UNITED STATES DEPARTMENT OF THE INTERIOR

GEOLOGICAL SURVEY

DISTRIBUTION OF ABNORMALLY HIGH PORE PRESSURES IN THE WESTERN TRANSVERSE RANGES, CALIFORNIA

By

Paia Levine[1] and R. F. Yerkes[1]

Open-File Report 85-522

This report is preliminary and has not been reviewed for conformity with U.S. Geological Survey editorial standards and stratigraphic nomenclature.

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Abnormally high pore pressures (AHP) in porous rocks are of interest for the role they play in facilitating thrust faulting by decreasing crustal strength. Elevated pore pressures counter the overburden stress and decrease normal stress across faults, thereby reducing shear strength of rocks and their resistance to failure (Hubbert and Rubey, 1959). In areas undergoing severe horizontal compression, such as the western Transverse Ranges, abnormally high pore pressures may thus contribute directly to thrust faulting. Another aspect of AHP is the technical challenge they pose to drillers, particularly offshore where fracture gradients--the pore pressure/depth ratios at which hydraulic fracturing occurs--are relatively low (Christman, 1973) and the consequences of blowouts severe.

The area surveyed for this report includes all of the Transverse Ranges west of the San Gabriel Mountains, including the Santa Barbara Channel and Cuyama and Santa Maria Valleys (fig. 1). The report consists of a map (pl. 1) and tables of well data. Plate 1 shows the distribution of Transverse-Ranges wells examined and those with bottom-hole pressure/depth (P/D) ratios greater than 0.6 psi/ft (13.6 kPa/m). Records for deep, modern wells, representative wells in older fields, and inter-field wells were examined, but data are listed only for wells in areas of AHP (table 1).

Equivalent pressures were determined from unit weights of drilling fluid (mud), which is carefully monitored and adjusted to balance fluid pressures[1]/. Comparisons of data from wells in the Kettleman Hills-Lost Hills

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[1]/Water of density 1.00 gm/cm^3 might be used to balance a "normal" hydrostatic gradient of 0.433 psi/ft; near the other end of the scale a heavy mud of density 2.31 gm/cm^3 would be required to balance an abnormally high "lithostatic" pressure gradient of 1.00 psi/ft.

Figure 1.--Index map showing oil fields in San Joaquin Valley and southern California. 1, area of this report; 2, Cuyama and Santa Maria Valley oil fields, canvassed for this report; 3, southern San Joaquin Valley, reported by Yerkes and others (1985).

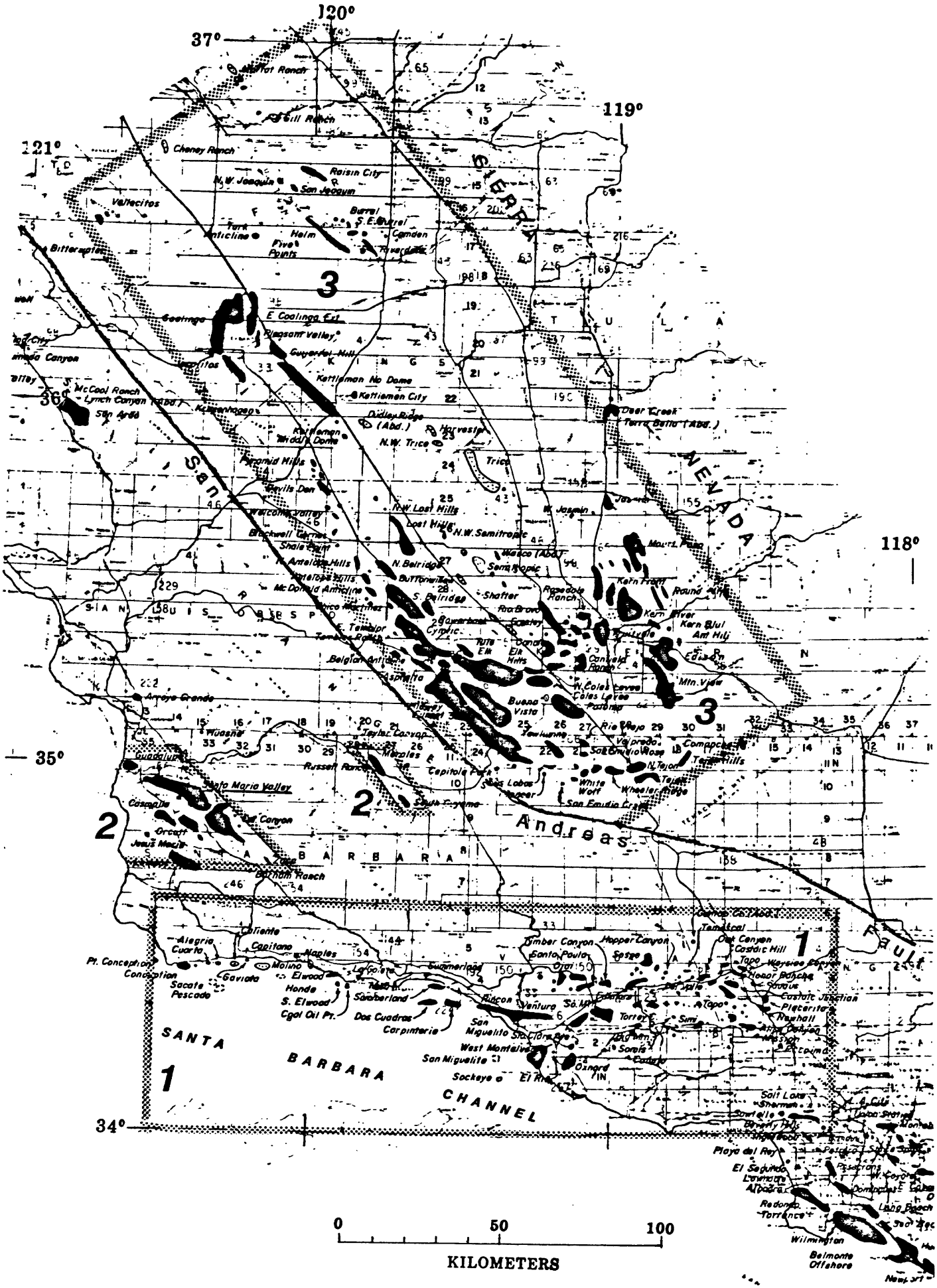
120°
119°
121°
37°
36°
35°
34°
118°
SIERRA
NEVADA
San Andreas
SANTA BARBARA CHANNEL
1
2
3
0
50
100
KILOMETERS

Figure 1

trend show that these equivalent pressures are commonly within 10 percent of measured pressures, but not consistently high or low (Yerkes and others, 1985).

The existence of abnormally high pore pressures in the northeastern Santa Barbara Channel-Ventura oil field area is well known (Watts, 1948; Glenn, 1949; McCulloh, 1969), but their full range and areal distribution has not been documented. We define as abnormally high those pressures that exceed a gradient of 0.6 psi/ft (13.6 kPa/m) on the basis that this is the average P/D ratio above about 14,000 ft depth for more than 600 examined wells in the western Transverse Ranges and southern San Joaquin Valley (pl. 1; Yerkes and others, 1985). Figure 2 shows the bottom-hole equivalent pressure vs. depth plot for more than 300 wells in the western Transverse Ranges. The figure shows a fairly strong correlation between bottom-hole pressure and depth. Here, as in San Joaquin Valley, the statistical fit indicates that the average P/D ratio increases with depth; below 14,000 ft, however, the San Joaquin Valley ratio increases much more rapidly.

ACKNOWLEDGMENTS

Data were gathered chiefly from the files and publications of the California Division of Oil and Gas and the U.S. Minerals Management Service. We appreciate the cooperation and assistance of Mike Stettner and staff, California Division of Oil and Gas, Santa Paula; and the U.S. Minerals Management staffs in Los Angeles and Ventura. R. K. Mark, U.S. Geological Survey, facilitated statistical treatment of the data.

Figure 2.--Plot of bottom-hole equivalent pressures vs. depth for 333 wells in the western Transverse Ranges (listed in table 1). Left curve shows statistical fit for onshore and Federal Offshore Continental Shelf (OCS) wells (P, pressure; D, depth):

$P\ (1\sigma = 1160\ psi) = 1.1 \times 10^{-5}D^2 + 0.449D + 128,\ r^2 = 0.79.$

Right curve shows fit for California offshore wells:

$P\ (1\sigma = 556\ psi) = 0.681D - 224,\ r^2 = 0.90.$

Lower bound (.445 psi/ft) suggests brine density of 1.026 gm/cm^3 and salinity of about 40,000 ppm. Upper bound (0.90 psi/ft) is equivalent to an average bulk density of 2.076 gm/cm^3.

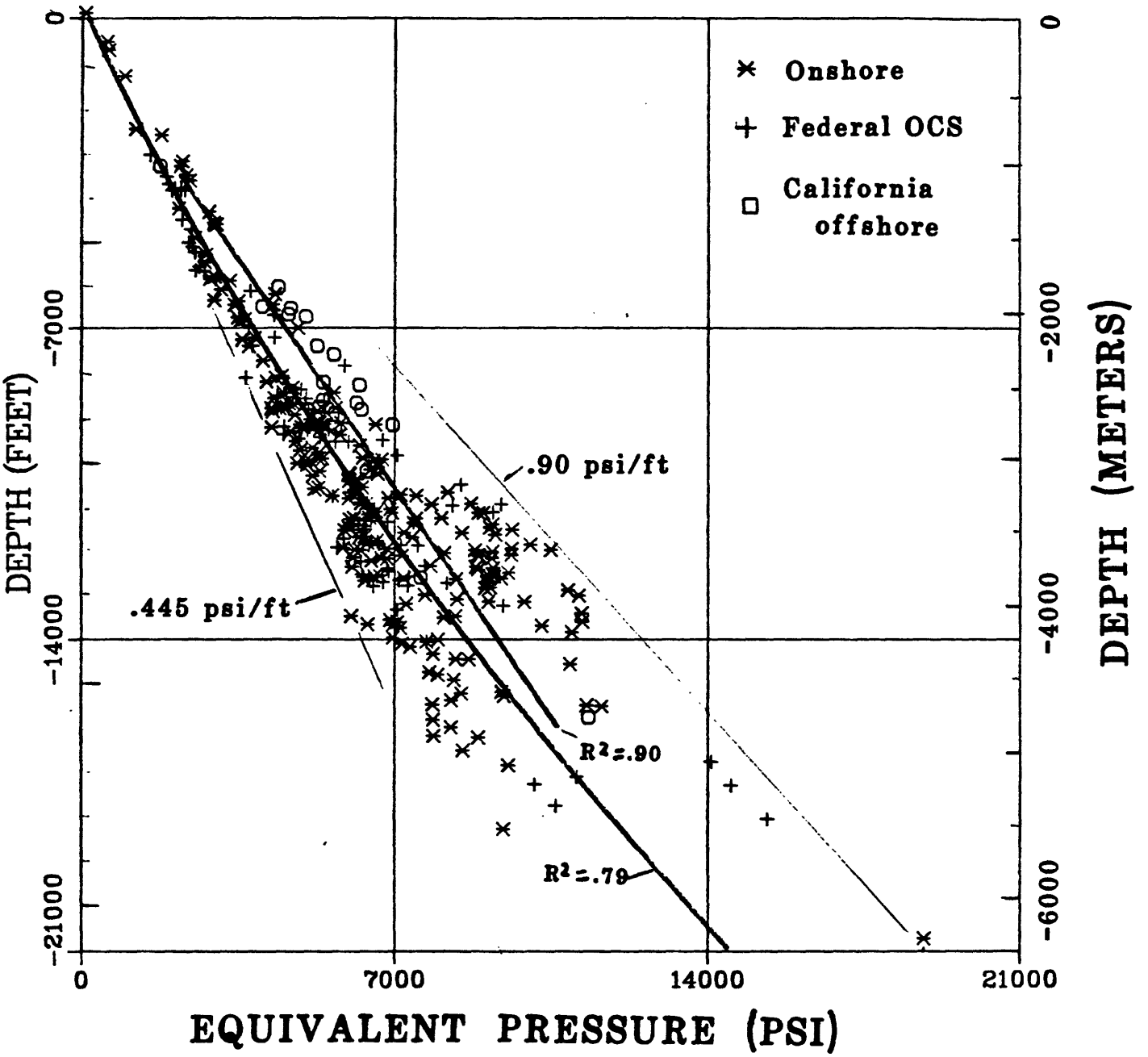
Onshore
Federal OCS
California offshore
.90 psi/ft
.445 psi/ft
R²=.90
R²=.79
DEPTH (FEET)
DEPTH (METERS)
EQUIVALENT PRESSURE (PSI)
0
-7000
-14000
-21000
-2000
-4000
-6000
7000
14000
21000

Figure 2

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Table 1a.--Data for onshore wells, Western Transverse Ranges
San Bernadino B & M, all townships and ranges are north and west.

T.N.-R.W-Sec. Year	Operator	Name	Elev.[2] (ft.)	Depth to AHP[3] (ft.)	TD/TVD[4] (ft.)	Bottom Hole Pressure/Depth (psi/ft.)	Bottom Hole Temp. (F°)	Field	Age	Bottom Hole Geology
1-21-30 1956	Gulf Oil Expl. and Prod. Co.	Union-Laubacher -1	12		11661	.57	199		L. Mio.	
1-22-5 1956	Arco Oil and Gas Co.	R.D. Oxnard-Airport -1	54		12243	.50	200		Olig.	Sespe Fm.
1-22-6 1955	Chevron USA, Inc.	Kellner Unit -1	35		14351	.50 at 14337'		W. Montalvo		
1-22-6 1969	Prudential	Alpine	2200		11726	.49		W. Montalvo		
1-22-7 1957	Chevron USA, Inc.	PRI-2, "1028"	2300		11212	.53		W. Montalvo		
1-22-10 1956	Arco Oil and Gas Co.	Arco-Stnd-E.G. Ruggles-1	50		12144 (12102)	.57 at 10656' (10549)	183			
1-22-11 1959	J. Morford II	S.F.N.B.-3	51	2000	9050	.63	170	Oxnard		
1-22-12 1959	Chevron USA, Inc.	Daily -1	52	1970	11217	.70	187	Oxnard		
1-22-12 1960	Chevron USA, Inc.	Daily -2	60	1298	9421	.70	180	Oxnard		
1-22-14 1957	Texaco, Inc.	Bannon-Silver -1	45	1500	10167	.62	162	Oxnard	Eoc.	
1-22-14 1959	Chevron USA, Inc.	S.F.N.B. -2	49	8490	11000	.65		Oxnard		
1-23-1 1957	Chevron USA, Inc.	PRI-919	24		11500	.53	193	W. Montalvo		
2-15-4 1956	Gulf Oil Expl. and Prod. Co.	Carey -1	1240		10136	.52	156	Pacoima	U. Mio.	
2-15-11 1975	Chevron USA, Inc.	Pacoima -1			9505	.53 at 9478'		Pacoima		
2-15-15 1983	Chevron USA, Inc.	Pacoima -4	978		10452	.56	149	Pacoima		
2-15-23 1976	Chevron USA, Inc.	Pacoima-2A	928		10257	.57	174		U. Cret.	
2-15-23 1976	Gulf Oil Expl. and Prod. Co.	Pacoima -3	928		11538	.58	188		U. Cret.	
2-16-1 1951	Union Oil Co.	Hartman -1	1135		8189	.50	152		U. Mio.	
2-16-16 1951	Sun Expl. and Prod. Co.	Porter Est. 81-16	1127		8089	.50	159		Cret.	
2-18-4 1975	Carlsberg	-1	915		6420	.48	120			
2-20-32 1955	Arco Oil and Gas Co.	Camarillo-1	136		11002	.51	189	Conejo	Oligo.	Sespe Fm.
2-21-5 1958	Chevron USA, Inc.	Lloyd-Butler-1	92		12291	.51	186		Oligo.	Sespe Fm.
2-21-19 1980	Hunnicut and Camp Drilling Co.	Sakioka -2	98	11044		.56				
2-21-31 1955	Lloyd Corp. Ltd.	W.R. Livingston-4			12460	.55	220	Oxnard		
2-21-31 1954	Chevron USA, Inc.	McGuinnes-2	63	9079	9401	.62	190	Oxnard		
2-21-31 1958	Lloyd Corp. Ltd.	Vacca 2-1	71	10350	10461	.62	182	Oxnard		
2-21-31 1955	Chevron USA, Inc.	Thatcher 302	67		9675	.60	179	Oxnard		
2-22-3 1955	Exxon Co., USA	P. J. Leavens et al.	276		16639	.49	156		Plio.	
2-22-5 1974	Mainoco, Inc.	Limoneira-1	304		12204	.53			Plio.	

T.N.-R.W-Sec. Year	Operator	Name	Elev.[2] (ft.)	Depth to AHP[3] (ft.)	TD/TVD[4] (ft.)	Bottom Hole Pressure/Depth (psi/ft.)	Bottom Hole Temp. (F)	Field	Age	Bottom Hole Geology
2-22-9 1949	Superior Oil Co.	Limoneira-1	261		18734	.51			Mio.	
2-22-10 1960	Shell CA. Prod. Inc.	Sharp-1	218		16915	.51	260		L. Plio.	Repettian
2-22-14 1980	Chevron USA, Inc.	Hertel-Woolsey	111		12950	.56	204			
2-22-16 1959	Lloyd Corp. Ltd.	Montalvo Ranch-1	106		14321	.56	218	El Rio	Oligo.	Sespe Fm.
2-22-17 1974	Conoco, Inc.	Jones Est.-1	91		13166	.49 at 12988'			Plio.	
2-22-18 1973	Mainoco Inc.	Jones-1	93		14352	.54	227		Plio.	
2-22-18 1975	Hilliard Oil & Gas Co., Inc.	Jones Est.-2	77		15745	.50	192		Plio.	
2-22-21 1957	Arco Oil and Gas Co.	H.M. Borchard 3-1	17		15022	.53	240	El Rio		
2-22-22 1959	Gulf Oil Expl. and Prod. Co.	Grubb-1	105		12012	.52	199	El Rio	Oligo.	
2-22-22 1958	Chevron USA, Inc.	W.C. Donlon-2	109		12547	.52	192	El Rio		
2-22-26 1959	Union Oil Co.	McGrath-Mc-Cormick-1	105		10058	.49	182		Oligo.	Sespe Fm.
2-22-28 1958	Chevron USA, Inc.	Standard-Gulf-Borchard 3-2	75		11592	.52	182		Oligo.	Sespe Fm.
2-22-29 1956	Chevron USA, Inc.	Baillard-Mee-1	59		15006	.52	192		Oligo.	Sespe Fm.
2-22-30 1947	Arco Oil and Gas Co.	Del Cielo-1	47	10003	10400	.64 at 10380'	185	W. Montalvo	U. Mio.	
2-22-31 1956	Sun Expl. and Prod. Co.	Sunray-Ohio-Del Cielo-1	45		15463	.58	200	W. Montalvo	Oligo.	Sespe Fm.
2-22-31 1959	Exxon Co., USA	J.D. McGrath-3	49		12200	.48	191	W. Montalvo	Oligo.	Sespe Fm.
2-22-31 1981	Westmont	Kramer-1	59	15443	15500	.61 et 15443'		W. Montalvo	Oligo.	Sespe Fm.
2-22-32 1971	Argo Pet. Corp.	U.P.R.R.-Leonard -1	37		14134	.58 at 9405'	170	W. Montalvo		
2-22-33 1948	Chevron USA, Inc.	Eastwood N-1	65		10709	.56	165		Oligo.	
2-23-2 1964	Getty Oil Co.	V.L.&W. C.H.-5	640		14490	.46	196		Plio.	
2-23-5 1964	Shell CA. Prod. Inc.	A. Wood-1	40		7515	.48	148		Plio.	
2-23-13 1957	Chevron USA, Inc.	Humble-Maxwell -1	65		10209	.52	183		Plio.	Pico Fm.
2-23-22 1948	Getty Oil Co.	Hartman -28	516	11256	12007	.65	214			
2-23-24 1947	Chevron USA, Inc.	Maxwell-1	25		17696	.56 at 17052'			Plio.	Pico Fm.
2-23-24 1947	Texaco, Inc.	J.V.-1	24		12051	.53	182 at 11410'		L. Plio.	
2-23-25 1959	Chevron USA, Inc.	McGrath 4-612A	36	1501	13347	.63	201	W. Montalvo	L. Plio.	
3-16-4 1962	MacPet Co.	Sorenson 76X-4	1300		11200	.52	180			
3-16-5 1970	MacPet Co.	Gross	1490		10562	.58	187		Mio.	
3-16-5 1969	MacPet Co.	Blinn 86x-5	1580		10500	.53	182		Mio.	
3-16-9 1959	Sun Expl. and Prod Co.	La Salle-2	1425		10858	.52	194			

T.N.-R.W-Sec. Year	Operator	Name	Elev.[2] (ft.)	Depth to AHP[3] (ft.)	TD/TVD[4] (ft.)	Bottom Hole Pressura/Depth (psi/ft.)	Bottom Hole Temp. (F°)	Field	Age	Bottom Hole Geology
3-16-25 1963	M.C.O.R.	Mission O'Melveney			10006	.50	168	Cascade		
3-16-28 1952	Pacific Lighting Service Co.	SFZU 55-17			12417	.51	220	Aliso Cyn.	Cret.	
3-17-14 1960	Union Oil Co.	Union-Tidewater -Stuck -1	2906		10405	.52 at 10332'	140			
3-17-24 1979	Union Oil Co.	Joaghin 1-24	3192		10195	.52	172			
3-18-3 1952	Union Oil Co.	Oakridge 1-3			12180	.49	190	Oakridge		
3-18-2 1960	Union Oil Co.	Oakridge 60-2	2622		11036	.49	181		Oligo.	
3-18-6 1952	Texaco, Inc.	Hunter -1	1493		10150	.52	160	Torrey Cyn.	Oligo.	Sespe Fm.
3-18-6 1956	Gulf Oil Expl. and Prod. Co.	Hunter -1	1522		10601	.47	146	Chaffee Cyn.		
3-18-12 1955	Union Oil Co.	Simi-28	1982		10990	.47	170	Sta. Susana	Oligo.	L. Sespe Fm
3-19-24 1973	Union Oil Co.	Simi 1-24	2090		11100	.49	165		Eoc.	
3-20-1 1959	Union Oil Co.	Irwin-Berylwood-5	446		16457	.49	199		Plio.	M. Pico Fm.
3-20-10 1965	Shell CA. Prod. Co.	Daniels-1	479		12845	.49	177		Plio.	
3-21-2 1955	Chevron USA, Inc.	Vanderkaar -1	412		15157	.50	210		Plio.	Pico Fm.
3-21-14 1957	Atlantic Oil Co.	Richardson -1			13402	.60	195		Plio.	Pico Fm.
3-21-27 1952	Mobil Oil Corp.	Hill Converse	1363		8860	.48 at 8826'	142		Oligo.	
3-21-28 1952	Mobil Oil Corp.	S.P.S.-1	198		11347	.56		Saticoy	Oligo.	Sespe Fm.
3-22-23 1952	Exxon Co., USA	Limoneira-1	354		15474	.55			U. Plio.	
3-22-29 1957	Lloyd Corp. Ltd.	W.S.-5	1048		14874	.51	183		Plio.	
3-22-31 1958	Texaco, Inc.	Ohio-Sunray Sexton-1	580		9360	.49	152			
3-22-36 1956	Chevron USA, Inc.	Sudden Invest-ment-1	184		10195	.53 at 10185'	160		Mio.	Modelo Fm.
3-23-7 1945	Conoco, Inc.	Casitas-2	1991		12188	.49				
3-23-9 1956	Superior Oil Co.	Canet-2	239		13018	.52	211		L. Plio.	
3-23-14 1950	Union Oil Co.	Fraser 88-14A	1070		14956	.50	215		Plio.	
3-23-19 1958	Shell CA. Prod. Inc.	Grubb 384	551	11600 ( )	13230 (app. 13159)	.73	230	Ventura Ave.		
3-23-19 1953	Conoco, Inc.	Grubb 604	618	9750	10800	.64	196	San Miguelito		
3-23-19 1954	Conoco, Inc.	Grubb 703	548	12258	13600	.70	230	San Miguelito		
3-23-19 1954	Conoco, Inc.	Grubb 704	542	11326	12779	.75	226	San Miguelito		
3-23-19 1952	Shell CA. Prod. Inc.	Taylor 387		10095	11397	.75	225	Ventura Ave.		
3-23-19 1952	Shell CA Prod. Inc.	Taylor 388	550	10875	12240	.78	212 at 11925'	Ventura Ave.		
3-23-19 1952	Shell CA. Prod. Inc.	Taylor 390	485	11939	13200	.75		Ventura Ave.		

T.N.-R.W.-Sec. Year	Operator	Name	Elev.[2] (ft.)	Depth to AHP[3] (ft.)	TD/TVD[4] (ft.)	Bottom Hole Pressure/Depth (psi/ft.)	Bottom Hole Temp. (F°)	Field	Age	Bottom Hole Geology
3-23-19 1953	Shell CA. Prod. Inc.	Taylor 420	565	12210 ( )	13488 (13411)	.73	236	Ventura Ave.		
3-23-19 1953	Shell CA. Prod. Inc.	Taylor 427		11195	12325 (12298)	.61		Ventura Ave.		
3-23-19 1953	Shell CA. Prod. Inc.	Taylor 430	482	11036	12788 ( )	.72	220	Ventura Ave.		
3-23-19 1953	Shell CA. Prod. Inc.	Taylor 437	504	9438	10350	.63	207	Ventura Ave.		
3-23-19 1953	Shell CA. Prod. Inc.	Taylor 439	819	11410 ( )	12101 ( )	.61	210	Ventura Ave.		
3-23-19 1953	Shell CA. Prod. Inc.	Taylor 440	521	11315	12850 (12830)	.78	215	Ventura Ave.		
3-23-19 1953	Shell CA. Prod. Inc.	Taylor 443	522	10244	11541	.64	202	Ventura Ave.		
3-23-19 1953	Shell CA. Prod. Inc.	Taylor 459	830	12100 (12061)	13806 (13762)	.70		Ventura Ave.		
3-23-19 1954	Shell CA. Prod. Inc.	Taylor 467		12123 (12103)	13365 (13331)	.72 at 13292'	230	Ventura Ave.		
3-23-19 1954	Shell CA. Prod. Inc.	Taylor 478		10030 (9999)	11020 (10981)	.63	204	Ventura Ave.		
3-23-19 1954	Shell CA. Prod. Inc.	Taylor 481	560	10900	12365	.72	230	Ventura Ave.		
3-23-19 1954	Shell CA. Prod. Inc.	Taylor 485(T)	675	12222	13260	.70	232	Ventura Ave.		
3-23-19 1955	Shell CA. Prod. Inc.	Taylor 487	545	11870 (11827)	14237 (14174)	.82		Ventura Ave.		
3-23-19 1954	Shell CA. Prod. Inc.	Taylor 489	495	12460	13749 (13726)	.84	235	Ventura Ave.		
3-23-19 1954	Shell CA. Prod. Inc.	Taylor 497	701	11780	13834 (13792)	.69	240	Ventura Ave.		
3-23-19 1955	Shell CA. Prod. Inc.	Taylor 518	675	12000	13670 (13449)	.71	252	Ventura Ave.		
3-23-19 1961	Shell CA. Prod. Inc.	Taylor 587	447	12356 (12314)	13140 (13090)	.70		Ventura Ave.		
3-23-19 1977	Shell CA. Prod. Inc.	Taylor 657	479		11370 (11327)	.56		Ventura Ave.		
3-23-20 1945	Shell CA. Prod. Inc.	Taylor 217	320	10123	10477	.66		Ventura Ave.		
3-23-20 1951	Shell CA. Prod. Inc.	Taylor 222	390	12272	12725 ( )	.72	222	Ventura Ave.		
3-23-20 1954	Shell CA. Prod. Inc.	Taylor 476	460	2390 (2387)	13600 (13565)	.83	235	Ventura Ave.		
3-23-21 1950	Shell CA. Prod. Inc.	Taylor 270	470	10479	12040 (12006)	.70 at 11950'	189	Ventura Ave.		
3-23-21 1950	Shell CA. Prod. Inc.	Taylor 314	210		11348	.56	212	Ventura Ave.		
3-23-22 1949	Getty Oil Co.	Hartman 24	988	12209	12341	.61	245	Ventura Ave.		
3-23-22 1953	Getty Oil Co.	Hartman 37	315	9900	12395	.83	208	Ventura Ave.		
3-23-24 1950	Getty Oil Co.	VL&W 89	1085	11379	12056	.68		Ventura Ave.		
3-23-24 1951	Conoco, Inc.	Grubb 308	847	8744 (8699)	9557 (9510)	.65		Ventura Ave.		
3-23-24 1970	Conoco, Inc.	Grubb 350	798	10681	12156	.79	225	Ventura Ave.		
3-23-24 1961	Getty Oil Co.	VL&W 126	654	12207	12920 ( )	.66		Ventura Ave.		
3-23-27 1946	Getty Oil Co.	Lloyd 134	329		9671	.56	178	Ventura Ave.		

T.N.-R.W-Sec. Year	Operator	Name	Elev.[2] (ft.)	Depth to AHP[3] (ft.)	TD/TVD[4] (ft.)	Bottom Hole Pressure/Depth (psi/ft.)	Bottom Hole Temp. (F)	Field	Age	Bottom Hole Geology
3-23-27 1954	Mobil Oil Corp.	Lloyd 172	528	10895	12150 ( )	.79		Ventura Ave.		
3-23-27	Getty Oil Co.	Lloyd 173	744	10649	12941	.86	212	Ventura Ave.		
3-23-27 1967	Getty Oil Co.	Lloyd 400	347	15107	15107	.74	258	Ventura Ave.		
3-23-28 1950	Bennet	Bennet-Foster	105	12251	12663	.62	227	Ventura Ave.		
3-23-28 1953	Shell CA. Prod. Inc.	Taylor 431		10303 (10279)	11598 (11574)	.84	221	Ventura Ave.		
3-23-28 1953	Shell CA. Prod. Inc.	Taylor 436	211	10244 (10225)	11974 (11945)	.82	225	Ventura Ave.		
3-23-29 1973	Shell CA. Prod. Inc.	Taylor 653	573	12421	at 20179' at 21500'	.94 .90	326	Ventura Ave.		
3-23-30 1954	Shell CA. Prod. Inc.	Taylor 468	345	9325 ( )	12730 ( )	.74	230	Ventura Ave.		
3-23-30 1954	Shell CA. Prod. Inc.	Taylor 469	820	10009 ( )	12985 ( )	.79	223	Ventura Ave.		
3-23-30 1957	Shell CA. Prod. Inc.	Taylor 536	531	11010 ( )	13392 ( )	.65		Ventura Ave.		
3-23-30 1955	Shell CA. Prod. Inc.	Taylor 811			10420 (9900)	.51		Ventura Ave.		
3-23-32 1965	Shell CA. Prod. Inc.	A. Wood 2	260		10007	.49	162		Plio.	
3-24-10 1976	Shell CA. Prod. Inc.	Hoffman Trust 1-10	1462		13790	.58	204		Eoc.	
3-24-13 1973	Conoco, Inc.	Grubb 173	937		14352	.54		San Miguelito		
3-24-15 1971	Conoco, Inc.	MPI-1	695	12900 ( )	15222 ( )	.68 at 14060'	246			
3-24-22 1967	Chevron USA, Inc.	State 3184-3	40	***CONFIDENTIAL***	17590					
3-24-22 1972	Santa Fe Energy Co.	Faria	50		14700	.57	219		Plio.	
3-24-23 1970	Conoco, Inc.	Grubb 160	782	14250 ( )	15878 ( )	.74	250	San Miguelito		
3-24-24 1940	Conoco, Inc.	Grubb 10	275		8613	.52		San Miguelito		
3-24-24 1972	Conoco, Inc.	Grubb 12	735		12410	.61	200	San Miguelito		
3-24-24 1940	Conoco, Inc.	Grubb 13	370		6709	.49		San Miguelito		
3-24-24 1939	Conoco, Inc.	Grubb 14	402		7080	.61		San Miguelito		
3-24-25 1949	Conoco, Inc.	Grubb 301	1042	9779	15727	.72	272	San Miguelito		
3-24-25	Conoco, Inc.	Grubb 351	865	10825 ( )	12018 ( )	.78	206	San Miguelito		
3-24-25 1971	Conoco, Inc.	Grubb 352		10900 (10835)	13135 (12945)	.81	220	San Miguelito		
3-24-25 1972	Conoco, Inc.	Grubb 353	1096	11715 ( )	13360 ( )	.78	220	San Miguelito		
3-24-25 1978	Conoco, Inc.	Grubb 356	572	11101 ( )	12423 ( )	.78		San Miguelito		
3-24-26 1974	Conoco, Inc.	Grubb 358		10672	13229	.75	220	San Miguelito		
3-24-26	Conoco, Inc.	Grubb 359		10782	12874	.77	225	San Miguelito		
3-24-26 1978	Conoco, Inc.	Grubb 366	600	11925 ( )	13650 (13349)	.72		San Miguelito		

T.N.-R.W-Sec. Year	Operator	Name	Elev.[2] (ft.)	Depth to AHP[3] (ft.)	TD/TVD[4] (ft.)	Bottom Hole Pressure/Depth (psi/ft.)	Bottom Hole Temp. (F°)	Field	Age	Bottom Hole Geology
3-24-26 1978	Conoco, Inc.	Grubb 367	71	10892 ( )	12474 (12272)	.72		San Miguelito		
3-24-26 1978	Conoco, Inc.	Grubb 368	608	11279 ( )	13979 ( )	.74		San Miguelito		
3-24-26 1979	Conoco, Inc.	Grubb 370	629	11778 (app. 11738)	14752 (14443)	.81		San Miguelito		
3-24-26 1980	Conoco, Inc.	Grubb 371	608	12070	14656	.78	254	San Miguelito		
3-24-26 1982	Conoco, Inc.	Grubb 375	447	12095 ( )	14660 (app. 14345)	.74	258	San Miguelito		
4-16-18 1960	Exxon Co., USA	N.L.& F.	1052		13633	.48	212	Castaic Junction		
4-17-1 1950	Exxon Co., USA	N.L.&F. C-1	1063		11440	.50 at 11264'	195			
4-17-11 1956	Texaco, Inc.	Newhall D-1	1120		11644	.49	181			
4-17-12 1951	Exxon Co., USA	N.L.&F. B-1	1007		12749	.53	218			
4-17-14 1960	Exxon Co., USA	N.L.&F 68	966		13345	.54	208	Castaic Junction		
4-18-19 1955	Exxon Co., USA	Edward 1	916		16075	.59 at 15573'			Plio.	L. Pico Fm.
4-18-20 1965	Getty Oil Co.	Camulos Ranch -1	675		11500	.48	162		U. Plio.	
4-18-22 1956	Union Oil Co.	Camulos Ranch #2	896		13694	.51	181		Mio.	
4-18-28 1960	Shell CA. Prod. Inc.	Sloan -1	676		17440	.51 at 16850'	219		Mio.	Sta. Margarita Fm.
4-18-29 1959	Exxon Co., USA	C. Mavro Warren -1	640		11008	.57	159		Plio.	M. Pico Fm.
4-18-30 1957	Exxon Co., USA	C.S. Johnson -2	626		14992 (13845)	.58	180		Plio.	
4-18-33 1980	Phillips Pet. Co.	Sloan Ranch -1	1256		16019 (15788)	.54	230	Eureka Cyn.		
4-19-7 1961	Chevron USA, Inc.	Goodenough-1	765		14501 ( )	.59 at 14485' ( )	191			
4-19-8 1958	Chevron USA, Inc.	N.W. Arundell -1	2711		11695	.51	164		Plio.	Pico Fm.
4-19-11 1966	Mculloch Oil Corp.	Hopper Canyon	1120		14016	.45 at 7696'				
4-19-17 1961	Chevron USA, Inc.	Arundell-5	1782		15546	.51	202			
4-19-19 1958	Arco Oil and Gas Co.	ROCO-G.P.-Arundell Comm.A	715		14890	.49	190		Plio.	M. Pico Fm.
4-19-27 1957	Texaco, Inc.	Lawton -1	1111		17485	.48	190		Pleist.	Saugus Fm.
4-19-31 1955	Arco Oil and Gas Co.	Hamburg -1	437		16015	.53	198		Plio.	M. Pico Fm.
4-19-34 1967	Arco Oil and Gas Co.	Laura Lawton -1	527		16936	.54	202		Plio.	
4-20-11 1960	Shell CA. Prod. Inc.	Pagenkopp -1	1435		15208	.50	220		Plio.	Pico Fm.
4-20-21 1956	Chevron USA, Inc.	C.W. West et al.	1256		15221 (15204)	.51	210		Plio.	
4-20-24 1955	Chevron USA, Inc.	Sespe Creek Comm.-1	504	12011	16100 ( )	.61 at 16083'	206		Plio.	L. Pico Fm.
4-20-25 1958	Union Oil Co.	U.R.S Fillmore Unit A-1	439		15117 (14126)	.44	207	Fillmore	Plio.	M. Pico Fm.
4-20-29 1955	Chevron USA, Inc.	Yuba Unconsolidated	1122		15500	.51	202		Plio.	Pico Fm.

T.N.-R.W-Sec. Year	Operator	Name	Elev.[2] (ft.)	Depth to AHP[3] (ft.)	Bottom Hole TD/TVD[4] (ft.)	Bottom Pressure/Depth (psi/ft.)	Hole Temp. (F°)	Field	Bottom Age	Hole Geology
4-21-9 1974	Argo Pet. Corp.	Benault #2	1950		10500 ( )	.55	186	Ojai	Eoc.	
4-21-16 1981	Argo Pet. Corp.	Valex-Ferndale 107	1061	6966	8271	.67	158	Ojai		
4-21-16 1980	Argo Pet. Corp.	Ferndale-8	1200	7032	7644	.67	105	Ojai		
4-21-16 1972	Sun Expl. and Prod. Co.	Hamp-45		5915	5915	.61	140	Ojai		
4-21-16 1973	Sun Expl. and Prod. Co.	Hamp-52	1091	4118	4644 ( )	.62	122	Ojai		
4-21-16 1973	Sun Expl. and Prod. Co.	Hamp-53	1091	5850	5958 ( )	.61	140	Ojai		
4-21-16 1974	Sun Expl. and Prod. Co.	Hamp-60	1091	5953	5953	.62	118	Ojai		
4-21-16 1976	Sun Expl. and Prod. Co.	Hamp-62	1091	6554	7920 (7766)	.64	162	Ojai		
4-21-25 1980	Texas Pacific	Rudolf 22-25	1731		10888	.52	180			
4-21-28 1961	Union Oil Co.	Ex Mission -2	1702		9991 (9985)	.54	199	Santa Paula		
4-22-13 1979	Arco Oil and Gas Co.	Ojai #77	1521	1673	5777 (4977)	.65	139	Ojai		
4-22-13 1978	Arco Oil and Gas Co.	Fee -101	1964	1472 (1469)	4829 ( )	.62	126	Ojai		
4-22-13 1979	Arco Oil and Gas Co.	Ojai Fee-104	1675	1810 ( )	5555 ( )	.62	132	Ojai		
4-22-13 1979	Arco Oil and Gas Co.	Fee-111	1521	3477 ( )	6102 ( )	.62	142	Ojai		
4-22-13 1984	Arco Oil and Gas Co.	Ojai 117	1651	3030	3176	.62	126	Ojai		
4-22-13 1978	Arco Oil and Gas Co.	Ojai 507	1620	1096	1500	.61	95	Ojai		
4-22-33 1952	Union Oil Co.	Ex Mission X-7	1702		9327 (9323)	.49	173			
4-23-12 1952	Cal-Metro Pet.	Bailey-1	863	847	955	.66	100	Lion Mtn.		
4-23-12 1956	Cal-Metro Pet.	Bailey-4	783	961	1530	.74		Lion Mtn.		
4-23-12 1957	Cal-Metro Pet.	Bailey -5		1275	1729	.61		Lion Mtn.		
4-23-12 1965	Cal-Metro Pet.	Bailey -10	800	1650	1730	.63	80	Lion Mtn.		
4-23-12 1950	Exxon Co. USA	Theo Hammond-4	734	2958	4500	.62	114	Lion Mtn.		
4-23-36 1954	A.D. Bushing	Wadleigh et el -1	684		3413	.44				
4-24-26 1951	Sun Expl. and Prod. Co.	Dunshee-1	1030		7160	.54				
4-25-35 1959	Shell CA. Prod. Inc.	Bates-2	414		10891 (10556)	.53	180		L. Mio.	
5-17-18 1967	B. Forguson	Hathaway-6	2280		8325	.48	150		Mio.	
5-17-19 1962	Marathon Oil Co.	Hathaway-1	2200		7917 (7814)	.48	150		Mio.	
5-18-25 1978	Cabeen	Hathaway-1	1910		7460	.50	150		U. Mio.	
5-19-33 1976	R.L. Burns	Federal 27-33	4240		9575 (9400)	.49	160	Sespe		

San Bernadino B & M, all townships and ranges are south and west.

T.S.-R.E.-Sec./ Year	Operator	Name	Elev.[2] (ft.)	Depth to AHP[3] (ft.)	TD/TV[4] (ft.)	Bottom Hole Pressure/Depth (psi/ft.)	Bottom Hole Temp. (°F)	Field	Age	Bottom Hole Geology
1-13-21 1945	Ventura Oil	L.A. Brick -1	375		7505	.53 at 6979'		L.A. City		
1-13-32 1969	Chevron USA, Inc.	Spring -2	235		8510	.47 at 6330'	160 at 6330'	L.A. Downtown		
1-14-20 1971	Chevron USA, Inc.	S-39	165		14076	.56 at 12336'		San Vincente		
1-14-20 1972	Chevron USA, Inc.	S-54	250		12963	.52 at 12683'		Beverly Hills		
1-14-21 1966	Texaco, Inc.	U-93-5	200		10446	.47		Salt Lake		
1-14-29 1942	Chevron USA, Inc.	Packard -6				.50 at 11185'				
1-14-35 1959	Union Oil Co.	U-19-1	215		9663	.45 at 9654'	160	Las Cienegas		
1-15-23 1959	Hudson Oil and Gas Co.	L.A.C.C. -1	280		9387	.60	194	Beverly Hills		
1-15-26 1964	Gulf Oil Expl. and Prod. Co.	20th Cent. Fox 27-F	250		12000	.50		Beverly Hills		
1-15-28 1966	Occidental Pet. Corp.	Sawtelle-1	350		11322	.49 at 11141'		Sawtelle		
1-15-28 1978	Argo Pet. Corp.	Adhoc 179-1	354	11943	12805	.64 at 11943'		Sawtelle		
1-15-28 1970	Arco Oil and Gas Co.	Aladdin-Durso -1	293	7645	11460	.70				
1-15-32 1966	Mobil Oil Corp.	Brentwood RD -1	295	10781	11326	.62	240			
1-15-34 1969	Aminoil USA, Inc.	U-67-1, RD -2	227		10650	.51	202			
1-15-34 1969	Chevron USA, Inc.	Duff CH -1	224		11209	.55				
1-15-36 1959	Hillcrest-Beverly Oil Corp.	Rancho Park -1	217		12688	.58 at 11004'	251	Cheviot Hills		
2-13-2 1967	Aminoil USA, Inc.	Budd -1			10518	.52				
2-14-6 1956	Pauley Pet. Inc.	Aladdin Comm -1	118		11721 (9508)	.57 at 11504' ( )	219 at 11504'			
2-14-7 1960	Conoco, Inc.	Culver City B-4-1	70		10385	.49 at 10353'				
2-14-16 1964	Chevron USA, Inc.	Cirtus Comm. -1			10650	.53		Inglewood		
2-14-16 1960	Exxon Co., USA	Buckler Comm.	300		13506 (11765)	.56	272	Inglewood		
2-14-16 1979	Chevron USA, Inc.	Champlin-Ladera Park 1-16	247		11279	.54				
2-14-17 1943	Chevron USA, Inc.	Baldwin-Cienaga 105,RD	363	10746	12276	.62		Inglewood		
2-14-25 1974	American Petrofina	Manchester -1	154		15886	.61 at 8091'	156			
2-14-27 1972	Chevron USA, Inc.	Inglewood Cemetary	184		11690	.53 at 11656'				
2-14-34	Chevron USA, Inc.	Hardy Comm.-1	168			.50 at 9149'		Portrero		
2-14-34 1960	Chevron USA, Inc.	Hardy Comm.-3	160		12932	.58 at 11490'	231	Portrero		

Table 1b.--State Offshore Wells (within 3 mile boundary), Santa Barbara Channel

T.S-R.E.-Sec./ Year	Operator	Name	Elev.[2] (ft.)	Depth to[3] AMP (ft.)	T.D. (ft.)	Bottom Hole Pressure/Depth (psi/ft.)	Bottom Hole Temp. (F.)	Field	Platform
2-23-35 1956	Chevron USA, Inc.	State E-1	26		12850 ( )	.59	224	Drilled from West Montalvo onshore	
3-24-7 1954	Mobil Oil Corp.	Ferguson 101	25		9702 (9453)	.60 at 9695 ( )		Rincon Island	
3-24-7 1954	Mobil Oil Corp.	Ferguson 102A	25	8450	10450 ( )	.61	186	Rincon Island	
3-24-8 1957	Energy Development Inc.	State PRC 145-11	26		8998	.59	160		
3-24-17 1979	Morris Oil Corp.	Hobson State -10A	12	7945 (7882)	8908 (8837)	.61	160	Rincon Island	
3-24-17 1954	Morris Oil Corp.	Hobson State -12	19		8790 (8690)	.54 at 8742 (8644)	172	Rincon Island	
3-24-28 1964/5	Chevron USA, Inc.	State 3184-1	65	13379	16305	.71 at 16024	178		
3-25-16 1964	Exxon Co., USA	State 3133-1	27	6183	7840	.72	156	Carpinteria	
3-25-16 1964	Exxon Co., USA	State 3133-2	27	6715	9412	.74	187	Carpinteria	
3-25-17 1966	Chevron USA, Inc.	3150-9	83	6506 ( )	14115 (14066)	.69 at 9018 (8976)	170	Carpinteria	Hope
3-25-17 1980	Chevron USA, Inc.	3150-9A	84		6800 ( )	.60	150	Carpinteria	Hope
3-25-17 1966	Chevron USA, Inc.	3150-18	84	5023 (4951)	6928 (6844)	.69	148	Carpinteria	Hope
3-25-17 1966	Chevron USA, Inc.	3150-20	84	5200 (5200)	7700 ( )	.69	164	Carpinteria	Hope
3-25-17 1966	Chevron USA, Inc.	3150-25	87	5400	7433 (7040)	.72	148	Carpioteria	Heidi
3-25-17 1966	Chevron USA, Inc.	3150-27	88		3645 ( )	.49	128	Carpinteria	Heidi
3-25-17 1967	Chevron USA, Inc.	3150-41	88	5228 (5073)	9130 ( )	.69	176	Carpinteria	Heidi
3-25-17 1968	Chevron USA, Inc.	3150-63	87	5085 (5065)	6392 (6362)	.70	147	Carpinteria	Heidi
3-25-17 1979	Chevron USA, Inc.	3150-65		7770 ( )	8016 ( )	.65	156	Carpinteria	Heidi
3-25-17 1980	Chevron USA, Inc.	3150-67	100	5730 ( )	8596 ( )	.73		Carpinteria	Heidi
3-25-17 1968	Chevron USA, Inc.	3150-117	87	5250 (4912)	7320 (6979)	.67	101	Carpinteria	Heidi
4-26-35 1967	Chevron USA, Inc.	SMSS 1824-8A	78	8502 ( )	8502 ( )	.64	182	Summerland	Hazel

Table 1c.--Data for Federal Pacific outer Continental Shelf wells, Santa Barbara Channel

O.C.S. LEASE/ YEAR	LAMBERT GRID COORD.[1] X	LAMBERT GRID COORD.[1] Y	OPERATOR	NAME	PLATFORM	ELEV.[2] (ft.)	WATER DEPTH (ft.)	DEPTH[3] TO AHP (ft.)	T.D.[4] T.V.D. (ft.)	BOTTOM HOLE PRESSURE/ DEPTH (psi/ft.)	COMP. BOTTOM HOLE PRESS/ DEPTH[5] (psi/ft.)	BOTTOM HOLE TEMP. (°F.)	FIELD	AGE	BOTTOM HOLE FORMATION
0166 1967	1,002,588	806,248	Phillips Pet. Co.	#1		25	155		6121	.49	.51	139	Dos Cuadras		
0166 1967	1,002,585	804,153	Phillips Pet. Co.	-3		25	165		5000	.49	.51	123	Dos Cuadras		
0166 1967	1,003,297	805,260	Phillips Pet. Co.	#4		55	155	5535	14229	.70 at 13508'	.71	240	Dos Cuadras		
0166 1968	1,006,332	805,666	Phillips Pet. Co.	A-3	Hogan	80	154	5825	7172 (7000)	.62	.64	154	Dos Cuadras		
0166 1969	1,006,331	805,670	Phillips Pet. Co.	A-5	Hogan	80	154		6209 (6002)	.46	.48	128	Dos Cuadras		
0166 1968	1,006,323	805,679	Phillips Pet. Co.	A-38	Hogan	80	154		9338 (8983)	.56	.57	190	Dos Cuadras		
0166 1969	1,006,320	805,694	Phillips Pet. Co.	A-39A	Hogan	80	154		6277 (5979)	.43	.45	136	Dos Cuadras		
0166 1969	1,006,332	805,588	Phillips Pet. Co.	A-42	Hogan	80	154		11017 (9499)	.48	.49	187	Dos Cuadras		
D166 1969	1,003,078	804,805	Phillips Pet. Co.	B-1	Houchin	89	163		6116 (5905)	.45	.47	139	Dos Cuadras		
0166 1974	1,003,080	804,790	Phillips Pet. Co.	B-32	Houchin	87	163	5350-17205	18439 (18034)	.72 at 9820' .59 at T.D.	.73 .60	290	Dos Cuadras	Mio.	Vaqueros
0166 1972	1,003,086	804,745	Phillips Pet. Co.	B-34	Houchin	89	163		5551 (5371)	.45	.47	129	Dos Cuadras		
D180 1970	816,547	819,197	Exxon Co., USA	#1		38	1478		12040	.55	.65	190			
0185 1969			Shell CA. Prod. Inc.	#1		68	913		13084	.50	.55	250		Eoc.	Matillija
D187 1970	852,005	829,085	Exxon Co., USA	-1		38	756		10938	.55	.60	225		Oligo.	Sespe
0187 1970	845,937	828,576	Exxon Co., USA	-2		38	873		9733	.50	.57	173		L. Mio.	
D187 1982			Exxon Co., USA	#3		38	1280		12124	.59	.67	241			
D188 1968	841,275	828,380	Exxon Co., USA	#1		68	941		12887	.49	.54	206		Eoc.	Gaviota
0188 1969	835,314	828,330	Exxon Co., USA	#2		68	1004		12210	.47	.53	200		Eoc.	Gaviota
0188 1972	830,257	827,645	Exxon Co., USA	-6		38	1070		9700	.55	.63	218		L. Mio.	Rincon
0188 1979	832,338	830,910	Exxon Co., USA	H-5	Hondo	137	842		13957 (11672)	.56	.61		Hondo		
D188 1980	832,536	830,898	Exxon Co., USA	H-11	Hondo	137	842		13329 (12945)	.57	.62	248	Hondo		
0188 1979	832,326	830,911	Exxon Co., USA	H-16	Hondo	137	842		14000 (11328)	.57	.63	240	Hondo		
D190 1969	823,193	827,895	Exxon Co., USA	#2		34	1046		12498	.50	.56	201		Eoc.	Gaviota
0190 1971	817,687	829,107	Exxon Co., USA	#4		68	1008		11050	.51	.58	182		L. Mio.	
0191 1871	809,426	827,447	Exxon Co., USA	-1		38	1212		12725	.54	.61	206		Olig.	Alegria
0193 1972	767,076	834,286	Exxon Co., USA	-2		38	612		13049	.56	.59	272		Eoc.	Sacate
0194 1970	775,335	827,030	Exxon Co., USA	#1		68	849		12955	.55	.60	213	Sacate	Eoc.	Sacate
D195 1970	753,223	835,095	Exxon Co., USA	-2		68	359		13290	.52	.54	234		Eoc.	Sacate
0197 1968	731,436	829,570	Exxon Co., USA	-2		68	737		10341	.48 at 10321'	.53	181		Eoc.	Sacate
D197 1969	720,459	831,200	Exxon Co., USA	#3		68	730		12006	.49	.53	233		Eoc.	Anita
0202 1969	1,084,180	722,857	Mobil Oil Corp.	-1A		119	94		8464	.44 at 8452'	.45	175	Hueneme	Olig.	
0203 1970	1,071,237	724,896	Mobil Oil Corp.	#4RD		25	304		7452	.58	.61	140	Hueneme	Olig.	
0205 1970	1,046,798	728,472	Exxon Co., USA	#1		39	719		12801	.49	.53	224	Sockeye	Cret.	
D208 1968	1,056,129	740,255	Chevron USA, Inc.	#1		27	168		12854	.50	.51	223	Santa Clara	Eoc.	
0209 1974	1,047,049	743,462	Exxon Co., USA	#1		27	212	4265 ( )	9826 (9783)	.61	.63	182	Santa Clara	Olig.	Sespe
0215 1973	1,057,800	748,200	Chevron USA, Inc.	#1		61	181	1715	10130	.77 at 4495' .70 at T.D.	.79 .71	193	Santa Clara	Olig.	Sespe
D215 1979	1,057,186	748,696	Chevron USA, Inc.	#2		91	102	4710 (4580)	10180 (9193)	.63	.64	210	Santa Clara		
0215 1980	1,057,009	754,719	Chevron USA, Inc.	#3		31	93	5106	10760	.79	.80	205	Santa Clara		

Federal Pacific Outer Continental Shelf wells, Santa Barbara Channel (continued)

O.C.S. LEASE/ YEAR	LAMBERT GRID COORD.[1] X	LAMBERT GRID COORD.[1] Y	OPERATOR	NAME	PLATFORM	ELEV.[2] (ft.)	WATER DEPTH (ft.)	DEPTH[3] TO AMP (ft.)	T.D.[4] T.V.D. (ft.)	BOTTOM HOLE PRESSURE/ DEPTH (psi/ft.)	COMP. BOTTOM HOLE PRESS/ DEPTH[5] (psi/ft.)	BOTTOM HOLE TEMP. (°F.)	FIELD	AGE	BOTTOM HOLE FORMATION
0216 1970	1,048,406	749,372	Union Oil Co.	#1		56	135	1220	12154	.70 at 7193' .62 at T.D.	.71 .63	215 at 7193'	Santa Clara		
0216 1976	1,038,742	748,952	Union Oil Co.	#2		27	225	4900 (4814)	9950 (8942)	.75 at 5535' .61 at T.D.	.78 .63	202 at 5535'	Santa Clara	Oligo.	Sespe
0216 1979	1,044,930	747,909	Union Oil Co.	#3		72	185	4775-7750 ( )	8943 (8667)	.72 at 5845' .57 at T.D.	.74 .58		Santa Clara		
0216 1979	1,044,930	747,909	Union Oil Co.	#4		72	180		7740 (6871)	.63	.65	145	Santa Clara		
0216 1984	1,041,778	747,025	Union Oil Co.	#26	Gilda	109	205	4100	10144 (8159)	.73	.74	155	Santa Clara		
0216 1983	1,041,700	748,032	Union Oil Co.	#31	Gilda	109	205		7858 (6480)	.59 at 7832'	.61	152	Santa Clara		
0217 1974	1,027,460	747,480	Chevron USA, Inc.	#1		27	316		9990 (9150)	.68 at 7200' .57 at T.D.	.71 .59	176 at 7200'	Santa Clara		
0217 1975	1,022,209	747,648	Union Oil Co.	#2		27	347	4406-6978	9450 (9400)	.69 .52 at T.D.	.73 .55	192 at 6990'	Santa Clara		
0217 1980	1,026,810	747,423	Chevron USA, Inc.	A-1	Grace	110	318	4822-7585 ( )	9800 (9605)	.67 at 4822 .58 at T.D.	.72 .60	204	Santa Clara		
0217 1980	1,026,742	747,464	Chevron USA, Inc.	A-2	Grace	108	318	5309-8854 ( )	11143 (9871)	.70 at 5309' .58 at T.D.	.74 .65		Santa Clara		
0217 1980	1,026,795	797,394	Chevron USA, Inc.	A-3	Grace	106	318	4596-6828	9279 (9136)	.74 at 4596' .56 at T.D.	.79 .59	178	Santa Clara		
0217 1980	1,026,797	747,444	Chevron USA, Inc.	A-4	Grace	106	318	4611-6715	9450 (9371)	.70 at 4611' .55 at T.D.	.75 .57		Santa Clara		
0217 1980	1,026,804	747,447	Chevron USA, Inc.	A-6	Grace	106	318	7540-8000 ( )	10506 (9545)	.68 at 7540' .54 at T.D.	.71 .57	178	Santa Clara		
0217 1981	1,026,820	747,400	Chevron USA, Inc.	A-7	Grace	106	318	5167-8007 ( )	10107 (9606)	.64 at 5197' .53 at T.D.	.69 .55	196	Santa Clara		
0217 1982	1,026,800	747,402	Chevron USA, Inc.	A-17	Grace	108	318		12722 (8436)	.54	.57	174	Santa Clara		
0217 1982	1,026,813	747,476	Chevron USA, Inc.	A-20	Grace	106	318	8945 ( )	13042 (9837)	.69	.71	188	Santa Clara		
0231 1968	933,284	766,482	Exxon Co., USA	#1		38	994		9630	.47	.54	186		Cret.	Anita/ Jalama
0231 1977	938,083	762,588	Exxon Co., USA	#2		73	992		8867	.57	.65	136			
0231 1977	936,146	736,946	Exxon Co., USA	#3		73	1007		8803	.50	.58	147			
0231 1979	938,314	762,222	Exxon Co., USA	#4			999		9775	.50	.58	164			
0231 1983	938,316	775,760	Sun Prod. Co.	#5		85	584		17575	.58 at 17547'	.60	301			
0232 1979			Exxon Co., USA	#3			1296		12761	.60	.67	218			
0234 1968	994,828	787,730	Texaco Inc.	#1		31	293		15247	.54 at 12653'	.56	217			
0234 1968	1,001,597	784,492	Texaco Inc.	#2		31	268	10290 (10284)	15456 (12900)	.64 at 15100'	.65	132	Pitas Point Unit	Mio.	Repetto
0234 1976	1,002,008	784,492	Texaco Inc.	#3		33	283	4862	18318 (18287)	.84	.85	304	Pitas Point Unit	Mio.	Monterey
0234 1977	990,140	788,400	Texaco Inc.	#4		52	302		9500	.52	.54	188	Pitas Point Unit		
0234 1978	992,750	789,911	Texaco Inc.	#5		52	288	8308	13000	.63	.65	220	Pitas Point Unit		
0234 1978	993,039	787,601	Texaco Inc.	#6		52	297	10000	12616	.61	.63	212	Pitas Point Unit		
0234 1981	986,396	786,755	Texaco Inc.	#7		72	312	4927	17980 (17862)	.86 at 16568' .83 at T.D.	.87 .84	318	Pitas Point Unit		
0234 1982	991,696	787,500	Texaco Inc.	A-1	Habitat	93	303		11360	.57	.59	179	Pitas Point Unit		
0234 1982	991,690	787,510	Texaco Inc.	A-2	Habitat	93	303		12900 (11604)	.55	.57	160	Pitas Point Unit		
0234 1982	991,691	787,531	Texaco Inc.	A-3	Habitat	93	303		12490 (11824)	.54	.56	206	Pitas Point Unit		
0234 1982	991,697	787,509	Texaco Inc.	A-4	Habitat	92	303		12400 (11716)	.52	.54	190	Pitas Point Unit		
0234 1982	991,698	787,530	Texaco Inc.	A-5	Habitat	93	303		14520 (11663)	.59	.60		Pitas Point Unit		
0234 1983	991,683	787,510	Texaco Inc.	A-7	Habitat	93	303	12200 ( )	13681 (<11256)	.84 at 13655'	.86	240	Pitas Point Unit		
0234 1983	991,684	787,538	Texaco Inc.	A-8	Habitat	93	303		11813 (11494)	.56	.58	208	Pitas Point Unit		

Federal Pacific outer Continental Shelf wells, Santa Barbara Channel (continued)

O.C.S. LEASE/ YEAR	LAMBERT GRID COORD 1/ X	LAMBERT GRID COORD 1/ Y	OPERATOR	NAME	PLATFORM	ELEV. 2/ (ft.)	WATER DEPTH (ft.)	DEPTH 3/ TO AHP (ft.)	T.D. 4/ T.V.D. (ft.)	BOTTOM HOLE PRESSURE/ DEPTH (psi/ft.)	COMP. BOTTOM HOLE PRESS/ DEPTH 5/ (psi/ft.)	BOTTOM HOLE TEMP. (°F.)	FIELD	AGE	BOTTOM HOLE FORMATION
0234 1983	991,697	787,509	Texaco Inc.	A-9	Habitat	93	303	<9400	12418 (11439)	.81	.83		Pitas Point Unit		
0234 1983	991,642	787,520	Texaco Inc.	A-10	Habitat	93	303		14290 (11629)	.55	.57	205	Pitas Point Unit		
0234 1984	991,648	787,531	Texaco Inc.	A-13	Habitat	93	303		7700 (6814)	.50	.53	146	Pitas Point Unit		
0234 1984	991,697	787,502	Texaco Inc.	A-15	Habitat	93	303	<13000	18776 ( )	.91 at 17306' .80 at T.D.	.92 .81	298	Pitas Point Unit		
0238 1980	920,449	776,879	Exxon Co., USA	#1		38	1146		12160 (12093)	.55	.62	200			
0238 1981			Exxon Co., USA	#2		38	1115		12150 (12125)	.53	.60	219			
0240 1971	987,597	803,970	Sun Prod. Co.	A-22	Hillhouse	87	188		4333 (4187)	.49	.52	128	Dos Cuadras		
0240 1970	987,642	803,937	Sun Prod. Co.	A-29	Hillhouse	87	190		4684 (4137)	.51	.54	123	Dos Cuadras		
0240 1980	1,000,558	804,216	Sun Prod. Co.	B-1	Henry	96	173		4850 (4857)	.47	.50	120	Dos Cuadras		
0240 1980	1,000,558	804,216	Sun Prod. Co.	B-2	Henry	96	175		6244 (5593)	.46	.48		Dos Cuadras		
0240 1980	1,000,576	804,222	Sun Prod. Co.	B-7	Henry	96	175		6019 (5471)	.46	.48	126	Dos Cuadras		
0241 1968	985,720	804,341	Union Oil Co.	#1RD		57	190	6950	13292 (12973)	.72 at 8990' .65 at 13050'	.62 .66		Dos Cuadras		
0241 1968	984,867	804,193	Union Oil Co.	A-25	A	88	188		4550 (4152)	.49	.52	112	Dos Cuadras		
0241 1970	984,849	804,205	Union Oil Co.	A-32	A	88	188		4666 (4189)	.56	.59	122	Dos Cuadras		
0241 1969	980,915	804,800	Union Oil Co.	B-2	B	89	188		4500 (3882)	.50	.62	115	Dos Cuadras		
0241 1972	982,126	804,449	Union Oil Co.	B-22	B	88	190	8175	11599 (11285)	.74	.75	226	Dos Cuadras		
0241 1970	980,915	804,800	Union Oil Co.	B-36	B	90	190		4735 (4174)	.54	.57	139	Dos Cuadras		
0241 1977	979,303	804,756	Union Oil Co.	C-15	C	89	193		3630 (3448)	.46 at 3579'	.50	118	Dos Cuadras		
0353 1982	868,250	772,485	Exxon Co., USA	#1		38	1911		13588	.52	.62	196			
0361 1982	1,070,965	748,960	Shell CA Prod. Inc.	#1		96	68		11000	.52 at 7249'	.53	140 at 7249'			
0361 1982	1,068,340	754,480	Shell CA Prod. Inc.	#3		97	72	10450	11679	.64	.64	214			
0361 1984	1,066,279	759,868	Shell CA Prod. Inc.	#4		90	70	<17379	17850	.64 at 17379'	.64	275			
0463 1984	706,742	769,090	Texaco Inc.	#1		73	748		11328	.58	.63	228			
0467 1984	926,580	777,960	Exxon Co., USA	#1		38	964		11692	.54	.60	196			
0472 1983	999,305	762,898	Champlin Pet. Co.	#1		37	326		14300	.54	.56				
0473 1984	1,009,974	761,505	Chevron USA, Inc.	#1		102	300	5403	12113 (11451)	.73 at 10914'	.75				

1/ Where X and Y were unavailable for development wells coordinates of the drilling platform were substituted.

2/ Usually measured from kelly bushing but may refer to ground level or drilling floor.

3/ AHP; zone of abnormally high fluid pressure, P/D > .60 psi/ft. (see Yerkes et al, 1985).

4/ T.V.D.; true vertical depth in parentheses for wells known to be directionally drilled. Empty parentheses indicate directional survey not available. Absence of parentheses indicates well is probably not directed.

5/ Compensated Bottom Hole P/D; assumes sea water replaced by saturated sediment of density 2.1 gm./cc.