 4 - 1/2" SHOTS, ON 4 - 4-3/4" DC's ON 132 JTS 2-7/8" TBG/SHOT 4 HOLES @ 4356/PU & SET PKR @ 4296 w TAIL @ 4324/HAD SLIGHT BLOW FOR 14 MIN, DEAD FOR REMAINDER OF 1 HR TST/REL PKR, POH, RECOVERD 120' OF WTR IN TBG/READ CHARTS, L.H. - 1850#, FH 1851#, 1.F. 43#, F.F. 55#/RU DRESSER ATLAS, RAN GAMMA RAY COR LOG FRM 4500-4000/PERFD 4412-4402, 4401-4391, 4391-4383, 4368-4376, TOT OF 143 SHOTS w 4" JUMBO JET II HOLLOW STEEL CARRIER GUNS w 4 - 1/2" HPF w 24.2 GRAM CHARGES/REL DRESSER ATLAS/NOTE: UNABL TO DETECT ANY FLUID RISE AFTR SHOOTING/RIH w 156' OF 2-7/8" TBG TAIL BELOW BKR 9-5/8" 36# FB PKR ON 75 JTS 2-7/8" TBG TO 2548/SIFN/
- 2/5 BLED WELL DN, HAD SLIGHT VAC ON CSG/CONTD IN HOLE w FB/RU HALIB, FILLED HOLE w 30 BBLS OF LSE WTR/SET FB @ 4205, ATMPD TO TST ANNULUS @ 700#, WD NOT TST/PU & SET FB @ 4011, PMPD AWAY DN ANNULUS @ 14 FT³ MIN @ 350 PSI/RESET FB @ FOLLOWNG DEPTHS w SAME RESULTS 2005, 992/SET FB @ 105, PMPD AWAY @ 14 FT³ MIN @ 350 PSI w RTNS FRM TBG/SET FB @ 100', TSTD ANNULUS TO 1000# OK/LOWERD FB TO 112, PMPD AWAY @ 14 FT³ MIN @ 350 PSI w NO COMMUNICATN THRU TBG/POH w FB/RAN KILL STG/SIFN/
- 2/6 MU BKR 9-5/8" 36# BP ON BKR 9-5/8" 36# FULLBORE PKR ON 2-7/8" TBG, RIH TO 4300/SET BP/PU TO 2003, SET FB & TST 9-5/8" CSG @ 500 PSI OK/RECOVERD BP, PU HOLE TO 110, SET FB, TSTD 9-5/8" TO 500 PSI OK/SET BP @ 135, PU SET FB @ 80', PMPD AWAY @ 12 FT³ MIN @ 300 PSI/REL FB/POH/DMPD 5 SX SIL SD, WAITD 1/2 HR, RIH & TAGD TOP OF SD @ 121/PU SET FB @ 80'/OPEND VALVE ON 13-3/8" ACHIEVD CIRC IMMEDIATELY, MXD & PMPD 60 FT³ API CL "G" CMT w 2% CaCl₂, GOT CMT TO SURF, CLOSD 13-3/8" VALVE & PMPD 113 FT³ OF CMT AWAY @ 14 FT³ OF CMT AWAY @ 14 FT³ MIN @ 350 PSI/SHUT PMP DN, TBG WENT ON A VAC/PMPD REMAINDR OF 200 SX, 57 FT³ @ SAME RATE & PRESS/CLEARD TOOLS & CSG w 20 FT³ OF FRSH WTR/SHUT WELL IN TILL AM 2-8-82/

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- 2/8 REL FB/LOWERD FB TAGGED TOC @ 95'/POH/MU 8-3/4" BIT ON 9-5/8, 36# ROTOVERT SCRPR ON 2 - 4-3/4" O.D. DCs, DRLD OUT CMT FRM 95-121 (TOP SD PLUG)/POH/MU 9-5/8 36# FB, RIH TO 80, SET FB, PUT 500# ON BK SIDE, PMPD DN TBG, ESTABLISHD BRK DN OF $\frac{1}{2}$ BBL PER MIN @ 500 PSI, OPEND VALVE BETWN 13-3/8" & 9-5/8" ANNULAR SPACE, NO COMMUNICATNS/RELSD FB/POH/RAN 2-7/8 TBG OPN ENDED TO 105, PMPD 25 FT³ CL "G" CMT w 2% CaCl₂, DISPL w 1.5 FT³ FRSH WTR/POH/CLOSD BLIND RAMS & VALVE ON 13-3/8"/STRTD BRADENHEAD SQZ @ 5 PM/SQZD AWAY 6 FT³ @ 6:30 PM, DID NOT EXCEED 500 PSI/SIFN/
- 2/9 BLEND WELL DN, HAD 200 PSI ON ANNULUS/RIH w 8-3/4" BIT ON 9-5/8" 36# ROTOVERT SCRPR ON 1 - 4-3/4 DC/DRLD OUT CMT FRM 57-106, CMT STGRS TO 111'/PRESS TSTD 9-5/8" CSG TO 500 PSI, HELD FOR 15 MIN OK/POH LAYNG DN DC SCRPR & BIT/MU BRIDGE PLUG RETRIEVNG HD, RIH ON 2-7/8" TBG, CIRC OUT SD FRM 121-135, RETRIEVD 9-5/8" 36# BP/POH/LOADED OUT POWER SWIVEL & TOOLS/RIH w 158' of 2-7/8 TBG TAIL ON 9-5/8" 36# FB PKR ON 2-7/8" TBG TO 200'/SIFN/
- 2/10 CONTD RIH w 2-7/8 TBG TAIL @ 4411, PMPD & SPOTD 1200 GALS 15% HCL ACID w ADDITIVES ACROSS PERFS FRM 4411-4368/PUH, SET FB @ 4204 & TBG TAIL @ 4364, PRESS ANNULUS ABOV PKR w 500 PSI/HALIB PMPD REMAINING 600 GALS OF 15% HCL ACID AWAY INTO PERFS w MAX RATE OF 56 GALS MIN @ 2500 PSI/FOLOWD w 1800 GALS OF 12% HCL, 3% HF ACID & REQUIRED ADDITIVES, w MIN PMPNG RATE OF 56 GALS MIN @ 2000 PSI @ STRT, TO MAX PMP RATE OF 95 GALS MIN @ 1600 PSI/FOLOWD ACID w 25 BBLS 2% AM CL WTR, DISPL TBG w 25 BBLS LSE PROD WTR @ 95 GAL MIN RATE @ 1600 PSI @ FINISH/REL FB/POH LAYNG DN 48 JTS OF 2-7/8 TBG & FB/MU & RAN 3 $\frac{1}{2}$ " OD MUD ANCHOR, 2 $\frac{1}{2}$ " API T/L PMP SHOE, 4 JTS 2-7/8 TBG, 2-7/8x9-5/8" 36# PAGE "R" TBG ANCHOR, 1 JT 2-7/8 TBG, PAGE "R" TBG DRAIN ON 25 JTS 2-7/8 TBG/SIFN/
- 2/11 CONTD RIH w 106 JTS 2-7/8" TBG/LANDED TBG w ST @ 4393.29, PMP SHOE @ 4360.66/REMOVD BOE/PU OILWELL 2 $\frac{1}{2}$ "x1 $\frac{1}{2}$ "x10'x13' ACID PMP ON 107 - 3/4x30 & 36 7/8x30' SUCKER RODS/SEATED & SPACD OUT PMP/FILLED TBG w LSE PROD WTR/RDMO/WELL OWES 498 BBLS LOAD WTR & ACID/PUT WELL ON PRODUCTION INTO BKR TK @ 4:30 PM/IN TST 14 HRS/O BO, 133 BW/TBG 50/CSG 0/11 SPMx72" LOS/FL 1536, OP 2813/pH 2/WELL OWES 365 BBLS LOAD WTR & ACID/
- 2/12 24 HRS/O BO, 187 BW/TBG 50/CSG 3/11 SPMx72" LOS/FL 3656, OP 693/pH 5/WELL OWES 178 BBLS OF LOAD WTR & ACID/
- 2/13 11 $\frac{1}{2}$ HRS/O BO, 59 BW/TBG 35/CSG 18/11 SPMx72" LOS/FL 4349 @ PMP/WELL OWES 119 BBLS OF LOAD WTR & ACID/SHUT WELL DN 6:30 PM 2-13-82/PMPD OFF/
- 2/14 WELL SHUT IN FOR STATIC FLUID BUILD UP/
- 2/15 WELL SI FOR 36.5 HRS, STATIC BUILD UP/FL 3698, OP 651, PRIOR TO STRT UP @ 7:20 AM 2-15-82/PMPD 4 HRS/O BO, 41 BW/11 SPMx72" LOS/FL 4349 @ PMP/SHUT WELL IN @ 11:20 AM 2-15-82/
- 2/16 WELL SI FOR 20 $\frac{1}{2}$ HRS, FLUID BUILD UP/FL 4123, OP 226, (226' RISE)/POP @ 8:00 AM/1 HR 45 MIN/O BO, 11 BW/CSG 16/FL 4349 @ PMP/SHUT WELL DN,PMPD OFF/

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- 2/17 WELL SI FOR 22 HRS, FLUID BUILD UP (125') FL 4224, OP 125/CSG 16/POP @ 8:00 AM 1 HR 15 MIN/O BO, 7 BW/CSG 16/FL 4349 @ PMP/SHUT WELL DN @ 9:15 AM, PMPD OFF/DROP FRM REPORT/
- 2-24 RESUME w RECOMPLETION OF WELL AS RECOMMENDED & APPROVD/TO PLUG EXISTING PERFORATIONS IN THE "K" SD & RECOMPLETE IN THE "I" SD/CPS MIRU/PULLED 36 - 7/8" & 107 - 3/4x30' SUCKER RODS & PMP/INSTLD BOP/POH w 136 JTS 2-7/8" TBG (4328)/RIH w SINKER BAR ON SD LINE TO 5500 (83' FILL)/CMT PLUG @ 5583/RIH w 136 JTS OF 2-7/8" TBG, OPN ENDED TO 4328/SIFN/
- 2-25 LOWERD TBG TO 4423/RU CIRC PMP, FILLED HOLE w 325 BBLS OF PROD WTR/RU HALIB MXD & PMPD 75 FT³ GLASS "G" CMT w 2% CaCl₂, DISPL w 24 BBLS PROD WTR/CMT IN PLACE @ 11:20 AM/PU TO 4225, REV CIRC w 250 BBLS OF PROD WTR/MR. W. SANTIAGO w D.O.G. WITNESSED PLACEMENT OF PLUG/POH w 10 STDS/SIFN/
- 2-26 LOWERD TBG & LOCATD TOP OF CMT PLUG @ 4243/WITNESSED & APROVD BY D.O.G./POH w TBG/MU JOHNSTON SHOOT & TST TOOLS ON 2-7/8" TBG, SHOT 4 - 3/8" HOLES @ 4031/MADE 1 HR WSO TST w PKR SET @ 3959 & TAIL TO 3988, HAD MED TO LIGHT BLOW FOR 25 MIN, DEAD REMAINDER OF TST/PULLED TBG & TST TOOLS, HAD 64' FLUID RISE IN TBG, INITIAL HYDRO 1733, INITIAL FLOW 40.5, FINAL FLOW - 46, FINAL HYDRO 1704/WSO WITNESSED & APROVD BY D.O.G. REP WILLIAM E. BRANNON/RU DRESSER ATLAS/RIH w CENTRALIZD 4" OD JUMBO JET II HOLLOW STEEL CARRIER GUNS w 22.5 GRAM CHARGE, PERFD 9-5/8" CSG w 4 - 1/2" HPF, @ 4119-4109, 4108-4091, 4069-4059, 4058-4038, TOT OF 234 HOLES, HAD 10 MIS FIRES ON BTM OF 1st GUN RUN/REL DRESSER ATLAS/RIH w 600' KILL STG TBG/SIFN/
- 2-27 POH w KILL STG/RAN SNKR BAR TO 4243, NO FILL/RIH w 9-5/8" 36# BKR FB PKR w 160' OF 2-7/8" TAIL ON 2-7/8" TBG, W TAIL @ 4048, FILLED HOLE w 40 BBLS LSE WTR/SET PKR @ 3888, TSTD ANNULUS TO 500 PSI, OK/REL FB & LOWERD TBG, TBG TAIL TO 4118/HALIB SPOTTED 1000 GALS OF 15% HCL PAD ACID ACROSS PERFS 4118-4038/PU & SET FB PKR @ 3878 w TAIL @ 4038, PRESS ANNULUS w 500#/HALIB SQZD AWAY 300 GALS 12% HCL - 3% HF ACID @ 13 FT³ PER MIN @ 1250 PSI, PMPD 125# BENZOIC FLAKES, FOLOWD w 500 GALS 12-3 ACID @ 17 FT³ PER MIN @ 1500# PSI, 125# BENZOIC FLAKES, 500 GALS 12-3 ACID @ 17 FT³ PER MIN @ 1500 PSI, 125# BENZOIC FLAKES, 500 GALS 12-3 ACID @ 24 FT³ PER MIN, @ 1250 PSI, 125# BENZOIC FLAKES, 500 GALS OF 12-3 ACID @ 24 FT³ PER MIN @ 1200 PSI, 125# BENZOIC FLAKES, 500 GALS OF 12-3 ACID, @ 24 FT³ PER MIN @ 1200 PSI, OVERFLSHD ACID w 1001 GALS OF 2% AM/CL WTR @ 24 FT³ PER MIN @ 1100 PSI/POH w GAS ANCHOR, PMP SHOE ON 40 STDS OF 2-7/8" TBG/SIFN/(NOTE: WELL OWES TOT OF 509 BBLS OF LOAD WTR & ACID)/
- 2-28 CONTD RIH w 2-7/8 PROD STG TBG (125 JTS TOT)/REMOVD BOE & LANDED TBG @ 4033, w SHOE @ 4001', & PAGE 2-7/8x9-5/8-36# ANCHOR @ 3873/RAN OILWELL 2 1/2"x1 1/2"x10'x13' RHA ACID PMP ON 98 - 3/4"x30' & 33 - 7/8"x30' SUCKER RODS/ SEATED & SPACD PMP FILLED TBG w LSE WTR/POP THRU PORTABLE TSTR INTO BKR TK/RDMO/IN TEST 17 HRS/O BO, 166 BW/TBG 12#/CSG 0#/11 SPMx72" LOS/FL 607, OP 3393/WELL OWES 343 BBLS OF LOAD WTR & ACID/pH 4/
- 3-1 24 HRS/O BO, 226 BW/TBG 12#/CSG 33#/11 SPMx72" LOS/FL 722, OP 3278/ WELL OWES 117 BBLS OF LOAD WTR & ACID/pH 5/

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- 3-2 24 HRS/Ø BO, 195 BW/TBG 12/CSG 25/11 SPMx72" LOS/FL 701, OP 3300/WELL HAS PAID BK ALL LOAD WTR & ACID, PLUS 78 BBLs FRM WELL pH 5/
- 3-3 24 HRS/Ø BO, 233 BW/TBG 12/CSG 16/11 SPMx72" LOS/FL 672, OP 3329/pH 5/
- 3-2 24 HRS/Ø BO, 195 BW/TBG 12/CSG 25/11 SPMx72" LOS/FL 701, OP 3300/WELL HAS PAID BK ALL LOAD WTR & ACID, PLUS 78 BBLs FRM WELL pH 5/
- 3-3 24 HRS/Ø BO, 233 BW/TBG 12/CSG 16/11 SPMx72" LOS/FL 672, OP 3329/pH 5/
- 3-4 24 HRS/Ø BO, 195 BW/TBG 12/CSG 16/11 SPMx72" LOS/FL 755, OP 3246/pH 5/
- 3-5 24 HRS/Ø BO, 208 BW/TBG 12/CSG 16/11 SPMx72" LOS/FL 736, OP 3265/pH 5.5/
- 3-6 24 HRS/Ø BO, 212 BW/TBG 19/CSG 16/11 SPMx72" LOS/pH 5.5/
- 3-7 24 HRS/Ø BO, 208 BW/TBG 19/CSG 16/11 SPMx72" LOS/FL 736, OP 3265/pH 5.5/
- 3-8 24 HRS/Ø BO, 239 BW/TBG 38/CSG 16/11 SPMx72" LOS/FL 723, OP 3278/
pH 7/
- 3-9 24 HRS/Ø BO, 234 BW/TBG 30/CSG 16/11 SPMx72" LOS/FL 745, OP 3256/pH 7/
- 3-10 24 HRS/Ø BO, 200 BW/TBG 19/CSG 16/11 SPMx72" LOS/FL 735, OP 3265/pH 7/
- 3-11 WELLTECK MIRU/POH w RODS & PMP/UNLANDED TBG/INSTLD BOP/POH w TBG/MU BKR 9-5/8" 36# FULLBORE PKR, RIH TO 4025, FILLED HOLE w 60 BBLs OF LSE PROD WTR (RECVRD APPROX 25 BBLs CRUDE OIL FRM ANNULUS)/SET FB @ 4035, HAD COMMUNICATION PUMPNG DN ANNULUS & DN TBG/RESET FB @ 4028.68', HAD COMM/RESET FB @ 4026.68 PRESS UP ANNULUS @ 500 PSI HELD OK/RIH TO 4121, SET FB, PMPD DN TBG, PRESS TO 700 PSI, HELD OK/PU TSTNG 1' @ A TIME @ 4116' HAD COMM/REL FB PUH TO 3468/
- 3-12 MEASURED PULLING OUT OF HOLE, TBG TALLEYS OK/RIH w KILL STG/SHUT WELL IN TILL AM 3-15-82/WAIT ON PROGRAM & APPROVAL/
- 3-15 BLED WELL DN/POH w KILL STG/TAGGED FILL @ 4233, CLND FINES TO 4237 (COULDN'T GET DPR)/PBD 4243, PU TO 4232 TO SPOT SD/RU HALIB, PLUGGED BOTH PMPs ON TRUCK w SD, REPLACEMENT TRK BROKE DN ON FREEWAY, PMP TRK ARIVD @ 3 PM/SPOTD 90 FT³ SILICA SD IN FOUR STGS FRM 4237-4030 (EST) TOP OF SD/PU TO 3022/SIFN/

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- 3-16 BLED WELL DN/LOWER TBG, TAG SD @ 4040/POH, RAN SCHLUM DMP BAILER, TAG SD @ 4034/BHT 140°/POH, MX $\frac{1}{2}$ SX HYDROMITE SET FOR 160°/RIH SET TOOL OFF @ 4034/POH, HYDROMITE SAT UP IN BAILER/RIH w 9-5/8" FB TO 3760/FILLED HOLE w 26 BBLS LSE WTR/SET FB, PRES TO 500 PSI ON CSG/EST BRK DN OF 2 BPM @ 550 PSI/PMP 25 SX THIXOTROPIC CMT FOLOWD BY 75 SX CL "G" CMT w 2% CaCl₂ & 6/10 OF 1% HALAD 9, DISP w 154 CF LSE WTR, PRES TO 1400 PSI/WAIT 20 MIN, DISP 22 CF @ 1675 PSI/EST TOP OF CMT @ 3883/CLOSE WELL IN w 1500 PSI ON TBG/PMP 51 CF CMT OUT HOLES/
- 3-17 BLED WELL DN/(HAD 150 PSI, SHUT IN PRESS ON TBG)/REL FB PKR/POH/MU 4 - 4-3/4" OD DRL CLRS ON 8-3/4" BIT, RIH ON 118 JTS OF 2-7/8" TBG, TAGD TOC @ 3885/RIGGED UP POWER SWIVEL, DRLD OUT CMT TO 4020 LEAVNG 11' CMT ABOV WSO HOLES @ 4031/POH, LAYD DN 21 JTS 2-7/8" TBG/BIT @ 3694/SIFN/
- 3-18 BLED WELL DN/REMOVD BOE/LANDED TBG w BIT @ 3707/RIH w RODS/LD DN 7 - 3/4", 6 - 7/8"x30' SUCKER RODS/CLND LOCATN/RDMO/WOC BEFORE CLN OUT & LOGGING/DROP FRM REPORT/
- 3-22 WELLTECH MIRU/BLED WELL DN/POH w RODS/UNLANDED TBG/INSTLD BOE/PICKED UP 11 JTS 2-7/8" TBG, RIH/DRLD OUT CMT FRM 4020-4025/BEGAN TSTNG TO 700 PSI EVERY 1' TO 4033, TSTS ALL OK/DRLD THRU CMT @ 4040/CLND OUT SD TO 4110/PUH TO 3523/SIFN/
- 3-23 BLED WELL DN/(VAC ON TBG) LOWERD 8-3/4" BIT TO 4110/FILLED HOLE w 7 BBLS LSE WTR, CONTD CLEANING OUT SD FRM 4110-4237/POH/RAN 8-3/4 BIT ON 9-5/8" 36# BKR CSG SCRPR TO 4235, CIRC OUT FINE CMT TO 4237/POH/RIGGED UP SCHLUM RAN GAMMA RAY - CMT BOND LOG FRM 4200-3348/SIFN/
- 3-24 BLED WELL DN/LD DN 4-3/4" DC/MU 9-5/8" 36# BKR CIRC WASH TOOL w 2' CUP SPACING, RIH ON 2-7/8" TBG TO 4007, TSTD TOOL, BLANKD OFF @ 1000 PSI/ CONTD IN HOLE w TOOL TO 4121-4119, BLANKD OFF @ 1000 PSI/PU TO 4118-4116 & TSTD PERFS EVERY 2' w AVG MAX BRK DN OF 500 PSI @ 15 FT³ PER MIN RATE & AVG FINAL PRESS OF 500 PSI @ 15 FT³ PER MIN RATE, THROUGHOUT PERFD INTERVL/FOLLOWNG INTERVLS BLANKD OFF @ 1000 PSI, 4094-4092, 4086-4074, 4050-4048, 4046-4078/POH, LD DN TOOL/RIH w KILL STG/SIFN/
- 3-25 BLED WELL DN/POH w KILL STG/RAN PROD TBG STG w PAGE TBG ANCHOR @ 3829, API T/L PMP SHOE @ 3957 & BTM OF MUD ANCHOR @ 3989.59/REMOVD BOE/LANDED TBG/RIH w OILWELL 3 TUBE 2 $\frac{1}{2}$ "x1-3/4"x25' PMP ON 97 - 3/4 & 32 - 7/8"x30' "EL" SUCKER RODS/SEATED & SPACD PMP/FILLED TBG w LSE PROD WTR/POP INTO BKR TK/RDMO/WELL OWES 154 BBLS WTR/IN TST 19 HRS/O BO, 207 BW/TBG 5#/CSG 0#/11 SPMx 72" LOS/FL 2636, OP 1322/(FLOWLINE CUT CONTAINED 1% MUD)/WELL PAID BK LOAD WTR, PLUS 53 BBLS FRM WELL)/

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- 3-26 10 HRS/O BO, 90 BW/TBG 5#/CSG 17#/11 SPMx72" LOS/WELL PMPD OFF @ 5:00 PM 3-26-82/SHUT WELL IN/FL 3956 @ PMP/FL @ 7:00 AM, 3-27-82 3602', OP 354'/
- 3-27 5 HRS/O BO, 28 BW/TBG 12#/CSG 16#/11 SPMx72" LOS/FL 3956 @ PMP/SHUT WELL IN/
- 3-28 2 HRS/O BO, 14 BW/TBG 12#/CSG 16#/11 SPMx72" LOS/FL 3956 @ PMP/SHUT WELL IN/
- 3-29 1½ HRS/Ø BO, 8 BW/TBG 12#/CSG 16#/11 SPMx72" LOS/FL 3956 @ PMP/SHUT WELL IN 3-30-82/FLUID RISE 20 HRS, 114'/DROP FRM REPORT/WELL TO BE SHUT IN 7 DAYS FOR BUILD UP/
- 5-3 14 HRS/98 BO, 60 BW/TBG 7#/CSG 19#/11 SPMx72" LOS/FL 3957 @ PMP/
NOTE: WELL HAS BEEN SHUT-IN FOR BUILD UP SINCE 3-29-82/FLUID LEVEL PRIOR TO PUTTING ON PROD, 1723', OP 2234'/
- 5-4 NO ACTIVITY/DROP FRM REPORT/
- 5-14 WELL SHUT-IN PENDING EVALUATION FOR STIMULATION PROGRAM/DROP FRM REPORT/
- 9-7 WELL TA'D 5-14-82/FINAL REPORT/

DIVISION OF OIL AND GAS

Report on Operations

L. B. Carroll, Jr., Agent
SUN EXPLORATION & PRODUCTION CO.
P.O. Box 55060
Valencia, CA 91355

Long Beach Calif.
April 20, 1982

Your operations at well NWLBU 8-7, API No. 037-22512,
Sec. 13, T4S, R13W, S.B. B.& M. Long Beach Field, in Los Angeles County,
were witnessed on 2/26/82 by W.E. Brannon, Engineer, representative of
the supervisor, was present from 1400 to 1600. There were also present J. Icardone

Present condition of well: 20" cem 50' 13-3/8" cem 1122'. 9-5/8" cem 4715', perf 4031' &
4356' & 4693' WSO, perf 4368-4412'; 7" cem 4626-5847', perf @ int. 5724-5777',
TD 5847 Plugged w/cem 5777-5583' & 4423-4242'.

The operations were performed for the purpose of Testing the 9-5/8" shut-off at 4031' with
a formation tester.

DECISION: APPROVED

NOTE: DEFICIENCIES TO BE CORRECTED
NONE

DEFICIENCIES CORRECTED
NONE

CONTRACTOR: California Production Service, Inc.

WEB:csw

cc: Update

Blanket Bond

M.G. MEFFERD

State Oil and Gas Supervisor

By

J. I. Hardon
Deputy Supervisor

J. I. HARDON

RM 3-23-82

Operator Sun Exploration & Production Co

Well designation NWLBW 8-7 Sec. 13, T. 4S, R. 13W, SB B.&M.

Field Long Beach, County Los Angeles was tested for water shutoff on 2-26-82. (Name) W.E. Brannon, representative of the supervisor, was present from 1400 to 1600. Also present were J. Icardone

Casing record of well: 20" ccm 50' 13 3/8" Cem 1122' 9 5/8" Cem 4715', perf 4031' 4356
4693' wsd, perf 4368-4412, 7" Cem 4626'-58 47, perf @ int 5729-5777, TD 5847 Plugged
w/ccm 5777-5593, 4423'-4242'

The operations were performed for the purpose of D-1 - 9 5/8" - 4031

- The 9 5/8" shutoff at 4031 ' is approved.
- The seal between the _____ " and _____ " casings is approved.
- The operations are approved as indicating that all of the injection fluid is confined to the formations below _____ ' at this time.

4693 wsd

Hole size: _____ " fr. _____ ' to _____ ' ; _____ " to _____ ' ; & _____ " to _____ '

Size	Wt.	Casing		Date	Cemented		Top of Fill		Sqd. Away	Final Press	Test psi/min. Perfs.
		Top	Bottom		MO-Depth	Volume	Annulus	Casing			

Depth or interval tested 4 1/2" holes @ 4031'
The hole was open to 4243 ' for test.

FORMATION TEST:

Packer(s) 3459 ' & _____ ' Tail 3980 ' Bean size 3/4" " Cushion NONE
IHP 1733 IFP 41 FFP 46 FHP 1704
Blow medium blow for 10 min, light blow for 20 min. Then dead remainder of test.
Open for test ONE Hr. _____ min. Fluid entry 60 feet oil & water

BAILING TEST:

The hole fluid was bailed to _____ ' , at _____ on _____ 19__ .
The hole fluid was found at _____ ' , at _____ on _____ 19__ .
(time)

PRODUCTION TEST:

Gauge/meter reading _____ on _____ 19__ , at _____ pump depth _____ ' Engr. _____
Gauge/meter reading _____ on _____ 19__ , at _____ Engr. _____
Fluid level _____ ' surveyed on _____ 19__ , reviewed (witnessed) by _____
Total fluid produced, Bbls. _____ Net oil _____ Water _____
Rate: _____ B/D oil, _____ B/D water, _____ % water cut

INJECTION SURVEY:

RA/Spinner/Temperature survey run at _____ B/D & _____ psi on _____ 19__ ,
fluid confined below _____ ' (Packer depth _____ ')

DEFICIENCIES—TO BE CORRECTED *NONE*

DEFICIENCIES—CORRECTED *NONE*

CONTRACTOR *California Production Service, Inc.*

DIVISION OF OIL AND GAS

Report on Operations

L. B. Carroll, Jr., Agent
SUN EXPLORATION & PRODUCTION CO.
P. O. Box 55060
Valencia, CA 91355

Long Beach Calif.
April 23, 1982

Your operations at well NWLBU 8-7, API No. 037-22512,
Sec. 13, T4S, R. 13W S. BB. & M. Long Beach Field, in Los Angeles County,
were witnessed on 2-25-82 by E. Santiago, Engineer, representative of
the supervisor, was present from 1030 to 1130. There were also present J. Incardone,
Drilling Foreman.

Present condition of well: 20" cem 50'; 13-3/8" cem 1122'; 9-5/8" cem 4715'.
perf 4356' WSO & 4693' WSO; 7" cem 4626'-5847', perf @ int 5724'
- 5777' & 4368' - 4412'. TD 5847'. Plugged w/cem 5777'-5583' &
4423'-4242'.

The operations were performed for the purpose of Witnessing the plugging operations in
the process of plugging back to abandon lower zone.

DECISION: APPROVED.

NOTE: DEFICIENCIES TO BE CORRECTED
NONE

DEFICIENCIES CORRECTED
NONE

CONTRACTOR: California Production Service, Inc.

ES:da

cc: Update

Blanket Bond

M. G. MEFFERD
State Oil and Gas Supervisor

By

V. J. Dade
Deputy Supervisor

M. J. HADLEY

DEFICIENCIES—TO BE CORRECTED

NONE

DEFICIENCIES—CORRECTED

NONE

CONTRACTOR CALIFORNIA PRODUCTION SERVICE, INC.

REPORT ON PROPOSED OPERATIONS

412
(field code)
03
(area code)
00
(new pool code)
00
(old pool code)

L. B. Carroll, Jr., Agent
SUN EXPLORATION & PRODUCTION CO.
P. O. Box 55060
Valencia, CA 91355

Long Beach, California
March 3, 1982

Your _____ proposal to Rework well NWLBU 8-7,
A.P.I. No. 037-22512, Section 13, T. 4S, R. 13W, S.B. B. & M.,
Long Beach field, Northwest Extension area, Brown pool,
Los Angeles County, dated 2-22-82, received 2-23-82 has been examined in conjunction with records
filed in this office.

THE PROPOSAL IS APPROVED PROVIDED:

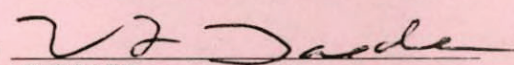
1. Blowout prevention equipment, equivalent to this division's Class II 2M requirements, or better, shall be installed and maintained in operating condition.
2. This division shall be consulted and a supplementary notice may be required before making any changes in the proposed program.
3. THIS DIVISION SHALL BE NOTIFIED:
 - a. To inspect the installed blowout prevention equipment prior to commencing down-hole operations.
 - b. To witness a test of the effectiveness of the 9-5/8" shut-off at 4030'.
 - c. To witness the location and hardness of the cement plug at 4250'.

RM:da

cc: Update

Blanket Bond

M. G. MEFFERD, State Oil and Gas Supervisor

By 
J. L. HARDOIN, Deputy Supervisor

A copy of this report and the proposal must be posted at the well site prior to commencing operations.

Records for work done under this permit are due within 60 days after the work has been completed or the operations have been suspended.

O&G
rerwork

DIVISION OF OIL AND GAS

Notice of Intention to Rerwork Well

This notice and indemnity or cash bond shall be filed, and approval given, before rerwork begins. If operations have not commenced within one year of receipt of the notice, this notice will be considered cancelled.

FOR DIVISION USE ONLY		
BOND	OGD114	OGD121
	<i>Blanket</i>	<i>2-23-82 CP</i>

DIVISION OF OIL AND GAS

In compliance with Section 3203, Division 3, Public Resources Code, notice is hereby given that it is our intention to rerwork well No. NWLBU #8-7, API No. 037-22512, Sec. 13, T. 4S, R. 13W, SB B. & M., LONG BEACH Field, LOS ANGELES County.

The present condition of the well is as follows:

- Total depth. 5847' PBD 5583'
- Complete casing record, including plugs and perforations:
13 3/8", 54.5# CSG 0-1122'
9 5/8", 36# CSG 0-4715' (3.247 GALLONS/FT)
7", 26# CSG 4626- 5847' (1.607 GALLONS/FT)
TD 5847'; PBD 5583'
PERFS: 4-1/2" JHPF FROM 4368-4376' & 4383-4412'
WSO @ 4356'
2 7/8", 6.5# TBG 0-4393' (.2431 GALLONS/FT)

- Present producing zone name BROWN "K" Zone in which well is to be recompleted BROWN "I"
- Present zone pressure 1150 PSI New zone pressure 1150 PSI
- Last produced 2/16/82 0 11 0
(Date) (Oil, B/D) (Water, B/D) (Gas, Mcf/D)
or
- Last injected — — — —
(Date) (Water, B/D) (Gas, Mcf) (Surface pressure, psig.)

The proposed work is as follows:

- MIRU
- SPOT CMT PLUG FROM 4423-4250': DOG TO WITNESS AND APPROVE
- SHOOT WSO @ 4031. DOG TO WITNESS.
- SQUEEZE CMT W/+50 SX IF REQD. RE SHOOT WSO @ 4030.
- PERFORATE FROM 4118-4041', 4087-4080', AND 4068-4038' W/4-1/2" JHPF
- ACIDIZE W/1000 GAL 15% HCL AND 3000 GAL 12% HCL 3% HF ACID
- RETURN WELL TO PRODUCTION.

It is understood that if changes in this plan become necessary we are to notify you immediately.

Address 25322 W RYE CANYON ROAD
(Street)
VALENCIA CALIFORNIA 91355-5060
(City) (State) (Zip)

By *LB Carroll Jr.* 2/22/82
(Name) (Date)

Telephone Number 805/257-6200 Type of Organization CORPORATION
(Corporation, Partnership, Individual, etc.)

DIVISION OF OIL AND GAS

Report on Operations

L. B. Carroll, Jr., Agent
SUN EXPLORATION & PRODUCTION CO. Long Beach Calif.
P. O. Box 55060 April 23, 1982
Valencia, CA 91355

Your operations at well NWLBU 8-7, API No. 037-22512,
Sec. 13, T.4S, R.13W S.B.B.&M. Long Beach Field, in Los Angeles County,
were witnessed on 2-4-82. G. W. Stark, Engineer, representative of
the supervisor, was present from 1250 to 1330. There were also present J. Incardone,
Drilling Foreman.

Present condition of well: 20" cem 50'; 13-3/8" cem 1122'; 9-5/8" cem 4715',
perf 4356', WSO & 4693' WSO; 7" cem 4626'-5847', perf @ int
5724'-5777'. TD 5847'. Plugged w/cem 5777'-5583'.

The operations were performed for the purpose of Testing the 9-5/8" shut-off at 4356'
with a formation tester.

DECISION: **APPROVED.**

NOTE: DEFICIENCIES TO BE CORRECTED
NONE

DEFICIENCIES CORRECTED
NONE

CONTRACTOR: Well Tech, Inc.

GWS:da

cc: Update

Blanket Bond

M. G. MEFFERD
State Oil and Gas Supervisor
By [Signature]
Deputy Supervisor

Operator SUN Oil Company *EXPLORATION & PRODUCTION CO.*

3-23-82

Well designation NW/4BU 8-7 Sec. 13, T. 4s, R. 13w, SBB.&M.

Field Long Beach, County Los Angeles was tested for water shutoff on 2-4-82. (Name) GW Stark, representative of the supervisor, was present from 1250 to 1330. Also present were J. Incardone PF

Casing record of well: 20" cem 50'; 13 3/8" cem 1122'; 9 5/8" cem 4715'; perf 4356' wso
6' 4693' wso; 7" cem 4626'-5847'; perf @ int. 5724'-5777'. T.D 5847'. Plugged
w/cem 5777'-5523'.

The operations were performed for the purpose of (D) - 1 4356'

- The 9 5/8 " shutoff at 4356 ' is approved.
- The seal between the _____ " and _____ " casings is approved.
- The operations are approved as indicating that all of the injection fluid is confined to the formations below _____ ' at this time.

Hole size: _____ " fr. _____ ' to _____ ' ; _____ " to _____ ' ; & _____ " to _____ '.

Size	Casing		Cemented			Top of Fill		Sqd. Away	Final Press	Test psi/min. Perfs.
	Wt.	Top	Bottom	Date	MO-Depth	Volume	Annulus			

Depth or interval tested 4 - 1/2" holes @ 4356'
The hole was open to _____ ' for test.

FORMATION TEST:
Packer(s) 4298 ' & _____ ' Tail 4326 ' Bean size 3/4 " Cushion 0
IHP 1850 IFP 43 FFP 55 FHP 1851
Blow 6 min light decreasing to dead in 14 min
Open for test 1 Hr. 0 min. Fluid entry 70' hole fluid

BAILING TEST:
The hole fluid was bailed to _____ ', at _____ on _____ 19__ .
The hole fluid was found at _____ ', at _____ on _____ 19__ .

PRODUCTION TEST:
Gauge/meter reading _____ on _____ 19__ , at _____ pump depth _____ ' Engr. _____
Gauge/meter reading _____ on _____ 19__ , at _____ Engr. _____
Fluid level _____ ' surveyed on _____ 19__ , reviewed (witnessed) by _____
Total fluid produced, Bbls. _____ Net oil _____ Water _____
Rate: _____ B/D oil, _____ B/D water, _____ % water cut

INJECTION SURVEY:
RA/Spinner/Temperature survey run at _____ B/D & _____ psi on _____ 19__ ,
fluid confined below _____ ' (Packer depth _____ ')

Deficiencies corrected
none

Deficiencies to be corrected
none

Contractor: Well Tech, Inc.

DIVISION OF OIL AND GAS

Report on Operations

L. B. Carroll, Jr., Agent
SUN EXPLORATION & PRODUCTION CO. Long Beach Calif.
P. O. Box 55060 April 23, 1982
Valencia, CA 91355

Your operations at well NWLBU 8-7, API No. 037-22512,
Sec. 13, T. 4S R. 13W S. B.B. & M. Long Beach Field, in Los Angeles County,
were witnessed on 2-3-82. G. W. Stark, Engineer, representative of
the supervisor, was present from 1800 to 1830. There were also present D. Wang,
Drilling Foreman.

Present condition of well: 20" cem 50'; 13-3/8" cem 1122'; 9-5/8" cem 4715',
perf 4693' WSO; 7" cem 4626'-5847', perf @ intervals 5724'-5777'.
TD 5847'.

The operations were performed for the purpose of Inspecting the blowout prevention
equipment and installation.

DECISION: APPROVED.

NOTE: DEFICIENCIES TO BE CORRECTED
NONE

DEFICIENCIES CORRECTED
NONE

CONTRACTOR: Well Tech, Inc.

GWS:da

cc: Update

Blanket Bond

M. G. MEFFERD
State Oil and Gas Supervisor
By [Signature]
Deputy Supervisor
[Signature] T. T. HADDON

**DIVISION OF OIL AND GAS
BLOWOUT PREVENTION EQUIPMENT MEMO**

PH 5-23-82

T 182251

EXPLORATION/PRODUCTION CO.

Operator or SUN Oil Company Well "NW4488-7" Field Long Beach County LA

VISITS: Date Engineer Time Operator's Rep. Title
 1st 2-3-82 GW Stark 1800 to 1830 D. Wang DF
 2nd _____ _____ _____ _____ _____

Casing record of well: 20" Cem 50; 13 3/8" Cem 1122; 9 5/8" Cem 4715; perf 4693 WSO; 7" Cem 4626'-5847'; perf @ intervals 5724'-5777'; TD 5847'.

OPERATION: ~~Testing~~ (inspecting) the blowout prevention equipment and installation.
 DECISION: The blowout prevention equipment and installation are approved.

Proposed Well Opns: Perf new zone MPSP: _____ psi
 Hole size: 1" fr. sur f' to 2000' , _____" to _____" & _____" to _____"

REQUIRED
 BOPE CLASS: II 2m

CASING RECORD (BOPE ANCHOR STRING ONLY)					Cement Details		Top of Cement	
Size	Weight(s)	Grade (s)	Shoe at	CP at			Casing	Annulus
			<u>1000</u>					

BOP STACK							a	b	a/b	TEST DATA			
API Symb.	Ram Sz.	Mfr.	Model or Type	Size In.	Press. Rtg.	Date Last Overhaul	Gal. to Close	Rec. Time Min.	Calc. GPM Output	psi Drop to Close	Secs. to Close	Test Date	Test Press.
<u>Rd</u>	<u>2 1/2</u>	<u>Shaffer</u>	<u>mech</u>	<u>A</u>	<u>3000</u>	<u>-</u>							
<u>+</u>	<u>CSO</u>	<u>"</u>	<u>"</u>	<u>"</u>	<u>"</u>	<u>-</u>							

ACTUATING SYSTEM			
Accum. Unit(s)	Wkg. Press.		psi
Total Rated Pump Output			gpm
Distance From Well Bore			ft.
Mfr.	Accum. Cap.	Precharge	
1	gal.	psi	
2	gal.	psi	
CONTROL STATIONS			Elec. Hyd.
Manif. at accum. unit			
Remote at Drlr's stn.			
Other:			
EMERG. BACKUP SYST.		Press.	Wkg. Fl.
N2 Cyl No:	Tpe:	1	gal
Other:		2	gal
		3	gal
		4	gal
		5	gal
		6	gal

AUXILIARY EQUIPMENT						
	No.	Sz. (in)	Rated Press.	Connections		
				Weld	Flan.	Thrd.
Fill-Up Line						
Kill Line						
Control Valve(s)						
Check Valve(s)						
Auxil. Pump Connec.						
Choke Line						
Control Valve(s)						
Pressure Gauge						
Adjustable Choke(s)						
Bleed Line						
Upper Kelly Cock						
Lower Kelly Cock						
Standpipe Valve						
Standpipe Pressure Ga.						
Pipe Safety Valve						
Internal Preventer						

HOLE FLUID MONITORING EQUIPMENT			Alarm	Class
Calibrated Mud Pit	Aud.	Vis.		A
Pit Level Indicator				B
Pump Stroke Counter				
Pit Level Recorder				C
Flow Sensor				
Mud Totalizer				
Calibrated Trip Tank				
Other:				

REMARKS: _____

Hole Fluid Type	Weight	Storage-Pits

DEFICIENCIES--TO BE CORRECTED

none

DEFICIENCIES--CORRECTED

none

CONTRACTOR *Well Tech, Inc.*

REPORT ON PROPOSED OPERATIONS

412

(field code)

03

(area code)

00

(new pool code)

00

(old pool code)

L. B. Carroll, Jr., Agent
SUN EXPLORATION & PRODUCTION CO.
P. O. Box 55060
Valencia, CA 91355

Long Beach, California
February 17, 1982

Your _____ proposal to Rework well NWLBU 8-7,
A.P.I. No. 037-22512, Section 13, T. 4S, R. 13W, S.B. B. & M.,
Long Beach field, Northwest Extension area, Brown pool,
Los Angeles County, dated 2-3-82, received 2-4-82 has been examined in conjunction with records
filed in this office.

THE PROPOSAL IS APPROVED PROVIDED:

1. Blowout prevention equipment, equivalent to this division's Class II 2M requirements, or better, shall be installed and maintained in operating condition.
2. This division shall be consulted and a supplementary notice may be required before making any changes in the proposed program.
3. **THIS DIVISION SHALL BE NOTIFIED:**
 - a. To inspect the installed blowout prevention equipment prior to commencing down-hole operations.
 - b. To witness the location and hardness of the cement plug at 5620'.

RM:da

cc: Update

Blanket Bond

M. G. MEFFERD, State Oil and Gas Supervisor

By J. L. Hardoin
J. L. HARDOIN, Deputy Supervisor

A copy of this report and the proposal must be posted at the well site prior to commencing operations.

Records for work done under this permit are due within 60 days after the work has been completed or the operations have been suspended.

o/g
rework

DIVISION OF OIL AND GAS
Notice of Intention to Rework Well

This notice and indemnity or cash bond shall be filed, and approval given, before rework begins. If operations have not commenced within one year of receipt of the notice, this notice will be considered cancelled.

FOR DIVISION USE ONLY		
BOND	OGD114	OGD121
Blanket	2-10-82 CP	2-10-82

DIVISION OF OIL AND GAS

In compliance with Section 3203, Division 3, Public Resources Code, notice is hereby given that it is our intention to rework well No. NWLB UNIT #8-7, API No. 037-22512, Sec. 13, T. 4S, R. 13W, SB B. & M., LONG BEACH Field, LOS ANGELES County.

The present condition of the well is as follows:

1. Total depth. 5847' PBD 5837'

2. Complete casing record, including plugs and perforations:

13 3/8", 54.5# CSG 0-1122'
9 5/8", 36# CSG 0-4715' (3.247 GALLONS/FT)
7", 26# CSG 4626-5847' (1.607 GALLONS/FT)
T.D. 5847'; PBD 5837'
PERFS: 8- .33" JHPF FROM 5764' - 5777'
4- 1/2" JHPF FROM 5724' - 5736' AND 5738' - 5756'

3. Present producing zone name BROWN - "V" Zone in which well is to be recompleted BROWN - "K"

4. Present zone pressure 1200 PSI New zone pressure 1200 PSI

5. Last produced 1/26/82 0 20 0
(Date) (Oil, B/D) (Water, B/D) (Gas, Mcf/D)

or

6. Last injected _____
(Date) (Water, B/D) (Gas, Mcf) (Surface pressure, psig.)

The proposed work is as follows:

- MIRU
- SPOT CMT PLUG FROM 5777'-5620'. DOG TO WITNESS PLACEMENT AND LOCATION OF PLUG.
- PERFORATE WELL FROM 4383'-4411' AND FROM 4368'-4376' W/4 1/2" JHPF.
- ACIDIZE AS FOLLOWS: 1800 GALLONS 15% HCR, 1800 GALLONS 12% HCI-3% HF, 25 BBL 2% AM-CL WATER.
- RIH W/RODS, TBG, AND ACID PUMP. RTP.

It is understood that if changes in this plan become necessary we are to notify you immediately.

Address 25322 W RYE CANYON ROAD
(Street)
VALENCIA CALIFORNIA 91355-0560
(City) (State) (Zip)
Telephone Number 805/257-6200

SUN EXPLORATION AND PRODUCTION COMPANY
SUN PRODUCTION DIVISION
(Name of Operator)
By [Signature] 2/3/82
(Name) (Date)
Type of Organization CORPORATION
(Corporation, Partnership, Individual, etc.)

GENE WINN
BASIN SEGMENT

RECEIVED

FEB 4 9 11 AM '82

DIV. OF OIL AND GAS
LONG BEACH, CA.

DIVISION OF OIL AND GAS

Report on Operations

L. B. Carroll, Jr., Agent
SUN OIL COMPANY
P. O. Box 55060
Valencia, CA 91355

Long Beach Calif.
October 21, 1981

Your operations at well NWLBU 8-7, API No. 037-22512,
Sec. 13, T4S, R. 13W, S.B. B. & M. Long Beach Field, in Los Angeles County,
were witnessed on 9-21-81. R. Manuel, Engineer, representative of
the supervisor, was present from 1145 to 1215. There were also present Don Rodgers,
Drilling Foreman.

Present condition of well: 20" cem 50'; 13-3/8" cem 1122'; 9-5/8" cem 4715', perf
4693' WSO. TD 4906' (Drilling).

The operations were performed for the purpose of Testing the 9-5/8" shut-off at 4693' with
a formation tester.

DECISION: APPROVED.

NOTE: DEFICIENCIES TO BE CORRECTED
NONE

DEFICIENCIES CORRECTED
NONE

CONTRACTOR: Atlantic Oil Company

RM:dh

cc: Update

TM / D. Daniels (Sun) 2-2-82
7" cem 4626' - 5841', perfs @ int 5724' - 5777'
OK to plug from 5777' to 5620'. Will send
Report on proposed operations
immediately.

M. G. MEFFERD
State Oil and Gas Supervisor

By

[Signature]
Deputy Supervisor

[Signature]
R. A. YBARRA

Operator Sun Oil Company

Well designation NWLRV 8-7 Sec. 13, T. 4S, R. 13W, SR B.&M.

Field Long Beach, County L-A. was tested for water shutoff on 9-21-81. (Name) R. Manuel, representative of the supervisor, was present from 1145 to 1215. Also present were Don Rodgers - D.F.

Casing record of well: 20" cem 50'; 13 3/8" cem 1122'; 9 5/8" cem 4715', perf 4693' WSO.
TD 4906' (drilling).

The operations were performed for the purpose of (D-1) 9 5/8" @ 4693'

- The 9 5/8" shutoff at 4693' is approved.
- The seal between the _____ " and _____ " casings is approved.
- The operations are approved as indicating that all of the injection fluid is confined to the formations below _____ ' at this time.

Hole size: 12 1/4" fr. 1122' to 4725'; 8 3/4" to 4906'; & _____ " to _____ '.

Size	Casing		Cemented		Top of Fill		Sqd. Away	Final Press	Test psi/min. Perfs.
	Wt.	Top	Bottom	Date	MO-Depth	Volume			
<u>9 5/8"</u>	<u>36</u>	<u>Ø</u>	<u>4715'</u>	<u>9-19-81</u>	<u>thru shoe</u>	<u>1276cf</u>	<u>Surf</u>	<u>4487'</u>	<u>1000</u>

Depth or interval tested 4-1/2" holes @ 4693'
The hole was open to 4705' for test.

FORMATION TEST:

Packer(s) 4641' & _____ ' Tail 4669' Bean size 3/4" Cushion Ø
IHP 2200 IFP 57 FFP 57 FHP 2190
Blow light throughout test
Open for test 1 Hr. Ø min. Fluid entry 30' mud

BAILING TEST:

The hole fluid was bailed to _____ ', at _____ on _____ 19___.
The hole fluid was found at _____ ', at _____ on _____ 19___.
(time)

PRODUCTION TEST:

Gauge/meter reading _____ on _____ 19__, at _____ pump depth _____ ' Engr. _____
Gauge/meter reading _____ on _____ 19__, at _____ Engr. _____
Fluid level _____ ' surveyed on _____ 19__, reviewed (witnessed) by _____
Total fluid produced, Bbls. _____ Net oil _____ Water _____
Rate: _____ B/D oil, _____ B/D water, _____ % water cut

INJECTION SURVEY:

RA/Spinner/Temperature survey run at _____ B/D & _____ psi on _____ 19__,
fluid confined below _____ ' (Packer depth _____ ')

DEFICIENCIES—TO BE CORRECTED

None

DEFICIENCIES—CORRECTED

None

CONTRACTOR

Atlantic Oil Co.

C.R.G. Properties, Ltd.

DECL. CORR. 14 DEG. 30 MIN. EAST

MEAS. DEPTH	DRIFT ANGLE	DRIFT BEARING	VERTICAL DEPTH	VERTICAL SUB-SEA	TOTAL COORDINATES
125	0015	N64 00E	125.0	-69.0	.1 N .2 E
215	0015	N14 00E	215.0	-159.0	.4 N .5 E
306	0015	S18 00W	306.0	-250.0	.5 N .1 E
417	0015	N36 00W	417.0	-361.0	.5 N .4 W
507	0015	N49 00E	507.0	-451.0	.8 N .3 W
600	0015	N60 00W	600.0	-544.0	1.3 N .4 W
693	0015	N34 00E	693.0	-637.0	1.6 N .5 W
783	0015	N09 30E	783.0	-727.0	2.0 N .3 W
875	0015	N80 00E	875.0	-819.0	2.3 N 0.0 W
965	0030	S05 00E	965.0	-909.0	1.9 N .4 E
1120	0030	N73 00W	1120.0	-1064.0	1.1 N .6 W
1192	0030	N15 00W	1192.0	-1136.0	1.5 N 1.0 W
1286	0000	N00 00E	1286.0	-1230.0	1.9 N 1.2 W
1386	0015	N21 00W	1386.0	-1330.0	2.1 N 1.2 W
1428	0245	N01 00W	1428.0	-1372.0	3.2 N 1.4 W
1489	0415	N14 00W	1488.9	-1432.9	6.9 N 1.9 W
1549	0600	N29 00W	1548.6	-1492.6	11.9 N 3.9 W
1611	0730	N24 00W	1610.2	-1554.2	18.4 N 7.1 W
1672	0930	N17 00W	1670.5	-1614.5	26.9 N 10.3 W
1735	1115	N11 00W	1732.5	-1676.5	37.9 N 13.0 W
1766	1215	N13 00W	1762.8	-1706.8	44.0 N 14.4 W
1894	1330	N25 00W	1887.6	-1831.6	71.0 N 23.6 W
1989	1315	N23 30W	1980.0	-1924.0	91.1 N 32.7 W
2081	1315	N22 00W	2069.6	-2013.6	110.5 N 40.8 W
2173	1315	N25 30W	2159.1	-2103.1	129.8 N 49.3 W
2264	1300	N30 30W	2247.8	-2191.8	148.0 N 59.0 W
2357	1230	N25 30W	2338.5	-2282.5	166.2 N 68.7 W
2404	1330	N21 00W	2384.3	-2328.3	175.9 N 72.8 W
2465	1330	N05 00W	2443.6	-2387.6	189.8 N 76.0 W
2571	1300	N02 00E	2546.8	-2490.8	214.0 N 76.7 W
2663	1300	N02 00E	2636.4	-2580.4	234.7 N 75.9 W
2754	1245	N03 00E	2725.1	-2669.1	255.0 N 75.1 W
2848	1230	N03 00E	2816.8	-2760.8	275.5 N 74.0 W
2938	1215	N05 30E	2904.7	-2848.7	294.7 N 72.6 W
3022	1200	N04 30E	2986.9	-2930.9	312.3 N 71.0 W

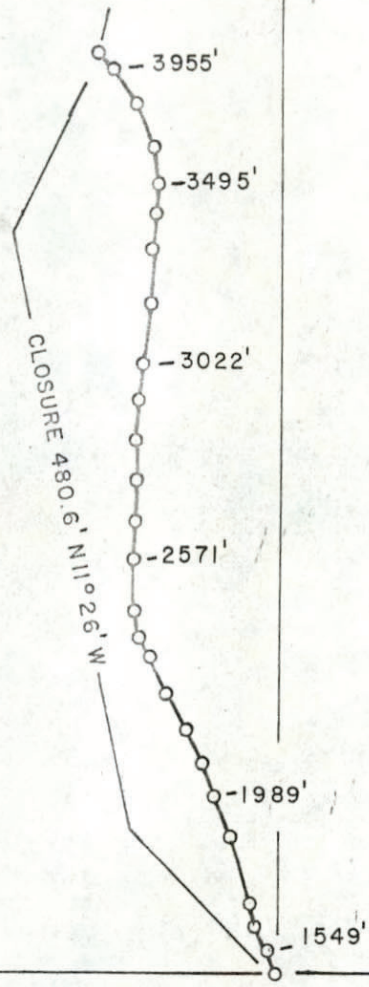
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 LONG BEACH, CALIF.

MEAS. DEPTH	DRIFT ANGLE	DRIFT BEARING	VERTICAL DEPTH	VERTICAL SUB-SEA	TOTAL COORDINATES	
3175	1200	N04 30E	3136.5	-3080.5	344.0 N	68.5 W
3207	1200	N04 30E	3167.8	-3111.8	350.7 N	68.0 W
3310	1130	N03 30E	3268.7	-3212.7	371.6 N	66.5 W
3404	1130	N04 30E	3360.8	-3304.8	390.3 N	65.2 W
3495	1045	N05 00E	3450.1	-3394.1	407.8 N	63.8 W
3575	1330	N11 00W	3528.3	-3472.3	424.6 N	64.7 W
3635	1200	N25 00W	3586.8	-3530.8	437.1 N	68.7 W
3696	0930	N34 00W	3646.7	-3590.7	447.1 N	74.3 W
3758	0615	N43 00W	3708.2	-3652.2	453.7 N	79.6 W
3863	0330	N41 00W	3812.8	-3756.8	460.3 N	85.6 W
3955	0215	N41 00W	3904.7	-3848.7	463.8 N	88.6 W
4047	0200	N42 00W	3996.6	-3940.6	466.4 N	90.9 W
4139	0115	N40 00W	4088.6	-4032.6	468.3 N	92.6 W
4235	0115	N69 00W	4184.5	-4128.5	469.6 N	94.3 W
4332	0045	N54 00W	4281.5	-4225.5	470.4 N	95.8 W
4427	0015	N34 00E	4376.5	-4320.5	471.2 N	95.9 W
4518	0030	S26 00E	4467.5	-4411.5	471.1 N	95.3 W

CLOSURE: 480.6 FEET N 11 DEG. 26 MIN. W

COMPUTED USING THE AVERAGED ANGLE METHOD

4518' M.D.
471.1' NORTH
95.3' WEST



DECL. 14°30'



1" = 100'

N.W.L.B.U. WEL L No. 8-7

DIVISION OF OIL AND GAS

Report on Operations

L. B. Carroll, Jr., Agent
SUN OIL COMPANY
P. O. Box 55060
Valencia, CA 91355

Long Beach Calif.
October 21, 1981

Your operations at well NWLBU 8-7, API No. 037-22512,
Sec. 13, T. 4S R.13W, S.B. B. & M. Long Beach Field, in Los Angeles County,
were witnessed on 8-30-81. W. E. Brannon, Engineer, representative of
the supervisor, was present from 0300 to 0700. There were also present D. Rodgers,
Drilling Foreman.
Present condition of well: 20" cem 50'; 13-3/8" cem 1122' TD 1122' (Drilling).

The operations were performed for the purpose of Testing the blowout prevention equipment and installation.

DECISION: APPROVED.

NOTE: DEFICIENCIES TO BE CORRECTED
NONE

DEFICIENCIES CORRECTED

1. Elbows on choke and kill lines.
2. Pipe safety valve was defective.
3. Driller did not know how to close upper kelly cock.
4. No tool available to close upper kelly cock.
5. Accumulator took too long to pressure up.
6. Leak in choke line.
7. No "P" report at drill site.

CONTRACTOR: Atlantic Oil Company

WEB:dh

cc: Update

M. G. MEFFERD

State Oil and Gas Supervisor

By [Signature]
Deputy Supervisor

R. A. YBARRA

DIVISION OF OIL AND GAS
BLOWOUT PREVENTION EQUIPMENT MEMO

110

T 1080

Operator Sun Oil Company Well NWILBU 8-7 Field Long Beach County Los Angeles

VISITS: Date Engineer Time Operator's Rep. Title
 1st 8-30-81 W.E. BRANNON 0300 to 0700 D. Rodgers DF
 2nd _____ _____ to _____ _____

Casing record of well: 20" Cem 50'; 13 3/8" Cem 1122 TD 1122 (drilling)

OPERATION: Testing (inspecting) the blowout prevention equipment and installation.
 DECISION: The blowout prevention equipment and installation are approved.

Proposed Well Opns: drill MPSP: _____ psi
 Hole size: 24 " fr. 0 ' to 50 ', 17 1/2 " to 1122 ' & _____ " to _____ ' REQUIRED
BOPE CLASS: III B3M

CASING RECORD (BOPE ANCHOR STRING ONLY)					Cement Details		Top of Cement	
Size	Weight(s)	Grade (s)	Shoe at	CP at			Casing	Annulus
<u>13 3/8</u>	<u>54 #</u>	<u>K-55</u>	<u>1122</u>		<u>1556 Rumped Plug w/1000#</u>		<u>1076</u>	<u>0</u>

BOP STACK						a	b	a/b	TEST DATA				
API Symb.	Ram Sz.	Mfr.	Model or Type	Size In.	Press. Rtg.	Date Last Overhaul	Gal. to Close	Rec. Time Min.	Calc. GPM Output	psi Drop to Close	Secs. to Close	Test Date	Test Press.
<u>A</u>	<u>12</u>	<u>Hydril</u>	<u>GK</u>	<u>12</u>	<u>3000</u>							<u>8/29</u>	<u>1200</u>
<u>Rd</u>	<u>4 1/2</u>	<u>Shaffer</u>	<u>B</u>	<u>12</u>	<u>3000</u>							<u>8/29</u>	<u>1000</u>
<u>Rd</u>	<u>650</u>	<u>Shaffer</u>	<u>B</u>	<u>12</u>	<u>3000</u>							<u>8/29</u>	<u>1200</u>

ACTUATING SYSTEM		
Accum. Unit(s)	Wkg. Press.	<u>1500</u> psi
Total Rated Pump Output		_____ gpm
Distance From Well Bore		<u>75</u> ft.
Mfr.	Accum. Cap.	Precharge
<u>1 Hydril</u>	<u>80</u> gal.	<u>600</u> psi
<u>2</u>	_____ gal.	_____ psi
CONTROL STATIONS		Elec. Hyd.
<input checked="" type="checkbox"/>	Manif. at accum. unit	<input checked="" type="checkbox"/>
<input checked="" type="checkbox"/>	Remote at Drlr's stn.	<input checked="" type="checkbox"/>
Other: _____		
EMERG. BACKUP SYST.	Press.	Wkg. Fl.
<input checked="" type="checkbox"/>	<u>N2 Cyl No: 3</u>	<u>12500</u> gal
	Other:	<u>22300</u> gal
		<u>32400</u> gal
		<u>4</u> gal
		<u>5</u> gal
		<u>6</u> gal

AUXILIARY EQUIPMENT						
	No.	Sz. (in)	Rated Press.	Connections		
				Weld	Flan.	Thrd.
<input checked="" type="checkbox"/>	Fill-Up Line					
<input checked="" type="checkbox"/>	Kill Line	<u>2</u>	<u>3000</u>			<u>X</u> <u>1200</u>
<input checked="" type="checkbox"/>	Control Valve(s)	<u>1</u>	<u>3000</u>			<u>X</u> <u>—</u>
<input checked="" type="checkbox"/>	Check Valve(s)	<u>1</u>	<u>3000</u>			<u>X</u> <u>1200</u>
<input checked="" type="checkbox"/>	Auxil. Pump Connec.		<u>3000</u>			<u>X</u> <u>1200</u>
<input checked="" type="checkbox"/>	Choke Line	<u>2"</u>	<u>3000</u>			<u>X</u> <u>1200</u>
<input checked="" type="checkbox"/>	Control Valve(s)	<u>3</u>	<u>3000</u>			<u>X</u> <u>1200</u>
<input checked="" type="checkbox"/>	Pressure Gauge					<u>X</u> <u>—</u>
<input checked="" type="checkbox"/>	Adjustable Choke(s)	<u>1</u> <u>2"</u>	<u>3000</u>			<u>X</u> <u>1200</u>
<input checked="" type="checkbox"/>	Bleed Line	<u>2"</u>				<u>X</u> <u>—</u>
<input checked="" type="checkbox"/>	Upper Kelly Cock					<u>—</u>
<input checked="" type="checkbox"/>	Lower Kelly Cock					<u>—</u>
<input checked="" type="checkbox"/>	Standpipe Valve					<u>1200</u>
<input checked="" type="checkbox"/>	Standpipe Pressure Ga.					<u>—</u>
<input checked="" type="checkbox"/>	Pipe Safety Valve	<u>4 1/2</u>	<u>3000</u>			<u>—</u>
<input checked="" type="checkbox"/>	Internal Preventer	<u>4 1/2</u>	<u>3000</u>			<u>—</u>

HOLE FLUID MONITORING EQUIPMENT			Alarm	Class
<input checked="" type="checkbox"/>	Calibrated Mud Pit	Aud.	Vis.	<u>A</u>
<input checked="" type="checkbox"/>	Pit Level Indicator	<u>X</u>	<u>X</u>	<u>B</u>
<input checked="" type="checkbox"/>	Pump Stroke Counter	<u>X</u>	<u>X</u>	<u>B</u>
	Pit Level Recorder			<u>C</u>
	Flow Sensor			
	Mud Totalizer			
	Calibrated Trip Tank			
	Other:			

REMARKS: _____

Hole Fluid Type	Weight	Storage-Pits
<u>Clay base mud</u>	<u>70#</u>	<u>770 Bbl</u>

DEFICIENCIES—TO BE CORRECTED

None on Kill and Control

DEFICIENCIES—CORRECTED

- 1- elbows on choke and kill lines
- 2- pipe safety valve was defective
- 3- driller did not know how to close upper Kelly Cock
- 4- No tool available to close upper Kelly cock
- 5- accumulator took too long to pressure up
- 6- leak in choke line
- 7- No "p" report at drill site

CONTRACTOR

Atlantic Oil Co.

REPORT ON PROPOSED OPERATIONS

412
(field code)
03
(area code)
00
(pool code)

L. B. Carroll, Jr., Agent
SUN OIL COMPANY
P. O. Box 55060
Valencia, CA 91355

Long Beach, California
August 28, 1981

Your _____ proposal to Drill well NWLBU 8-7,
A.P.I. No. 037-22512, Section 13, T. 4S, R. 13W, S. B. B. & M., Marine &
Long Beach field, Northwest Extension area, L. Alamitos, Brown pool,
Los Angeles County, dated 8-20-81, received 8-21-81 has been examined in conjunction with records
filed in this office.

1. Blowout prevention equipment, equivalent to this division's Class 4 III B, 3M requirements or better, shall be installed and maintained in operating condition.
2. Drilling fluid of a quality and in sufficient quantity to control all sub-surface conditions in order to prevent blowouts shall be used.
3. All oil, gas or fresh water sands behind the 9-5/8" casing shall be protected by either lifting cement or by multiple stage cementing.
4. A directional survey shall be made and filed with this division.
5. THIS DIVISION SHALL BE NOTIFIED:
 - a. To witness a test of the installed blowout prevention equipment prior to drilling out cement in the shoe of the 10-3/8" casing.
 - b. To witness a test of the effectiveness of the 9-5/8" shut-off above the lower Alamitos zone.

HO:dh

cc: Update
EDP

Blanket Bond

M. G. MEFFERD, State Oil and Gas Supervisor

By [Signature]
R. A. YBARRA, Deputy Supervisor

A copy of this report and the proposal must be posted at the well site prior to commencing operations.

Records for work done under this permit are due within 60 days after the work has been completed or the operations have been suspended.

*O&G
News*

DIVISION OF OIL AND GAS
Notice of Intention to Drill New Well

C.E.Q.A. INFORMATION			
EXEMPT <input type="checkbox"/>	NEG. DEC. <input checked="" type="checkbox"/>	E.I.R. <input type="checkbox"/>	DOCUMENT NOT REQUIRED BY LOCAL JURISDICTION <input type="checkbox"/>
CLASS _____	64-77 S.C.H. NO. _____	S.C.H. NO. _____	
See Reverse Side			

FOR DIVISION USE ONLY					
MAP	MAP BOOK	CARDS	BOND	FORMS	
				114	121
137	825181	825181	Balke	825181	825181

In compliance with Section 3203, Division 3, Public Resources Code, notice is hereby given that it is our intention to commence drilling well NW LONG BEACH UNIT #8-7, API No. 037-22512,
(Assigned by Division)
Sec. 13, T. 4S, R. 13W, SB B. & M., Long Beach Field, Los Angeles County.
Legal description of mineral-right lease, consisting of 149 acres, is as follows: _____
(Attach map or plat to scale)
see attached

Do mineral and surface leases coincide? Yes _____ No X If answer is no, attach legal description of both surface and mineral leases, and map or plat to scale.

Location of well 487 feet North ~~along section/property line~~ and 779 feet West
(Direction) (Cross out one) (Direction)
at right angles to said line from the ~~xxxxxx section/property~~ _____
(Cross out one)
intersection of centerline of San Antonio Drive & Del Mar Avenue

Is this a critical well according to the definition on the reverse side of this form? Yes No

If well is to be directionally drilled, show proposed coordinates (from surface location) at total depth:
463 feet North and 100 feet West
(Direction) (Direction)

Elevation of ground above sea level 45.5 feet.

All depth measurements taken from top of Kelly Bushing that is +10 feet above ground.
(Derrick Floor, Rotary Table, or Kelly Bushing)

PROPOSED CASING PROGRAM

SIZE OF CASING INCHES API	WEIGHT	GRADE AND TYPE	TOP	BOTTOM	CEMENTING DEPTHS	CALCULATED FILL BEHIND CASING
13 3/8"	54.5#	K-55; BT & C	Surface	1100'	1100'	1528 CF=200% to surf
9 5/8"	36#	K-55; ST & C	Surface	2900'	2900'	705 CF=125% to 13 3/8" shoe
7"	26#	K-55; ST & C	2700'	5900'	5900'	1473 CF=125% to 9 5/8" shoe

(A complete drilling program is preferred and may be submitted in lieu of the above program.)
Intended zone(s) Lower Alamitos @ 3946' TVD; Brown @ 4626' TVD;
of completion Marine @ 5196' TVD; Pressure = 800 PSI Estimated total depth 5826' TVD
(Name, depth, and expected pressure)

It is understood that if changes in this plan become necessary we are to notify you immediately.

Name of Operator <u>SUN OIL COMPANY (DELAWARE)</u>	Type of Organization (Corporation, Partnership, Individual, etc.) <u>CORPORATION</u>
Address <u>P O BOX 55060</u>	City <u>VALENCIA, CA</u>
Telephone Number <u>805/257-6200</u>	Name of Person Filing Notice <u>L. B. Carroll, Jr.</u>
	Signature <i>L B Carroll Jr.</i>
	Date <u>8/20/81</u>

This notice and indemnity or cash bond shall be filed, and approval given, before drilling begins. If operations have not commenced within one year of receipt of the notice, this notice will be considered cancelled.

Information for compliance with the California Environmental Quality Act of 1970 (C.E.Q.A.).

If an environmental document has been prepared by the lead agency, please submit a copy of the document with this notice or supply the following information:

Lead Agency: City of Long Beach
Contact Person: G. H. Felgemaker
Address: 333 West Ocean Blvd.
Long Beach, CA 90802
Phone: (805) 590-6894

FOR DIVISION USE ONLY	
District review of environmental document (if applicable)?	Yes <input type="checkbox"/> No <input type="checkbox"/>
Remarks:	<hr/> <hr/> <hr/>

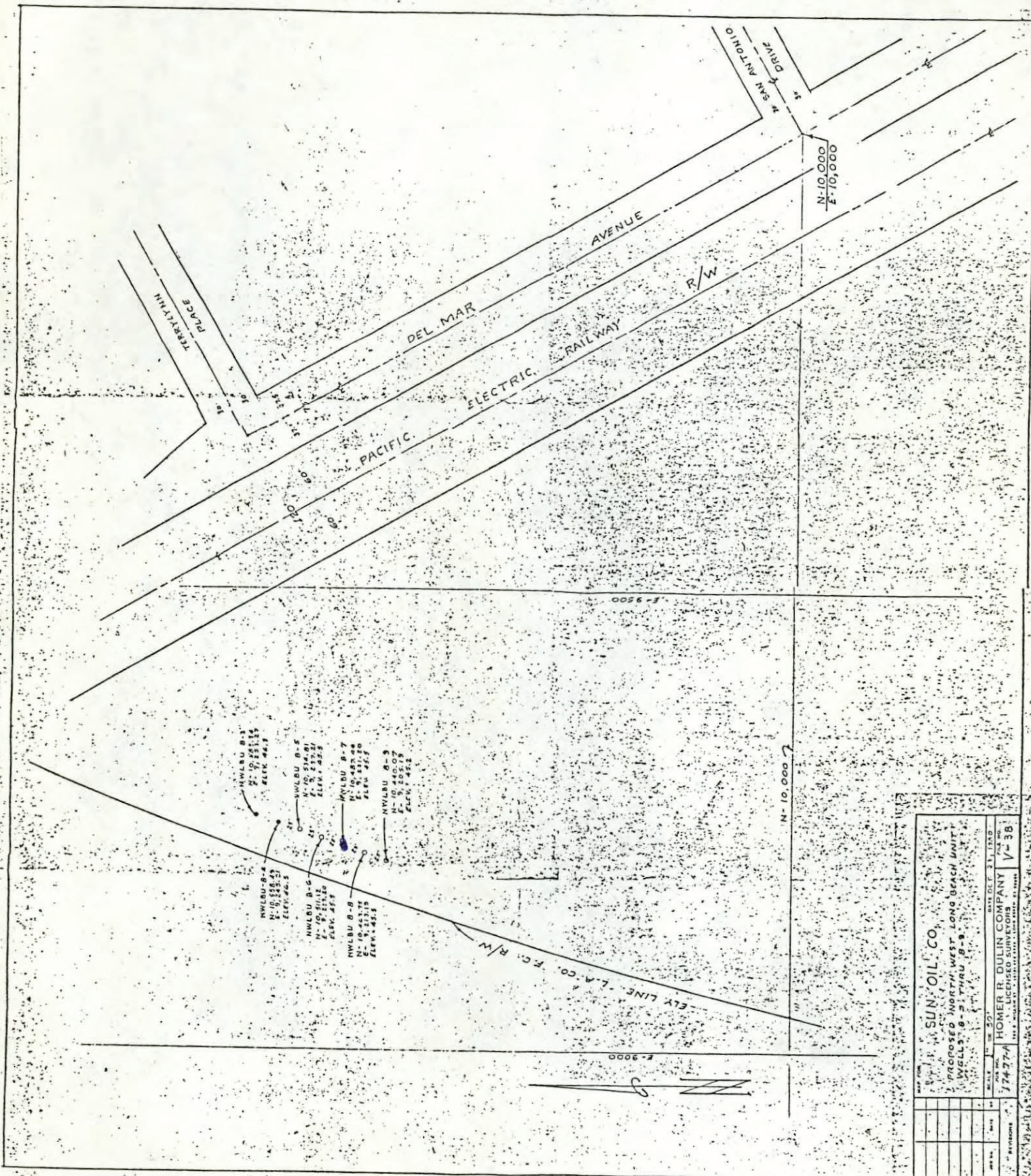
CRITICAL WELL

As defined in the California Administrative Code, Title 14, Section 1720(a), "Critical well" means a well within:

- (1) 300 feet of the following:
 - (A) Any building intended for human occupancy that is not necessary to the operation of the well; or
 - (B) Any airport runway.
- (2) 100 feet of the following:
 - (A) Any dedicated public street, highway, or nearest rail of an operating railway that is in general use;
 - (B) Any navigable body of water or watercourse perennially covered by water;
 - (C) Any public recreational facility such as a golf course, amusement park, picnic ground, campground, or any other area of periodic high-density population; or
 - (D) Any officially recognized wildlife preserve.

Exceptions or additions to this definition may be established by the supervisor upon his own judgment or upon written request of an operator. This written request shall contain justification for such an exception.

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DIV. OF OIL AND GAS
LONG BEACH, CA



SUN OIL CO.	
PROPOSED NORTH WEST LONG BEACH UNIT	
WELLS B-3 THRU B-8	
DATE	NOV 27 1930
BY	HORNER B. DULIN COMPANY
NO.	7477A
REVISIONS	V-38

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DIV. OF OIL AND GAS
LONG BEACH, CA.

NORTHWEST LONG BEACH UNIT
SURFACE RIGHTS

Block 1 (Lease 800388 - W. T. McDonald)
No surface rights

Block 2 (Lease 800389 - Atlantic Richfield)
No surface rights

Block 3 (Unleased - Los Cerritos Park)
No surface rights

Block 4 (Lease 800390 - Amebco)
Sun's surface rights cover only Lot 39 in Block G of Los Cerritos and do not include acreage south of the Westerly prolongation of the Northerly line of Bixby Road

Block 5 (Leases 800391 and 800392 - Pacific Electric Ry. Co. and Southern Pacific Trans. Co.)

Sun has no surface rights south of the Easterly prolongation of the Southerly line of Wilmington (Baker, 223rd) Street. As to the remainder, Sun's surface rights are limited to those areas shaded in red on the attached Exhibit "A".

Block 6 (Lease 800390 - Amebco)
Sun has surface rights over this entire Block save for that portion thereof quitclaimed to the State of California on August 11, 1961 for the construction of the San Diego Freeway.

Block 7 (Lease 800392 - Southern Pacific)
No surface rights

Block 8 (Lease 800393 - Oil Operators)
Sun has surface rights over the entire Block save for that portion thereof quitclaimed to the State of California on April 17, 1958 for the construction of the San Diego Freeway.

Block 9 (Lease 800394 - Los Angeles County Flood Control District)
Sun has surface rights over all of this Block save for a five-acre strip on the Southwest portion thereof which was quitclaimed to the Flood Control District on June 29, 1962 and is presently occupied by the Long Beach and San Diego Freeways and their access roads. Paragraph 2 of this lease does provide that Lessee's operations shall neither be so located nor so conducted as to interfere with the Flood Control Channel and further provides that no structures shall be placed between or upon the tops of the channel levees without the approval of Lessor's Chief Engineer.

Block 10 (Lease 800392 - Southern Pacific)
No surface rights.

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DIV. OF OIL AND GAS
LONG BEACH, CA.

EXHIBIT A

DESCRIPTION OF LEASES

BLOCK 1 - 15.06 Acres

Oil and Gas Lease dated March 1, 1977, by and between W. T. McDonald, as Lessor, and General Exploration Company, as Lessee, covering the following described lands:

All of Tract No. 9117 shown on map recorded in Book 181, Page 47 of the Map Records of Los Angeles County, California, and all of Lot 40 and that portion of Lot 41 in Block "G" of Los Cerritos, as shown on map recorded in Book 12, Pages 198 and 199 of Map Records of Los Angeles County, California, described as follows:

All that portion of said Lot 41 lying Southerly of a line which is the prolongation Easterly of the center line of Wilmington Street Extension, now known as 223rd Street, as said street is shown on map of the aforesaid Tract No. 9117.

BLOCK 2 - 7.94 Acres

Oil and Gas Lease by and between Atlantic Richfield Company, as Lessor, and General Exploration Company, as Lessee, dated March 9, 1977, covering the following described lands:

Lots 42, 44, 45, 46, 47 and that portion of Lot 41, all in Block "G" of Los Cerritos, in the City of Long Beach, County of Los Angeles, State of California, as per map recorded in Book 12, Pages 198 and 199 of Maps, in the office of the County Recorder of said County, included within the following described premises:

Beginning at the point of intersection of the center line of Wilmington Street Extension with the Northeasterly line of the right-of-way of the Pacific Electric Railway Company, as shown on map of Los Cerritos, recorded in Map Book 12, Pages 198 and 199, Records of Los Angeles County, thence East along the prolongation East of said center line of Wilmington Street Extension to its intersection with the Southwesterly line of Lincoln Avenue, as shown on map of Los Cerritos; thence Northwesterly along the Southwesterly line of said Lincoln Avenue to the Northeasterly line of Lot 42 in Block "G", as shown on said map of Los Cerritos; thence Southwesterly along the Northwesterly line of said Lot 42 in Block "G"; and its prolongation Southwesterly to its intersection with the Northeasterly line of said right-of-way of the Pacific Electric Railway Company; thence in a Southeasterly direction along the Northeasterly line of said right-of-way to the point of beginning.

BLOCK 3 - 2.43 Acres

That portion of Rancho Los Cerritos as shown as Los Cerritos Park on that certain map of Los Cerritos filed for record in Book 12, Pages 198 and 199, Map Records of the County of Los Angeles, State of California, being more particularly described as follows:

Beginning at the point of intersection of the Westerly line of Country Club Drive, formerly known as Lincoln Avenue, with the Northwesterly boundary line of Tract 30977; being also the Northwesterly line of Lot 42 of Block "G" of Los Cerritos, as shown on map thereof in Book 12, Pages 198 and 199, Map Records of Los Angeles County, State of California; thence South 60° 51' 30" West 373.64 feet to the Easterly Boundary line of the right-of-way of the Pacific Electric Railway Company, as shown on the map of Tract 1400, filed for record in Book 18, Page 96 of the Map Records of said county; thence along the Easterly line of said right-of-way North 29° 08' 30" West to its intersection with the Westerly prolongation of the Southeasterly line of Lot 43 of Block "G" of Los Cerritos, as shown on map thereof in Book 12, Page 198 et seq., Map Records of said County; thence on and along said Westerly prolongation and the Southeasterly line of said Lot 43 of Block "G" of Los Cerritos to its intersection with the Westerly line of Country Club Drive; thence on and along the Westerly line of Country Club Drive to the point of beginning.

BLOCK 4 - 6.65 Acres

Oil and Gas Lease dated May 24, 1934, Recorded in Book 13539, Page 1 of the Official Records of Los Angeles County, California, from Amelia M. E. Bixby Company, as Lessor, to C. G. Willis, as Lessee, insofar as said lease covers the following described lands:

All of Lot 43 in Block "G" of Los Cerritos, as shown on map recorded in Book 12, Pages 198 and 199 of the Map Records of the County of Los Angeles, State of California, and those portions of the Rancho Los Cerritos in the City of Long Beach, Los Angeles County, California described as follows:

Beginning at the intersection of the Northerly line of Bixby Road with the Easterly line of the 120 foot right-of-way of the Pacific Electric Railway Company, as shown on a map of Los Cerritos recorded in Book 12, Pages 198 and 199, Map Records of Los Angeles County, California; thence along the Easterly line of said right-of-way North 29° 08' 30" West 85.31 feet to its intersection with the Southeasterly line of San Antonio Drive, as shown on a map of Tract 2612, recorded in Book 27, Page 28 of said map records; thence along said

San Antonio Drive North 60° 46' East 648.15 feet to its intersection with the Westerly line of Magnolia Avenue (formerly Lincoln Avenue), as shown on map of said Los Cerritos; thence along said Avenue South 5° 34' East 391.34 feet to the intersection of the Westerly line of said Magnolia Avenue with the Northerly line of said Bixby Road; thence Westerly along said road 562.11 feet to the point of beginning.

Excepting from the above described parcel of land that portion described as follows:

Beginning at the intersection of the Northerly line of Bixby Road with the Westerly line of Magnolia Avenue (formerly Lincoln Avenue), as shown on the map of Los Cerritos recorded in Book 12, Pages 198 and 199 of said Map Records; thence along the Westerly line of said Magnolia Avenue North 5° 34' West 193.26 feet; thence Westerly parallel with said Bixby Road 155 feet; thence South 5° 34' East 193.26 feet to a point in the Northerly line of said Bixby Road; thence Easterly along said Northerly line 155 feet to the point of beginning.

BLOCK 5 - 9.20 Acres

Oil and Gas Lease dated April 30, 1937, by and between Pacific Electric Railway Company, as Lessor, and Cornelius G. Willis, as Lessee, Recorded in Book 15573, Page 167 of the Official Records of Los Angeles County, California and Oil and Gas Lease by and between Southern Pacific Transportation Company, as Lessor, and General Exploration Company, as Lessee, dated March 31, 1977, covering the following described lands:

Those certain lands lying, situated and being in the County of Los Angeles, State of California, described as follows:

That portion of the former Pacific Electric Railway Company 120 foot strip of land as conveyed by Deed dated October 29, 1912, by George H. Bixby and wife, to Pacific Electric Railway Company, and recorded November 8, 1913, in Book 5596, Page 175 of Deeds, Los Angeles County Records, extending from the Easterly prolongation of the Southerly line of 223rd Street (formerly Wilmington Street), as shown on map of Tract 1400, recorded in Book 18, Page 96 of Maps in Los Angeles County Records, Northwesterly to the intersection with the Westerly prolongation of the Southerly line of San Antonio Drive, as shown on Tract 2612 recorded in Map Book 27, Page 28, Los Angeles County Records.

BLOCK 6 - 12.69 Acres

Oil and Gas Lease dated May 24, 1934, Recorded in Book 13539, Page 1 of the Official Records of Los Angeles County, California, from Amelia M. E. Bixby Company, as Lessor, to C. G. Willis, as Lessee, insofar as said lease covers the following described lands:

A part of Lot 4, Tract 1400, as shown on Map recorded in Book 18, Page 96 of Maps, Records of the County of Los Angeles, State of California, described as follows:

Beginning at the Southeasterly corner of said Lot 4, thence South 89° 49' West along the Southerly line of said Lot 4, a distance of 571.84 feet to the Southeast corner of that certain property described in Deed to Gregorio Encinas, recorded in Deed Book 7086, Page 273, records of said Los Angeles County; thence North 0° 09' 30" West 535.00 feet along the Easterly line of said property; thence South 89° 49' West, along the Northerly line of said property to the Easterly line of the right-of-way of the Pacific Electric Railway Company, 70.00 feet wide; thence in a Northerly direction along the Easterly line of said right-of-way to its intersection with the Northeasterly line of said Lot 4; thence in a Southeasterly direction along said Northeasterly line of Lot 4 to the point of beginning.

BLOCK 7 - 2.68 Acres

Oil and Gas Lease by and between Southern Pacific Transportation Company, as Lessor, and General Exploration Company, as Lessee, dated March 31, 1977, covering the following described lands:

That certain strip of land described as "SECOND" hereinafter, lying between the center line of Wilmington Street and the Southwesterly line of the former Pacific Electric Railway Company's 120 foot right of way, to wit:

Those certain strips of land situated in the County of Los Angeles, being portions of Lots 3, 4 and 7 of Tract No. 1400, as per map recorded on Page 96 in Book 18 of Maps, Records of Los Angeles County and portion of Tract No. 2220 as per map recorded on Page 97 in Book 22 of Maps, Records of said County, said strips of land being described as follows:

FIRST: A strip of land 60 feet in width, being 21.75 feet on the Southwesterly and Westerly side, and 38.25 feet on the Northeasterly and Easterly side of the following described line:

Commencing at a point in the center line of Wardlow Road, distant Easterly thereon 364.71 feet from the Southerly prolongation of the center line of Golden Avenue as shown on Map of Tract No. 2220 recorded on Page 97 in Book 22 of Maps, Records of said County; thence North 33° 54' 10" West, 607.02 feet to the beginning of a tangent curve concave to the Northeast and having a radius of 5729.61 feet; thence Northwesterly along said curve, 30 feet to point of compound curve concave to the Northeast and having a radius of 2864.84 feet; thence Northwesterly along last mentioned curve 30 feet to point of compound curve concave to the Northeast and having a radius of 1909.91 feet; thence

Northwesterly along last mentioned curve, 30 feet to point of compound curve concave to the Northeast and having a radius of 1432.47 feet; thence Northwesterly along last mentioned curve, 30 feet to point of compound curve concave to the Northeast and having a radius of 1146.01 feet; thence Northwesterly along last mentioned curve, 30 feet to point of compound curve concave to the East and having a radius of 955.04 feet; thence Northerly along last mentioned curve, 612.57 feet to a point of compound curve concave to the East and having a radius of 1146.01 feet; thence Northeasterly along last mentioned curve, 30 feet to point of compound curve concave to the East and having a radius of 1432.47 feet; thence Northeasterly along last mentioned curve, 30 feet to point of compound curve concave to the East and having a radius of 1909.91 feet; thence Northeasterly along last mentioned curve, 30 feet to point of compound curve concave to the East and having a radius of 2864.84 feet; thence Northeasterly along last mentioned curve, 30 feet to point of compound curve concave to the East and having a radius of 5729.61 feet; thence Northeasterly along last mentioned curve, 30 feet to the end of said curve; thence Northeasterly, tangent to last mentioned curve, 309.18 feet to a point in the center line of Wilmington Street, distant Westerly along said center line, 79.64 feet from the Northerly prolongation of the center line of Golden Avenue as shown on said map of Tract No. 2220. The side lines of said 60 foot strip of land terminating in the center line of Wilmington Street on the North, and in the center of Wardlow Road on the South.

SECOND: A strip of land 70 feet in width, being 26.75 feet on the Westerly side and 43.25 feet on the Easterly side of the following described line:

Commencing at above mentioned point in the center line of Wilmington Street, distant Westerly along said center line 79.64 feet from the Northerly prolongation of the center line of Golden Avenue as shown on said map of Tract No. 2220; thence Northeasterly continuing along last mentioned tangent to curve 5729.61 feet radius in the above described 60 foot strip of land, 1221.20 feet to the beginning of a tangent curve concave to the West and having a radius of 1146.01 feet; thence Northerly along last mentioned curve, 452.45 feet to a point in the Southwesterly line of that certain strip of land 120 feet in width conveyed by Geo. H. Bixby, et ux to Pacific Electric Railway Company, by Deed recorded on Page 175 in Book 5596 of Deeds, Los Angeles County Records, said last mentioned point being distant Southeasterly along said Southwesterly line, 360.21 feet from the West line of above mentioned Lot 4 of Tract No. 1400. The Westerly line of said 70 foot strip of land being extended, and the Easterly line thereof shortened to terminate

in the center line of Wilmington Street on the South, and in the Southwesterly line of above mentioned 120 foot strip of land on the North. Excepting from above described strip of land 70 feet in width any portion thereof included within the lines of the 6.49 acre tract conveyed by Amelia M. E. Bixby to Gregorio Encinas by Deed recorded on Page 273 in Book 7086 of Deeds, Los Angeles County Records. Subject to the rights of the public in those portions of above described 60 foot strip and 70 foot strip included within the lines of Wardlow Road, Golden Avenue and Wilmington Street.

The base of bearings for this description is the South line of Powers Street, having a bearing of East, as shown on map of Tract No. 4351, recorded on Pages 94 and 95 in Book 53 of Maps, Los Angeles County Records.

BLOCK 8 - 23.89 Acres

Oil and Gas Lease dated December 1, 1935, from Oil Operators Incorporated, as Lessor, to Union Oil Company of California, as Lessee, Recorded in Book 14010, Page 66, Official Records of Los Angeles County, California, insofar as said lease covers the following described lands:

Those portions of Lots 3 and 4 of Tract 1400, in the County of Los Angeles, State of California, as per map recorded in Book 18, Page 96 of Maps, Records of said County, described as follows:

Beginning at the point of intersection of the Southerly line of said Lot 3 with the Westerly line of the Pacific Electric Railway Company's 70 foot right-of-way, as described in Deed recorded in Book 3991, Page 88, Official Records; thence Westerly along the Southerly line of said Lot 3 to its intersection with the Easterly line of the Los Angeles County Flood Control Channel; thence Northerly along the Easterly line of Flood Control Channel to its intersection with the Southwesterly line of Pacific Electric Railway Company's 120 foot right-of-way, as described in Deed recorded in Book 5596, Page 175 of Deeds; thence South-easterly along aforesaid Southwesterly line of right-of-way to its intersection with the Westerly line of Pacific Electric Railway Company's 70 foot right-of-way, as described in Deed recorded in Book 3991, Page 88, Official Records; thence Southerly and Westerly along aforesaid Westerly line of 70 foot right-of-way to the point of beginning, Excepting from the lands hereinabove described that portion of said Lot 4 included within the land described in Deed from Amelia M. E. Bixby to Gregorio Encinas, recorded May 18, 1920 in Book 7086, Page 273 of Deeds of said County.

BLOCK 9 - 67.63 Acres

Oil and Gas Lease dated October 7, 1935, from Los Angeles County Flood Control District, as Lessor, to Cornelius G. Willis, as Lessee, recorded in Book 13784, Page 4, Official Records of Los Angeles County, California, insofar as said lease covers the following described property:

(1) That portion of Lot 3 of said Tract No. 1400, described as follows:

Beginning at a point in the Southerly line of said Lot 3 distant East thereon 30.00 feet from the Southwesterly corner thereof; thence East along the Southerly line of said Lot 3 a distance of 720.00 feet; thence Northerly along a 1° curve concave to the East, 2241.33 feet to the Northeasterly line of said Lot 3; thence Northerly along said Northeasterly line 318.47 feet to the most Northerly corner of said Lot 3; thence along the Northerly line of said Lot 3 the following courses and distances: S 40° 43' 45" W 146.46 feet; S 68° 43' 45" W 321.42 feet; S 47° 28' 45" W 458.04 feet and S 61° 43' 45" W 298.92 feet; thence Southerly in a direct line 1788.59 feet to the point of beginning.

Also that portion of Wilmington Street, a vacated street, as shown on said map that accrues to said portion of Lot 3 by reason of said vacation.

(2) That portion of Lot 5 in Block "F" of the Subdivision of a part of the Rancho San Pedro, known as the Dominguez Colony as shown on Partition Map filed in Case No. 3284 of the Superior Court of the State of California in and for the County of Los Angeles, and on a map recorded in Book 1, Pages 601 and 602, of Miscellaneous Records of said County, described as follows:

Beginning at the intersection of the Northerly line of said Lot 5 with the Westerly line of the strip of land 120 feet wide as conveyed to the Pacific Electric Railway Company by a Deed recorded in Book 1549, Page 61, of Deeds, records of said County; thence West along the Northerly line of said Lot 5 a distance of 698.15 feet; thence S 0° 02' 11" W 1216.28 feet, more or less, to the Northerly line of the aforesaid Lot 3 of Tract No. 1400; thence along the Northerly line of said Lot 3 the following courses and distances: N 61° 43' 45" E 298.92 feet; N 47° 28' 45" E 458.04 feet; N 68° 43' 45" E 321.42 feet and N 40° 43' 45" E 146.46 feet to said Westerly line of said 120 foot strip; thence Northerly along said Westerly line 618.27 feet to the point of beginning.

Also that portion of the South half of Carson Street, a vacated street, as shown on said map which accrues to said portion of Lot 5 by reason of said vacation.

(3) That portion of Lot 6 in Block "E" of said Subdivision of a part of the Rancho San Pedro, known as the Dominguez Colony, described as follows:

Beginning at the intersection of the Southerly line of said Lot 6 with the Westerly line of the strip of land 120 feet wide as conveyed to the Pacific Electric Railway Company by a Deed recorded in Book 1540, Page 218 of Deeds Records of said County; thence Northerly along the Westerly line of said 120 foot strip of land 1376.14 feet to the North line of said Lot 6; thence Westerly along said Northerly line 182.24 feet; thence South 1287.00 feet to a point on the Southerly line of said Lot 6 distant West thereon 664.17 feet from the point of beginning; thence East along said Southerly line 664.17 feet to the point of beginning.

Also that portion of the North half of Carson Street, a vacated street, as shown on said map that accrues to said portion of Lot 6 by reason of said vacation.

Excepting therefrom that portion thereof within the Southern California Edison Company, Ltd., right-of-way as shown on Licensed Surveyor's Map filed in Book 30, Page 24, of Record of Surveys on file in the office of the Recorder of Los Angeles County.

BLOCK 10 - 5.72 Acres

Oil and Gas Lease by and between Southern Pacific Transportation Company, as Lessor, and General Exploration Company, as Lessee, dated March 31, 1977, covering the following described lands:

That portion of the former Pacific Electric Railway Company's 120 foot strip of land as conveyed by Deed dated October 29, 1912, by George H. Bixby and wife to Pacific Electric Railway Company, and recorded November 8, 1913, in Book 5596, Page 175 of Deeds, Los Angeles County Records, 60 feet on either side of the center line of said land and extending northwesterly from the intersection with westerly prolongation of southerly line of San Antonio Drive as shown on Tract No. 2612, recorded in Map Book 27, Page 28, Los Angeles County Records, a distance of 2,000 feet along the center line of said strip of land.

RECEIVED

AUG 21 2 33 PM '81

DIV. OF OIL AND GAS
LONG BEACH, CA.

C.R.G. Properties, Ltd.

DECL. CORR. 14 DEG. 30 MIN. EAST

PAGE 1

MEAS. DEPTH	DRIFT ANGLE	DRIFT BEARING	VERTICAL DEPTH	VERTICAL SUB-SEA	TOTAL COORDINATES
125	0015	N64 00E	125.0	-69.0	.1 N .2 E
215	0015	N14 00E	215.0	-159.0	.4 N .5 E
306	0015	S18 00W	306.0	-250.0	.5 N .1 E
417	0015	N36 00W	417.0	-361.0	.5 N .4 W
507	0015	N49 00E	507.0	-451.0	.8 N .3 W
600	0015	N60 00W	600.0	-544.0	1.3 N .4 W
693	0015	N34 00E	693.0	-637.0	1.6 N .5 W
783	0015	N09 30E	783.0	-727.0	2.0 N .3 W
875	0015	N80 00E	875.0	-819.0	2.3 N 0.0 W
965	0030	S05 00E	965.0	-909.0	1.9 N .4 E
1120	0030	N73 00W	1120.0	-1064.0	1.1 N .6 W
1192	0030	N15 00W	1192.0	-1136.0	1.5 N 1.0 W
1286	0000	N00 00E	1286.0	-1230.0	1.9 N 1.2 W
1386	0015	N21 00W	1386.0	-1330.0	2.1 N 1.2 W
1428	0245	N01 00W	1428.0	-1372.0	3.2 N 1.4 W
1489	0415	N14 00W	1488.9	-1432.9	6.9 N 1.9 W
1549	0600	N29 00W	1548.6	-1492.6	11.9 N 3.9 W
1611	0730	N24 00W	1610.2	-1554.2	18.4 N 7.1 W
1672	0930	N17 00W	1670.5	-1614.5	26.9 N 10.3 W
1735	1115	N11 00W	1732.5	-1676.5	37.9 N 13.0 W
1766	1215	N13 00W	1762.8	-1706.8	44.0 N 14.4 W
1894	1330	N25 00W	1887.6	-1831.6	71.0 N 23.6 W
1989	1315	N23 30W	1980.0	-1924.0	91.1 N 32.7 W
2081	1315	N22 00W	2069.6	-2013.6	110.5 N 40.8 W
2173	1315	N25 30W	2159.1	-2103.1	129.8 N 49.3 W
2264	1300	N30 30W	2247.8	-2191.8	148.0 N 59.0 W
2357	1230	N25 30W	2338.5	-2282.5	166.2 N 68.7 W
2404	1330	N21 00W	2384.3	-2328.3	175.9 N 72.8 W
2465	1330	N05 00W	2443.6	-2387.6	189.8 N 76.0 W
2571	1300	N02 00E	2546.8	-2490.8	214.0 N 76.7 W
2663	1300	N02 00E	2636.4	-2580.4	234.7 N 75.9 W
2754	1245	N03 00E	2725.1	-2669.1	255.0 N 75.1 W
2848	1230	N03 00E	2816.8	-2760.8	275.5 N 74.0 W
2938	1215	N05 30E	2904.7	-2848.7	294.7 N 72.6 W
3022	1200	N04 30E	2986.9	-2930.9	312.3 N 71.0 W

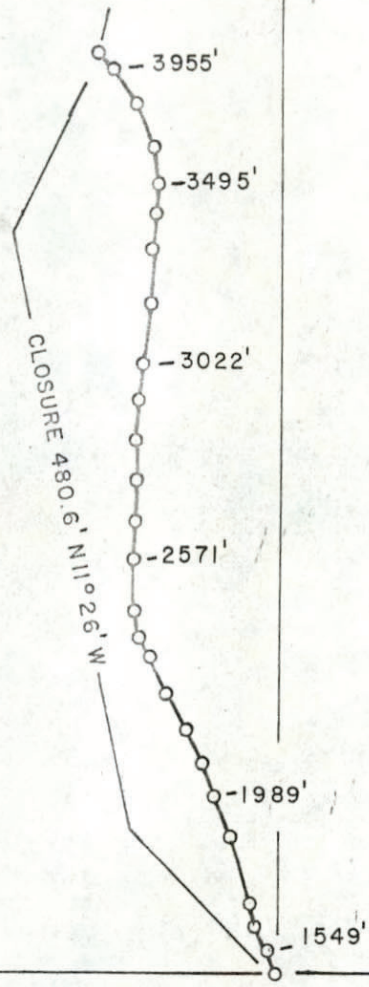
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 MAY 19 11 51 AM '83
 DIV OF OIL AND GAS
 LONG BEACH, CALIF.

MEAS. DEPTH	DRIFT ANGLE	DRIFT BEARING	VERTICAL DEPTH	VERTICAL SUB-SEA	TOTAL COORDINATES	
3175	1200	N04 30E	3136.5	-3080.5	344.0 N	68.5 W
3207	1200	N04 30E	3167.8	-3111.8	350.7 N	68.0 W
3310	1130	N03 30E	3268.7	-3212.7	371.6 N	66.5 W
3404	1130	N04 30E	3360.8	-3304.8	390.3 N	65.2 W
3495	1045	N05 00E	3450.1	-3394.1	407.8 N	63.8 W
3575	1330	N11 00W	3528.3	-3472.3	424.6 N	64.7 W
3635	1200	N25 00W	3586.8	-3530.8	437.1 N	68.7 W
3696	0930	N34 00W	3646.7	-3590.7	447.1 N	74.3 W
3758	0615	N43 00W	3708.2	-3652.2	453.7 N	79.6 W
3863	0330	N41 00W	3812.8	-3756.8	460.3 N	85.6 W
3955	0215	N41 00W	3904.7	-3848.7	463.8 N	88.6 W
4047	0200	N42 00W	3996.6	-3940.6	466.4 N	90.9 W
4139	0115	N40 00W	4088.6	-4032.6	468.3 N	92.6 W
4235	0115	N69 00W	4184.5	-4128.5	469.6 N	94.3 W
4332	0045	N54 00W	4281.5	-4225.5	470.4 N	95.8 W
4427	0015	N34 00E	4376.5	-4320.5	471.2 N	95.9 W
4518	0030	S26 00E	4467.5	-4411.5	471.1 N	95.3 W

CLOSURE: 480.6 FEET N 11 DEG. 26 MIN. W

COMPUTED USING THE AVERAGED ANGLE METHOD

4518' M.D.
471.1' NORTH
95.3' WEST



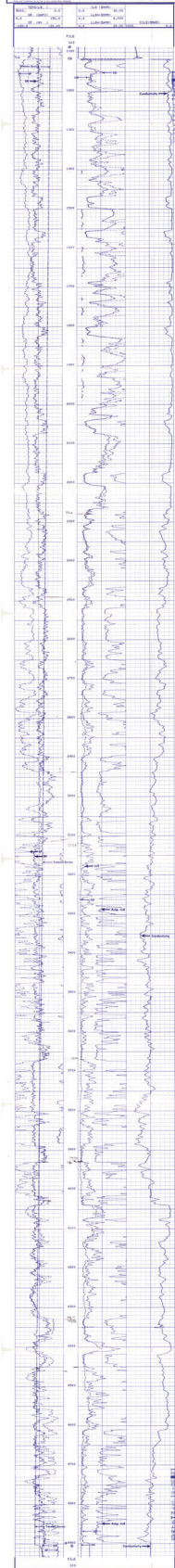
DECL. 14°30'



1" = 100'

N.W.L.B.U. WELL No. 8-7

PROPERTY RECORD No. _____ Date _____	
OWNER _____ _____	ADDRESS _____ _____
SECTION _____	TOWNSHIP _____
RANGE _____	COUNTY _____
STATE _____	DATE OF RECORD _____

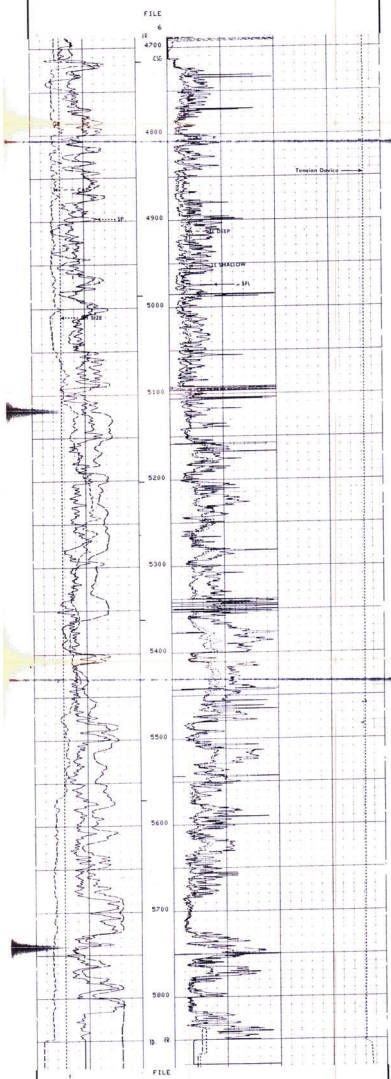


DATE _____	TIME _____	LOCATION _____	REMARKS _____
NO. _____	DATE _____	TIME _____	REMARKS _____

GENERAL INFORMATION	
Well No.	10101
Project Name	...
Client	...
Operator	...
DATE	03/27/2012
TIME	05:30:00
COMMENTS	
...	

EQUIPMENT DATA	
Power (HP)	30.00
Flow (GPM)	...
Stroke (IN)	...
...	...
MEASUREMENT DATA	
...	...
...	...

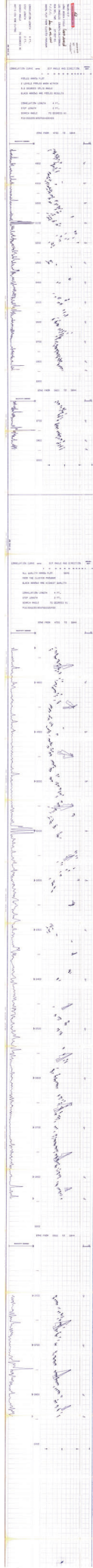
LOGGING DATA	
...	...
...	...
...	...



SENSOR MEASURE POINT TO TENSION REFERENCE POINT			
SPR	47.1 FEET	SR	47.1 FEET
GR	14.6 FEET	GR	14.6 FEET
DIV	14.6 FEET	DIV	14.6 FEET
TEN	14.6 FEET	TEN	14.6 FEET
LLD	14.6 FEET	LLD	14.6 FEET
...

NAME	VALUE	UNIT	PARAMETERS	NAME	VALUE	UNIT
...

3/27/12 10:10 AM
 LARRY LARSEN, CA
 GEOSCIENCE





9 5/8" RADII BOND LOG
W/ GR & CCL

Company ALLEN CO
 Well NVALBU 6.7
 Field LONG BEACH
 County LOS ANGELES
 State CALIFORNIA
 Location
 Country USA

Company ALLEN CO
 Well NVALBU 6.7
 Field LONG BEACH
 County LOS ANGELES
 State CALIFORNIA
 Location
 Country USA

APR 18 - NO. 0498

SEC TYPE
 SEC TYPED
 SEC NUMBER
 SEC DATE

CHD-AES (000001)
 Cable Head

PRC-634 (C1161)
 Protection Rotor Controller (4 Arm)

RBT-Probe (000119 9 020)
 Probe Head Back From Log Assembly

PRC-634 (C1162)
 Protection Rotor Controller (4 Arm)

CCL-PRO (000313)
 probe 2 7/8 in pipe o.d.

GR-PTS (000508)
 Probe 2 7/8" ID WITH ATTACHABLE DUAL OR 4 MARKET CCL

Database File: allencombu7-6cbl.db
 Dataset Pathname: c:\test
 Presentation Format: fit
 Dataset Creation: Fri Dec 06 08:32:17 2013 by Log SCH 120430
 Charted by: Depth in Feet scaled 1.240

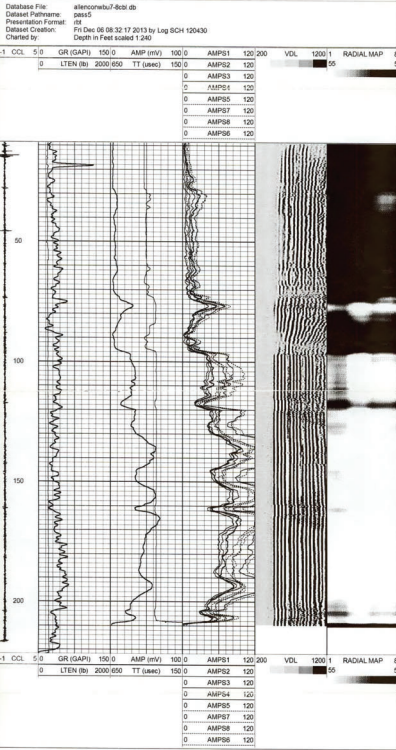
1 CCL 5.0 GR (GAP) 150.0 AMP (mv) 100.0 AMPB1 120.0 VDL 1200.1 RADIAL MAP 6
 0 LLEN (ft) 2000/600 TT (secs) 150.0 AMPB2 120.0
 0 AMPB3 120.0
 0 AMPB4 120.0
 0 AMPB5 120.0
 0 AMPB7 120.0
 0 AMPB8 120.0
 0 AMPB6 120.0

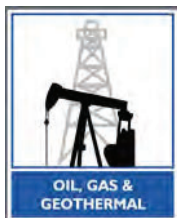
All interpretations are opinions based on inferences from electrical or other measurements and we cannot and do not guarantee the accuracy or completeness of any interpretation, and we shall not, except in the case of gross or willful negligence on our part, be liable or responsible for any loss, cost, damages, or expenses incurred or sustained by anyone resulting from any interpretation made by any of our officers, agents or employees. These interpretations are also subject to our general terms and conditions set out in our current Price Schedule.

LOG DEPTHS BASED ON TIGER WIRELINE MEASUREMENTS

Sensor	Offset (ft)	Schematic	Description	Len (ft)	OO (in)	WT (lb)
			CHD-AES (000001) Cable Head	1.04	1.38	2.00
			PRC-634 (C1161) Protection Rotor Controller (4 Arm)	2.77	2.38	13.00
			RBT-Probe (000119 9 020) Probe Head Back From Log Assembly	9.17	2.75	90.00
WVF3T	13.17					
WVF4L	13.17					
WVF51	13.17					
WVF52	13.17					
WVF53	13.17					
WVF54	13.17					
WVF55	13.17					
WVF56	13.17					
WVF57	13.17					
WVF58	13.17					
WVF5T	12.08					
			PRC-634 (C1162) Protection Rotor Controller (4 Arm)	2.77	2.38	13.00
CCL	4.50		CCL-PRO (000313) probe 2 7/8 in pipe o.d.	2.71	2.75	
GR	0.79		GR-PTS (000508) Probe 2 7/8" ID WITH ATTACHABLE DUAL OR 4 MARKET CCL	3.35	2.75	

Dataset: allencombu7-6cbl.db; Well: NVALBU 6.7; Pass: 5
 Total Length: 21.81 ft
 Total Weight: 118.00 lb
 C.D. 2.75 in





DEPARTMENT OF CONSERVATION
DIVISION OF OIL, GAS & GEOTHERMAL RESOURCES
5816 Corporate Ave., Suite 100 Cypress, CA 90630-4731
Phone:(714) 816-6847 Fax:(714) 816-6853
REPORT OF WELL ABANDONMENT

Cypress, California
March 27, 2017

Mr Mark Pender
C.R.G. Properties, LTD (C0250)
149 S. Barrington Ave. #804
Los Angeles, CA 90049

Your report of abandonment of well **"Nwlbu" 9-2**, A.P.I. No. **037-13525**, Section **13**, T. **04S**, R. **13W, SB B.&M.**, **Long Beach** field, **Los Angeles** County, dated **4/21/2014**, received **5/6/2014**, has been examined in conjunction with records filed in this office. We have determined that the requirements of this Division have been fulfilled relative to plugging and abandonment of the well, removal of well equipment and junk, and filing of well records. The plugging and abandonment of the well is **approved**.

The determination of this well plugging and abandonment is based on the following information, consistent with California Public Resources Code (PRC), and the California Code of Regulations (CCR):

1. Surface plugging completed on 1/7/2014.
2. Site inspection made and approved on 1/15/2014.

Kenneth A. Harris Jr.

State Oil and Gas Supervisor

Digitally signed by Scott Walker
DN: cn=Scott Walker, o=Department of Conservation,
ou=Division of Oil, Gas & Geothermal Resources,
email=scott.walker@conservation.ca.gov, c=US
Date: 2017.04.07 16:55:45 -07'00'

By
For

Daniel J. Dudak, *District Deputy*

EPM:epm

cc: Long Beach Dept. of Gas & Oil

CHECK LIST - RECORDS RECEIVED AND WELL STATUS

Company:	Westates Petroleum Corp. <i>C.R.G. Properties, LTD</i>	Well: "NWLBU 8-7"
API#:	037-22512	Sec. 13, T. 4S, R.13W. S. B. B. & M.
County:	Los Angeles	Field: Long Beach

RECORDS RECEIVED	DATE	STATUS
Well Summary (Form OG100)	1/8/2014 (2)	Producing <input type="checkbox"/> Drilling <input type="checkbox"/>
History (Form OG103)		Abandoned <input checked="" type="checkbox"/> Idle <input type="checkbox"/>
Core Record (Form OG101)		Reabandoned <input type="checkbox"/> Other <input type="checkbox"/>
Directional Survey		
Sidewall Samples		
Date final records received.		
Electric Logs:		
Other:		
		WELL TYPE
		Oil <input checked="" type="checkbox"/> Waterflood <input type="checkbox"/>
		Gas <input type="checkbox"/> Water Disposal <input type="checkbox"/>
		Water Source <input type="checkbox"/> Cyclic Steam <input type="checkbox"/>
		Observation <input type="checkbox"/> Steam Flood <input type="checkbox"/>
		Exploratory <input type="checkbox"/> Fire Flood <input type="checkbox"/>
		Dry Hole <input type="checkbox"/> Other <input type="checkbox"/>
		EFFECTIVE DATE: 12/21/13
		REMARKS: Abandoned

ENGINEERS CHECK LIST	CLERICAL CHECK LIST
<input checked="" type="checkbox"/> Summary, History & Core Record (Dupl.)	Location change
<input type="checkbox"/> Electric Log	Elevation change
<input checked="" type="checkbox"/> Operator's Name	Form OGD121
<input checked="" type="checkbox"/> Signature	Form OGD150b (Release of Bond)
<input checked="" type="checkbox"/> Well Designation	Duplicate logs to archives
<input checked="" type="checkbox"/> Location	Notice of Records Due
<input type="checkbox"/> Elevation	EDP MC 5-2-14
<input type="checkbox"/> Notices	District Date Base
<input checked="" type="checkbox"/> "T" Reports	Final Letter (OG159)
<input checked="" type="checkbox"/> Casing Record	Update Center MC 5-2-14
<input type="checkbox"/> Plugs	
<input type="checkbox"/> Directional Survey	
<input checked="" type="checkbox"/> Production/Injection (FAP Codes: 412-03-)	
<input type="checkbox"/> E Well on Prod., enter EDP	
<input checked="" type="checkbox"/> Surface Inspection Required	FIELD CHECK LIST
<input type="checkbox"/> Surface inspection Waived (Island)	Date Surface Inspection Completed: 12/19/2013
<input type="checkbox"/> Well site restoration deferred (common cellar)	Other:
<input checked="" type="checkbox"/> Final Letter Required AB: <input checked="" type="checkbox"/> REAB: <input type="checkbox"/>	
<input type="checkbox"/> Other:	

RECORDS NOT APPROVED	RECORDS APPROVED
(Reason:)	<i>DEL 4/30/14</i>
Well Summary (OG100)	(Signature)
Core Record (OG101)	RELEASE BOND
Directional Survey	Date Eligible
	(Use date last needed records received.)
	MAP AND MAP BOOK



JRAL RESOURCES AGENCY OF CALIFORNIA
DEPARTMENT OF CONSERVATION
DIVISION OF OIL, GAS & GEOTHERMAL RESOURCES
5816 Corporate Ave., Suite 200 Cypress, CA 90630-4731
Phone:(714) 816-6847 Fax:(714) 816-6853

No. T 114-0090

REPORT ON OPERATIONS

Mr Mark Pender
C.R.G. Properties, LTD (C0250)
149 S. Barrington Ave. #804
Los Angeles, CA 90049

Cypress, California
January 29, 2014

Your operations at well "Nwlbu" 8-7, A.P.I. No. 037-22512, Sec. 13, T. 04S, R. 13W, SB B.&M., Long Beach field, in Los Angeles County, were witnessed on 12/24/2013, by Cary Wicker, a representative of the supervisor.

The operations were performed for the purpose of re-abandonment.

DECISION: **APPROVED**

NOTE: The required Class II3M blowout prevention equipment was inspected and approved on 11/20/2013.

DEFICIENCIES NOTED AND CORRECTED: **None**

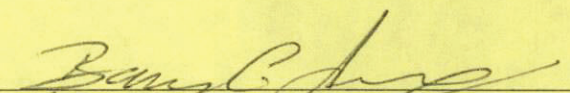
BI/kj

cc: Update
AllenCo

Tim Kustic

State Oil and Gas Supervisor

By



Daniel J. Dudak, District Deputy

T# 114-0090

DIVISION OF OIL, GAS, AND GEOTHERMAL RESOURCES

CEMENTING/PLUGGING MEMO

Operator C.R.G. Properties, LTD Well No. "Nwlbu" 8-7
API No. 037-22512 Sec. 13 T. 04 S R. 13 W , SB B&M
Field Long Beach , County Los Angeles . On 12-24-2013
Mr. / Ms. Cary Wicker representative of the supervisor, was present from 0900 to 1215

There were also present Mick Beyer (Allenco)

Casing record of well: 13 3/8" cem 1122'; 9 5/8" cem 4715', CP 100', 210', and 2440'; 7" Id 4626'-5847'. TD 5850'. Plugged w/ cem 5425' - 3522', 3058' - 2852', 2440' - 2136', 214' - 6'.

The operations were performed for the purpose of: 3 (Re-abandon)

- The plugging/cementing operations as witnessed and reported are approved.
The location and hardness of the cement plug @ are approved.

Hole size: 17 1/2 " fr. 50 ' to 1122 ' , 12 1/4 " to 4715 ' & 11 " to 5850 '

Table with columns: Casing (Size, Wt., Top, Bottom), Cemented (Date, MO-Depth, Volume), Top of Fill (Annulus, Casing), Squeezed Away, Final Pressure, Perforations.

Casing/tubing recovered: " Shot/cut at , Pulled fr.
" Shot/cut at , Pulled fr.
" Shot/cut at , Pulled fr.

Junk (in hole):

Hole fluid (bailed to) at Witnessed by

*mud interval displaced upward 70± by subsequent cement plug

Table with columns: Mudding, Date, bbls, Displaced, Poured, Fill, Engineer.

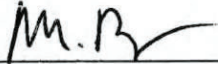
Note: 12 113M - ZA 11/20/13

C/O @ 5425'; 11-26-2014; M. Chavez (w/ B. Irick approval).

Table with columns: Cement Plugs (Date, Sx./cf, MO & Depth), Placing (Time, Engineer), Placing Witnessed (Depth, Wt./Sample), Top Witnessed (Date & Time, Engineer).

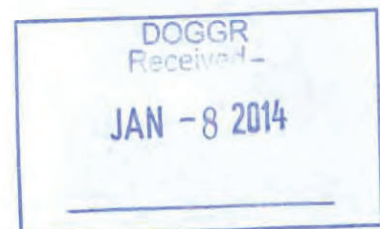
** press test 9" csg 12/2/13 0820-0835, 690-660 psi

RESOURCES AGENCY OF CALIFORNIA
DEPARTMENT OF CONSERVATION
DIVISION OF OIL, GAS, AND GEOTHERMAL RESOURCES
HISTORY OF OIL OR GAS WELL

Operator C.R.G. Properties, LTD Field Long Beach County Los Angeles
Well "NWLBU" 8-7 Sec. 13 T. 04S R. 13w sbB.&M.
A.P.I. No. 037-22512 Name Mick Beyer Title Operations Manager
(Person submitting report) (President, Secretary, or Agent)
Date 12-15-13
(Month, day, year)
Signature 
Address 2109 Gundry Ave. Signal Hill, Ca. 90755 Telephone Number 562 989-6100

History must be complete in all detail. Use this form to report all operations during drilling and testing of the well or during redrilling or altering the casing, plugging, or abandonment, with the dates thereof. Include such items as hole size, formation test details, amounts of cement used, top and bottom of plugs, perforation details, sidetracked junk, bailing tests, and initial production data.

- 11-20-13 M.I.R.U. – Installed and tested BOPE–Witnessed by Z. Amilhussin w/DOGGR - Secured Well
- 11-21-13 R.I.H. W/5 ½" Scraper on 2 7/8" tbg. tagged down at 4110' - Circ.with water w/returns of oily water and gas – Witnessed by Z. Amilhussin w/ DOGGR – P.O.H. - Secured well
- 11-22-13 R.I.H.W/Tbg. Tagged fill at 4110' Cleaned out sand to 4250' unable to work deeper – P.O.H.– Secured
- 11-25-13 to 11-26-13 R.I.H. W/ 4 1/8" Drill bit Tagged fill at 4250' drilled hard formation, gravel and cement to 4490' dropped to 5423' circ. Hole clean – P.O.H. Witnessed by T. Tyler w/DOGGR - Secured well.
- 11-27-13 R.I.H. W/ 5 ½" scraper on 2 7/8" tbg. Stopped at 4250' unable to work deeper – P.O.H. – R.I.H. W/Tbg. To 5425' Mixed and pumped 346 cu/ft. (304 sxs) class G cement in 5 stages – All witnessed by M. Chavez w/ DOGGR – Secured well
- 12-02-13 R.I.H.Tagged cement plug at 3580' – Pumped 30 bbls. of 73# mud – W/Tbg. Tail at 3580' mixed and pumped 25 cu/ft.(22 sxs) class G cement – P.O.H.- W/Tbg. Tail at 3060' Mixed and pumped 78 cu/ft.(68 sxs) class G cement - P.O.H. – All Witnessed by P. Kaufman w/ DOGGR – Secured well
- 12-03-13 R.I.H. Tagged cement at 2850' – Pump 30 bbls. 73# mud – Prs. Tested csg. At 1000 psi good – P.O.H. - Shot perforations from 2450' to 2440' – P.O.H.- R.I.H.w/ Tbg. Tail at 1914' mixed and pumped 183 cu/ft (161 sxs) class G cement squeezed away 54 cu/ft.(47 sxs) unable to squeeze any more (s.i.prs.1500 psi) Witnessed by R. Morlan w/ DOGGR - secured well
- 12-04-13 R.I.H. Tagged cement 2136' – Pumped 130 bbls, 73# mud – P.O.H. – R.I.H. Cut 9" casing at 210' – P.O.H. – R.I.H. W/Spear unable to pull casing – Removed B.O.P.E. – Welder cut wellhead bowl – Witnessed by T. Tyler w/DOGGR – Secured well
- 12-05-13 TO 12-06-13 Attempted to pull casing at 80k unable to pull free – R.I.H. W/Cement bond log found cement between casings from 95' to surface - Shot perforation from 110' to 100' – R.I.H. W/tbg. Tail at 210' mixed and pumped 140 cu/ft.(123 sxs) class G cement – cement to surface – P.O.H.- installed wellhead flange and mixed and pumped 95 cu/ft.(83 sxs) Total of 235 cu/ft (s.i. prs.600 psi) Witnessed by P. Kaufman w/DOGGR - R.D.M.O.
- 12-24-13 Dug down around well and cut casing ' below surface – C. Wicker w/DOGGR witnessed surface tag and welding of I.D.Plate - Backfilled well location - Job complete.

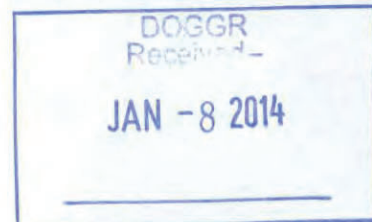


RESOURCES AGENCY OF CALIFORNIA
DEPARTMENT OF CONSERVATION
DIVISION OF OIL, GAS, AND GEOTHERMAL RESOURCES
HISTORY OF OIL OR GAS WELL

Operator C.R.G. Properties, LTD Field Long Beach County Los Angeles
Well "NWLBU" 8-7 Sec. 13 T. 04S R. 13w sbB.&M.
A.P.I. No. 037-22512 Name Mick Beyer Title Operations Manager
(Person submitting report) (President, Secretary, or Agent)
Date 12-15-13
(Month, day, year)
Signature M. Beyer
Address 2109 Gundry Ave. Signal Hill, Ca. 90755 Telephone Number 562 989-6100

History must be complete in all detail. Use this form to report all operations during drilling and testing of the well or during redrilling or altering the casing, plugging, or abandonment, with the dates thereof. Include such items as hole size, formation test details, amounts of cement used, top and bottom of plugs, perforation details, sidetracked junk, bailing tests, and initial production data.

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Irick, Barry@DOC

To: Abdulrahman, Abdulmageed@DOC
Subject: RE: Well NWLBU 8-7

For cementing in well NWLBU 8-7 per the program contained in the Corrected Permit of July 22, 2013:

The bottom plug was to be above the 7" liner. Top of liner @ 4626'. Bottom plug was to be from 3831'-4626' within a 9 5/8" 36# casing.

4626'-3831' = 795' linear
9 5/8" 36# casing conversion factor: 0.4340 cf/lf
795lf x 0.4340cf/lf = **345cf**

346cf was pumped on 11/27/2013.
25cf was pumped on top of 3580' tag on 12/02/2013.

HOWEVER

Tubing tail was at 5423'.
5423'-4626' (TOL) = 797' in 7" casing
7" 26# casing conversion factor: 0.2148 cf/lf
797lf x 0.2148 cf/lf = 171cf in 7" casing

346cf-171cf = 175cf in 9 5/8" casing
9 5/8" 36# casing conversion factor: 2.3038 lf/cf
175cf x 2.3038 lf/cf = 403lf
4626'-403' = 4223'

4223' SHOULD have been the tag after pumping of 346cf.
4223' - 3580' (actual tag) = 643'
643lf x 0.4340cf/lf = 279cf (where is this from?)

OLD PLUG FROM 4242'-4423' IN 9 5/8" CASING
4423'-4242' = 181'
181lf x 0.4340 cf/lf = 78cf (78.5cf) volume of plug

4 1/8" drill bit used to drill through plug.
4 1/8" hole conversion: 0.0928cf/lf or 10.7752 lf/cf
181lf x 0.0928 cf/lf = 17cf (16.8cf) volume of hole drilled through plug
78cf-17cf = 61cf cement left in hole from plug.

279cf-61cf = 218cf (fill/cement ?) unaccounted for in casing.

From: Abdulrahman, Abdulmageed@DOC
Sent: Thursday, December 12, 2013 9:06 AM
To: Irick, Barry@DOC
Subject: FW: Well NWLBU 8-7

"Nwbu" 8-7
API: 037-22512

HAM
Well Class - Oil
12/05/2013

9-5/8", 36#
13-3/8"; 54.5#
0'?

40 cf in 9 5/8" x 13 3/8"
91 cf in 9 5/8" casing

131 cf

234 CF = 143.592' @ 600psi

0' - 458' = 199 CF
40
239 CF

1122'
ETOC 884'

Hole: 12-1/4" top mul = 458
M & D = 728 CF

2218
BFW-2280'±

Log shows salt

U gas zone @ 2500'

Wilbur zone @ 3120'

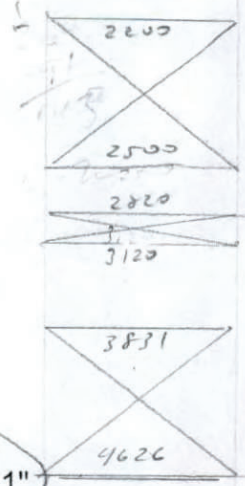
Alamitos @ 4038'

4715'

Brown zone @ 5724'

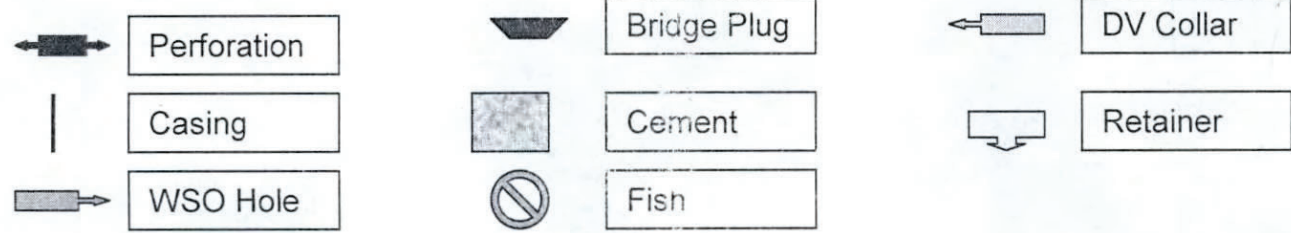
5847'

TD - 5850'



345 CF

346 CF @ 5423 = 3812 (tag?)
tag 3580
+ 25 CF =
3522



Perf: 5724-5777, 4356-4412, 4038 - 40119

BLOWOUT PREVENTION EQUIPMENT MEMO

Operator C.R.G. Properties, LTD Well "Nwlbu" 8-7 Sec. 13 T. 4S R. 13W
 Field Long Beach County L.A. Spud Date _____
VISITS: Date Engineer Time Operator's Rep. Title
 1st 11/20/13 Z. Amilhussin (1630 to 1700) _____
 2nd _____ (_____ to _____) _____
 Contractor Allenco Rig # 2 Contractor's Rep. & Title I. Sandoval, Rig Manager
 Casing record of well: **memo**

OPERATION: Testing (inspecting) the blowout prevention equipment and installation. Critical well? Y N
DECISION: The blowout prevention equipment and its installation on the 9 " casing are approved.

Proposed Well Ops: 1. MACP: _____ psi **REQUIRED BOPE CLASS: II3M**
 Hole size: _____ " fr. _____ ' to _____ ' & _____ " to _____ ' _____

CASING RECORD OF BOPE ANCHOR STRING					Cement Details			Top of Cement	
Size	Weight(s)	Grade(s)	Shoe at	CP at				Casing	Annulus

BOP STACK							TEST DATA						
API Symb.	Ram Size (in.)	Manufacturer	Model or Type	Vert. Bore Size (in.)	Press. Rtg.	Date Last Overhaul	Gal. to Close	Recov. Time (Min.)	Calc. GPM Output	psi Drop to Close	Secs. to Close	Test Date	Test Press.
Rd	2 7/8	Townsend	81	9	3M		1						
Rd	cso	Townsend	81	9	3M		1						

ACTUATING SYSTEM				TOTAL: 2		AUXILIARY EQUIPMENT						
Accumulator Unit(s) Working Pressure _____ psi						Connections						
Total Rated Pump Output _____ gpm				Fluid Level		No.	Size (in.)	Rated Press	Weld	Flange	Thread	Test Press.
Distance from Well Bore <u>25</u> ft.				ok								
Accum. Manufacturer		Capacity		Precharge		Fill-up Line						
1		gal.	psi	x			2	3M				x
2		gal.	psi	x			2	3M				x
CONTROL STATIONS						Check Valve(s)						
Manifold at accumulator unit						Aux. Pump Cnct.						
Remote at Driller's station						Choke Line						
Other: hand pump						Control Valve(s)						
EMERG. BACKUP SYSTEM						Pressure Gauge						
N ₂ Cylinders		1	L= 55 "	2,750psi	10 gal.	Adjstble Choke(s)						
Other:		2	L= "		gal.	Bleed Line						
		3	L= "		gal.	Upper Kelly Cock						
		4	L= "		gal.	Lower Kelly Cock						
		5	L= "		gal.	Standpipe Valve						
		6	L= "		gal.	Stndpipe Pres. Gau.						
TOTAL: 10					gal.	x		2.88	3M			
HOLE FLUID MONITORING EQUIPMENT						Internal Preventer						
Alarm Type			Class			Hole Fluid Type		Weight		Storage Pits (Type & Size)		
Audible			Visual			lease water				50 bbl pump, 250 bbl spare		
Calibrated Mud Pit			A			REMARKS AND DEFICIENCIES:						
Pit Level Indicator			B									
Pump Stroke Counter			C									
Pit Level Recorder												
Flow Sensor												
Mud Totalizer												
Calibrated Trip Tank												
Other:												

03/29/01

CONTRACTOR:

Atterco

UNCORRECTABLE DEFICIENCIES:

DEFICIENCIES NOTED AND TO BE CORRECTED:

DEFICIENCIES NOTED AND CORRECTED:

} none



NATURAL RESOURCES AGENCY OF CALIFORNIA
 DEPARTMENT OF CONSERVATION
 DIVISION OF OIL, GAS & GEOTHERMAL RESOURCES
 5816 Corporate Ave., Suite 200 Cypress, CA 90630 - 4731

No. P 113-0598

Old	New
412	412
FIELD CODE	
03	03
AREA CODE	
00	--
POOL CODE	

PERMIT TO CONDUCT WELL OPERATIONS

**CRITICAL WELL
 CORRECTED COPY**

Cypress, California
 July 22, 2013

Mr Mark Pender, Agent
 C.R.G. Properties, LTD (C0250)
 149 S. Barrington Ave. #804
 Los Angeles, CA 90049

Your proposal to (Re) Abandon well "Nwlbu" 8-7, A.P.I. No. 037-22512, Section 13, T. 04S, R. 13W, SB B. & M., Long Beach field, Northwest Extension area, Brown pool, Los Angeles County, dated 7/10/2013, received 7/10/2013 has been examined in conjunction with records filed in this office.

THE PROPOSAL IS APPROVED PROVIDED:

1. Blowout prevention equipment, as defined by this Division's publication No. M07, shall be installed and maintained in operating condition and meet the following minimum requirements:
 - a. Class II3M, with hydraulic controls, during abandonment operations.
 - b. A 3M lubricator for wire line operations.
2. Blowout prevention practice drills are conducted at least weekly and recorded on the tour sheet. A practice drill may be required at the time of the test/inspection.
3. The well is cleaned out to 4626'.
4. The well is plugged with cement from 4626' to 3831'.
5. The proposed cement plug from 2600' to 2180' shall extend from 2500' to at least 2200'.
6. All portions of the well not plugged with cement are filled with inert mud fluid having a minimum density of 72 lbs/cu.ft and a minimum gel shear strength of 25 lbs./100 sq. ft.
7. Prior to shooting any perforations for braidenhead squeezes, a pressure test of the 9-5/8" casing shall be made to ensure casing integrity. If casing integrity is not demonstrated, a retainer or packer is required for squeeze operations.
8. All casing must be removed from between 5' and 10' below ground level.
9. Well site restoration shall be completed within 60 days following the completion of plugging operations.
10. A steel plate, at least as thick as the outer well casing and bearing the last five digits of the API number, shall be tack welded around the top circumference of the outer casing.
11. The well location shall be surveyed prior to burying the well, and the survey shall be filed with this office. Latitude and longitude shall be in decimal degrees, to six decimal places, in NAD83.
12. No program changes are made without prior Division approval.

(Continue on page 2)

No Bond Required Bond
 cc: Update
 EDP
 AllenCo.
 DOGGR - Dist. 1 (Cypress)

Tim Kustic
 State Oil and Gas Supervisor

Engineer Ellen Moser
 Office (714) 816-6847

By *Daniel J. Dudak*
 For: Daniel J. Dudak, District Deputy

GN/gn

A copy of this permit and the proposal must be posted at the well site prior to commencing operations. Records for work done under this permit are due within 60 days after the work has been completed or the operations have been suspended. Issuance of this permit does not affect the Operator's responsibility to comply with other applicable state, federal, and local laws, regulations, and ordinances.

13. THIS DIVISION SHALL BE NOTIFIED TO:

- a. Inspect the installed blowout prevention equipment prior to commencing **downhole** operations.
- b. Witness the clean-out depth at **4426'**.
- c. Witness the placing, location and hardness of the cement plug from **4626' to 3831'**.
- d. Witness the mudding operations.
- e. Witness the placing, location and hardness of the cement plug from **3120' to 2820'**.
- f. Witness the placing, location and hardness of the cement plug from **2500' to 2200'**.
- g. Witness the cement squeeze through the **perforations** at **200'** or through a retainer or packer (if casing integrity is not demonstrated).
- h. Witness the placing, location and hardness of the cement plug from **210' to 0'**.
- i. Inspect the restored well site.

NOTE:

1. The well abandonment history (History of Oil or Gas Well - form OG103), must include a description of the removal or abandonment of the well flowline and any associated piping.
2. Upon completion of the proposed work, a History of Oil or Gas Well (form OG103) shall be submitted to this office.
3. Hydrogen sulfide gas (H₂S) is known to be present in this area, adequate safety precautions shall be taken prior to and during well operations.
4. The operator shall isolate the following zones:
 - a. **Base of the Freshwater Sand 2280'**
 - b. **Top of the Upper Gas Zone 2500'**
 - c. **Top of the Wilbur Zone 3120'**
 - d. **Top of the Alamitos Zone 4038'**
 - e. **Top of the Brown Zone 5724'**

Failure to achieve adequate zonal isolation may have negative impacts on current and future operations. In addition, failure to achieve adequate zonal isolation will also be noted on the Report of Operations (OG 109).



NATURAL RESOURCES AGENCY OF CALIFORNIA
 DEPARTMENT OF CONSERVATION
 DIVISION OF OIL, GAS & GEOTHERMAL RESOURCES
 5816 Corporate Ave., Suite 200 Cypress, CA 90630 - 4731

No. P 113-0598

PERMIT TO CONDUCT WELL OPERATIONS

CRITICAL WELL

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FIELD CODE	
03	03
AREA CODE	
00	--
POOL CODE	

Cypress, California
 July 22, 2013

Mr Mark Pender, Agent
 C.R.G. Properties, LTD (C0250)
 149 S. Barrington Ave. #804
 Los Angeles, CA 90049

Your proposal to **(Re) Abandon** well "Nwlbu" 8-7, A.P.I. No. **037-22512**, Section **13**, T **04S**, R. **13W**, **SB B. & M.**, **Long Beach** field, **Northwest Extension** area, **Brown** pool, **Los Angeles** County, dated **7/10/2013**, received **7/10/2013** has been examined in conjunction with records filed in this office.

THE PROPOSAL IS APPROVED PROVIDED:

1. Blowout prevention equipment, as defined by this Division's publication No. M07, shall be installed and maintained in operating condition and meet the following minimum requirements:
 - a. Class **II3M**, with hydraulic controls, during **abandonment** operations.
 - b. A **3M** lubricator for **wire line** operations.
2. Blowout prevention practice drills are conducted at least weekly and recorded on the tour sheet. A practice drill may be required at the time of the test/inspection.
3. A diligent effort shall be made to clean out to **4242'**.
4. All portions of the well not plugged with cement are filled with inert mud fluid having a minimum density of **72** lbs/cu. ft and a minimum gel shear strength of **25** lbs./100 sq. ft.
5. Prior to shooting any perforations for braidenhead squeezes, a pressure test of the **9-5/8"** casing shall be made to ensure casing integrity. If casing integrity is not demonstrated, a retainer or packer is required for squeeze operations.
6. The proposed cement plug from **3120'** to **2920'** shall extend from **3130'** to at least **2930'**.
7. All casing must be removed from between 5' and 10' below ground level.
8. Well site restoration shall be completed within 60 days following the completion of plugging operations.
9. A steel plate, at least as thick as the outer well casing and bearing the last five digits of the API number, shall be tack welded around the top circumference of the outer casing.
10. The well location shall be surveyed prior to burying the well, and the survey shall be filed with this office. Latitude and longitude shall be in decimal degrees, to six decimal places, in NAD83.
11. No program changes are made without prior Division approval.
 - a. Inspect the installed blowout prevention equipment prior to commencing **downhole** operations.

(Continue on page 2)

No Bond Required Bond
 cc: Update
 EDP
 AllenCo.
 DOGGR - Dist. 1 (Cypress)

Engineer Ellen Moser
 Office (714) 816-6847

Tim Kustic
 State Oil and Gas Supervisor

By *[Signature]*
 For: Daniel J. Dudak, District Deputy

GN/gn

A copy of this permit and the proposal must be posted at the well site prior to commencing operations. Records for work done under this permit are due within 60 days after the work has been completed or the operations have been suspended. Issuance of this permit does not affect the Operator's responsibility to comply with other applicable state, federal, and local laws, regulations, and ordinances.

- b. Witness the clean-out depth at **4242'**.
- c. Witness the placing, location and hardness of the cement plug from **3130'** to **2930'**.
- d. Witness the mudding operations.
- e. Witness the placing, location and hardness of the cement plug from **2600'** to **2180'**.
- f. Witness the cement squeeze through the **perforations** at **200'** or through a retainer or packer (if casing integrity is not demonstrated).
- g. Witness the placing, location and hardness of the cement plug from **210'** to **0'**.
- h. Inspect the restored well site.

NOTE:

1. The well abandonment history (History of Oil or Gas Well - form OG103), must include a description of the removal or abandonment of the well flowline and any associated piping.
2. Upon completion of the proposed work, a History of Oil or Gas Well (form OG103) shall be submitted to this office.
3. Hydrogen sulfide gas (H₂S) is known to be present in this area, adequate safety precautions shall be taken prior to and during well operations.
4. The operator shall isolate the following zones:
 - a. **Base of the Freshwater Sand 2280'**
 - b. **Top of the Upper Gas Zone 2500'**
 - c. **Top of the Wilbur Zone 3120'**
 - d. **Top of the Alamitos Zone 3930'**
 - e. **Top of the Brown Zone 4380'**

Failure to achieve adequate zonal isolation may have negative impacts on current and future operations. In addition, failure to achieve adequate zonal isolation will also be noted on the Report of Operations (OG 109).



NATURAL RESOURCES AGENCY OF CALIFORNIA
DEPARTMENT OF CONSERVATION
DIVISION OF OIL, GAS, AND GEOTHERMAL RESOURCES

113-0599
FOR DIVISION USE ONLY
Forms
Bond OGD114 OGD121
BB 7/13/13 7/10/13 JF

NOTICE OF INTENTION TO ABANDON / RE-ABANDON WELL

Detailed instructions can be found at: www.conservation.ca.gov/dog

In compliance with Section 3229, Division 3, Public Resources Code, notice is hereby given that it is our intention to abandon / re-abandon well "Nwlbu" 8-7, API No. 037-22512
(Check one)

Sec. 13, T. 4s, R. 13w, S.B. B.&M., Long Beach Field, Los Angeles County.

The complete casing record of the well (present hole), including plugs and perforations, is as follows: (Attach wellbore schematics diagram also.)
See Attachment

The total depth is: 5847 feet. The effective depth is: 4243 feet.
Present completion zone(s): see attachment (Name) Present zone pressure: N/A psi.
Oil or gas shows: see attachment (Name and depth) feet. Depth to base of fresh water: 2280 feet.
Top of uppermost hydrocarbon zone (which may be behind unperforated casing): see attachment (Depth of interval) feet.

Is this a critical well as defined in the California Code of Regulations, Title 14, Section 1720(a) (see next page)? Yes No

The proposed work is as follows: (A complete program is preferred and may be attached.)
See Attachment.

The Division must be notified immediately of changes to the proposed operations. Failure to provide a true and accurate representation of the well and proposed operations may cause rescission of the permit.

Name of Operator C.R.G. Properties, Ltd		
Address 2109 GUNDRY AVE.	City/State SIGNAL HILL	Zip Code 90755
Name of Person Filing Notice MICK BEYER	Telephone Number: 562 989-6100	Signature <i>M. B.</i>
Individual to contact for technical questions: MICK BEYER	Telephone Number: 310 505-9787	Date 07-10-13
		E-Mail Address: Mbeyer@allencoca.com

This notice must be filed, and approval given, before plugging and abandonment operations begin. If operations have not commenced within one year of the Division's receipt of the notice, this notice will be considered cancelled.

DOGGR
Received-
JUL 10 2013
p. Elora 7/10/13

CRITICAL WELL DEFINITION

As defined in the California Code of Regulations, Title 14, Section 1720 (a), "Critical well" means a well within:

- (1) 300 feet of the following:
 - (A) Any building intended for human occupancy that is not necessary to the operation of the well; or
 - (B) Any airport runway.
- (2) 100 feet of the following:
 - (A) Any dedicated public street, highway or the nearest rail of an operating railway that is in general use;
 - (B) Any navigable body of water or watercourse perennially covered by water;
 - (C) Any public recreational facility such as a golf course, amusement park, picnic ground, campground or any other area of periodic high-density population; or
 - (D) Any officially recognized wildlife preserve.

This form may be printed from the DOGGR website at www.conservation.ca.gov/dog/

EXHIBIT A – Attachment II (continued)
WELL CONDITIONS AND ABANDONMENT SPECIFICATIONS

C.R.G. Properties, Ltd. Well "Nwlbu" 8-7 (037-22512), Sec.13, Twn. 4S, Rge. 13W, S.B. B&M, Long Beach Oil Field

According to Division records, the present condition of the well is as follows:

1. **Location:** See map Exhibit A - Attachment II
2. **Accessibility:**
3. **Status:** Idle deserted
4. **Total Depth:** 5847' **Effective Depth:** 4243, **Elevation of Kelly Bushing (KB) above sea level:** 55.5'.
5. **Casing:** 13-3/8" cemented at 1122'; 9 5/8" casing cemented at 4715', cemented to 884' behind pipe; 7" casing landed from 4626' to 5847', perf @ int. 5724-5777', perf 4038'-4119 & perf int @ 4356-4412'. TD 5847'. Plugged w/cem 5777'-5583' & 4423'-4242'.
6. **Tubing:** Unknown **Rods:** Unknown
7. **Base of Fresh Water (BFW):** 2280'
8. **Producing Zone(s):** Brown
9. **Hole Fluid:** Unknown
10. **Junk:** Unknown
11. **Plugs:** 5777'-5583' & 4423'-4242'.
12. **Comments:** Top of Brown zone 4380', top of Alamitos zone 3930', top of Wilbur zone 3120', and top of Upper Gas zone 2500'.

The following operations are necessary to plug and abandon the well:

1. A Notice of Intention to Abandon (form OG 108) is to be filed with this Division at least 10 days prior to commencing work. Work is not to begin until a Permit to Conduct Well Operations (Form OG 111) has been issued. All well operations are to be witnessed by a representative of this Division as directed in the Permit to Conduct Well Operations.
2. The abandonment contractor will review job safety programs (JSP) with all crewmembers prior to work startup and/or if conditions change. Monitor well for any leaking gas. Position gas monitors and ventilation fans, if warranted before moving in any other equipment or personnel.
3. Adequate blowout prevention equipment, as defined in Division's publication No. M07, shall be installed and maintained in operating condition at all times. The minimum requirements are:
 - a. A 3M rod Reagan or equivalent BOPE for pulling rods and pump operations.
 - b. A Class II 3M, with hydraulic controls, during abandonment operations.
 - c. A 3M lubricator for wire line operations.
4. All portions of the well not plugged with cement are filled with inert mud fluid having a minimum density of 72 lbs/cu ft and a minimum gel shear strength of 25 lbs. /100 sq. ft. All cement plugs are to have a minimum compressive strength of 1000 psi and maximum liquid permeability of 0.1 md. All depths noted are from the KB.
5. Hole fluid of a quality and in sufficient quantity to control all subsurface conditions in order to prevent blowouts shall be used.
6. Kill well. Install and function test rod Reagan or equivalent BOPE. Pull out of the hole with rods and pump.

EXHIBIT A – Attachment II (continued)
WELL CONDITIONS AND ABANDONMENT SPECIFICATIONS

7. Remove rod Reagan. Install and function test Class II3M BOPE (function test BOPE each day thereafter).
8. Pull out all production tubing.
9. Use appropriate combination tools to clean out to 4243'.
10. Run in scraper. Scrape the 7" casing.
11. Run in hole with tubing (if tag high, clean out fill to 4243).
12. The well shall be plugged with cement from 4243' to 3730'.
13. The well shall be plugged with cement from 3120' to 2920.
14. The well shall be plugged with cement from 2600' to 2180.
15. Prior to shooting any perforations for braidenhead squeezes, a pressure test of the casing shall be made to ensure casing integrity. If casing integrity is not demonstrated, a packer is required for squeeze operations.
16. The 9-5/8" casing shall be perforated from 210 to 200'. Get an injection rate or a breakdown.
17. Sufficient cement shall be squeezed into the perforations to fill to surface.
18. The well shall be plugged with cement from 210' to surface.
19. All casing must be removed from between 5' and 10' below ground level.
20. A steel plate, at least as thick as the outer well casing and bearing the last five digits of the API number, shall be tack welded around the top of the outer casing.
21. Cellar, production pads and pipelines shall be removed and the resulting excavations filled with earth and compacted properly to prevent settling.
22. Remaining buried pipelines that cannot be removed shall be purged with clean water. Abandon line by pumping approved cement slurry mixture, weld steel cap on both ends of the line and bury.
23. All equipment, casing, or junk that requires removal to implement restoration to lawful conditions shall be removed and properly disposed of in accordance with environmental laws and in accordance with instructions from the Division of Oil and Gas. All liquid wastes shall be removed and properly disposed.
24. A well History (Form OG 103) shall be filed in duplicate with the Division within 60 days of completing the work and must include a description of the removal or abandonment of the well flow line and any associated piping.

1 DEPARTMENT OF CONSERVATION
2 Legal Office
3 801 K Street
4 Sacramento, California
5 Telephone (916) 323-6733
6 Facsimile (916) 445-9916
7

8 **STATE OF CALIFORNIA**
9 **NATURAL RESOURCES AGENCY**
10 **DEPARTMENT OF CONSERVATION**
11 **DIVISION OF OIL, GAS, AND GEOTHERMAL RESOURCES**
12

13 **FORMAL ORDER TO:**
14 **PLUG AND ABANDON WELLS &**
15 **RESTORE LEASE CONDITIONS**
16
17

18 **NO. 1032**

19 **Dated: October 17, 2012**

20 **Operator: C.R.G. Properties, Ltd. (C0250)**
21
22

23 **BY**

24 **Tim Kustic**

25 **STATE OIL AND GAS SUPERVISOR**
26
27

NATURAL RESOURCE AGENCY
DEPARTMENT OF CONSERVATION
DIVISION OF OIL, GAS, AND GEOTHERMAL RESOURCES

REPORT OF CANCELLATION

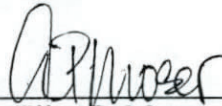
Cypress, California
March 29, 2010

J. W. Scott
6191 Point Loma
Huntington Beach, CA 92647

In accordance with **the expiration of Permit to Conduct Well Operations** the following change pertaining to your well **C.R.G. Properties Ltd/"Nwlbu" 8-7**, API. No. **037-22512**, **Long Beach** Field, **Los Angeles** County, **Sec. 13**, **T. 4S**, **R. 13W**, **S.B. B. & M.**, is being made in our records:

Your notice to **abandon** dated **02/18/2009**, and our report No. **P 109-0096** issued in answer thereto, is hereby **cancelled** inasmuch as the work will not be done. If you have an individual bond on file covering this notice, it will be returned. No request for such return is necessary.

Elena M. Miller
State Oil and Gas Supervisor


By _____
Ellen P. Moser
Associate Engineer

cc: Update
City of Signal Hill
C.R.G. Properties, Ltd.

CANCELLATION/ CORRECTION made:	Date/Initial
Form 121 _____	3-29-2010
Form 177 _____	/
Form 140 _____	/
WELL Reports _____	3-29-2010
RECORDS: Log Fid _____	4-1-10 VM
EDP _____	/
BOND _____	/
FIELD MAP _____	/
MAP BOOK _____	/

PERMIT TO CONDUCT WELL OPERATIONS

J. W. Scott
6191 Point Loma
Huntington Beach, CA 92647

Cypress, California
March 4, 2009

Your proposal to **abandon** well **C.R.G. Properties, Ltd./"Nwlbu" 8-7**, A.P.I. No. **037-22512**, Section **13**, T. **4S**, R. **13W**, **S.B. B. & M., Long Beach Field, Northwest Extension** area, -- pool, **Los Angeles County**, dated **2/18/2009**, received **2/19/2009** has been examined in conjunction with records filed in this office.

THE PROPOSAL IS APPROVED PROVIDED:

1. Blowout prevention equipment with hydraulic controls, equivalent to this Division's Class **II3M** requirements, or better, shall be installed and maintained in operating condition.
2. All portions of the well not plugged with cement shall be filled with clay base mud having a minimum density of 72 lb/cu ft and a minimum gel-shear strength of 25 lb/100 sq ft.
3. The well shall be plugged with cement from **2600'** to **2500'**, and **2330'** to **2230'**.
4. All uncemented casing annuli shall be cemented from **30'** to **5'**.
5. This Division shall be consulted and a Supplementary Notice may be required before making any changes in the proposed program.
6. **THIS DIVISION SHALL BE NOTIFIED TO:**
 - a. Inspect the installed blowout prevention equipment prior to commencing downhole operations.
 - b. Witness the clean-out depth
 - c. Witness the location and hardness of the cement plug at **2835'**.
 - d. Witness the mudding of the well.
 - e. Witness the placing, location and hardness of the cement plug from **2600'** to **2500'**.
 - f. Witness the placing, location and hardness of the cement plug from **2330'** to **2230'**.
 - g. Witness the placing, location and hardness of the cement plug from **100'** to **5'**.
 - h. Inspect and approve the cleanup of the well site within 60 days after placement of the surface plug.

NOTE:

1. A crew drill may be required at the time of the blowout prevention equipment inspection.
2. The proposed surface plug shall not contain rock or gravel.
3. The base of freshwater sands is at **2270' ±**.
4. This division does not pass upon your right to enter the property, but merely approves the proposal as conforming to our requirements.

JCH:jch

cc: Update
City of Signal Hill
C.R.G. Properties, Ltd.

BLANKET BOND

Engineer: John Huff

Phone: 714/816-6847

Cancelled 3-29-2010

Hal Bopp

State Oil and Gas Supervisor

By 

For William E. Brannon, Deputy Supervisor

A copy of this permit and the proposal must be posted at the well site prior to commencing operations. Records for work done under this permit are due within 60 days after the work has been completed or the operations have been suspended.

CRITICAL WELL

As defined in the California Administrative Code, Title 14, Section 1720 (a), "Critical well" means a well within:

- (1) 300 feet of the following:
 - (A) Any building intended for human occupancy that is not necessary to the operation of the well; or
 - (B) Any airport runway.

- (2) 100 feet of the following:
 - (A) Any dedicated public street, highway, or nearest rail of an operating railway that is in general use;
 - (B) Any navigable body of water or watercourse perennially covered by water;
 - (C) Any public recreational facility such as a golf course, amusement park, picnic ground, campground, or any other area of periodic high-density population; or
 - (D) Any officially recognized wildlife preserve.

Exceptions or additions to this definition may be established by the supervisor upon his own judgment or upon written request of an operator. This written request shall contain justification for such an exception.

ABANDONMENT PROGRAM
Well NWLBU (A)

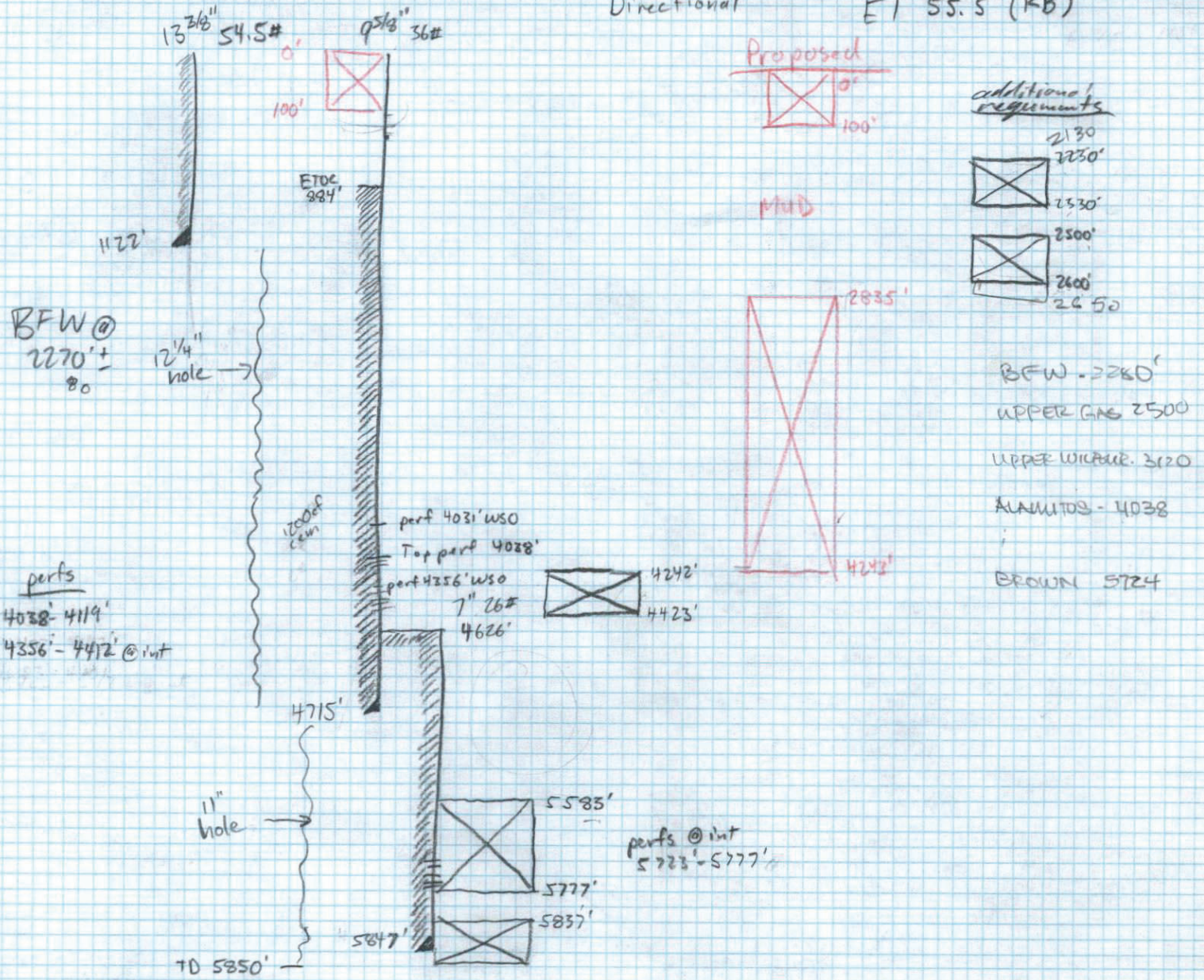
A 8-7

1. MIRU. Install and test class III 3 M BOPE.
2. PU and RIH with 2 7/8" workstring and cleanout to 4243'(TD). POOH.
3. MU and RIH with cementers. Cement from TD to 2835' to 611 cf class G cement. PU.
4. .RIH and tag for top of cement.
5. Mud well from TOC to surface @ 219 bbls of 72 pcf cude.
6. RIH with tbq and cement 7" casing and 7" x 10 3/34" annulus from 100' to surface with 80 cf of class G cement. RDMO.
7. Cut recover csqs 8' below surface. Weld or plate on largest diameter csq.
8. Remove cellar. Cleanup well site.

wlbu 8-7 (037-22512)

Directional

EI 55.5' (KB)



9 5/8" csg cem w/ 1276 cf cem w/ 76 cf cem
left in shoe ± 1200 cf cem in 9 5/8" x 12 1/4" annulus

SCH
3/2/2004

RESOURCES AGENCY OF CALIFORNIA
DEPARTMENT OF CONSERVATION
DIVISION OF OIL, GAS, AND GEOTHERMAL RESOURCES

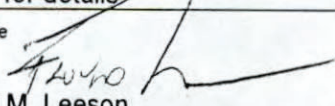
REPORT OF PROPERTY AND WELL TRANSFER

Field or County <p style="text-align: center;">Long Beach</p>	District District 1 (Cypress, California)
Former owner <p style="text-align: center;">Pacific Energy Res. P0252</p>	Date July 26, 2000

Well Name	API Number	Section Township Range
"Nwlbu" 5-2	037-00397	Sec. 13-4S-13W
"Nwlbu" 5-3	037-09796	Sec. 13-4S-13W
"Nwlbu" 5-4	037-09797	Sec. 13-4S-13W
"Nwlbu" 8-3	037-06496	Sec. 13-4S-13W
"Nwlbu" 8-4	037-06415	Sec. 13-4S-13W
"Nwlbu" 8-7	037-22512	Sec. 13-4S-13W
"Nwlbu" 9-2	037-13525	Sec. 13-4S-13W
"Nwlbu" 9-3	037-09791	Sec. 13-4S-13W
"Nwlbu" 9-4	037-00392	Sec. 13-4S-13W
"Nwlbu" 9-5	037-00142	Sec. 13-4S-13W
"Nwlbu" 9-6	037-00393	Sec. 13-4S-13W

Description of the land upon which the well (s) is (are) located. See above

Date of transfer May 9, 2000	New owner C.R.G. Properties, Ltd. C0250	Type of organization Corp./Ltd.
	Address: 15332 Antioch Street, Suite 338 Pacific Palisades, CA 90272	Telephone (310) 808-9071
Reported by	OG34A received 6/2/2000 signed by both parties	
Confirmed by	Same as above	
New operator new status PA	Designation of Agent Mark Pender	
Old operator new status PA	Remarks See operator file for C.R.G. Properties, Ltd. for details	

OPERATOR STATUS ABBREVIATIONS	Deputy Supervisor R. K. Baker	Signature  Floyd M. Leeson Operations Engineer				
	PA - Producing Active					
NPA- No potential, Active						
PI- Potential Inactive						
NPI-No potential, Inactive						
Ab-Abandoned or No More Wells						
cc: Update; Envir Dsk; File Conservation Committee Harold W. Bertholf, Inc. LA County Assessor Sacramento EDP Cypress EDP	FORM AND RECORD CHECK LIST					
	Form or Record	Initials	Date	Form or Record	Initials	Date
	Form OGD121	N/A		Map and Book		
	Operator Card			Notice cancellations	N/A	
	Well Records	SR	7/27/2000	Bond Status BB/FML	SR	7/26/2000
	Log Records	SR	7/31/2000	EDP	SR	7/27/2000
Production Repts	N/A		Data Base	SR	7/27/2000	

WELL TRANSFER NOTICE

EFFEC MAY 9, 1994, PETRO RESOURCES, INC.

TRANS LONG BEACH NWLBU WELLS

TO PACIFIC ENERGY ~~CORP~~ *Resources*

SEE OGD156 DATED 5-13-94

RESOURCES AGENCY OF CALIFORNIA
DEPARTMENT OF CONSERVATION
DIVISION OF OIL AND GAS

REPORT OF PROPERTY AND WELL TRANSFER

Field or county <p style="text-align:center;">Long Beach</p>	District <p style="text-align:center;">1</p>
Former owner <p style="text-align:center;">Sun Exploration & Production Co.</p>	Date <p style="text-align:center;">June 15, 1983</p>
Name and location of well(s) <p style="text-align:center;">Sec. 13-4S-13W S.B.B.&M.</p>	
NWLBU 5-1 (037-09795)	NWLBU 8-1 (037-09792)
NWLBU 5-2 (037-00397)	NWLBU 8-2 (037-09793)
NWLBU 5-3 (037-09796)	NWLBU 8-3 (037-06496)
NWLBU 5-4 (037-09797)	NWLBU 8-4 (037-06415)
NWLBU 6-1 (037-09788)	NWLBU 8-7 (037-22512)
NWLBU 6-2 (037-09789)	NWLBU 9-2 (037-13525)
NWLBU 9-3 (037-09791)	NWLBU 9-4 (037-00392)
NWLBU 9-5 (037-00142)	NWLBU 9-6 (037-00393)

Description of the land upon which the well(s) is (are) located

Date of transfer, sale, assignment, conveyance, or exchange <p style="text-align:center;">May 1, 1983</p>	New owner <p style="text-align:center;">Petro Resources, Inc.</p>	Type of organization <p style="text-align:center;">Corp.</p>
	Address <p style="text-align:center;">4200 Easton Drive, Suite 16 Bakersfield, CA 94309</p>	

Reported by
Letter from Sun Exploration & Production Co. dated 5-16-83.

Confirmed by
Letter from Petro Resources, Inc., dated 5-18-83.

New operator new status (status abbreviation) <p style="text-align:center;">PA</p>	Request designation of agent <p style="text-align:center;">Joe D. Rose, same address.</p>
--	---

Old operator new status (status abbreviation) <p style="text-align:center;">PA</p>	Remarks
--	---------

OPERATOR STATUS ABBREVIATIONS	Deputy Supervisor <p style="text-align:center;">V. F. Gaede</p>	Signature
--------------------------------------	---	---------------

	FORM AND RECORD CHECK LIST					
	Form or record	Initials	Date	Form or record	Initials	Date
PA - Producing Active						
NPA - No Potential, Active	Form OGD121	CP	7-7-83	Map and book	137	7/12/83
PI - Potential Inactive	Form OGD140	NONE		Notice to be cancelled		
NPI - No Potential, Inactive	New well cards	CP	7-7-83	Bond status		
Ab - Abandoned or No More Wells	Well records	CP	7-7-83	EDP files Update		
	Electric logs	CP	7-7-83	Conservation Committee		
	Production reports			L. A. Assessors		

DIVISION OF OIL AND GAS

CHECK LIST - RECORDS RECEIVED AND WELL STATUS

Company Sun Oil Company Well No. NEW BU 8-7
 API No. 037 22512 Sec. 13, T. 4S, R. 13W, S.B. B.&M.
 County _____ Field Long Beach

RECORDS RECEIVED	DATE	
Well Summary (Form OGI00)	<u>11/2/82</u>	<u>(2)</u>
History (Form OGI03)	<u>11/2/82</u>	<u>(2)</u>
Core Record (Form OGI01)		
Directional Survey	<u>5/19/83</u>	<u>(2)</u>
Sidewall Samples		
Other		
Date final records received		
Electric logs:		
<u>Dipmeter (cluster)</u>	<u>10-21-81</u>	<u>(2)</u>
<u>Arrow Plot (cluster)</u>	<u>10-21-81</u>	<u>(2)</u>
<u>Dual log</u>	<u>5/27/83</u>	<u>(2)</u>
<u>Comp Neutron</u>	<u>5/27/83</u>	<u>(2)</u>
<u>Dual log</u>	<u>5/27/83</u>	<u>(2)</u>
<u>Cement Bond</u>	<u>5/27/83</u>	<u>(2)</u>

STATUS	STATUS
Producing - Oil	Water Disposal
Idle - Oil	Water Flood
Abandoned - Oil	Steam Flood
Drilling - Idle	Fire Flood
Abandoned - Dry Hole	Air Injection
Producing - Gas	Gas Injection
Idle - Gas	CO2 Injection
Abandoned - Gas	LPG Injection
Gas-Open to Oil Zone	Observation
Water Flood Source	
DATE	<u>5-14-82</u>
RECOMPLETED	
REMARKS	

ENGINEER'S CHECK LIST

- Summary, History, & Core record (dupl.) ✓✓
- Electric Log ✓
- Operator's Name _____
- Signature _____
- Well Designation _____
- Location _____
- Elevation _____
- Notices ✓
- "T" Reports ✓
- Casing Record _____
- Plugs _____
- Surface Inspection _____
- Production _____
- E Well on Prod. Dir. Sur. ✓

Dipmeter ✓
" ✓

R. Manuel/Vicky Grupp 5-18-83
will send D.S. & E-log
right away.

CLERICAL CHECK LIST

- Location change (F-OGD165) _____
- Elevation change (F-OGD165) _____
- Form OGD121 _____
- Form OGI59 (Final Letter) _____
- Form OGD150b (Release of Bond) _____
- Duplicate logs to archives _____
- Notice of Records due (F-OGD170) _____

No. P 182-109

Cont. Dipmeter 5/27/83 (2)

Hold for rest of records 10/23/81

BPB
UPDATE CENTER 6/7/83

RECORDS NOT APPROVED

Reason: Need E-log, dir survey

RECORDS APPROVED

RELEASE BOND

Date Eligible _____
 (Use date last needed records were received.)

MAP AND MAP BOOK

137
6/7/83

WELL SUMMARY REPORT

Operator SUN EXPLORATION AND PRODUCTION COMPANY		Well NWLBU #8-7				
Field LONG BEACH		County LOS ANGELES	Sec. 13	T. 4S	R. 13W	B.&M. SB
Location (Give surface location from property or section corner, street center line and/or California coordinates) 487.44' N & 778.80' W OF SAN ANTONIO DRIVE & DEL MAR AVENUE					Elevation of ground above sea level 45.5	
Commenced drilling (date) 8/25/81	Total depth			Depth measurements taken from top of:		
Completed drilling (date) TA 5/14/82	(1st hole) 5837'	(2nd)	(3rd)	<input type="checkbox"/> Derrick Floor <input type="checkbox"/> Rotary Table <input checked="" type="checkbox"/> Kelly Bushing Which is 10± feet above ground		
Commenced producing (date) N/A	Present effective depth 4243'			GEOLOGICAL MARKERS DEPTH UPPER ALAMITOS I ₁ 4038' I ₂ 4080' LOWER ALAMITOS K ₁ 4367' BROWN ZONE V 5724'		
<input type="checkbox"/> Flowing <input type="checkbox"/> Pumping <input type="checkbox"/> Gas lift	Junk NONE					
Name of producing zone(s) LOWER ALAMITOS BROWN "I"		Formation and age at total depth LOWER ALAMITOS				

	Clean Oil (bbl per day)	Gravity Clean Oil	Percent Water including emulsion	Gas (Mcf per day)	Tubing Pressure	Casing Pressure
Initial Production	N/A					
Production After 30 days	N/A					

CASING RECORD (Present Hole)								
Size of Casing (API)	Top of Casing	Depth of Shoe	Weight of Casing	Grade and Type of Casing	New or Second Hand	Size of Hole Drilled	Number of Sacks or Cubic Feet of Cement	Depth of Cementing (if through perforations)
13 3/8"	SURFACE	1122'	54.5#	K-55, BT&C	NEW	17 1/2"	1456 CF POZ 100 CF CL	MIX "A" & "G"
9 5/8"	SURFACE	4715'	36.0#	K-55, LT&C S-80, ST&C	NEW	12 1/4"	1076 CF CL 200 CF CL	"G" & "G"
7"	4626'	5847'	26.0#	K-55, BT&C	NEW	8 3/4"	468 CF POZ 100 CF CL	MIZ "A" & "G"

PERFORATED CASING (Size, top, bottom, perforated intervals, size and spacing of perforation and method.)
 4- 1/2" HPF 4119'-4109': 143 SHOTS W/4-1/2" HPF 4412'-4402'; 4401'-4383': 4-1/2" H @ 4356';
 PERF'D 4-1/2" HPF 4412'-4402'; 4401'-4383': WSO 4-3/8" H @ 4031': 4-.43" HPF 5757'-5749',
 5748'-5738', 5736.5'-5734.5', 5733'-5723.5'

Was the well directionally drilled? If yes, show coordinates at total depth
 Yes No **460' N & 82" W**

Electrical log depths
FDC-CNL-GR-CAL-TEN 4902'-3000': DLL-GR-TEN 5850'-4713': FDC-CNL-GR-CAL-TEN 5850'-4713'

Other surveys
GAMMA RAY 4500'-4000': GAMMA RAY CMT BOND LOG 4200'-3348': DIPMETER

In compliance with Sec. 3215, Division 3 of the Public Resources Code, the information given herewith is a complete and correct record of the present condition of the well and all work done thereon, so far as can be determined from all available records.

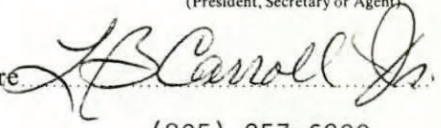
Name L. B. CARROLL, JR.		Title DISTRICT ENGINEER	
Address P O BOX 55060		City VALENCIA	Zip Code 91355-0560
Telephone Number 805/257-6200	Signature <i>L B Carroll Jr</i>	Date 10/28/82	

SUBMIT IN DUPLICATE
RESOURCES AGENCY OF CALIFORNIA
DEPARTMENT OF CONSERVATION
DIVISION OF OIL AND GAS

History of Oil or Gas Well

Sun Exploration & Production Co.

Operator Sun Production Division Field or County Long Beach
 Well Northwest Long Beach Unit #8-7, Sec. 13, T. 4S, R. 13W, SB. B. & M.
 A.P.I. No. 037-22512 Name L.B. Carroll, Jr. Title Agent
 Date October 28, 1982 19 (Person submitting report) (President, Secretary or Agent)

Signature 

PO Box 55060, Valencia, CA 91355 0560
 (Address)

(805) 257-6200
 (Telephone Number)

History must be complete in all detail. Use this form to report all operations during drilling and testing of the well or during redrilling or altering the casing, plugging, or abandonment with the dates thereof. Include such items as hole size, formation test details, amounts of cement used, top and bottom of plugs, perforation details, sidetracked junk, bailing tests and initial production data.

Date	
1981	
8/25	5826 TVD/"V"/IR/ATLANTIC/LA CA/WI 1.00/SURF LOC: 487.44' N & 778.80' W OF SANTONIO DR & DEL MAR AVE/BHL: 463 N, 100' W OF SURF LOC/ 370' SD SH D (320) MXNG LCM/MIRU ATLANTIC OIL RIG #3/SPUD @ 2 PM 8-24-81/DRLG 17½" HOLE FRM 50-370, LOST COMPLETE RTNS/WRK TIGHT PIPE OUT OF HOLE/MW 68/VIS 45/
8/26	370 DRLG OUT CMT/MX & PMP 100 BBLs OF 18# PER BBL LCM, NO RTNS/w DP @ 240, PMP 8 YDS OF 3-1 MX CMT/DISP w 22 CF DRLG MUD/POH/WOC 12 HRS, TAG SOFT CMT @ 85/CO MED HRD CMT TO 105 w FULL RTNS/MW 66/VIS 38/
8/27	965 SD SH D (595) LOST CIRC/DRLG CMT & CLND OUT TO 370 w FULL RTNS/ DRLG 17½ HOLE FRM 370-965 LOST COMPLET RTNS/POH/MW 70/VIS 43/
8/28	1120 SD SH D (155) PREPNG TO RUN 13-3/8" CSG/MX LCM PILL, RIH TO 945 w OPN ENDED DP/PMP 100 BBLs OF 18# PER BBL LCM, REGAIN FULL CIRC/ TRIP FOR BIT, HAD 15' FILL, NO FLUID LOSS/DRLG 17½" HOLE FRM 965- 1120/CIRC & WIPE HOLE TO RUN CSG/MW 71/VIS 57/
8/31	8-29/1122 SD SH INST CSG HD/CIRC & COND MUD, POH/RAN 28 JTS (1125) 13-3/8" 54.5# K-55 BT&C CSG w SHOE @ 1122, FLOAT CLR @ 1076/B.J. PMPD 150 CF SODIUM SILICATE FOLLOWED BY 1456 CF POZ "A" 1-1 PERLITE w 4% GEL & 2% CaCl ₂ FOLOWD BY 100 CF CL "G" CMT w 2% CaCl ₂ /DISP w 940 CF DRLG MUD/BMPD ² PLUG w 1000 PSI, BLED TO 0/440 CF CMT RTNS/CIP @ 10:45 PM/WOC 4 HRS/LND CSG/MW 68/VIS 40/8-30/1122 SD SH RIH w 12¼" BIT/CUT OFF CONDUCTOR & CLN CELLAR/WELD ON 13-3/8" CSG HD/INST BOE/RIH w 12¼" BIT TO TST CSG & BOE/MW 68/VIS 35/8-31/1503 SD SH D (381) DD/TST CL III BOP & CK BY DOG/DRLG PLUGS, FLOAT CLR, CMT & SHOE @ 1122/DRLG 12P" HOLE FRM 1122-1503/SURV @ 1428, 2°45', N01W/TVD 1427.97/SEC. 3.45/N-3.22/W-1.44/MW 68/VIS 36/
9/1	2233 SD SH D (730) DRLG/DRLG 12¼" HOLE FRM 1503-2233/SURV @ 2173 13°15', N25°30'W/TVD 2159.14/SEC.137.22/N-129.80/W-49.32/MW 67/VIS 42/
9/2	2425 SD SH D (192) FISHING D.C. SLIPS OUT OF BOP/3 HRS DN TIME REPAIRNG HOOK/DRLG & DYNA DRLG 12¼" HOLE FRM 2233-2455/UNABL TO GET SURV/TRIP TO CHG ORIENTATION SUB/DROP D.C. SLIPS IN BOP/FISHING OUT SAME/SURV @ 2357, 12°30', N25°30'W/TVD 2338.47/SEC.176.81/N-166.17/ W-68.65/MW 69/VIS 38/

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- 9/3 2714 SD SH D (289) DRLG/FISHED SLIPS OUT OF BOP/DRLG 12 $\frac{1}{4}$ " HOLE FRM 2425-2714/RIG OFF DAY WORK FOR 7 $\frac{1}{2}$ HRS FISHING OUT SLIPS/SURV @ 2663, 13 $^{\circ}$, N02E/TVD 2637.37/SEC.245.62/N-234.85/W-76.00/MW 69/VIS 36/
- 9/4 2950 SD SH D (236) RIH/DRLG 12 $\frac{1}{4}$ " HOLE FRM 2714-2950/WIPE 12 $\frac{1}{4}$ " HOLE TO 1100, HOLE TIGHT/CIRC COND MUD/TRIP FOR 8-3/4" BHA/SURV @ 2938, 12 $^{\circ}$ 15', N05 $^{\circ}$ 30'E/TVD 2905.72/SEC.303.61/N-294.96/W-72.61/MW 70/VIS 37/
- 9/5 3495 SD SH D (545) TRIP FOR DD/DRLG 8-3/4" HOLE FRM 2950-3495/TRIP FOR DD/SURV @ 3495, 10 $^{\circ}$ 45', N5 $^{\circ}$ E/TVD 3451.05/SEC.412.36/N-408.54/W-63.83/MW 70/VIS 40/
- 9/6 3822 SD SH DD (327) TRIP FOR BHA/TRIP FOR DD/DD 8-3/4" HOLE FRM 3495-3822/POH/SURV @ 3758, 6 $^{\circ}$ 15', N43 $^{\circ}$ W/TVD 3709.13/SEC.460.58/N-453.93/W-79.69/MW 70/VIS 38/
- 9/7 3822 SD SH FISHING/POH & LAY DN DD/RIH w NEW BHA TO 3640/REAM 8-3/4" HOLE FRM 3640-3792/WRK ON PMP & POH LOOKNG FOR WASHOUT/LEFT DBL PIN X0, MONEL, & 8-3/4" BIT IN HOLE/WO FISHNG TOOLS 5 HRS/RIH w NEW DBL BOX X0 & ATTMPT TO SCREW INTO FISH/MW 69/VIS 38/
- 9/8 3996 SD SH D (174) DRLG/POH, REC ALL FISH/RIH, REAM DYNA DRL RUN FRM 3733-3822/DRLG 9-7/8" HOLE FRM 3822-3996/SURV @ 3955, 2 $^{\circ}$ 15', N41W/TVD 3905.66/SEC.471.79/N-463.97/W-88.40/MW 68/VIS 38/
- 9/9 4170 SD SH D (174) REPAIRNG SWIVEL/DRLG 8-3/4" HOLE FRM 3996-4095/REPAIR SWIVEL FOR 7 HRS/DRLG 8-3/4" HOLE FRM 4095-4170/REPAIR SWIVEL FOR 4 HRS/MW 68/VIS 45/SURV @ 4139, 1 $^{\circ}$ 15', N40W/TVD 4089.56/SEC.477.22/N-468.24/W-92.37/
- 9/10 4297 SD SH D (127) DRLG/REPAIR SWVL 1 HR/DRLG 8-3/4" HOLE FRM 4170-4235/TRIP FOR NEW BIT & TWO D.C./DRLG FRM 4235-4297/SURV @ 4235, 1 $^{\circ}$ 15', N69W/TVD 4185.59/SEC.478.76/N-496.46/W-94.08/MW 68/VIS 44/
- 9/11 4483 SD SH D (186) REPAIRNG PMP/DRLG 8-3/4" HOLE FRM 4297-4379/REPAIR SWIVEL 3 HRS/DRLG 8-3/4" HOLE FRM 4379-4483/REPAIR MUD PMP FOR 7 HRS/SURV @ 4427, 0 $^{\circ}$ 15', N34 $^{\circ}$ E/TVD 4377.52/SEC.480.69/N-471.08/W-95.71/MW 70/VIS 37/
- 9/12 4673 SD SH D (190) DRLG/REPAIR MUD PMP 1 $\frac{1}{2}$ HRS/DRLG 8-3/4" HOLE FRM 4483-4548/TRIP FOR NEW BIT/DRLG 8-3/4" HOLE FRM 4548-4673/SURV @ 4610, 0 $^{\circ}$ VERT/TVD 4560.52/SEC.480.14/N-470.68/W-94.94/MW 68/VIS 38/
- 9/13 4906 SD SH D (233) PREP TO LOG/DRLG 8-3/4" HOLE FRM 4673-4906/CIRC HOLE & COND MUD/WIPE HOLE FOR LOGS, NO FILL/POH FOR LOGS/SURV @ 4906 1 $^{\circ}$, S81 $^{\circ}$ E/TVD 4856.49/SEC.478.56/N-469.82/W-91.45/MW 69/VIS 40/

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- 9/14 4906 TD OH 3234 SD SH OH (284) OH/SCHLUM RAN DLL-GR-TEN FRM 4906-1122/FDC-CNL-GR-CAL-TEN FRM 4902-3000/DIPMETER FRM 4903-3000/ TOOK SWC FRM 4607-4006, SHOT 57, REC 42/OPN 8-3/4" HOLE TO 12½" FRM 2950-3234/MW 69/VIS 40/
- 9/15 4906 TD OH 4095 SD SH OH (861) OH/OPN 8-3/4" HOLE TO 12½" FRM 3234-3451/CIRC & COND HOLE FOR LOG/POH/SCHLUM RAN DIPMETER/UNABL TO GET LOG TOOL BELOW 3482/TRIP FOR DRLG ASSY/OPN 8-3/4" HOLE TO 12½" FRM 3451-4095/MW 70/VIS 43/
- 9/16 4905 TD OH 4406 SD SH OH (311) OH/OPN 8-3/4" HOLE TO 12½" FRM 4095-4406/MW 69/VIS 37/
- 9/17 4906 TD OH 4528 SD SH OH (122) OH/OPN 8-3/4" HOLE FRM 4406-4499/POH & REPAIR BRAKES FOR 4½ HRS/OPN HOLE FRM 4499-4528/MW 69/VIS 39/
- 9/18 4906 TD OH 4685 SD SH OH (157) OH/OPN 8-3/4" HOLE TO 12½" FRM 4528-4685/MW 69/VIS 40/
- 9/19 4906 TD OH 4725 SD SH OH (40) RUNNING 9-5/8" CSG/OPN 8-3/4" HOLE TO 12½" FRM 4685-4725/COND HOLE FOR LOG/WO SCHLUM 3½ HRS/SCHLUM RAN DIPMETER FRM 4725-3000/CIRC FOR CSG/RUNNING 9-5/8" CSG/MW 69/VIS 40/
- 9/20 4906 TD PRES TSTG WELL HD/RAN TOT OF 108 JTS (4718) w 56 JTS 9-5/8" 36# S-80 ST&C ON BTM & 52 JTS 9-5/8" 36# K-55 LT&C ON TOP/DFC @ 4670/DFS @ 4715/DOWELL PMPD 1076 CF CL 'G' CMT w 1-1 POZ, 0.5% CFR-2, 2% GEL, 3% KCL FOLLOWD BY 200 CF CL 'G' CMT w 0.75% CFR-2 & 3% KCL/DISP w 2060 CF DRLG MUD/DID NOT BMP PLUG/BLD TO 0/40 CF CMT RTNS TO SURF/CIP @ 2:23 PM/REM BOE/INST 9-5/8" PKNG/CUT OFF CSG & WELD ON CSG HD/WAIT ON HD TO COOL/TSTG HD/
- 9/21 4906 WSO TSTG/TST WELL HD TO 5000 PSI OK/INST CL III BOP & TST TO 1000 PSI OK/RIH, TAG PLUG @ 4540/TST PIPE RAMS & BAG, WITNESS BY D.O.G. OK/DRLG PLUGS, CMT & FLOAT CLR TO 4705/CIRC CLN/TRIP FOR WSO TOOL/SHOT 4 - ½" HOLES @ 4693, SET SLIPS & OPN TOOL @ 6:27 AM w LIGHT BLOW/MW 69/VIS 35/
- 9/22 5090 SD SH D (184) DRLG/REL PKR, POH w WSO & REC 30' DRLG MUD/ IH 2200 PSI, FH 2190, IF 57, FF 57/TST OK & WITNESS BY D.O.G./PU BHA RIH INST NEW RUBBERS ON EVERY JT OF DP/DRLG OUT SHOE & CLN OUT TO 4906/DRLG 8-3/8" HOLE FRM 4906-5090/SURV @ 5007, 1°30', S89°E/TVD 4957.81/SEC.477.81/N-469.31/W-89.27/MW 68/

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- 9/23 5200 SD SH D (110) DRLG/DRLG 8-3/4" HOLE FRM 5090-5164/
TRIP FOR LOCKED BHA/REAM FRM 4830-5164/DRLG FRM 5164-5200/SURV @
5200, 1^o, S65^oE/TVD 5150.44/SEC.475.87/N-468.23/W-85.74/MW 68/
VIS 40/
- 9/24 5360 SD SH D (160) DRLG/DRLG 8-3/4" HOLE FRM 5200-5360/SURV
@ 5290, 0^o45', S05E/TVD 5242.42/SEC.474.58/N-467.13/W-84.93/MW 68/
VIS 38/
- 9/25 5580 SD SH D (220) DRLG/LOST 50 BBLs MUD @ 5360/PULL TO SHOE,
MX 50 BBLs LCM/RIH TO 5360, SPOT LCM PILL/DRLG w FULL RTNS FRM
5360-5580/SURV @ 5447, 1^o15', S06E/TVD 5397.40/SEC.471.40/
N-464.44/W-84.68/MW 68/VIS 38/
- 9/26 5784 SD SH D (204) DRLG/DRLG 8-3/4" HOLE FRM 5580-5600/TRIP
FOR NEW BIT A PK SWIVEL/2½ HRS DN TIME/DRLG FRM 5600-5784/SURV @
5754 3/4^o, S41E/TVD 5704.38/SEC.468.28/N-461.00/W-83.47/MW 69/VIS 41/
- 9/27 5850 SD SH D (66) LOGGING/DRLG 8-3/4" HOLE FRM 5784-5850/
WIPE HOLE TO 9-5/8" CSG/CIRC FOR LOGS/RU SCHLUM & STRTD LOGGNG/SURV
@ 5850, 1^o15', S70E/TVD 5800.35/SEC.467.22/N-460.00/W-82.26/MW 69/
VIS 41/
- 9/28 5850 TD HO 4730 SD-SH OH (15) OH/SCHLUM RAN DLL-GR-TEN FRM
5850-4713/FDC-CNL-GR-CAL-TEN FRM 5850-4713/DIPMETER FRM 5850-4713/TOOK
57 SWC FRM 4727-5845, REC 35/RD SCHLUM/RIH w 11" HO/OPN HOLE FRM 8-3/4"
TO 11" FRM 4715-4730/MW 69/VIS 39/
- 9/29 5850 TD OH 4999 SD-SH OH (269) OH/OPN 8-3/4" HOLE TO 11" FRM 4730-4999/
MW 68/VIS 42/
- 9/30 5850 TD OH 5450 SD-SH OH (460') REPAIRING SWIVEL/OPEN
8-3/4" HOLE TO 11" FRM 4999 TO 5459/PULL TO SHOE TO REPAIR
SWIVEL/4-1/2 HRS DOWNTIME/MW 68/VIS 38/
- 10/1 5850 TD OH 5725 SD SH OH (266) OH/REPLACE SWIVEL, 4½ HRS
DN/OPN 8-3/4" HOLE TO 11" FRM 5459-5725/MW 67/VIS 40/
- 10/2 5850 TD, OH 5832 SD SH OH (107) OH/GAUGE 11" HOLE FRM
4715-5725/OPN 8-3/4" HOLE TO 11" FRM 5725-3832/MW 67/VIS 41/
- 10/3 5850 PREPNG TO CMT 7" CSG/OPN 8-3/4" HOLE TO 11" FRM
5832-5850/PULL TO SHOE, WAIT ½ HR, RIH TO 5850 (NO FILL)/POH/RAN
30 JTS (1217) 7" 26# K-55 BT-C w SHOE @ 5847, FLOAT 5802/CIRC CSG
1 HR WRKNG CSG 40'/MW 67/VIS 41/

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- 10/4 5850 TD 5847 PBSD, CLNG OUT 7" LNR/PMP 468 CF POZ-MIX "A"
CMT 1-1 w .5% CFR-2, 2% GEL, 3% KCL FOLLOWD BY 100 CF CL "G" w
.75% CFR-2, 3% KCL/DISP w 640 CF MUD/BMP PLUG w 1400 PSI, BLEED TO
O/SET & REL FRM LNR/CIRC OUT 50 CF OF EXCESS CMT/POH, PU 8-3/4"
BIT w 9-5/8" 36# CSNG SCRPR/RIH, CO TO 4626 TOP OF LNR HANGER/
TRIP FOR 6-1/8" BIT, 4 - 4-3/4" DC ON 3 1/2" DP TO CO LNR/MW 67/VIS
40/
- 10/5 5850 TD, 5847 PBSD PREPNG TO PULL BOP/CO TO 5801/TST CSG
TO 1000 PSI FOR 15 MIN, OK/DRL PLUG, FLOAT CLR, CMT TO 5837, 10'
ABOV SHOE/CHG OVR TO 5% KCL WTR/LD 4 1/2" DP & TOOLS/PREP TO PULL
BOP/
- 10/6 5837 PBSD REL RIG @ 1:30 PM 10-5-81/PULL BOP/INST TBG HD/
REL RIG/DROP FRM REPORT PENDING COMPLETION/
- 10/10 5837 PBSD/RIG UP SCHLUM & RAN CBL FRM 5815-4000/RIG DN
SCHLUM & MOVE OUT/
- 10/16 5837 PBSD/MIRU ALLIED PROD RIG/INST BOP/PU BELL NIP ON BTM OF
9-5/8" 36# FB/RIH TO 3211/SET FB/RU & SWAB FLUID LEVL DN TO
700'/OPENING BYPASS EVERY OTHER RUN TO EQUALIZE FLUID IN
ANNULUS/SIFN/
- 10/17 5837 PBSD/CONT SWABNG FLUID FRM 700-2920/CLOSE IN WELL/
- 10/18 5837 PBSD/RU McCULLOUGH & SHOT 4 - 1/3" JHPF FRM 5777-
5764, HAD 25' FLUID RISE AFTR 1 HR/POH w FB/RAN SNKR BAR TAG BTM @
5837 (BTM)/RAN 500 KILL STG/SIFN/
- 10/19 5837 PBSD/PULL KILL STG/MAKE UP GAS ANCHOR & RIH ON 180 JTS OF
2-7/8" TBG w TAIL @ 5766/RAN 2 1/2x1 1/2x12'x15' PMP ON 123 3/4" RODS &
66 7/8" RODS/SIFN/
- 10/20 5837 PBSD/SPACD OUT BH PMP/FILLED TBG STG w LSE PROD WTR/CLND
LOCATN/RDMO/PUT WELL ON PROD/IN TST 17 HRS/O BO, 124 BW/TBG 32#,
CSG 0#/12.5 SPMx72" LOS/FL 4341, OP 1392/
- 10/21 7 HRS/O BO, 25 BW/TBG 32#/CSG 0#/12.5 SPMx72" LOS/FL
5733 @ PMP/NOTE! BH PMP SANDED UP, STUCK IN OPN POSSITION @
2:00 PM 10-21-81/SHUT PU DN/SHOT FL @ 5:00 AM 10-22-81, FL @
5733, NO FLUID ENTRY/
- 10/22 WELLTECK MIRU/FND BH PMP STUCK, UNABL TO WRK LOOSE/REL ON & OFF TOOL
POH w RODS/INSTLD BOE/REL BKR 7" 26# ANCHOR-CATCHER, LOWERD TBG TO
5837 (TD)/PULLING OUT HOLE w TBG WET/SIFN/

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- 10/23 CONTD PULLING TBG OUT OF HOLE, PULLING WET/FLUID ABOVE PMP SHOE WAS MUDDY WTR w NO SD/FLUID SAMPLE FRM PMP & MUD ANCHOR TSTD 40% SOLIDS & CLORIDES OF 3600 PPM+, OR EQUAL TO 5% KCL WTR, LEFT IN HOLE, NO FORMATION WTR IN EVIDENCE/SENT BH PMP TO SHOP, PMP PLGR STUCK IN PMP BARREL w BUILD UP OF A CARBON TYPE MATERIAL ON PLGR WHICH COULD BE REMOVD w KNIFE/RIH w 2-1/8" BAILER, BAILD UNSET & CONTAMINATD CMT FRM 5826-5841 (7" SHOE @ 5847)/RIH w 9-5/8 36# BKR FB ON 101 JTS 2-7/8" TBG TO 3211/PMPD 171 BBLs OF 5% KCL WTR DN TBG, SHOT FL TOP OF KCL WTR @ 2892/SET FB/SIFN/
- 10/24 RU SCHLUM, INSTLD LUBRICATR/RAN 2-1/8" DOMED SCALLOP THRU TBG GUN w 6.5 GM CHG, 0.32" EH, 0° PHASE, DECENTRALIZD, 13' 52 SHOTS, RIH, 1ST RUN CLR LOCATR SHORTD OUT/2ND & 3RD RUNS, FAULTY CLR LOCATR/REMOVD LUBRICATR/REL SCHLUM/SHUT WELL IN TILL AM 10/26/81/
- 10/26 RU SCHLUM & FULL LUBRICATOR/MU 2-1/8" OD DOMED SCALLOP THRU TBG GUN (6.5 GRM CHG, 0.32" EH); 0° PHASE; DECENTRALIZED; 13'-53 SHOTS w CLR LOCATR, RIH, LOCATD CLRS @ 5723, 5764 & 5810 (NOTE FL INSIDE TBG @ 2888) SHOT HOLES FRM 5764½ TO 5777½/WAITD 15 MIN & FND FL INSIDE TBG @ 2370 (518 FLUID RISE)/REL SCHLUM/REL FB PKR & POH w TBG/MEAS IN HOLE w TBG & BKR "B-2" 7" 26# ANCHOR CATCHER, REMOVD BOE & SET ANCHOR w TOP @ 5317.92, LANDED TBG w ST @ 5703.14/RAN 2½"x1-3/4"x25' 3 - TUBE PMP ON 123 - 3/4" & 65 - 7/8"x30' SUCKER RODS/SEATED & SPACD PMP/FILLED TBG w 16 BBLs WTR/PUT WELL ON PROD INTO BKR TANK/RDMO/NOTE: SHOT FL BEFORE PRODUCNG WELL @ 2770/NO TEST, FND PU DN THIS AM 10-27-81, MURPHY HI-LO FLOWLINE PRESSURE SWITCH, SHUT WELL DN/
- 10/27 14 HRS/0 BO, 165 BW/TBG 42# CSG 0#/12½ SPMx72" LOS/FL 5671, @ PMP/SHUT WELL IN 1 HR/FL 5589, OP 82'/POP WELL PMPD OFF IN 30 MIN/SHUT IN 9 HRS/FL 5589, OP 82'/POP, WELL PMPD OFF IN 30 MIN/SWI, POUNDING FLUID/FL 5671 @ PMP/
- 10/28 WELLTECK MIRU/SHOT FL @ 5637 (34' OVR PMP)/UNSEATD 3 TUBE PMP, EQUALIZD FLUID, SHOT FL @ 4847 (824' OVR PMP)/POH/INSTLD BOE/REL BKR ANCHOR CATCHER, LOWERD TBG, TAGGED BTM @ 5737 (NO FILL)/LD DN EXCESS TBG/SFT TBG ANCHOR CATCHER w TBG ST @ 5766.68', PMP SHOE @ 5734.33/RAN OILWELL 1 -½"x1-3/4"x25' 3 TUBE PMP & RODS/FILLED TBG w 21 BBLs PROD LSE WTR/POP @ 7:40 PM 10-28-81, IN TEST/SHOT FL PRIOR TO PRODUCNG FL 4809' (924' OVR PMP)/9 HRS/0 BO, 28 BW/TBG 25#, CSG 0#/11 SPMx72" LOS/FL 5733, @ PMP/SHUT WELL IN @ 5:00 AM 10-29-81/

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- 10/29 24 HR SI BUILD UP TST/TBO#/CSG 5#/FL 5637, OP 96/
10/30 ½ HR/1.2 BO, .3 BW/TBG 18#/CSG 0#/11 SPMx72" LOS/
FL 5650, OP 83'/
10/31 ½ HR/1.8 BO, .2 BW/TBG 16#/CSG 0#/11 SPMx72" LOS/
FL 5662, OP 71'/
11/1 ½ HR/1.8 BO, .2 BW/TBG 15#/CSG 0#/11 SPMx72" LOS/
FL 5656, OP 77'/
11/2 ½ HR/.96 BO, .04 BW/TBG 15/CSG 0/11 SPMx72# LOS/FL 5662, OP 71/
11/3 NO REPORT/WELL SHUT IN FOR STATIC BUILD UP TEST/
11/4 NO REPORT/WELL SHUT IN FOR STATIC BUILD-UP TEST/
11/5 NO REPORT/WELL SHUT IN FOR STATIC BUILD-UP TST/
11/6 NO REPORT/WELL SI FOR STATIC BUILD UP TST/
11/7 NO REPORT/WELL SI FOR STATIC BUILD UP TST/
11/8 NO REPORT/WELL SI FOR STATIC BUILD UP TST/
11/9 NO REPORT/WELL SI FOR STATIC BUILD UP TST/
11/10 CP 52/FL 5298, OP 435/
11/11 CP 60#/FL 5263, OP 470/
11/12 SICP 68#/STATIC FL 5212/OP 521/
11/13 SICP 73#/STATIC FL 5176, OP 557/
11/14 NO REPORT/
11/15 SICP 82#/WTATIC FL 5086', OP 647'/
11/16 SICP 92#/STATIC FL 5032, OP 701/
11/17 WELL TECK MIRU/INSTLD ROD REGAN/POH w 66 - 6/8" & 125 -
3/4" x 30' SUCKER RODS & 3 - TUBE PMP/UNLANDED TBG, REL BKR TBG
ANCHOR, INSTLD BOE/POH w 180 JTS 2-7/8" TBG/MU 1¼" SNKR BAR, RIH
ON SD LINE TO 5837, NO FILL/MU 2-3/8" x 1-3/4"x16'x28'x32' "THE"
PMP BARREL BELOW 7" - 26# BKR FB PKR ON 160 JTS 2-7/8" TBG, RIH TO
4560/SIFN/
11/18 CONTD IN HOLE w 7" 26# FB PKR & 2-7/8" TBG, SET FB @
5697, w BTM OF "THE" PMP BARREL @ 5737/RU DOWELL/FILLED ANNULUS
w 340 BBLs OF 65# 5% KCL WTR/PRESS ANNULUS TO 500 PSI/PMPD 1000
GALS "MSR" ACID w 40# FLAX 4 DIVERTING AGENT & 92 GALS 15% HCL
ACID w MUTUAL SOLVENT DN TBG/SQZD TOT 378 GALS ACID AWAY IN 4 HRS
w MAX PRESS OF 2000#, BLEEDING BK TO 1000 PSI IN 3 MIN, FORMATION
TIGHT/OPEND UNLOADR REV CIRC ACID OUT OF TBG w 35 BBLs OF 5% KCL
WTR/SIFN/

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- 11/19 REL FB/REV CIRC w 5% KCL, RECOVERD 10 BBLs CRUDE OIL FRM ANNULUS/LOWERD TBG FRM 5737-5835, REV CIRC 1 HR NO ACID IN RTNS/PU TO 5737/SHUT WELL IN TILL AM 11/20/81/
- 11/20 LOWERD TBG TO 5780 (3' BELOW PERFS)/DISPL TBG w 45 BBLs OF KCL WTR, RECOVERD 20 BBLs CRUDE OIL FRM ANNULUS/RU DOWELL, PMPD 100 GALS 12% HCL-3% HF ACID w INHIBITORS & SURFACTANT ADDED, FOLOWD w 1344 GALS 5% KCL WTR, SPOTTED ACID ACROSS PERFS (5764-5777½')/PU SET FB @ 5675 w BTM OF "THE" PMP BARREL @ 5716/TSTD ANNULUS TO 800 PSI, OK/OPEND UNLOADR, PMPD DN TBG w 150 GALS 12-3 MUD ACID, FOLOWD w 1000 GALS "MSR" ACID w 40# FLAX 4 DIVERTR, FOLOWD w 190 GALS 15% HCL ACID w 10% MUTUAL SOLVENT, CLOSD UNLOADER/PRESSURD ANNULUS TO 800 PSI/SQZD ACID AWAY w 810 GALS 15% HCL ACID, FOLOWD w 1450 GALS KCL WTR, PRESSURE & RATE STAYD CONSTANT THRUOUT SQZ 2750 PSI @ ¼ BBL PER MIN/ACID IN PLACE @ 3:00 PM, SHUT IN PRESS 2750#/BLED DN TO 500# IN 15 MIN, 0# IN 30 MIN, NO FLEED BK/MU & RAN STDG VALVE & PMP PLGR & RODS/STROKD PMP w RIG FOR 1½ HRS, RECOVERD 6 BBLs KCL WTR (APPARENT LOW FLUID ENTRY) LET SET 1 HR, STROKD AGAIN FOR 1 HR, RECOVERD 5 BBLs KCL WTR, PMPD OFF/PULLD STDG VALVE, PLGR & 150' OF ROD UP HOLE/DISPL 12 BBLs KCL WTR DN TBG @ 1000 PSI/SIFN/
- 11/21 SEATD STDG VALVE, FILLED TBG w 1½ BBLs 5% KCL WTR, STROKD PMP w RIG/WELL PMPD OFF AFTR 1½ BBLs RTNS/LET SET FOR 15 MIN, PMPD ½ BBL/PULLED STDG VALVE, POH w RODS & PMP PLGR/RELSD FB & LOWERD TBG TO 5830/FILLED HOLE w 8 BBLs 5% KCL WTR, REV CIRC, GOT pH OF 3 AFTR 30 BBLs, pH OF 7 AFTR 75 BBLs RTNS/PULLED TBG w TAIL TO 5500/SHUT WELL IN TILL AM 11-23-81/
- 11/23 LOWERD TBG FRM 5500-5837, NO FILL/POH w TBG, LD "THE" PMP BARREL/MU 2½" API T/L PMP SHOE ON 3½" OD MUD ANCHOR, RIH ON 11 JTS 2-7/8" TBB, ON BKR 7" ANCHOR CATCHER, ON 169 JTS 2-7/8" TBG/REMOVD BOE/SET ANCHOR @ 5383.84 & LANDED TBG w TBG ST @ 5766.68/RAN 2½"x1-3/4"x25 3-TUBE PMP ON 125 - 3/4 & 66 - 7/8"x30' SUCKER RODS/SEATED & SPACD PMP, HUNG WELL ON/RDMO/WELL SHUT IN/DROP FRM REPORT/

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- 12/1 CPS MIRU/POH w RODS & 3 TUBE PMP/REL BKR TENSION PKR/INSTLD BOE/SIFN/
12/2 POH w 180 JTS 2-7/8" TBG/MU BROWN 7" 26#, 4 CUP w 1' SPACING BETWN CUPS, RIH ON 2-7/8" TBG TO 4500/RU BJ HUGHES/LONG BEACH CITY INSPECTOR SHUT RIG DN DUE TO HIGH NOISE LEVEL IN AREA/MADE WELL SECURE/SIFN/
12/3 WITH 7" 26# BROWN 4 CUP PKR @ 4500 (IN 9-5/8 CSG) BJ HUGHES FILLED HOLE w 162 BBLS OF 5% KCL WTR/LOWERD PKR TO 5700, BLANKD TOOL IN 7" CSG @ 3500 PSI/ LOWERD TOOL TO 5777, PMPD 2 BPM IN PERFS @ 1000 PSI @ 5776' 2 BBLS PER MIN @ 1000#, 5775' 2 BPM @ 500#, 5774' 2 BPM @ 500#, 5773' 2 BPM @ 500#, 5772' 2 BPM @ 500#, 5771 2 BPM @ 400#, 5770'2 BPM @ 500#, 5769 - 2 BPM @ 600#, 5768' 2 BPM @ 600#, 5767' - 2 BPM @ 800#, 5766' - 1 BPM @ 1000#, 5765' - 2 BPM @ 1200#, 5764' - 2 BPM @ 1300 PSI/POH/RU DRESSER ATLAS, PERFORATED THE FOLOWNG INTERVLS w 4" O.D. CSG GUNS, 4 - .43" HOLES/FT, 22 - ½ GRAM JUMBO JET CHG, 15.07" PENETRATION, FRM 5757-5749, 5748-5738, 5736.5'-5734.5'/5733-5723.5'/ REL DRESSER ATLAS/RIH w 2-7/8" TBG, REMOVD BOE, SET BKR ANCHOR-CATCHER w 2500# TENSION, PMP SHOE @ 5737/SIFN/
12/4 20 HRS/0 BO, 224 BW/TBG 32#/CSG 0#/11 SPMx72" LOS/FL 3398, OP 2335/WELL OWES 130 BBLS OF KCL LOAD WTR/
12/5 24 HRS/0 BO, 153.5 BW, 1.5 BBLS MUD/TBG 30#/CSG 0#/11 SPMx72" LOS/FL 5478, OP 255/WELL PD BK ALL LOAD WTR PLUS 35 BBLS FRM WELL/
12/6 3.5 HRS/.2 BO, 10.3 BW/TBG 20#, CSG 0#/11 SPMx72" LOS/FL 5624, OP 109/WELL NOT PRODUCING/SHUT DN FOR STATIC BUILD UP, 13½ HRS, FL 5323, OP 510/
12/7 22 HRS/0 BO, 33 BW/TBG 9#/CSG 0# (VENTED TO BKR TANK)/11 SPMx72" LOS/FL 5695, OP 39/LOW FLUID ENTRY/
12/8 6.5 HRS/0 BO, 5 BW/TBG 9#/CSG 0# (VENTED TO BKR TANK)/11 SPMx72" LOS/WELL PMPD OFF @ 3:30 PM/SHUT DN PU/FLUID LEVEL AFTR 15 HRS WAS 5365, OP 368/ APPROX 11 BBLS ENTRY/
12/9 3 HRS/0 BO, 13 BW/TBG 9/CSG 0 (VENTED TO BKR TANK)/11 SPMx72" LOS/FL 5644, OP 89/WELL QUIT PMPNG (PMPD OFF)/SHUT WELL IN @ 10:30 AM 12-9-81 FOR FL BUILD UP TST/7:30 AM 12-10-81/21 HRS/FL 5282, OP 451/CSG 14#/
12/10 SHUT IN 24 HRS FOR FLUID LEVEL BUILD UP TST/CSG 24#/FL 4935, OP 798/
12/11 SHUT IN 24 HRS FOR FLUID LEVEL BUILD UP TST/CSG 32#/FL 4650, OP 1083/
12/12 SHUT IN 24 HRS FOR FLUID LEVEL BUILD UP TST/CSG 38#/FL 4490, OP 1243/DROP FRM REPORT UNTIL TST IS COMPLETE/
1/15 FLUID LEVEL BUILD UP TST COMPLETE/RESUME OPERATIONS TO ACIDZ PERFORATD INTERVLS 5724-5736 & 5738-5756 TO REMOV SUSPECTD CLAY SWELLING & EMULSION BLOCKAGE IN FORMATN/CPS MIRU/INSTLD SD PROOFNG SCRIN AROUND RIG & EQUIP/ STAKD OUT RODS FILLED TBG w LSE WTR, TBG OK/POH w 65 - 7/8, 123 - 3/4"x30' SUCKER RODS & PMP/RELSD BKR TENSION ANCHOR-CATCHER/INSTLD BOP/POH w 167 JTS 2-7/8" TBG & CATCHER/SIFN

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- 1/16 POH w KILL STG/MU BKR 7" 26# CSG SCRPR ON 2-7/8" TBG, HYDROTESTNG TBG IN HOLE @ 5000 PSI (NO LEAKS) TO 5780, NO RESTRICTNS/POH/MU BKR 7" 26# MOD "C" BRIDGE PLUG ON BKR 7" 26# FULLBORE PKR, ON 2-7/8" TBG, RIH TO 4500/CLOSD WELL IN TILL AM 1-18-82/
- 1/17 CONTD RIH w BKR BP & FB PKR/SET BP @ 5760/PU w FB @ 5755, FILLED HOLE w 277 BBLS PRODUCED WTR/RU BJ HUGHES, PMPD 33 BBLS OF 2% AM-CL WTR ON TBG/ PULLED FB UP & SET @ 5650/TSTD SURF LINES TO 4000 PSI/PMPD PRODUCED WTR IN ANNULUS, PRESSURE UP TO 1000 PSI/OBTAINED BRK DN w 20 FT³ OF AM-CL WTR @ 1 BBL PER MIN @ 2700 PSI/OPND UNLOADER & PMPD 600 GALS 15% HCL ACID w 2 GALS INHIBITOR & IRON CHELANT, PLUS 300 GALS OF 12% WTR, 3% HF ACID w ADDITIVES DN TBG/CLOSD UNLOADER, PRESS ANNULUS TO 800 PSI/SQZD w 600 GALS OF 12% HCL 3% HF ACID @ 1 BBL PER MIN @ 2500 PSI, AFTR PMPNG 1500 GALS PRESSURE DRPD FRM 2500# TO 1750 PSI @ 2.5 BBL PER MIN RATE REMAINING CONSTANT THRU OUT JOB/CONTD SQZNG AWAY w REMAINING 300 GALS OF 12-3 ACID FOLOWD w 600 GALS OF 15% HCL ACID & 1200 GALS OF DIESEL w 1% J-10 SURFACTANT/DISPL TBG w 25 BBLS 2% AM-CL WTR/ REL FB, LOWERD TBG & RETRIEVD BP/POH w TBG & TOOLS/RIH w 179 JTS TBG/SIFN/
- 1/19 COMPLETD RIH w 2-7/8" TBG/REMOVD BOE/SET BKR ANCHOR-CATCHER @ 5350 w 12,000# TENSION, PMP SHOE @ 5703 & BTM OF MUD ANCHOR @ 5734.82/RAN 2½"x1½"x 12'x13' RHA PMP ON 123 - 3/4" & 65 - 7/8"x30' SUCKER RODS/SEATED & SPACD PMP, FILLED TBG w WTR/REMOVD SOUND SCREEN/RDMO/POP/IN TST 15 HRS/O BO, 102 BW/ TBG 42#/CSG 0#/11 SPMx72" LOS/FL 2677, OP 3008/pH OF 7/WELL OWES 260 BBLS OF LOAD WTR & ACID/
- 1/20 24 HRS/O BO, 160 BW/TBG 40/CSG 39/11 SPMx72" LOS/FL 4431, OP 1254/ pH of 7/ WELL OWES 100 BBLS OF LOAD WTR & ACID/
- 1/21 9½ HRS/O BO, 56 BW/TBG 40/CSG 66/11 SPMx74" LOS/FL 5685, OP @ PMP/SHUT WELL DN @ 4:30 PM, PMPD OFF/WELL OWES 44 BBLS OF LOAD WTR & ACID/
- 1/22 POP @ 9:30 AM/TBG 65#/CSG 80#/FL 4928, OP 757/PRODUCED UNTIL PMP OFF/5½ HRS/14 BBLS OF DIESEL w TRACE OF OIL, 16 BBLS WTR w MUD TYPE SEDIMENT/11 SPMx72" LOS/FL 5685, OP @ PMP/SHUT IN UNTIL 7 AM 1-23-82/7:00 AM 1-23-82/ CSG 58#/FL 5054, OP 631/WELL OWES 14 BBLS OF LOAD WTR & ACID/
- 1/23 POP @ 9:30 AM/TBG 65#/CSG 58#/FL 5054/OP 631/PRODUCED UNTIL PMP-OFF 6 HRS/ O BO, 29 BW/TBG 63/CSG 63/11 SPMx72" LOS/FL 5685, OP @ PMP/SHUT IN TILL AM 1-24-82/WELL HAS PD BK 14 BBLS OF LOAD WTR & ACID, PLUS 15 BBLS FRM WELL/ 7:00 AM 1-24-82/CSG 90#/FL 5126, OP 559/
- 1/24 POP @ 7 AM/TBG 65/CSG 90/FL 5126, OP 559/PRODUCED UNTIL PMP-OFF/5 HRS/1 BO, 24 BW/TBG 65/CSG 90/11 SPMx72" LOS/FL 5685, OP @ PMP/SHUT IN TILL AM/8:00 AM 1-25082 CSG 80/FL 5001, OP 684/
- 1/25 5½ HRS/O BO, 31 BW/TBG 68/CSG 15/11 SPMx72" LOS/FL 5685 @ PMP/7:00 AM 1-26-82/STATIC BUILD UP/18½ HRS/CSG 15/FL 5102, OP 583/
- 1/26 4 HRS/O BO, 20 BW/TBG 58/CSG 16/11 SPMx72" LOS/FL 5685 W PMP/7:00 AM 1-27-82/STATIC BUILD UP/20 HRS/CSG 16/FL 5023, OP 662/DROP FRM REPORT/ AWAIT APPROVAL ON RECOMPLETION PROGRAM/

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- 2/2 RESUME w RECOMPLETION OF WELL AS RECOMMENDED & APPROVD TO PLUG EXISTING PERFORATIONS & RECOMPLETE WELL IN THE "K" SAND/
WELLTECK MIRU/POH w RODS & PMP/re1 tbg anchor-CATCHER, INSTLD BOE, POH w 2-7/8" TBG, PMP SHOE & MUD ANCHOR/RIH w 2-7/8" TBG, OPN ENDED TO 5777/RU HALIB, FILLED HOLE w 300 BBLs LSE WTR/(RECOVERD 8 BBLs OIL) HALIB MXD & PMPD 50 FT³ CL "G" CMT w 2% CaCl₂ ACROSS PERFS @ 5777-5724, DISPLACD w 178 FT³ LSE WTR/POH TO 4450, LEAVING EST TOC @ 5544/PLACING CMT PLUG FRM 5777, WITNESSED BY D.O.G. REP, MR. G. W. STACK/SIFN/
- 2/3 RIH, TAGD TOC PLUG @ 5583/POH/MEAS & PU LYNES 9-5/8" SHOOT & TST TOOL w 2'x4" JET PERF GUN, CONTAINING 4 - 1/2" CHARGES, RIH ON 4-3/4" D.C. ON 132 JTS OF 2-7/8" TBG TO 4356/ROTATD TBG TO ACTIVATE GUN, PU & SET PKR @ 4296, OPENED TOOL, HAD FAINT BLOW FOR 10 MIN, DEAD FOR REST OF 1 HR TST/POH w TBG & TOOLS, HAD 120' OF FLUID IN TBG/INSPECTION SHOWD THAT GUN HAD NOT FIRED/TORE DN TOOLS & SENT TO SHOP/RIH w KILL STG/(NOTE: D.O.G. REP, G.W. STARK WITNESSED TOP OF CMT PLUG @ 5583)/SIFN/
- 2/4 RIH w LYNES 9-5/8" SHOOT & TST TOOK, w 2'x4" GUN LOADED w 4 - 1/2" SHOTS, ON 4 - 4-3/4" DC's ON 132 JTS 2-7/8" TBG/SHOT 4 HOLES @ 4356/PU & SET PKR @ 4296 w TAIL @ 4324/HAD SLIGHT BLOW FOR 14 MIN, DEAD FOR REMAINDER OF 1 HR TST/REL PKR, POH, RECOVERD 120' OF WTR IN TBG/READ CHARTS, L.H. - 1850#, FH 1851#, 1.F. 43#, F.F. 55#/RU DRESSER ATLAS, RAN GAMMA RAY COR LOG FRM 4500-4000/PERFD 4412-4402, 4401-4391, 4391-4383, 4368-4376, TOT OF 143 SHOTS w 4" JUMBO JET II HOLLOW STEEL CARRIER GUNS w 4 - 1/2" HPF w 24.2 GRAM CHARGES/REL DRESSER ATLAS/NOTE: UNABL TO DETECT ANY FLUID RISE AFTR SHOOTING/RIH w 156' OF 2-7/8" TBG TAIL BELOW BKR 9-5/8" 36# FB PKR ON 75 JTS 2-7/8" TBG TO 2548/SIFN/
- 2/5 BLED WELL DN, HAD SLIGHT VAC ON CSG/CONTD IN HOLE w FB/RU HALIB, FILLED HOLE w 30 BBLs OF LSE WTR/SET FB @ 4205, ATMPD TO TST ANNULUS @ 700#, WD NOT TST/PU & SET FB @ 4011, PMPD AWAY DN ANNULUS @ 14 FT³ MIN @ 350 PSI/RESET FB @ FOLLOWNG DEPTHs w SAME RESULTS 2005, 992/SET FB @ 105, PMPD AWAY @ 14 FT³ MIN @ 350 PSI w RTNS FRM TBG/SET FB @ 100', TSTD ANNULUS TO 1000# OK/LOWERD FB TO 112, PMPD AWAY @ 14 FT³ MIN @ 350 PSI w NO COMMUNICATN THRU TBG/POH w FB/RAN KILL STG/SIFN/
- 2/6 MU BKR 9-5/8" 36# BP ON BKR 9-5/8" 36# FULLBORE PKR ON 2-7/8" TBG, RIH TO 4300/SET BP/PU TO 2003, SET FB & TST 9-5/8" CSG @ 500 PSI OK/RECOVERD BP, PU HOLE TO 110, SET FB, TSTD 9-5/8" TO 500 PSI OK/SET BP @ 135, PU SET FB @ 80', PMPD AWAY @ 12 FT³ MIN @ 300 PSI/REL FB/POH/DMPD 5 SX SIL SD, WAITD 1/2 HR, RIH & TAGD TOP OF SD @ 121/PU SET FB @ 80'/OPEND VALVE ON 13-3/8" ACHIEVD CIRC IMMEDIATELY, MXD & PMPD 60 FT³ API CL "G" CMT w 2% CaCl₂, GOT CMT TO SURF, CLOSD 13-3/8" VALVE & PMPD 113 FT³ OF CMT AWAY @ 14 FT³ OF CMT AWAY @ 14 FT³ MIN @ 350 PSI/SHUT PMP DN, TBG WENT ON A VAC/PMPD REMAINDR OF 200 SX, 57 FT³ @ SAME RATE & PRESS/CLEARD TOOLS & CSG w 20 FT³ OF FRSH WTR/SHUT WELL IN TILL AM 2-8-82/

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- 2/8 REL FB/LOWERD FB TAGGED TOC @ 95'/POH/MU 8-3/4" BIT ON 9-5/8, 36# ROTOVERT SCRPR ON 2 - 4-3/4" O.D. DCs, DRLD OUT CMT FRM 95-121 (TOP SD PLUG)/POH/MU 9-5/8 36# FB, RIH TO 80, SET FB, PUT 500# ON BK SIDE, PMPD DN TBG, ESTABLISHD BRK DN OF $\frac{1}{2}$ BBL PER MIN @ 500 PSI, OPEND VALVE BETWN 13-3/8" & 9-5/8" ANNULAR SPACE, NO COMMUNICATNS/RELS D FB/POH/RAN 2-7/8 TBG OPN ENDED TO 105, PMPD 25 FT³ CL "G" CMT w 2% CaCl₂, DISPL w 1.5 FT³ FRSH WTR/POH/CLOSD BLIND RAMS & VALVE ON 13-3/8"/STRTD BRADENHEAD SQZ @ 5 PM/SQZD AWAY 6 FT³ @ 6:30 PM, DID NOT EXCEED 500 PSI/SIFN/
- 2/9 BLED WELL DN, HAD 200 PSI ON ANNULUS/RIH w 8-3/4" BIT ON 9-5/8" 36# ROTOVERT SCRPR ON 1 - 4-3/4 DC/DRLD OUT CMT FRM 57-106, CMT STGRS TO 111'/PRESS TSTD 9-5/8" CSG TO 500 PSI, HELD FOR 15 MIN OK/POH LAYNG DN DC SCRPR & BIT/MU BRIDGE PLUG RETRIEVNG HD, RIH ON 2-7/8" TBG, CIRC OUT SD FRM 121-135, RETRIEVD 9-5/8" 36# BP/POH/LOADED OUT POWER SWIVEL & TOOLS/RIH w 158' of 2-7/8 TBG TAIL ON 9-5/8" 36# FB PKR ON 2-7/8" TBG TO 200'/SIFN/
- 2/10 CONTD RIH w 2-7/8 TBG TAIL @ 4411, PMPD & SPOTD 1200 GALS 15% HCL ACID w ADDITIVES ACROSS PERFS FRM 4411-4368/PUH, SET FB @ 4204 & TBG TAIL @ 4364, PRESS ANNULUS ABOV PKR w 500 PSI/HALIB PMPD REMAINING 600 GALS OF 15% HCL ACID AWAY INTO PERFS w MAX RATE OF 56 GALS MIN @ 2500 PSI/FOLOWD w 1800 GALS OF 12% HCL, 3% HF ACID & REQUIRED ADDITIVES, w MIN PMPNG RATE OF 56 GALS MIN @ 2000 PSI @ STRT, TO MAX PMP RATE OF 95 GALS MIN @ 1600 PSI/FOLOWD ACID w 25 BBLS 2% AM CL WTR, DISPL TBG w 25 BBLS LSE PROD WTR @ 95 GAL MIN RATE @ 1600 PSI @ FINISH/REL FB/POH LAYNG DN 48 JTS OF 2-7/8 TBG & FB/MU & RAN 3 $\frac{1}{2}$ " OD MUD ANCHOR, 2 $\frac{1}{2}$ " API T/L PMP SHOE, 4 JTS 2-7/8 TBG, 2-7/8x9-5/8" 36# PAGE "R" TBG ANCHOR, 1 JT 2-7/8 TBG, PAGE "R" TBG DRAIN ON 25 JTS 2-7/8 TBG/SIFN/
- 2/11 CONTD RIH w 106 JTS 2-7/8" TBG/LANDED TBG w ST @ 4393.29, PMP SHOE @ 4360.66/REMOVD BOE/PU OILWELL 2 $\frac{1}{2}$ "x1 $\frac{1}{2}$ "x10'x13' ACID PMP ON 107 - 3/4x30 & 36 7/8x30' SUCKER RODS/SEATED & SPACD OUT PMP/FILLED TBG w LSE PROD WTR/RDMO/WELL OWES 498 BBLS LOAD WTR & ACID/PUT WELL ON PRODUCTION INTO BKR TK @ 4:30 PM/IN TST 14 HRS/O BO, 133 BW/TBG 50/CSG 0/11 SPMx72" LOS/FL 1536, OP 2813/pH 2/WELL OWES 365 BBLS LOAD WTR & ACID/
- 2/12 24 HRS/O BO, 187 BW/TBG 50/CSG 3/11 SPMx72" LOS/FL 3656, OP 693/pH 5/WELL OWES 178 BBLS OF LOAD WTR & ACID/
- 2/13 11 $\frac{1}{2}$ HRS/O BO, 59 BW/TBG 35/CSG 18/11 SPMx72" LOS/FL 4349 @ PMP/WELL OWES 119 BBLS OF LOAD WTR & ACID/SHUT WELL DN 6:30 PM 2-13-82/PMPD OFF/
- 2/14 WELL SHUT IN FOR STATIC FLUID BUILD UP/
- 2/15 WELL SI FOR 36.5 HRS, STATIC BUILD UP/FL 3698, OP 651, PRIOR TO STRT UP @ 7:20 AM 2-15-82/PMPD 4 HRS/O BO, 41 BW/11 SPMx72" LOS/FL 4349 @ PMP/SHUT WELL IN @ 11:20 AM 2-15-82/
- 2/16 WELL SI FOR 20 $\frac{1}{2}$ HRS, FLUID BUILD UP/FL 4123, OP 226, (226' RISE)/POP @ 8:00 AM/1 HR 45 MIN/O BO, 11 BW/CSG 16/FL 4349 @ PMP/SHUT WELL DN,PMPD OFF/

DIVISION OF OIL & GAS
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- 2/17 WELL SI FOR 22 HRS, FLUID BUILD UP (125') FL 4224, OP 125/CSG 16/POP @ 8:00 AM 1 HR 15 MIN/O BO, 7 BW/CSG 16/FL 4349 @ PMP/SHUT WELL DN @ 9:15 AM, PMPD OFF/DROP FRM REPORT/
- 2-24 RESUME w RECOMPLETION OF WELL AS RECOMMENDED & APPROVD/TO PLUG EXISTING PERFORATIONS IN THE "K" SD & RECOMPLETE IN THE "I" SD/CPS MIRU/PULLED 36 - 7/8" & 107 - 3/4x30' SUCKER RODS & PMP/INSTLD BOP/POH w 136 JTS 2-7/8" TBG (4328)/RIH w SINKER BAR ON SD LINE TO 5500 (83' FILL)/CMT PLUG @ 5583/RIH w 136 JTS OF 2-7/8" TBG, OPN ENDED TO 4328/SIFN/
- 2-25 LOWERD TBG TO 4423/RU CIRC PMP, FILLED HOLE w 325 BBLS OF PROD WTR/RU HALIB MXD & PMPD 75 FT³ GLASS "G" CMT w 2% CaCl₂, DISPL w 24 BBLS PROD WTR/CMT IN PLACE @ 11:20 AM/PU TO 4225, REV CIRC w 250 BBLS OF PROD WTR/MR. W. SANTIAGO w D.O.G. WITNESSED PLACEMENT OF PLUG/POH w 10 STDS/SIFN/
- 2-26 LOWERD TBG & LOCATD TOP OF CMT PLUG @ 4243/WITNESSED & APROVD BY D.O.G./POH w TBG/MU JOHNSTON SHOOT & TST TOOLS ON 2-7/8" TBG, SHOT 4 - 3/8" HOLES @ 4031/MADE 1 HR WSO TST w PKR SET @ 3959 & TAIL TO 3988, HAD MED TO LIGHT BLOW FOR 25 MIN, DEAD REMAINDER OF TST/PULLED TBG & TST TOOLS, HAD 64' FLUID RISE IN TBG, INITIAL HYDRO 1733, INITIAL FLOW 40.5, FINAL FLOW - 46, FINAL HYDRO 1704/WSO WITNESSED & APROVD BY D.O.G. REP WILLIAM E. BRANNON/RU DRESSER ATLAS/RIH w CENTRALIZD 4" OD JUMBO JET II HOLLOW STEEL CARRIER GUNS w 22.5 GRAM CHARGE, PERFD 9-5/8" CSG w 4 - 1/2" HPF, @ 4119-4109, 4108-4091, 4069-4059, 4058-4038, TOT OF 234 HOLES, HAD 10 MIS FIRES ON BTM OF 1st GUN RUN/REL DRESSER ATLAS/RIH w 600' KILL STG TBG/SIFN/
- 2-27 POH w KILL STG/RAN SNKR BAR TO 4243, NO FILL/RIH w 9-5/8" 36# BKR FB PKR w 160' OF 2-7/8" TAIL ON 2-7/8" TBG, W TAIL @ 4048, FILLED HOLE w 40 BBLS LSE WTR/SET PKR @ 3888, TSTD ANNULUS TO 500 PSI, OK/REL FB & LOWERD TBG, TBG TAIL TO 4118/HALIB SPOTTED 1000 GALS OF 15% HCL PAD ACID ACROSS PERFS 4118-4038/PU & SET FB PKR @ 3878 w TAIL @ 4038, PRESS ANNULUS w 500#/HALIB SQZD AWAY 300 GALS 12% HCL - 3% HF ACID @ 13 FT³ PER MIN @ 1250 PSI, PMPD 125# BENZOIC FLAKES, FOLOWD w 500 GALS 12-3 ACID @ 17 FT³ PER MIN @ 1500# PSI, 125# BENZOIC FLAKES, 500 GALS 12-3 ACID @ 17 FT³ PER MIN @ 1500 PSI, 125# BENZOIC FLAKES, 500 GALS 12-3 ACID @ 24 FT³ PER MIN, @ 1250 PSI, 125# BENZOIC FLAKES, 500 GALS OF 12-3 ACID @ 24 FT³ PER MIN @ 1200 PSI, 125# BENZOIC FLAKES, 500 GALS OF 12-3 ACID, @ 24 FT³ PER MIN @ 1200 PSI, OVERFLSHD ACID w 1001 GALS OF 2% AM/CL WTR @ 24 FT³ PER MIN @ 1100 PSI/POH w GAS ANCHOR, PMP SHOE ON 40 STDS OF 2-7/8" TBG/SIFN/(NOTE: WELL OWES TOT OF 509 BBLS OF LOAD WTR & ACID)/
- 2-28 CONTD RIH w 2-7/8 PROD STG TBG (125 JTS TOT)/REMOVD BOE & LANDED TBG @ 4033, w SHOE @ 4001', & PAGE 2-7/8x9-5/8-36# ANCHOR @ 3873/RAN OILWELL 2 1/2"x1 1/2"x10'x13' RHA ACID PMP ON 98 - 3/4"x30' & 33 - 7/8"x30' SUCKER RODS/ SEATED & SPACD PMP FILLED TBG w LSE WTR/POP THRU PORTABLE TSTR INTO BKR TK/RDMO/IN TEST 17 HRS/O BO, 166 BW/TBG 12#/CSG 0#/11 SPMx72" LOS/FL 607, OP 3393/WELL OWES 343 BBLS OF LOAD WTR & ACID/pH 4/
- 3-1 24 HRS/O BO, 226 BW/TBG 12#/CSG 33#/11 SPMx72" LOS/FL 722, OP 3278/ WELL OWES 117 BBLS OF LOAD WTR & ACID/pH 5/

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- 3-2 24 HRS/Ø BO, 195 BW/TBG 12/CSG 25/11 SPMx72" LOS/FL 701, OP 3300/WELL HAS PAID BK ALL LOAD WTR & ACID, PLUS 78 BBLs FRM WELL pH 5/
- 3-3 24 HRS/Ø BO, 233 BW/TBG 12/CSG 16/11 SPMx72" LOS/FL 672, OP 3329/pH 5/
- 3-2 24 HRS/Ø BO, 195 BW/TBG 12/CSG 25/11 SPMx72" LOS/FL 701, OP 3300/WELL HAS PAID BK ALL LOAD WTR & ACID, PLUS 78 BBLs FRM WELL pH 5/
- 3-3 24 HRS/Ø BO, 233 BW/TBG 12/CSG 16/11 SPMx72" LOS/FL 672, OP 3329/pH 5/
- 3-4 24 HRS/Ø BO, 195 BW/TBG 12/CSG 16/11 SPMx72" LOS/FL 755, OP 3246/pH 5/
- 3-5 24 HRS/Ø BO, 208 BW/TBG 12/CSG 16/11 SPMx72" LOS/FL 736, OP 3265/pH 5.5/
- 3-6 24 HRS/Ø BO, 212 BW/TBG 19/CSG 16/11 SPMx72" LOS/pH 5.5/
- 3-7 24 HRS/Ø BO, 208 BW/TBG 19/CSG 16/11 SPMx72" LOS/FL 736, OP 3265/pH 5.5/
- 3-8 24 HRS/Ø BO, 239 BW/TBG 38/CSG 16/11 SPMx72" LOS/FL 723, OP 3278/
pH 7/
- 3-9 24 HRS/Ø BO, 234 BW/TBG 30/CSG 16/11 SPMx72" LOS/FL 745, OP 3256/pH 7/
- 3-10 24 HRS/Ø BO, 200 BW/TBG 19/CSG 16/11 SPMx72" LOS/FL 735, OP 3265/pH 7/
- 3-11 WELLTECK MIRU/POH w RODS & PMP/UNLANDED TBG/INSTLD BOP/POH w TBG/MU BKR 9-5/8" 36# FULLBORE PKR, RIH TO 4025, FILLED HOLE w 60 BBLs OF LSE PROD WTR (RECVRD APPROX 25 BBLs CRUDE OIL FRM ANNULUS)/SET FB @ 4035, HAD COMMUNICATION PUMPNG DN ANNULUS & DN TBG/RESET FB @ 4028.68', HAD COMM/RESET FB @ 4026.68 PRESS UP ANNULUS @ 500 PSI HELD OK/RIH TO 4121, SET FB, PMPD DN TBG, PRESS TO 700 PSI, HELD OK/PU TSTNG 1' @ A TIME @ 4116' HAD COMM/REL FB PUH TO 3468/
- 3-12 MEASURED PULLING OUT OF HOLE, TBG TALLEYS OK/RIH w KILL STG/SHUT WELL IN TILL AM 3-15-82/WAIT ON PROGRAM & APPROVAL/
- 3-15 BLED WELL DN/POH w KILL STG/TAGGED FILL @ 4233, CLND FINES TO 4237 (COULDN'T GET DPR)/PBD 4243, PU TO 4232 TO SPOT SD/RU HALIB, PLUGGED BOTH PMPs ON TRUCK w SD, REPLACEMENT TRK BROKE DN ON FREEWAY, PMP TRK ARIVD @ 3 PM/SPOTD 90 FT³ SILICA SD IN FOUR STGS FRM 4237-4030 (EST) TOP OF SD/PU TO 3022/SIFN/

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- 3-16 BLED WELL DN/LOWER TBG, TAG SD @ 4040/POH, RAN SCHLUM DMP BAILER, TAG SD @ 4034/BHT 140°/POH, MX $\frac{1}{2}$ SX HYDROMITE SET FOR 160°/RIH SET TOOL OFF @ 4034/POH, HYDROMITE SAT UP IN BAILER/RIH w 9-5/8" FB TO 3760/FILLED HOLE w 26 BBLS LSE WTR/SET FB, PRES TO 500 PSI ON CSG/EST BRK DN OF 2 BPM @ 550 PSI/PMP 25 SX THIXOTROPIC CMT FOLOWD BY 75 SX CL "G" CMT w 2% CaCl₂ & 6/10 OF 1% HALAD 9, DISP w 154 CF LSE WTR, PRES TO 1400 PSI/WAIT 20 MIN, DISP 22 CF @ 1675 PSI/EST TOP OF CMT @ 3883/CLOSE WELL IN w 1500 PSI ON TBG/PMP 51 CF CMT OUT HOLES/
- 3-17 BLED WELL DN/(HAD 150 PSI, SHUT IN PRESS ON TBG)/REL FB PKR/POH/MU 4 - 4-3/4" OD DRL CLRS ON 8-3/4" BIT, RIH ON 118 JTS OF 2-7/8" TBG, TAGD TOC @ 3885/RIGGED UP POWER SWIVEL, DRLD OUT CMT TO 4020 LEAVNG 11' CMT ABOV WSO HOLES @ 4031/POH, LAYD DN 21 JTS 2-7/8" TBG/BIT @ 3694/SIFN/
- 3-18 BLED WELL DN/REMOVD BOE/LANDED TBG w BIT @ 3707/RIH w RODS/LD DN 7 - 3/4", 6 - 7/8"x30' SUCKER RODS/CLND LOCATN/RDMO/WOC BEFORE CLN OUT & LOGGING/DROP FRM REPORT/
- 3-22 WELLTECH MIRU/BLED WELL DN/POH w RODS/UNLANDED TBG/INSTLD BOE/PICKED UP 11 JTS 2-7/8" TBG, RIH/DRLD OUT CMT FRM 4020-4025/BEGAN TSTNG TO 700 PSI EVERY 1' TO 4033, TSTS ALL OK/DRLD THRU CMT @ 4040/CLND OUT SD TO 4110/PUH TO 3523/SIFN/
- 3-23 BLED WELL DN/(VAC ON TBG) LOWERD 8-3/4" BIT TO 4110/FILLED HOLE w 7 BBLS LSE WTR, CONTD CLEANING OUT SD FRM 4110-4237/POH/RAN 8-3/4 BIT ON 9-5/8" 36# BKR CSG SCRPR TO 4235, CIRC OUT FINE CMT TO 4237/POH/RIGGED UP SCHLUM RAN GAMMA RAY - CMT BOND LOG FRM 4200-3348/SIFN/
- 3-24 BLED WELL DN/LD DN 4-3/4" DC/MU 9-5/8" 36# BKR CIRC WASH TOOL w 2' CUP SPACING, RIH ON 2-7/8" TBG TO 4007, TSTD TOOL, BLANKD OFF @ 1000 PSI/ CONTD IN HOLE w TOOL TO 4121-4119, BLANKD OFF @ 1000 PSI/PU TO 4118-4116 & TSTD PERFS EVERY 2' w AVG MAX BRK DN OF 500 PSI @ 15 FT³ PER MIN RATE & AVG FINAL PRESS OF 500 PSI @ 15 FT³ PER MIN RATE, THROUGHOUT PERFD INTERVL/FOLOWNG INTERVLS BLANKD OFF @ 1000 PSI, 4094-4092, 4086-4074, 4050-4048, 4046-4078/POH, LD DN TOOL/RIH w KILL STG/SIFN/
- 3-25 BLED WELL DN/POH w KILL STG/RAN PROD TBG STG w PAGE TBG ANCHOR @ 3829, API T/L PMP SHOE @ 3957 & BTM OF MUD ANCHOR @ 3989.59/REMOVD BOE/LANDED TBG/RIH w OILWELL 3 TUBE 2 $\frac{1}{2}$ "x1-3/4"x25' PMP ON 97 - 3/4 & 32 - 7/8"x30' "EL" SUCKER RODS/SEATED & SPACD PMP/FILLED TBG w LSE PROD WTR/POP INTO BKR TK/RDMO/WELL OWES 154 BBLS WTR/IN TST 19 HRS/O BO, 207 BW/TBG 5#/CSG 0#/11 SPMx 72" LOS/FL 2636, OP 1322/(FLOWLINE CUT CONTAINED 1% MUD)/WELL PAID BK LOAD WTR, PLUS 53 BBLS FRM WELL)/

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- 3-26 10 HRS/O BO, 90 BW/TBG 5#/CSG 17#/11 SPMx72" LOS/WELL PMPD OFF @ 5:00 PM 3-26-82/SHUT WELL IN/FL 3956 @ PMP/FL @ 7:00 AM, 3-27-82 3602', OP 354'/
- 3-27 5 HRS/O BO, 28 BW/TBG 12#/CSG 16#/11 SPMx72" LOS/FL 3956 @ PMP/SHUT WELL IN/
- 3-28 2 HRS/O BO, 14 BW/TBG 12#/CSG 16#/11 SPMx72" LOS/FL 3956 @ PMP/SHUT WELL IN/
- 3-29 1½ HRS/Ø BO, 8 BW/TBG 12#/CSG 16#/11 SPMx72" LOS/FL 3956 @ PMP/SHUT WELL IN 3-30-82/FLUID RISE 20 HRS, 114'/DROP FRM REPORT/WELL TO BE SHUT IN 7 DAYS FOR BUILD UP/
- 5-3 14 HRS/98 BO, 60 BW/TBG 7#/CSG 19#/11 SPMx72" LOS/FL 3957 @ PMP/
NOTE: WELL HAS BEEN SHUT-IN FOR BUILD UP SINCE 3-29-82/FLUID LEVEL PRIOR TO PUTTING ON PROD, 1723', OP 2234'/
- 5-4 NO ACTIVITY/DROP FRM REPORT/
- 5-14 WELL SHUT-IN PENDING EVALUATION FOR STIMULATION PROGRAM/DROP FRM REPORT/
- 9-7 WELL TA'D 5-14-82/FINAL REPORT/

DIVISION OF OIL AND GAS

Report on Operations

L. B. Carroll, Jr., Agent
SUN EXPLORATION & PRODUCTION CO.
P.O. Box 55060
Valencia, CA 91355

Long Beach Calif.
April 20, 1982

Your operations at well NWLBU 8-7, API No. 037-22512,
Sec. 13, T4S, R13W, S.B. B.& M. Long Beach Field, in Los Angeles County,
were witnessed on 2/26/82 by W.E. Brannon, Engineer, representative of
the supervisor, was present from 1400 to 1600. There were also present J. Icardone

Present condition of well: 20" cem 50' 13-3/8" cem 1122'. 9-5/8" cem 4715', perf 4031' &
4356' & 4693' WSO, perf 4368-4412'; 7" cem 4626-5847', perf @ int. 5724-5777',
TD 5847 Plugged w/cem 5777-5583' & 4423-4242'.

The operations were performed for the purpose of Testing the 9-5/8" shut-off at 4031' with
a formation tester.

DECISION: APPROVED

NOTE: DEFICIENCIES TO BE CORRECTED
NONE

DEFICIENCIES CORRECTED
NONE

CONTRACTOR: California Production Service, Inc.

WEB:csw

cc: Update

Blanket Bond

M.G. MEFFERD

State Oil and Gas Supervisor

By

J. I. Hardon
Deputy Supervisor

J. I. HARDON

RM 3-23-82

Operator Sun Exploration & Production Co

Well designation NWLBW 8-7 Sec. 13, T. 4S, R. 13W, SB B.&M.

Field Long Beach, County Los Angeles was tested for water shutoff on 2-26-82. (Name) W.E. Brannon, representative of the supervisor, was present from 1400 to 1600. Also present were J. Jcardone

Casing record of well: 20" cem 50' 13 3/8" Cem 1122' 9 5/8" cem 4715', perf 4031' 4356
4693' wsd, perf 4368-4412, 7" Cem 4626'-58 47, perf @ int 5729-5777, TD 5847 Plugged
w/cem 5777-5593, 4423'-4242'

The operations were performed for the purpose of D-1 - 9 5/8" - 4031

- The 9 5/8" shutoff at 4031 ' is approved.
- The seal between the _____ " and _____ " casings is approved.
- The operations are approved as indicating that all of the injection fluid is confined to the formations below _____ ' at this time.

4693 wsd

Hole size: _____ " fr. _____ ' to _____ ' ; _____ " to _____ ' ; & _____ " to _____ '

Size	Wt.	Casing		Date	Cemented		Top of Fill		Sqd. Away	Final Press	Test psi/min. Perfs.
		Top	Bottom		MO-Depth	Volume	Annulus	Casing			

Depth or interval tested 4 1/2" holes @ 4031'
The hole was open to 4243 ' for test.

FORMATION TEST:

Packer(s) 3459 ' & _____ ' Tail 3980 ' Bean size 3/4" " Cushion NONE
IHP 1733 IFP 41 FFP 46 FHP 1704
Blow medium blow for 10 min, light blow for 20 min. Then dead remainder of test.
Open for test ONE Hr. _____ min. Fluid entry 60 feet oil & water

BAILING TEST:

The hole fluid was bailed to _____ ' , at _____ on _____ 19__ .
The hole fluid was found at _____ ' , at _____ on _____ 19__ .
(time)

PRODUCTION TEST:

Gauge/meter reading _____ on _____ 19__ , at _____ pump depth _____ ' Engr. _____
Gauge/meter reading _____ on _____ 19__ , at _____ Engr. _____
Fluid level _____ ' surveyed on _____ 19__ , reviewed (witnessed) by _____
Total fluid produced, Bbls. _____ Net oil _____ Water _____
Rate: _____ B/D oil, _____ B/D water, _____ % water cut

INJECTION SURVEY:

RA/Spinner/Temperature survey run at _____ B/D & _____ psi on _____ 19__ ,
fluid confined below _____ ' (Packer depth _____ ')

DEFICIENCIES—TO BE CORRECTED *NONE*

DEFICIENCIES—CORRECTED *NONE*

CONTRACTOR *California Production Service, Inc.*

DIVISION OF OIL AND GAS

Report on Operations

L. B. Carroll, Jr., Agent
SUN EXPLORATION & PRODUCTION CO.
P. O. Box 55060
Valencia, CA 91355

Long Beach Calif.
April 23, 1982

Your operations at well NWLBU 8-7, API No. 037-22512,
Sec. 13, T4S, R. 13W S. BB. & M. Long Beach Field, in Los Angeles County,
were witnessed on 2-25-82 by E. Santiago, Engineer, representative of
the supervisor, was present from 1030 to 1130. There were also present J. Incardone,
Drilling Foreman.

Present condition of well: 20" cem 50'; 13-3/8" cem 1122'; 9-5/8" cem 4715'.
perf 4356' WSO & 4693' WSO; 7" cem 4626'-5847', perf @ int 5724'
- 5777' & 4368' - 4412'. TD 5847'. Plugged w/cem 5777'-5583' &
4423'-4242'.

The operations were performed for the purpose of Witnessing the plugging operations in
the process of plugging back to abandon lower zone.

DECISION: APPROVED.

NOTE: DEFICIENCIES TO BE CORRECTED
NONE

DEFICIENCIES CORRECTED
NONE

CONTRACTOR: California Production Service, Inc.

ES:da

cc: Update

Blanket Bond

M. G. MEFFERD
State Oil and Gas Supervisor

By

V. J. Dade
Deputy Supervisor

M. J. HADLEY

DEFICIENCIES—TO BE CORRECTED

NONE

DEFICIENCIES—CORRECTED

NONE

CONTRACTOR CALIFORNIA PRODUCTION SERVICE, INC.

REPORT ON PROPOSED OPERATIONS

412
(field code)
03
(area code)
00
(new pool code)
00
(old pool code)

L. B. Carroll, Jr., Agent
SUN EXPLORATION & PRODUCTION CO.
P. O. Box 55060
Valencia, CA 91355

Long Beach, California
March 3, 1982

Your _____ proposal to Rework well NWLBU 8-7,
A.P.I. No. 037-22512, Section 13, T. 4S, R. 13W, S.B. B. & M.,
Long Beach field, Northwest Extension area, Brown pool,
Los Angeles County, dated 2-22-82, received 2-23-82 has been examined in conjunction with records
filed in this office.

THE PROPOSAL IS APPROVED PROVIDED:

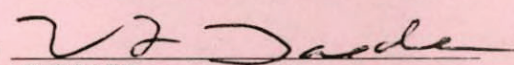
1. Blowout prevention equipment, equivalent to this division's Class II 2M requirements, or better, shall be installed and maintained in operating condition.
2. This division shall be consulted and a supplementary notice may be required before making any changes in the proposed program.
3. THIS DIVISION SHALL BE NOTIFIED:
 - ✓ a. To inspect the installed blowout prevention equipment prior to commencing down-hole operations.
 - b. To witness a test of the effectiveness of the 9-5/8" shut-off at 4030'.
 - c. To witness the location and hardness of the cement plug at 4250'.

RM:da

cc: Update

Blanket Bond

M. G. MEFFERD, State Oil and Gas Supervisor

By 
J. L. HARDOIN, Deputy Supervisor

A copy of this report and the proposal must be posted at the well site prior to commencing operations.

Records for work done under this permit are due within 60 days after the work has been completed or the operations have been suspended.

OEG
rework

DIVISION OF OIL AND GAS
Notice of Intention to Rework Well

This notice and indemnity or cash bond shall be filed, and approval given, before rework begins. If operations have not commenced within one year of receipt of the notice, this notice will be considered cancelled.

FOR DIVISION USE ONLY		
BOND	OGD114	OGD121
	Blanket	2-23-82 CP

DIVISION OF OIL AND GAS

In compliance with Section 3203, Division 3, Public Resources Code, notice is hereby given that it is our intention to rework well No. NWLBU #8-7, API No. 037-22512,
Sec. 13, T. 4S, R. 13W, SB B. & M., LONG BEACH Field, LOS ANGELES County.

The present condition of the well is as follows:

- Total depth. 5847' PBD 5583'
- Complete casing record, including plugs and perforations:
13 3/8", 54.5# CSG 0-1122'
9 5/8", 36# CSG 0-4715' (3.247 GALLONS/FT)
7", 26# CSG 4626- 5847' (1.607 GALLONS/FT)
TD 5847'; PBD 5583'
PERFS: 4-1/2" JHPF FROM 4368-4376' & 4383-4412'
WSO @ 4356'
2 7/8", 6.5# TBG 0-4393' (.2431 GALLONS/FT)

- Present producing zone name BROWN "K" Zone in which well is to be recompleted BROWN "I"
- Present zone pressure 1150 PSI New zone pressure 1150 PSI
- Last produced 2/16/82 0 11 0
(Date) (Oil, B/D) (Water, B/D) (Gas, Mcf/D)
or
- Last injected — — — —
(Date) (Water, B/D) (Gas, Mcf) (Surface pressure, psig.)

The proposed work is as follows:

- MIRU
- SPOT CMT PLUG FROM 4423-4250': DOG TO WITNESS AND APPROVE
- SHOOT WSO @ 4031. DOG TO WITNESS.
- SQUEEZE CMT W/+50 SX IF REQD. RE SHOOT WSO @ 4030.
- PERFORATE FROM 4118-4041', 4087-4080', AND 4068-4038' W/4-1/2" JHPF
- ACIDIZE W/1000 GAL 15% HCL AND 3000 GAL 12% HCL 3% HF ACID
- RETURN WELL TO PRODUCTION.

It is understood that if changes in this plan become necessary we are to notify you immediately.

Address 25322 W RYE CANYON ROAD
(Street)
VALENCIA CALIFORNIA 91355-5060
(City) (State) (Zip)
Telephone Number 805/257-6200

SUN EXPLORATION AND PRODUCTION COMPANY
SUN PRODUCTION DIVISION
(Name of Operator)
By [Signature] 2/22/82
(Name) (Date)
Type of Organization CORPORATION
(Corporation, Partnership, Individual, etc.)

DIVISION OF OIL AND GAS

Report on Operations

L. B. Carroll, Jr., Agent
SUN EXPLORATION & PRODUCTION CO. Long Beach Calif.
P. O. Box 55060 April 23, 1982
Valencia, CA 91355

Your operations at well NWLBU 8-7, API No. 037-22512,
Sec. 13, T.4S, R.13W S.B.B.&M. Long Beach Field, in Los Angeles County,
were witnessed on 2-4-82. G. W. Stark, Engineer, representative of
the supervisor, was present from 1250 to 1330. There were also present J. Incardone,
Drilling Foreman.

Present condition of well: 20" cem 50'; 13-3/8" cem 1122'; 9-5/8" cem 4715',
perf 4356', WSO & 4693' WSO; 7" cem 4626'-5847', perf @ int
5724'-5777'. TD 5847'. Plugged w/cem 5777'-5583'.

The operations were performed for the purpose of Testing the 9-5/8" shut-off at 4356'
with a formation tester.

DECISION: **APPROVED.**

NOTE: DEFICIENCIES TO BE CORRECTED
NONE

DEFICIENCIES CORRECTED
NONE

CONTRACTOR: Well Tech, Inc.

GWS:da

cc: Update

Blanket Bond

M. G. MEFFERD
State Oil and Gas Supervisor
By [Signature]
Deputy Supervisor

Operator SUN Oil Company EXPLORATION & PRODUCTION CO.

M 3-23-82

Well designation NW/4BU 8-7 Sec. 13, T. 4s, R. 13w, SBB.&M.

Field Long Beach, County Los Angeles was tested for water shutoff on 2-4-82. (Name) GW Stark, representative of the supervisor, was present from 1250 to 1330. Also present were J. Incardone PF

Casing record of well: 20" cem 50'; 13 3/8" cem 1122'; 9 5/8" cem 4715'; perf 4356' wso @ 4693' wso; 7" cem 4626'-5847'; perf @ int. 5724'-5777'. TD 5847'. Plugged w/cem 5777'-5523'.

The operations were performed for the purpose of (D) - 1 4356'

- The 9 5/8 " shutoff at 4356 ' is approved.
- The seal between the _____ " and _____ " casings is approved.
- The operations are approved as indicating that all of the injection fluid is confined to the formations below _____ ' at this time.

Hole size: _____ " fr. _____ ' to _____ ' ; _____ " to _____ ' ; & _____ " to _____ ' .

Size	Casing		Cemented			Top of Fill		Sqd. Away	Final Press	Test psi/min. Perfs.
	Wt.	Top	Bottom	Date	MO-Depth	Volume	Annulus			

Depth or interval tested 4 - 1/2" holes @ 4356'
The hole was open to _____ ' for test.

FORMATION TEST:
Packer(s) 4298 ' & _____ ' Tail 4326 ' Bean size 3/4 " Cushion 0
IHP 1850 IFP 43 FFP 55 FHP 1851
Blow 6 min light decreasing to dead in 14 min
Open for test 1 Hr. 0 min. Fluid entry 70' hole fluid

BAILING TEST:
The hole fluid was bailed to _____ ', at _____ on _____ 19__ .
The hole fluid was found at _____ ', at _____ on _____ 19__ .

PRODUCTION TEST:
Gauge/meter reading _____ on _____ 19__ , at _____ pump depth _____ ' Engr. _____
Gauge/meter reading _____ on _____ 19__ , at _____ Engr. _____
Fluid level _____ ' surveyed on _____ 19__ , reviewed (witnessed) by _____
Total fluid produced, Bbls. _____ Net oil _____ Water _____
Rate: _____ B/D oil, _____ B/D water, _____ % water cut

INJECTION SURVEY:
RA/Spinner/Temperature survey run at _____ B/D & _____ psi on _____ 19__ ,
fluid confined below _____ ' (Packer depth _____ ')

Deficiencies corrected
none

Deficiencies to be corrected
none

Contractor: Well Tech, Inc.

DIVISION OF OIL AND GAS

Report on Operations

L. B. Carroll, Jr., Agent
SUN EXPLORATION & PRODUCTION CO. Long Beach Calif.
P. O. Box 55060 April 23, 1982
Valencia, CA 91355

Your operations at well NWLBU 8-7, API No. 037-22512,
Sec. 13, T. 4S, R. 13W, S. B.B. & M. Long Beach Field, in Los Angeles County,
were witnessed on 2-3-82. G. W. Stark, Engineer, representative of
the supervisor, was present from 1800 to 1830. There were also present D. Wang,
Drilling Foreman.

Present condition of well: 20" cem 50'; 13-3/8" cem 1122'; 9-5/8" cem 4715',
perf 4693' WSO; 7" cem 4626'-5847', perf @ intervals 5724'-5777'.
TD 5847'.

The operations were performed for the purpose of Inspecting the blowout prevention
equipment and installation.

DECISION: APPROVED.

NOTE: DEFICIENCIES TO BE CORRECTED
NONE

DEFICIENCIES CORRECTED
NONE

CONTRACTOR: Well Tech, Inc.

GWS:da

cc: Update

Blanket Bond

M. G. MEFFERD
State Oil and Gas Supervisor
By [Signature]
Deputy Supervisor
[Signature] T. T. HADDON

**DIVISION OF OIL AND GAS
BLOWOUT PREVENTION EQUIPMENT MEMO**

PH 5-23-82

T 182251

EXPLORATION/PRODUCTION CO.

Operator or SUN Oil Company Well "NW4488-7" Field Long Beach County LA

VISITS: Date Engineer Time Operator's Rep. Title
 1st 2-3-82 GW Stark 1800 to 1830 D. Wang DF
 2nd _____ _____ _____ _____ _____

Casing record of well: 20" Cem 50; 13 3/8" Cem 1122; 9 5/8" Cem 4715; perf 4693 WSO; 7" Cem 4626'-5847'; perf @ intervals 5724'-5777'. TD 5847'.

OPERATION: ~~Testing~~ (inspecting) the blowout prevention equipment and installation.
 DECISION: The blowout prevention equipment and installation are approved.

Proposed Well Opns: Perf new zone MPSP: _____ psi
 Hole size: _____ " fr. _____' to _____', _____ " to _____' & _____ " to _____'

REQUIRED
 BOPE CLASS: II 2m

CASING RECORD (BOPE ANCHOR STRING ONLY)					Cement Details		Top of Cement	
Size	Weight(s)	Grade (s)	Shoe at	CP at			Casing	Annulus
			<u>1000</u>					

BOP STACK							a	b	a/b	TEST DATA			
API Symb.	Ram Sz.	Mfr.	Model or Type	Size In.	Press. Rtg.	Date Last Overhaul	Gal. to Close	Rec. Time Min.	Calc. GPM Output	psi Drop to Close	Secs. to Close	Test Date	Test Press.
<u>Rd</u>	<u>2 1/2</u>	<u>Shaffer</u>	<u>mech</u>	<u>A</u>	<u>3000</u>	<u>-</u>							
<u>+</u>	<u>CSO</u>	<u>"</u>	<u>"</u>	<u>"</u>	<u>"</u>	<u>-</u>							

ACTUATING SYSTEM			
Accum. Unit(s)	Wkg. Press.		psi
Total Rated Pump Output			gpm
Distance From Well Bore			ft.
Mfr.	Accum. Cap.	Precharge	
1	gal.	psi	
2	gal.	psi	
CONTROL STATIONS			Elec. Hyd.
Manif. at accum. unit			
Remote at Drlr's stn.			
Other:			
EMERG. BACKUP SYST.		Press.	Wkg. Fl.
N2 Cyl No:	Tpe:	1	gal
Other:		2	gal
		3	gal
		4	gal
		5	gal
		6	gal

AUXILIARY EQUIPMENT						
	No.	Sz. (in)	Rated Press.	Connections		
				Weld	Flan.	Thrd.
Fill-Up Line						
Kill Line						
Control Valve(s)						
Check Valve(s)						
Auxil. Pump Connec.						<u>Well Head Valves only</u>
Choke Line						
Control Valve(s)						
Pressure Gauge						
Adjustable Choke(s)						
Bleed Line						
Upper Kelly Cock						
Lower Kelly Cock						
Standpipe Valve						
Standpipe Pressure Ga.						
Pipe Safety Valve						
Internal Preventer						

HOLE FLUID MONITORING EQUIPMENT			Alarm	Class
Calibrated Mud Pit	Aud.	Vis.		A
Pit Level Indicator				B
Pump Stroke Counter				
Pit Level Recorder				C
Flow Sensor				
Mud Totalizer				
Calibrated Trip Tank				
Other:				

REMARKS: _____

Hole Fluid Type	Weight	Storage-Pits

DEFICIENCIES--TO BE CORRECTED

none

DEFICIENCIES--CORRECTED

none

CONTRACTOR *Well Tech, Inc.*

REPORT ON PROPOSED OPERATIONS

412
(field code)
03
(area code)
00
(new pool code)
00
(old pool code)

L. B. Carroll, Jr., Agent
SUN EXPLORATION & PRODUCTION CO.
P. O. Box 55060
Valencia, CA 91355

Long Beach, California
February 17, 1982

Your _____ proposal to Rework well NWLBU 8-7,
A.P.I. No. 037-22512, Section 13, T. 4S, R. 13W, S.B. B. & M.,
Long Beach field, Northwest Extension area, Brown pool,
Los Angeles County, dated 2-3-82, received 2-4-82 has been examined in conjunction with records
filed in this office.

THE PROPOSAL IS APPROVED PROVIDED:

1. Blowout prevention equipment, equivalent to this division's Class II 2M requirements, or better, shall be installed and maintained in operating condition.
2. This division shall be consulted and a supplementary notice may be required before making any changes in the proposed program.
3. **THIS DIVISION SHALL BE NOTIFIED:**
 - a. To inspect the installed blowout prevention equipment prior to commencing down-hole operations.
 - b. To witness the location and hardness of the cement plug at 5620'.

RM:da

cc: Update

Blanket Bond

M. G. MEFFERD, State Oil and Gas Supervisor

By J. L. Hardoin
J. L. HARDOIN, Deputy Supervisor

A copy of this report and the proposal must be posted at the well site prior to commencing operations.

Records for work done under this permit are due within 60 days after the work has been completed or the operations have been suspended.

o/g
rework

DIVISION OF OIL AND GAS
Notice of Intention to Rework Well

This notice and indemnity or cash bond shall be filed, and approval given, before rework begins. If operations have not commenced within one year of receipt of the notice, this notice will be considered cancelled.

FOR DIVISION USE ONLY		
BOND	OGD114	OGD121
<i>Blanket</i>	<i>2-10-82</i>	<i>2-10-82</i>

DIVISION OF OIL AND GAS

In compliance with Section 3203, Division 3, Public Resources Code, notice is hereby given that it is our intention to rework well No. NWLB UNIT #8-7, API No. 037-22512, Sec. 13, T. 4S, R. 13W, SB B. & M., LONG BEACH Field, LOS ANGELES County.

The present condition of the well is as follows:

1. Total depth. 5847' PBD 5837'

2. Complete casing record, including plugs and perforations:

13 3/8", 54.5# CSG 0-1122'
9 5/8", 36# CSG 0-4715' (3.247 GALLONS/FT)
7", 26# CSG 4626-5847' (1.607 GALLONS/FT)
T.D. 5847'; PBD 5837'
PERFS: 8- .33" JHPF FROM 5764' - 5777'
4- 1/2" JHPF FROM 5724' - 5736' AND 5738' - 5756'

3. Present producing zone name BROWN - "V" Zone in which well is to be recompleted BROWN - "K"

4. Present zone pressure 1200 PSI New zone pressure 1200 PSI

5. Last produced 1/26/82 0 20 0
(Date) (Oil, B/D) (Water, B/D) (Gas, Mcf/D)

or

6. Last injected _____
(Date) (Water, B/D) (Gas, Mcf) (Surface pressure, psig.)

The proposed work is as follows:

- MIRU
- SPOT CMT PLUG FROM 5777'-5620'. DOG TO WITNESS PLACEMENT AND LOCATION OF PLUG.
- PERFORATE WELL FROM 4383'-4411' AND FROM 4368'-4376' W/4 1/2" JHPF.
- ACIDIZE AS FOLLOWS: 1800 GALLONS 15% HCR, 1800 GALLONS 12% HCI-3% HF, 25 BBL 2% AM-CL WATER.
- RIH W/RODS, TBG, AND ACID PUMP. RTP.

It is understood that if changes in this plan become necessary we are to notify you immediately.

Address 25322 W RYE CANYON ROAD
(Street)
VALENCIA CALIFORNIA 91355-0560
(City) (State) (Zip)
Telephone Number 805/257-6200

SUN EXPLORATION AND PRODUCTION COMPANY
SUN PRODUCTION DIVISION
(Name of Operator)
By [Signature] 2/3/82
(Name) (Date)
Type of Organization CORPORATION
(Corporation, Partnership, Individual, etc.)

GENE WINN
BASIN SEGMENT

RECEIVED

FEB 4 9 11 AM '82

DIV. OF OIL AND GAS
LONG BEACH, CA.

DIVISION OF OIL AND GAS

Report on Operations

L. B. Carroll, Jr., Agent
SUN OIL COMPANY
P. O. Box 55060
Valencia, CA 91355

Long Beach Calif.
October 21, 1981

Your operations at well NWLBU 8-7, API No. 037-22512,
Sec. 13, T4S, R13W, S.B. B.& M. Long Beach Field, in Los Angeles County,
were witnessed on 9-21-81 by R. Manuel, Engineer, representative of
the supervisor, was present from 1145 to 1215. There were also present Don Rodgers,
Drilling Foreman.

Present condition of well: 20" cem 50'; 13-3/8" cem 1122'; 9-5/8" cem 4715', perf
4693' WSO. TD 4906' (Drilling).

The operations were performed for the purpose of Testing the 9-5/8" shut-off at 4693' with
a formation tester.

DECISION: APPROVED.

NOTE: DEFICIENCIES TO BE CORRECTED
NONE

DEFICIENCIES CORRECTED
NONE

CONTRACTOR: Atlantic Oil Company

RM:dh

cc: Update

TM / D. Daniels (Sun) 2-2-82
7" cem 4626'-5841', perfs @ int 5724'-5777'
OK to plug from 5777' to 5620'. Will send
Report on proposed operations
immediately.

M. G. MEFFERD
State Oil and Gas Supervisor

By *[Signature]*
Deputy Supervisor

[Signature]
R. A. YBARRA

Operator Sun Oil Company

Well designation NWLRV 8-7 Sec. 13, T. 4S, R. 13W, SR B.&M.

Field Long Beach, County L-A. was tested for water shutoff on 9-21-81. (Name) R. Manuel, representative of the supervisor, was present from 1145 to 1215. Also present were Don Rodgers - D.F.

Casing record of well: 20" cem 50'; 13 3/8" cem 1122'; 9 5/8" cem 4715', perf 4693' WSO.
ID 4906' (drilling).

The operations were performed for the purpose of (D-1) 9 5/8" @ 4693'

- The 9 5/8" shutoff at 4693' is approved.
- The seal between the _____ " and _____ " casings is approved.
- The operations are approved as indicating that all of the injection fluid is confined to the formations below _____ ' at this time.

Hole size: 12 1/4" fr. 1122' to 4725'; 8 3/4" to 4906'; & _____ " to _____ '.

Size	Casing		Cemented		Top of Fill		Sqd. Away	Final Press	Test psi/min. Perfs.
	Wt.	Top	Bottom	Date	MO-Depth	Volume			
<u>9 5/8"</u>	<u>36</u>	<u>Ø</u>	<u>4715'</u>	<u>9-19-81</u>	<u>thru shoe</u>	<u>1276cf</u>	<u>Surf</u>	<u>4487'</u>	<u>1000</u>

Depth or interval tested 4-1/2" holes @ 4693'
The hole was open to 4705' for test.

FORMATION TEST:

Packer(s) 4641' & _____ ' Tail 4669' Bean size 3/4" Cushion Ø
IHP 2200 IFP 57 FFP 57 FHP 2190
Blow light throughout test
Open for test 1 Hr. Ø min. Fluid entry 30' mud

BAILING TEST:

The hole fluid was bailed to _____ ', at _____ on _____ 19___.
The hole fluid was found at _____ ', at _____ on _____ 19___.
(time)

PRODUCTION TEST:

Gauge/meter reading _____ on _____ 19__, at _____ pump depth _____ ' Engr. _____
Gauge/meter reading _____ on _____ 19__, at _____ Engr. _____
Fluid level _____ ' surveyed on _____ 19__, reviewed (witnessed) by _____
Total fluid produced, Bbls. _____ Net oil _____ Water _____
Rate: _____ B/D oil, _____ B/D water, _____ % water cut

INJECTION SURVEY:

RA/Spinner/Temperature survey run at _____ B/D & _____ psi on _____ 19__,
fluid confined below _____ ' (Packer depth _____ ')

DEFICIENCIES—TO BE CORRECTED

None

DEFICIENCIES—CORRECTED

None

CONTRACTOR

Atlantic Oil Co.

C.R.G. Properties, Ltd.

DECL. CORR. 14 DEG. 30 MIN. EAST

PAGE 1

MEAS. DEPTH	DRIFT ANGLE	DRIFT BEARING	VERTICAL DEPTH	VERTICAL SUB-SEA	TOTAL COORDINATES
125	0015	N64 00E	125.0	-69.0	.1 N .2 E
215	0015	N14 00E	215.0	-159.0	.4 N .5 E
306	0015	S18 00W	306.0	-250.0	.5 N .1 E
417	0015	N36 00W	417.0	-361.0	.5 N .4 W
507	0015	N49 00E	507.0	-451.0	.8 N .3 W
600	0015	N60 00W	600.0	-544.0	1.3 N .4 W
693	0015	N34 00E	693.0	-637.0	1.6 N .5 W
783	0015	N09 30E	783.0	-727.0	2.0 N .3 W
875	0015	N80 00E	875.0	-819.0	2.3 N 0.0 W
965	0030	S05 00E	965.0	-909.0	1.9 N .4 E
1120	0030	N73 00W	1120.0	-1064.0	1.1 N .6 W
1192	0030	N15 00W	1192.0	-1136.0	1.5 N 1.0 W
1286	0000	N00 00E	1286.0	-1230.0	1.9 N 1.2 W
1386	0015	N21 00W	1386.0	-1330.0	2.1 N 1.2 W
1428	0245	N01 00W	1428.0	-1372.0	3.2 N 1.4 W
1489	0415	N14 00W	1488.9	-1432.9	6.9 N 1.9 W
1549	0600	N29 00W	1548.6	-1492.6	11.9 N 3.9 W
1611	0730	N24 00W	1610.2	-1554.2	18.4 N 7.1 W
1672	0930	N17 00W	1670.5	-1614.5	26.9 N 10.3 W
1735	1115	N11 00W	1732.5	-1676.5	37.9 N 13.0 W
1766	1215	N13 00W	1762.8	-1706.8	44.0 N 14.4 W
1894	1330	N25 00W	1887.6	-1831.6	71.0 N 23.6 W
1989	1315	N23 30W	1980.0	-1924.0	91.1 N 32.7 W
2081	1315	N22 00W	2069.6	-2013.6	110.5 N 40.8 W
2173	1315	N25 30W	2159.1	-2103.1	129.8 N 49.3 W
2264	1300	N30 30W	2247.8	-2191.8	148.0 N 59.0 W
2357	1230	N25 30W	2338.5	-2282.5	166.2 N 68.7 W
2404	1330	N21 00W	2384.3	-2328.3	175.9 N 72.8 W
2465	1330	N05 00W	2443.6	-2387.6	189.8 N 76.0 W
2571	1300	N02 00E	2546.8	-2490.8	214.0 N 76.7 W
2663	1300	N02 00E	2636.4	-2580.4	234.7 N 75.9 W
2754	1245	N03 00E	2725.1	-2669.1	255.0 N 75.1 W
2848	1230	N03 00E	2816.8	-2760.8	275.5 N 74.0 W
2938	1215	N05 30E	2904.7	-2848.7	294.7 N 72.6 W
3022	1200	N04 30E	2986.9	-2930.9	312.3 N 71.0 W

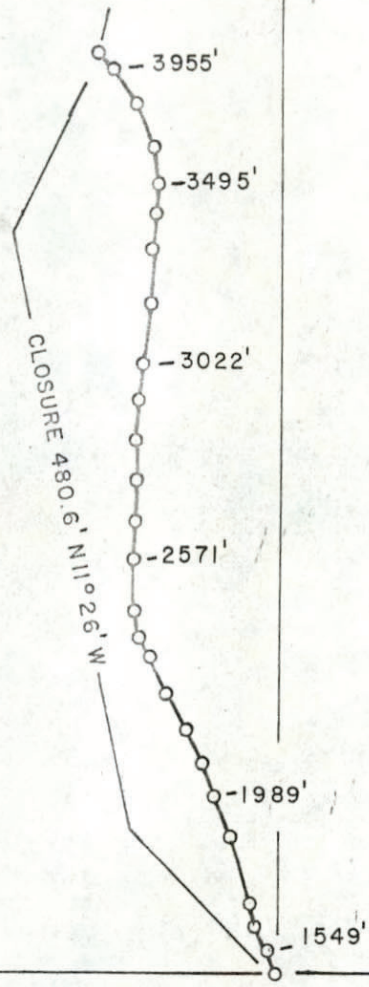
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 MAY 19 11 51 AM '83
 DIV OF OIL AND GAS
 LONG BEACH, CALIF.

MEAS. DEPTH	DRIFT ANGLE	DRIFT BEARING	VERTICAL DEPTH	VERTICAL SUB-SEA	TOTAL COORDINATES	
3175	1200	N04 30E	3136.5	-3080.5	344.0 N	68.5 W
3207	1200	N04 30E	3167.8	-3111.8	350.7 N	68.0 W
3310	1130	N03 30E	3268.7	-3212.7	371.6 N	66.5 W
3404	1130	N04 30E	3360.8	-3304.8	390.3 N	65.2 W
3495	1045	N05 00E	3450.1	-3394.1	407.8 N	63.8 W
3575	1330	N11 00W	3528.3	-3472.3	424.6 N	64.7 W
3635	1200	N25 00W	3586.8	-3530.8	437.1 N	68.7 W
3696	0930	N34 00W	3646.7	-3590.7	447.1 N	74.3 W
3758	0615	N43 00W	3708.2	-3652.2	453.7 N	79.6 W
3863	0330	N41 00W	3812.8	-3756.8	460.3 N	85.6 W
3955	0215	N41 00W	3904.7	-3848.7	463.8 N	88.6 W
4047	0200	N42 00W	3996.6	-3940.6	466.4 N	90.9 W
4139	0115	N40 00W	4088.6	-4032.6	468.3 N	92.6 W
4235	0115	N69 00W	4184.5	-4128.5	469.6 N	94.3 W
4332	0045	N54 00W	4281.5	-4225.5	470.4 N	95.8 W
4427	0015	N34 00E	4376.5	-4320.5	471.2 N	95.9 W
4518	0030	S26 00E	4467.5	-4411.5	471.1 N	95.3 W

CLOSURE: 480.6 FEET N 11 DEG. 26 MIN. W

COMPUTED USING THE AVERAGED ANGLE METHOD

4518' M.D.
471.1' NORTH
95.3' WEST



DECL. 14°30'



1" = 100'

N.W.L.B.U. WELL No. 8-7

DIVISION OF OIL AND GAS

Report on Operations

L. B. Carroll, Jr., Agent
SUN OIL COMPANY
P. O. Box 55060
Valencia, CA 91355

Long Beach Calif.
October 21, 1981

Your operations at well NWLBU 8-7, API No. 037-22512,
Sec. 13, T. 4S R.13W, S.B. B. & M. Long Beach Field, in Los Angeles County,
were witnessed on 8-30-81. W. E. Brannon, Engineer, representative of
the supervisor, was present from 0300 to 0700. There were also present D. Rodgers,
Drilling Foreman.
Present condition of well: 20" cem 50'; 13-3/8" cem 1122' TD 1122' (Drilling).

The operations were performed for the purpose of Testing the blowout prevention equipment and installation.

DECISION: APPROVED.

NOTE: DEFICIENCIES TO BE CORRECTED
NONE

DEFICIENCIES CORRECTED

1. Elbows on choke and kill lines.
2. Pipe safety valve was defective.
3. Driller did not know how to close upper kelly cock.
4. No tool available to close upper kelly cock.
5. Accumulator took too long to pressure up.
6. Leak in choke line.
7. No "P" report at drill site.

CONTRACTOR: Atlantic Oil Company

WEB:dh

cc: Update

M. G. MEFFERD

State Oil and Gas Supervisor

By [Signature]
Deputy Supervisor

R. A. YBARRA

DIVISION OF OIL AND GAS
BLOWOUT PREVENTION EQUIPMENT MEMO

110

T 1080

Operator Sun Oil Company Well NWILBU 8-7 Field Long Beach County Los Angeles

VISITS: Date Engineer Time Operator's Rep. Title
 1st 8-30-81 W.E. BRANNON 0300 to 0700 D. Rodgers DF
 2nd _____ _____ _____ _____ _____

Casing record of well: 20" Cem 50'; 13 3/8" Cem 1122 TD 1122 (drilling)

OPERATION: Testing (inspecting) the blowout prevention equipment and installation.
 DECISION: The blowout prevention equipment and installation are approved.

Proposed Well Opns: drill MPSP: _____ psi
 Hole size: 24 " fr. 0 ' to 50 ', 17 1/2 " to 1122 ' & _____ " to _____ ' REQUIRED
BOPE CLASS: III B3M

CASING RECORD (BOPE ANCHOR STRING ONLY)					Cement Details		Top of Cement	
Size	Weight(s)	Grade (s)	Shoe at	CP at			Casing	Annulus
<u>13 3/8</u>	<u>54 #</u>	<u>K-55</u>	<u>1122</u>		<u>1556 Rumped Plug w/1000#</u>		<u>1076</u>	<u>0</u>

BOP STACK						a	b	a/b	TEST DATA				
API Symb.	Ram Sz.	Mfr.	Model or Type	Size In.	Press. Rtg.	Date Last Overhaul	Gal. to Close	Rec. Time Min.	Calc. GPM Output	psi Drop to Close	Secs. to Close	Test Date	Test Press.
<u>A</u>	<u>12</u>	<u>Hydril</u>	<u>GK</u>	<u>12</u>	<u>3000</u>							<u>8/29</u>	<u>1200</u>
<u>Rd</u>	<u>4 1/2</u>	<u>Shaffer</u>	<u>B</u>	<u>12</u>	<u>3000</u>							<u>8/29</u>	<u>1000</u>
<u>Rd</u>	<u>650</u>	<u>Shaffer</u>	<u>B</u>	<u>12</u>	<u>3000</u>							<u>8/29</u>	<u>1200</u>

ACTUATING SYSTEM		
Accum. Unit(s)	Wkg. Press.	<u>1500</u> psi
Total Rated Pump Output		_____ gpm
Distance From Well Bore		<u>75</u> ft.
Mfr.	Accum. Cap.	Precharge
<u>1 Hydril</u>	<u>80</u> gal.	<u>600</u> psi
<u>2</u>	_____ gal.	_____ psi
CONTROL STATIONS		Elec. Hyd.
<input checked="" type="checkbox"/>	Manif. at accum. unit	<input checked="" type="checkbox"/>
<input checked="" type="checkbox"/>	Remote at Drlr's stn.	<input checked="" type="checkbox"/>
Other: _____		
EMERG. BACKUP SYST.	Press.	Wkg. Fl.
<input checked="" type="checkbox"/>	<u>N2 Cyl No: 3</u>	<u>Tpe: G 12500</u> gal
		<u>22300</u> gal
		<u>32400</u> gal
		<u>4</u> gal
		<u>5</u> gal
		<u>6</u> gal
Other: _____		

AUXILIARY EQUIPMENT						
	No.	Sz. (in)	Rated Press.	Connections		
				Weld	Flan.	Thrd.
<input checked="" type="checkbox"/>	Fill-Up Line					
<input checked="" type="checkbox"/>	Kill Line	<u>2</u>	<u>3000</u>			<u>X 1200</u>
<input checked="" type="checkbox"/>	Control Valve(s)	<u>1</u>	<u>3000</u>			<u>X -</u>
<input checked="" type="checkbox"/>	Check Valve(s)	<u>1</u>	<u>3000</u>			<u>X 1200</u>
<input checked="" type="checkbox"/>	Auxil. Pump Connec.		<u>3000</u>			<u>X 1200</u>
<input checked="" type="checkbox"/>	Choke Line	<u>2"</u>	<u>3000</u>			<u>X 1200</u>
<input checked="" type="checkbox"/>	Control Valve(s)	<u>3</u>	<u>3000</u>			<u>X 1200</u>
<input checked="" type="checkbox"/>	Pressure Gauge					<u>X -</u>
<input checked="" type="checkbox"/>	Adjustable Choke(s)	<u>1 2"</u>	<u>3000</u>			<u>X 1200</u>
<input checked="" type="checkbox"/>	Bleed Line	<u>2"</u>				<u>X -</u>
<input checked="" type="checkbox"/>	Upper Kelly Cock					<u>-</u>
<input checked="" type="checkbox"/>	Lower Kelly Cock					<u>-</u>
<input checked="" type="checkbox"/>	Standpipe Valve					<u>1200</u>
<input checked="" type="checkbox"/>	Standpipe Pressure Ga.					<u>-</u>
<input checked="" type="checkbox"/>	Pipe Safety Valve	<u>4 1/2</u>	<u>3000</u>			<u>-</u>
<input checked="" type="checkbox"/>	Internal Preventer	<u>4 1/2</u>	<u>3000</u>			<u>-</u>

HOLE FLUID MONITORING EQUIPMENT			Alarm	Class
<input checked="" type="checkbox"/>	Calibrated Mud Pit	Aud.	Vis.	<u>A</u>
<input checked="" type="checkbox"/>	Pit Level Indicator	<u>X</u>	<u>X</u>	<u>B</u>
<input checked="" type="checkbox"/>	Pump Stroke Counter	<u>X</u>	<u>X</u>	<u>B</u>
	Pit Level Recorder			<u>C</u>
	Flow Sensor			
	Mud Totalizer			
	Calibrated Trip Tank			
	Other:			

REMARKS: _____

Hole Fluid Type	Weight	Storage-Pits
<u>Clay base mud</u>	<u>70#</u>	<u>770 Bbl</u>

DEFICIENCIES—TO BE CORRECTED

None on Kill and Choke

DEFICIENCIES—CORRECTED

- 1- elbows on choke and kill lines
- 2- pipe safety valve was defective
- 3- driller did not know how to close upper Kelly Cock
- 4- No tool available to close upper Kelly cock
- 5- accumulator took too long to pressure up
- 6- leak in choke line
- 7- No "p" report at drill site

CONTRACTOR

Atlantic Oil Co.

REPORT ON PROPOSED OPERATIONS

412
(field code)
03
(area code)
00
(pool code)

L. B. Carroll, Jr., Agent
SUN OIL COMPANY
P. O. Box 55060
Valencia, CA 91355

Long Beach, California
August 28, 1981

Your _____ proposal to Drill well NWLBU 8-7,
A.P.I. No. 037-22512, Section 13, T. 4S, R. 13W, S. B. B. & M., Marine &
Long Beach field, Northwest Extension area, L. Alamitos, Brown pool,
Los Angeles County, dated 8-20-81, received 8-21-81 has been examined in conjunction with records
filed in this office.

1. Blowout prevention equipment, equivalent to this division's Class 4 III B, 3M requirements or better, shall be installed and maintained in operating condition.
2. Drilling fluid of a quality and in sufficient quantity to control all sub-surface conditions in order to prevent blowouts shall be used.
3. All oil, gas or fresh water sands behind the 9-5/8" casing shall be protected by either lifting cement or by multiple stage cementing.
4. A directional survey shall be made and filed with this division.
5. THIS DIVISION SHALL BE NOTIFIED:
 - a. To witness a test of the installed blowout prevention equipment prior to drilling out cement in the shoe of the 10-3/8" casing.
 - b. To witness a test of the effectiveness of the 9-5/8" shut-off above the lower Alamitos zone.

HO:dh

cc: Update
EDP

Blanket Bond

M. G. MEFFERD, State Oil and Gas Supervisor

By [Signature]
R. A. YBARRA, Deputy Supervisor

A copy of this report and the proposal must be posted at the well site prior to commencing operations.

Records for work done under this permit are due within 60 days after the work has been completed or the operations have been suspended.

*O&G
News*

DIVISION OF OIL AND GAS
Notice of Intention to Drill New Well

C.E.Q.A. INFORMATION			
EXEMPT <input type="checkbox"/>	NEG. DEC. <input checked="" type="checkbox"/>	E.I.R. <input type="checkbox"/>	DOCUMENT NOT REQUIRED BY LOCAL JURISDICTION <input type="checkbox"/>
CLASS _____	64-77 S.C.H. NO. _____	S.C.H. NO. _____	
See Reverse Side			

FOR DIVISION USE ONLY					
MAP	MAP BOOK	CARDS	BOND	FORMS	
				114	121
137	825181	825181	Balke	825181	825181

In compliance with Section 3203, Division 3, Public Resources Code, notice is hereby given that it is our intention to commence drilling well NW LONG BEACH UNIT #8-7, API No. 037-22512,
(Assigned by Division)
Sec. 13, T. 4S, R. 13W, SB B. & M., Long Beach Field, Los Angeles County.
Legal description of mineral-right lease, consisting of 149 acres, is as follows: _____
(Attach map or plat to scale)
see attached

Do mineral and surface leases coincide? Yes _____ No X If answer is no, attach legal description of both surface and mineral leases, and map or plat to scale.

Location of well 487 feet North ~~along section/property line~~ and 779 feet West
(Direction) (Cross out one) (Direction)
at right angles to said line from the ~~xxxxxx section/property~~ _____
(Cross out one)
intersection of centerline of San Antonio Drive & Del Mar Avenue

Is this a critical well according to the definition on the reverse side of this form? Yes No

If well is to be directionally drilled, show proposed coordinates (from surface location) at total depth:
463 feet North and 100 feet West
(Direction) (Direction)

Elevation of ground above sea level 45.5 feet.

All depth measurements taken from top of Kelly Bushing that is +10 feet above ground.
(Derrick Floor, Rotary Table, or Kelly Bushing)

PROPOSED CASING PROGRAM

SIZE OF CASING INCHES API	WEIGHT	GRADE AND TYPE	TOP	BOTTOM	CEMENTING DEPTHS	CALCULATED FILL BEHIND CASING
13 3/8"	54.5#	K-55; BT & C	Surface	1100'	1100'	1528 CF=200% to surf
9 5/8"	36#	K-55; ST & C	Surface	2900'	2900'	705 CF=125% to 13 3/8" shoe
7"	26#	K-55; ST & C	2700'	5900'	5900'	1473 CF=125% to 9 5/8" shoe

(A complete drilling program is preferred and may be submitted in lieu of the above program.)
Intended zone(s) Lower Alamitos @ 3946' TVD; Brown @ 4626' TVD;
of completion Marine @ 5196' TVD; Pressure = 800 PSI Estimated total depth 5826' TVD
(Name, depth, and expected pressure)

It is understood that if changes in this plan become necessary we are to notify you immediately.

Name of Operator <u>SUN OIL COMPANY (DELAWARE)</u>	Type of Organization (Corporation, Partnership, Individual, etc.) <u>CORPORATION</u>
Address <u>P O BOX 55060</u>	City <u>VALENCIA, CA</u>
Telephone Number <u>805/257-6200</u>	Name of Person Filing Notice <u>L. B. Carroll, Jr.</u>
	Signature <i>L. B. Carroll Jr.</i>
	Date <u>8/20/81</u>

This notice and indemnity or cash bond shall be filed, and approval given, before drilling begins. If operations have not commenced within one year of receipt of the notice, this notice will be considered cancelled.

Information for compliance with the California Environmental Quality Act of 1970 (C.E.Q.A.).

If an environmental document has been prepared by the lead agency, please submit a copy of the document with this notice or supply the following information:

Lead Agency: City of Long Beach
Contact Person: G. H. Felgemaker
Address: 333 West Ocean Blvd.
Long Beach, CA 90802
Phone: (805) 590-6894

FOR DIVISION USE ONLY	
District review of environmental document (if applicable)?	Yes <input type="checkbox"/> No <input type="checkbox"/>
Remarks:	<hr/> <hr/> <hr/>

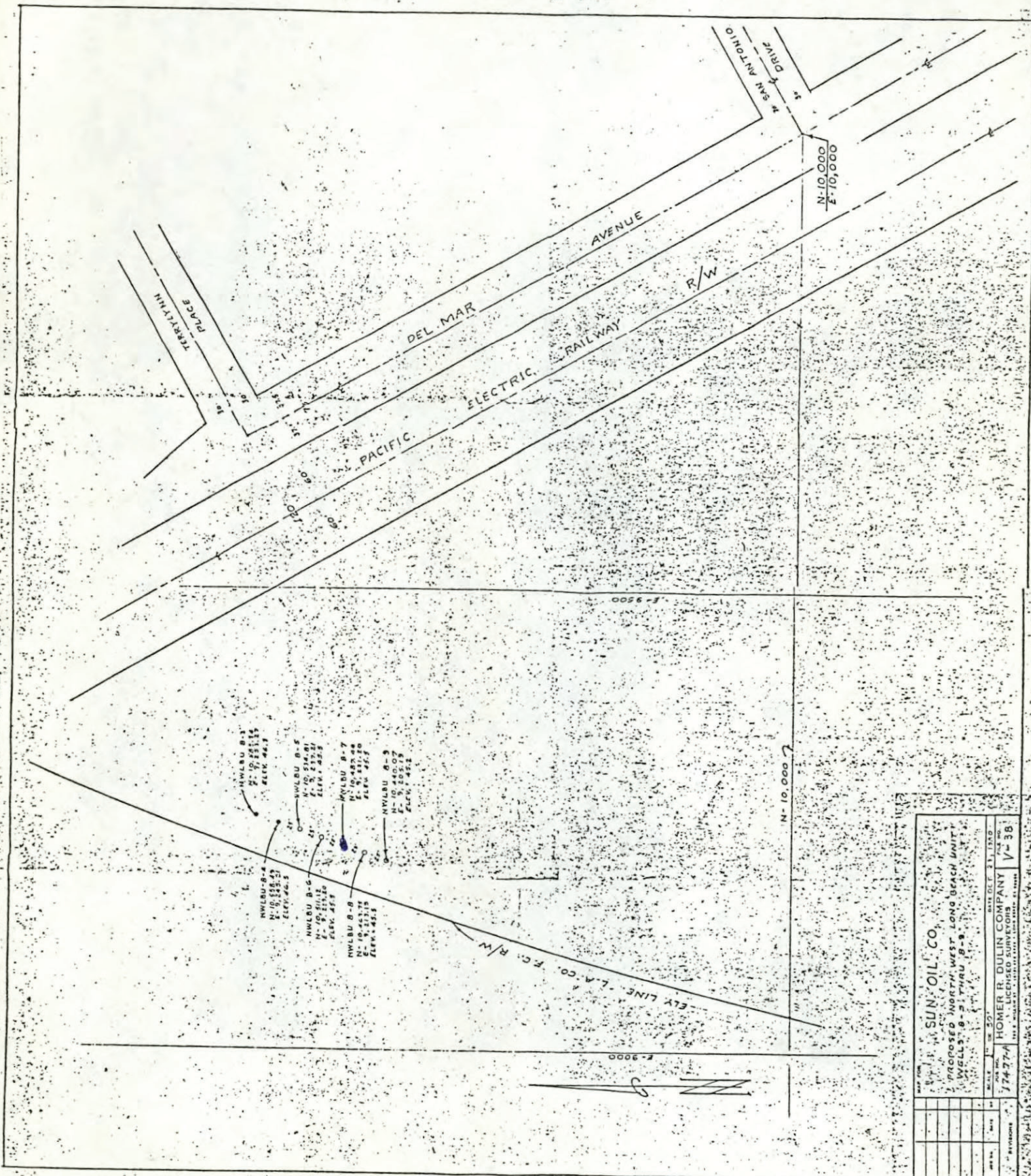
CRITICAL WELL

As defined in the California Administrative Code, Title 14, Section 1720(a), "Critical well" means a well within:

- (1) 300 feet of the following:
 - (A) Any building intended for human occupancy that is not necessary to the operation of the well; or
 - (B) Any airport runway.
- (2) 100 feet of the following:
 - (A) Any dedicated public street, highway, or nearest rail of an operating railway that is in general use;
 - (B) Any navigable body of water or watercourse perennially covered by water;
 - (C) Any public recreational facility such as a golf course, amusement park, picnic ground, campground, or any other area of periodic high-density population; or
 - (D) Any officially recognized wildlife preserve.

Exceptions or additions to this definition may be established by the supervisor upon his own judgment or upon written request of an operator. This written request shall contain justification for such an exception.

RECEIVED
AUG 21 2 37 PM '81
DIV. OF OIL AND GAS
LONG BEACH, CA



NWLBU B-3
 N-10,000
 E-10,000
 ELEV. 442.7

NWLBU B-4
 N-10,000
 E-10,000
 ELEV. 442.3

NWLBU B-5
 N-10,000
 E-10,000
 ELEV. 442.3

NWLBU B-6
 N-10,000
 E-10,000
 ELEV. 442.3

NWLBU B-7
 N-10,000
 E-10,000
 ELEV. 442.3

NWLBU B-8
 N-10,000
 E-10,000
 ELEV. 442.3

SUN OIL CO.	
PROPOSED NORTH WEST LONG BEACH UNIT	
WELLS B-3 THRU B-8	
DATE	NOV 27 1930
BY	HORNER B. DULIN COMPANY
NO.	7477A
REVISIONS	V-38

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AUG 21 2 32 PM '81

DIV. OF OIL AND GAS
LONG BEACH, CA.

NORTHWEST LONG BEACH UNIT
SURFACE RIGHTS

Block 1 (Lease 800388 - W. T. McDonald)
No surface rights

Block 2 (Lease 800389 - Atlantic Richfield)
No surface rights

Block 3 (Unleased - Los Cerritos Park)
No surface rights

Block 4 (Lease 800390 - Amebco)
Sun's surface rights cover only Lot 39 in Block G of Los Cerritos and do not include acreage south of the Westerly prolongation of the Northerly line of Bixby Road

Block 5 (Leases 800391 and 800392 - Pacific Electric Ry. Co. and Southern Pacific Trans. Co.)

Sun has no surface rights south of the Easterly prolongation of the Southerly line of Wilmington (Baker, 223rd) Street. As to the remainder, Sun's surface rights are limited to those areas shaded in red on the attached Exhibit "A".

Block 6 (Lease 800390 - Amebco)
Sun has surface rights over this entire Block save for that portion thereof quitclaimed to the State of California on August 11, 1961 for the construction of the San Diego Freeway.

Block 7 (Lease 800392 - Southern Pacific)
No surface rights

Block 8 (Lease 800393 - Oil Operators)
Sun has surface rights over the entire Block save for that portion thereof quitclaimed to the State of California on April 17, 1958 for the construction of the San Diego Freeway.

Block 9 (Lease 800394 - Los Angeles County Flood Control District)
Sun has surface rights over all of this Block save for a five-acre strip on the Southwest portion thereof which was quitclaimed to the Flood Control District on June 29, 1962 and is presently occupied by the Long Beach and San Diego Freeways and their access roads. Paragraph 2 of this lease does provide that Lessee's operations shall neither be so located nor so conducted as to interfere with the Flood Control Channel and further provides that no structures shall be placed between or upon the tops of the channel levees without the approval of Lessor's Chief Engineer.

Block 10 (Lease 800392 - Southern Pacific)
No surface rights.

RECEIVED

AUG 21 2 33 PM '81

DIV. OF OIL AND GAS
LONG BEACH, CA.

EXHIBIT A

DESCRIPTION OF LEASES

BLOCK 1 - 15.06 Acres

Oil and Gas Lease dated March 1, 1977, by and between W. T. McDonald, as Lessor, and General Exploration Company, as Lessee, covering the following described lands:

All of Tract No. 9117 shown on map recorded in Book 181, Page 47 of the Map Records of Los Angeles County, California, and all of Lot 40 and that portion of Lot 41 in Block "G" of Los Cerritos, as shown on map recorded in Book 12, Pages 198 and 199 of Map Records of Los Angeles County, California, described as follows:

All that portion of said Lot 41 lying Southerly of a line which is the prolongation Easterly of the center line of Wilmington Street Extension, now known as 223rd Street, as said street is shown on map of the aforesaid Tract No. 9117.

BLOCK 2 - 7.94 Acres

Oil and Gas Lease by and between Atlantic Richfield Company, as Lessor, and General Exploration Company, as Lessee, dated March 9, 1977, covering the following described lands:

Lots 42, 44, 45, 46, 47 and that portion of Lot 41, all in Block "G" of Los Cerritos, in the City of Long Beach, County of Los Angeles, State of California, as per map recorded in Book 12, Pages 198 and 199 of Maps, in the office of the County Recorder of said County, included within the following described premises:

Beginning at the point of intersection of the center line of Wilmington Street Extension with the Northeasterly line of the right-of-way of the Pacific Electric Railway Company, as shown on map of Los Cerritos, recorded in Map Book 12, Pages 198 and 199, Records of Los Angeles County, thence East along the prolongation East of said center line of Wilmington Street Extension to its intersection with the Southwesterly line of Lincoln Avenue, as shown on map of Los Cerritos; thence Northwesterly along the Southwesterly line of said Lincoln Avenue to the Northeasterly line of Lot 42 in Block "G", as shown on said map of Los Cerritos; thence Southwesterly along the Northwesterly line of said Lot 42 in Block "G"; and its prolongation Southwesterly to its intersection with the Northeasterly line of said right-of-way of the Pacific Electric Railway Company; thence in a Southeasterly direction along the Northeasterly line of said right-of-way to the point of beginning.

BLOCK 3 - 2.43 Acres

That portion of Rancho Los Cerritos as shown as Los Cerritos Park on that certain map of Los Cerritos filed for record in Book 12, Pages 198 and 199, Map Records of the County of Los Angeles, State of California, being more particularly described as follows:

Beginning at the point of intersection of the Westerly line of Country Club Drive, formerly known as Lincoln Avenue, with the Northwesterly boundary line of Tract 30977; being also the Northwesterly line of Lot 42 of Block "G" of Los Cerritos, as shown on map thereof in Book 12, Pages 198 and 199, Map Records of Los Angeles County, State of California; thence South 60° 51' 30" West 373.64 feet to the Easterly Boundary line of the right-of-way of the Pacific Electric Railway Company, as shown on the map of Tract 1400, filed for record in Book 18, Page 96 of the Map Records of said county; thence along the Easterly line of said right-of-way North 29° 08' 30" West to its intersection with the Westerly prolongation of the Southeasterly line of Lot 43 of Block "G" of Los Cerritos, as shown on map thereof in Book 12, Page 198 et seq., Map Records of said County; thence on and along said Westerly prolongation and the Southeasterly line of said Lot 43 of Block "G" of Los Cerritos to its intersection with the Westerly line of Country Club Drive; thence on and along the Westerly line of Country Club Drive to the point of beginning.

BLOCK 4 - 6.65 Acres

Oil and Gas Lease dated May 24, 1934, Recorded in Book 13539, Page 1 of the Official Records of Los Angeles County, California, from Amelia M. E. Bixby Company, as Lessor, to C. G. Willis, as Lessee, insofar as said lease covers the following described lands:

All of Lot 43 in Block "G" of Los Cerritos, as shown on map recorded in Book 12, Pages 198 and 199 of the Map Records of the County of Los Angeles, State of California, and those portions of the Rancho Los Cerritos in the City of Long Beach, Los Angeles County, California described as follows:

Beginning at the intersection of the Northerly line of Bixby Road with the Easterly line of the 120 foot right-of-way of the Pacific Electric Railway Company, as shown on a map of Los Cerritos recorded in Book 12, Pages 198 and 199, Map Records of Los Angeles County, California; thence along the Easterly line of said right-of-way North 29° 08' 30" West 85.31 feet to its intersection with the Southeasterly line of San Antonio Drive, as shown on a map of Tract 2612, recorded in Book 27, Page 28 of said map records; thence along said

San Antonio Drive North 60° 46' East 648.15 feet to its intersection with the Westerly line of Magnolia Avenue (formerly Lincoln Avenue), as shown on map of said Los Cerritos; thence along said Avenue South 5° 34' East 391.34 feet to the intersection of the Westerly line of said Magnolia Avenue with the Northerly line of said Bixby Road; thence Westerly along said road 562.11 feet to the point of beginning.

Excepting from the above described parcel of land that portion described as follows:

Beginning at the intersection of the Northerly line of Bixby Road with the Westerly line of Magnolia Avenue (formerly Lincoln Avenue), as shown on the map of Los Cerritos recorded in Book 12, Pages 198 and 199 of said Map Records; thence along the Westerly line of said Magnolia Avenue North 5° 34' West 193.26 feet; thence Westerly parallel with said Bixby Road 155 feet; thence South 5° 34' East 193.26 feet to a point in the Northerly line of said Bixby Road; thence Easterly along said Northerly line 155 feet to the point of beginning.

BLOCK 5 - 9.20 Acres

Oil and Gas Lease dated April 30, 1937, by and between Pacific Electric Railway Company, as Lessor, and Cornelius G. Willis, as Lessee, Recorded in Book 15573, Page 167 of the Official Records of Los Angeles County, California and Oil and Gas Lease by and between Southern Pacific Transportation Company, as Lessor, and General Exploration Company, as Lessee, dated March 31, 1977, covering the following described lands:

Those certain lands lying, situated and being in the County of Los Angeles, State of California, described as follows:

That portion of the former Pacific Electric Railway Company 120 foot strip of land as conveyed by Deed dated October 29, 1912, by George H. Bixby and wife, to Pacific Electric Railway Company, and recorded November 8, 1913, in Book 5596, Page 175 of Deeds, Los Angeles County Records, extending from the Easterly prolongation of the Southerly line of 223rd Street (formerly Wilmington Street), as shown on map of Tract 1400, recorded in Book 18, Page 96 of Maps in Los Angeles County Records, Northwesterly to the intersection with the Westerly prolongation of the Southerly line of San Antonio Drive, as shown on Tract 2612 recorded in Map Book 27, Page 28, Los Angeles County Records.

BLOCK 6 - 12.69 Acres

Oil and Gas Lease dated May 24, 1934, Recorded in Book 13539, Page 1 of the Official Records of Los Angeles County, California, from Amelia M. E. Bixby Company, as Lessor, to C. G. Willis, as Lessee, insofar as said lease covers the following described lands:

A part of Lot 4, Tract 1400, as shown on Map recorded in Book 18, Page 96 of Maps, Records of the County of Los Angeles, State of California, described as follows:

Beginning at the Southeasterly corner of said Lot 4, thence South 89° 49' West along the Southerly line of said Lot 4, a distance of 571.84 feet to the Southeast corner of that certain property described in Deed to Gregorio Encinas, recorded in Deed Book 7086, Page 273, records of said Los Angeles County; thence North 0° 09' 30" West 535.00 feet along the Easterly line of said property; thence South 89° 49' West, along the Northerly line of said property to the Easterly line of the right-of-way of the Pacific Electric Railway Company, 70.00 feet wide; thence in a Northerly direction along the Easterly line of said right-of-way to its intersection with the Northeasterly line of said Lot 4; thence in a Southeasterly direction along said Northeasterly line of Lot 4 to the point of beginning.

BLOCK 7 - 2.68 Acres

Oil and Gas Lease by and between Southern Pacific Transportation Company, as Lessor, and General Exploration Company, as Lessee, dated March 31, 1977, covering the following described lands:

That certain strip of land described as "SECOND" hereinafter, lying between the center line of Wilmington Street and the Southwesterly line of the former Pacific Electric Railway Company's 120 foot right of way, to wit:

Those certain strips of land situated in the County of Los Angeles, being portions of Lots 3, 4 and 7 of Tract No. 1400, as per map recorded on Page 96 in Book 18 of Maps, Records of Los Angeles County and portion of Tract No. 2220 as per map recorded on Page 97 in Book 22 of Maps, Records of said County, said strips of land being described as follows:

FIRST: A strip of land 60 feet in width, being 21.75 feet on the Southwesterly and Westerly side, and 38.25 feet on the Northeasterly and Easterly side of the following described line:

Commencing at a point in the center line of Wardlow Road, distant Easterly thereon 364.71 feet from the Southerly prolongation of the center line of Golden Avenue as shown on Map of Tract No. 2220 recorded on Page 97 in Book 22 of Maps, Records of said County; thence North 33° 54' 10" West, 607.02 feet to the beginning of a tangent curve concave to the Northeast and having a radius of 5729.61 feet; thence Northwesterly along said curve, 30 feet to point of compound curve concave to the Northeast and having a radius of 2864.84 feet; thence Northwesterly along last mentioned curve 30 feet to point of compound curve concave to the Northeast and having a radius of 1909.91 feet; thence

Northwesterly along last mentioned curve, 30 feet to point of compound curve concave to the Northeast and having a radius of 1432.47 feet; thence Northwesterly along last mentioned curve, 30 feet to point of compound curve concave to the Northeast and having a radius of 1146.01 feet; thence Northwesterly along last mentioned curve, 30 feet to point of compound curve concave to the East and having a radius of 955.04 feet; thence Northerly along last mentioned curve, 612.57 feet to a point of compound curve concave to the East and having a radius of 1146.01 feet; thence Northeasterly along last mentioned curve, 30 feet to point of compound curve concave to the East and having a radius of 1432.47 feet; thence Northeasterly along last mentioned curve, 30 feet to point of compound curve concave to the East and having a radius of 1909.91 feet; thence Northeasterly along last mentioned curve, 30 feet to point of compound curve concave to the East and having a radius of 2864.84 feet; thence Northeasterly along last mentioned curve, 30 feet to point of compound curve concave to the East and having a radius of 5729.61 feet; thence Northeasterly along last mentioned curve, 30 feet to the end of said curve; thence Northeasterly, tangent to last mentioned curve, 309.18 feet to a point in the center line of Wilmington Street, distant Westerly along said center line, 79.64 feet from the Northerly prolongation of the center line of Golden Avenue as shown on said map of Tract No. 2220. The side lines of said 60 foot strip of land terminating in the center line of Wilmington Street on the North, and in the center of Wardlow Road on the South.

SECOND: A strip of land 70 feet in width, being 26.75 feet on the Westerly side and 43.25 feet on the Easterly side of the following described line:

Commencing at above mentioned point in the center line of Wilmington Street, distant Westerly along said center line 79.64 feet from the Northerly prolongation of the center line of Golden Avenue as shown on said map of Tract No. 2220; thence Northeasterly continuing along last mentioned tangent to curve 5729.61 feet radius in the above described 60 foot strip of land, 1221.20 feet to the beginning of a tangent curve concave to the West and having a radius of 1146.01 feet; thence Northerly along last mentioned curve, 452.45 feet to a point in the Southwesterly line of that certain strip of land 120 feet in width conveyed by Geo. H. Bixby, et ux to Pacific Electric Railway Company, by Deed recorded on Page 175 in Book 5596 of Deeds, Los Angeles County Records, said last mentioned point being distant Southeasterly along said Southwesterly line, 360.21 feet from the West line of above mentioned Lot 4 of Tract No. 1400. The Westerly line of said 70 foot strip of land being extended, and the Easterly line thereof shortened to terminate

in the center line of Wilmington Street on the South, and in the Southwesterly line of above mentioned 120 foot strip of land on the North. Excepting from above described strip of land 70 feet in width any portion thereof included within the lines of the 6.49 acre tract conveyed by Amelia M. E. Bixby to Gregorio Encinas by Deed recorded on Page 273 in Book 7086 of Deeds, Los Angeles County Records. Subject to the rights of the public in those portions of above described 60 foot strip and 70 foot strip included within the lines of Wardlow Road, Golden Avenue and Wilmington Street.

The base of bearings for this description is the South line of Powers Street, having a bearing of East, as shown on map of Tract No. 4351, recorded on Pages 94 and 95 in Book 53 of Maps, Los Angeles County Records.

BLOCK 8 - 23.89 Acres

Oil and Gas Lease dated December 1, 1935, from Oil Operators Incorporated, as Lessor, to Union Oil Company of California, as Lessee, Recorded in Book 14010, Page 66, Official Records of Los Angeles County, California, insofar as said lease covers the following described lands:

Those portions of Lots 3 and 4 of Tract 1400, in the County of Los Angeles, State of California, as per map recorded in Book 18, Page 96 of Maps, Records of said County, described as follows:

Beginning at the point of intersection of the Southerly line of said Lot 3 with the Westerly line of the Pacific Electric Railway Company's 70 foot right-of-way, as described in Deed recorded in Book 3991, Page 88, Official Records; thence Westerly along the Southerly line of said Lot 3 to its intersection with the Easterly line of the Los Angeles County Flood Control Channel; thence Northerly along the Easterly line of Flood Control Channel to its intersection with the Southwesterly line of Pacific Electric Railway Company's 120 foot right-of-way, as described in Deed recorded in Book 5596, Page 175 of Deeds; thence South-easterly along aforesaid Southwesterly line of right-of-way to its intersection with the Westerly line of Pacific Electric Railway Company's 70 foot right-of-way, as described in Deed recorded in Book 3991, Page 88, Official Records; thence Southerly and Westerly along aforesaid Westerly line of 70 foot right-of-way to the point of beginning, Excepting from the lands hereinabove described that portion of said Lot 4 included within the land described in Deed from Amelia M. E. Bixby to Gregorio Encinas, recorded May 18, 1920 in Book 7086, Page 273 of Deeds of said County.

BLOCK 9 - 67.63 Acres

Oil and Gas Lease dated October 7, 1935, from Los Angeles County Flood Control District, as Lessor, to Cornelius G. Willis, as Lessee, recorded in Book 13784, Page 4, Official Records of Los Angeles County, California, insofar as said lease covers the following described property:

- (1) That portion of Lot 3 of said Tract No. 1400, described as follows:

Beginning at a point in the Southerly line of said Lot 3 distant East thereon 30.00 feet from the Southwesterly corner thereof; thence East along the Southerly line of said Lot 3 a distance of 720.00 feet; thence Northerly along a 1° curve concave to the East, 2241.33 feet to the Northeasterly line of said Lot 3; thence Northerly along said Northeasterly line 318.47 feet to the most Northerly corner of said Lot 3; thence along the Northerly line of said Lot 3 the following courses and distances: S 40° 43' 45" W 146.46 feet; S 68° 43' 45" W 321.42 feet; S 47° 28' 45" W 458.04 feet and S 61° 43' 45" W 298.92 feet; thence Southerly in a direct line 1788.59 feet to the point of beginning.

Also that portion of Wilmington Street, a vacated street, as shown on said map that accrues to said portion of Lot 3 by reason of said vacation.

- (2) That portion of Lot 5 in Block "F" of the Sub-division of a part of the Rancho San Pedro, known as the Dominguez Colony as shown on Partition Map filed in Case No. 3284 of the Superior Court of the State of California in and for the County of Los Angeles, and on a map recorded in Book 1, Pages 601 and 602, of Miscellaneous Records of said County, described as follows:

Beginning at the intersection of the Northerly line of said Lot 5 with the Westerly line of the strip of land 120 feet wide as conveyed to the Pacific Electric Railway Company by a Deed recorded in Book 1549, Page 61, of Deeds, records of said County; thence West along the Northerly line of said Lot 5 a distance of 698.15 feet; thence S 0° 02' 11" W 1216.28 feet, more or less, to the Northerly line of the aforesaid Lot 3 of Tract No. 1400; thence along the Northerly line of said Lot 3 the following courses and distances: N 61° 43' 45" E 298.92 feet; N 47° 28' 45" E 458.04 feet; N 68° 43' 45" E 321.42 feet and N 40° 43' 45" E 146.46 feet to said Westerly line of said 120 foot strip; thence Northerly along said Westerly line 618.27 feet to the point of beginning.

Also that portion of the South half of Carson Street, a vacated street, as shown on said map which accrues to said portion of Lot 5 by reason of said vacation.

- (3) That portion of Lot 6 in Block "E" of said Sub-division of a part of the Rancho San Pedro, known as the Dominguez Colony, described as follows:

Beginning at the intersection of the Southerly line of said Lot 6 with the Westerly line of the strip of land 120 feet wide as conveyed to the Pacific Electric Railway Company by a Deed recorded in Book 1540, Page 218 of Deeds Records of said County; thence Northerly along the Westerly line of said 120 foot strip of land 1376.14 feet to the North line of said Lot 6; thence Westerly along said Northerly line 182.24 feet; thence South 1287.00 feet to a point on the Southerly line of said Lot 6 distant West thereon 664.17 feet from the point of beginning; thence East along said Southerly line 664.17 feet to the point of beginning.

Also that portion of the North half of Carson Street, a vacated street, as shown on said map that accrues to said portion of Lot 6 by reason of said vacation.

Excepting therefrom that portion thereof within the Southern California Edison Company, Ltd., right-of-way as shown on Licensed Surveyor's Map filed in Book 30, Page 24, of Record of Surveys on file in the office of the Recorder of Los Angeles County.

BLOCK 10 - 5.72 Acres

Oil and Gas Lease by and between Southern Pacific Transportation Company, as Lessor, and General Exploration Company, as Lessee, dated March 31, 1977, covering the following described lands:

That portion of the former Pacific Electric Railway Company's 120 foot strip of land as conveyed by Deed dated October 29, 1912, by George H. Bixby and wife to Pacific Electric Railway Company, and recorded November 8, 1913, in Book 5596, Page 175 of Deeds, Los Angeles County Records, 60 feet on either side of the center line of said land and extending northwesterly from the intersection with westerly prolongation of southerly line of San Antonio Drive as shown on Tract No. 2612, recorded in Map Book 27, Page 28, Los Angeles County Records, a distance of 2,000 feet along the center line of said strip of land.

RECEIVED

AUG 21 2 33 PM '81

DIV. OF OIL AND GAS
LONG BEACH, CA.

Paid BY: BURALO, STEVE CONSTRUCTION
REGISTERED DEPUTY INSPECTOR REQUIRED - GRADING

Check # 1100 - 462.00
634 - 50.00

M U L T I P L E P E R M I T

GRADING	Plan Review Fee	90.00
GRADING	TOTAL FEE	372.00
VALUATION	Processing Fee	12.00
DEPUTY INSP.	Valuation Fee	360.00
	TOTAL FEE	50.00
	Permit Fee	50.00
		50.00

4 DEPUTY INSPECT

FINAL DATE 6/22/17

Paid By: BUBALO STEVE CONSTRUCTION
REGISTERED DEPUTY INSPECTOR REQUIRED - GRADING

Check # 1100 - 462.00
65H - 50.00

M U L T I P L E P E R M I T

GRADING	Plan Review Fee	90.00
GRADING	TOTAL FEE	372.00
VALUATION	Processing Fee	13.00
DEPUTY INSP.	Valuation Fee	360.00
	TOTAL FEE	50.00
	Permit Fee	50.00
		50.00

1 DEPUTY INSPECT

FINAL DATE 6/13/11 7:00 PM

CITY OF LONG BEACH
INSPECTION REQUEST LINE (562) 570-6103

PLANNING & BUILDING DEPARTMENT 313 W. OCEAN BLV. (562) 570-6651

LICENSE CONTRACTOR DECLARATION
I hereby certify that I am exempt from the Contractor's License Law for the following reasons: (Sec. 703) I am a duly licensed professional engineer, architect, or other person who is licensed in this state and my license is in full force and effect.

LICENSE CLASS
Date: 3/21/97 Licensee: *K.A. Schaefer*

WORKER-EMPLOYER DECLARATION
I hereby certify that I am exempt from the Contractor's License Law for the following reasons: (Sec. 703) I am a duly licensed professional engineer, architect, or other person who is licensed in this state and my license is in full force and effect.

ROBERT'S COMPENSATION DECLARATION
I have not been employed by the contractor, or any other person, who is licensed in this state and my license is in full force and effect.

WORKER'S DECLARATION
I have not been employed by the contractor, or any other person, who is licensed in this state and my license is in full force and effect.

APPLICANT INFORMATION

PROJECT NO. 03/21/97 PROJECT NO. 0325893

DATE 02/25/97

PERMITS 13

ISSUES 7140014920

PERMITS 5721.00

ISSUES \$321.75

DEPUTY INSP. PER \$100.00

F.M.I. TAX 54.83

PROJECT NO. 03/21/97 PROJECT NO. 0325893

DATE 02/25/97

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PERMITS 5721.00

ISSUES \$321.75

DEPUTY INSP. PER \$100.00

F.M.I. TAX 54.83

VALIDATION	PRESENT BLDG USE COMMERCIAL	PROPOSED BLDG USE COMMERCIAL	BLDG INTENT	TYPE OF 2000
LEGAL DESCRIPTION	PAID BY CHECK		FEE	
Paid By: GOLF, M S			Check # 1119	
COUNTY SANITATION FORM RECEIVED BY REGISTERED DEPUTY INSPECTOR REQUIRED - WELDING REGISTERED DEPUTY INSPECTOR REQUIRED - STRUCTURAL STEEL				

BUILDING	M U L T I P L E	P E R M I T	TOTAL FEE
VALUATION	Current Val	23040	Permit Fee Processing Fee Valuation Fee 305.75
DEPUTY INSP.			TOTAL PER 100.00
2 DEPUTY INSPECT			Permit Fee 100.00
			100.00

FINAL BY 4/25/97 E. [Signature]

Certificate of Occupancy

As Authorized By The Building Official
City of Long Beach

This document certifies that, at the time of issuance, this structure, or portion thereof, was in compliance with the various ordinances of the City of Long Beach regulating building construction or use.

Address: 3701 PACIFIC PL 90806

Occupancy Type: COMMERCIAL

Permit No.: 225893

Portion of Building: BLDG C, NEW PREFABRICATED STORAGE BLDG

Max. Occupant Load:

George Richardson
Building Official

Date: September 25, 1997

Post in a conspicuous place at or close to building entrance.

CITY OF LONG BEACH

INSPECTION REQUEST FORM (SBZ) 570-6105

PLANNING & BUILDING DEPARTMENT

333 W. OCEAN BLVD. (562) 570-6851

CITY OF LONG BEACH

WORKER'S COMPENSATION DECLARATION

I hereby affirm that I am licensed under Chapter 3, commencing with Section 10000 of Division 2 of the Labor Code and I am duly licensed in my full-time and other business. (License No. 543360)

I have not willfully violated workers compensation provisions, as required by Section 17000 of the Labor Code, for the performance of the work for which this permit is sought. (Policy Number: 11/16/98)

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CITY	STATE	ZIP CODE	PHONE	ISSUE HEIGHT	TYPE OF EMER
PARISH NAME OR VACANT	PROPOSED NAME OR GOLF				
LEGAL DESCRIPTION	PUB BY CHECK		RES	2855.43	

Paid By: LLC GOLF CENTER
 REGISTRE DEPUTY INSPECTOR REQUIRED - SPECIAL CASES
 Check # 1084

OIL CODE	MULTIPLE PERMIT	TOTAL FEE
1 OIL WELL RECOR		55.00
BUILDING	Permit Fee	55.00
BUILDING	Plan Review Fee	55.00
	TOTAL FEE	47.38
VALUATION	Permit Fee	11.75
	Processing Fee	55.75
	Valuation Fee	16.00
SCHOOL FEES	TOTAL FEE	55.75
	Permit Fee	440.80
336 COMMERCIAL	TOTAL FEE	640.80
DEPUTY INSPECTOR	Permit Fee	140.80
	TOTAL FEE	50.00
	Permit Fee	50.00
	TOTAL FEE	50.00

FINAL DATE 6/25/97

3701 PACIFIC AVE
 NEH 2193602

CAN'T LOCATE
 THE LINE
 D.V.

OIL CODE, 4/3/97
 JHR



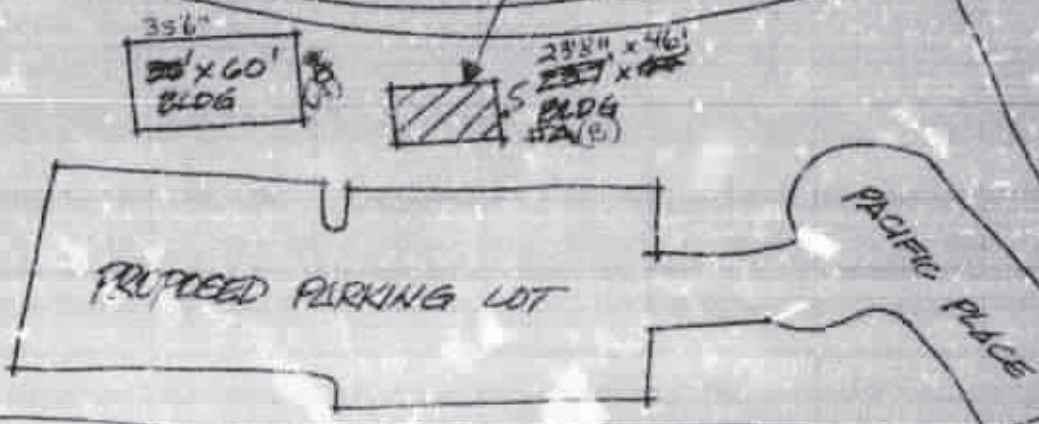
APPROVED
 APPROVED WITH CONDITIONS
 DENIED

CITY OF LONG BEACH
 PUBLIC WORKS - ENGINEERING
 43-96 DV

DRIVING RANGE

L.A. RIVER

Proposed one-story Bldg
 1,058 sq ft



SAN DIEGO FREEWAY (405)

DEPARTMENT USE ONLY

764

DATE IL	PERMITS 1	CF 10/1	REVISED C-29	WORK APPROVED JHR	PLANNING (LID) REQUIRED []	SPECIAL PLANNING PERMIT REQ. []
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Check One: New Alteration Addition Repair Demolition
 Per 9508-02

Location of Job: 3701 PACIFIC PLACE Zone J-1

Owner's Name: M & S GOLF Address: 3188-A AIRWAY AVE

Lot: FRACTION LOT 4 CDOTB MESH, CA 92626

Block: Tract: 1400

Contractor's Name: Address:

Valuation Of Proposed Work \$: Applicant: Phone: (714) 546-3814

CHECKED BY: Counterman: Field Inspector: Plan Checker:

3701 Pacific Pl.

F2C

ADD
231692



NO GAS
196-G

NO WATER
G-25

NO SEWER
(775)

710
L.A. River

Driving Range

Proposed Open
Patio Cover
240' linear ft
11' high - 4' wide
(Color to match building)

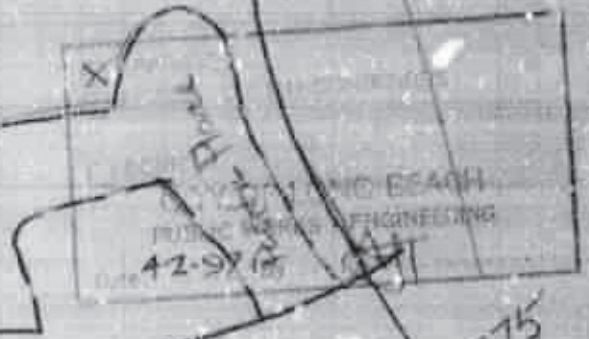


Auto Shop

Office

Mailbox

Parking lot



PLR CUP SPR 9508-02

BL 000000 DEPARTMENT USE ONLY

TYPE IL	DATE 4-2-87	APPROVED GOS	PERMITTED X	PLANNING DEPT. REQUIRED	SPECIAL PERMIT REQUIRED
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Date Rec'd: 4-2-87 Check One: New Alteration Addition Repair Demolition

Location of Job: 3701 Pacific Pl. Tract 1 Zone: IL

Owner's Name: M+S Golf Address:

Lot: Fraction Lot 4

Block: Tract:

Contractor's Name: Address:

Valuation Of Proposed Work: \$ Applicant: Phone:

ORDERED BY: Countyman Field Inspector Plan Checker

Certificate of Occupancy

As Authorized By The Building Official
City of Long Beach

This document certifies that, at the time of issuance, this structure or portion thereof, was in compliance with the various ordinances of the City of Long Beach regulating building construction or use.

Address: 3701 PACIFIC PL 90606

Occupancy Type: COMMERCIAL

Permit No.: 219362

Portion of Building: EDN & RAMP PRE-MANUF BUILDING "OFFICE"
SNACK SHOP- BLDG B

Max. Occupant Load:

Date: September 25 1957

A. Richmond
Building Official

Post in a conspicuous place at or close to building entrance.

3701 PACIFIC R.

FZC

ADD
231692

Meters and Service Lines cannot be located in or under any structure or in an inaccessible location.

OK GAS DEPARTMENT
ALFRED WHITE

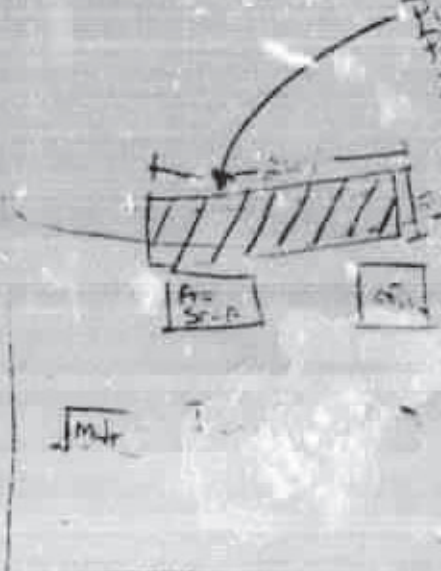
LOG 0 21997

NO GAS
190-G
NO WATER
G-25
NO SEWER
(775)

Drilling For

Proposed Opim
for a 3/4" dia
340' length gas
11" dia - 18' wide
(Color to match)

OIL



ILL JURSK 91510-02

DEPARTMENT USE ONLY

ZONE IL	STREETS F	S	R	CT. 2025	PAGE NO. 62	ZONING X-14	PLAN REVIEW REQUIRED <input type="checkbox"/>	SPECIAL PLANNING PERMIT REQ. <input type="checkbox"/>
------------	--------------	---	---	----------	----------------	----------------	--	--

Date Rec'd 11-2-97 Check One: New Alteration Addition Repair Demolition

Location of Job 3701 Pacific R. Zone IL

Owner's Name M+S Golf Address _____

Lot Fr 100 604

Block _____ Tract _____

Contractor's Name _____ Address _____

Valuation Of Proposed Work \$ _____ Applicant _____ Phone _____

CHECKED BY: Counterpart _____ Field Inspector _____ Plan Checker _____

Certificate of Occupancy

As Authorized By The Building Official
City of Long Beach

This document certifies that, at the time of issuance, this structure, or portion thereof, was in compliance with the various ordinances of the City of Long Beach regulating building construction or use.

Address: 3701 PACIFIC PL 90806

Occupancy Type: COMMERCIAL

Permit No.: 231692

Portion of Building: CONSTRUCT 18' X 240' OPEN STEEL CANOPY O
VER TEE LINE

Max. Occupant Load:

A. Robinson
Building Official

Date: August 13, 1997

Post in a conspicuous place at or close to building entrance.

ADDRESS	CITY	STATE	ZIP CODE	PHONE	BLOCK HEIGHT	TYPE OF CONST
VALUATION	PRECAT BLDG USE	PROPOSED BLDG USE			PAID BY	YES
LEGAL DESCRIPTION	VACANT	GOLF			CHECK	\$2,326.40

Contract # 1084

Paid By: LLC, GOLF LEARNING

M U L T I P L E P E R M I T

CIL CODE	TOTAL FEE	55.00
1 O. L. WELL RECOR	Permit Fee	55.00
BUILDING	TOTAL FEE	555.60
	Permit Fee	639.80
	Processing Fee	16.00
	Valuation Fee	526.75
	Var Review Fee	113.05
VALUATION	TOTAL FEE	1603.10
VARIANCE REVIEW	Permit Fee	1589.10
ELECTRICAL	Processing Fee	16.00
	Var Review Fee	211.10
VARIANCE REVIEW	TOTAL FEE	1063.50
400 SERVICE 1-AMPS	Permit Fee	227.50
113 OUTLETS	Processing Fee	87.00
1 MOTOR 51-100HP	Var Review Fee	

Current Val 50000

44 LIGHT STANDARDS
 5 SP OUTLI-51/1/C
 1 SB c= 500

7 PANELS
 113 FIXTURES
 1 SIGN, 1 CRCT

File 7/7/97 T. Nelson
 Date 8/26/97 [Signature]

3701 PACIFIC
NEW
217492

3701 PACIFIC

F2C

NO GAS INFO
196+G
NO WATER
G-25

NO SEWER

T 1-16-96

OIL CODE

APPROVED BY

Driving Range

L.A. River

Proj # 205713

Proj # 219359

Proj # 219352

169

Pro Shop
Emergency
2,150 sq ft

Rest Office
1,000 sq ft

Proposed
Driving Range
& Access
to improve access
PH-9508-2
11507-9

Proposed Parking Lot
w/119 spaces - 116 min. required
(86'x18')

Pacific Place

San Diego Freeway (405)

DEPARTMENT USE ONLY

IL	NETWORK 1	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100
DATE REC'D		7-16-96		CHECK ONE: <input checked="" type="checkbox"/> New		<input type="checkbox"/> Alteration		<input type="checkbox"/> Addition		<input type="checkbox"/> Repair		<input type="checkbox"/> Demolition		PLANNING DEPT. REVIEWED		S.D. HAS PLANS/PERMIT RECORD																																																																																			
LOCATION OF JOB												3701 PACIFIC PLACE												ZONE		IL																																																																									
OWNER'S NAME												M & S GOLF												ADDRESS		3188-A AIRWAY AVE. COSTA MESA, CA 92626																																																																									
LOT												FRACTION LOT 4												TRACT		1400																																																																									
CONTRACTOR'S NAME												ADDRESS												PHONE		(714) 436 6139																																																																									
VALUATION OF PROPOSED WORK \$												APPLICANT												JOB #																																																																											
CHECKED BY: Commissioner												FIELD INSPECTOR												JOB #																																																																											

Certificate of Occupancy

Authorized By The Building Official
City of Long Beach

This document certifies that, at the time of issuance, this structure, or portion thereof, was in compliance with the various ordinances of the City of Long Beach regulating building construction or use.

Address: 3701 PACIFIC PL 90806

Occupancy Type: COMMERCIAL

Permit No.: 217462

Portion of Building: CONE OF GOLF LEARNING CNTR *LANDSCAPE, PRKI
NG ART. & LGHTG STANDARDS

Max Occupant Load:

Margie P. ...
Building Official

Date: December 2, 1997

Post in a conspicuous place at or close to building entrance.

Certificate of Occupancy

As Authorized By The Building Official
City of Long Beach

This document certifies that, at the time of issuance, this structure, or portion thereof, was in compliance with the various ordinances of the City of Long Beach regulating building construction or use.

Address: 3701 PACIFIC PL S0806

Occupancy Type: COMMERCIAL

Permit No.: 219359

Portion of Building: FDN & RAMP FOR PRE-MANUFACTURED BUILDING
"PRO SHOP" BLDG. A

Max. Occupant Load:

Lyssa Bedwell
Building Official

Date: November 13, 1997

Post in a conspicuous place at or close to building entrance.

DAY	BUILDING	APPR. DATE	PLUMBING	APPR. DATE	MECHANICAL	APPR. DATE	ELECTRICAL
	001 STEEL/ROOF		001 COND WDRG-GRD		020 HEATING SYSTEMS		000 TRAP HOOP
	003 FOOTING/TEEL/UPRC		001 COND W/ WATER		021 P-WORK/DUCTS		001 DRIP WIRE
	003 FOUND. JOIST/CLUB		002 COND WDRG-GR		022 EXHAUST FANS		002 EXTING. EQUIPMT
	004 ROOF HEATING		003 WASTE/WET TYP		023 HEV-DRUM DRUM		003 ROUGH ELEC
9:25 AM	005 TRAMING		004 SHOWER JOB TEST		024 HEV-ABOVE-GRND		004 SERVICE PANEL
	006 DR TO COVER EXT		005 ROOF PLUMBING		025 WREN. EMPLOYE		005 REL TRAP WTR
	007 1000-SOUND/BRCK		006 RELOC. GAS JCK		026 ROOF RIAL		006 OTHER
	008 DR TO COVER INT		007 GAS TEST		027 FIRE/SMOK PAMP		008 ELEC FINAL
	009 LATE		008 GAS CO. METERING		028 WREN CLASS 1		
	010 BRK/ALL		009 WATER SERVICE		029 WREN CLASS II		
	011 TARD BLAST		000 SEWER		030 ELEC. WARE-UP		
	012 T-SHOP EXTING		001 OTHER		031 OTHER		
	013 OTHER		002 PLUMBING FINAL		032 WREN FINAL		
	014 SHOW INT./AUB						
9:25 AM	015 BRK/INSUL. TRAIL						
	016 PACIFIC						
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STREET NO. 0198602 DATE 02/04/97 PROJECT NO. C0219362
 ADDRESS 701 N HAVEN AVE # 250
 CITY COSTA MESA CA 92626
 COUNTY ORANGE
 ZIP 92626
 PERMIT NO. 71-0014920
 EXPIRES 12/12/96 GR
 TYPE PR
 OIL CODE PER \$55.00
 BUILDING REV \$47.38
 BUILDING PER \$71.75
 SCHOOL FEES PER \$740.80
 DEPUTY INSP. PER \$50.00
 S.M.I. TAX \$0.50

Certificate of Occupancy

As Authorized By The Building Official
City of Long Beach

This document certifies that, at the time of issuance, this structure, or portion thereof, was in compliance with the various ordinances of the City of Long Beach regulating building construction or use.

Address: 3701 PACIFIC PL 90806

Occupancy Type: COMMERCIAL

Permit No.: 219362

Portion of Building: FDN & RAMP PRE-MANUF. BUILDING 'OFFICE & SNACK SHOP" BLDG B

Max Occupant Load:

Alvaro Pedraza
Building Official
Date: September 25, 1997

Post in a conspicuous place at or close to building entrance.

CITY LONG BEACH

INSPECTION REQUEST LINE (562) 570-8105

PLANNING & BUILDING DEPARTMENT

333 E OCEAN BLVD. (562) 570-1351

LICENSED CONTRACTORS DECLARATION				WORKER'S COMPENSATION DECLARATION																																																																																																																											
<p>I hereby certify that I am licensed under provisions of Chapter 2 of Commencing with Section 7000 of the Building and Professional Code, and my license is in full force and effect.</p> <p>License No. _____ License No. _____</p> <p>Contractor _____</p>				<p>I have and will maintain workers' compensation insurance, as required by Section 3700 of the Labor Code, for the performance of the work for which this permit is issued. My workers' compensation insurance and policy are: Carrier: _____ Policy Number: _____</p> <p>When Section 3700 shall be completed if the permit is for one hundred dollars (\$100) or less.</p> <p>I certify that in the performance of the work for which this permit is issued, I shall not employ any person in any manner so as to become subject to the workers' compensation laws of California, and agree that if I shall become subject to the workers' compensation provisions of Section 3700 of the Labor Code, I shall forthwith comply with those provisions.</p> <p>Date: <u>4-30-02</u> Signature: <u>Rubén Sánchez</u></p>																																																																																																																											
<p>OWNER-BUILDER DECLARATION</p> <p>I hereby certify that I am exempt from the Contractors License Law for the following reason (Sec. 7001):</p> <p>C. Home Builders and Professional Code. Any City which requires a permit to construct, alter, improve, or repair any structure prior to its issuance also requires the applicant for such permit to file a signed statement that he is a licensed contractor pursuant to the provisions of the Contractors License Law (C.L.L.) (Commencing with Sec. 7000 of Div. 3 of the B. & P. C.) and that he is exempt therefrom and the basis for the alleged exemption. Any violation of Sec. 7001.5 of the C.L.L. for a permit subject to the applicant is a civil penalty of not more than five hundred dollars (\$500.00).</p> <p>I, as owner of the property or my employees with wages or their own compensation, will do the work and the structure is not to be sold or altered for sale (Sec. 7044, B. & P. C.). The Contractors License Law does not apply to me, owner of property who builds or improves thereon, and who does such work through his own employees, provided that such improvements are not intended or allowed for sale. However, the building or improvements in sale within one year of completion, the owner-builder will bear burden of proof that he did not build or improve for the purpose of sale.</p> <p>I, as owner of the property, am exclusively contracting with licensed _____ to construct the project (Sec. 7044, B. & P. C.). The Contractors License Law does not apply to an owner of contracts for such projects with a Contractor License pursuant to the Contractors License Law.</p> <p>I am exempt under Sec. _____ B. & P. C. for this reason: _____</p> <p>Date: <u>4-30-02</u> Owner: <u>Rubén Sánchez</u></p>				<p>WARNING: VIOLATION TO SECTION 3700 WORKERS' COMPENSATION COVERAGE IS UNLAWFUL, AND SHALL SUBJECT AN EMPLOYER TO CRIMINAL PENALTIES AND CIVIL FINES UP TO ONE HUNDRED THOUSAND DOLLARS, IN ADDITION TO THE COST OF COMPENSATION DAMAGED AS PROVIDED FOR IN SECTION 3706 OF THE LABOR CODE, INTEREST, AND ATTORNEY'S FEES.</p> <p>I hereby state that there is a construction lending agency for the performance of the work for which this permit is issued (Sec. 3971.5, C.J.).</p> <p>Lender's Name: _____</p> <p>Lender's Address: _____</p> <p>I certify that I have read this application and state that the above information is correct. I agree to comply with all City and State laws relating to the building construction, and hereby authorize representatives of the City to enter upon the above mentioned property for inspection purposes.</p> <p>Signature of Owner or Contractor: <u>Rubén Sánchez</u> Date: <u>4-30-02</u></p>																																																																																																																											
<p>IMPORTANT</p> <p>Application is hereby made to the Supervisor of Building and Safety for a permit subject to the conditions and restrictions set forth on the front face of this application.</p> <p>1. Each person who, without this application is made and each person at whose benefit work is performed under or pursuant to any permit issued as a result of this application agreed to and shall, lawfully and bona fides, be the City of Long Beach its officers, agents and employees from any liability arising out of the issuance of any permit from this application.</p> <p>2. Any permit issued as a result of this application becomes null and void if work is not commenced within ONE HUNDRED EIGHTY (180) DAYS from date of issuance of such permit.</p>				<table border="1"> <tr> <td>JOB ADDRESS</td> <td>RECEIPT NO.</td> <td>DATE</td> <td>PROJECT NO.</td> </tr> <tr> <td>3701 PACIFIC PL</td> <td>0297017</td> <td>04/30/02</td> <td>C0349468</td> </tr> <tr> <td>JOB DESCRIPTION</td> <td>AREA</td> <td colspan="2"></td> </tr> <tr> <td>FDN FOR MODULAR BLDG TO EXTEND RETAIL BLDG @GOLF DRIVING RANGE</td> <td>12</td> <td colspan="2"></td> </tr> <tr> <td>OWNER</td> <td>OCCUPANCY</td> <td colspan="2">PLANNING</td> </tr> <tr> <td>GOLF, M S</td> <td></td> <td colspan="2">04/16/02 CNT</td> </tr> <tr> <td>ADDRESS</td> <td>ASSESSOR NO.</td> <td colspan="2">ZONE</td> </tr> <tr> <td>3188 AIRWAY AVE A</td> <td>7140014920</td> <td colspan="2">PR</td> </tr> <tr> <td>CITY</td> <td>USE</td> <td>3</td> <td>RUR</td> </tr> <tr> <td>COSTA MESA CA 92626</td> <td></td> <td>CENSUS TR</td> <td>5721.00</td> </tr> <tr> <td>APPLICANT</td> <td colspan="3">TRANSACTIONS</td> </tr> <tr> <td>SANCHEZ, RUBEN C</td> <td>SCHOOL FEES</td> <td>Per</td> <td>\$234.30</td> </tr> <tr> <td>CONTRACTOR</td> <td>OIL CODE</td> <td>Per</td> <td>\$55.00</td> </tr> <tr> <td>LEARNING CENTER LONB BEACH</td> <td>DEPUTY INSP.</td> <td>Per</td> <td>\$70.00</td> </tr> <tr> <td>ADDRESS</td> <td>BUILDING</td> <td>Per</td> <td>\$154.35</td> </tr> <tr> <td>3188 AIRWAY AVE A</td> <td>STORM WATER</td> <td>Per</td> <td>\$4.95</td> </tr> <tr> <td>CITY</td> <td>STATE</td> <td>ZIP CODE</td> <td>PHONE</td> </tr> <tr> <td>COSTA MESA CA 92626</td> <td></td> <td>714-546-3814</td> <td></td> </tr> <tr> <td>STATE LICENSE NO.</td> <td>CITY LICENSE NO.</td> <td colspan="2">S.M.I. TAX</td> </tr> <tr> <td></td> <td></td> <td colspan="2">\$0.50</td> </tr> <tr> <td>ARCHITECT/ENGINEER</td> <td>LICENSE NO.</td> <td colspan="2"></td> </tr> <tr> <td></td> <td></td> <td colspan="2"></td> </tr> <tr> <td>ADDRESS</td> <td></td> <td colspan="2"></td> </tr> <tr> <td></td> <td></td> <td colspan="2"></td> </tr> <tr> <td>CITY</td> <td>STAT.</td> <td>ZIP CODE</td> <td>PHONE</td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>DATION</td> <td>PRESENT BLDG USE</td> <td>PROPOSED BLDG USE</td> <td>BLDG HEIGHT</td> </tr> <tr> <td></td> <td>COMM</td> <td>COMM</td> <td></td> </tr> <tr> <td>LEGAL DESCRIPTION</td> <td>PAID BY</td> <td>FEES</td> <td></td> </tr> <tr> <td></td> <td>CHECK</td> <td></td> <td>\$519.10</td> </tr> </table>				JOB ADDRESS	RECEIPT NO.	DATE	PROJECT NO.	3701 PACIFIC PL	0297017	04/30/02	C0349468	JOB DESCRIPTION	AREA			FDN FOR MODULAR BLDG TO EXTEND RETAIL BLDG @GOLF DRIVING RANGE	12			OWNER	OCCUPANCY	PLANNING		GOLF, M S		04/16/02 CNT		ADDRESS	ASSESSOR NO.	ZONE		3188 AIRWAY AVE A	7140014920	PR		CITY	USE	3	RUR	COSTA MESA CA 92626		CENSUS TR	5721.00	APPLICANT	TRANSACTIONS			SANCHEZ, RUBEN C	SCHOOL FEES	Per	\$234.30	CONTRACTOR	OIL CODE	Per	\$55.00	LEARNING CENTER LONB BEACH	DEPUTY INSP.	Per	\$70.00	ADDRESS	BUILDING	Per	\$154.35	3188 AIRWAY AVE A	STORM WATER	Per	\$4.95	CITY	STATE	ZIP CODE	PHONE	COSTA MESA CA 92626		714-546-3814		STATE LICENSE NO.	CITY LICENSE NO.	S.M.I. TAX				\$0.50		ARCHITECT/ENGINEER	LICENSE NO.							ADDRESS								CITY	STAT.	ZIP CODE	PHONE					DATION	PRESENT BLDG USE	PROPOSED BLDG USE	BLDG HEIGHT		COMM	COMM		LEGAL DESCRIPTION	PAID BY	FEES			CHECK		\$519.10
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	CHECK		\$519.10																																																																																																																												

Paid By: LEARNING, LONB COLP Check # 3852
 REGISTERED DEPUTY INSPECTOR REQUIRED - SPECIAL CASES

		M U L T I P L E P E R M I T			
SCHOOL FEES				TOTAL FEE	234.30
				Permit Fee	234.30
710 COMMERCIAL					234.30
OIL CODE				TOTAL FEE	55.00
				Permit Fee	55.00
1 OIL WELL RECORDER					55.00
DEPUTY INSP.				TOTAL FEE	70.00
				Permit Fee	70.00
1 DEPUTY INSPECTOR					70.00
BUILDING				TOTAL FEE	154.35
				Permit Fee	69.05
				Double/Half Fee	69.05
				Processing Fee	16.25
VALUATION	Current Val	2424		Valuation Fee	69.05
STORM WATER				TOTAL FEE	4.95
				Permit Fee	4.95

** CONTINUED ON NEXT PAGE **

ISSUE DATE 11-5-02	INSPECTOR'S NAME R. Ward
-----------------------	-----------------------------

JOB ADDRESS

3701 PACIFIC PLACE

PROJECT #

349468

UTILITIES
 NOT ON ATLAS SHEETS
 GAS
 WATER
 SWR
 4/11/02
 CB

APPROVED
 APPROVED WITH CONDITIONS
 PRIOR TO P.C. ...
 DENIED
 CITY OF LONG BEACH
 PUBLIC WORKS - ENGINEERING
 Date 4/11/02 By CB

NORTH
 N.T.S.

MAKE INVESTIGATION
 FOR GAS, SEWER, WATER
 LA RIVER 4/11/02
 CB

DRIVING RANGE

Meters and Service Lines cannot be located in or under any structure or in an inaccessible location.

NOT OK - Have Consumer Contact Gas Department. 4/13/02

Per [Signature]



NEW 4' x 6' 60' ADDITIONAL BLDG. 710 sq. ft. 1st story



3-11'0" x 60' EXISTING BLDG.

for Pro Shop (Retail Bldg)
 PARKING LOT
 119 space Lot

PACIFIC PLACE

PLEASE MAKE INVESTIGATION

SAN DIEGO FREEWAY (405) Per 0203-38

DATE REC'D 4/11/02 NEW ALTERNATION ADDITION REPAIR DEMOLITION

DESCRIPTION OF WORK SDP NEW TRAILER/BLDG SPACE TO EXISTING 400-SHOP FL. 76.

APPLICANT/CONTACT RUBEN C. SANCHEZ. PHONE # (714) 576-3814

APPLICANTS ADDRESS 3188-A AIRWAY AVE, WOOD HILLS, CA 92626

LOT FRACTION LOT 4 BLOCK TRACT 1400

DEPARTMENT USE ONLY

ZONE: IL	SET BACKS	F	S	R	CF TO PL	PAGE #	ZONING APPROVED	PLANNING STAMP	SPECIAL PLANNING	
							AWT	<input type="checkbox"/> REQUIRED	<input type="checkbox"/> PERMIT REQUIRED	
FLOOD EVALUATION CERTIFICATE REQUIRED							HISTORICAL DISTRICT APPROVAL REQUIRED			
YES <input type="checkbox"/>							YES <input type="checkbox"/>			

Certificate of Occupancy

As Authorized By The Building Official
City of Long Beach

This document certifies that, at the time of issuance, this structure, or portion thereof, was in compliance with the various ordinances of the City of Long Beach regulating building construction, or use.

Address: 3701 PACIFIC PL 90806

Occupancy Type: M

Permit No. 349158

Portion of Building: FDN FOR MODULAR BLDG TO EXTEND RETAIL BL
DG @GCLF DRIVING RANGE

Max. Occupant Load:

Tom Shabo
Building Official

Date: June 5, 2002

Post in a conspicuous place at or close to building entrance.

PACIFIC PLACE

4021

George Jackson

ENGINEERING PLAN CHECK CERTIFICATION

Plan Check # 223667, Soil Report# _____

Site Address: 4021 PACIFIC PLACE

Engineering Plan Check Officer
Planning and Building Department
City of Long Beach
331 W. Ocean Blvd. 4th Floor
Long Beach, CA 90802

MF

The site grading work has been completed and was done in accordance with the requirements of the approved plans, and Chapter 70 of the Uniform Building Code. All drainage facilities as shown on the plans have been installed and the site surface drainage is substantially as shown on the approved plans or approved built plans.

Date _____ Contractor _____ License # _____

Address _____ Telephone No. _____

3/14/97 George Bash REG 11092
Supervising Civil Engineer or Soil Engineer P.E. #

2821 E. White Star Ave (714) 630-9355
Address Telephone No.

Comments: _____



The site grading work has been completed and was done in accordance with the requirements of the soil report, and Chapter 70 of the Uniform Building Code.

Attached are substantiating inspection reports and other data and comments.

3/14/97 George Bash C.E. 107
Date Supervising Soil Engineer P.E. #

2821 E. White Star Ave (714) 630-9355
Address Anaheim, CA 92806 Telephone No.

Comments: _____



Soil Report # _____

George Im... **ROUGH**
~~PROPOSED~~ GRADING CERTIFICATION

Plan Check # 191190 / ~~223607~~, Soil Report # _____
Site Address: 4021 PACIFIC PLACE

Engineering Plan Check Officer
Planning and Building Department
City of Long Beach
333 W. Ocean Blvd. 4th floor
Long Beach, CA 90802

MF

The site grading work has been completed and was done in accordance with the requirements of the approved plans, and Chapter 70 of the Uniform Building Code. All drainage facilities as shown on the plans have been installed and the site surface drainage is substantially as shown on the approved plans or approved as-built plans.

Date _____ Contractor _____ License # _____

Address _____ Telephone No. _____

3/14/97 George Bach RGE 11092
Date Supervising Civil Engineer or Soil Eng. Lic. No. P.E. #

2821 E. White Star Ave (714) 630-9333
Address Telephone No.

Comments: _____



The site grading work has been completed and was done in accordance with the requirements of the soil report, and Chapter 70 of the Uniform Building Code.

Attached are substantiating compaction reports and other data and comments.

3/14/97 George Bach G.E. 107
Date Supervising Soil Engineer P.E. #

2821 E. White Star Ave (714) 630-9333
Address Anaheim, CA 92806 Telephone No.

Comments: _____



soil.rwb





DATE	BUILDING	APPR.	DATE	PLUMBING	APPR.	DATE	MECHANICAL	APPR.	DATE	ELECTRICAL	APPR.
9/2/96	001 SETBACKS/LOCATE	JW6		040 GRND WORK-SOIL			020 VENTING SYSTEMS			060 TEMP POWER	
	002 FOOTNG/STEEL/UFER			041 GRND WK.WATER			021 PLENUM/DUCTS			061 GRND WORK	
	003 FLOOR JOIST/SLAB			042 GROUND WORK-OK			022 EXHAUST FANS			062 CEILING CONDUIT	
	004 ROOF SHEATING			043 WASTE/VENT TEST			023 REFER-UNDR GRND			063 ROUGH ELECT.	
	005 FRAMING			044 SHOWER TUB TEST			024 REFER.ABOVE-GRND			064 SERVICE PANEL	
	006 OK TO COVER EXT			045 ROUGH PLUMBING			025 MECH. FIREPLACE			065 REL TEMP UTIL.	
	007 INSU-SOUND/ENRGY			046 RELOC. GAS MTR.			026 ROUGH HVAC			066 OTHER	
	008 OK TO COVER INT			047 GAS TEST			027 FIRE/SMOK DAMP.			069 ELECT.FINAL	
	009 LATH			048 GAS CO. NOTIFIED			028 HOOD CLASS I				
	010 DRYWALL			049 WATER SERVICE			029 HOOD CLASS II				
	011 SAND BLAST			050 SEWER			030 EVAP./MAKE-UP				
	012 T-BAR CEILING			051 OTHER			031 OTHER				
	013 OTHER			059 PLUMBING FINAL			039 MECH FINAL				
	014 SMOKE DET./ADD.										
	019 BUILDING FINAL										

JOB ADDRESS 4021 PACIFIC PL		RECEIPT NO. 0193233	DATE 09/25/96	PROJECT NO. C0220399
JOB DESCRIPTION DEMOLISH DETACHED 40' X 60' STEEL BUILDING				
OWNER OIL, NORTHSIDE		OCCUPANCY		PLANNING
ADDRESS 4021 PACIFIC PL		ASSESSOR NO. 7140014920		ZONE PR
CITY LONG BEACH CA 90806		FSB	S	RSB CENSUS TR. 5721.00
APPLICANT SNAUPPNER, TOM		TRANSACTIONS DEMOLITION Per \$36.75		
CONTRACTOR SIGNAL HILL CONSTRUCTION				
ADDRESS 2275 REDONDO AVE				
CITY LONG BEACH		STATE CA	ZIP CODE 90806	PHONE 714-597-1133
STATE LICENSE NO. 289892				
ARCHITECT/ENGINEER		LICENSE NO.		
ADDRESS				
CITY		STATE	ZIP CODE	PHONE
VALUATION	PRESENT BLDG USE COMMERCIAL	PROPOSED BLDG USE DEMOLISH		BLDG HEIGHT
LEGAL DESCRIPTION			PAID BY CASH	FEES \$36.75

Paid By: SIGNAL, CONSTRUCTION

DEMOLITION DEMOLITION TOTAL FEE 36.75

VALUATION Current Val 1000 Permit Fee 24.75
Processing Fee 12.00
Valuation Fee 24.75

VOID

7/23/94 PMR

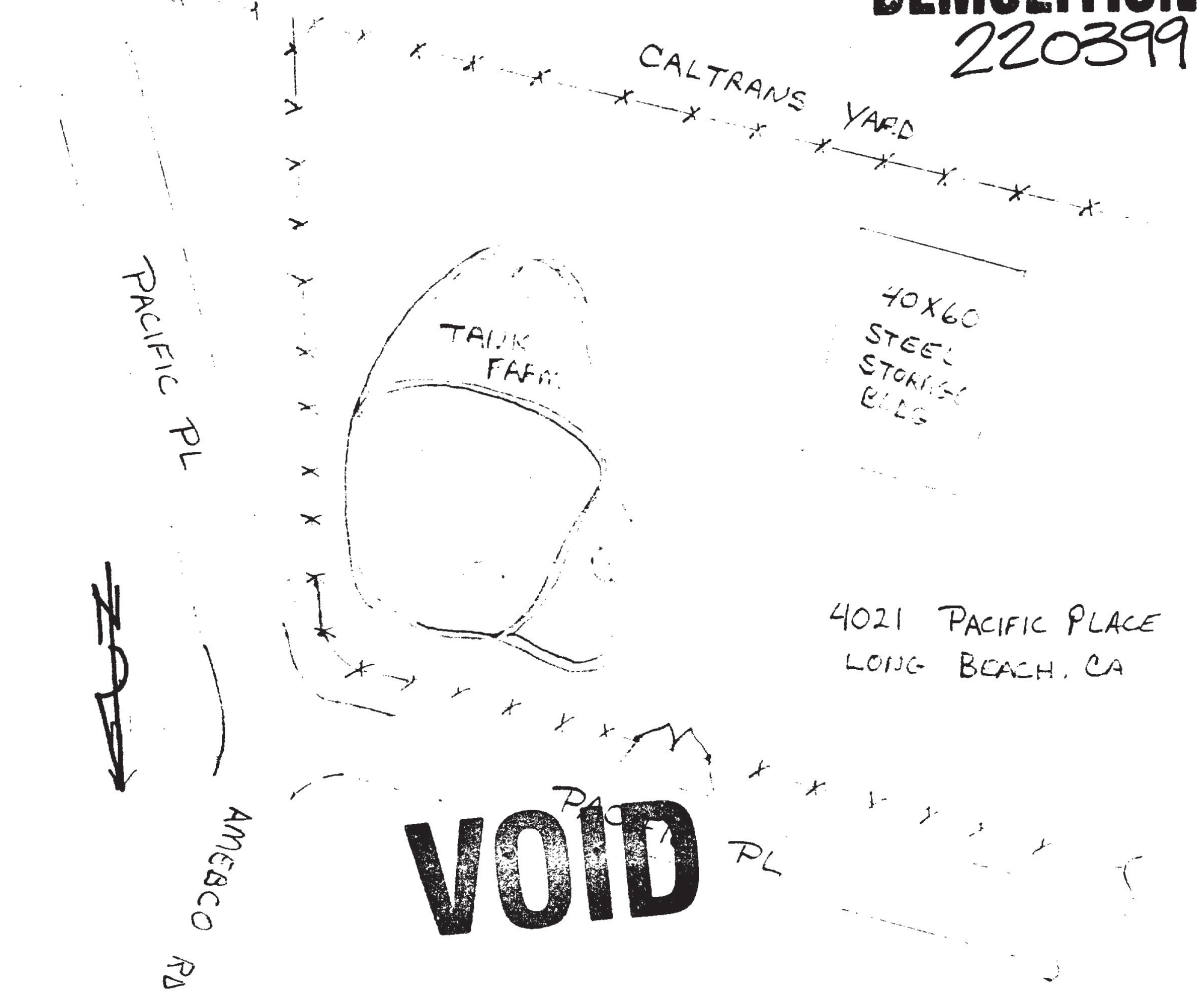
BLDG. FINAL	INSPECTORS NAME
ELECT. FINAL	INSPECTORS NAME
PLUMB. FINAL	INSPECTORS NAME
MECH. FINAL	INSPECTORS NAME
PROJECT FINAL	INSPECTORS NAME

DEMOLITION

~~4021~~
4021

PACIFIC PLACE

DEMOLITION
220399



4021 PACIFIC PLACE
LONG BEACH, CA

VOID

BL-9515/901

DEPARTMENT USE ONLY

ZONE	SETBACKS F	S	R	CF TO PL	PAGE NO 925	ZONING APPROVED <input type="checkbox"/> INT	PLANNING STAMP REQUIRED <input type="checkbox"/>	SPECIAL PLANNING PERMIT REQ'D <input type="checkbox"/>
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Date Rec'd. 9-5-96 Check One: New Alteration Addition Repair Demolition

Location of Job. 4021 Pacific Place Zone _____

Owner's Name NORTHSIDE OIL CORP Address 712 W. BAKER

Lot FRACTIONAL LOT 4

Block _____ Tract 1400

Contractor's Name _____ Address _____

Valuation Of Proposed Work: \$ _____ Applicant _____ Phone _____

CHECKED BY: Counterman _____ Field Inspector _____ Plan Checker _____



CITY OF LONG BEACH

DEPARTMENT OF HEALTH AND HUMAN SERVICES

2525 GRAND AVENUE • LONG BEACH, CALIFORNIA 90815 • (310) 570-4000

REC
JAN 2
FIRE PRE

January 24, 1997

Mr. Steve Graner
Oil Operators, Inc.
712 West Baker Street
Long Beach, CA 90807

Re: **4021 PACIFIC PLACE, LONG BEACH, CALIFORNIA**

Dear Mr. Graner:

The Long Beach Department of Health and Human Services has received the results of soil analysis associated with removal of two (2) 42,000, two (2) 21,000 and two (2) 8,400 gallon above ground storage tanks on October 9, 1996, located at the above referenced site.

Based on the results of the samples, no further action will be required by this Department.

If any further information is required, please contact Robert Hunt at 310-570-4138, Environmental Health, between the hours of 8:00 a.m. and 9:30 a.m., or 4:00 p.m. to 5:00 p.m., Monday through Friday.

Sincerely,

Richard E. Smith

cc: Long Beach Fire Prevention Bureau
M and S Golf
Soil Services, Inc.

sallet



UNDERGROUND STORAGE TANK REMOVAL INSPECTION REPORT

925 Harbor Plaza, Suite 100
Phone (310) 570-2560

Long Beach, California 90802
Fax (310) 570-2566

NAME

ADDRESS

PHONE#

Site Northside Oil Co. 4021 Pacific Pl. L.B. 90807 N.A. DATE 10-9-96
 Owner Oil Operators Inc. 712 W. Baker St. L.B. 90807 424-2451
 Contractor Signal Hill Const. 2275 Redondo Ave. S.H. 90806 597-5237 PROJECT# 218696
 Geologist Andrew L. Gram CE 12607 1981 N. Craig Ave. Altadena, CA. 91001 (818) 794-8516
 Lab CTL Environmental 24404 S. Vermont #307 Harbor City 90710 INSPECTOR W. Swenson
SSI 2821 E. White Star Ave. #A Anaheim 92806 (714) 630-2812 (310) 530-5006

SITE MAP

N ↑

Remove 6 (Remaining 6 tanks to be removed in the near future) tank(s) per current Long Beach Fire Department and Long Beach Health Department guidelines. Soil sample analysis shall be submitted to both agencies within 14 days.

I have read and understand the above.

WR Johnson W. R. JOHNSON (310) 597-5237 PRES.
 Signature Print name & phone # Company and Title



UNDERGROUND STORAGE TANK REMOVAL INSPECTION REPORT

925 Harbor Plaza, Suite 100
Phone (310) 570-2560

Long Beach, California 90802
Fax (310) 570-2566

NAME

ADDRESS

PHONE#

Dominguez Colony SCC 3284

Site *c.r.g. Properties* 4021 Pacific Pl. L.A. 90807 Assessors Parcel # PZ-202-209 DATE 9/21/01

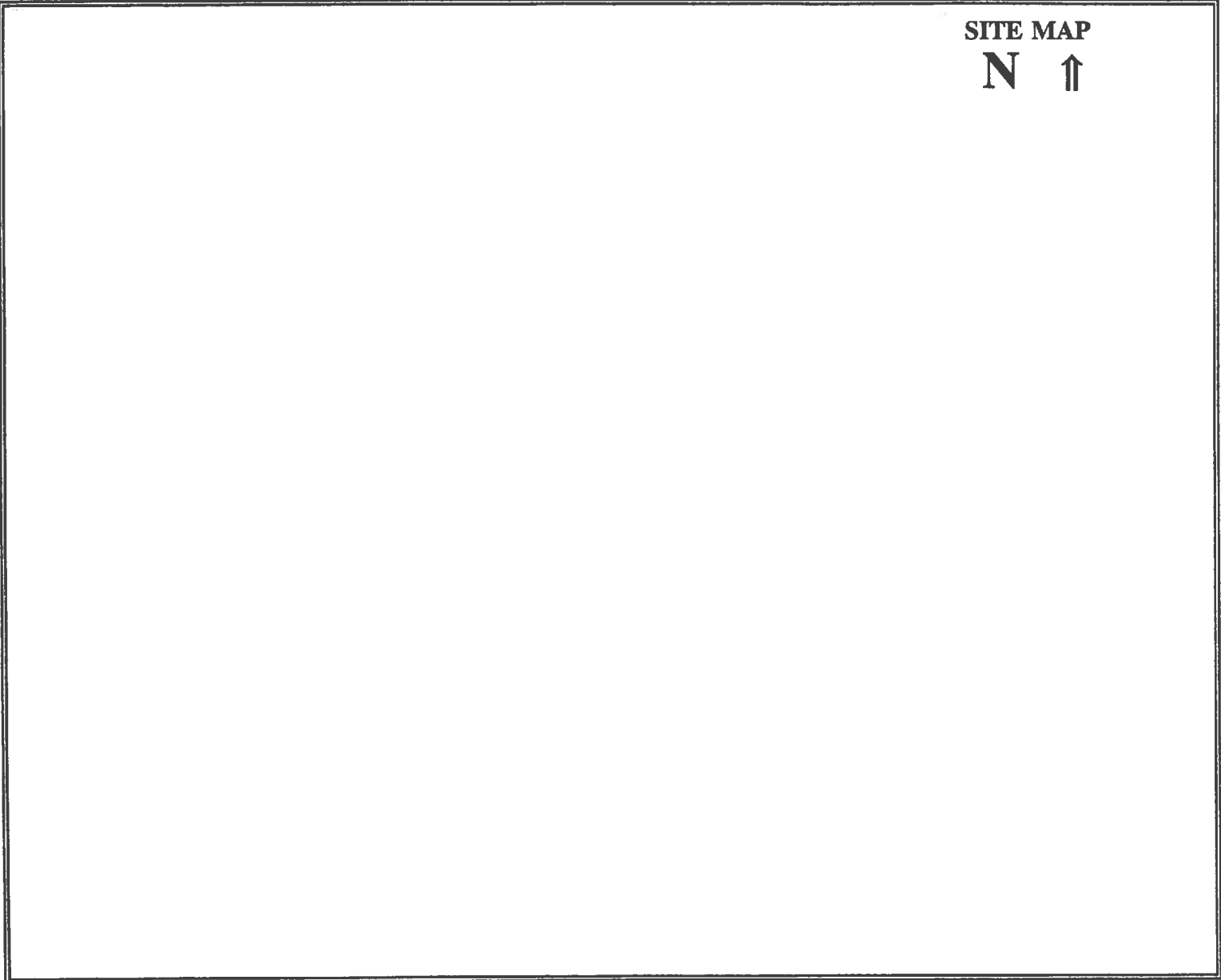
Owner Pender Properties, Inc. 15332 Antioch St. #338 Pacific Palisades 90272 (310) 808-9071

Contractor Signal Hill Const. 2425 Gundry Ave. Signal Hill 90806 424-1210 PROJECT# 326816

Geologist Duff Kerwin (CTL) 24404 S. Vermont Ave. #307 Harbor City 90710 (310) 530-5006

Lab Cal Tech Env. 6814 Rosecrans Ave. Paramount 90723 272-2700 INSPECTOR W. Swenson

SITE MAP



aboveground

Remove _____ tank(s) per current Long Beach Fire Department and Long Beach Health Department guidelines. Soil sample analysis shall be submitted to both agencies within 14 days.

I have read and understand the above.

SIGNAL HILL CONST.

WR Johnson
Signature

W. R. JOHNSON (512) 424-1210
Print name & phone #

PRESIDENT
Company and Title

LONG BEACH FIRE DEPARTMENT
 FIRE PREVENTION BUREAU
 -- Underground Storage Tanks --

Tanks	Tank Test	Leak	Strt Number	Street Name	Business Name
01	*****	*****	4021	11/01/86	SWENSON-> DIRTY-RWQCB LEAD
					PACIFIC PLACE ** C.R.G. PROPERTIES
				01/16/03	SWENSON-> LETTER FROM HEALTH ASKING FOR SOIL ANALYSIS RESULTS BY
				FEBRUARY 15,2003	CONTACT CARMEN PIRO 570-4137
				09/21/01	SWENSON-> SIGNAL HILL CONST REMOVED 5 AST'S PROJECT #3226816.
				D.KERWIN (CTL)	(310)530-5006 SAMPLING TO CAL TECH ENV 272-2700
				01/24/97	SWENSON-> HEALTH SAYS CLEAN CONTACT ROBERT HUNT 570-4138
				10/09/96	SWENSON-> SIGNAL HILL CONSTRUCTION REMOVED 6 AST'S (2 1M BBL, 2
				500 BBL & 2 200 BBL PROJECT #218696. A.GRAM (818)794-8516 SAMPLING TO SSI	
				(714)630-2812. THERE ARE 6 MORE AST'S 1,500 FEET N/W THAT ARE TO BE REMOVED	
				AT A LATER DATE	

LB -> 518

Pertinent Historical Documents

**Final Remedial Investigation Report
Former Oil Operators North Site
3701 Pacific Place
Long Beach, California**

**May 27, 2009
002-10231-063**

Prepared For
CRG Properties, Ltd.
4010 W. Chandler Avenue
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002-10231-06

Mr. Greg Holmes, Unit Chief
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Southern California Cleanup Operations
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Subject: Final Remedial Investigation Report, Former Oil Operators North Site,
3701 Pacific Place, Long Beach, California

Dear Mr. Holmes:

LFR Inc. (LFR) has prepared the attached Final Remedial Investigation Report to document and present the results of investigation activities at the former Oil Operators, Inc. North facility located at 3701 Pacific Place, Long Beach, California (“the Site”). LFR previously completed and submitted a Revised Data Characterization Report for the Site, which included our responses to the California Department of Toxic Substances Control’s (DTSC) comments dated March 12, 2007. Data gaps identified by that report have been addressed by this remedial investigation, and we believe the project is now ready for a Feasibility Study.

If you have any questions regarding the material presented in this report, please contact the undersigned at 714-444-0111.

Sincerely,



Melissa C. Schuetz
Senior Associate Geologist

Attachments

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1.0 INTRODUCTION

On behalf of CRG Properties, Ltd. (CRG), LFR Inc. (LFR) is submitting this Remedial Investigation (RI) Report to document investigation activities at the former Oil Operators, Inc. (Oil Operators) North facility located at 3701 Pacific Place, Long Beach, California (“the Site”; Figure 1). LFR previously completed and submitted a Revised Data Characterization Report for the Site, which included our responses to the California Department of Toxic Substances Control’s (DTSC) comments dated March 12, 2007. Data gaps identified from that investigation have been addressed by efforts to complete this RI.

The Site is a Brownfield development, with CRG and its development partners aspiring to develop the property with a one- or two-story warehouse-type building, parking facility or combination of these uses. As such, in cooperation with DTSC, requirements for this RI and other related regulatory efforts have been streamlined to effect decisions for this more directed purpose. Since this is a voluntary action and CRG knows what it desires, the related efforts are directed, with less strict adherence to the National Contingency Plan or similar State directives. CRG entered into the Voluntary Cleanup Agreement on December 20, 2005, and desires DTSC and other agency approvals to effect development of this parcel in the near future.

The Site is currently occupied by the Long Beach Golf Learning Center, which consists of a golf driving range, practice putting and chipping areas, a snack bar, a golf shop, a maintenance building, and a paved parking lot. The approximately 18-acre Site consists of three contiguous properties: Portion 1 is owned by CRG Properties, Ltd., and is designated by Los Angeles County Assessor Parcel Numbers (APNs) 7140-014-019 and 7140-014-020; Portion 2 is owned by John B. McDonald/Family J.B. McDonald and is designated by APNs 7140-014-021, 7140-014-022, 7140-014-023, and 7140-014-027; Portion 3 is owned by Victor R. Tookey and Evelyn M. Tookey, and is designated by APN 7140-014-025. Portion 1 is roughly triangular-shaped. Portion 2 is irregularly shaped and is situated east of Portion 1. Portion 3 is situated in the south central portion of the Site.

The Site is located in a mixed residential and industrial area of Long Beach. The subject property is bounded on the east by the Metro Blue Line (a light rail transit system), followed by a residential development and Los Cerritos Park (a City of Long Beach public park); on the south by Interstate 405; and on the west by the Los Angeles River flood control channel (Figure 2).

In accordance with the DTSC-approved work plan dated August 29, 2007, the primary objectives of this investigation were to:

- Collect additional on-site soil samples for laboratory analysis to complete site characterization.

- In accordance with DTSC comments, collect soil gas samples from the overlying fill and submit for laboratory analysis to provide information for an assessment of potential risks.
- In accordance with DTSC comments, collect soil samples for laboratory analysis to provide aromatic and aliphatic fractions from petroleum hydrocarbon-affected soils using the Massachusetts Department of Environmental Protection (MA DEP) approach to evaluate potential hazard from exposure to total petroleum hydrocarbon (TPH) compounds.
- In accordance with DTSC comments, collect soil samples for laboratory analysis to characterize the fill material.
- In accordance with DTSC comments, obtain off-site data to determine background concentrations for metals in the site vicinity.
- In accordance with DTSC comments, install an additional groundwater monitoring well.
- In accordance with DTSC comments, collect groundwater samples for laboratory analysis.
- Prepare a RI report summarizing the investigation results to poise the project for Feasibility Study (FS) completion.

2.0 BACKGROUND

The Site was formerly owned by Oil Operators, a non-profit cooperative organization that functioned as a central brine water treatment facility serving member oil companies (AEMC 1991). Beginning in 1926, oil brine (drilling mud and other waste materials generated from oil production operations) was pumped to sumps on the Oil Operators property, of which the Site was the northernmost portion. Most of the Site was utilized as a treatment sump. After the water had evaporated or infiltrated the aquifer from the sumps, the remaining sludge was either drummed or left in the treatment sumps. When a water treatment plant, including evaporation ponds, was built south of the Site in the mid-1950s, evaporation activities at the Site sumps ceased.

A partial cleanup/treatment operation was conducted at the Site in the 1970s, which involved the removal, treatment, and replacement of a portion of the sump materials (ETC 1984). However, detailed records of the treatment operation are not available.

Additional investigations were conducted in the 1980s, culminating in a land farming operation that was begun in 1989 (AEMC 1991). Details of the investigations conducted at this time are included in Section 2.1. The land farming operation was halted when public complaints were received by the South Coast Air Quality Management District (SCAQMD).

A groundwater monitoring program for the Site and southern adjacent property was implemented in 1987, according to Monitoring and Reporting Program No. 6775 for

Oil Operators (Land Treatment File No. 86-66). According to records available to LFR, annual monitoring at three groundwater wells (MW-2, MW-3, and MW-4) was ongoing as of 1997 (Oil Operators 1997).

Currently, the Site is being utilized as a golf learning center. Improvements include a paved parking lot, several structures, and a large grassy area.

On behalf of CRG, LFR submitted a Voluntary Cleanup Program (VCP) application for the Site to the DTSC on March 24, 2005. Approval of the VCP application was granted on December 20, 2005.

LFR prepared a Characterization Data Report dated April 4, 2006 to describe current and historical investigation and remediation activities at the Site. In a letter dated July 12, 2006, the DTSC raised numerous issues that needed to be addressed as a remedial investigation prior to approval of the report. In general, the DTSC believed that data gaps existed, that the Site had not been fully characterized, and that the Characterization Data Report should be used in conjunction with further research and investigation to develop a remedial investigation workplan. The DTSC also made 19 specific comments to the Characterization Data Report. The DTSC's Human and Ecological Risk Division (HERD) also provided comments to the Characterization Data Report in a memorandum dated July 5, 2006. Copies of the memorandum and the letter dated July 12, 2006 are attached as Appendix A.

LFR's responses to DTSC comments, along with an historical review of the Site, were submitted on March 12, 2007. The historical review included historical aerial photographs, topographic maps, and a review of California Department of Oil, Gas, and Geothermal Resources (DOGGR) records. The response to comments is attached as Appendix B, and the historical review is included as Appendix C.

On August 29, 2007, in conjunction with various meetings and other communications, LFR submitted a remedial investigation workplan for the Site that was subsequently approved by the DTSC on September 6, 2007.

2.1 Previous Site Investigations

The results of previous environmental investigations known by LFR to have been conducted at the Site are summarized below. Copies of the reports are included in Appendix D of this report.

2.1.1 Oil Sump Site Development Feasibility Study (August 25, 1983) and Oil Sump Site Development, Supplemental Investigation (January 1984)

Earth Technology Corporation (ETC) conducted two preliminary geotechnical investigations to assess the feasibility of supporting light industrial structures on the sump materials. Sixteen electronic cone penetrometer tests (CPTs) were performed for the two investigations; the CPT locations (C1 through C16) are shown on Figure 3.

The results of these two studies indicated that the majority of sump materials were too compressible to directly support shallow foundations. If foundations were to be placed on these materials, differential foundation settlement would likely be excessive.

Three cross-section maps (Subsurface Profiles No. 1, 2, and 3) were prepared using the information obtained from the CPT tests. These cross-sections are presented as Figures 4, 5, and 6, respectively, with profile locations shown on Figure 3. Four zones are identified in the cross-sections. According to the 1984 Supplemental Investigation, Zones 1 through 3 were considered to be stiff to very soft sump materials with the following characteristics:

- Zone 1 – Stiff clay and sandy clay soil with occasional sand near the ground surface; relatively high to moderate oil content; “appears to have been treated and recompacted.”
- Zone 2 – Firm to soft clay and silt; moderate to low oil content; may have been lightly treated and replaced; very compressible.
- Zone 3 – Very soft clay; untreated and uncompacted; water saturated; highly compressible.

Zone 3 materials reached as deep as 30 feet below ground surface (bgs) in some locations at the Site. The deepest area appears to be in the central portion of the property, mimicking somewhat the triangular shape of the Site itself. Zone 4, beneath the other zones, was believed to be possibly natural soil with some moderately compacted sump material near the top.

2.1.2 Geotechnical Investigation

GEOFON, Inc. (GEOFON) performed a geotechnical investigation to provide an evaluation of subsurface conditions at the Site in relation to the design and construction of a proposed business park development. This undated report appears to be the same document referred to in a 1986 Site Characterization Study (see Section 2.1.3). The investigation included drilling 12 borings (identified as B-1 through B-12 in the report and as GB-1 through GB-12 on Figure 3) to obtain soil samples for laboratory testing, visually classify soil types, ascertain the level of soil contamination, and confirm the depth of sump materials. Data from the previous geotechnical studies (see Section 2.1.1) were also incorporated in the preparation of the report.

Based on the results of the investigation, the greatest amount of sump materials (approximately 75,000 cubic yards [yd^3]) was found to be distributed in a zone approximately 450 feet long, 300 feet wide, and 15 feet thick in the south-central portion of the Site. Another large triangular-shaped body of unprocessed sump material (approximately 7,000 yd^3 and 7 to 10 feet thick) occurs in the northernmost corner of the Site. The very soft, unprocessed sump materials were found to be at the base of the sump (below 24 to 34 feet above mean sea level [msl], approximately 20 to 30 feet bgs). Together with other smaller pockets of unprocessed sump material, the total volume of unprocessed sump material at the Site was estimated to be 80,000 to

100,000 yd³. Combined with lightly and moderately processed sump materials, the total volume of all sump fills was estimated at between 390,000 and 490,000 yd³.

Sump materials were found to consist primarily of mud similar to clayey soils, mixed with highly variable amounts of salty water (brine) and oily wastes. Shallow groundwater was encountered at 8 feet bgs in one boring (GB-4). This was believed to be a localized perched condition because native sands at greater depths were not saturated and no other borings encountered perched groundwater.

GEOFON concluded that surface conditions at the time were not suitable for supporting structures on shallow foundations. The sump materials have highly variable engineering properties and are too compressible for supporting structures or fills. They would be suitable, however, once moisture-conditioned and compacted.

An isopach map of the sump material is presented as Figure 7.

2.1.3 Site Characterization Study

Jaykim Engineers, Inc. (Jaykim) and GEOFON conducted a Site Characterization Study for Statewide Investors, Incorporated, in October 1986. Twelve borings were drilled, and soil samples were collected from the borings for geophysical properties and chemical analysis. The borings were subsequently converted to gas monitoring probes, and gas pressures and lower explosive limit (LEL) levels were monitored. These boring locations are labeled as GB-1 through GB-12 on Figure 3, and are the same borings referred to in the GEOFON report (see Section 2.1.2).

Soil Results

The soil at the Site was characterized into six types, based on physical characteristics:

- Type 1 – low to medium oil content in a dark silty or sandy clay
- Type 2 – medium to high oil content, with some samples showing liquid oil, in a black, silty to sandy clay
- Type 3 – extremely high oil content in a toothpaste-like consistency
- Type 4 – very low oil content in a dry blue clay
- Type 5 – very low oil content in a dry gray sand
- Type 6 – none to very low oil content in a brown silty sand

Analytical results included concentrations of TPH ranging from no detection (Type 6) to 75,800 milligrams per kilogram (mg/kg; Type 3) and lead up to 444 mg/kg (Type 3). Benzene and xylenes were detected at concentrations up to 3.0 mg/kg (Type 3) and 28 mg/kg (Type 2), respectively. Tables and figures are not available for this report; therefore, the location and distribution of contaminants is not known.

Other Soil Results

Four soil samples were taken with a backhoe on April 28, 1986 and submitted for chemical analysis (the sample identifications and sampler were not identified). Analytical results were summarized as follows:

- low levels of xylenes (93 mg/kg average)
- other volatile organic hydrocarbons averaged 11,158 mg/kg
- non-volatiles averaged 130,200 mg/kg
- organic lead averaged 3.21 mg/kg

Appendix B of the Site Characterization Study, which provided details of analytical results, is missing from the report.

According to a Preliminary Assessment by Ecology and Environment, Inc. (EEI), the California Department of Health Services (DHS) collected soil samples from the Site in October 1989 (EEI 1990). Tables and figures are not available for this report; therefore, the location and distribution of contaminants is not known. Analytical results exceeding their respective guidance levels were as follows:

- Analytical results for metals resulted in elevated concentrations of arsenic (44 mg/kg).
- Analytical results for volatile organic compounds (VOCs) resulted in elevated concentrations of naphthalene (8,700 micrograms per kilogram [$\mu\text{g}/\text{kg}$]).
- TPH was reportedly detected at concentrations as high as 95,000 parts per million (ppm).

Vapor Probe Results

Gas analyses included field testing for lower explosive concentrations and probe pressures, and laboratory testing for “major gases” (in two probes, “GC/halogenated compounds and BTX”). The laboratory results were missing from LFR’s copy of the report. Methane concentrations reportedly ranged from 12.1 to 83.6 percent (locations unknown).

Groundwater Results

A groundwater sample was obtained from a perched water layer at 8 feet bgs in boring GB-4 performed by GEOFON in 1986. Analytical results reportedly identified concentrations of TPH at 26,000 micrograms per liter ($\mu\text{g}/\text{l}$), zinc at 18,000 $\mu\text{g}/\text{l}$, and lead at 16,000 $\mu\text{g}/\text{l}$.

According to a Preliminary Assessment by EEI (1990), perched groundwater samples were collected from the Site by Jaykim in 1988. The text, tables, and figures for this

report are not available; therefore, the location and distribution of contaminants is not known. Analytical results reportedly identified concentrations of lead at 16 milligrams per liter (mg/l), chromium at 5.5 mg/l, and copper at 7.3 mg/l.

The executive summary of the report states: "...the volume of fill material to be reprocessed is approximately 400,000 to 500,000 cubic yards. About 2/3 of this fill material has been previously processed and has a relatively low oil content and soil-like properties. This material can be removed, replaced, and compacted with relative ease. The remaining 1/3 of fill material has a high oil content and variable consistency. This portion will be mixed with clean fill dirt, replaced, and compacted" (Jaykim 1986).

2.1.4 Test Plot at Oil Operators North Site

In a letter to the DTSC dated May 27, 1988, Jaykim informed the agency that operations for a test plot at the Site were to commence on May 31, 1988. Notification to the Regional Water Quality Control Board (RWQCB) was also provided in a letter dated June 6, 1988.

A letter report to Mr. J. T. Liu at the RWQCB dated July 18, 1988, written by Jaykim, described the operation of the test plot to demonstrate the feasibility of soil bioremediation at the Site. Beginning on May 31, 1988, the test plot area was cleared and leveled. Soil vapor readings within 3 inches of the soil surface were taken with a combustible vapor detector during clearing operations. Six "cells" approximately 8 feet wide by 50 feet long were staked out and rototilled, after which ammonium nitrate and phosphate were applied to the cells and tilled into the soil.

On June 3, 1988, composite soil samples were taken from each cell. Oil-utilizing bacteria and warm water were added to five of the cells, and were then tilled and watered into the soil. On June 6, approximately 20 yd³ of oil-contaminated soil was removed to a depth of 15 to 20 feet bgs and mixed with surface soil in a one-to-one ratio. The mixture was then spread onto each of the cells at varying depths ranging from 3 to 6 inches and tilled into the surface. Mixing of the cells was performed between two and six times daily on five days between June 3 and June 13, 1988.

Results of the test indicated that the treatment process worked most effectively with more mixing, as the plots mixed six times per day showed the greatest reduction in petroleum contamination (TPH concentrations reduced from 3,200 to 1,300 mg/kg between June 6 and June 13, 1988, compared with reductions from 840 to 770 mg/kg for a plot that was mixed twice daily).

2.1.5 Land Farming Activities

The following documents present information relating to the land farming activities that were initiated at the Site:

- *Revised Excavation Management Plan for Oil Operators, Inc. North Site*, by Jaykim. Submitted to the SCAQMD on October 21, 1987, the document presented plans for managing air quality and public safety concerns during Site remediation. Land farming procedures were described and a timeframe for completion of the project was given (approximately 11 months). The land farming activities were to be accomplished in a grid pattern across the Site. The control of odor and dust during the project was to be through maintenance of adequate moisture and aeration in the soil, and application of odor-suppressing foam if necessary. Groundwater monitoring was also planned.
- *Rule 1150 Excavation Permit* dated February 11, 1988. In a letter from the SCAQMD to Oil Operators, approval of the permit was granted subject to 34 conditions stipulated in the approval letter.
- *Revisions to the Rule 1150 Excavation Permit for Landfarming the North Site* by Jaykim, dated January 22, 1988. This letter to Oil Operators presented changes to the Rule 1150 Excavation Permit that would be incorporated prior to approval by the SCAQMD.
- *Oil Operators, Inc. Rule 1150 Permit No. 157742* by Jack K. Bryant & Associates (JB) dated April 19, 1989. This letter to the SCAQMD requested an extension of the Rule 1150 permit for the period of time required to process 100,000 yd³ of material containing 20,000 mg/kg or greater of oil. At that time the permit would again be extended, provided that the material encountered had an absolute vapor pressure below 36 millimeters of mercury.

2.1.6 Results of Post-Excavation Soil Sampling

A letter report from JB to CRG dated August 30, 1989, provided analytical results for 14 soil samples collected during excavation activities that occurred on August 1, August 14, August 17, and August 18, 1989. Boring locations are designated as E-1 through E-11, E(S1), and E(S2) on Figure 3. It appears that the purpose of the soil sampling was to determine the amount of total recoverable petroleum hydrocarbons (TRPH) in soil at the Site; to analyze one sample for VOCs, semivolatile organic compounds (SVOCs), pesticides, polychlorinated biphenyls (PCBs), metals, and pH; and to determine the suitability of the soil for bioremediation. Concentrations of TRPH ranged from 16 to 92,000 ppm. Samples with the highest concentrations (E1, E2, E7, E9, and E10) were closer to the center of the Site. The sample which was analyzed more extensively showed VOC detections that included 7.5 mg/kg of ethylbenzene and 3 mg/kg of benzene. Lead and arsenic were detected at concentrations of 540 mg/kg and 44 mg/kg, respectively.

2.1.7 Groundwater Monitoring Reports

In a letter from the RWQCB to Oil Operators dated May 5, 1987, approval was given for waste discharge requirements (Order No. 87-54) for the Oil Operators land treatment at the Site (File No. 86-66), effective April 27, 1987. This included a requirement for monthly groundwater elevation measurement and quarterly

groundwater quality monitoring. LFR has reviewed the following documents relating to groundwater monitoring at the Site (also located in Appendix D):

- *Letters dated November 7, 1989 and October 24, 1990* requesting that quarterly groundwater monitoring as required by RWQCB Order No. 87-54 be changed to annual monitoring, since monitoring results did not show variations from previous test results.
- *1995 Groundwater Monitoring Report for Oil Operators North Site dated February 1, 1996*. This annual report prepared by JB presents the results of monitoring and sampling of wells MW-2, MW-3, and MW-4 that took place on January 10, 1996 (well locations are shown on Figure 3). Groundwater elevations at the time ranged from 39.3 feet bgs (MW-4) to 50.6 feet bgs (MW-2). Analytical results included the following:
 - The pH of the monitoring wells ranged from 6.45 to 6.65 units.
 - Concentrations of Total Dissolved Solids (TDS) ranged from 2,690,000 $\mu\text{g/l}$ (MW-4) to 10,800,000 $\mu\text{g/l}$ (MW-2).
 - TRPH was detected in well MW-2 at a concentration of 1,400 $\mu\text{g/l}$.
 - TPH was not detected in any of the monitoring wells.
 - Ethylbenzene and total xylenes were detected in MW-3 at concentrations of 0.9 $\mu\text{g/l}$ and 2.4 $\mu\text{g/l}$, respectively. Toluene was detected in monitoring well MW-4 at a concentration of 0.5 $\mu\text{g/l}$.
 - Lead, chromium, and nickel were not detected in any of the monitoring wells. Zinc was detected at concentrations ranging from 20 $\mu\text{g/l}$ (MW-3) to 120 $\mu\text{g/l}$ (MW-2). Copper was detected at concentrations ranging from 74 $\mu\text{g/l}$ (MW-4) to 80 $\mu\text{g/l}$ (MW-2).
- *RWQCB File Number 86-66, Annual Groundwater Monitoring Report 1996 for Oil Operators North Site, Pacific Place, Long Beach, CA dated March 17, 1997*, prepared by JB. Monitoring and sampling of wells MW-2, MW-3, and MW-4 took place on February 17, 18, and 19, 1997. The following results were reported:
 - Groundwater depths ranged from 42.43 feet bgs (MW-4) to 61.95 feet bgs (MW-2). Increases in groundwater depth were attributed to grading and other earthmoving activities at the Site.
 - The pH ranged between 6.34 and 6.78.
 - TDS concentrations ranged from 2,030,000 to 11,800,000 $\mu\text{g/l}$.
 - TRPH and TPH were not detected in any of the wells.
 - Benzene was detected in two wells, MW-2 and MW-3, at concentrations of 0.6 $\mu\text{g/l}$ and 88 $\mu\text{g/l}$, respectively. Toluene, ethylbenzene, and xylenes were detected in well MW-3 at concentrations ranging from 1.6 $\mu\text{g/l}$ to 15 $\mu\text{g/l}$.
 - Zinc was detected at concentrations ranging from 100 $\mu\text{g/l}$ (MW-4) to 200 $\mu\text{g/l}$ (MW-2); lead was detected at concentrations ranging from 130 $\mu\text{g/l}$ (MW-4) to

280 $\mu\text{g/l}$ (MW-3); and nickel was detected in MW-3 at a concentration of 65 $\mu\text{g/l}$.

No other quarterly or annual groundwater monitoring reports were available for review. It is unclear whether additional groundwater sampling was conducted at the Site.

3.0 GEOLOGY

The subject property is located within a transition area of the Peninsular Ranges and Transverse Range geomorphic provinces. The major geologic feature in the site vicinity is the Newport-Inglewood Fault Zone (NIFZ), which traverses the Site in a northwest-southeast direction. The term fault “zone” is used to emphasize the occurrence of a series of interconnected fault planes, rather than a single defining fault plane. Tertiary and younger sediments are structurally folded and deformed along the NIFZ. The Long Beach Anticline is expressed at Signal Hill and is composed of Middle Miocene through Pleistocene and Holocene sediments resting unconformably on the Late Cretaceous to Late Jurassic Catalina Schist.

Based on previous investigations by LFR and others, soil beneath the Site consists of variable thicknesses of sand, silt, and clay. The soil is underlain by a thin veneer of Recent alluvium, alluvial sediments of the Late Pleistocene-age Lakewood Formation, and sediments of the Early Pleistocene-age San Pedro Formation. The thickness of the sedimentary section underlying this area is approximately 12,000 feet (Dames & Moore 1988). The Site is located within the active Long Beach Oil Field. According to DOGGR, 17 oil wells are located on the Site. Additional information regarding these oil wells is provided in the historical review (Appendix C).

4.0 HYDROLOGY

The Site lies within the southern portion of the Coastal Plain of Los Angeles County, which gently slopes down to the south-southwest. The Site is located within the West Coast Basin, although it is adjacent to the boundary of the Central and West Coast Basins. The Los Angeles River is located along the western boundary of the Site and flows southward, where it discharges into the Pacific Ocean at San Pedro Bay. The Site is located along the NIFZ, which forms the boundary between the Central and West Coast subbasins and acts as partial barrier to groundwater movement in the area. The NIFZ offsets, thins, and folds many of the aquifers. Due to the proximity of the Site to the NIFZ, aquifer depths, thicknesses, and potential for interconnections may vary significantly across the Site.

Named aquifers beneath the Site in order of increasing depth are the Gaspar, Gage, Lynwood, Silverado, and Sunnyside (California Department of Water Resources

[CDWR] 1961). The Lakewood Formation contains the Gaspar and Gage aquifers, and the lower aquifers are in the San Pedro Formation.

The Bellflower aquitard immediately underlies the Site at approximately 5 to 50 feet bgs. Shallow groundwater was encountered at 8 feet bgs at one boring location (GB-4) during soil sampling activities in 1986. This was believed to be a localized perched condition because native sands at greater depths were not saturated and no other on-site borings encountered perched groundwater.

The uppermost portion of the Lakewood Formation is designated as the Gaspar aquifer, which is present beneath the Site from approximately 50 to 70 feet bgs as sand and gravel. The Gaspar aquifer is believed to be the water-bearing zone encountered during the well installation by LFR and subsequently sampled and analyzed. On December 16, 2007, groundwater was found beneath the Site from 32.6 to 49.32 feet bgs, with a shallow gradient flowing in a southerly direction.

In the vicinity of the subject property, the Gage aquifer has a base at approximately 180 feet bgs and is approximately 35 feet thick. Deposits in this aquifer vary from silty sand to minor gravel (CDWR 1961). Groundwater in both aquifers of the Lakewood Formation has been reported to be of inferior chemical quality.

The lower Pleistocene San Pedro Formation unconformably underlies the Lakewood Formation and is known to contain numerous aquifers of varying quality; however, the deep Silverado aquifer is the only significant water-producing zone. The Lynwood aquifer has a base at approximately 600 feet bgs and is approximately 400 feet in thickness. In this location, the Silverado aquifer joins the Lynwood aquifer at approximately 600 feet bgs and continues to over 1,000 feet bgs. The City of Long Beach obtains groundwater from more than 1,000 feet bgs within the Silverado aquifer.

Groundwater beneath the Site is considered of beneficial use by the RWQCB (AEMC 1991). However, the regional groundwater is highly degraded due to salt water intrusion and industrial waste disposal (EMCON 1981). The Site lies within an area of poor groundwater quality due to historic oil and gas production activities in the site vicinity (Jaykim 1986). Salts released during the production of oil appear to have degraded the regional groundwater to be non-potable, with TDS concentrations exceeding State Water Resources Control Board (SWRCB) Resolution 88-63 of 3,000 mg/l.

According to the hydrologic records maintained by the County of Los Angeles Department of Public Works (LAPDW), groundwater well 896E is located approximately 0.5 mile north and upgradient of the Site. The well is inactive, and the last depth to water measurement was recorded at 81.2 feet bgs on May 6, 1996. Groundwater well 897KK, located approximately 50 feet southwest and cross-gradient of the Site, was destroyed in 1999. The last depth to water measurement was recorded at 50.4 feet bgs on April 19, 1995. Another groundwater well, 906D, is located approximately 0.75 mile northeast and cross-gradient of the Site at the Virginia Country Club. The groundwater is listed as having no reported use, and the most

recent depth to groundwater was recorded at 112.5 feet bgs on June 16, 2007. Approximately 1 mile north and upgradient of the Site are two active wells, 906A and 906E. The listed usage for 906A is domestic and stock supply; 906E is used for irrigation. The most recent depth to water measurement for 906A was 69.1 feet bgs on April 30, 2006. The most recent depth to water measurement for 906E was 70.7 feet bgs on October 19, 2005 (LADPW 2008).

In summary, while some local wells exist and are used for monitoring and agriculture purposes, none are used as a source of potable water.

4.1 Regional Degradation of Groundwater Quality from TDS and Chloride Concentrations

On July 9, 2008, LFR submitted a document titled "Summary of Groundwater Conditions" to the DTSC. This document was prepared at the request of DTSC and the RWQCB, and provided additional data supporting the overall interpretation that the region's salt-impacted groundwater originates from numerous and complex historic sources. Additional data included analytical results for chloride and TDS concentrations detected in groundwater samples collected from monitoring wells at the former Oil Operator's South Site and chloride concentrations detected in LADPW groundwater observations wells in the Dominguez Gap. A copy of LFR's "Summary of Groundwater Conditions" is provided as Appendix E. LFR's conclusions regarding regional degradation of groundwater quality from TDS and chloride concentrations are summarized below.

In March 2008, TDS was measured at concentrations of 1,000 mg/l and 2,000 mg/l in on-site wells MW-5 and MW-6, respectively. Higher concentrations of TDS were measured in MW-3 and MW-7 (6,200 mg/l and 7,800 mg/l, respectively). Elevated measurements of TDS at the Site indicated inferior quality of groundwater in the shallow aquifer, not suitable for use as drinking water. Concentrations of TDS in the groundwater increase in the downgradient direction. It is unknown whether the elevated concentrations are due to natural processes or human activity. However, the Gaspar aquifer has historically been intruded by an influx of seawater during low water conditions in an inland direction to areas beyond Carson Street (located north of the Site) toward the crest of the Newport-Inglewood uplift (Poland 1959). Based on the concentrations of TDS detected during this sampling event, groundwater enters the Site classified as slightly saline (1,000 to 3,000 mg/l), and exits the Site classified as moderately saline (3,000 to 10,000 mg/l).

Higher levels of TDS and chloride than those found at the Site have been detected in the Gaspar aquifer south of the Site. As presented on figures in the document titled "Summary of Groundwater Conditions" (Appendix E), there does not appear to be any obvious or clear regional trend to the chloride concentrations detected in groundwater.

While some degradation was observed at the Site, the conditions appear to be in general accordance with the regional degradation of groundwater quality, given the

region's degraded surficial aquifers resulting from historical oil production operations. TDS appears to have increased from potential historical Site activities; however, given the broader regional degradation, these concerns become more limited.

Based on the additional data provided, LFR believes the following are reasonable conclusions:

1. Groundwater in the area is degraded from numerous and complex interactions of nature as well as historical man-caused activities that date back numerous decades. The Site is likely part of this, but does not appear to be the sole or even primary cause of groundwater degradation.
2. Remedial consideration of historical Site activities would be highly problematic within this environment, and would do little to remedy potential historical discharges within the context of the region's degraded groundwater. Salt is not easily remedied, and pump and treat options would pose highly costly challenges and could exacerbate the regional condition.

5.0 REMEDIAL INVESTIGATION ACTIVITIES

LFR initiated soil investigation activities at the Site on November 21, 2003 to delineate the lateral and vertical extent of impacted soil and sump material and to provide data on the type and concentration of contaminants in the impacted areas. At this time, an inspection of the Site was conducted to locate and identify any existing groundwater monitoring wells present on the property. Well MW-3 was the only well located on the Site. This well was sampled as described in the following section. In addition, two additional wells were subsequently installed and sampled.

The installation of two monitoring wells (MW-5 and MW-6) on May 6, 2004 was designed to characterize in greater detail the type and concentration of chemical constituents in soil and groundwater at the Site. Lithologic and well construction logs for drilling activities are presented in Appendix E. Soil and groundwater samples were collected and logged by LFR personnel using the protocols described in Appendix F. Field activities associated with this phase of investigation at the Site, including mobilization, pre-field activities, geophysical survey for utility clearance, soil sampling, groundwater sampling, and concrete sampling, are described below.

5.1 Pre-Field Activities

Prior to initiating fieldwork, LFR coordinated with subcontractors and arranged for access to the Site and the neighboring property where sampling was to be conducted. LFR prepared a site-specific Health and Safety Plan (HSP) dated May 5, 2004 to be used in the field by LFR personnel during well installation and boring activities at the Site, as required by 29 Code of Federal Regulations (CFR) 1910.120. The well permit is located in Appendix F.

Each proposed boring location was cleared for the presence of underground utilities, and Underground Service Alert (USA) was notified a minimum of 48 hours in advance of drilling activities to ensure that new soil borings and monitoring wells were not located where they could damage underground utilities.

5.2 Soil Sampling

Soil sampling was conducted on November 21, 2003 to evaluate and provide additional information on the extent of impacted soil at the Site. LFR advanced seven borings (B1 through B7) via hollow-stem auger and two borings (CPT1 and CPT2) via CPT. The seven HSA borings (see Figure 3) were advanced to 50 feet bgs. Soil samples were collected every 5 feet for lithologic description and photoionization detector (PID) readings with a 2.0-inch modified California split-spoon sampler lined with 6-inch stainless steel rings. In addition, soil samples were preserved in volatile organic analysis (VOA) vials with methanol and sodium bisulfate in accordance with EPA Method 5035. The bottom sample from each of the seven borings was analyzed for VOCs, SVOCs, PCBs, TPH with carbon chain distinction (TPHcc), and metals. Additional samples were collected based on PID readings, staining, and lithology, and analyzed for VOCs and TPHcc. Upon review of the analytical results, additional samples were analyzed to help evaluate the vertical extent of impacted soil. The following table presents soil sample identifications, analytical methods, and sampling rationale.

Sample ID	Analytical Method	Sampling Rationale
B1 through B7 at 50 feet bgs	EPA Methods 8260B (VOCs), 8270 (SVOCs), 8015M (TPHcc), 6010 (metals), and 8082 (PCBs)	Bottom sample from each boring was analyzed to evaluate the vertical extent of impacted soil.
B1 and B7 at 35 feet bgs; B2 and B6 at 30 feet bgs; B3 and B4 at 10 feet bgs; and B5 at 15 feet bgs	EPA Methods 8260B (VOCs) and 8015M (TPHcc)	Analyzed for VOCs and TPHcc, based on PID readings, staining, and lithology.
B3 at 25, 30, and 45 feet bgs; B4 at 15 and 20 feet bgs; and B5 at 20, 25, 40, and 45 feet bgs	EPA Methods 8260B (VOCs) and 8015M (TPHcc and TPH gasoline range)	Analyzed to evaluate the vertical extent of impacted soil, based on previous analytical results.

Two CPT borings were advanced by Gregg In Situ, Inc. (Gregg) in November 2003 to characterize the soil beneath the Site (Gregg 2003). The locations of the CPT borings are illustrated on Figure 3. The borings were advanced to 80 feet bgs in both locations. Predominantly silts, clayey silts, and sandy silts were found in CPT-1 to 52 feet bgs, with layers of cemented sand and stiff sand found from 19 to 22 feet bgs and from 35 to 42 feet bgs. Below 52 feet bgs, stiff fine-grained sand, cemented sand, and silty

sand predominate. In CPT-2, silt, sandy silt, clay, and clayey silt predominate to 42 feet bgs. Below that, layers of silty sand, cemented sand, silt, silty sand, and sandy silt are found. A thick layer of sand is located between 67 and 76 feet bgs.

Borings B1 through B7 were all advanced to 50 feet bgs. Soil lithology in these borings was predominantly silt and silty sand, with some clay lenses found in B5 between 10 and 15 feet bgs and in B3 at 20 feet bgs. Sand was also found at depths of 20 to 30 feet bgs and 40 to 45 feet bgs in boring B1, and at 20 to 25 feet bgs in boring B2.

The boring logs for B1 through B7 are located in Appendix E. A copy of the CPT report is located in Attachment F.

5.3 Groundwater Monitoring Well Installation

As previously discussed, a site inspection revealed the location of only one of the previously existing wells (MW-3).

Two new monitoring wells, MW-5 and MW-6, were installed at the Site on May 6, 2004, using a hollow-stem auger rig. MW-5 was installed north of the Site, near the reported location of MW-4, and MW-6 was installed west of the Site, near the reported location of MW-2. The purpose of adding the two wells was to be able to monitor groundwater flow and direction, and to evaluate groundwater quality at the perimeter of the Site.

Wells MW-5 and MW-6 were constructed of 2-inch diameter Schedule 40 polyvinyl chloride (PVC) well casing with 20 feet of 0.020-inch screened casing. Fifteen feet of screened casing was placed below the groundwater surface, with the remaining 5 feet above the groundwater surface. The wells were advanced to approximately 55 feet bgs.

Wells MW-5 and MW-6 were developed on May 11, 2004. Development consisted of surging for 15 minutes, followed by purging with a 3.5-gallon metal bailer of significantly more than three well volumes of groundwater to obtain clear groundwater for sampling. Wells MW-3, MW-5, and MW-6 were developed and sampled on May 19, 2004. Following surging, at least three well volumes of groundwater were purged prior to obtaining the groundwater samples.

Following the collection of all groundwater samples, LFR subcontracted a California-licensed surveyor to conduct a well survey at the Site to establish horizontal control, top of casing (TOC), and ground surface elevations referenced to msl at the monitoring well locations. Depth to groundwater was 40 feet bgs and 41 feet bgs in wells MW-5 and MW-6, respectively. A summary of the well survey data is included in Appendix F.

Monitoring well locations are presented on Figure 3. Well logs are located in Appendix E.

5.4 Groundwater Sampling

During the investigation on December 19, 2003, a sample was obtained from existing groundwater monitoring well MW-3 for analysis of TPHcc, VOCs, and metals. The groundwater sample was submitted to SunStar in Tustin, California, following proper chain-of-custody protocol. On May 19, 2004, samples were obtained from groundwater monitoring wells MW-3, MW-5, and MW-6 and submitted to SunStar for analysis of TPHcc, VOCs, and metals. On December 18, 2006, samples were collected from groundwater monitoring wells MW-3, MW-5, and MW-6 and submitted to SunStar for analysis of TPHcc, VOCs, SVOCs, metals, specific conductance (EC), pH, anions, and inorganics. Sampling procedures and field reports are located in Appendix F.

6.0 REMEDIAL INVESTIGATION RESULTS

6.1 Soil Sampling and Analysis

Analytical results for soil samples collected in November 2003 are summarized below:

- The deepest samples from each boring were analyzed for metals using EPA Method 6010B (Table 1). Arsenic, barium, cadmium, chromium, cobalt, copper, lead, molybdenum, nickel, vanadium, and zinc were detected at concentrations above laboratory reporting limits in at least one of the borings. Analytical results were below the U.S. Environmental Protection Agency's (USEPA) industrial preliminary remediation goals (iPRGs) for all metals, with the following exception: Arsenic was detected at concentrations ranging from 5.8 to 24 mg/kg in borings B1, B2, B3, B5, and B7; the iPRG for arsenic is 0.25 mg/kg. Arsenic is a naturally occurring trace metal that has been found in California soils at concentrations ranging between 0.6 and 11.0 mg/kg (Kearney 1996) and in native U.S. alluvial soils at concentrations ranging from 2.1 to 22 mg/kg (Kabata-Pendias and Pendias 1984). Arsenic concentrations in all the samples where it was detected exceeded the iPRG, and in three locations (B1, B3, and B7) the concentrations exceeded expected background levels for California soils.
- Soil samples were analyzed for TPHcc using EPA Method 8015M. TPH was not detected in samples from borings B1, B2, and B6. Gasoline-range hydrocarbons (TPHg) were only detected in borings B3 and B4, located in the center of the Site, at concentrations ranging from 0.680 mg/kg (B4-20) to 53.0 mg/kg (B3-30). TPH (C₁₂-C₄₀) was detected at depths ranging from 10 to 30 feet bgs in B3, at 10 feet bgs in B4, at 15 and 20 feet bgs in B5, and between 30 and 50 feet bgs in B7. TPH (C₁₂-C₂₈) was detected at concentrations ranging from 350 mg/kg (B3-25) to 20,000 mg/kg (B3-10 and B7-50). TPH (C₂₈-C₄₀) was detected at concentrations ranging from 280 mg/kg (B3-25) to 22,000 mg/kg (B3-10 and B7-50). TPH was detected at depths between 10 and 30 feet bgs in these borings, with the exception of B7, where TPH was detected at 35 and 50 feet bgs. Analytical results for TPH are summarized in Table 2 and shown on Figure 8.

- PCBs were not detected at concentrations above the laboratory reporting limit in any boring (Table 3).
- The deepest soil samples and those soil samples that exhibited elevated TPH concentrations were analyzed for VOCs using EPA Method 8260B. VOCs were detected in borings B3, B5, and B7 (see Table 4 and Figure 9). Benzene was detected at concentrations up to 580 $\mu\text{g}/\text{kg}$ (B7-50). Ethylbenzene and toluene were detected at concentrations up to 290 $\mu\text{g}/\text{kg}$ (ethylbenzene at B3-30). Total xylenes were detected at concentrations up to 607 $\mu\text{g}/\text{kg}$ (B7-50). None of the VOC concentrations exceeded iPRGs for those compounds. The VOCs were detected in samples collected between 10 and 30 feet bgs in B3 and B5, and in the 35- and 50-foot samples from B7.
- Soil samples were analyzed for SVOCs using EPA Method 8270C. SVOCs were detected in borings B3 at 10 feet bgs, B5 at 15 feet bgs, and B7 at 50 feet bgs (see Table 5 and Figure 10). The highest concentrations of SVOCs detected in soil samples collected at the Site are summarized below:
 - 1-methylnaphthalene at 9,300 $\mu\text{g}/\text{kg}$ in B3-10
 - 2-methylnaphthalene at 6,400 $\mu\text{g}/\text{kg}$ in B3-10
 - benzo(a)pyrene at 400 $\mu\text{g}/\text{kg}$ in B7-50, above the iPRG of 210 $\mu\text{g}/\text{kg}$
 - fluorine at 1,500 $\mu\text{g}/\text{kg}$ in B3-10
 - naphthalene at 3,600 $\mu\text{g}/\text{kg}$ in B7-50
 - phenanthrene at 2,200 $\mu\text{g}/\text{kg}$ in B3-10 and B7-50

The iPRGs for SVOCs were not exceeded for those compounds that have iPRGs, with the exception of benzo(a)pyrene in sample B7-50. The iPRG for benzo(a)pyrene is 210 $\mu\text{g}/\text{kg}$.

6.2 Groundwater Elevation and Flow Direction

Hall & Foreman, Inc. surveyed well elevations at the Site on September 9, 2004. Elevation measurements were made from a notch on the north side of each casing; the same location is used to measure depth to groundwater. The elevation of each well is documented on Table 11.

Depth to groundwater was measured at wells MW-3, MW-5, and MW-6 on December 18, 2006. Depths to groundwater ranged from 28.43 feet (MW-6) to 47.77 feet (MW-3) below TOC (Table 11).

The depth to groundwater and the elevation for each well were used to calculate the elevation of the potentiometric surface beneath the Site. Groundwater flow was determined to be generally south with a relatively flat gradient at approximately 0.3 foot of drop for every 100 feet of distance flowed (or 0.003 ft/ft).

6.3 Groundwater Sampling – November 2003 and May 2004

Analytical results for groundwater samples collected from well MW-3 in November 2003 and from MW-3, MW-5, and MW-6 in May 2004 are included in Tables 6 through 9 and summarized below.

Metals were analyzed using EPA Method 6010B and 7470A. Nine metals were detected at concentrations above their respective laboratory reporting limits, as summarized below:

- antimony (22 $\mu\text{g/l}$ at MW-6)
- arsenic (72 $\mu\text{g/l}$ and 15 $\mu\text{g/l}$ in MW-3 in November 2003 and May 2004, respectively)
- barium (ranging from 97 $\mu\text{g/l}$ in MW-5 to 290 $\mu\text{g/l}$ in MW-3)
- lead (16 $\mu\text{g/l}$ in MW-5)
- mercury (4.8 $\mu\text{g/l}$ and 160 $\mu\text{g/l}$ in MW-3 in November 2003 and May 2004, respectively, and 12 $\mu\text{g/l}$ in MW-6)
- molybdenum (24 $\mu\text{g/l}$ in MW-3)
- selenium (52 $\mu\text{g/l}$ in MW-6)
- silver (84 $\mu\text{g/l}$ in MW-3)
- vanadium (59 $\mu\text{g/l}$ in MW-6)

California maximum contaminant levels (MCLs) (per California Code of Regulations [CCR] Title 22, September 12, 2003) were exceeded for five of these metals:

- antimony at 22 $\mu\text{g/l}$ in MW-6 (exceeded the MCL of 6 $\mu\text{g/l}$)
- arsenic at 72 $\mu\text{g/l}$ and 15 $\mu\text{g/l}$ in MW-3 in 2003 and 2004, respectively (exceeded the MCL of 10 $\mu\text{g/l}$)
- mercury at 12 $\mu\text{g/l}$ in MW-6, and at 4.8 $\mu\text{g/l}$ and 160 $\mu\text{g/l}$ in MW-3 (exceeded the MCL of 2 $\mu\text{g/l}$)
- lead at 16 $\mu\text{g/l}$ in MW-5 (exceeded the MCL of 15 $\mu\text{g/l}$)
- selenium at 52 $\mu\text{g/l}$ in MW-6 (exceeded the MCL of 50 $\mu\text{g/l}$)

Vanadium, an unregulated chemical requiring monitoring, was detected in MW-6 at a concentration of 59 $\mu\text{g/l}$. The action level for vanadium is 50 $\mu\text{g/l}$.

TPH, VOCs, and SVOCs were not detected at concentrations above their respective laboratory reporting limits in any of the groundwater samples collected from MW-3 in November 2003 and from MW-3, MW-5, and MW-6 in May 2004.

Laboratory reports and chain-of-custody forms are included in Appendix G.

6.4 Groundwater Sampling – December 2006

Analytical results for groundwater samples collected from MW-3, MW-5, and MW-6 in December 2006 are included in Tables 6 through 10 and summarized below.

Metals were analyzed using EPA Methods 6010B and 7470A. Seven metals were detected at concentrations above their respective laboratory reporting limits, as summarized below:

- barium (ranging from 100 $\mu\text{g/l}$ [MW-5 and MW-6] to 140 $\mu\text{g/l}$ [MW-3])
- calcium (ranging from 3,200 $\mu\text{g/l}$ [MW-5] to 5,200 $\mu\text{g/l}$ [MW-3])
- copper (ranging from 55 $\mu\text{g/l}$ [MW-5] to 400 $\mu\text{g/l}$ [MW-3])
- magnesium (ranging from 750 $\mu\text{g/l}$ [MW-5] to 2,100 $\mu\text{g/l}$ [MW-3])
- mercury (0.82 $\mu\text{g/l}$ in MW-3 and 7.3 $\mu\text{g/l}$ in MW-6)
- silver (62 $\mu\text{g/l}$ in MW-3)
- sodium (ranging from 5,100 $\mu\text{g/l}$ [MW-5] to 24,000 $\mu\text{g/l}$ [MW-3]).

Arsenic was detected at concentrations above the laboratory method detection limit (MDL) in MW-3 (7.8 $\mu\text{g/l}$), MW-5 (12 $\mu\text{g/l}$), and MW-6 (12 $\mu\text{g/l}$).

Mercury was detected in MW-6 at a concentration of 7.3 $\mu\text{g/l}$. The California MCL for mercury (per CCR Title 22, September 12, 2003) is listed at 2 $\mu\text{g/l}$.

TPH was analyzed using EPA Method 8015M. TPH was not detected at concentrations above laboratory reporting limits in the groundwater samples collected from MW-3, MW-5, and MW-6 in December 2006, with the exception of TPH gasoline range organics (C₆-C₁₂). Concentrations of TPH (C₆-C₁₂) ranged from 0.05 $\mu\text{g/l}$ in MW-5 to 0.38 $\mu\text{g/l}$ in MW-6.

VOCs were analyzed using EPA Method 8260B. VOCs were not detected at concentrations above their respective laboratory reporting limits in any of the groundwater samples collected from MW-3, MW-5, and MW-6 in December 2006.

SVOCs were analyzed using EPA Method 8270C. SVOCs were not detected at concentrations above their respective laboratory reporting limits in any of the groundwater samples collected from MW-3, MW-5, and MW-6 in December 2006.

EC was detected at concentrations ranging from 1,700 microsiemens per centimeter ($\mu\text{s/cm}$) to 7,740 $\mu\text{s/cm}$. California Secondary MCLs – recommended ranges (per CCR Title 22, September 12, 2003) were exceeded for EC (1,700 $\mu\text{s/cm}$ in MW-5, 3,660 $\mu\text{s/cm}$ in MW-6, and 7,740 $\mu\text{s/cm}$ in MW-3). The recommended secondary MCL for EC is listed as 900 $\mu\text{s/cm}$.

California Secondary MCLs – recommended ranges were exceeded for chloride (1,100 mg/l in MW-6 and 3,270 mg/l in MW-3). The recommended secondary MCL for chloride is listed as 250 mg/l.

Detected TDS concentrations ranged from 900 mg/l in MW-5 to 4,710 mg/l in MW-3.

7.0 ADDITIONAL REMEDIAL INVESTIGATION ACTIVITIES

Field activities at the Site were performed from October 26 through December 6, 2007. The scope of work for this additional investigation was conducted in accordance with LFR's Remedial Investigation Workplan dated August 29, 2007 (LFR 2007a). Copies of the workplan and DTSC's approval letter are provided in Appendix H.

LFR initiated remedial investigation activities at the Site on October 26, 2007 with the installation of one additional groundwater monitoring well (MW-7). Soil gas and soil sampling were performed on November 12, November 13, and November 14, 2007. Groundwater monitoring and sampling of the four monitoring wells was conducted on December 6, 2007. Lithologic and well construction logs for the drilling activities are presented in Appendix J. Soil and groundwater samples were collected and logged by LFR personnel using the protocols described in the Quality Assurance Control Plan (QAPP; LFR 2007a). Field activities associated with the most recent phase of investigation at the Site (including mobilization, pre-field activities, utility clearance, and soil, soil gas, and groundwater sampling) are described below. The QAPP is included in Appendix H.

7.1 Pre-Field Activities

Prior to initiating fieldwork, LFR coordinated with subcontractors and site personnel for access to areas of the Site where sampling was to be conducted. LFR prepared a site-specific HSP dated July 22, 2007 to be used in the field by LFR personnel during well installation and sampling activities at the Site, as required by 29 CFR 1910.120. A copy of the HSP was provided to the DTSC. Each proposed boring location was cleared for the presence of underground utilities, and USA was notified a minimum of 48 hours in advance of drilling activities to ensure that borings were not located where they could damage underground utilities.

7.2 Soil Gas Sampling

On November 12 and 13, 2007, Environmental Support Technologies, Inc. (EST), under LFR supervision, advanced 17 borings (SG1 through SG16 and SG8A) using a direct-push drill-rig with a 1-inch diameter hollow tube and 4-foot acetate sleeves fitted into the hollow tube. The borings were advanced to a maximum depth of 10 feet bgs. The objective was to collect soil gas samples in the fill overlying the sump material for laboratory analysis.

Prior to sample collection, the borings were advanced to observe the depth of the fill. At two locations (SG4 and SG8) sump material was observed at a depth of 5 feet bgs. No soil gas samples were collected at these locations. At SG5, SG7, SG8A, and SG16, sump material was found at approximately 10 feet bgs, so a soil gas sample was collected only at the 5-foot depth at these locations.

The overlying fill was observed to consist primarily of silt that ranged from sandy silt to clayey silt.

Soil gas sampling was conducted in general accordance with the QAPP on November 12, November 13, and November 14, 2007. Teflon tubing was placed in the borings at the target sample depths and labeled accordingly. Soil gas samples were collected by EST personnel using a syringe and directly injected into the analytical instrument in their California-certified on-site mobile laboratory for VOC analysis using EPA Method 8260B. The volume for the gas-tight soil-gas syringe samples used was approximately 10 milliliters. The first five dead volumes of gas were discarded to flush the sample tubing and filled with in situ soil gas. Prior to sample collection, a purge volume test was performed at the first sample location to determine the appropriate purge volume.

An additional purge volume test was conducted on November 14, 2007 after VOC concentrations above the laboratory detection limits were detected in soil gas samples collected at SG9 and SG13. Twenty percent of the soil gas samples were subsequently resampled and reanalyzed according to DTSC guidelines.

Soil gas samples were also collected in Tedlar bags at each sampling location and depth for on-site analysis for oxygen, carbon dioxide, hydrogen sulfide, and methane using a Landtec Gem™ 2000 Plus landfill gas monitor and analyzer. Soil gas samples were collected in Tedlar bags for off-site analysis for methane using EPA Method 8015m at the EST laboratory in Irvine, California.

In addition, EST collected six soil gas samples in Summa canisters on November 14, 2007. These soil gas samples were analyzed for VOCs using EPA Method TO-15 by Ace Laboratories, Inc. (Ace) in Thousand Oaks, California.

7.3 Soil Sampling

Soil sampling was conducted on October 26 and November 13, 2007 to evaluate and provide additional information on the extent of impacted soil at the Site. Soil samples for VOC analysis were preserved in VOA vials with methanol and sodium bisulfate in accordance with EPA Method 5035.

On October 26, 2007, under LFR's supervision, Gregg Drilling and Testing (GD&T) drilled a borehole and installed groundwater monitoring well MW-7. Soil samples were collected every 5 feet for lithologic description and PID readings. Three select samples were analyzed for VOCs, SVOCs, TPHcc, and metals. Soil samples were submitted to

SunStar in Tustin, California, following proper chain-of-custody protocol. Field reports are located in Appendix J.

On November 13, 2007, under LFR's supervision, EST advanced two borings (B6A and B7A) in the vicinity of previously drilled borings B-6 and B-7 using a direct-push drill-rig with a 1½-inch diameter hollow tube and 4-foot acetate sleeves fitted into the hollow tube. Boring B6A was advanced to 25 feet bgs, and soil samples were collected at depths of 15, 20, and 25 feet bgs. Boring B7A was advanced to 50 feet bgs, and soil samples were collected at depths of 5, 10, 20, 30, 40, and 50 feet bgs. Soil lithology in these borings consisted predominantly of silt and sandy silt, with some clayey silt. Oily sludge material was found at approximately 10 and 15 feet bgs in borings B7A and B6A, respectively. At 50 feet bgs in boring B7A, the soil was observed to be dark brown sandy silt with oil staining. Boring logs are located in Appendix J.

Soil samples were analyzed for Title 22 metals, VOCs, SVOCs, PCBs, and TPHcc to assess the vertical extent of impacted soil. Based on total metal concentrations for lead and barium, which exceeded 10 times their respective soluble threshold limit concentration (STLC), a Waste Extraction Test (WET) was performed. Two samples were additionally analyzed for pH using EPA Method 9045 and lead using the WET analysis with deionized water to simulate actual pH conditions at the Site.

The three worst-case TPH samples from these borings (B7A-30, B7A-40, and B7A-50) were selected for additional analysis utilizing the Synthetic Precipitation Leaching Procedure (SPLP) with EPA Method 1312/8015, and for the volatile (VPH) and extractable (EPH) fractions of petroleum hydrocarbon mixtures using the MA DEP approach for assessing potential hazard from TPH exposure.

The extraction fluid for the SPLP is an aqueous solution (of sulfuric and nitric acids) intended to simulate rain water. Consequently, the SPLP would provide a more conservative evaluation than deionized water, and evaluate the buffering capacity of Site materials from the effects from acid rain. The VPH and EPH are reported according to categories of aliphatic chain lengths and aromatic carbon numbers.

Soil samples were collected at six locations at depths of approximately 0.5 foot, 5 feet, and 10 feet from the fill material that was placed over the sump. Soil samples were analyzed for California Assessment Manual (CAM) 17 metals using EPA Method 6010B/7471A, organochlorine pesticides using EPA Method 8081A, PCBs using EPA Method 8082, and SVOCs using EPA Method 8082.

Soil samples were submitted to Associated Laboratories (Associated) in Orange, California, following proper chain-of-custody protocol. Field data reports are located in Appendix K.

On January 10, 2008, five drums of non-hazardous soil were transported offsite to TPST Soil Recyclers of CA by American Integrated Services (AIS). The manifest is located in Appendix K.

LFR used a hand auger to advance soil borings at 10 locations along Del Mar Avenue. Soil samples collected from these borings were analyzed for Title 22 metals to establish background metals concentrations for the site vicinity. Soil samples were submitted to SunStar in Tustin, California, following proper chain-of-custody protocol.

7.4 Groundwater Monitoring Well Installation, Development, and Survey

On October 26, 2007 a new groundwater monitoring well (MW-7) was installed on the southern portion of the Site using a hollow-stem auger rig. The purpose of adding the new well was to be able to monitor groundwater flow and direction, and to evaluate groundwater quality downgradient from the Site. A copy of the City of Long Beach well permit is attached in Appendix K.

Well MW-7 was constructed of 2-inch diameter Schedule 40 PVC well casing with 15 feet of 0.020-inch screened casing. MW-7 was advanced to approximately 60 feet bgs, with 10 feet of screened casing placed below the groundwater surface and the remaining 5 feet above the groundwater surface. The well log is located in Appendix J.

Well MW-7 was developed on November 6, 2007. Development consisted of surging for 15 minutes, followed by purging with a 3.5-gallon metal bailer. Significantly more than three well volumes of groundwater were purged from the well to obtain clear groundwater for sampling.

LFR contracted Kelsurveys, a California-licensed surveyor, to conduct a well survey at the Site to establish horizontal control, TOC, and ground surface elevations referenced to msl at the monitoring well locations. Well locations are shown on Figure 11. Well survey data are included in Appendix K.

7.5 Groundwater Sampling

On December 6, 2007, one water sample was obtained from each of the four groundwater monitoring wells for analysis of TPHcc using EPA Method 8015B, VOCs, SVOCs, and metals. The groundwater samples were submitted to SunStar following proper chain-of-custody protocol. On January 10, 2008, three drums of non-hazardous waste liquid were transported offsite to Crosby & Overton in Long Beach, California, by AIS. The non-hazardous waste manifest is located in Appendix K.

8.0 ADDITIONAL REMEDIAL INVESTIGATION RESULTS

8.1 Soil Gas Sampling and Analysis

Analytical results for soil vapor samples collected at the Site are discussed below and summarized on Tables 12 through 14. Soil gas probe installation and monitoring forms from EST are provided in Appendix L.

8.1.1 VOCs

Using the EST on-site mobile laboratory, four VOCs were detected in the 28 samples analyzed using EPA Method 8260B. Tetrachloroethene (PCE) was detected in 12 samples at concentrations ranging from 5.3 $\mu\text{g/l}$ to 9.1 $\mu\text{g/l}$. The highest concentration was detected in sample SG13-5 collected at a depth of 5 feet bgs. The detected PCE concentrations exceeded the California Human Health Screening Level (CHHSL) of 0.603 $\mu\text{g/l}$ for shallow soil gas for commercial/industrial land use. Toluene was detected in five of the samples at concentrations ranging from 1.5 $\mu\text{g/l}$ to 1.6 $\mu\text{g/l}$. Trichloroethene (TCE) was detected in 12 samples at concentrations ranging from 1.2 $\mu\text{g/l}$ to 2.0 $\mu\text{g/l}$. These TCE concentrations exceeded the CHHSL of 1.77 $\mu\text{g/l}$. Meta- and para-xylenes (m,p-xylenes) were detected in five samples at concentrations ranging from 1.2 $\mu\text{g/l}$ to 1.3 $\mu\text{g/l}$. Analytical results for VOCs using EPA Method 8260B are summarized in Table 12 and shown on Figure 12.

Twenty VOCs were detected in the six soil gas samples collected in Summa canisters and analyzed by Ace using EPA Method TO-15. PCE was detected in two of the samples at concentrations of 0.03 $\mu\text{g/l}$ and 0.13 $\mu\text{g/l}$. Toluene was detected in all six samples at concentrations ranging from 0.04 $\mu\text{g/l}$ to 0.35 $\mu\text{g/l}$. TCE was detected in two of the samples at concentrations of 0.01 $\mu\text{g/l}$ and 0.02 $\mu\text{g/l}$. M,p-xylenes were detected in all six samples at concentrations ranging from 0.02 $\mu\text{g/l}$ to 0.47 $\mu\text{g/l}$. O-xylenes were detected in five samples at concentrations ranging from 0.01 $\mu\text{g/l}$ to 0.14 $\mu\text{g/l}$. Ethylbenzene was detected in four of the samples at concentrations ranging from 0.01 $\mu\text{g/l}$ to 0.13 $\mu\text{g/l}$. Benzene was detected in five of the samples at concentrations ranging from 0.02 $\mu\text{g/l}$ to 0.33 $\mu\text{g/l}$. Only two concentrations of benzene exceeded the CHHSL for benzene (0.122 $\mu\text{g/l}$). Analytical results for VOCs using EPA Method TO-15 are summarized in Table 13 and shown on Figure 13.

8.1.2 Methane

A Landtec GEM 2000 Plus field gas monitor and analyzer (Landtec) was used to measure methane concentrations in 32 soil gas samples at the Site on November 12 through November 14, 2007. At 5 feet bgs, detected methane concentrations ranged from 1,000 parts per million by volume (ppmv) to 104,000 ppmv. Three concentrations were detected within the explosive range. At 10 feet bgs, detected methane concentrations ranged from 12 ppmv to 196,000 ppmv. The highest concentration (19.6% by volume) was detected at the SG-11 location at a depth of 10 feet bgs. Soil gas probe installation and monitoring forms from EST showing the methane results are attached as Appendix L.

Methane concentrations were detected in 26 soil gas samples collected on November 14, 2007 and analyzed at EST's stationary laboratory. At 5 feet bgs, detected methane concentrations ranged from 12 ppmv to 180,000 ppmv. At 10 feet bgs, detected methane concentrations ranged from 27 ppmv to 300,000 ppmv. The highest concentration (30% by volume) was detected at the SG-11 location at a depth of 10 feet bgs. Four methane concentrations exceeded the upper explosive limit (UEL) of

15% per volume of air or 150,000 ppmv. Two concentrations were within the explosive limit, at 7.2% and 15%. All the other samples were below the LEL of 5%.

Analytical results for methane are summarized in Table 14. The analytical results for methane at 5 and 10 feet bgs are shown on Figures 14 and 15, respectively. Laboratory reports are included in Appendix M.

8.1.3 Oxygen, Carbon Dioxide, and Hydrogen Sulfide

The Landtec was used to collect oxygen, carbon dioxide, and hydrogen sulfide field measurements at the Site on November 12 through November 14, 2007. Field measurements are summarized below, and soil gas probe installation and monitoring forms from EST showing the soil gas results are provided in Appendix L.

At 5 feet bgs, oxygen concentrations ranged from 0.8% at SG-11 to 19.1% at SG-7. At 10 feet bgs, oxygen concentrations ranged from 0.6% at SG-11 to 15.5% at SG-10.

At 5 feet bgs, carbon dioxide concentrations ranged from 1.1% at SG-7 to 14.6% at SG-11. At 10 feet bgs, carbon dioxide concentrations ranged from 2.3% at SG-13 to 19.3% at SG-6.

Hydrogen sulfide was not detected in any of the samples collected at depths of 5 and 10 feet bgs.

8.2 Soil Sampling and Analysis

8.2.1 Total Petroleum Hydrocarbons as Gasoline

TPHg (C₆-C₁₀) was not detected in any of the samples collected from boring B7A, with one exception. The sample collected from B7A at 10 feet bgs exhibited a TPHg concentration of 5.0 mg/kg.

TPHg was not detected at concentrations above the laboratory reporting limits in the three samples analyzed from borings B6A and MW-7.

8.2.2 Total Petroleum Hydrocarbons as Diesel

In boring B7A, detectable concentrations of total petroleum hydrocarbons as diesel (TPHd [C₁₀-C₂₂]) ranged from 16 mg/kg to 4,070 mg/kg. The highest concentration was detected at a depth of 40 feet bgs. TPHd was not detected at 5 and 20 feet bgs.

TPHd was not detected at concentrations above the laboratory reporting limits in the three samples analyzed from borings B6A and MW-7.

8.2.3 Total Petroleum Hydrocarbons as Motor Oil

In boring B7A, detectable concentrations of total petroleum hydrocarbons as motor oil (TPHmo [C₂₂-C₃₆]) ranged from 24 mg/kg to 8,970 mg/kg. The highest concentration was detected at a depth of 40 feet bgs. The TPHmo concentrations detected in B7A ranged from 30 to 50 feet bgs, and were above the RWQCB's soil screening level (SSL) of 1,000 mg/kg, where the distance is 20 to 150 feet above a drinking water aquifer (RWQCB 1996).

In boring B6A, TPHmo concentrations ranged from 42 mg/kg to 526 mg/kg, with the highest concentration detected in the 25-foot sample. In boring MW-7, TPHmo (C₂₉-C₄₀) was detected only in the 25-foot sample at a concentration of 55 mg/kg.

Analytical results for TPH are summarized in Table 15 and shown on Figure 16.

8.2.4 SPLP TPHcc

TPH in the C₆-C₁₀ range using the SPLP were not detected above the laboratory detection limit in the three samples analyzed. C₁₀-C₂₂ ranged from 4.0 mg/kg to 18 mg/kg, and C₂₂-C₃₆ ranged from 3.6 mg/kg to 22 mg/kg. The highest concentrations were detected in B7A-50. Analytical results for SPLP TPHcc are summarized in Table 15 and shown on Figure 16.

8.2.5 MA DEP EPH

Aliphatic hydrocarbons C₉-C₁₈ ranged from 2,210 mg/kg in B7A-50 to 5,290 mg/kg in B7A-40. Aliphatic hydrocarbons C₁₉-C₃₆ ranged from 3,390 mg/kg in B7A-50 to 7,850 mg/kg in B7A-40. Aromatic hydrocarbons C₁₁-C₂₂ ranged from 2,960 mg/kg in B7A-50 to 6,580 mg/kg in B7A-40. When compared with the MA DEP screening level of 5,000 mg/kg, only the TPH concentration detected in sample B7A-40 (7,850 mg/kg) would be considered a potential hazard or pose a threat to human health or the environment at the Site.

8.2.6 MA DEP VPH

Aliphatic hydrocarbons C₅-C₈ ranged from 54 mg/kg in B7A-40 to 102 mg/kg in B7A-30. Aliphatic hydrocarbons C₉-C₁₂ ranged from 140 mg/kg in B7A-50 to 322 mg/kg in B7A-30. Aromatic hydrocarbons C₉-C₁₀ ranged from 82 mg/kg in B7A-50 to 176 mg/kg in B7A-30. These TPH concentrations were evaluated using the MA DEP screening level of 500 mg/kg. None of these TPH concentrations would be considered a potential hazard or pose a threat to human health or the environment at the Site.

Analytical results for MA DEP EPH/VPH are summarized in Table 16 and shown on Figure 16.

8.2.7 VOCs

No VOCs were detected in the three samples collected from boring B6A or from the three samples collected from MW-7.

Thirteen VOCs (acetone, 1,3,5-trimethylbenzene, 1,2,4-trimethylbenzene, benzene, ethylbenzene, isopropylbenzene, n-butylbenzene, n-propylbenzene, naphthalene, p-isopropyltoluene, sec-butylbenzene, toluene, and total xylenes) were detected in samples collected from boring B7A, as summarized below:

- Acetone (58 $\mu\text{g}/\text{kg}$) was the only VOC detected in the 10-foot sample collected from B7A. No VOCs were detected above the laboratory detection limit in the 20-foot sample from B7A.
- Benzene and toluene were only detected in the 30-foot sample at concentrations of 824 $\mu\text{g}/\text{kg}$ and 307 $\mu\text{g}/\text{kg}$, respectively.
- 1,3,5-Trimethylbenzene was detected in the 30- and 40-foot samples (B7A-30 and B7A-40) at concentrations of 3,120 $\mu\text{g}/\text{kg}$ and 2,240 $\mu\text{g}/\text{kg}$, respectively.
- 1,2,4-Trimethylbenzene was only detected in the 50-foot sample (B7A-50) at a concentration of 10,000 $\mu\text{g}/\text{kg}$.
- Ethylbenzene concentrations ranged from 944 $\mu\text{g}/\text{kg}$ in B7A-30 to 2,960 $\mu\text{g}/\text{kg}$ in B7A-30.
- Isopropylbenzene concentrations ranged from 782 $\mu\text{g}/\text{kg}$ in B7A-40 to 2,080 $\mu\text{g}/\text{kg}$ in B7A-50.
- N-butylbenzene concentrations ranged from 994 $\mu\text{g}/\text{kg}$ in B7A-40 to 1,400 $\mu\text{g}/\text{kg}$ in B7A-30.
- N-propylbenzene concentrations ranged from 1,170 $\mu\text{g}/\text{kg}$ in B7A-40 to 2,560 $\mu\text{g}/\text{kg}$ in B7A-30.
- Naphthalene concentrations ranged from 5,980 $\mu\text{g}/\text{kg}$ in B7A-50 to 8,310 $\mu\text{g}/\text{kg}$ in B7A-30.
- P-isopropyltoluene concentrations ranged from 1,330 $\mu\text{g}/\text{kg}$ in B7A-30 to 1,680 $\mu\text{g}/\text{kg}$ in B7A-40.
- Sec-butylbenzene concentrations ranged from 1,110 $\mu\text{g}/\text{kg}$ in B7A-40 to 1,640 $\mu\text{g}/\text{kg}$ in B7A-30.
- Total xylenes concentrations ranged from 677 $\mu\text{g}/\text{kg}$ in B7A-50 to 8,210 $\mu\text{g}/\text{kg}$ in B7A-30.

VOC analytical results for these three borings are summarized in Table 17 and shown on Figure 17.

8.2.8 SVOCs

No SVOCs were detected in the 18 samples collected from the fill material at depths of 0.5, 5, and 10 feet bgs; in the 3 samples collected from boring B6A at depths of 15, 20, and 25 feet bgs; and in the 3 samples collected from MW-7 at depths of 15, 25, and 35 feet bgs. No SVOCs were detected in the samples collected in boring B7A at depths of 5, 10, and 15 feet bgs.

Three SVOCs (2-methylnaphthalene, 4-methylphenol, and naphthalene) were detected in boring B7A, as summarized below:

- 2-methylnaphthalene concentrations ranged from 26,000 $\mu\text{g}/\text{kg}$ in B7A-50 to 34,700 $\mu\text{g}/\text{kg}$ in B7A-30.
- 4-methylphenol was detected in B7A-30 and B7A-40 at concentrations of 3,680 $\mu\text{g}/\text{kg}$ and 6,150 $\mu\text{g}/\text{kg}$, respectively.
- Naphthalene was detected in B7A-30 and B7A-50 at concentrations of 8,450 $\mu\text{g}/\text{kg}$ and 7,540 $\mu\text{g}/\text{kg}$, respectively. Both concentrations of naphthalene exceed the California-modified iPRG of 4,200 $\mu\text{g}/\text{kg}$.

Analytical results for SVOCs from these three borings are summarized in Table 18 and shown on Figure 18.

8.2.9 Metals

Metals results are discussed in the following sections. Analytical results for metals detected in the fill are summarized in Table 19. Analytical results for metals detected in borings 6A, 7A, and MW-7 are summarized in Table 20 and shown on Figure 19.

Arsenic

Arsenic concentrations detected in the 18 samples collected from the fill ranged from 1.71 mg/kg to 13.7 mg/kg, with an average concentration of 6.55 mg/kg. These arsenic concentrations are within the range and below the average background arsenic concentration of 7.15 mg/kg. Arsenic concentrations in the six samples collected from boring B7A ranged from less than 1.0 mg/kg to 28.6 mg/kg in B7A-30, with an average concentration of 13.74 mg/kg. These arsenic concentrations are above the range and above the average background arsenic concentration of 7.15 mg/kg. Arsenic concentrations in the samples collected from boring B6A ranged from 2.34 mg/kg to 8.86 mg/kg. These arsenic concentrations are within the range and below the average background arsenic concentration of 7.15 mg/kg.

Barium

Barium concentrations detected in the samples collected from the fill ranged from 74 mg/kg to 382 mg/kg, with an average concentration of approximately 183 mg/kg.

These barium concentrations are above the range and slightly above the average background barium concentration of 157.5 mg/kg.

Barium concentrations in the four samples from boring B6A ranged from 113 mg/kg to 249 mg/kg. These barium concentrations are above the range and above the average background barium concentration of 157.5 mg/kg, but below the iPRG of 67,000 mg/kg.

In boring B7A, barium concentrations ranged from 152 mg/kg in B7-20 to 1,600 mg/kg in B7A-40. These barium concentrations are above the range and above the average background barium concentration of 157.5 mg/kg. Two samples from B7A (B7A-30 and B7A-40) exceeded 10 times the STLC for barium. The soluble barium concentrations in B7A-30 and B7A-40 were 35.4 mg/l and 40.7 mg/l, respectively.

Lead

Lead concentrations detected in the samples collected from the fill ranged from 5.13 mg/kg to 86 mg/kg in SB9-10, with an average concentration of 19.7 mg/kg. These lead concentrations are above the range and above the average background lead concentration of 7.15 mg/kg. Soluble lead was detected in SB9-10 at a concentration of 3.22 mg/l.

Lead concentrations in the three samples from boring B6A ranged from 5.2 mg/kg to 10.8 mg/kg, with an average concentration of 7.48 mg/kg. These lead concentrations are within the range and below the average background lead concentration of 7.15 mg/kg.

In boring B7A, lead concentrations ranged from 7.05 mg/kg in B7-20 to 376 mg/kg in B7A-30, with an average concentration of 128.77 mg/kg. These lead concentrations are above the range and above the average background lead concentration of 7.15 mg/kg, and below the iPRG of 800 mg/kg.

Three samples from B7A (B7A-10, B7A-30, and B7A-40) exceeded 10 times the STLC for lead. The soluble lead concentration in B7A-10 was 2.58 mg/l. The soluble lead concentrations in B7A-30 and B7A-40 were 8.54 mg/l and 12.5 mg/l, respectively.

Mercury

No mercury concentrations were detected above the laboratory detection limit in 15 of the 18 samples collected from the fill material. Mercury was detected in three samples, at concentrations ranging from 0.14 mg/kg in SG9-10 to 1.69 mg/kg in SG2-0.5.

Mercury was not detected in any of the samples collected from B6A. Mercury was detected in two of the samples collected from B7A (B7A-30 and B7A-40) at concentrations of 0.59 mg/l and 0.46 mg/l, respectively. These mercury concentrations

are above the range and above the average background mercury concentration of 0.13 mg/kg, and below the iPRG of 310 mg/kg.

Background Metals Concentrations

In a letter dated July 5, 2006, HERD recommended that background soil samples be collected, if feasible, from the same parent materials as found on the Site and analyzed for concentrations of metals to compare to on-site concentrations. Since the Site consists of sump material and imported fill, it is unlikely that background soil samples could be collected from the same parent material. This area has also experienced significant urbanization and industrial use.

LFR collected 10 shallow soil samples along Del Mar Avenue for Title 22 metals analysis that were planned to be used to determine background metals concentrations. However, LFR does not consider these samples to be indicative of background levels, because lead was detected above the laboratory detection limit in 9 of the 10 samples, at concentrations ranging from 47 mg/kg to 230 mg/kg. The average lead concentration in the 10 samples was 72.7 mg/kg. The soil has apparently been impacted from the adjacent street traffic and/or the Metro Blue Line. LFR will compare analytical results for the on-site soil samples with the background metals concentrations provided by the DTSC, as discussed below.

The DTSC provided background metals concentrations from a school site in Long Beach, California. Arsenic concentrations in the four background samples ranged from 5.3 mg/kg to 11 mg/kg, with an average concentration of 7.15 mg/kg. Barium concentrations ranged from 140 mg/kg to 170 mg/kg, with an average concentration of 157.5 mg/kg. Lead concentrations ranged from 5.6 mg/kg to 11 mg/kg, with an average concentration of 7.15 mg/kg. Mercury was detected in two of the samples, at concentrations of 0.10 mg/kg and 0.16 mg/kg, with an average concentration of 0.13 mg/kg. A copy of the summary table for all 17 metals is attached as Appendix I.

8.2.10 PCBs

No PCBs were detected in 17 of the 18 samples collected from the fill material. In sample SG9-10, PCB-1248 and PCB-1260 were detected at concentrations of 0.13 mg/kg and 0.038 mg/kg, respectively.

No concentrations of PCBs detected in samples from the fill material were greater than the iPRG of 0.74 mg/kg (EPA 2004).

No PCBs were detected in the three samples collected from B6A. PCBs were detected in three samples from boring B7A (B7A-30, B7A-40, and B7A-50). Concentrations of PCB-1248 ranged from 0.19 mg/kg in B7A-50 to 0.42 mg/kg in B7A-40. Concentrations of PCB-1260 ranged from 0.046 mg/kg in B7A-50 to 0.12 mg/kg in B7A-40.

Analytical results for PCBs detected in the fill are summarized in Table 21. Analytical results for PCBs detected in borings 6A, 7A, and MW-7 are summarized in Table 22.

8.2.11 Organochlorine Pesticides

Organochlorine pesticides detected in the fill include chlordane, dieldrin, and 4,4-dichlorodiphenyltrichloroethylene (4,4-DDE), as summarized below:

- Chlordane was detected in samples SG13-5 and SG3-10 at concentrations of 0.041 mg/kg and 0.035 mg/kg, respectively.
- Dieldrin was detected in SG2-10 at a concentration of 0.013 mg/kg.
- 4,4-DDE was detected in SG14-0.5 at a concentration of 0.007 mg/kg.

Analytical results for organochlorine pesticides in the fill are summarized in Table 23.

8.2.12 pH

In B7A-30 and B7A-40, pH was measured at 7.82 and 7.79, respectively.

8.3 Groundwater Elevation and Flow Direction

Kelsurveys surveyed the well elevations at the Site on November 6, 2007. Elevation measurements were made from a notch on the north side of each casing; the same location is used to measure depth to groundwater. The elevation of each well is shown on Table 11.

Depth to groundwater was measured at wells MW-3, MW-5, MW-6, and MW-7 on December 3, 2007. Depths to groundwater ranged from 29.56 feet (MW-6) to 49.32 feet (MW-7) below TOC (Table 11).

The depth to groundwater and the elevation for each well were used to calculate the elevation of the potentiometric surface beneath the Site. A map showing horizontal groundwater flow, generally to the south-southeast, is included as Figure 20. The gradient of the potentiometric surface beneath the Site is relatively flat, at approximately 0.64 foot of drop for every 100 feet of distance flowed (or 0.0064 ft/ft).

Groundwater levels have decreased approximately 0.46 foot in MW-5 to 1.16 feet in MW-3 since the previous measurements in December 2006.

8.4 Groundwater Sampling – December 2007

Analytical results for groundwater samples collected from MW-3, MW-5, MW-6, and MW-7 in December 2007 are discussed below. Groundwater analytical results are summarized in Tables 6 through 10 and 11, and shown on Figure 21.

Three metals were detected at concentrations above laboratory reporting limits:

- barium (at concentrations ranging from 86 $\mu\text{g/l}$ and 100 $\mu\text{g/l}$ in MW-5 and MW-6, respectively, to 1,100 $\mu\text{g/l}$ in MW-7)
- mercury (at concentrations of 0.74 $\mu\text{g/l}$ in MW-3 and 5.6 $\mu\text{g/l}$ in MW-6)
- arsenic (at a concentration of 210 $\mu\text{g/l}$ in MW-7)

California MCLs (per CCR Title 22, June 27, 2007) were exceeded for mercury and barium. Mercury was detected in MW-6 at a concentration of 5.6 $\mu\text{g/l}$; the MCL for mercury is 2 $\mu\text{g/l}$. Barium was detected in MW-7 at a concentration of 1,100 $\mu\text{g/l}$; the MCL for barium is 1,000 mg/l . Analytical results for metals are summarized in Table 11 and shown on Figure 21.

TPH was not detected at concentrations above laboratory reporting limits in the groundwater samples collected at the Site, with one exception: TPHd was detected in MW-7 at a concentration of 1.1 mg/l . A summary of historical TPH analytical results is provided in Table 7.

No VOCs or SVOCs were detected at concentrations above laboratory reporting limits in any of the groundwater samples collected at the Site. Historical summaries of the analytical results for VOCs and SVOCs are shown in Tables 8 and 9, respectively.

8.5 Quality Assurance/Quality Control

One duplicate sample was collected during the groundwater monitoring event. Sample DUP-1 was collected as a duplicate from well MW-7. Analytical results for the duplicate sample were generally consistent with results for the primary sample.

Three duplicate soil samples were collected during the soil investigation. Sample SG3-10-Dup was collected as a duplicate of SG3-10; sample SG9-5-Dup was collected as a duplicate of SG9-5; and sample B6A-20-Dup was collected as a duplicate of B6A-20. Analytical results for the duplicate samples were generally consistent with results for the primary samples, with two exceptions:

- In sample SG3-10, chlordane was detected at a concentration of 0.035 mg/kg , which is slightly above the detection limit of 0.025 mg/kg . In the duplicate sample, chlordane was not detected above the laboratory reporting limit.
- In sample SG9-5, DDE and dichlorodiphenyldichloroethane (DDD) were not detected at concentrations above their respective laboratory reporting limits of 0.005 mg/kg and 0.004 mg/kg . In the duplicate samples, DDE and DDD were reported at concentrations of 0.011 mg/kg and 0.006 mg/kg , respectively, which are both slightly above the detection limits.

Two equipment blanks were collected, one during the soil sampling and the other during the groundwater sampling event. Analytical results for the equipment blanks

indicated that there was no cross-contamination of sampling equipment during the sampling activities.

One field blank was collected during the soil sampling. Analytical results for the field blank indicated that there was no cross-contamination from the deionized water that was used to wash sampling equipment during equipment cleaning activities.

9.0 SUMMARY

9.1 Soil

Petroleum hydrocarbons are the predominant contaminant found at the Site, with longer carbon chains predominant. Both extractable and volatile hydrocarbon criteria are near or below the screening levels established using the MA DEP approach for low quality groundwater.

Soils beneath the Site contain significant levels of TPH. The extent of the impacted soil is illustrated on an isopach map developed using historical data (predominantly the ETC cross-sections, as shown on Figures 4 through 6) and data collected by LFR as presented in this report (Figure 7). The isopach map shows that the areas of deepest impact are in two locations in the central and northern portions of the CRG property (the northernmost part of the Site). The largest area extends from LFR boring B3 northward to GEOFON boring GB10, and extends vertically to at least 30 feet bgs. The second area, located north of the first area, is centered around LFR borings B7 and CPT2, and extends vertically to approximately 50 feet bgs. Analysis of soil samples collected in November 2003 indicated that lower-range carbon chain concentrations (C₁₂-C₂₈) ranged from 350 mg/kg to 20,000 mg/kg, and higher-range carbon chain concentrations (C₂₈-C₄₀) ranged from 280 mg/kg to 22,000 mg/kg. Gasoline-range hydrocarbons, tested in three locations at the Site (B3, B4, and B5), were found at concentrations ranging from 0.680 mg/kg to 53 mg/kg.

TPH-impacted soil, as detected in soil samples collected in October and November 2007, consists predominantly of TPHd and TPHmo. In boring B7A, detectable concentrations of TPHd ranged from 16 mg/kg to 4,070 mg/kg, with the highest concentration detected at a depth of 40 feet bgs. TPHd was not detected at depths of 5 and 20 feet bgs. In boring B7A, detectable concentrations of TPHmo ranged from 24 mg/kg to 8,970 mg/kg, with the highest concentration detected at a depth of 40 feet bgs.

No TPHg, TPHd, and TPHmo were detected at concentrations above the RWQCB SSL applicable to the Site.

Using the MA DEP EPH fractions of petroleum hydrocarbon mixtures on the three worst-case samples (B7A-30, B7A-40, and B7A-50) yielded the following results:

- Aliphatic hydrocarbons C₉-C₁₈ ranged from 2,210 mg/kg in B7A-50 to 5,290 mg/kg in B7A-40.
- Aliphatic hydrocarbons C₁₉-C₃₆ ranged from 3,390 mg/kg in B7A-50 to 7,850 mg/kg in B7A-40.
- Aromatic hydrocarbons C₁₁-C₂₂ ranged from 2,960 mg/kg in B7A-50 to 6,580 mg/kg in B7A-40.
- Aliphatic hydrocarbons C₅-C₈ ranged from 54 mg/kg in B7A-40 to 102 mg/kg in B7A-30.
- Aliphatic hydrocarbons C₉-C₁₂ ranged from 140 mg/kg in B7A-50 to 322 mg/kg in B7A-30.
- Aromatic hydrocarbons C₉-C₁₀ ranged from 82 mg/kg in B7A-50 to 176 mg/kg in B7A-30.

When compared with the MA DEP screening levels, only the TPH concentration of 7,850 mg/kg detected in sample B7A-40 would be considered a potential hazard. Based on the depth below ground surface, this concentration is not likely to pose a threat to any receptors.

Using the SPLP to simulate actual Site conditions, TPH in the C₆-C₁₀ range were not detected at concentrations above the laboratory detection limit in the three samples analyzed. C₁₀-C₂₂ ranged from 4.0 mg/kg to 18 mg/kg, and C₂₂-C₃₆ ranged from 3.6 mg/kg to 22 mg/kg. The highest concentrations were detected in B7A-50.

Analytical results for metals in soil samples were below the EPA iPRGs for all metals, with the exception of arsenic, which was detected in borings B1, B2, B3, B5, and B7 at concentrations ranging from 5.8 mg/kg to 24 mg/kg. The iPRG for arsenic is 0.25 mg/kg. Arsenic is a naturally occurring trace metal that has been found in California soils at concentrations ranging between 0.6 mg/kg and 11.0 mg/kg (Kearney 1996). Concentrations of arsenic in all the samples where it was detected exceeded the iPRG, and in three locations (B1, B3, and B7) the concentrations also exceeded expected background levels for southern California soils.

VOCs detected in soil samples were below iPRGs. Benzene, ethylbenzene, toluene, and total xylenes were detected at concentrations above laboratory reporting limits, but none of these VOC concentrations exceeded iPRGs for those compounds.

PCBs and pesticides were detected at concentrations below iPRGs. SVOC analyses found only a few PRG exceedances, with one benzo (a) pyrene exceedance at 50 feet bgs, and two naphthalene exceedances at depth. The iPRGs for SVOCs were not exceeded for those compounds that have iPRGs, with the exception of benzo(a)pyrene in sample B7-50. The iPRG for benzo(a)pyrene is 210 µg/kg.

9.2 VOCs in Soil Gas

PCE, TCE, and benzene were detected slightly above CHHSL concentrations, with a preliminary Johnson and Ettinger evaluation finding insignificant concerns for these compounds.

Four VOCs were detected in the 28 samples analyzed using EPA Method 8260B. PCE was detected in 12 samples at concentrations ranging from 5.3 $\mu\text{g/l}$ to 9.1 $\mu\text{g/l}$. The highest concentration was detected in sample SG13-5 at 5 feet bgs. Toluene was detected in five samples at concentrations ranging from 1.5 $\mu\text{g/l}$ to 1.6 $\mu\text{g/l}$. TCE was detected in 12 samples at concentrations ranging from 1.2 $\mu\text{g/l}$ to 2.0 $\mu\text{g/l}$. M,p-xylenes were detected in five samples at concentrations ranging from 1.2 $\mu\text{g/l}$ to 1.3 $\mu\text{g/l}$. The PCE concentrations in 12 samples exceeded the CHHSL of 0.603 $\mu\text{g/l}$ for shallow soil gas for commercial/industrial land use. The TCE concentrations in seven samples exceeded the CHHSL of 1.77 $\mu\text{g/l}$.

Twenty VOCs were detected in six soil gas samples using EPA Method TO-15. PCE was detected in two of the samples at concentrations of 0.03 $\mu\text{g/l}$ and 0.13 $\mu\text{g/l}$. Toluene was detected in all six samples at concentrations ranging from 0.04 $\mu\text{g/l}$ to 0.35 $\mu\text{g/l}$. TCE was detected in two samples at concentrations of 0.01 $\mu\text{g/l}$ and 0.02 $\mu\text{g/l}$. M,p-xylenes were detected in all six samples at concentrations ranging from 0.02 $\mu\text{g/l}$ to 0.47 $\mu\text{g/l}$. O-xylenes were detected in five samples at concentrations ranging from 0.01 $\mu\text{g/l}$ to 0.14 $\mu\text{g/l}$. Ethylbenzene was detected in four samples at concentrations ranging from 0.01 $\mu\text{g/l}$ to 0.13 $\mu\text{g/l}$. Benzene was detected in five samples at concentrations ranging from 0.02 $\mu\text{g/l}$ to 0.33 $\mu\text{g/l}$. The only VOC concentrations that exceeded the CHHSL were two concentrations of benzene. The CHHSL for benzene is 0.122 $\mu\text{g/l}$.

9.3 Methane

The presence of methane will require consideration and potential mitigation during subsequent design and construction.

Using a field gas monitor and analyzer on 32 soil gas samples, detected methane concentrations ranged from 1,000 ppmv to 104,000 ppmv at 5 feet bgs and from 12 ppmv to 196,000 ppmv at 10 feet bgs. The highest concentration (19.6% by volume) was detected at the SG-11 location at a depth of 10 feet bgs.

Methane concentrations were detected in 26 soil gas samples analyzed at the laboratory. At 5 feet bgs, detected methane concentrations ranged from 12 ppmv to 180,000 ppmv. At 10 feet bgs, detected methane concentrations ranged from 27 ppmv to 300,000 ppmv. The highest concentration (30% by volume of air) was detected at the SG-11 location at a depth of 10 feet bgs. Four methane concentrations exceeded the UEL of 15% per volume of air or 150,000 ppmv. Two concentrations were within the explosive limit, at 7.2% and 15%. Methane concentrations in all the other samples were below the LEL of 5%.

9.4 Groundwater

Given the regional area's degraded surficial aquifers from historic oil production, the conditions observed at the Site appear to be in general accordance with the regional degradation of groundwater quality. Lead has been historically observed, but recent analyses find no significant impact. Detected concentrations of arsenic, barium, and mercury slightly exceeded their respective MCLs. TDS appears to have increased from potential historic Site activities, but regional degradation of groundwater quality limits these concerns.

Seven metals were detected at concentrations above laboratory reporting limits in groundwater samples collected during the sampling event in December 2006, including barium, calcium, copper, magnesium, mercury, silver, and sodium. The California MCL (per CCR Title 22, September 12, 2003) was exceeded for mercury ($7.3 \mu\text{g/l}$ in MW-3).

TPH was not detected at concentrations above laboratory reporting limits in the groundwater samples collected at the Site, with the exception of TPH gasoline range organics (C₆-C₁₂). Concentrations of TPH (C₆-C₁₂) ranged from $0.05 \mu\text{g/l}$ in MW-5 to $0.38 \mu\text{g/l}$ in MW-6.

VOCs and SVOCs were not detected at concentrations above laboratory detection limits in any of the groundwater samples collected at the Site during the December 2006 sampling event.

California Secondary MCLs – recommended ranges (per CCR Title 22, September 12, 2003) for EC were exceeded in MW-5 ($1,700 \mu\text{s/cm}$), MW-6 ($3,660 \mu\text{s/cm}$), and MW-3 ($7,740 \mu\text{s/cm}$). The secondary MCL recommended range for EC is listed as $900 \mu\text{s/cm}$.

California Secondary MCLs – recommended ranges for chloride were exceeded in MW-6 ($1,100 \text{ mg/l}$) and MW-3 ($3,270 \text{ mg/l}$). The secondary MCL recommended range for chloride is listed as 250 mg/l .

Concentrations of TDS and EC in the groundwater increase in the downgradient direction. It is unknown whether the elevated concentrations are due to natural processes or human activity. However, the Gaspar aquifer has historically been intruded by an influx of seawater during low water conditions in an inland direction to areas beyond Carson Street (located north of the Site) toward the crest of the Newport-Inglewood uplift (Poland 1959). Based on the concentrations of TDS detected during the latest sampling event, groundwater enters the Site classified as slightly saline, and exits the Site classified as moderately saline.

Three metals were detected at concentrations above laboratory reporting limits in groundwater samples collected during the sampling event in December 2007, including barium, arsenic, and mercury. California MCLs were exceeded for barium ($1,100 \mu\text{g/l}$

in MW-7) and mercury (5.6 $\mu\text{g/l}$ in MW-6). The detected arsenic concentration (210 $\mu\text{g/l}$) is above the federal MCL for arsenic of 10 $\mu\text{g/l}$.

TPH was not detected at concentrations above laboratory reporting limits in the groundwater samples collected at the Site, with one exception. TPHd was detected in MW-7 at a concentration of 1.1 mg/l.

VOCs and SVOCs were not detected at concentrations above laboratory detection limits in any of the groundwater samples collected at the Site during the December 2007 sampling event.

10.0 CONCLUSIONS

10.1 Soil

In November 2003 and May 2004, LFR advanced soil borings, installed two additional groundwater monitoring wells, and performed soil and groundwater sampling at the Site. Additional groundwater sampling was performed in December 2006. In response to DTSC comments, LFR implemented additional investigation activities in November 2007. LFR advanced soil borings, installed one additional groundwater monitoring well, and performed soil gas, soil, and groundwater sampling at the Site. Groundwater sampling was performed in December 2007. The objective of the soil gas, soil, and groundwater sampling activities was to further characterize the extent of impacted soil and groundwater in order to continue the process of site remediation.

Petroleum hydrocarbons are the predominant contaminant found at the Site, with longer carbon chains predominant. Both extractable and volatile hydrocarbon criteria are near or below the screening levels established using the MA DEP approach for low quality groundwater. The areas of deepest impact are in two locations in the central and northern portions of the CRG property.

Analytical results for TPH in soil samples collected by LFR in 2003 indicated TPHd and TPHmo exceeded SSLs at depths ranging from 10 to 50 feet bgs in borings located in the central and northern portions of the Site. Analytical results in 2007 confirmed TPHd was present at concentrations above the SSL in boring B7A from 30 to 50 feet bgs.

When compared with the MA DEP screening levels, only the TPH concentration detected in sample B7A-40 (7,850 mg/kg) would be considered a potential hazard. Based on the depth below ground surface, this concentration is not likely to pose a threat to any receptors.

Analytical results for VOCs collected in soil samples by LFR in 2003 indicated VOCs were not present at levels above iPRGs. Analytical results in 2007 confirmed that

VOCs were not present above the iPRGs in the sump samples collected from the three borings drilled on the Site in November 2007.

SVOC analyses found only a few PRG exceedances, with one benzo (a) pyrene exceedance at 50 feet bgs, and two naphthalene exceedances at depth. Analytical results for SVOCs collected in soil samples by LFR in 2003 indicated that benzo(a)pyrene at a depth of 50 feet bgs in boring B7 was the only SVOC that exceeded the iPRG. Analytical results in 2007 found that the only SVOC to exceed the iPRG was naphthalene at 30 and 50 feet bgs in boring B7A. Based on the depth below ground surface, these concentrations would not likely pose a threat to any receptors.

The only metals of concern identified at the Site are arsenic (concentrations slightly above typical California background levels to as high as 28.6 mg/kg) and lead (STLC concentrations exceeded for disposal purposes; however, a deionized water evaluation suggested no significant water quality threat).

Analytical results for soil samples collected by LFR in 2003 were below iPRGs for all metals, with one exception. Arsenic was detected at 50 feet bgs in borings B1, B2, B3, B5, and B7 at concentrations ranging from 5.8 mg/kg to 24 mg/kg. Analytical results for soil samples collected in 2007 confirmed that arsenic concentrations were present above the iPRG in samples collected from fill material and from sump material. In the fill, two samples collected at 0.5 feet bgs exhibited arsenic concentrations of 11.5 mg/kg and 13.7 mg/kg, which were greater than the highest background arsenic concentration of 11 mg/kg. Only two arsenic concentrations detected in samples collected from the sump material were greater than the highest background concentration. Arsenic was detected at concentrations of 28.6 mg/kg and 28.5 mg/kg at depths of 30 and 40 feet bgs, respectively, in boring B7.

Concentrations of lead above the iPRG of 800 mg/kg were not detected in either LFR investigation. Soluble concentrations of lead above the STLC that would be considered hazardous if excavated and disposed of offsite were detected in boring B7 at depths of 30 and 40 feet bgs. However, an STLC extraction using deionized water indicated that soluble lead is less than 5 mg/l and would be considered acceptable to leave in place.

No PCBs or organochlorine pesticides have been detected at concentrations above iPRGs during LFR's investigations.

10.2 Soil Gas

PCE, TCE, and benzene were detected at concentrations slightly above CHHSLs, with a preliminary Johnson and Ettinger evaluation finding insignificant concerns for these compounds.

Analytical results of soil gas samples collected in the fill and analyzed for VOCs using EPA Method 8260B indicated only PCE and TCE were detected at concentrations greater than the CHHSLs. Detectable PCE concentrations ranged from 5.3 $\mu\text{g/l}$ to

9.1 $\mu\text{g}/\text{l}$, and TCE concentrations ranged from 1.8 $\mu\text{g}/\text{l}$ to 2.0 $\mu\text{g}/\text{l}$. Using EPA Method TO-15, benzene was the only VOC that exceeded the CHHSL. Benzene was detected at concentrations of 0.20 $\mu\text{g}/\text{l}$ and 0.33 $\mu\text{g}/\text{l}$, which are only slightly above the CHHSL of 0.122 $\mu\text{g}/\text{l}$.

A preliminary screening based on the Johnson and Ettinger soil gas screening model was conducted for the highest concentrations of benzene, PCE, and TCE. The risk for commercial usage of the Site was calculated for benzene at 9.6×10^{-7} . For PCE and TCE the risk was calculated to be 5.1×10^{-6} and 3.9×10^{-7} , respectively. Only PCE was calculated to be above the target risk criteria of 1×10^{-6} .

10.3 Methane

The presence of methane will require consideration and potential mitigation during subsequent design and construction.

Methane was detected at concentrations up to 30%, concentrations within the LEL, and concentrations greater than the UEL during LFR's investigation. These concentrations corroborate the methane concentrations detected in a previous investigation by others, where methane concentrations ranged from 12.1% to 83.6%.

10.4 Groundwater

Historically, TPHcc, VOCs, and SVOCs have either not been detected in groundwater samples or were detected at concentrations well below their respective MCLs. Given the regional area's degraded surficial aquifers from historic oil production, while some degradation was observed at the Site, the conditions appear to be in general accordance with the regional degradation of groundwater quality. Lead has been historically observed, but recent analyses find no significant impact. Arsenic, barium, and mercury were detected at concentrations that slightly exceed the MCLs. TDS appears to have increased from potential historic Site activities, but regional degradation limits these concerns.

Lead was detected at concentrations above the MCL of 15 $\mu\text{g}/\text{l}$ in groundwater samples collected from three of the groundwater wells in 1994 and 1997, including upgradient well MW-4. In 2004, lead was detected at 16 $\mu\text{g}/\text{L}$ in MW-5 (the replacement upgradient well for MW-4). In subsequent sampling, lead has not been detected in groundwater samples.

Arsenic was previously detected in MW-3, MW-5, and MW-6 at concentrations ranging from 7.8 $\mu\text{g}/\text{l}$ to 15 $\mu\text{g}/\text{l}$. In 2003, an estimated arsenic concentration of 72 $\mu\text{g}/\text{l}$ was reported in MW-3. In recently installed MW-7, arsenic was detected at a concentration of 210 $\mu\text{g}/\text{l}$, which is greater than the Federal MCL of 10 $\mu\text{g}/\text{l}$.

Barium has historically not been detected above the MCL in any of the wells. In recently installed MW-7, barium was detected at a concentration of 1,100 $\mu\text{g/l}$, which is slightly above the MCL of 1,000 $\mu\text{g/l}$.

Mercury has historically been detected in MW-3 and MW-6 at concentrations ranging from 0.82 $\mu\text{g/l}$ to 160 $\mu\text{g/l}$. In December 2007, mercury was detected in two of the wells (MW-3 and MW-7) at concentrations of 0.74 $\mu\text{g/l}$ and 5.6 $\mu\text{g/l}$, respectively. The MCL for mercury is 2 $\mu\text{g/l}$.

In January 1996, TDS concentrations ranged from 2,690 mg/l (MW-4) to 10,800 mg/l (MW-2). In 2006, TDS concentrations ranged from 900 mg/l (MW-5) to 4,710 mg/l (MW-3). Although TDS increased across the Site, historically the Gaspur aquifer has been intruded by an influx of seawater during low water conditions in an inland direction to areas beyond the Site.

Groundwater in the region is degraded from numerous and complex interactions of nature as well as historical man-caused activities that date back numerous decades. The Site apparently also contributed to the regional degradation, but does not appear to be the sole or even the primary cause of groundwater degradation.

Remedial consideration of historical Site activities would be highly problematic within this environment, and would do little to remedy potential historical discharges within the context of the region's degraded groundwater. Salt is not easily remedied, and pump and treat options would pose highly costly challenges and could exacerbate the regional condition.

LFR presented these conclusions to the DTSC and RWQCB on July 23, 2008 in a meeting to discuss groundwater issues. The understandings reached with the DTSC and RWQCB are summarized in LFR's letter dated October 10, 2008 (attached as Appendix O). The DTSC accepted LFR's responses in their letter dated October 10, 2008 (attached as Appendix P).

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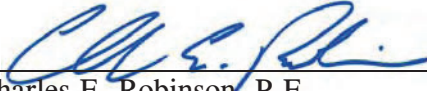
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12.0 SIGNATURES OF ENVIRONMENTAL PROFESSIONALS

All information, conclusions, and recommendations in this document have been prepared under the supervision of and reviewed by the undersigned of LFR Inc.



May 27, 2009

Charles E. Robinson, P.E.

Date

Vice President/Principal Engineer

California Professional Civil Engineer #C-035368



TABLES

Table 1
 Summary of Soil Samples Analyzed for Metals
 3701 Pacific Place, Long Beach, CA
 CRG Properties
 Former Oil Operators North Site
 002-10231-03

Sample ID	Sample Depth (ft bgs)	Date Sampled	Lab	Lab ID	Antimony EPA 6010B mg/kg	Arsenic EPA 6010B mg/kg	Barium EPA 6010B mg/kg	Beryllium EPA 6010B mg/kg	Cadmium EPA 6010B mg/kg	Chromium EPA 6010B mg/kg	Cobalt EPA 6010B mg/kg	Copper EPA 6010B mg/kg	Lead EPA 6010B mg/kg	Mercury EPA 7471A mg/kg	Molybdenum EPA 6010B mg/kg	Nickel EPA 6010B mg/kg	Selenium EPA 6010B mg/kg	Silver EPA 6010B mg/kg	Thallium EPA 6010B mg/kg	Vanadium EPA 6010B mg/kg	Zinc EPA 6010B mg/kg
B1-50	50	11/21/03	SunStar	T301260-13	<3	14	140	<1	2.0	22	9.2	21	10	<0.1	1.0	18	<5	<2	<2	31	60
B2-50	50	11/21/03	SunStar	T301260-01	<3	5.8	35	<1	<2	3.8	5.2	15	3.5	<0.1	<1	7.6	<5	<2	<2	12	32
B3-50	50	11/21/03	SunStar	T301260-02	<3	12	59	<1	<2	9.9	7.7	21	4.1	<0.1	<1	17	<5	<2	<2	17	48
B4-50	50	11/22/03	SunStar	T301260-43	<3	<5	38	<1	<2	<2	5.2	8.7	3.6	<0.1	<1	7.0	<5	<2	<2	11	36
B5-50	50	11/21/03	SunStar	T301260-03	<3	8.4	62	<1	<2	13	9.6	23	6.2	<0.1	<1	19	<5	<2	<2	29	65
B6-50	50	11/22/03	SunStar	T301260-33	<3	<5	77	<1	<2	13	9.1	16	4.3	<0.1	<1	13	<5	<2	<2	32	45
B7-50	50	11/21/03	SunStar	T301260-23	<3	24	340	<1	<2	29	8.5	54	350	<0.1	1.6	32	<5	<2	<2	22	210
iPRGs					410	0.25*	67,000	1,900	450	100,000	1,900	41,000	800	310	5,100	20,000	5,100	5,100	67	1000	100,000

ID = Identification

ft bgs = feet below ground surface

mg/kg = milligrams per kilogram

< = Not detected above laboratory reporting limit indicated.

SunStar = SunStar Laboratories Inc., Tustin, CA.

iPRG = Preliminary Residential Goals for Industrial Sites

* = California-modified PRG

QAI/QC

Table 2
Summary of Soil Samples Analyzed for Total Petroleum Hydrocarbon Chain Range (TPHcc)
3701 Pacific Place, Long Beach, CA
CRG Properties
Former Oil Operators North Site
002-10231-03

Sample ID	Sample Depth (ft bgs)	Date Sampled	Lab	Lab ID	C6-C12	C12-C28	C28-C40	Gasoline Range Hydrocarbons
					EPA 8015M mg/kg	EPA 8015M mg/kg	EPA 8015M mg/kg	EPA 8015M µg/kg
B1-35	35	11/21/03	SunStar	T301260-10	<10	<10	<10	--
B1-50	50	11/21/03	SunStar	T301260-13	<10	<10	<10	--
B2-30	30	11/21/03	SunStar	T301254-06	<10	<10	<10	--
B2-50	50	11/21/03	SunStar	T301260-01	<10	<10	<10	--
B3-10	10	11/21/03	SunStar	T301254-12	<10	20,000	22,000	--
B3-25	25	11/21/03	SunStar	T301254-15	--	350	280	4,900
B3-30	30	11/21/03	SunStar	T301254-16	--	14,000	11,000	53,000
B3-45	45	11/21/03	SunStar	T301254-19	--	<10	<10	<500
B3-50	50	11/21/03	SunStar	T301260-02	<10	<10	<10	--
B4-10	10	11/22/03	SunStar	T301260-35	<10	8,400	22,000	--
B4-15	15	11/22/03	SunStar	T301260-36	--	<10	<10	<500
B4-20	20	11/22/03	SunStar	T301260-37	--	<10	<10	680
B4-50	50	11/22/03	SunStar	T301260-43	<10	<10	<10	--
B5-15	15	11/21/03	SunStar	T301254-23	<10	17,000	20,000	--
B5-20	20	11/21/03	SunStar	T301254-24	--	12,000	11,000	7,300
B5-25	25	11/21/03	SunStar	T301254-25	--	<10	<10	<500
B5-40	40	11/21/03	SunStar	T301254-28	--	<10	<10	<500
B5-45	45	11/21/03	SunStar	T301254-29	--	<10	<10	<500
B5-50	50	11/21/03	SunStar	T301260-03	<10	<10	<10	--
B6-30	30	11/22/03	SunStar	T301260-29	<10	<10	<10	--
B6-50	50	11/22/03	SunStar	T301260-33	<10	<10	<10	--
B7-35	35	11/21/03	SunStar	T301260-20	<10	15,000	20,000	--
B7-50	50	11/21/03	SunStar	T301260-23	<10	20,000	22,000	--

ID = Identification
ft bgs = feet below ground surface
mg/kg = milligrams per kilogram
µg/kg = micrograms per kilogram
< = Not detected above laboratory reporting limit indicated.
SunStar = SunStar Laboratories Inc., Tustin, CA.
-- = Not analyzed.

QA/QC 

Table 3
Summary of Soil Samples Analyzed for Polychlorinated Biphenyls (PCBs)
3701 Pacific Place, Long Beach, CA
CRG Properties
Former Oil Operators North Site
002-10231-03

Sample ID	Sample Depth (ft bgs)	Date Sampled	Lab	Lab ID	PCB-1016	PCB-1221	PCB-1232	PCB-1242	PCB-1248	PCB-1254	PCB-1260
					EPA 8082 µg/kg	EPA 8082 µg/kg	EPA 8082 µg/kg	EPA 8082 µg/kg	EPA 8082 µg/kg	EPA 8082 µg/kg	EPA 8082 µg/kg
B1-50	50	11/21/03	SunStar	T301260-13	<10	<10	<10	<10	<10	<10	<10
B2-50	50	11/21/03	SunStar	T301260-01	<10	<10	<10	<10	<10	<10	<10
B3-50	50	11/21/03	SunStar	T301260-02	<10	<10	<10	<10	<10	<10	<10
B4-50	50	11/22/03	SunStar	T301260-43	<10	<10	<10	<10	<10	<10	<10
B5-50	50	11/21/03	SunStar	T301260-03	<10	<10	<10	<10	<10	<10	<10
B6-50	50	11/22/03	SunStar	T301260-33	<10	<10	<10	<10	<10	<10	<10
B7-50	50	11/21/03	SunStar	T301260-23	<10	<10	<10	<10	<10	<10	<10

ID = Identification

ft bgs = feet below ground surface

µg/kg = micrograms per kilogram

< = Not detected above laboratory reporting limit indicated.

SunStar = SunStar Laboratories Inc., Tustin, CA.

QA/QC *Am*

Table 4
 Summary of Soil Samples Analyzed for Volatile Organic Compounds (VOCs)
 3701 Pacific Place, Long Beach, CA
 CRG Properties
 Former Oil Operators North Site
 002-10231-03

Sample ID	Sample Depth (ft bgs)	Date Sampled	Lab	Lab ID	1,2,4-Trimethylbenzene EPA 8260B µg/kg	1,3,5-Trimethylbenzene EPA 8260B µg/kg	Benzene EPA 8260B µg/kg	Ethylbenzene EPA 8260B µg/kg	Isopropylbenzene EPA 8260B µg/kg	m,p-Xylene EPA 8260B µg/kg	Naphthalene EPA 8260B µg/kg	n-Butylbenzene EPA 8260B µg/kg	n-Propylbenzene EPA 8260B µg/kg	o-Xylene EPA 8260B µg/kg	p-Isopropyltoluene EPA 8260B µg/kg	sec-Butylbenzene EPA 8260B µg/kg	Toluene EPA 8260B µg/kg
B1-35	35	11/21/03	SunStar	T301260-10	<2	<2	<2	<2	<2	<4	<2	<2	<2	<2	<2	<2	<2
B1-50	50	11/21/03	SunStar	T301260-13	<2	<2	<2	<2	<2	<4	<2	<2	<2	<2	<2	<2	<2
B2-30	30	11/21/03	SunStar	T301254-06	<2	<2	<2	<2	<2	<4	<2	<2	<2	<2	<2	<2	<2
B2-50	50	11/21/03	SunStar	T301254-10	<2	<2	<2	<2	<2	<4	<2	<2	<2	<2	<2	<2	<2
B3-10	10	11/21/03	SunStar	T301254-12	210	60	63	52	22	180	140	25	36	81	34	<2	45
B3-25	25	11/21/03	SunStar	T301254-15	3.1	<2	4.4	38	19	4.8	<2	8.1	31	<2	3.3	11	<2
B3-30	30	11/21/03	SunStar	T301254-16	62	<2	51	290	130	7.2	360	41	190	10	49	75	<2
B3-45	45	11/21/03	SunStar	T301254-19	<2	<2	<2	<2	<2	<4	<2	<2	<2	<2	<2	<2	<2
B3-50	50	11/21/03	SunStar	T301254-20	<2	<2	<2	<2	<2	<4	<2	<2	<2	<2	<2	<2	<2
B4-10	10	11/22/03	SunStar	T301260-35	<2	<2	<2	<2	<2	<4	<2	<2	<2	<2	<2	<2	<2
B4-50	50	11/22/03	SunStar	T301260-43	<2	<2	<2	<2	<2	<4	<2	<2	<2	<2	<2	<2	<2
B5-15	15	11/21/03	SunStar	T301254-23	130	35	10	24	13	42	130	10	17	22	18	11	7.3
B5-20	20	11/21/03	SunStar	T301254-24	94	21	21	16	7.8	58	73	8.2	13	27	13	7.7	8.0
B5-25	25	11/21/03	SunStar	T301254-25	<2	<2	<2	<2	<2	<4	<2	<2	<2	<2	<2	<2	<2
B5-40	40	11/21/03	SunStar	T301254-28	<2	<2	<2	<2	<2	<4	<2	<2	<2	<2	<2	<2	<2
B5-45	45	11/21/03	SunStar	T301254-29	<2	<2	<2	<2	<2	<4	<2	<2	<2	<2	<2	<2	<2
B5-50	50	11/21/03	SunStar	T301254-30	<2	<2	<2	<2	<2	<4	<2	<2	<2	<2	<2	<2	<2
B6-30	30	11/22/03	SunStar	T301260-29	<2	<2	<2	<2	<2	<4	<2	<2	<2	<2	<2	<2	<2
B6-50	50	11/22/03	SunStar	T301260-33	<2	<2	<2	<2	<2	<4	<2	<2	<2	<2	<2	<2	<2
B7-35	35	11/21/03	SunStar	T301260-20	120	27	40	29	11	140	110	6.7	15	47	12	7.2	19
B7-50	50	11/21/03	SunStar	T301260-23	360	92	580	160	37	520	150	<2	64	87	49	30	28
					iPRGs	170,000	70,000	1,400	400,000	420,000	4200*	240,000	240,000	420,000	420,000	220,000	520,000

Note: VOCs are shown for detected compounds only. See laboratory reports for a complete list of compounds analyzed.

ID = Identification

ft bgs = feet below ground surface

µg/kg = micrograms per kilogram

< = Not detected above laboratory reporting limit indicated.

SunStar = SunStar Laboratories Inc., Tustin, CA.

iPRG = Preliminary Residential Goals for Industrial Sites

* = California-modified PRG

-- = Not available

QA/QC 

Table 5
Summary of Soil Samples Analyzed for Semi-Volatile Organic Compounds (SVOCs)
3701 Pacific Place, Long Beach, CA
CRG Properties
Former Oil Operators North Site
002-10231-03

Sample ID	Sample Depth (ft bgs)	Date Sampled	Lab	Lab ID	1-Methylnaphthalene	2-Methylnaphthalene	Benzo (a) pyrene	Fluorene	Naphthalene	Phenanthrene
					EPA 8270C µg/kg	EPA 8270C µg/kg	EPA 8270C µg/kg	EPA 8270C µg/kg	EPA 8270C µg/kg	EPA 8270C µg/kg
B1-50	50	11/21/03	SunStar	T301260-13	<300	<300	<300	<300	<300	<300
B2-50	50	11/21/03	SunStar	T301260-01	<300	<300	<300	<300	<300	<300
B3-10	10	11/21/03	SunStar	T301254-12	9,300	6,400	<300	1,500	1,600	2,200
B3-50	50	11/21/03	SunStar	T301260-02	<300	<300	<300	<300	<300	<300
B4-10	10	11/22/03	SunStar	T301260-35	<300	<300	<300	<300	<300	<300
B4-50	50	11/22/03	SunStar	T301260-43	<300	<300	<300	<300	<300	<300
B5-15	15	11/21/03	SunStar	T301254-23	6,300	4,900	<300	1,300	1,100	1,800
B5-50	50	11/21/03	SunStar	T301260-03	<300	<300	<300	<300	<300	<300
B6-50	50	11/22/03	SunStar	T301260-33	<300	<300	<300	<300	<300	<300
B7-50	50	11/21/03	SunStar	T301260-23	8,700	5,300	400	<300	3,600	2,200
iPRGs					--	-	210	26,000,000	190,000	--

Note: SVOCs are shown for detected compounds only. See laboratory ID = Identification
ft bgs = feet below ground surface
µg/kg = micrograms per kilogram
< = Not detected above laboratory reporting limit indicated.
SunStar = SunStar Laboratories Inc., Tustin, CA.
reports for a complete list of compounds analyzed.
iPRG = Preliminary Residential Goals for Industrial Sites
-- = Not Available

QA/QC 

Table 6
 Summary of Groundwater Samples Analyzed for Metals
 3701 Pacific Place, Long Beach, CA
 CRG Properties
 Former Oil Operators North Site
 002-10231-03

Sample ID	Date Sampled	Lab	Lab ID	Antimony	Arsenic	Barium	Beryllium	Cadmium	Calcium	Chromium	Cobalt	Copper	Lead	Magnesium	Mercury	Molybdenum	Nickel	Selenium	Silver	Sodium	Thallium	Vanadium	Zinc
				EPA 6010B µg/L	EPA 6010B µg/L	EPA 6010B µg/L	EPA 6010B µg/L	EPA 6010B µg/L	EPA 6010B µg/L	EPA 6010B µg/L	EPA 6010B µg/L	EPA 6010B µg/L	EPA 6010B µg/L	EPA 6010B µg/L	EPA 6010B µg/L	EPA 6010B µg/L	EPA 6010B µg/L	EPA 6010B µg/L	EPA 6010B µg/L	EPA 6010B µg/L	EPA 6010B µg/L	EPA 6010B µg/L	EPA 6010B µg/L
MW-3	01/10/96	STS	--	--	--	--	--	--	--	ND	--	75	ND	--	--	--	ND	--	--	--	--	--	20
	2/17-19/97	STS	--	--	--	--	--	--	--	ND	--	ND	280	--	--	--	65	--	--	--	--	--	130
	12/19/03	SunStar	T301367-01	<100	72 J	150	<50	<50	--	<50	<50	<50	<50	--	4.8	24 J	<50	<250	84 J	--	<100	<100	12 J
	05/19/04	SunStar	T400513-01	<15	15	290	<3	<5	--	<10	<50	<50	<10	<10	--	160	<50	<25	<50	--	<10	<40	66
	12/16/06	SunStar	T601731-01	<50	7.8	140	<50	<50	5,200	<50	<50	400	<1.4	<1.4	2,100	0.82	<50	<50	62	24,000	<50	<50	<50
MW-5	12/03/07	SunStar	T701575-02	<50	<20	<50	<50	<50	--	<50	<50	<50	<8.6	--	0.74	<50	<50	<50	<50	--	<50	<50	<50
	05/19/04	STS	T400513-02	<15	<10	97	<3	<5	--	<10	<50	<50	16	--	<0.5	<50	<50	<25	<50	--	<10	<40	140
	12/18/06	SunStar	T601731-02	<50	12	100	<50	<50	3,200	<50	<50	55	<1.4	750	<0.5	<50	<50	<50	<50	5,100	<50	<50	<50
	12/3/2007	SunStar	T701575-04	<50	<20	<50	<50	<50	--	<50	<50	<50	<8.6	--	<0.5	<50	<50	<50	<50	--	<50	<50	<50
MW-6	05/19/04	STS	T400513-03	22	<10	180	<3	<5	--	<10	<50	<50	<10	--	12	<50	<50	52	<50	--	<10	59	180
	12/18/06	SunStar	T601731-03	<50	12	100	<50	<50	4,100	<50	<50	140	<1.4	1,200	7.3	<50	<50	<50	<50	12,000	<50	<50	<50
MW-7	12/03/07	SunStar	T701575-05	<50	<20	<50	<50	<50	--	<50	<50	<50	<8.6	--	5.6	<50	<50	<50	<50	--	<50	<50	<50
	12/03/07	SunStar	T701575-06	<50	210	1,100	<50	<50	--	<50	<50	<50	<8.6	--	<0.5	<50	<50	<50	<50	--	<50	<50	<50
<i>The following wells have not been located since the 1997 sampling event</i>																							
MW-2	01/10/96	STS	--	--	--	--	--	--	--	ND	--	80	ND	--	--	--	ND	--	--	--	--	--	120
	2/17-19/97	STS	--	--	--	--	--	--	--	ND	--	ND	210	--	--	--	ND	--	--	--	--	--	200
MW-4	01/10/96	STS	--	--	--	--	--	--	--	ND	--	74	ND	--	--	--	ND	--	--	--	--	--	40
	2/17-19/97	STS	--	--	--	--	--	--	--	ND	--	ND	130	--	--	--	ND	--	--	--	--	--	100
MCLs				6	10	1,000	4	5	--	50	--	1,000*	15	--	2	--	100	50	100*	--	2	50**	5,000

µg/L = micrograms per liter
 < = Not detected above laboratory reporting limit indicated, except for arsenic and lead where the method detection limit (MDL) is shown.
 SunStar = SunStar Laboratories Inc., Tustin, CA.
 STS = Southland Technical Services, Inc., Montebello, CA.
 MCLs = Maximum Contaminant Levels
 -- = Not available
 * = Secondary MCL
 ** = Action Level (AL) for unregulated chemical requiring monitoring.
 J = Detected below the standard reporting limit, the result is an estimated concentration.
 Note - Groundwater analysis from 2004 has a lower method detection limit.



Table 7

Summary of Groundwater Samples Analyzed for TPHcc and TRPH
 3701 Pacific Place, Long Beach, CA
 CRG Properties
 Former Oil Operators North Site
 002-10231-03

Sample ID	Date Sampled	Laboratory	C6-C12 EPA 8015M mg/l	C13-C28 EPA 8015M mg/l	C29-C40 EPA 8015M mg/l	TPH EPA 8015M mg/l	TRPH EPA 8015M mg/l
MW-3	01/10/96	STS	--	--	--	ND	ND
	2/17-19/97	STS	--	--	--	ND	ND
	12/19/03	SunStar	<0.1	<0.1	<0.1	--	--
	05/19/04	SunStar	<0.1	<0.1	<0.1	--	--
	12/18/06	SunStar	0.13	<0.05	<0.1	--	--
	12/03/07	SunStar	<0.50	<0.50	<0.50	--	--
MW-5	05/19/04	SunStar	<0.1	<0.1	<0.1	--	--
	12/18/06	SunStar	0.05	<0.50	<0.50	--	--
	12/03/07	SunStar	<0.50	<0.50	<0.50	--	--
MW-6	05/19/04	SunStar	<0.1	<0.1	<0.1	--	--
	12/18/06	SunStar	0.38	<0.05	<0.1	--	--
	12/03/07	SunStar	<0.50	<0.50	0.50	--	--
MW-7	12/03/07	SunStar	<0.50	1.1	<0.50	--	--
<i>The following wells have not been located since the 1997 sampling event</i>							
MW-2	01/10/96	STS	--	--	--	ND	1.4
	2/17-19/97	STS	--	--	--	ND	ND
MW-4	01/10/96	STS	--	--	--	ND	ND
	2/17-19/97	STS	--	--	--	ND	ND

Notes:

- TPHcc = Total petroleum hydrocarbons with carbon chain identification
- TRPH = Total recoverable petroleum hydrocarbons
- < = Not detected above laboratory reporting limit indicated.
- ID = Identification
- mg/l = milligrams per liter
- SunStar = SunStar Laboratories Inc., Tustin, CA.
- STS = Southland Technical Services, Inc., Montebello, CA.
- = Not Available
- ND = Not detected above laboratory reporting limit (reporting limits from previous investigations are not available)

QA/QC 

Table 8
Summary of Groundwater Samples Analyzed for VOCs
3701 Pacific Place, Long Beach, CA
CRG Properties
Former Oil Operators North Site
002-10231-03

Sample ID	Date Sampled	Laboratory	Benzene EPA 8260B µg/L	Toluene EPA 8260B µg/L	Ethylbenzene EPA 8260B µg/L	Xylenes EPA 8260B µg/L
MW-3	01/10/96	STS	ND	ND	0.9	2.4
	2/17-19/97	STS	88	1.6	15	10
	12/19/03	SunStar	<0.5	<0.5	<0.5	<1.5
	05/19/04	SunStar	<0.5	<0.5	<0.5	<1.5
	12/18/06	SunStar	<0.5	<0.5	<0.5	<1.5
	12/3/2007	SunStar	<0.5	<0.5	<0.5	<1.5
MW-5	05/19/04	SunStar	<0.5	<0.5	<0.5	<1.5
	12/18/06	SunStar	<0.5	<0.5	<0.5	<1.5
	12/03/07	SunStar	<0.5	<0.5	<0.5	<1.5
MW-6	05/19/04	SunStar	<0.5	<0.5	<0.5	<1.5
	12/18/06	SunStar	<0.5	<0.5	<0.5	<1.5
	12/03/07	SunStar	<0.5	<0.5	<0.5	<1.5
MW-7	12/03/07	SunStar	<0.5	0.95	<0.5	<1.5
<i>The following wells have not been located since the 1997 sampling event</i>						
MW-2	01/10/96	STS	ND	ND	ND	ND
	2/17-19/97	STS	0.6	ND	ND	ND
MW-4	01/10/96	STS	ND	0.5	ND	ND
	2/17-19/97	STS	ND	ND	ND	ND
MCLs			1	150	300	1,750

Note: See laboratory reports for a complete list of compounds analyzed.

VOCs = Volatile Organic Compounds

ID = Identification

µg/L = micrograms per liter

< = Not detected above laboratory reporting limit indicated.

SunStar = SunStar Laboratories Inc., Tustin, CA.

STS = Southland Technical Services, Inc., Montebello, CA.

ND = Non-detect.

-- = Not Available.

MCLs = Maximum Contamination Levels


QA/QC 

Table 9
Summary of Groundwater Samples Analyzed for SVOCs
3701 Pacific Place, Long Beach, CA
CRG Properties
Former Oil Operators North Site
002-10231-03

Sample ID	Date Sampled	Lab	All Analytes EPA 8270C µg/L
MW-3	05/19/04	SunStar	ND
	12/18/06	SunStar	ND
	12/3/07	SunStar	ND
MW-5	05/19/04	SunStar	ND
	12/18/06	SunStar	ND
	12/3/07	SunStar	ND
MW-6	05/19/04	SunStar	ND
	12/18/06	SunStar	ND
	12/3/07	SunStar	ND
MW-7	12/3/07	SunStar	ND

ID = Identification

SVOCs = Semi-volatile organic compounds

µg/L = micrograms per liter

SunStar = SunStar Laboratories Inc., Tustin, CA.

ND = Non-detect.

Note: See laboratory reports for a complete list of compounds analyzed.


QA/QC 

Table 10
Summary of Groundwater Samples Analyzed for
Specific Conductance, pH, Anions, and Inorganics
CRG Properties
3701 Pacific Place, Long Beach, CA
002-10231-03

Sample ID	Date Sampled	Lab	Lab ID	Specific Conductance (EC)	Alkalinity as CaCO ₃	Chloride	Nitrate as NO ₃	pH	Sulfate as SO ₄	Total Dissolved Solids (TDS)
				SM2510b mod. umhos/cm	EPA 310.1 mg/l	EPA 300.0 mg/l	EPA 300.0 mg/l	EPA 150.1 pH Units	EPA 300.0 mg/l	mg/l
MW-3	01/10/96	STS	--	--	--	--	--	6.45	--	8,970
	2/17-19/97	STS	--	--	--	--	--	6.34	--	11,800
	12/18/06	Sunstar	T601731-01	7,740	590	3,270	1.74	6.4	107	4,710*
MW-5	12/18/06	Sunstar	T601731-02	1,700	520	240	<0.5	6.9	92.7	900*
MW-6	12/18/06	Sunstar	T601731-03	3,660	540	1,100	40.1	6.8	102	2,090*
<i>The following wells have not been located since the 1997 sampling event</i>										
MW-2	01/10/96	STS	--	--	--	--	--	6.46	--	10,800
	2/17-19/97	STS	--	--	--	--	--	6.76	--	8,560
MW-4	01/10/96	STS	--	--	--	--	--	6.65	--	2,690
	2/17-19/97	STS	--	--	--	--	--	6.78	--	2,030

< = Not detected above laboratory reporting limit indicated.

umhos/cm = microsiemens per centimeter

mg/l = milligrams per liter

STS = Southland Technical Services, Inc., Montebello, CA.

SunStar = SunStar Laboratories Inc., Tustin, CA.

* = TDS analytical results provided by SunStar and communicated by electronic mail - provided in Appendix D

CaCO₃ = calcium carbonate

NO₃ = nitrate

SO₄ = sulfate

-- = Not Available


QA/QC 

Table 11
Groundwater Elevations
3701 Pacific Place, Long Beach, CA
CRG Properties
Former Oil Operators North Site
002-10231-03

Sample ID	Measurement Date	Top of Casing Elevation (ft msl)	Depth to Groundwater (ft bgs)	Groundwater Elevation (ft msl)
MW-3	01/10/96	41.70	47.90	-6.20
	02/17-19/97	45.11	53.54	-8.43
	12/18/2006	48.28	47.77	0.51
	12/3/2007	50.925	48.93	2.00
MW-5	12/18/2006	34.19	32.14	2.05
	12/3/2007	36.903	32.60	4.30
MW-6	12/18/2006	28.97	28.43	0.54
	12/3/2007	32.041	29.56	2.48
MW-7	12/3/2007	51.300	49.32	1.98
<i>The following wells have not been located since the 1997 sampling event</i>				
MW-2	01/10/96	42.96	50.6	-7.64
	02/17-19/97	55.62	61.95	-6.33
MW-4	01/10/96	37.86	39.3	-1.44
	02/17-19/97	41.42	42.43	-1.01

ft msl = feet above mean sea level

ft bgs = feet below ground surface

The well locations were surveyed on November 11, 2007 with NGVD 1988

QA/QC 

Table 12
 Summary of Soil Gas Samples Analyzed for VOCs Using EPA Method 8260B
 3701 Pacific Place, Long Beach, CA
 CRG Properties
 Former Oil Operators North Site
 LFR 002-10231-03

Sample ID	Sample Depth (ft bgs)	Date Sampled	Laboratory	Lab ID	Analyte			
					meta- and para-Xylenes	Tetrachloroethene	Toluene	Trichloroethene
SG1-5	5	11/13/2007	EST	4K72002-03	<1	<1	<1	<1
SG1-10	10	11/13/2007	EST	4K72002-04	<1	<1	<1	<1
SG2-5	5	11/13/2007	EST	4K72002-10	<1	<1	<1	<1
SG2-10	10	11/13/2007	EST	3K71401-11	<1	7.6	<1	1.7
SG3-5	5	11/13/2007	EST	4K72002-11	<1	<1	<1	<1
SG3-10	10	11/13/2007	EST	3K71401-12	<1	6.8	<1	1.7
SG4-5	5	11/13/2007	EST	4K72002-07	<1	<1	<1	<1
SG4-10	10	11/13/2007	EST	3K71401-09	<1	8.3	<1	1.8
SG5-5	5	11/13/2007	EST	4K72002-08	<1	<1	<1	<1
SG5-10	10	11/13/2007	EST	3K71401-10	<1	5.6	<1	1.1
SG6-5	5	11/13/2007	EST	4K72002-15	<1	<1	<1	<1
SG6-10	10	11/13/2007	EST	3K71401-08	<1	8.4	<1	1.9
SG7-5	5	11/12/2007	EST	4K72002-01	<1	<1	<1	<1
SG7-10	10	11/12/2007	EST	4K72002-02	<1	<1	<1	<1
SG8A-5	5	11/14/2007	EST	4K72001-05	<1	<1	<1	<1
SG8A-10	10	11/14/2007	EST	3K71401-01	1.3	5.8	1.5	2.0
SG9-5	5	11/14/2007	EST	3K71401-02	1.3	5.4	1.5	2.0
SG9-10	10	11/14/2007	EST	3K71401-03	1.2	5.3	1.6	1.5
SG10-5	5	11/12/2007	EST	4K72001-06	<1	<1	<1	<1
SG10-10	10	11/12/2007	EST	4K72001-07	<1	<1	<1	<1
SG11-5	5	11/12/2007	EST	4K72001-09	<1	<1	<1	<1
SG11-10	10	11/12/2007	EST	4K72001-08	<1	<1	<1	<1
SG12-5	5	11/12/2007	EST	4K72001-04	<1	<1	<1	<1
SG12-10 (1PV)	10	11/12/2007	EST	4K72001-01	<1	<1	<1	<1
SG12-10 (3PV)	10	11/12/2007	EST	4K72001-02	<1	<1	<1	<1
SG13-5	5	11/14/2007	EST	4K72001-03	<1	<1	<1	<1
SG13-5 (1PV)	5	11/14/2007	EST	3K71401-04	1.2	7.1	1.5	1.8
SG13-5 (7PV)	5	11/14/2007	EST	3K71401-06	<1	8.1	<1	1.9
SG13-10	10	11/14/2007	EST	3K71401-07	<1	7.0	<1	1.9
SG14-5	5	11/13/2007	EST	3K71401-05	<1	6.2	1.6	1.2
SG14-10	10	11/13/2007	EST	4K72002-12	<1	<1	<1	<1
SG15-5	5	11/13/2007	EST	4K72002-13	<1	<1	<1	<1
SG16-5	5	11/12/2007	EST	4K72001-10	<1	<1	<1	<1
CHHSLS	5	11/13/2007	EST	4K72002-14	<1	<1	<1	<1
CHHSLS	5	11/13/2007	EST	4K72002-14	8.87E+06	0.603	3.78E+05	1.77


Notes:
 VOCs = Volatile organic compounds
 ID = Identification
 < = Not detected above laboratory reporting limit indicated
 ug/l = Micrograms per liter
 Only concentration detected above the laboratory limits are shown. See laboratory report for complete analytical results.
 CHHSLS = California Human Health Screening Levels for Shallow Soil Gas for Commercial/Industrial Land Use (OEHHA, 2005);
Fluor denotes concentration above respective CHHSLS.

It bgs = Feet below ground surface.
 EST = Environmental Support Technologies, Inc.
 PV = Purge volume

QA/QC **AM**

Table 13
 Summary of Soil Gas Samples Analyzed for VOCs using EPA Method TO-15
 3701 Pacific Place, Long Beach, CA
 CRG Properties
 Former Oil Operators North Site
 002-10231-03

Sample ID	Sample Depth	Date Sampled	Laboratory	Analyte:																				
				Chromethane	Acetone	Carbon Disulfide	2-Butanone	Hexane	Chloroform	Benzene	Cyclohexane	2,2,4-Trimethylpentane	Heptane	Trichloroethene	Toluene	2-Hexanone	Tetrachloroethene	Ethylbenzene	m,p-Xylenes	o-Xylene	4-Ethyltoluene	1,3,5-Trimethylbenzene	1,2,4-Trimethylbenzene	
SG3-5	5	11/14/2007	Ace	<0.01	0.17	<0.01	0.02	<0.01	0.02	<0.01	<0.01	<0.01	<0.01	0.04	<0.01	<0.01	0.02	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
SG8A-5	5	11/14/2007	Ace	0.02	0.03	0.08	0.07	1.6	0.03	0.33	1.4	0.03	0.30	0.01	0.35	<0.01	0.03	0.47	0.14	0.05	0.04	0.13	0.13	0.13
SG9-5	5	11/14/2007	Ace	<0.01	0.06	<0.01	<0.01	<0.01	0.04	0.02	<0.01	0.02	<0.01	<0.01	0.14	<0.01	0.13	0.10	0.03	<0.01	<0.01	<0.01	<0.01	<0.01
SG9-10	10	11/14/2007	Ace	0.01	0.02	<0.01	0.06	6.8 E	0.05	0.26	2.9	0.08	0.20	0.02	0.19	<0.01	0.03	0.09	0.03	<0.01	<0.01	0.01	0.02	0.02
SG13-5	5	11/14/2007	Ace	<0.01	0.12	0.02	0.09	0.05	<0.01	0.02	<0.01	0.01	0.01	<0.01	0.12	0.01	0.01	0.04	0.01	<0.01	<0.01	<0.01	<0.01	<0.01
SG13-10	10	11/14/2007	Ace	<0.01	0.09	0.06	0.02	0.21	<0.01	0.04	0.02	0.04	0.03	<0.01	0.11	<0.01	<0.01	0.03	0.01	<0.01	<0.01	<0.01	<0.01	0.01
Trip Blank	--	11/14/2007	Ace	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
CHHSLS				--	--	--	--	--	--	0.122	--	--	1.77	3.78E+05	--	0.603	--	8.87E+06	8.79E+06	--	--	--	--	--

QA/QC


Notes:
 VOCs = Volatile organic compounds
 ID = Identification
 ft bgs = Feet below ground surface.
 < = Not detected above laboratory reporting limit indicated
 Ace = Ace Laboratories Inc.
 Only concentration detected above the laboratory limits are shown.
 See laboratory reports for complete analytical results.
 E = Estimated Result. The concentration exceeded, the linear calibration of the instrument.
 ug/l = Micrograms per liter
 CHHSLS = California Human Health Screening Levels for Shallow Soil Gas for Commercial/Industrial Land Use (OEHHA, 2005)
 Red denotes concentration above respective CHHSLS.
 -- = Not applicable

Table 14
Summary of Soil Gas Samples Analyzed for Methane
3201 Pacific Place, Long Beach, CA
CRG Properties
Former Oil Operators North Site
LFR 002-10231-03

					ANALYTE METHOD NAME UNITS
					Methane EPA-8015M ppmv
Sample ID	Sample Depth (ft bgs)	Date	Lab	Lab ID	
SG1-5	5	11/14/2007	EST	2K71402-13	1,600
SG1-10	10	11/14/2007	EST	2K71402-14	32
SG2-5	5	11/14/2007	EST	2K71402-11	<10
SG2-10	10	11/14/2007	EST	2K71402-12	36
SG3-5	5	11/14/2007	EST	2K71402-16	21
SG3-10	10	11/14/2007	EST	2K71402-17	<10
SG5-5	5	11/14/2007	EST	2K71402-26	170,000
SG6-5	5	11/14/2007	EST	2K71402-03	110
SG6-10	10	11/14/2007	EST	2K71402-04	<10
SG7-5	5	11/14/2007	EST	2K71402-20	32,000
SG8A-5	5	11/14/2007	EST	2K71402-25	150,000
SG9-5	5	11/14/2007	EST	2K71402-21	490
SG9-10	10	11/14/2007	EST	2K71402-22	72,000
SG10-5	5	11/14/2007	EST	2K71402-09	1,400
SG10-10	10	11/14/2007	EST	2K71402-10	27
SG11-5	5	11/14/2007	EST	2K71402-07	180,000
SG11-10	10	11/14/2007	EST	2K71402-08	300,000
SG12-5	5	11/14/2007	EST	2K71402-01	1,900
SG12-10	10	11/14/2007	EST	2K71402-02	160,000
SG13-5	5	11/14/2007	EST	2K71402-18	<10
SG13-10	10	11/14/2007	EST	2K71402-19	560
SG14-5	5	11/14/2007	EST	2K71402-05	12
SG14-10	10	11/14/2007	EST	2K71402-06	<10
SG15-5	5	11/14/2007	EST	2K71402-23	<10
SG15-10	10	11/14/2007	EST	2K71402-24	<10
SG16-5	5	11/14/2007	EST	2K71402-15	3,300
LEL					50,000
UEL					150,000

Notes:

ID = Identification

ft bgs = Feet below ground surface.

< = Not detected above laboratory reporting limit indicated

EST = Environmental Support Technologies, Inc.

ppmv = Parts per million per volume

LEL = Lower explosive limit

UEL = Upper explosive limit

Red denotes methane concentration within the explosive range.

Blue denotes methane concentration above the UEL.

QA/QC 

Table 15
Summary of Soil Samples Analyzed for TPH in Borings B6A, B7A and MW-7
3701 Pacific Place, Long Beach, CA
CRG Properties
Former Oil Operators North Site
LF 002-10231-03

Sample ID	Sample Depth	Date Sampled	Laboratory	TPHg		TPHd		TPHmo	
				1312/8015 * mg/l	8015 mg/kg	1312/8015* mg/l	8015 mg/kg	1312/8015* mg/l	8015 mg/kg
B6A-15	15	11/13/2007	AL	--	<3	--	<3	--	42
B6A-20	20	11/13/2007	AL	--	<3	--	<3	--	68
B6A-25	25	11/13/2007	AL	--	<15	--	<15	--	526
B7A-5	5	11/13/2007	AL	--	<3	--	<3	--	24
B7A-10	10	11/13/2007	AL	--	5	--	16	--	203
B7A-20	20	11/13/2007	AL	--	<3	--	<3	--	149
B7A-30	30	11/13/2007	AL	<4	<1200	8	2,700	7	4,740
B7A-40	40	11/13/2007	AL	<2	<1200	4	4,070	3.6	8,970
B7A-50	50	11/13/2007	AL	<4	<1200	18	2,580	22	4,400
MW-7-15	15	10/25/2007	SS	--	<10	--	<10	--	<10
MW-7-25	25	10/25/2007	SS	--	<10	--	<10	--	55
MW-7-35	35	10/25/2007	SS	--	<10	--	<10	--	<10

Notes:

- ID = Identification
- < = Not detected above laboratory reporting limit indicated
- mg/kg = Milligrams per kilograms
- mg/l = Milligrams per liter
- See laboratory reports for complete analytical results, carbon chain data is slightly different for each lab.
- * = Method 1312/8015 for Synthetic Precipitation Leaching Procedure
- = Not Analyzed

TPHg = Total petroleum hydrocarbon as gasoline
 TPHd = Total petroleum hydrocarbon as diesel
 TPHmo = Total petroleum hydrocarbon as motor oil
 Red denotes concentration exceeds 1,000 mg/kg, the maximum soil screening level for TPHd 20-150 feet above a drinking water aquifer (CRWQCB, 1996)

AL = Associated Laboratories
 SS = SunStar Laboratories, Inc.

QA/QC AW

Table 16
Summary of Selected Soil Samples Analyzed
using MA DEP EPH and VPH Methodologies in Boring B7A
3701 Pacific Place, Long Beach, CA
CRG Properties
Former Oil Operators North Site
LF02-10231-03

Sample ID	Sample Depth	Date Sampled	Laboratory	Analyte Methods		Units
				MA-EPH	MA-VPH	
B7A-30	30	11/13/2007	AL	2,500	102	mg/Kg
	40	11/13/2007	AL	5,290	54	mg/Kg
	50	11/13/2007	AL	2,210	84.9	mg/Kg
(1) C09-C18 Aliphatic Hydrocarbons						
(2) C19-C36 Aliphatic Hydrocarbons						
(2) C9-C12 Unadj. Aliphatic Hydrocarbons						
(3) C11-C22 Aromatic Hydrocarbons						
(3) C9-C10 Aromatic Hydrocarbons						
B7A-30				3,530	322	176
B7A-40				7,850	152	106
B7A-50				3,390	140	82

Notes:

- ID = Identification
- < = Not detected above laboratory reporting limit indicated
- AL = Associated Laboratories
- mg/kg = Milligrams per kilograms
- = Not Analyzed
- MA DEP = Massachusetts Department of Environmental Protection
- EPH = Extractable petroleum hydrocarbons
- VPH = Volatile petroleum hydrocarbons

QA/QC *AW*

Table 17
Summary of Soil Samples Analyzed for VOCs in Borings B6A, B7A and MW-7
3701 Pacific Place, Long Beach, CA
CRG Properties
LF8 002-10231-03

Sample ID	Sample Depth	Date Sampled	Laboratory	1,2,4-Trimethylbenzene		1,3,5-Trimethylbenzene		Acetone		Benzene		Ethyl benzene		Isopropylbenzene (Cumene)		Naphthalene		n-Butylbenzene		n-Propylbenzene		p-Isopropyltoluene		sec-Butylbenzene		Toluene		Xylenes, total		
				8260B	ug/kg	8260B	ug/kg	8260B	ug/kg	8260B	ug/kg	8260B	ug/kg	8260B	ug/kg	8260B	ug/kg	8260B	ug/kg	8260B	ug/kg	8260B	ug/kg	8260B	ug/kg	8260B	ug/kg	8260B	ug/kg	8260B
B6A-15	15	11/13/2007	AL	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	
B6A-20	20	11/13/2007	AL	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	
B6A-25	25	11/13/2007	AL	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	
B7A-5	5	11/13/2007	AL	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	
B7A-10	10	11/13/2007	AL	<5	<5	<5	<5	58	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	
B7A-20	20	11/13/2007	AL	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	
B7A-30	30	11/13/2007	AL	13,500	3,120	2,500	824	2,960	1,680	1,680	8,310	1,400	2,560	1,330	1,640	1,110	1,110	1,110	1,110	1,110	1,110	1,110	1,110	1,110	1,110	1,110	1,110	1,110	1,110	
B7A-40	40	11/13/2007	AL	7,780	2,240	2,240	944	2,080	782	782	6,150	994	1,170	1,680	1,680	1,110	1,110	1,110	1,110	1,110	1,110	1,110	1,110	1,110	1,110	1,110	1,110	1,110	1,110	1,110
B7A-50	50	11/13/2007	AL	10,000	<250	<250	<250	2,080	1,330	1,330	5,980	1,050	2,080	1,660	1,660	1,140	1,140	1,140	1,140	1,140	1,140	1,140	1,140	1,140	1,140	1,140	1,140	1,140	1,140	1,140
MW-7-15	15	10/25/2007	SS	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
MW-7-25	25	10/25/2007	SS	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
MW-7-35	35	10/25/2007	SS	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5

QA/QC


Notes:
VOCs = Volatile organic compounds
ID = Identification
<= Not detected above laboratory reporting limit indicated
See laboratory reports for complete analytical results, only detected concentrations are included
AL = Associated Laboratories
SS = SunStar Laboratories, Inc.
ug/kg = Micrograms per kilograms
-- = Not Analyzed
Red denotes naphthalene concentration is greater than EPA region 9 "CAL-Modified" preliminary remediation goal for industrial soil of 4,200 ug/kg (EPA, 2004)

Table 18
Summary of Soil Samples Analyzed for SVOCs
in Borings B6A, B7A and MW-7
3701 Pacific Place, Long Beach, CA
CRG Properties
LFR 002-10231-03

Sample ID	Sample Depth	Date Sampled	Laboratory	Analyte Method Units	2-Methylnaphthalene 8270C ug/kg	4-Methylphenol 8270C ug/kg	Naphthalene 8270C ug/kg
B6A-15	15	11/13/2007	AL	<3000	<3000	<3000	<3000
B6A-20	20	11/13/2007	AL	<3000	<3000	<3000	<3000
B6A-25	25	11/13/2007	AL	<3000	<3000	<3000	<3000
B7A-40	40	11/13/2007	AL	26,300	6,150	<3000	<3000
B7A-10	10	11/13/2007	AL	<3000	<3000	<3000	<3000
B7A-20	20	11/13/2007	AL	<3000	<3000	<3000	<3000
B7A-30	30	11/13/2007	AL	34,700	3,680	8,450	<3000
B7A-5	5	11/13/2007	AL	<3000	<3000	<3000	<3000
B7A-50	50	11/13/2007	AL	26,000	<3000	7,540	<3000
MW-7-15	15	10/25/2007	SS	<300	<1000	<300	<300
MW-7-25	25	10/25/2007	SS	<300	<1000	<300	<300
MW-7-35	35	10/25/2007	SS	<300	<1000	<300	<300
iPRG				NL	3.E+06	4,200	

Notes:

SVOCs = Semi-volatile organic compounds

ID = Identification

< = Not detected above laboratory reporting limit indicated

AL = Associated Laboratories

SS = SunStar Laboratories, Inc.

ug/kg = Micrograms per kilograms

iPRG = EPA Region 9 preliminary remediation goal for industrial soil

NL = Not listed

Red indicates concentration exceeds iPRG

QA/QC *Am*

Table 19
Summary of Soil Samples Collected in the Fill and Analyzed for Metals
3701 Pacific Place, Long Beach, CA

CRG Properties
Former Oil Operators North Site
LFRR 002-10231-03

Sample ID	Sample Depth	Date Sampled	Analyte Method	Laboratory	Arsenic 6010B mg/kg	Barium 6010B mg/kg	Beryllium 6010B mg/kg	Cadmium 6010B mg/kg	Copper 6010B mg/kg	Lead 6010B mg/kg	Lead 6010B/STLC mg/l	Mercury 7471A mg/kg	Nickel 6010B mg/kg	Vanadium 6010B mg/kg	Zinc 6010B mg/kg	Chromium 6010B mg/kg	Cobalt 6010B mg/kg	Molybdenum 6010B mg/kg
SG2-0.5	0.5	11/13/2007	AL		3.4	109	<0.5	<0.5	16.3	5.85	--	1.69	15.2	29.9	48.5	18.2	8.93	1.29
SG2-5	5	11/13/2007	AL		4.66	117	0.644	<0.5	17.8	9.28	--	<0.14	16.7	38.3	56.4	21.2	10.8	<1
SG2-10	10	11/13/2007	AL		4.07	99.1	0.582	<0.5	15	5.13	--	<0.14	14.1	36.4	45.4	19	8.89	<1
SG3-0.5	0.5	11/13/2007	AL		7.09	170	0.912	0.677	22.5	19	--	<0.14	21.5	57.8	103	27.3	14.6	1.52
SG3-5	5	11/13/2007	AL		10.1	211	0.807	0.593	40.6	34.3	--	0.21	21.9	48.3	96.4	29.2	13.1	<1
SG3-10	10	11/13/2007	AL		1.71	74	0.625	<0.5	10.3	5.23	--	<0.14	11	31.6	91.2	18.1	8.06	<1
SG9-0.5	0.5	11/13/2007	AL		5.66	197	0.844	0.533	29.9	32.5	--	<0.14	20.8	50.5	107	27.2	14.5	<1
SG9-5	5	11/13/2007	AL		4.73	142	0.843	0.608	21.9	8.93	--	<0.14	19.2	48.4	61.3	24.3	15.1	<1
SG9-10	10	11/13/2007	AL		10.1	267	<0.5	<0.5	10.8	86	3.22	0.14	28.1	19.8	117	20.3	4.82	<1
SG13-0.5	0.5	11/13/2007	AL		11.5	382	0.942	1.16	33.5	14.1	--	<0.14	29.6	67.2	78.5	35.9	13.8	<1
SG13-5	5	11/13/2007	AL		7.61	266	1.04	0.754	35.7	15.3	--	<0.14	26	62.9	84.6	32.9	16.1	<1
SG13-10	10	11/13/2007	AL		4.28	122	0.961	0.629	26.3	6.95	--	<0.14	21.1	50.7	69.3	30.8	13	<1
SG14-0.5	0.5	11/13/2007	AL		13.7	280	1.1	0.586	37.9	15.2	--	<0.14	27.4	62.8	85	35	17.1	<1
SG14-5	5	11/13/2007	AL		5.96	224	0.743	0.971	30.1	49	--	<0.14	19.9	46.6	320	23.7	12.6	<1
SG14-10	10	11/13/2007	AL		4.37	197	0.928	<0.5	36.6	9.07	--	<0.14	23.6	59.1	70.3	30.8	16.7	<1
SG15-0.5	0.5	11/13/2007	AL		7.64	203	0.87	0.556	29.9	44	--	<0.14	20.8	51.4	97.9	27.7	14.5	1.45
SG15-5	5	11/13/2007	AL		4.62	168	0.779	<0.5	25.9	13.2	--	<0.14	18.5	47.1	77.2	25	13.6	<1
SG15-10	10	11/13/2007	AL		6.8	176	0.75	<0.5	26.4	6.91	--	<0.14	19.1	46.3	66.3	25.2	13.4	<1
iPRGs					0.25*	67.00	1,900	450	41,000	800		310	20,000	1,000	100,000	100,000	1900	5,100

Notes:
ID = Identification
< = Not detected above laboratory reporting limit indicated
AL = Associated Laboratories
See laboratory reports for complete analytical results, only detected concentrations are included
mg/kg = Milligrams per kilograms
mg/l = Milligrams per liter
STLC = Soluble Threshold Limit Concentration
* = California - modified iPRG
iPRG = US EPA Region 9 preliminary remediation goal for industrial soil
Green indicates concentration exceeds iPRG
Background arsenic concentrations range from 5.3 to 11 mg/kg

QA/QC 

Table 20
Summary of Soil Samples Analyzed for Metals in Borings B6A, B7A and MW-7
3701 Pacific Place, Long Beach, CA
CRG Properties
Former Oil Operators North Site
LFRR 002-10231-03

Sample ID	Sample Depth	Date Sampled	Laboratory	Analyte		Barium	Barium 6010 STLC mg/l	Beryllium 6010B mg/kg	Cadmium 6010B mg/kg	Chromium 6010B mg/kg	Cobalt 6010B mg/kg	Copper 6010B mg/kg	Lead 6010B mg/kg	Lead 6010 STLC mg/l	Lead 6010 STLC/DI mg/l	Molybdenum 6010B mg/kg	Nickel 6010B mg/kg	Vanadium 6010B mg/kg	Zinc 6010B mg/kg	Mercury 7471A mg/kg	
				6010B mg/kg	6010B mg/kg																
B6A-15	15	11/13/2007	AL	As	161		0.977	0.531	32.8	15.8	32.8	6.45				<1	25.7	62	75.6	<0.14	
B6A-20	20	11/13/2007	AL	As	154		0.809	0.798	35.3	13.3	21.9	10.8				1.19	22.5	56.8	65.8	<0.14	
B6A-25	25	11/13/2007	AL	As	113		0.89	0.597	30.9	11.4	19.4	5.2				<1	16.9	43.6	66.2	<0.14	
B7A-5	5	11/13/2007	AL	As	194		1.01	0.504	34.6	17.1	37.9	11.9				1.11	26.6	55.7	79.2	<0.14	
B7A-10	10	11/13/2007	AL	As	427		0.663	0.518	30.3	10.8	35.1	61.3	2.58			<1	18.6	38.9	131	<0.14	
B7A-20	20	11/13/2007	AL	As	152		0.978	<0.5	29.6	15.6	27.4	7.05				<1	22.9	58.8	65.9	<0.14	
B7A-30	30	11/13/2007	AL	As	1560	35.4	0.522	1.09	39.2	12.1	59.9	376	8.54		<5	1.58	33.5	45.8	174	0.59	
B7A-40	40	11/13/2007	AL	As	1600	40.7	0.571	1.04	37.9	11.4	48.8	309	12.5		<5	1.47	33.3	42.5	157	0.46	
B7A-50	50	11/13/2007	AL	As	258		0.909	<0.5	30.2	13.7	25	7.35				<1	27.2	50.3	59.4	<0.14	
MW-7-15	15	10/25/2007	SS	As	140		<1	<2	18	9.7	10	<3				<1	14	34	18	<0.1	
MW-7-25	25	10/25/2007	SS	As	130		<1	<2	26	11	16	9.1				<1	18	51	26	<0.1	
MW-7-35	35	10/25/2007	SS	As	53		<1	<2	12	7.3	17	<3				<1	9.3	23	12	<0.1	
				iPRGs	67,000		1,900	450	100,000	1,900	41,000	800				5,100	20,000	1,000	100,000	310	
					0.25*																

Notes:
ID = Identification
< = Not detected above laboratory reporting limit indicated
AL = Associated Laboratories
SS = SunStar Laboratories, Inc.
Only concentrations detected above the laboratory reporting limits are shown. See laboratory report for all analytes.
mg/kg = Milligrams per kilograms
mg/l = milligrams per liter
STLC = Soluble Threshold Limit Concentration
STLC/DI = Soluble concentration using deionized water
Red denotes soluble concentration exceeds STLC
* = California -modified iPRG
iPRG = US EPA Region 9 preliminary remediation goal for industrial soil
Green indicates concentration exceeds iPRG
Background arsenic concentrations range from 5.3 to 11 mg/kg

QAVOC AW

Table 21
Summary of Soil Samples Collected in the Fill and Analyzed for PCBs
3701 Pacific Place, Long Beach, CA
CRG Properties
Former Oil Operators North Site
LFR 002-10231-03

Sample ID	Sample Depth	Date Sampled	Laboratory	Analyte Method Units										
				PCB-1016 8082 mg/kg	PCB-1221 8082 mg/kg	PCB-1232 8082 mg/kg	PCB-1242 8082 mg/kg	PCB-1248 8082 mg/kg	PCB-1254 8082 mg/kg	PCB-1260 8082 mg/kg				
SG2-0.5	0.5	11/13/2007	AL	<0.03	<0.06	<0.05	<0.05	<0.08	<0.03	<0.03	<0.03	<0.03		
SG2-5	5	11/13/2007	AL	<0.03	<0.06	<0.05	<0.05	<0.08	<0.03	<0.03	<0.03	<0.03		
SG2-10	10	11/13/2007	AL	<0.03	<0.06	<0.05	<0.05	<0.08	<0.03	<0.03	<0.03	<0.03		
SG3-0.5	0.5	11/13/2007	AL	<0.03	<0.06	<0.05	<0.05	<0.08	<0.03	<0.03	<0.03	<0.03		
SG3-5	5	11/13/2007	AL	<0.03	<0.06	<0.05	<0.05	<0.08	<0.03	<0.03	<0.03	<0.03		
SG3-10	10	11/13/2007	AL	<0.03	<0.06	<0.05	<0.05	<0.08	<0.03	<0.03	<0.03	<0.03		
SG9-0.5	0.5	11/13/2007	AL	<0.03	<0.06	<0.05	<0.05	<0.08	<0.03	<0.03	<0.03	<0.03		
SG9-5	5	11/13/2007	AL	<0.03	<0.06	<0.05	<0.05	<0.08	<0.03	<0.03	<0.03	<0.03		
SG9-10	10	11/13/2007	AL	<0.03	<0.06	<0.05	<0.05	<0.08	<0.03	<0.03	<0.03	<0.03		
SG13-0.5	0.5	11/13/2007	AL	<0.03	<0.06	<0.05	<0.05	<0.08	<0.03	<0.03	<0.03	<0.03		
SG13-5	5	11/13/2007	AL	<0.03	<0.06	<0.05	<0.05	<0.08	<0.03	<0.03	<0.03	<0.03		
SG13-10	10	11/13/2007	AL	<0.03	<0.06	<0.05	<0.05	<0.08	<0.03	<0.03	<0.03	<0.03		
SG14-0.5	0.5	11/13/2007	AL	<0.03	<0.06	<0.05	<0.05	<0.08	<0.03	<0.03	<0.03	<0.03		
SG14-5	5	11/13/2007	AL	<0.03	<0.06	<0.05	<0.05	<0.08	<0.03	<0.03	<0.03	<0.03		
SG14-10	10	11/13/2007	AL	<0.03	<0.06	<0.05	<0.05	<0.08	<0.03	<0.03	<0.03	<0.03		
SG15-0.5	0.5	11/13/2007	AL	<0.03	<0.06	<0.05	<0.05	<0.08	<0.03	<0.03	<0.03	<0.03		
SG15-5	5	11/13/2007	AL	<0.03	<0.06	<0.05	<0.05	<0.08	<0.03	<0.03	<0.03	<0.03		
SG15-10	10	11/13/2007	AL	<0.03	<0.06	<0.05	<0.05	<0.08	<0.03	<0.03	<0.03	<0.03		

Notes:
PCBs = Polychlorinated Biphenyls
ID = Identification
< = Not detected above laboratory reporting limit indicated
AL = Associated Laboratories
mg/kg = Milligrams per kilograms

QA/QC *AM*

Table 22
Summary of Soil Samples Analyzed for PCBs in Borings B6A and B7A
3701 Pacific Place, Long Beach, CA
CRG Properties
Former Oil Operators North Site
LF02-10231-03

Sample ID	Sample Depth	Date Sampled	Laboratory	PCB-1016		PCB-1221		PCB-1232		PCB-1242		PCB-1248		PCB-1254		PCB-1260	
				8082	mg/kg	8082	mg/kg	8082	mg/kg	8082	mg/kg	8082	mg/kg	8082	mg/kg	8082	mg/kg
B6A-15	15	11/13/2007	AL	<0.03		<0.06		<0.05		<0.05		<0.08		<0.03		<0.03	
B6A-20	20	11/13/2007	AL	<0.03		<0.06		<0.05		<0.05		<0.08		<0.03		<0.03	
B6A-25	25	11/13/2007	AL	<0.03		<0.06		<0.05		<0.05		<0.08		<0.03		<0.03	
B7A-5	5	11/13/2007	AL	<0.03		<0.06		<0.05		<0.05		<0.08		<0.03		<0.03	
B7A-10	10	11/13/2007	AL	<0.03		<0.06		<0.05		<0.05		<0.08		<0.03		<0.03	
B7A-20	20	11/13/2007	AL	<0.03		<0.06		<0.05		<0.05		<0.08		<0.03		<0.03	
B7A-30	30	11/13/2007	AL	<0.03		<0.06		<0.05		<0.05		<0.08		<0.03		<0.03	
B7A-40	40	11/13/2007	AL	<0.03		<0.06		<0.05		<0.05		0.41		<0.03		0.11	
B7A-50	50	11/13/2007	AL	<0.03		<0.06		<0.05		<0.05		0.42		<0.03		0.12	
			AL	<0.03		<0.06		<0.05		<0.05		0.19		<0.03		0.046	

QA/QC 

Notes:
 ID = Identification
 < = Not detected above laboratory reporting limit indicated
 AL = Associated Laboratories
 mg/kg = Milligrams per kilogram
 PCBs = Polychlorinated biphenyls

Table 23
Summary of Soil Samples Collected in the Fill and Analyzed for Organochlorine Pesticides
3701 Pacific Place, Long Beach, CA
CRG Properties
Former Oil Operators North Site
LF02-10231-03

Sample ID	Sample Depth	Date Sampled	Laboratory	Analyte Method		Units
				Chlordane	Dieldrin	
SG2-0.5	5	11/13/2007	AL	<0.025	<0.003	<0.004
SG2-5	5	11/13/2007	AL	<0.025	<0.003	<0.004
SG2-10	10	11/13/2007	AL	<0.025	0.013	<0.004
SG3-0.5	0.5	11/13/2007	AL	<0.025	<0.003	<0.004
SG3-5	5	11/13/2007	AL	<0.025	<0.003	<0.004
SG3-10	10	11/13/2007	AL	0.035	<0.003	<0.004
SG9-0.5	0.5	11/13/2007	AL	<0.025	<0.003	<0.004
SG9-5	5	11/13/2007	AL	<0.025	<0.003	<0.004
SG9-10	10	11/13/2007	AL	<0.025	<0.003	<0.004
SG13-0.5	0.5	11/13/2007	AL	<0.025	<0.003	<0.004
SG13-5	5	11/13/2007	AL	0.041	<0.003	<0.004
SG13-10	10	11/13/2007	AL	<0.025	<0.003	<0.004
SG14-0.5	0.5	11/13/2007	AL	<0.025	<0.003	0.007
SG14-5	5	11/13/2007	AL	<0.025	<0.003	<0.004
SG14-10	10	11/13/2007	AL	<0.025	<0.003	<0.004
SG15-0.5	0.5	11/13/2007	AL	<0.025	<0.003	<0.004
SG15-5	5	11/13/2007	AL	<0.025	<0.003	<0.004
SG15-10	10	11/13/2007	AL	<0.025	<0.003	<0.004

Notes: ID = Identification QA/QC *Sum*
 < = Not detected above laboratory reporting limit indicated
 AL = Associated Laboratories

See laboratory reports for complete analytical results, only detected concentrations are included
 mg/kg = Milligrams per kilograms

Table 24
Summary of Groundwater Samples Analyzed for Metals
December 3, 2007
3701 Pacific Place, Long Beach, CA
CRG Properties
Former Oil Operators North Site
 LFR 002-10231-03

			Analyte Method Units	Arsenic 6010B ug/l	Barium 6010B ug/l	Lead 6010B ug/l	Mercury 6010B ug/l
Sample ID	Date Sampled	Laboratory					
MW-3	12/03/2007	SS	<20	29	<8.6	0.74	
MW-5	12/03/2007	SS	<20	86	<8.6	<0.5	
MW-6	12/03/2007	SS	<20	100	<8.6	5.6	
MW-7	12/03/2007	SS	210	1,100	<8.6	<0.5	
MCL			10	1,000	15	2	

Notes:

ID = Identification

< = Not detected above laboratory reporting limit indicated, except for arsenic and lead where the method detection limit (MDL) is shown.

SS = SunStar Laboratories, Inc.

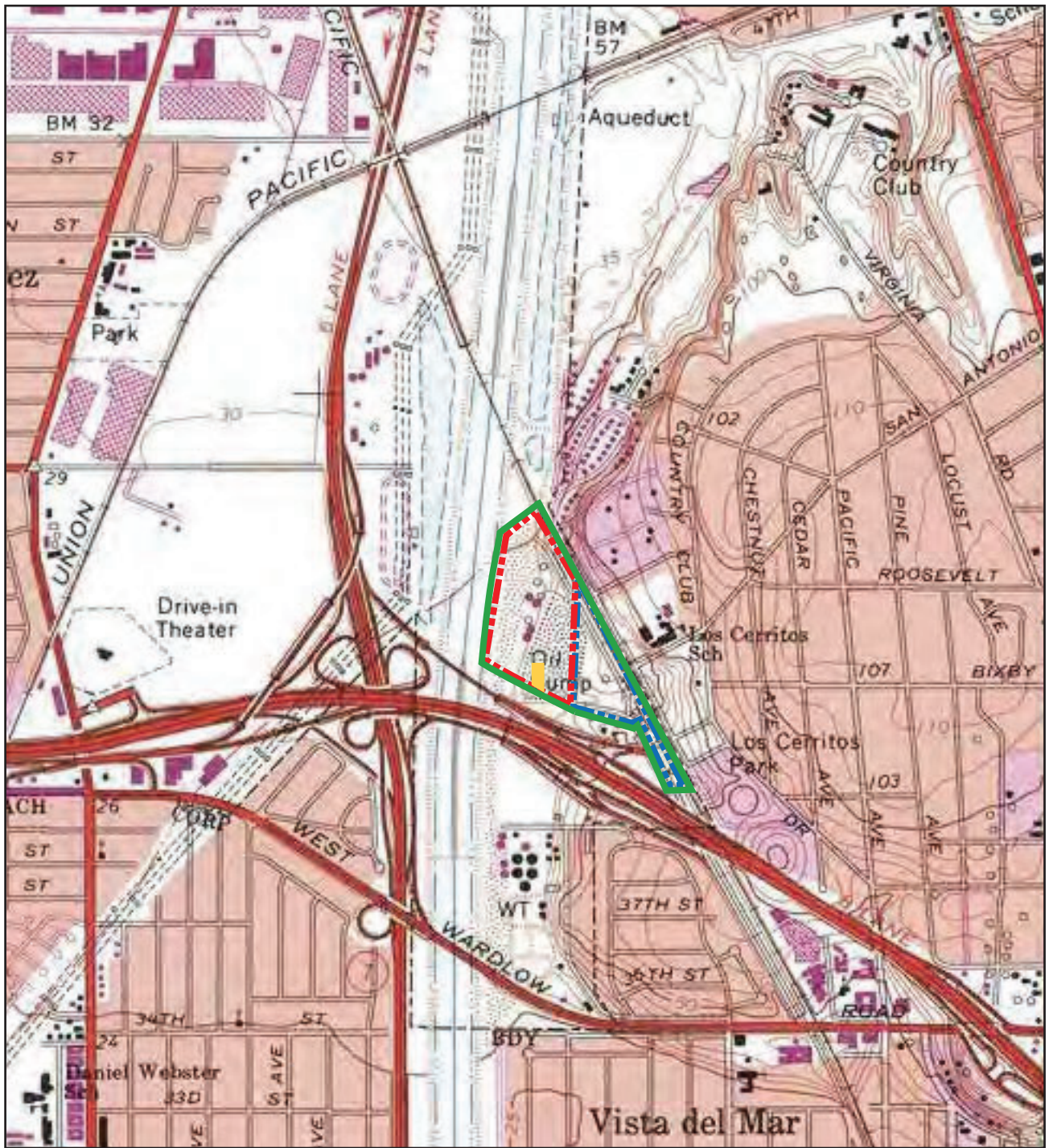
Only concentrations detected above the laboratory reporting limits are shown.

See laboratory report for all analytes.

ug/l = Micrograms per liter

QA/QC *SM*

FIGURES



- - - CRG Property
- - - McDonald Property
- Tookey Property
- Site



0 2000 ft

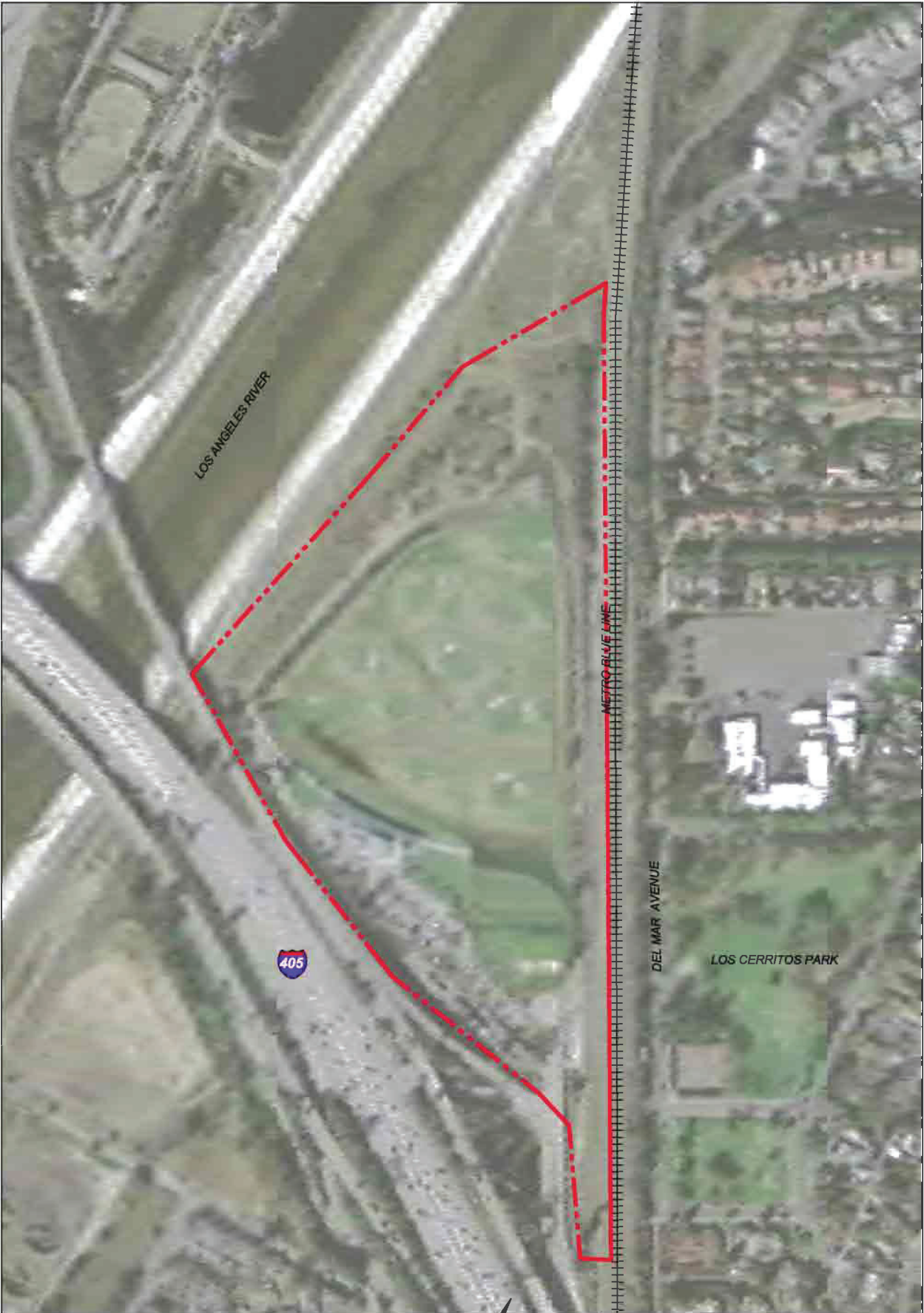
Vicinity Map

CRG Properties, Former Oil Operators North Site,
Long Beach, CA - 002-10231-03



Figure 1

C:\Data\Graphics\1000\10231\0310231-03 Well Locations-F1.dwg [Site] 2/12/08 2:01pm - JDLoving XREFS: [Map137.dwg]



EXPLANATION
 - - - - - Property Boundary
 + + + + + Railroad Tracks

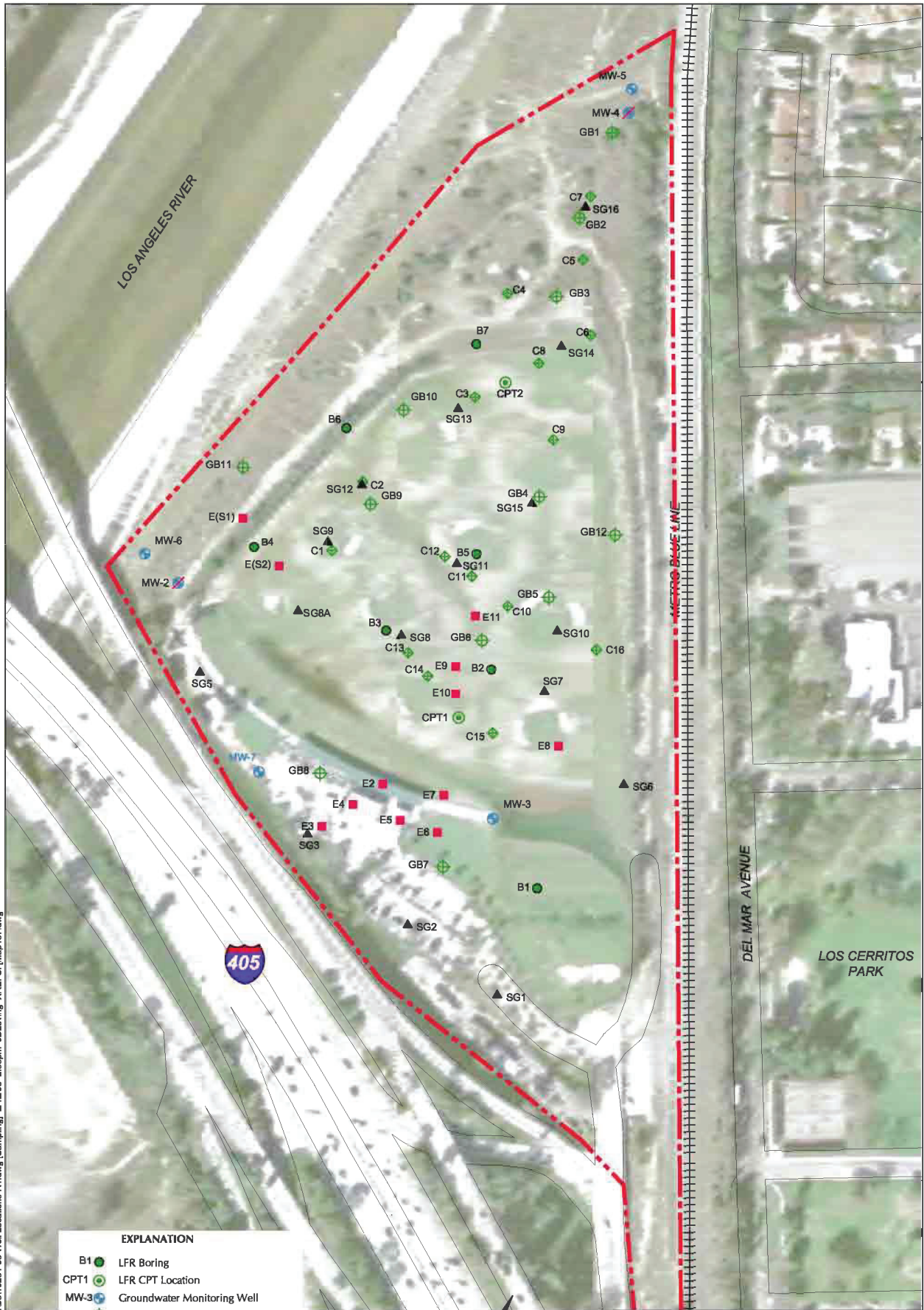


Site Plan

CRG Properties, Former Oil Operators North Site
3701 Pacific Place, Long Beach, CA - 002-10231-03

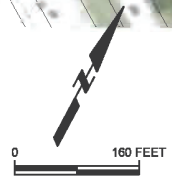


Figure 2

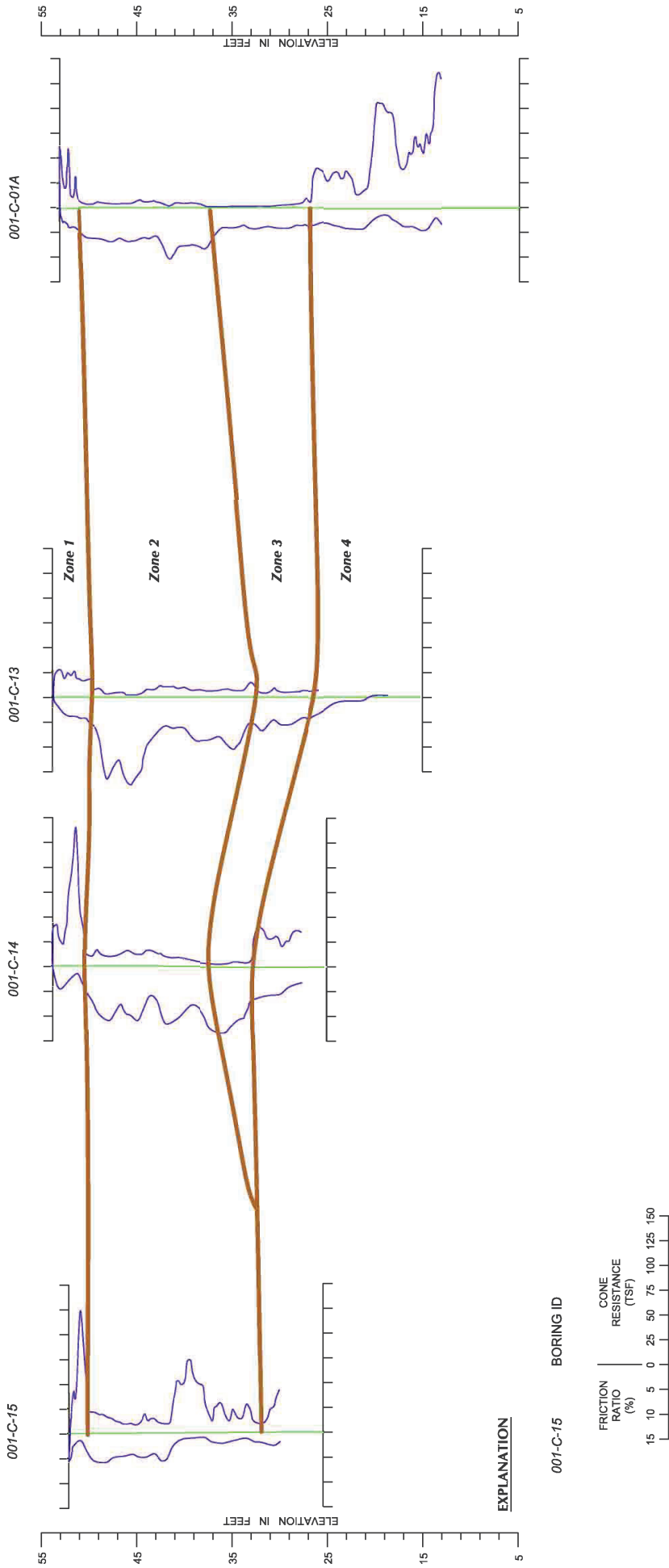


C:\Data\Graphics\1000\01\0231\0231-03 Well Locations-R1.dwg [Sampling] 2/12/08 2:03pm JD.Loving XREFS: [Map137.dwg]

- EXPLANATION**
- B1 ● LFR Boring
 - CPT1 ● LFR CPT Location
 - MW-3 ● Groundwater Monitoring Well
 - GB1 ● Geon Boring (Jaykim, 1998)
 - E1 ■ Excavation Sample Location (JB, 1989)
 - C1 ● ETC CPT Location (ETC, 1983)
 - MW-2 ● Former Groundwater Monitoring Well (JB, 1995)
 - Property Boundary
 - ++++ Railroad Tracks



**Sampling Locations
Previous Investigations**
 CRG Properties, Former Oil Operators North Site
 3701 Pacific Place, Long Beach, CA - 002-10231-03



Subsurface Profile No. 1

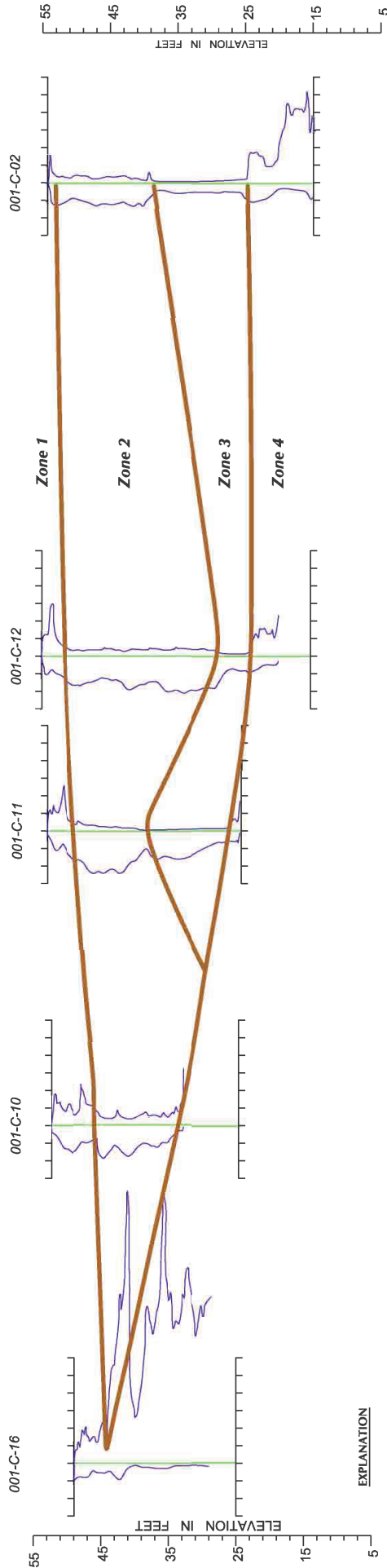
CRG Properties, Former Oil Operators North Site
3701 Pacific Place, Long Beach, CA - 002-10231-03



Figure 4

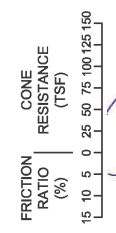
Zone 1 - Sump Material - Moderately Compact, Firm
Zone 2 - Sump Material - Lightly Compact, Soft, Compressible
Zone 3 - Sump Material - Very Soft, Highly Compressible
Zone 4 - Possible Natural Soil - Moderately Compact

SOURCE: The Earth Technology Corporation, Sump Site Supplemental Study, Figure 3



EXPLANATION

001-C-16 BORING ID



EXPLANATION

- Zone 1 - Sump Material - Moderately Compact, Firm
- Zone 2 - Sump Material - Lightly Compact, Soft, Compressible
- Zone 3 - Sump Material - Very Soft, Highly Compressible
- Zone 4 - Possible Natural Soil - Moderately Compact

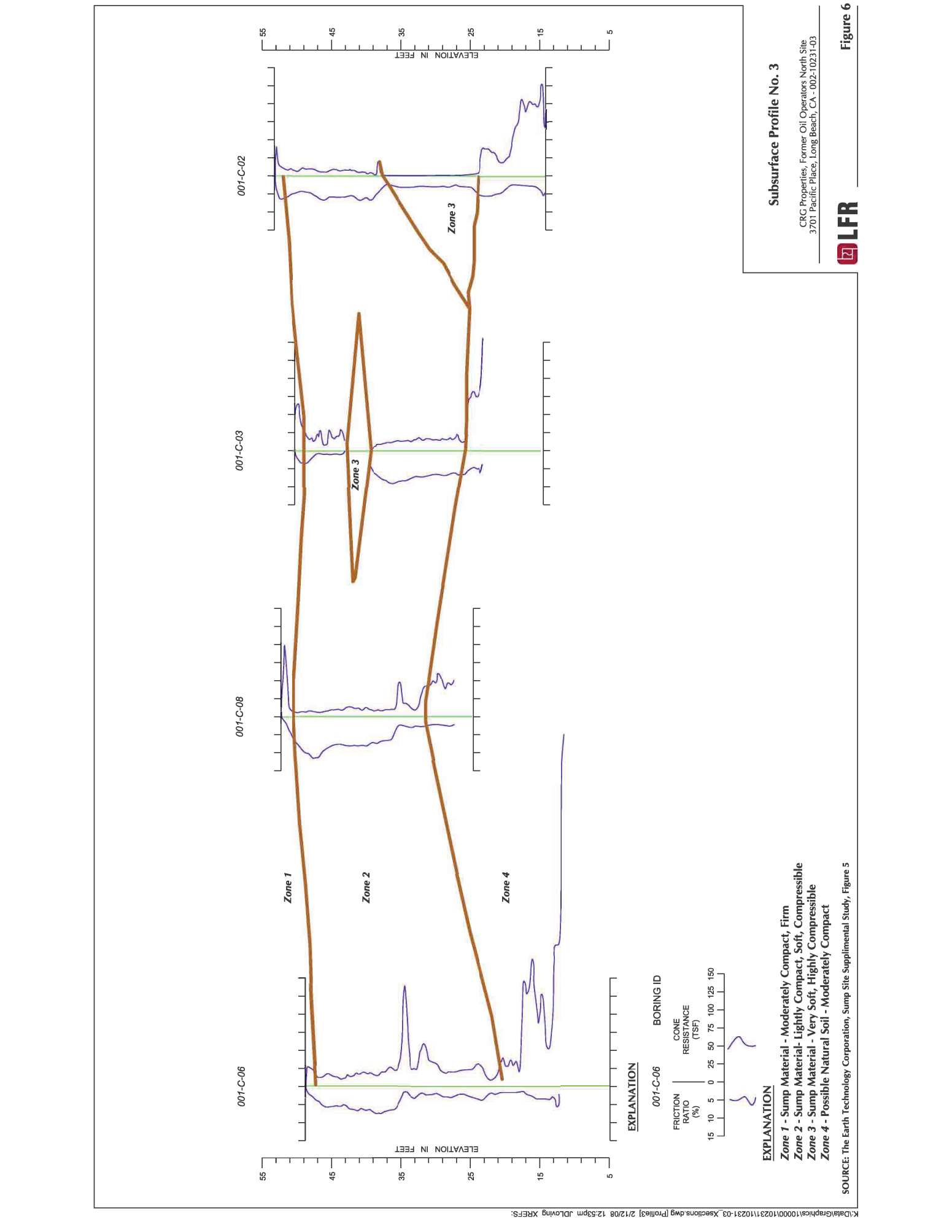
SOURCE: The Earth Technology Corporation, Sump Site Supplemental Study, Figure 4

Subsurface Profile No. 2

CRG Properties, Former Oil Operators North Site
3701 Pacific Place, Long Beach, CA - 002-10231-03



Figure 5



Subsurface Profile No. 3

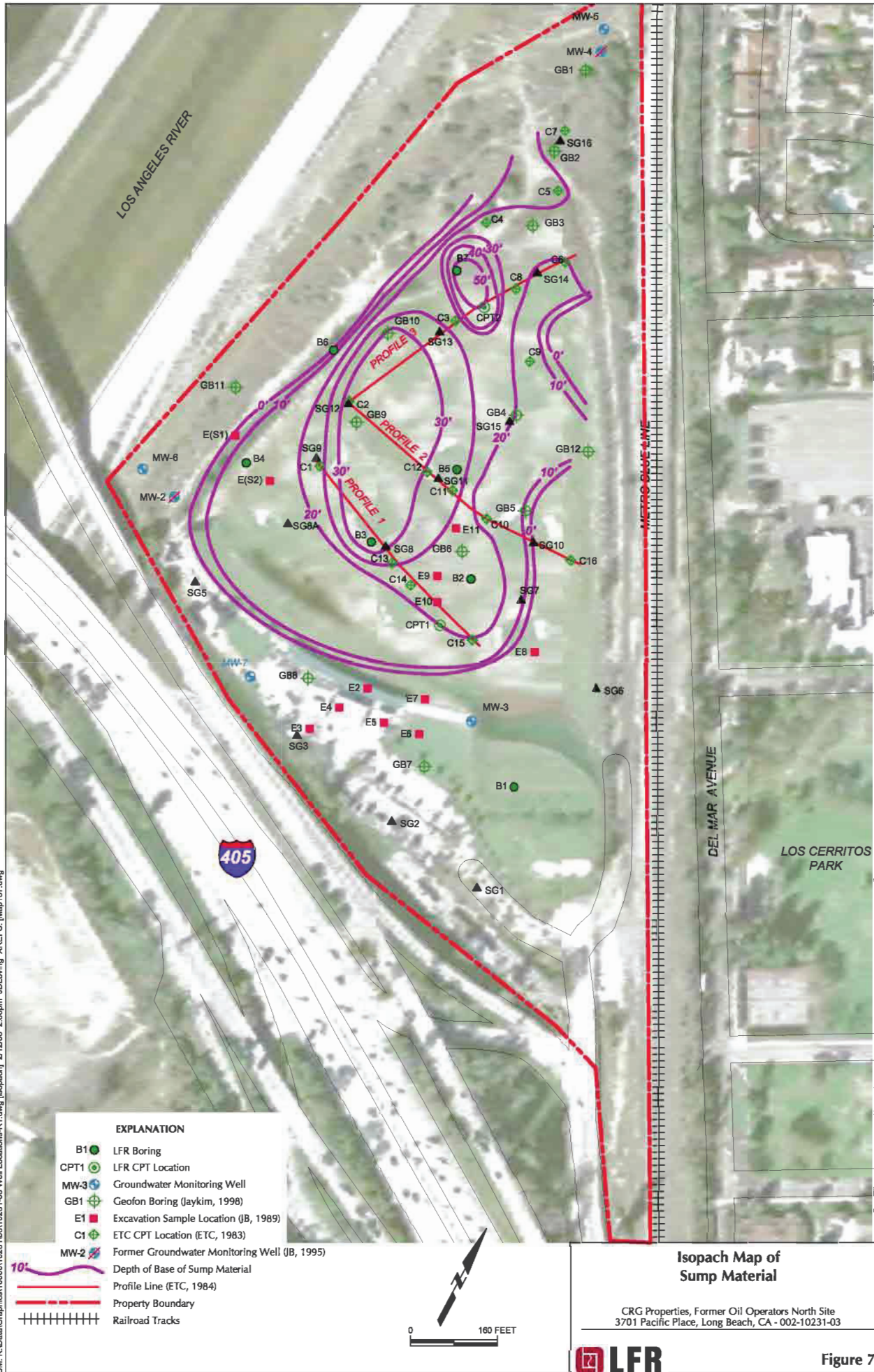
CRG Properties, Former Oil Operators North Site
3701 Pacific Place, Long Beach, CA - 002-10231-03



Figure 6

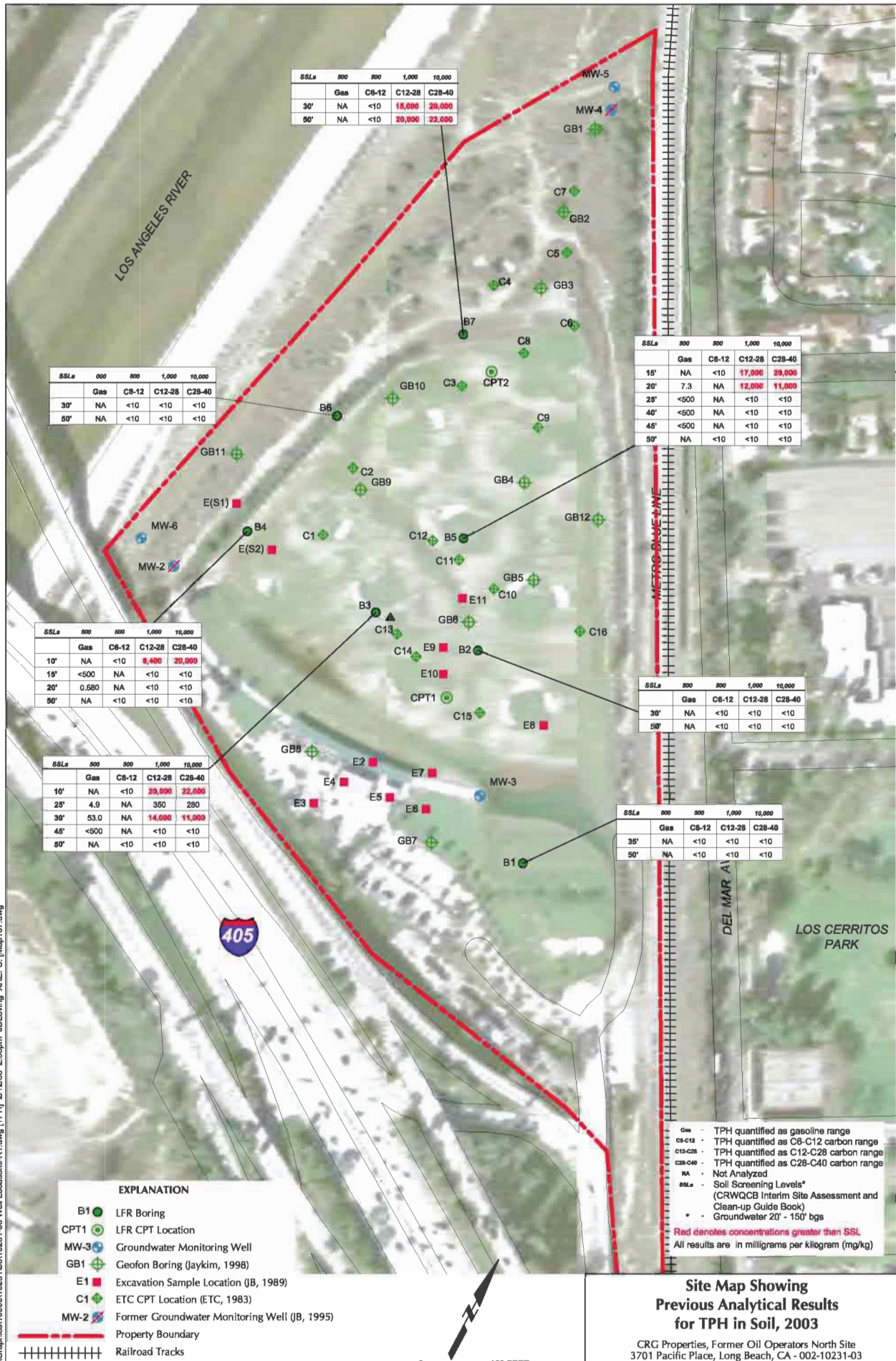
- EXPLANATION**
- Zone 1 - Sump Material - Moderately Compact, Firm
 - Zone 2 - Sump Material - Lightly Compact, Soft, Compressible
 - Zone 3 - Sump Material - Very Soft, Highly Compressible
 - Zone 4 - Possible Natural Soil - Moderately Compact

SOURCE: The Earth Technology Corporation, Sump Site Supplemental Study, Figure 5



C:\K:\Data\Graphics\1000\01\0231\03\10231-03 Well Locations-F1.dwg [isopach] 2/12/08 2:06pm JDLoving XREFS: [Map137.dwg]

Figure 7



SSLs	500	500	1,000	10,000
Gas	C6-12	C12-28	C28-40	
30'	NA	<10	15,000	20,000
50'	NA	<10	20,000	22,000

SSLs	500	500	1,000	10,000
Gas	C6-12	C12-28	C28-40	
30'	NA	<10	<10	<10
50'	NA	<10	<10	<10

SSLs	500	500	1,000	10,000
Gas	C6-12	C12-28	C28-40	
15'	NA	<10	17,000	20,000
20'	7.3	NA	12,000	11,000
28'	<500	NA	<10	<10
40'	<500	NA	<10	<10
45'	<500	NA	<10	<10
50'	NA	<10	<10	<10

SSLs	500	500	1,000	10,000
Gas	C6-12	C12-28	C28-40	
10'	NA	<10	8,400	23,000
15'	<500	NA	<10	<10
20'	0.680	NA	<10	<10
50'	NA	<10	<10	<10

SSLs	500	500	1,000	10,000
Gas	C6-12	C12-28	C28-40	
30'	NA	<10	<10	<10
50'	NA	<10	<10	<10

SSLs	500	500	1,000	10,000
Gas	C6-12	C12-28	C28-40	
10'	NA	<10	20,000	22,000
28'	4.9	NA	350	280
38'	53.0	NA	14,000	11,000
45'	<500	NA	<10	<10
50'	NA	<10	<10	<10

SSLs	500	500	1,000	10,000
Gas	C6-12	C12-28	C28-40	
35'	NA	<10	<10	<10
50'	NA	<10	<10	<10

- EXPLANATION**
- B1 ● LFR Boring
 - CPT1 ● LFR CPT Location
 - MW-3 ● Groundwater Monitoring Well
 - GB1 ● Geofon Boring (Jaykim, 1998)
 - E1 ■ Excavation Sample Location (JB, 1989)
 - C1 ● ETC CPT Location (ETC, 1983)
 - MW-2 ● Former Groundwater Monitoring Well (JB, 1995)
 - Property Boundary
 - ++++ Railroad Tracks

Gas - TPH quantified as gasoline range
 C6-12 - TPH quantified as C6-C12 carbon range
 C12-28 - TPH quantified as C12-C28 carbon range
 C28-40 - TPH quantified as C28-C40 carbon range
 NA - Not Analyzed
 SSLs - Soil Screening Levels* (CRWQCB Interim Site Assessment and Clean-up Guide Book)
 * - Groundwater 20' - 150' bgs
 Red denotes concentrations greater than SSL.
 All results are in milligrams per kilogram (mg/kg)

Site Map Showing Previous Analytical Results for TPH in Soil, 2003

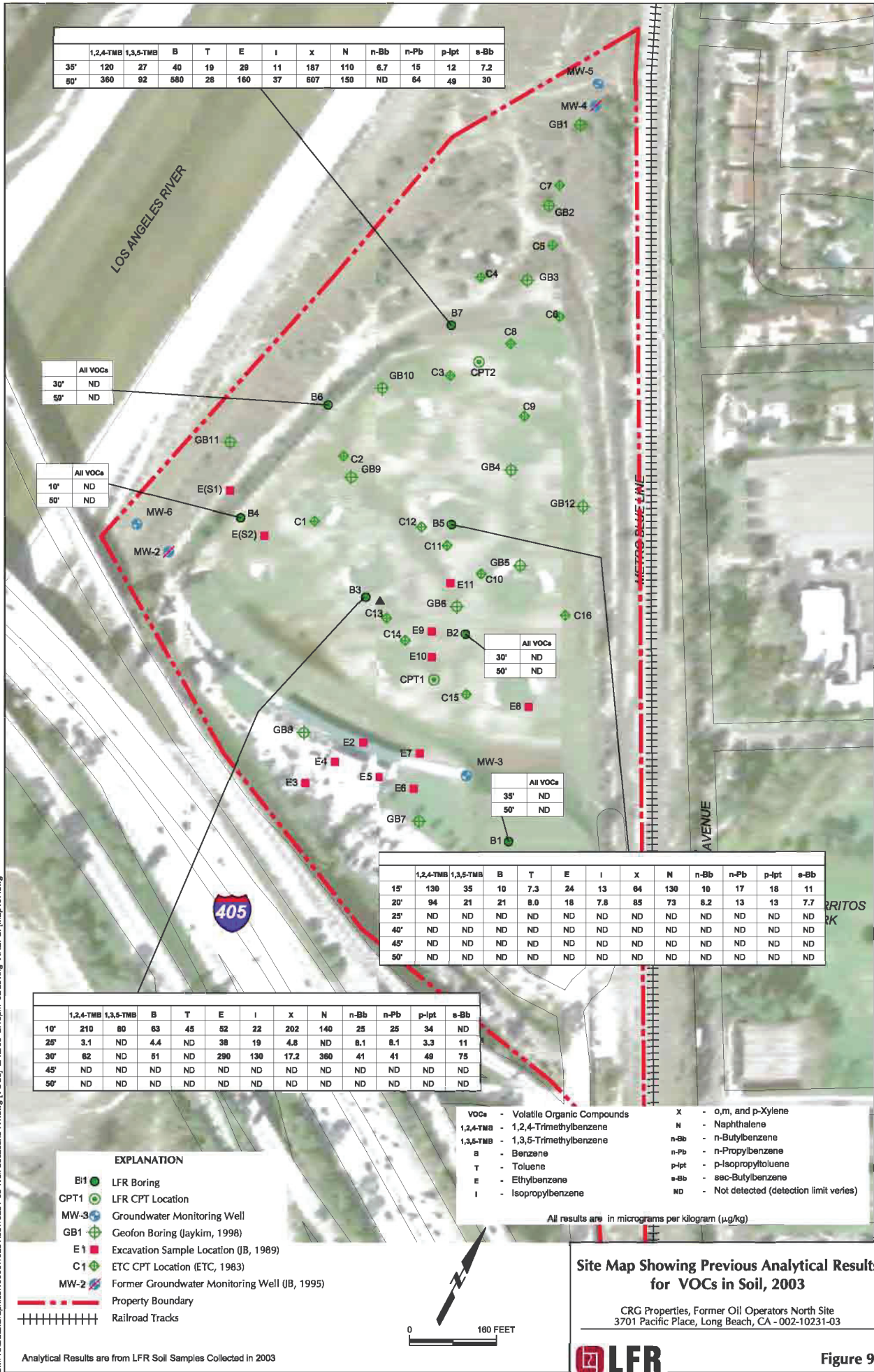
CRG Properties, Former Oil Operators North Site
 3701 Pacific Place, Long Beach, CA - 002-10231-03

CM: K:\Data\Graphics\1000\01\0231\03\10231-C0 Well Locations-R1.dwg [TPH] 2/12/08 2:08pm JDLoving XREFS: [Map137.dwg]

Analytical results are from LFR samples collected in 2003.



Figure 8



	1,2,4-TMB	1,3,5-TMB	B	T	E	I	X	N	n-Bb	n-Pb	p-lpt	s-Bb
35'	120	27	40	19	29	11	187	110	6.7	15	12	7.2
50'	360	92	880	28	160	37	607	150	ND	64	49	30

	All VOCs
30'	ND
50'	ND

	All VOCs
10'	ND
50'	ND

	All VOCs
30'	ND
50'	ND

	All VOCs
35'	ND
50'	ND

	1,2,4-TMB	1,3,5-TMB	B	T	E	I	X	N	n-Bb	n-Pb	p-lpt	s-Bb
15'	130	35	10	7.3	24	13	64	130	10	17	18	11
20'	94	21	21	8.0	18	7.8	85	73	8.2	13	13	7.7
25'	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
40'	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
45'	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
50'	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND

	1,2,4-TMB	1,3,5-TMB	B	T	E	I	X	N	n-Bb	n-Pb	p-lpt	s-Bb
10'	210	80	63	45	52	22	202	140	25	25	34	ND
25'	3.1	ND	4.4	ND	38	19	4.8	ND	8.1	8.1	3.3	11
30'	82	ND	51	ND	290	130	17.2	360	41	41	49	75
45'	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
50'	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND

- EXPLANATION**
- B1 ● LFR Boring
 - CPT1 ● LFR CPT Location
 - MW-3 ● Groundwater Monitoring Well
 - GB1 ● Geofon Boring (Jaykim, 1998)
 - E1 ■ Excavation Sample Location (JB, 1989)
 - C1 ● ETC CPT Location (ETC, 1983)
 - MW-2 ● Former Groundwater Monitoring Well (JB, 1995)
 - Property Boundary
 - ++++ Railroad Tracks

- VOCs - Volatile Organic Compounds
- 1,2,4-TMB - 1,2,4-Trimethylbenzene
- 1,3,5-TMB - 1,3,5-Trimethylbenzene
- B - Benzene
- T - Toluene
- E - Ethylbenzene
- I - Isopropylbenzene
- X - o,m, and p-Xylene
- N - Naphthalene
- n-Bb - n-Butylbenzene
- n-Pb - n-Propylbenzene
- p-lpt - p-Isopropyltoluene
- s-Bb - sec-Butylbenzene
- ND - Not detected (detection limit varies)

All results are in micrograms per kilogram (µg/kg)

Site Map Showing Previous Analytical Results for VOCs in Soil, 2003

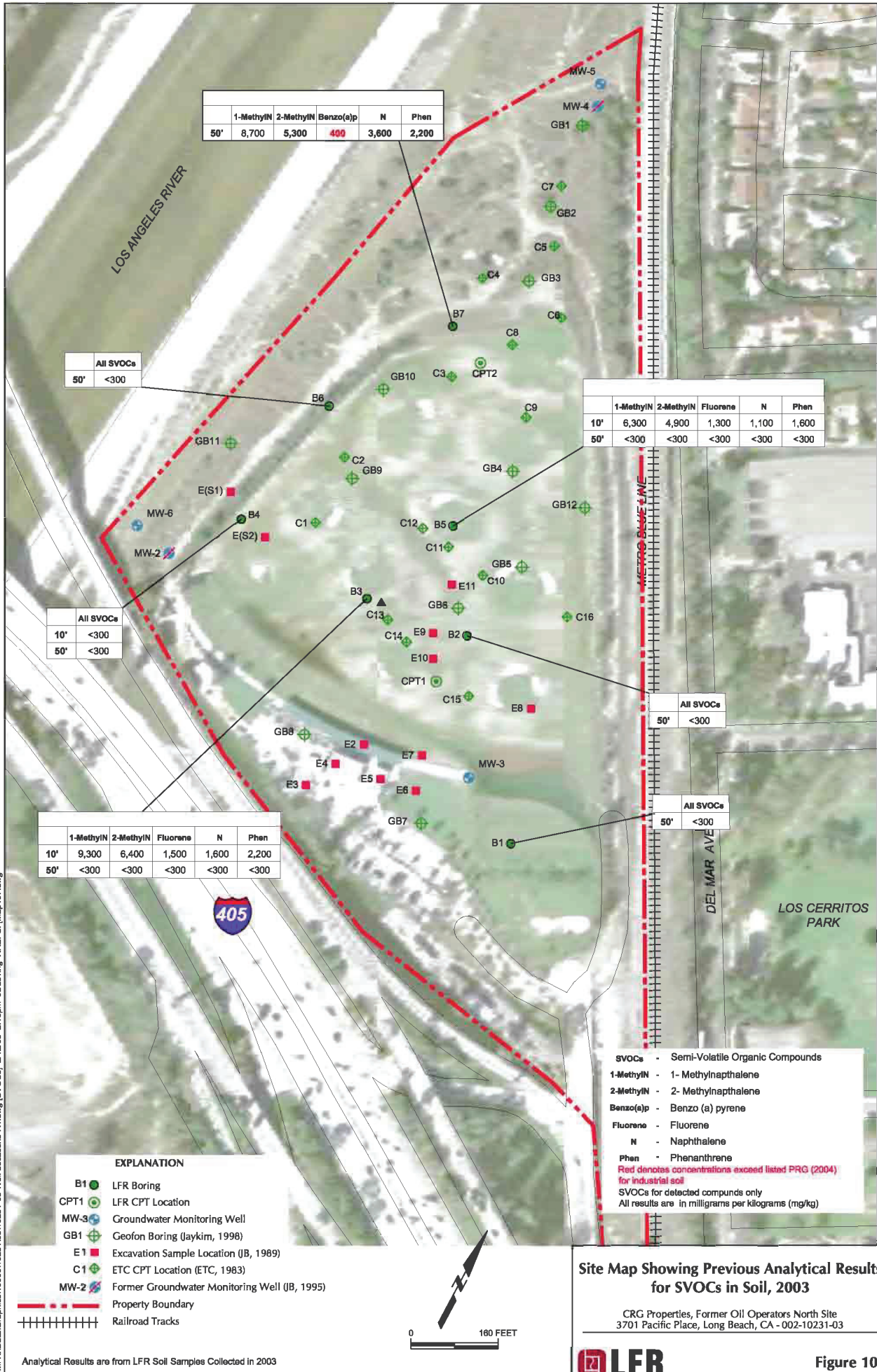
CRG Properties, Former Oil Operators North Site
3701 Pacific Place, Long Beach, CA - 002-10231-03



Figure 9

C:\K:\Data\Graphics\100001\02311031\0231-03 Well Locations-R1.dwg [VOCs] 2/12/08 2:16pm JDL\wing XREFS: [Map137.dwg]

Analytical Results are from LFR Soil Samples Collected in 2003



C:\K:\Data\Graphics\10000\102310231-03\Map Locations-R1.dwg [metals] 2/12/08 2:27pm JDLoving XREFS: [Map137.dwg

MW-5		Antimony	Arsenic	Barium	Beryllium	Cadmium	Calcium	Chromium	Cobalt	Copper	Lead	Magnesium	Mercury	Molybdenum	Nickel	Selenium	Silver	Sodium	Thallium	Vanadium	Zinc
		µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
05/19/04		<15	<10	97	<3	<5	<10	<50	<50	<50	16	<0.5	<50	<50	<50	<25	<50	<50	<10	<40	140
12/18/06		<50	<50	100	<50	<50	3,200	<50	<50	55	<50	750	<0.5	<50	<50	<50	<50	5,100	2	<50	<50
MCLs		6	10	1,000	4	5	-	50	-	1,000*	15	-	2	-	100	50	100*	-	-	50**	5,000

MW-4		Antimony	Arsenic	Barium	Beryllium	Cadmium	Calcium	Chromium	Cobalt	Copper	Lead	Magnesium	Mercury	Molybdenum	Nickel	Selenium	Silver	Sodium	Thallium	Vanadium	Zinc
		µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
01/10/96		-	-	-	-	-	-	ND	-	74	ND	-	-	-	-	-	-	-	-	-	40
2/17-19/97		-	-	-	-	-	-	ND	-	ND	130	-	-	-	-	-	-	-	-	-	100
MCLs		6	10	1,000	4	5	-	50	-	1,000*	15	-	2	-	100	50	100*	-	-	50**	5,000

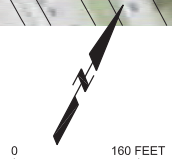
MW-6		Antimony	Arsenic	Barium	Beryllium	Cadmium	Calcium	Chromium	Cobalt	Copper	Lead	Magnesium	Mercury	Molybdenum	Nickel	Selenium	Silver	Sodium	Thallium	Vanadium	Zinc
		µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
05/19/04		22	<10	180	<3	<5	<10	<50	<50	<10	12	<50	<50	52	<50	<50	<10	59	180	180	180
12/18/06		<50	<50	100	<50	<50	4,100	<50	<50	140	<50	1,200	7.3	<50	<50	<50	<50	12,000	<50	<50	<50
MCLs		6	10	1,000	4	5	-	50	-	1,000*	15	-	2	-	100	50	100*	-	-	50**	5,000

MW-2		Antimony	Arsenic	Barium	Beryllium	Cadmium	Calcium	Chromium	Cobalt	Copper	Lead	Magnesium	Mercury	Molybdenum	Nickel	Selenium	Silver	Sodium	Thallium	Vanadium	Zinc
		µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
01/10/96		-	-	-	-	-	-	ND	-	80	ND	-	-	-	-	-	-	-	-	-	120
2/17-19/97		-	-	-	-	-	-	ND	-	ND	210	-	-	-	-	-	-	-	-	-	200
MCLs		6	10	1,000	4	5	-	50	-	1,000*	15	-	2	-	100	50	100*	-	-	50**	5,000

MW-3		Antimony	Arsenic	Barium	Beryllium	Cadmium	Calcium	Chromium	Cobalt	Copper	Lead	Magnesium	Mercury	Molybdenum	Nickel	Selenium	Silver	Sodium	Thallium	Vanadium	Zinc
		µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
01/10/96		-	-	-	-	-	-	ND	-	75	ND	-	-	-	-	-	-	-	-	-	130
2/17-19/97		-	-	-	-	-	-	ND	-	ND	280	-	-	-	-	-	-	-	-	-	200
12/19/03		<100	72 J	150	<50	<50	<50	<50	<50	<50	<50	<50	4.8	24 J	<50	<250	84 J	-	<100	<100	12 J
05/19/04		<15	15	290	<3	<5	<10	<50	<50	<50	<10	<50	160	<50	<50	<25	<50	-	<10	<40	66
12/18/06		<50	<50	140	<50	<50	5,200	<50	<50	400	<50	2,100	0.82	<50	<50	<50	62	24,000	<50	<50	<50
MCLs		6	10	1,000	4	5	-	50	-	1,000*	15	-	2	-	100	50	100*	-	-	50**	5,000

EXPLANATION

- MW-3 Groundwater Monitoring Well
- MW-2 Former Groundwater Monitoring Well (JB, 1995)
- Property Boundary
- Railroad Tracks
- µg/L micrograms per liter
- MCLs Maximum Contaminant Levels
- * Secondary MCL
- ** Action level for unregulated chemical requiring monitoring
- Red denotes concentrations exceed listed MCL
- Blue denotes positive result



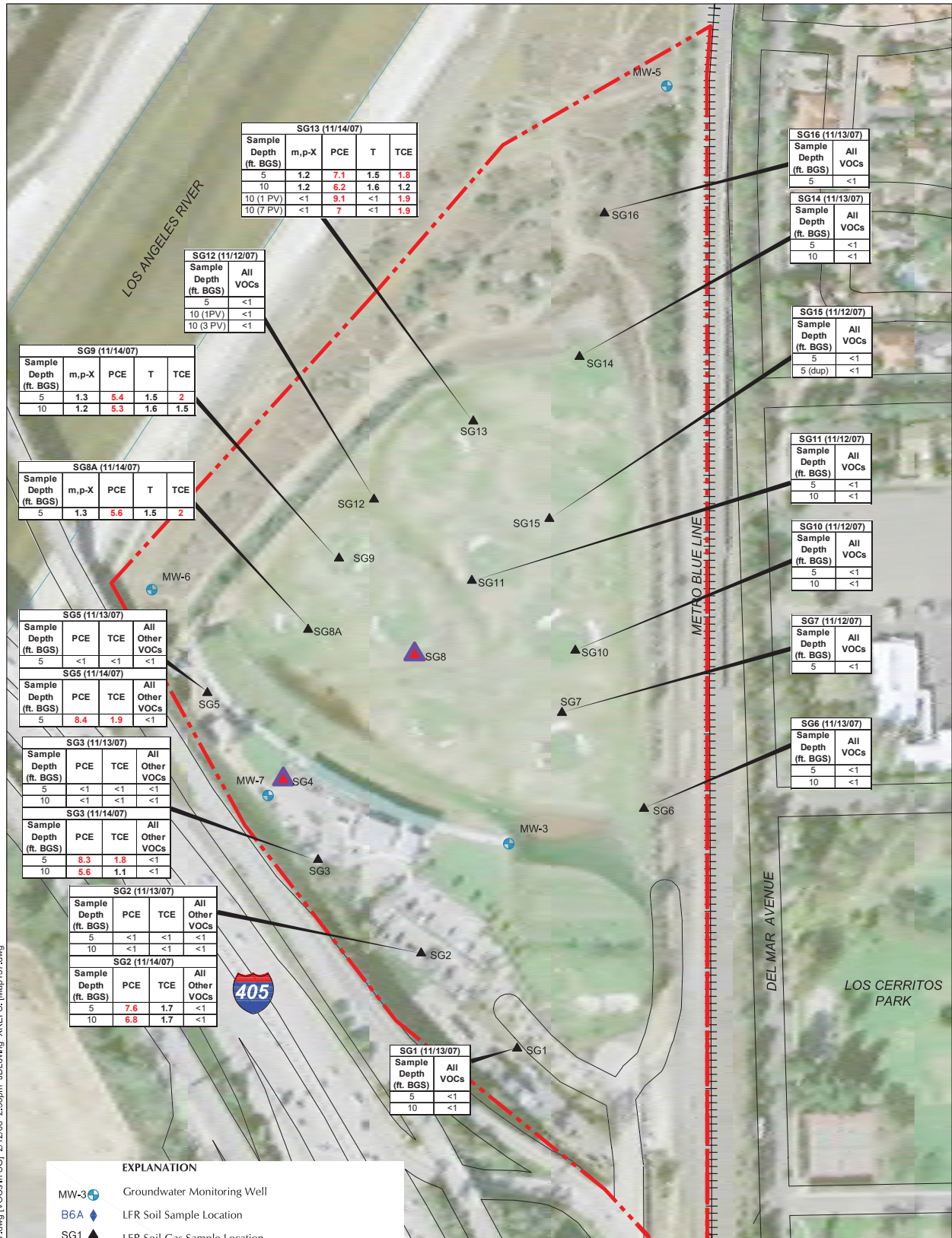
Site Map Showing Concentrations of Metals in Groundwater, 1996-2006

CRG Properties, Former Oil Operators North Site
3701 Pacific Place, Long Beach, CA - 002-10231-03

Analytical Results as Reported by Jack K. Bryant Engineers in 1996 and 1997 and LFR in 2004 and 2006.



Figure 11



SG9 (11/14/07)				
Sample Depth (ft. BGS)	m,p-X	PCE	T	TCE
5	1.3	5.4	1.5	2
10	1.2	5.3	1.6	1.5

SG8A (11/14/07)				
Sample Depth (ft. BGS)	m,p-X	PCE	T	TCE
5	1.3	5.6	1.5	2

SG5 (11/13/07)			
Sample Depth (ft. BGS)	PCE	TCE	All Other VOCs
5	<1	<1	<1

SG5 (11/14/07)			
Sample Depth (ft. BGS)	PCE	TCE	All Other VOCs
5	8.4	1.9	<1

SG3 (11/13/07)			
Sample Depth (ft. BGS)	PCE	TCE	All Other VOCs
5	<1	<1	<1
10	<1	<1	<1

SG3 (11/14/07)			
Sample Depth (ft. BGS)	PCE	TCE	All Other VOCs
5	8.3	1.8	<1
10	5.6	1.1	<1

SG2 (11/13/07)			
Sample Depth (ft. BGS)	PCE	TCE	All Other VOCs
5	<1	<1	<1
10	<1	<1	<1

SG2 (11/14/07)			
Sample Depth (ft. BGS)	PCE	TCE	All Other VOCs
5	7.6	1.7	<1
10	6.8	1.7	<1

SG1 (11/13/07)	
Sample Depth (ft. BGS)	All VOCs
5	<1
10	<1

SG13 (11/14/07)				
Sample Depth (ft. BGS)	m,p-X	PCE	T	TCE
5	1.2	7.1	1.5	1.8
10	1.2	6.2	1.6	1.2
10 (1 PV)	<1	9.1	<1	1.9
10 (7 PV)	<1	7	<1	1.9

SG12 (11/12/07)	
Sample Depth (ft. BGS)	All VOCs
5	<1
10 (1PV)	<1
10 (3 PV)	<1

SG16 (11/13/07)	
Sample Depth (ft. BGS)	All VOCs
5	<1

SG14 (11/13/07)	
Sample Depth (ft. BGS)	All VOCs
5	<1
10	<1

SG15 (11/12/07)	
Sample Depth (ft. BGS)	All VOCs
5	<1
5 (dup)	<1

SG11 (11/12/07)	
Sample Depth (ft. BGS)	All VOCs
5	<1
10	<1

SG10 (11/12/07)	
Sample Depth (ft. BGS)	All VOCs
5	<1
10	<1

SG7 (11/12/07)	
Sample Depth (ft. BGS)	All VOCs
5	<1

SG6 (11/13/07)	
Sample Depth (ft. BGS)	All VOCs
5	<1
10	<1

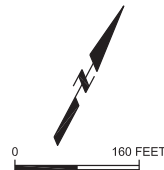
C:\K:\Data\Graphics\100001\02311\0231 Well Locations 1207.dwg [VOCs in SG] 2/12/08 2:36pm -JDLoving XREFS: [Map137.dwg]

EXPLANATION

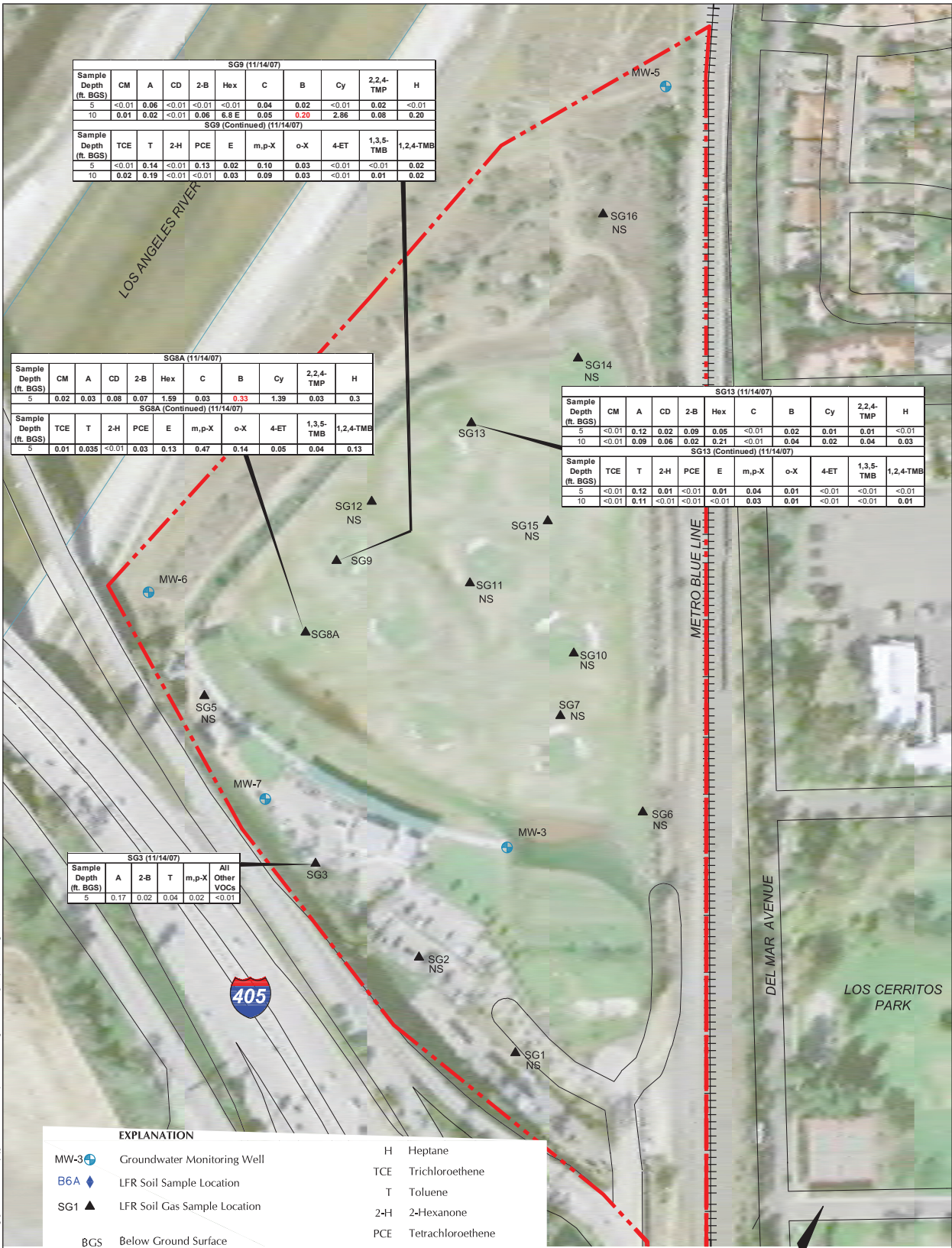
- MW-3+ Groundwater Monitoring Well
- B6A ♦ LFR Soil Sample Location
- SG1 ▲ LFR Soil Gas Sample Location
- SG4 ▲ Location Not Sampled Because Fill is Less Than 5 Feet BGS
- BGS Below Ground Surface
- TCE Trichloroethene
- T Toluene
- PCE Tetrachloroethene
- m,p-X m,p-Xylenes
- PV Purge Volume
- Property Boundary
- ||||| Railroad Tracks

All results reported in micrograms per liter
 VOCs-Volatile Organic Compounds
 Only detected VOC Concentrations are shown.
 See EST Laboratory report for other analyzed VOCs.
 Red denotes concentrations above respective CHHSL

**Site Map Showing
 VOCs Concentrations in Soil Gas Using
 EPA Method 8260B, November 12-14, 2007**
 CRG Properties, Former Oil Operators North Site
 3701 Pacific Place, Long Beach, CA - 002-10231-03



C:\K:\Data\Graphics\100001\023110231\Well Locations 1207.dwg [VOCs in SG (2)] 2/12/08 2:37pm JDLoving XREFS: [Map137.dwg]



SG9 (11/14/07)										
Sample Depth (ft. BGS)	CM	A	CD	2-B	Hex	C	B	Cy	2,2,4-TMP	H
5	<0.01	0.06	<0.01	<0.01	<0.01	0.04	0.02	<0.01	0.02	<0.01
10	0.01	0.02	<0.01	0.06	6.8 E	0.05	0.20	2.86	0.08	0.20

SG9 (Continued) (11/14/07)										
Sample Depth (ft. BGS)	TCE	T	2-H	PCE	E	m,p-X	o-X	4-ET	1,3,5-TMB	1,2,4-TMB
5	<0.01	0.14	<0.01	0.13	0.02	0.10	0.03	<0.01	<0.01	0.02
10	0.02	0.19	<0.01	<0.01	0.03	0.09	0.03	<0.01	0.01	0.02

SG8A (11/14/07)										
Sample Depth (ft. BGS)	CM	A	CD	2-B	Hex	C	B	Cy	2,2,4-TMP	H
5	0.02	0.03	0.08	0.07	1.59	0.63	0.33	1.39	0.03	0.3

SG8A (Continued) (11/14/07)										
Sample Depth (ft. BGS)	TCE	T	2-H	PCE	E	m,p-X	o-X	4-ET	1,3,5-TMB	1,2,4-TMB
5	0.01	0.035	<0.01	0.03	0.13	0.47	0.14	0.05	0.04	0.13

SG13 (11/14/07)										
Sample Depth (ft. BGS)	CM	A	CD	2-B	Hex	C	B	Cy	2,2,4-TMP	H
5	<0.01	0.12	0.02	0.09	0.05	<0.01	0.02	0.01	0.01	<0.01
10	<0.01	0.09	0.06	0.02	0.21	<0.01	0.04	0.02	0.04	0.03

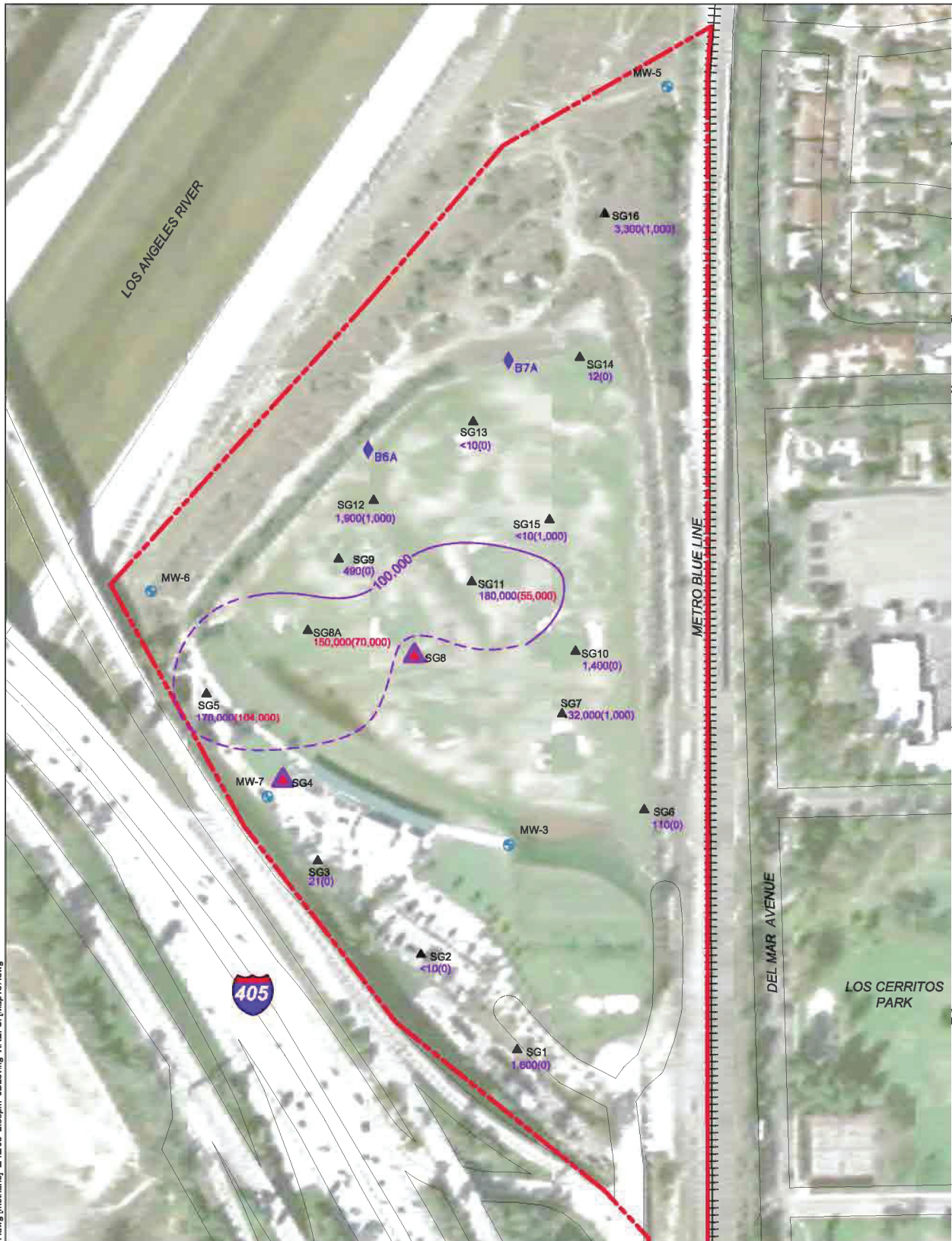
SG13 (Continued) (11/14/07)										
Sample Depth (ft. BGS)	TCE	T	2-H	PCE	E	m,p-X	o-X	4-ET	1,3,5-TMB	1,2,4-TMB
5	<0.01	0.12	0.01	<0.01	<0.01	0.01	0.04	0.01	<0.01	<0.01
10	<0.01	0.11	<0.01	<0.01	<0.01	0.03	0.01	<0.01	<0.01	0.01

SG3 (11/14/07)						
Sample Depth (ft. BGS)	A	2-B	T	m,p-X	All Other VOCs	H
5	0.17	0.02	0.04	0.02	<0.01	<0.01

EXPLANATION	
MW-3	Groundwater Monitoring Well
B6A	LFR Soil Sample Location
SG1	LFR Soil Gas Sample Location
BGS	Below Ground Surface
NS	Not Sampled
CM	Chloromethane
A	Acetone
CD	Carbon Disulfide
2-B	2-Butanone
Hex	Hexane
C	Chloroform
B	Benzene
Cy	Cyclohexane
2,2,4-TMP	2,2,4-Trimethylpentane
H	Heptane
TCE	Trichloroethene
T	Toluene
2-H	2-Hexanone
PCE	Tetrachloroethene
E	Ethylbenzene
m,p-X	m,p-Xylenes
o-X	o-Xylene
4-ET	4-Ethyltoluene
1,3,5-TMB	1,3,5-Trimethylbenzene
1,2,4-TMB	1,2,4-Trimethylbenzene
VOCs	Volatile Organic Compounds
-----	Property Boundary
+++++	Railroad Tracks

All results reported in micrograms per liter. Only detected VOC concentrations are shown. See ACE laboratory report for other analyzed VOCs. Red denotes concentrations above respective CHHSL.

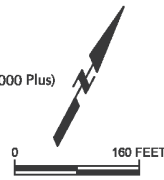
Site Map Showing VOC Concentrations in Soil Gas Using EPA Method TO-15, November 14, 2007
 CRG Properties, Former Oil Operators North Site
 3701 Pacific Place, Long Beach, CA - 002-10231-03



C:\K:\Data\Graphics\1000\10231\10231 Well Locations 1207.dwg [methane] 2/12/08 2:38pm JDLoving XREFS: [Map137.dwg]

- EXPLANATION**
- MW-3 Groundwater Monitoring Well
 - B6A LFR Soil Sample Location
 - SG1 LFR Soil Gas Sample Location
 - SG4 Location Not Sampled Because Fill is Less Than 5 Feet BGS
 - BGS Below Ground Surface
 - Methane Concentration using a field gas monitor (Landtec GEM 2000 Plus)
 - Methane Concentration using EPA Method 8015M
 - Isocontour for Methane, dashed where inferred
 - Property Boundary
 - Railroad Tracks

180,000 - Blue denotes concentration above upper explosive limit
 150,000 - Red denotes concentration within explosive range
 Note: All results reported in parts per million per volume



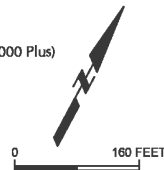
Site Map Showing
Methane Concentrations in Soil Gas
at 5 feet BGS, November 12-15, 2007
 CRG Properties, Former Oil Operators North Site
 3701 Pacific Place, Long Beach, CA - 002-10231-03



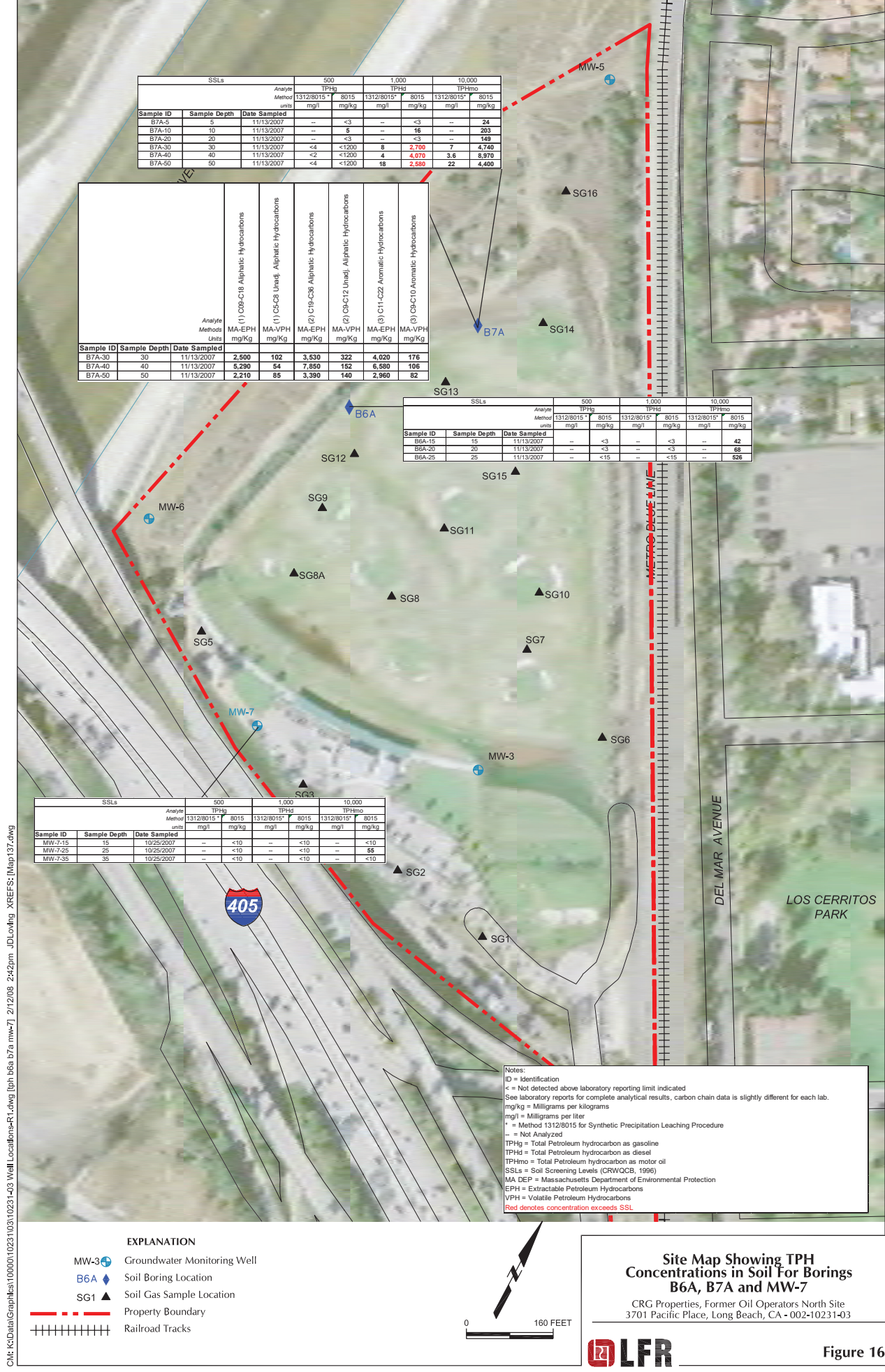
C:\K:\Data\Graphics\1000\10231\10231 Well Locations 1207.dwg [methane 10ft] 2/12/08 2:38pm JDLoving XREFS: [Map137.dwg]

- EXPLANATION**
- MW-3 Groundwater Monitoring Well
 - B6A LFR Soil Sample Location
 - SG1 LFR Soil Gas Sample Location
 - BGS Below Ground Surface
 - NS Not Sampled Because Fill is Less Than 10 Feet BGS
 - 160,000(122,000) Methane Concentration using a field gas monitor (Landtec GEM 2000 Plus)
 - 100,000 Methane Concentration using EPA Method 8015M
 - 100,000 Isocontour for Methane, dashed where inferred
 - Property Boundary
 - Railroad Tracks

300,000 - Blue denotes concentration above upper explosive limit
 72,000 - Red denotes concentration within explosive range
 Note: All results reported in parts per million per volume



Site Map Showing
Methane Concentrations in Soil Gas
at 10 feet BGS, November 12-15, 2007
 CRG Properties, Former Oil Operators North Site
 3701 Pacific Place, Long Beach, CA - 002-10231-03



Sample ID	Sample Depth	Date Sampled	500		1,000		10,000	
			TPH _g	TPH _h	TPH _g	TPH _h	TPH _g	TPH _h
B7A-5	5	11/13/2007	--	<3	--	<3	--	24
B7A-10	10	11/13/2007	--	5	--	16	--	203
B7A-20	20	11/13/2007	--	<3	--	<3	--	149
B7A-30	30	11/13/2007	<4	<1200	8	2,100	7	4,749
B7A-40	40	11/13/2007	<2	<1200	4	4,070	3.6	8,970
B7A-50	50	11/13/2007	<4	<1200	18	2,580	22	4,400

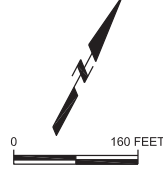
Sample ID	Sample Depth	Date Sampled	Aliphatic Hydrocarbons			Aromatic Hydrocarbons		
			MA-EPH	MA-VPH	MA-EPH	MA-VPH	MA-EPH	MA-VPH
B7A-30	30	11/13/2007	2,500	102	3,530	322	4,020	176
B7A-40	40	11/13/2007	5,290	54	7,850	152	6,580	106
B7A-50	50	11/13/2007	2,210	85	3,390	140	2,960	82

Sample ID	Sample Depth	Date Sampled	500		1,000		10,000	
			TPH _g	TPH _h	TPH _g	TPH _h	TPH _g	TPH _h
B6A-15	15	11/13/2007	--	<3	--	<3	--	42
B6A-20	20	11/13/2007	--	<3	--	<3	--	68
B6A-25	25	11/13/2007	--	<15	--	<15	--	526

Sample ID	Sample Depth	Date Sampled	500		1,000		10,000	
			TPH _g	TPH _h	TPH _g	TPH _h	TPH _g	TPH _h
MW-7-15	15	10/25/2007	--	<10	--	<10	--	<10
MW-7-25	25	10/25/2007	--	<10	--	<10	--	55
MW-7-35	35	10/25/2007	--	<10	--	<10	--	<10

Notes:
 ID = Identification
 < = Not detected above laboratory reporting limit indicated
 See laboratory reports for complete analytical results, carbon chain data is slightly different for each lab.
 mg/kg = Milligrams per kilograms
 mg/l = Milligrams per liter
 * = Method 1312/8015 for Synthetic Precipitation Leaching Procedure
 -- = Not Analyzed
 TPH_g = Total Petroleum hydrocarbon as gasoline
 TPH_h = Total Petroleum hydrocarbon as diesel
 TPH_m = Total Petroleum hydrocarbon as motor oil
 SSLs = Soil Screening Levels (CRWCCB, 1996)
 MA DEP = Massachusetts Department of Environmental Protection
 EPH = Extractable Petroleum Hydrocarbons
 VPH = Volatile Petroleum Hydrocarbons
 Red denotes concentration exceeds SSL

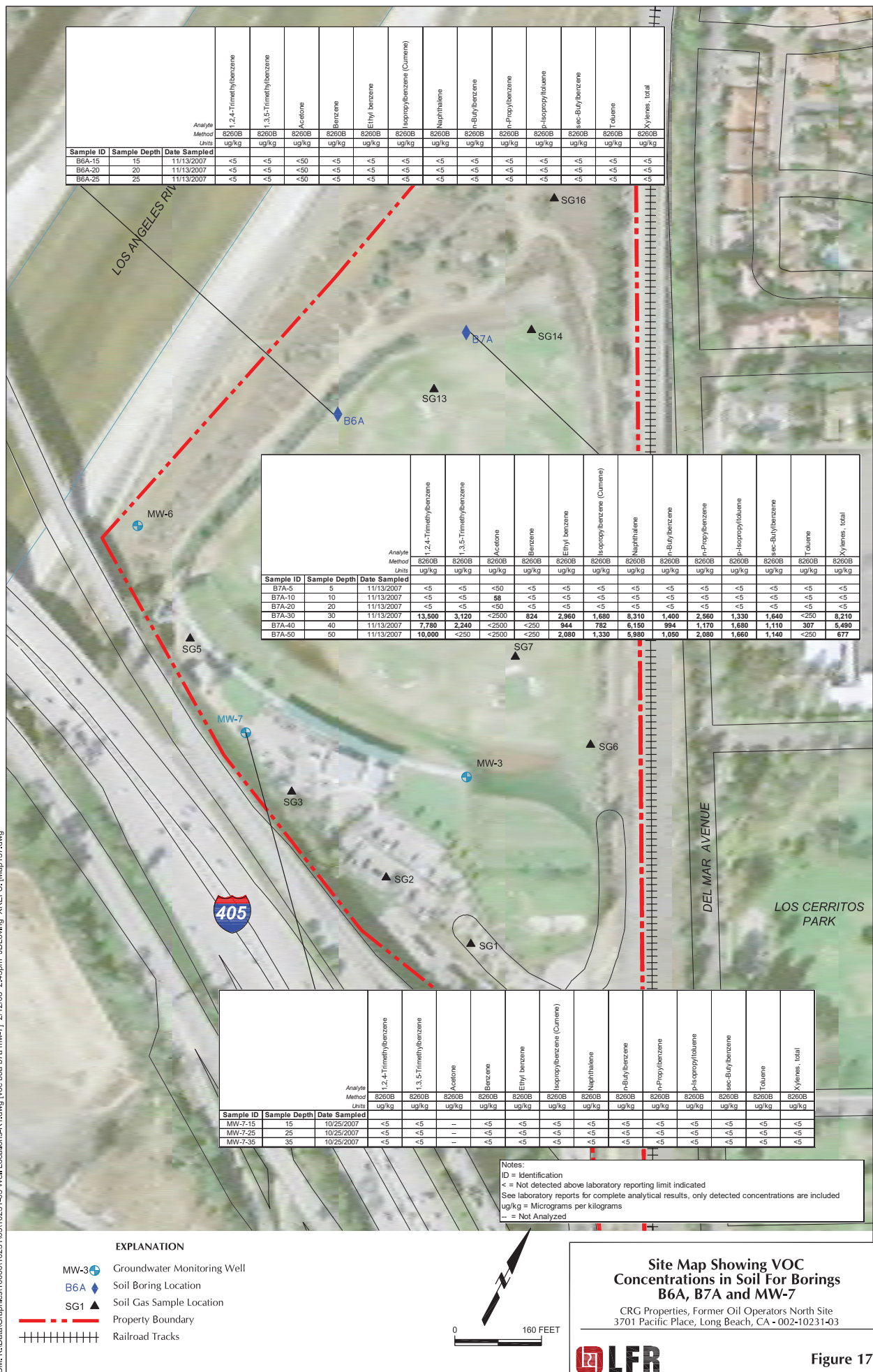
- EXPLANATION**
- MW-3 Groundwater Monitoring Well
 - B6A Soil Boring Location
 - SG1 Soil Gas Sample Location
 - Property Boundary
 - Railroad Tracks



Site Map Showing TPH Concentrations in Soil For Borings B6A, B7A and MW-7
 CRG Properties, Former Oil Operators North Site
 3701 Pacific Place, Long Beach, CA - 002-10231-03

C:\K:\Data\Graphical\100001\0231031\0231-03 Well Locations-R1.dwg [pjh b6a b7a mw-7] 2/12/08 2:42pm JDL\mfg_XREFS:\Map137.dwg

C:\K:\Data\Graphics\100001\0231\031\0231-03 Well Locations-RT1.dwg [voc b6a b7a mw-7] 2/12/08 2:43pm JD.Lovring XREFS: [Map137.dwg]



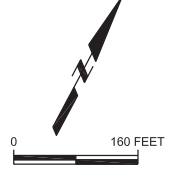
Sample ID	Sample Depth	Date Sampled	Analyte												
			1,2,4-Trimethylbenzene	1,3,5-Trimethylbenzene	Acetone	Benzene	Ethyl benzene	Isopropylbenzene (Cumene)	Naphthalene	n-Butylbenzene	n-Propylbenzene	p-Isopropyltoluene	sec-Butylbenzene	Toluene	Xylenes, total
Method	Units	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	
B6A-15	15	11/13/2007	<5	<5	<50	<5	<5	<5	<5	<5	<5	<5	<5	<5	
B6A-20	20	11/13/2007	<5	<5	<50	<5	<5	<5	<5	<5	<5	<5	<5		
B6A-25	25	11/13/2007	<5	<5	<50	<5	<5	<5	<5	<5	<5	<5	<5		

Sample ID	Sample Depth	Date Sampled	Analyte												
			1,2,4-Trimethylbenzene	1,3,5-Trimethylbenzene	Acetone	Benzene	Ethyl benzene	Isopropylbenzene (Cumene)	Naphthalene	n-Butylbenzene	n-Propylbenzene	p-Isopropyltoluene	sec-Butylbenzene	Toluene	Xylenes, total
Method	Units	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	
B7A-5	5	11/13/2007	<5	<5	<50	<5	<5	<5	<5	<5	<5	<5	<5	<5	
B7A-10	10	11/13/2007	<5	<5	58	<5	<5	<5	<5	<5	<5	<5	<5	<5	
B7A-20	20	11/13/2007	<5	<5	<50	<5	<5	<5	<5	<5	<5	<5	<5	<5	
B7A-30	30	11/13/2007	13,500	3,120	<2500	824	2,960	1,680	8,310	1,400	2,560	1,330	1,640	<250	
B7A-40	40	11/13/2007	7,780	2,240	<2500	944	782	6,150	994	1,170	1,680	1,110	307	5,490	
B7A-50	50	11/13/2007	10,000	<250	<2500	2,080	2,080	1,330	5,980	1,050	2,080	1,660	1,140	<250	

Sample ID	Sample Depth	Date Sampled	Analyte												
			1,2,4-Trimethylbenzene	1,3,5-Trimethylbenzene	Acetone	Benzene	Ethyl benzene	Isopropylbenzene (Cumene)	Naphthalene	n-Butylbenzene	n-Propylbenzene	p-Isopropyltoluene	sec-Butylbenzene	Toluene	Xylenes, total
Method	Units	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	
MW-7-15	15	10/25/2007	<5	<5	-	<5	<5	<5	<5	<5	<5	<5	<5	<5	
MW-7-25	25	10/25/2007	<5	<5	-	<5	<5	<5	<5	<5	<5	<5	<5	<5	
MW-7-35	35	10/25/2007	<5	<5	-	<5	<5	<5	<5	<5	<5	<5	<5	<5	

Notes:
 ID = Identification
 < = Not detected above laboratory reporting limit indicated
 See laboratory reports for complete analytical results, only detected concentrations are included
 ug/kg = Micrograms per kilograms
 - = Not Analyzed

- EXPLANATION**
- MW-3 Groundwater Monitoring Well
 - B6A Soil Boring Location
 - SG1 Soil Gas Sample Location
 - Property Boundary
 - Railroad Tracks



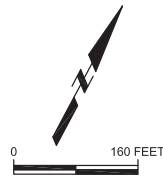
Site Map Showing VOC Concentrations in Soil For Borings B6A, B7A and MW-7
 CRG Properties, Former Oil Operators North Site
 3701 Pacific Place, Long Beach, CA - 002-10231-03

C:\K:\Data\Graphics\100001\02310231-03 Well Locations-R1.dwg [svoc.b6a b7a mw-7] 2/12/08 2:43pm JDLoving XREFS: [Map137.dwg



- EXPLANATION**
- MW-3+ Groundwater Monitoring Well
 - B6A Soil Boring Location
 - SG1 Soil Gas Sample Location
 - Property Boundary
 - ++++ Railroad Tracks

Red denotes concentrations exceeds EPA Preliminary Remediation Goals for commercial/industrial land use



Notes:
 ID = Identification
 < = Not detected above laboratory reporting limit indicated
 ug/kg = Micrograms per kilograms

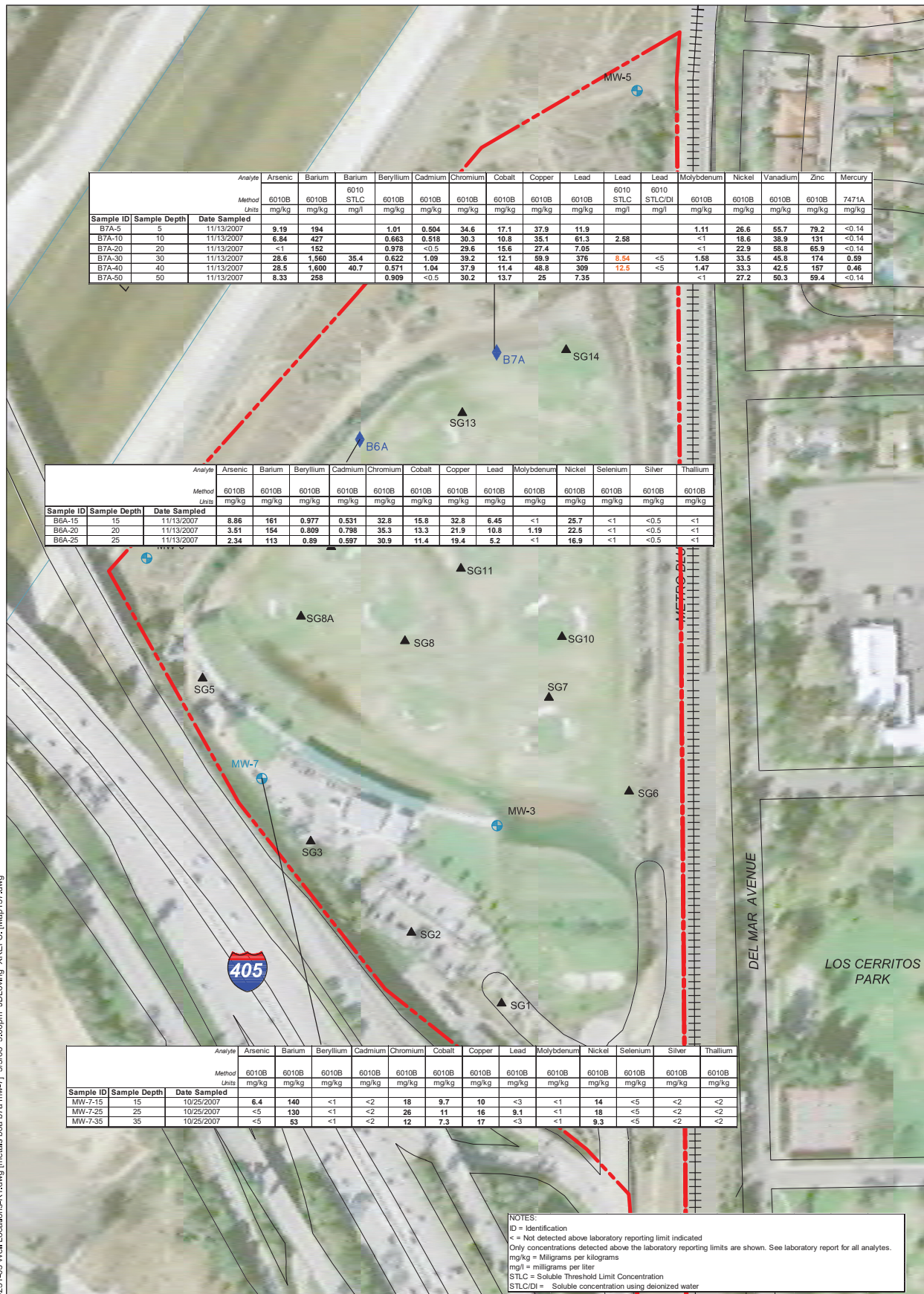
Site Map Showing SVOC Concentrations in Soil From Borings B6A, B7A and MW-7

CRG Properties, Former Oil Operators North Site
 3701 Pacific Place, Long Beach, CA - 002-10231-03



Figure 18

C:\K:\Data\Graphics\100001\0231031\0231-03 Well Locations-R1.dwg [metals b6a b7a mw-7] 3/5/08 5:00pm JDLoving_XREFS; [Map137.dwg



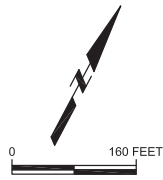
Sample ID	Sample Depth	Date Sampled	Analyte																	
			Arsenic	Barium	Beryllium	Cadmium	Chromium	Cobalt	Copper	Lead	Lead	Lead	Molybdenum	Nickel	Vanadium	Zinc	Mercury			
Method Units			6010B mg/kg	6010B mg/kg	6010 STLC mg/l	6010B mg/kg	6010B mg/kg	6010B mg/kg	6010B mg/kg	6010B mg/kg	6010B mg/kg	6010B mg/kg	6010 STLC mg/l	6010 STLC/DI mg/l	6010B mg/kg	6010B mg/kg	6010B mg/kg	6010B mg/kg	6010B mg/kg	7471A mg/kg
B7A-5	5	11/13/2007	9.19	194		1.01	0.504	34.6	17.1	37.9	11.9				1.11	26.6	55.7	79.2	<0.14	
B7A-10	10	11/13/2007	6.84	427		0.663	0.518	30.3	10.8	35.1	61.3	2.58			<1	18.6	38.9	131	<0.14	
B7A-20	20	11/13/2007	<1	162		0.978	<0.5	29.6	15.6	27.4	7.05				<1	22.9	58.8	65.9	<0.14	
B7A-30	30	11/13/2007	28.6	1,560	35.4	0.622	1.09	39.2	12.1	59.9	376	8.54	<5	<5	1.58	33.5	45.8	174	0.59	
B7A-40	40	11/13/2007	28.5	1,600	40.7	0.571	1.04	37.9	11.4	48.9	309	12.5	<5	<5	1.47	33.3	42.5	157	0.48	
B7A-50	50	11/13/2007	8.33	258		0.909	<0.5	30.2	13.7	25	7.35				<1	27.2	50.3	59.4	<0.14	

Sample ID	Sample Depth	Date Sampled	Analyte												
			Arsenic	Barium	Beryllium	Cadmium	Chromium	Cobalt	Copper	Lead	Molybdenum	Nickel	Selenium	Silver	Thallium
Method Units			6010B mg/kg	6010B mg/kg	6010B mg/kg	6010B mg/kg	6010B mg/kg	6010B mg/kg	6010B mg/kg	6010B mg/kg	6010B mg/kg	6010B mg/kg	6010B mg/kg	6010B mg/kg	
B6A-15	15	11/13/2007	8.86	161	0.977	0.531	32.8	15.9	32.8	6.45	<1	25.7	<1	<0.5	<1
B6A-20	20	11/13/2007	3.51	154	0.809	0.798	35.3	13.3	21.9	10.8	1.19	22.5	<1	<0.5	<1
B6A-25	25	11/13/2007	2.34	113	0.89	0.597	30.9	11.4	19.4	5.2	<1	16.9	<1	<0.5	<1

Sample ID	Sample Depth	Date Sampled	Analyte												
			Arsenic	Barium	Beryllium	Cadmium	Chromium	Cobalt	Copper	Lead	Molybdenum	Nickel	Selenium	Silver	Thallium
Method Units			6010B mg/kg	6010B mg/kg	6010B mg/kg	6010B mg/kg	6010B mg/kg	6010B mg/kg	6010B mg/kg	6010B mg/kg	6010B mg/kg	6010B mg/kg	6010B mg/kg	6010B mg/kg	
MW-7-15	15	10/25/2007	6.4	140	<1	<2	18	9.7	10	<3	<1	14	<5	<2	<2
MW-7-25	25	10/25/2007	<5	130	<1	<2	26	11	16	9.1	<1	18	<5	<2	<2
MW-7-35	35	10/25/2007	<5	53	<1	<2	12	7.3	17	<3	<1	9.3	<5	<2	<2

NOTES:
 ID = Identification
 < = Not detected above laboratory reporting limit indicated
 Only concentrations detected above the laboratory reporting limits are shown. See laboratory report for all analytes.
 mg/kg = Milligrams per kilogram
 mg/l = milligrams per liter
 STLC = Soluble Threshold Limit Concentration
 STLC/DI = Soluble concentration using deionized water

- EXPLANATION**
- MW-3 Groundwater Monitoring Well
 - B6A Soil Boring Location
 - SG1 Soil Gas Sample Location
 - Property Boundary
 - Railroad Tracks
 - Red denotes concentrations exceeds Soluble Threshold Limit Concentration



Site Map Showing Metals Concentrations in Soil From Borings B6A, B7A and MW-7






CRG Properties, Former Oil Operators North Site
 3701 Pacific Place, Long Beach, CA - 002-10231-03

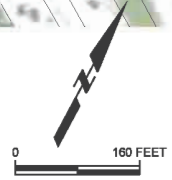


Figure 19



C:\K:\Data\Graphics\1000\10231\10231 Well Locations 1207.dwg [gw] 2/12/2008 2:35pm JDLoving XREFS: [Map137.dwg]

EXPLANATION	
MW-3 	Groundwater Monitoring Well
2.00	Groundwater Elevation (ft above MSL)
	Groundwater Flow Contour (dashed where inferred)
	Groundwater Flow Direction
	Property Boundary
	Railroad Tracks

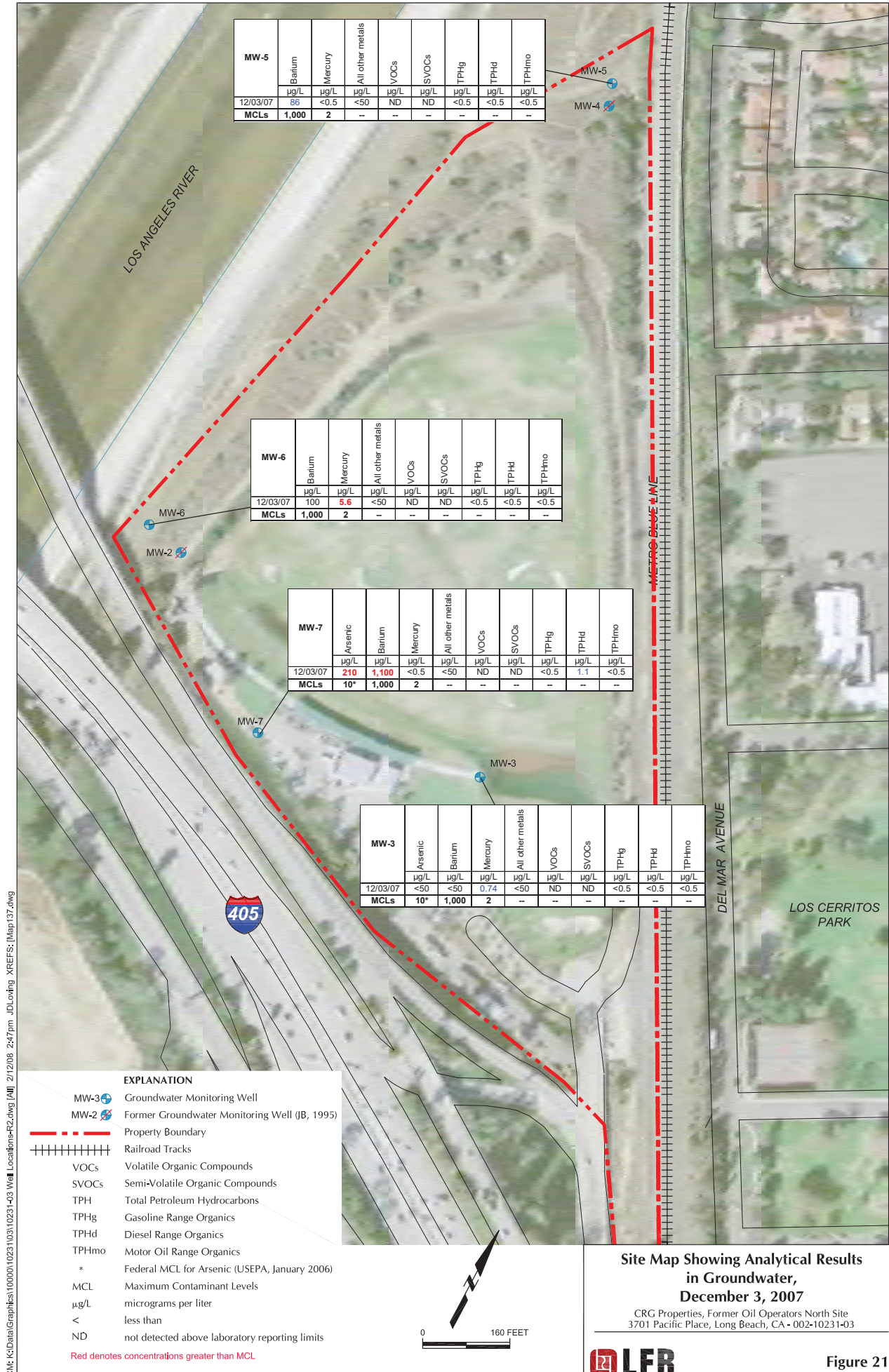


**Groundwater Elevation and
 Flow Direction,
 December 3, 2007**

CRG Properties, Former Oil Operators North Site
 3701 Pacific Place, Long Beach, CA - 002-10231-03



Figure 20



MW-5	Barium	Mercury	All other metals	VOCs	SVOCs	TPHg	TPHd	TPHmo
	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
12/03/07	86	<0.5	<50	ND	ND	<0.5	<0.5	<0.5
MCLs	1,000	2	t	t	t	t	t	t

MW-6	Barium	Mercury	All other metals	VOCs	SVOCs	TPHg	TPHd	TPHmo
	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
12/03/07	100	5.6	<50	ND	ND	<0.5	<0.5	<0.5
MCLs	1,000	2	t	t	t	t	t	t

MW-7	Arsenic	Barium	Mercury	All other metals	VOCs	SVOCs	TPHg	TPHd	TPHmo
	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
12/03/07	210	1,100	<0.5	<50	ND	ND	<0.5	1.1	<0.5
MCLs	10*	1,000	2	t	t	t	t	t	t

MW-3	Arsenic	Barium	Mercury	All other metals	VOCs	SVOCs	TPHg	TPHd	TPHmo
	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
12/03/07	<50	<50	0.74	<50	ND	ND	<0.5	<0.5	<0.5
MCLs	10*	1,000	2	t	t	t	t	t	t

- EXPLANATION**
- MW-3 (blue circle with cross) Groundwater Monitoring Well
 - MW-2 (blue circle with cross) Former Groundwater Monitoring Well (JB, 1995)
 - Red dashed line Property Boundary
 - Black lines with cross-ticks Railroad Tracks
 - VOCs Volatile Organic Compounds
 - SVOCs Semi-Volatile Organic Compounds
 - TPH Total Petroleum Hydrocarbons
 - TPHg Gasoline Range Organics
 - TPHd Diesel Range Organics
 - TPHmo Motor Oil Range Organics
 - * Federal MCL for Arsenic (USEPA, January 2006)
 - MCL Maximum Contaminant Levels
 - µg/L micrograms per liter
 - < less than
 - ND not detected above laboratory reporting limits
- Red denotes concentrations greater than MCL

Site Map Showing Analytical Results in Groundwater, December 3, 2007

CRG Properties, Former Oil Operators North Site
3701 Pacific Place, Long Beach, CA - 002-10231-03

CW: K:\Data\Graphics\100001023102310231-03 Well Locations-R2.dwg [AU] 2/12/08 2:47pm JDLoving_XREFS: [Map137.dwg]

APPENDIX A

**DTSC Correspondence
dated July 5 and July 12, 2006**



Linda S. Adams
Secretary for
Environmental Protection



Department of Toxic Substances Control

Maureen F. Gorsen, Director
5796 Corporate Avenue
Cypress, California 90630



Arnold Schwarzenegger
Governor

July 12, 2006

Mr. Charles Robinson
Levine Fricke
3150 Bristol Street, Suite 250
Costa Mesa, California 92626-7324

LONG BEACH INDUSTRIAL FORMER OIL OPERATORS NORTH SITE - SITE CHARACTERIZATION REPORT COMMENTS

Dear Mr. Robinson:

The Department of Toxic Substances Control (DTSC) has reviewed the Characterization Data Report dated April 4, 2006 for the Long Beach Industrial Former Oil Operators North Site. Based on our review, we have developed the following comments:

General Comment

In general, data gaps exist, which need to be addressed prior to approval of the Report. We believe the Site has not been fully characterized and that the Characterization Data Report should be used in conjunction with further research and investigation to develop a Remedial Investigation Workplan.

Specific Comments

1. Historical and current operations and conditions should be detailed in the text and supported by historical aerial photographs or topographic maps.
2. Boring logs are hard to find.
3. Sample depths should be included in tables.
4. Section 5.0: Background sampling data is necessary. If a point referenced in Kearny (1996) is close to the Site, then you might be able to use background values for arsenic.

5. A Health and Safety Plan should be included.
6. Copies of associated documentation, including annual groundwater sampling, should be included.
7. In sampling point B-7 benzo(a)pyrene was detected at 400 mg/kg at 50 feet below ground surface (bgs). Additional characterization is necessary and naphthalene should also be included.
8. In sampling point B-6 at 15 feet bgs hydrocarbon odors and staining were noted on the boring logs; this sample was not analyzed. Additional characterization is needed.
9. In sampling point B-7 at 40 feet bgs hydrocarbon odors and staining were noted on the boring logs; this sample was not analyzed. Additional characterization is needed. Samples B7 at 35 ft and B7 at 50 ft bgs were analyzed.
10. The vertical extent of contamination has not been defined. There should be a clean interval of at least 10 feet.
11. In MW-3, mercury was detected at 160 ug/L (the MCL is 2 ug/L). The source of the mercury in the soil needs to be determined.
12. The text in section 4.2 and Table 10 is inconsistent. Depth to groundwater and groundwater flow direction are unclear.
13. Identify areas where water may collect in the soil based on topography and/or site conditions. Saturated soil could inhibit soil gas sampling and water may tend to collect above the groundwater table or perched groundwater due to the soil composition.
14. Define where perched groundwater was found.
15. Additional groundwater monitoring wells are needed. At a minimum, one up gradient well for background conditions and one down gradient well need to be installed.
16. Aquifer information should be included and the underlying aquifer(s), characteristics, and uses identified. DTSC can provide guidance manuals.
17. Raw lab data and chains of custody from previous investigations should be included or, if not available, so stated.

Mr. Charles Robinson

July 12, 2006

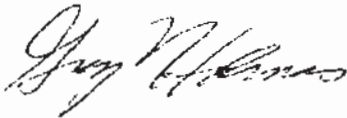
Page 3

18. Old wells (MW1, MW2, and MW 4) need to be relocated and properly abandoned. A geophysical survey might be needed to locate the wells.
19. The source of the fill material needs to be determined and fill areas sampled.

Comments from DTSC's Human and Ecological Risk Division are attached.

We would like to schedule a meeting to discuss DTSC's comments and to develop a strategy to move forward with the Site. If you have any questions, please contact me at (714) 484-5461, or Mr. Joseph Kaslowski, Project Manager, at (714) 484-5471.

Sincerely,



Greg Holmes

Unit Chief

Southern California Cleanup Operations Branch – Cypress Office

Enclosure

cc: Mr. Myron Sukut
Chairman of the Board
Sukut Construction, Inc.
4010 West Chandler
Santa Ana, California 92704-5202

Ms. Onamia Chun
Geological Services Unit – Cypress

Ms. Fran Collier
Human and Ecological Risk Division
Department of Toxic Substances Control
8800 Cal Center Drive
Sacramento, California 95826-3200



Department of Toxic Substances Control



Linda S. Adams,
Secretary for
Environmental Protection

Maureen F. Gorsen, Director
8800 Cal Center Drive
Sacramento, California 95826-3200



Arnold Schwarzenegger
Governor

DRAFT
MEMORANDUM
July 5, 2006

TO: Joseph Kaslowski
Project Manager
Site Mitigation and Brownfields Reuse Program
Cypress Office

From: Fran Collier, M.S.
Associate Toxicologist
Human and Ecological Risk Division

Date:

SUBJECT: Characterization Data Report, Former Oil Operators North Site, 3701
Pacific Place, Long Beach, California

PCA: 12050 **Site Code:** 401282 **WP:** 11

The Human and Ecological Risk Division (HERD) has reviewed the Characterization Data Report (CDR), Former Oil Operators North Site (FOONS), 3701 Pacific Place, Long Beach, California prepared by Levine and Fricke (LFR) and dated April 4, 2006.

Background:

The FOONS is an 18 acre site located in a mixed commercial, industrial and residential area. The site was used from 1926 until the mid 1950's for disposal of off-shore drilling oil and brine waste. The waste was deposited in unlined evaporation ponds. When water evaporated, waste sludge was either left in place or drummed for disposal. The site is currently used as a golf learning center with a paved parking area, several structures and a large grassy area.

In the 1970's some of the sump materials were removed and treated. Additional investigations occurred in the 1980's that culminated in a land farming operation that began in 1989. This operation was halted due to public complaints. Four ground water monitoring wells were installed and annual monitoring was conducted from 1987 until 1997. A geotechnical study was done in 1984 to assess the feasibility of constructing

light industrial structures on the sump material. The report concluded that the materials were too compressible to directly support shallow foundations. The report estimated that the total volume of all sump fills was between 390,000 and 400,000 cubic yards. In 1986, 12 borings were installed to evaluate soil physical properties. Soil samples were also collected for chemical analysis. Significant concentrations of volatile organics (VOC) and total petroleum hydrocarbons (TPH) were detected. These soil borings were converted to vapor monitoring probes. Laboratory results from this historical investigation are not available for VOCs, however methane concentrations were reported that ranged from 12.1 to 83.6 percent.

Ground water monitoring wells were installed at four locations. Ground water elevations ranged from 39.3 feet (ft) below ground surface (bgs) to 61.95 ft bgs between 1995 and 1996 monitoring events.

LFR conducted soil sampling and ground water investigations starting in 2003 to delineate the lateral and vertical extent of impacted soil and sump material and to provide data on the type and concentration of contaminants in the impacted areas. Only the former MW3 ground water monitoring well could be located. In 2004, LFR installed two new monitoring wells, MW5 and MW6, located near the estimated locations of MW4 and MW2, respectively.

LFR advanced seven borings to 50 ft bgs. Soil samples were collected at 5 foot intervals. The bottom sample from each boring was analyzed for VOCs, semi-volatile organic compounds (SVOC), polychlorinated biphenyls (PCB) and TPH with carbon chain distinction. Additional samples were analyzed based on PID, staining, lithology and results from the bottom samples. Two additional borings were advanced to 80 ft bgs for cone penetrometer testing of the materials. Soil sample results were compared to United States Environmental Protection Agency (USEPA) Region IX industrial preliminary remediation goals (iPRG). Background samples were not collected. Only arsenic concentrations exceeded the iPRG and regional background levels as described in the Kearny Report. PCBs were not detected above the laboratory detection limit of 10 ug/kg. Various VOCs and SVOCs were detected in the soil samples including:

- Benzene was detected up to 580 ug/kg.
- Naphthalene was detected upto 3,600 ug/kg, and
- Benzo-a-pyrene was detected up to 400 ug/kg.

Ground water sample results showed concentrations of antimony, arsenic, mercury, lead, selenium and vanadium exceeded regulatory thresholds or action levels. TPH, VOCs and SVOCs were not detected above laboratory detection levels.

Documents Reviewed

HERD reviewed the Characterization Data Report, Former Oil Operators North Site, 3701 Pacific Place, Long Beach, California prepared by Levine and Fricke (LFR) and dated April 4, 2006.

Scope of Review

HERD has reviewed this report with emphasis on site characterization information for use in assessing potential risk and hazard to human health and the environment. Mr. Kaslowski requested that HERD review the CDR to identify potential work needed to complete site characterization and assess risk to human health and the environment for a potential future commercial and industrial land use. Mr. Kaslowski indicated that a scoping meeting will be held to discuss future needs for the site. This memo is intended to provide preliminary comments for this scoping meeting. Grammatical or typographical errors contained in the CDR that do not affect the evaluation have not been noted.

General Comments

1. HERD recommends that LFR submit a risk assessment work plan to evaluate potential risk and hazard to people and ecological organisms that could be exposed to contaminants at the site once site characterization is complete. The CDR does not include recommendations for further site characterization, assessment of potential risk and hazard to human health or ecological receptors, or investigating remedial alternatives. Typically, once a site is characterized, a baseline risk assessment for unrestricted use is conducted to determine if remedial measures are needed and to use in comparing potential risk reduction from implementation of various remedial alternatives. This information can also be used to assess potential risk and hazard to potential on site and off site receptors during implementation of the selected remedial remedy. Based on existing data, concentrations of contaminants in soil and sump materials indicate that a risk assessment should be conducted once site characterization is complete.
2. The CDR indicates that significant volumes of soils and sump materials at the site are not suitable for construction of light industrial structures. At this time it is unclear whether the property owner intends to excavate these materials. If these materials will be excavated, treated and returned to the excavated areas for compaction to meet engineering requirements, HERD recommends that a post remedial risk assessment be conducted in addition to the baseline risk assessment.
3. Because soil gas sampling has not been conducted, and significant concentrations of VOCs were detected in the soil matrix, HERD recommends that a soil gas investigation be conducted. The investigation should identify VOCs and their respective concentration distributions throughout the soil and sump materials at the site. This information is needed for evaluating potential risk to human health from potential migration of VOCs to indoor air. Because of the high levels of methane detected in a previous investigation, HERD recommends that soil gas samples also be evaluated for methane concentrations. To facilitate this investigation, HERD

recommends that a soil gas sampling work plan be prepared for DTSC approval prior to conducting the field work.

4. HERD recommends that if feasible, background soil samples be collected from the same parent materials as found on the site and analyzed for concentrations of metals to compare to on site concentrations.
5. HERD recommends that a risk assessment work plan be submitted that follows the USEPA Risk Assessment Guidance documents using California Office of Environmental Health Hazard Assessment exposure values and toxicity values when available. In addition, HERD recommends that, at a minimum, the risk assessment work plan include using the following specific approaches:
 - To evaluate potential risk from exposure to soil vapor intrusion to indoor air, use the Johnson and Ettinger Vapor Intrusion model as adapted for California available on the DTSC web site at http://www.dtsc.ca.gov/AssessingRisk/JE_Models.cfm
 - To evaluate potential risk from exposure to fugitive dust HERD recommends using the particulate Emission Factor approach described in the USEPA "Soil Screening Guidance: Technical Background" document EPA/540/R-95/128 July 1996 for evaluating fugitive dust exposure. The document is available on USEPA's web site at <http://www.epa.gov/superfund/resources/soil/introtbd.htm>.
 - HERD recommends using the USEPA adult lead model pregnant worker scenario for evaluating the commercial/industrial worker exposure as described in the "Recommendations of the Technical Review Workgroup for Lead for an Approach to Assessing Risks Associated with Adult Exposures to Lead in Soil", dated January 2003 (USEPA publication EPA-540-R-03-001 found at www.epa.gov/superfund/programs/lead/products/adultpb.pdf) HERD recommends using the default exposure parameters specified in the document.
 - For evaluate potential hazard from exposure to lead for unrestricted land use, HERD recommends using LeadSpread 7 as developed by OEHHA and available at <http://www.dtsc.ca.gov/AssessingRisk/leadsread.cfm>
 - To evaluate potential hazard from exposure to TPH compounds, HERD recommends using the Massachusetts Department of Environmental Protection approach for assessing hazard from TPH exposure with the following toxicity criteria:

Exposure Route	Carbon Range	HERD (proposed) (mg/kg/day)
Oral	Aliphatic	
	C ₅ -C ₈	0.04
	C ₉ -C ₁₈	0.1
	C ₁₉ -C ₃₂	2.0
	C _{>16} -C ₃₅	2.0
	Aromatic	
	C ₆ -C ₈	Evaluate each COPC (i.e. BTEX)
	C ₉ -C ₁₆	0.03
	C ₁₇ -C ₃₂	0.03
	C ₉ -C ₃₂	0.03
Inhalation	Aliphatic	
	C ₅ -C ₈	0.06
	C ₉ -C ₁₈	0.3
	C ₁₉ -C ₃₂	
	Aromatic	
	C ₆ -C ₈	Evaluate each COPC (i.e., BTEX)
	C ₉ -C ₁₆	0.006
C ₁₇ -C ₃₂		

- To identify the metal contaminants of potential concern in soil, compare on site metals concentrations to site specific background metals concentrations in soil using the following tiered approach Using an appropriate data set from similar soil types and sampling depths:
 - A) Compare the highest site concentration with the highest background concentration. If the site concentration is equal to or less than the background, the metal may be eliminated as a chemical of potential concern (COPC). If the onsite maximum is greater than the background maximum, go to B).
 - B) Compare the site and background arithmetic mean concentrations. If the means are comparable, and if the highest site concentration is below the concentration associated with unacceptable risk or hazard, the metal may be eliminated as a COPC. If the site mean is greater than the maximum background, go to C).

C) Two approaches may be used, depending on the size of the background data set.

- i) If the background data set is of sufficient size, statistically evaluate the overlap of the background and onsite distributions to determine if they come from the same population. If they do, and if the highest site concentration is below the concentration associated with unacceptable risk or hazard, the metal may be eliminated as a COPC. If not, include the metal as a COPC in the risk evaluation. See HERD 1997 guidance.
 - ii) If the background data set is limited ($n=4$), the onsite data can be evaluated statistically using probability plots to determine if one or more populations are present. If only one population is present, and if the highest site concentration is below the concentration associated with unacceptable risk or hazard, the metal may be eliminated as a COPC. If there are two or more populations present, then include the metal as a COPC.
- For ecological risk, use the screening level checklist approach as a first step. The checklist and screening approach can be found at <http://www.dtsc.ca.gov/AssessingRisk/eco.cfm>

Conclusions and Recommendations

HERD concurs that a scoping meeting be helpful to discuss further site characterization needs and approaches to use in assessing risk. HERD recommends that a site characterization work plan be prepared following this meeting that addresses collecting soil gas samples as well as other sampling needs to fill site characterization data gaps identified at the scoping meeting. Following completion of site characterization, HERD recommends that a risk assessment work plan be prepared and submitted for DTSC approval prior to conducting the risk assessment.

The recommendations made in this document are site specific and should not be construed as a policy decision applicable to other sites. If you have any questions regarding the above comments, please feel free to contact me at (916) 255-6431 or by e-mail at fcollier@dtsc.ca.gov.

Reviewed by: Gerald A. Pollock, Ph.D.
Senior Toxicologist, HERD

cc: Onamia Chun, Geologic Services

Joseph Kaslowski
Draft 7/5/06
Page 7

OONS CDR
Long Beach, California

Cypress Office

APPENDIX B

**Response to DTSC Comments
on the Characterization Data Report
March 12, 2007**

March 12, 2007

002-10231-01

Ms. Loni Adams
Department of Toxic Substances Control
5796 Corporate Avenue
Cypress, California 90630

Subject: Submittal of Response to DTSC Comments to the Characterization Data Report, Revised Characterization Data Report, Former Oil Operators North Site, 3701 Pacific Place, Long Beach, California

Dear Ms. Adams:

On behalf of CRG Properties, LFR Inc. (LFR) is pleased to submit the following response to comments to LFR's Characterization Data Report and a Revised Characterization Data Report for the subject Site. LFR had developed a Remedial Investigation Workplan and is being transmitted in conjunction with this submittal.

LFR prepared a Characterization Data Report dated April 4, 2006 to describe current and historical investigation and remediation activities at the Site. In a letter dated July 12, 2006, the Department of Toxic Substances Control (DTSC) raised numerous issues that needed to be addressed prior to approval of the report. In general, the DTSC believed that data gaps exist, that the Site has not been fully characterized, and that the Characterization Data Report should be used in conjunction with further research and investigation to develop a Remedial Investigation Workplan.

The DTSC also made nineteen specific comments to the Characterization Data Report. A copy of the July 12 letter is attached in Appendix A of the Revised Characterization Data Report. The DTSC's Human and Ecological Risk Division (HERD) also provided comments to the Characterization Data Report in a memorandum dated July 5, 2006. A copy of the memorandum is also attached in Appendix A.

RESPONSE TO COMMENTS

July 12, 2006 DTSC Comments

Each specific comment by the DTSC is printed below in italics followed by the LFR response.

- 1. Historical and current operations and conditions should be detailed in text and supported by historical aerial photographs or topographic maps.*

A Historical Review of the Site including historical aerial photographs and topographic maps has been prepared as a separate document. A copy of the Historical Review is attached as Appendix B in the Revised Characterization Data Report. A current Site description has been included in the Revised Characterization Data Report.

- 2. Boring Logs are hard to find.*

Soil boring and well construction logs prepared by LFR are attached as a separate appendix (Appendix D) in the Revised Characterization Data Report. Cone penetrometer test results from 1983 and probe logs from 1986 are included in Appendix C: Reports of Previous Investigations in the Revised Characterization Data Report.

- 3. Sample depths should be included in tables.*

Tables 1 through 5 have been revised and the sample depths have been included in the Revised Characterization Data Report.

- 4. Section 5.0: Background sampling data is necessary. If a point referenced in Kearney (1966) is close to the Site, then you might be able to use background values for arsenic.*

LFR has proposed the collection of ten soil samples in the Site vicinity to establish background concentrations for arsenic and other metals. Details of the background sampling are included in the Remedial Investigation Workplan.

- 5. A Health and Safety Plan should be included.*

A site-specific Health and Safety Plan has been prepared. A copy has been attached in the Remedial Investigation Workplan.

- 6. Copies of associated documentation, including annual groundwater sampling, should be included.*

LFR conducted groundwater sampling at the Site in May 2004 and December 2006. Field data sheets, non-hazardous waste data forms, and sampling protocols are included in

Appendix E in the Revised Characterization Data Report. Groundwater monitoring reports and associated documentation from January 1996 and February 1997 sampling events conducted by Jack K. Bryant Engineers are included in Appendix C: Reports of Previous Investigations in the Revised Characterization Data Report.

- 7. In sampling point B-7 benzo(a)pyrene was detected at 400 mg/kg at 50 feet below ground surface (bgs). Additional characterization is necessary and naphthalene should also be included.*

LFR will drill a boring in the vicinity of boring B-7, samples will be collected at depths of 5, 10, 20, 30, and 40 feet bgs and analyzed for arsenic, lead, mercury, SVOCs, and TPH to characterize the subsurface soil. Previous sampling indicated concentrations of arsenic and lead at concentrations of 24 and 350 mg/kg, respectively, at a depth of 50 feet bgs. Based on previous soil sampling in this area, the total metal concentrations for lead and arsenic exceeded ten times their respective soluble threshold limit concentration (STLC). If a sample exceeds ten times their respective STLC, soil samples will be analyzed with the waste extraction test using deionized water and simulated rain water to determine the soluble metal concentration. Details of the sampling program are included in the Remedial Investigation Workplan.

- 8. In sampling point B-6 at 15 feet bgs hydrocarbon odors and staining were noted on the boring logs; this sample was not analyzed. Additional characterization is needed.*

LFR will drill soil borings in the vicinity of boring B-6. At this location, samples will be collected for TPH using EPA method 8015M to a depth of 25 feet bgs. Details of the sampling program are included in the Remedial Investigation Workplan.

- 9. In sampling point B-7 at 40 feet bgs hydrocarbon odors and staining were noted on the boring logs; this sample was not analyzed. Additional characterization is needed. Samples B7 at 35 feet and B7 at 50 feet bgs were analyzed.*

LFR will drill a boring in the vicinity of boring B-7, samples will be collected at depths of 5, 10, 20, 30, and 40 feet bgs and analyzed for TPH as well as arsenic, lead, mercury and SVOCs to characterize the subsurface soil (see response to Comment #7). Details of the sampling program are included in the Remedial Investigation Workplan.

- 10. The vertical extent of contamination has not been defined. There should be a clean interval of at least 10 feet.*

December 2006 depth to groundwater beneath the site ranged from approximately 28 to 48 feet bgs. Impacted soil extends to a depth of 50 feet in some areas based on samples analyzed from LFR boring B7. In the other LFR borings, a 10-foot clean interval was found with the

exception of B3 where at least a 5-foot clean interval was found, where the base of the sump is approximately 30 feet bgs in this area. Since impacted material is found below the ground water surface, it would be impractical to define the vertical extent. These materials were placed well before any land disposal criteria existed, making the 10' criteria less relevant. Current evaluations contained in the work plan are to evaluate if the material pose a significant threat or impact to water quality, or to human health, in accordance with exemptions for engineered alternatives to the 10' criteria.

11. *In MW-3, mercury was detected at 160 µg/L (the MCL is 2 µg/L). The source of the mercury in the soil needs to be determined. In the December 2006 sampling, mercury was detected in MW-3 at 7.3 µg/L.*

Mercury was commonly used in oil field operations as it was used in meters. It is possible that some mercury may have been included in the material placed into the sump. In the December 2006 groundwater sampling, mercury was detected in MW-3 at a concentration 0.82 µg/L, below the MCL.

12. *The text in section 4.2 and Table 10 is inconsistent. Depth to groundwater and groundwater flow direction is unclear.*

In the Characterization Data Report, the depths to groundwater measurements were incorrect in the text in section 4.2. Table 10 contained the correct depth to groundwater measurements. The depth to groundwater measured in May 2004 ranged from 35.96 feet bgs in MW-6 to 55.64 bgs in MW-3. In the most recent groundwater data collected in December 2006, groundwater ranged from 28.43 bgs in MW-6 bgs to 47.77 feet bgs in MW-3. The groundwater flow direction was determined to be to the south.

13. *Identify areas where water may collect in the soil based on topography and/or site conditions. Saturated soil could inhibit soil gas sampling and water may tend to collect above the groundwater table or perched groundwater due to soil composition.*

There is a topographically low area along the eastern portion of the Site in front of the grass tees of the driving range (east of MW-3). There is a storm drain here that collects runoff. The storm drain is connected to the Los Angeles River. According to Pat Nutter, General Manager of the Long Beach Golf Learning Center, storm water accumulates in this area.

Shallow groundwater was found at 8 feet bgs during the 1986 GEOFON geotechnical investigation in one boring (B-4). This was believed to be a localized perched condition because native sands at greater depths were not saturated. This perched groundwater was sampled and the analytical results are included in the Revised Characterization Data Report. Zone 3 was described as water saturated in the Earth Technology 1984 Supplemental Investigation. Zone 3 materials reached as deep as 30 feet bgs in some locations at the Site. The deepest area appears to be in the central portion of the property. No other perched conditions were noted in other investigations on the Site.

14. Define where perched groundwater was found.

In 1986, groundwater was found at a depth of 8 feet bgs in boring B-4 and was believed a localized perched condition, because native sands at greater depths were not saturated and no other borings encountered perched groundwater. This boring is located in the center portion of the Site in an area where the base of the sump is approximately 20 feet bgs. No other areas of perched groundwater were noted in other investigations on the Site.

Additional groundwater monitoring wells are needed. At a minimum, one up gradient well for background conditions and one down gradient well need to be installed.

Existing well MW-5 is currently located in an upgradient location (upgradient of the sump). Although an additional well could be installed upgradient of well MW-5, it appears that MW-5 provides data on background conditions. LFR has proposed in the Remedial Investigation Workplan that a downgradient well (proposed well MW-7) be installed southwest of existing well MW-3 in the parking area of the Long Beach Golf Learning Center. The projected location is shown on Figure 3 of the Remedial Investigation Workplan.

15. Aquifer information should be included and the underlying aquifer(s), characteristics, and uses identified. DTSC can provide guidance manuals.

A description of the Geology and Hydrogeology in the Site vicinity has been included in the Revised Data Characterization Report.

16. Raw lab data and chains of custody from previous investigations should be included, or if not available, so stated.

Laboratory reports and chains of custody from previous annual groundwater sampling conducted by Jack K. Bryant Engineers in January 1996 and February 1997 are included in Appendix A: Reports of Previous Investigations in the Revised Characterization Data Report. These are the only laboratory reports that were available for review by LFR.

Laboratory reports and chains of custody from groundwater sampling conducted by LFR in 2004 and 2006 are included in Appendix E.

17. Old wells (MW1, MW2, and MW4) need to be replaced and properly abandoned. A geophysical survey might be needed to locate these wells.

Prior to site grading, these three wells will be located either by geophysical survey and/or backhoe excavation and be properly abandoned.

18. The source of the fill material needs to be determined and fill areas sampled.