Overview of Aera’s California Oil and Gas Fields

ResLink Consulting Services LLC
A Texas and Oklahoma Company

Royal Dutch Shell Plc is looking to exit Aera Energy LLC, its California-based oil and gas producing JV with ExxonMobil Corp, according to a Reuters article dated 1-Jul-2021.

Aera Energy Operations Overview:

JV ownership structure (Aera Energy): Shell (51.8%) and ExxonMobil (48.2%).
Production (for 51.8% WI) is approximately 67,516 BOE/d , which equates roughly to 96% oil and 4% gas, based on the most-recent reports that Aera produces 130,340 BOE/d for 100% working interest.
Shell share of Aera's accounts for 18% of California's oil and gas production.
Located primarily in San Joaquin Valley in Kern Co., CA and in Fresno Co., Monterey Co., Ventura Co., and Santa Barbara Co., CA.
Aera Energy operates nearly 13,000 wells in the San Joaquin Valley producing equal amounts of light and heavy oil with minimal associated gas. Permitting over additional lighter oil assets is underway in Northern Santa Barbara county.

Asset Summary

Holds the Belridge producing complex, Coalinga field, Midway Sunset field, San Ardo field, and Ventura County assets:

Belridge producing complex*: Covers 35,200 acres. Includes the following oil and gas fields North Belridge and South Belridge, Lost Hills, Cymric, and McKittrick with a production of 41,440 BOE/d (based on 80,000 MBOE/d for 100% WI).

- Light oil (25° to 30° API) is produced from the Diatomite (low perm chalk formation requiring frac-stimulation in vertical shallow wells) with heavy (11°-16° API) oil from the Tulare and an assorted other clastic formations (sandstone, and fractured shale). Production requires cyclic steam flood, water flood and pump-assist.

Coalinga field: Covers 9,600 acres with a production of 3,620 BO/d (based on 7,000 Mbbl/d for 100% WI).

- Heavy 11° to 14° API oil is produced using cyclic steam and artificial lift.

Midway Sunset field: Includes North Midway Sunset and South Midway Sunset units with a production of 3,620 BOE/d (based on 7,000 BOE/d for 100% WI) and 6,210 BOE/d (based on 12,000 BOE/d for 100% WI), respectively.

- Heavy 13° to 15° API oil nearly all of which is produced using cyclic steam injection.

San Ardo field: Covers 4,480 acres with a production of 5,180 bbl/d (based on 10,000 bbl/d for 100% WI).

- Heavy 12° to 15° API oil requiring cyclic steam, some waterflooding and artificial lift.

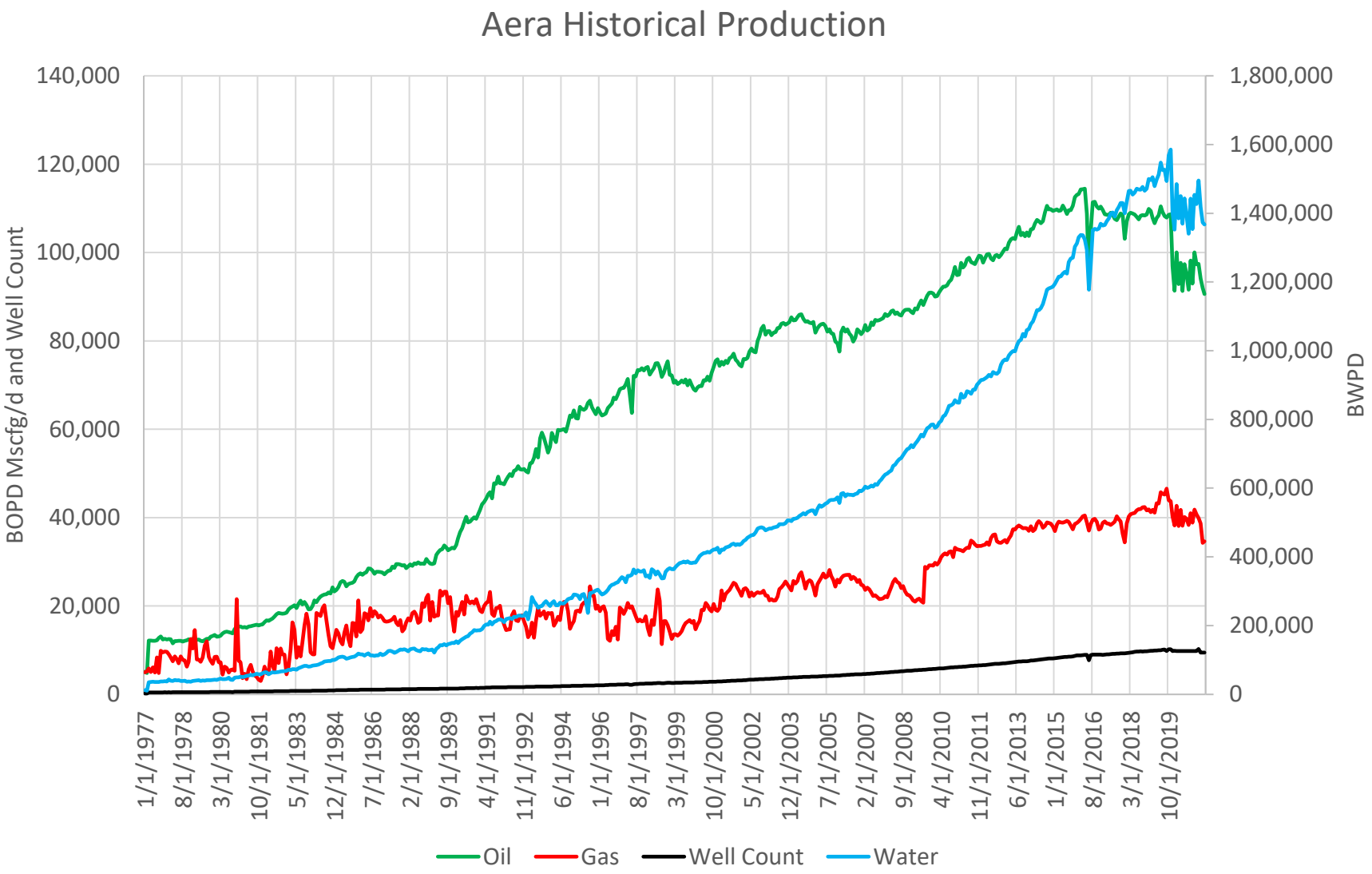
Ventura county: Covers 4,300 acres with a production of 6,820 MBOE/d (91% oil and 9% gas, based on 13,167 BOE/d for 100% WI).

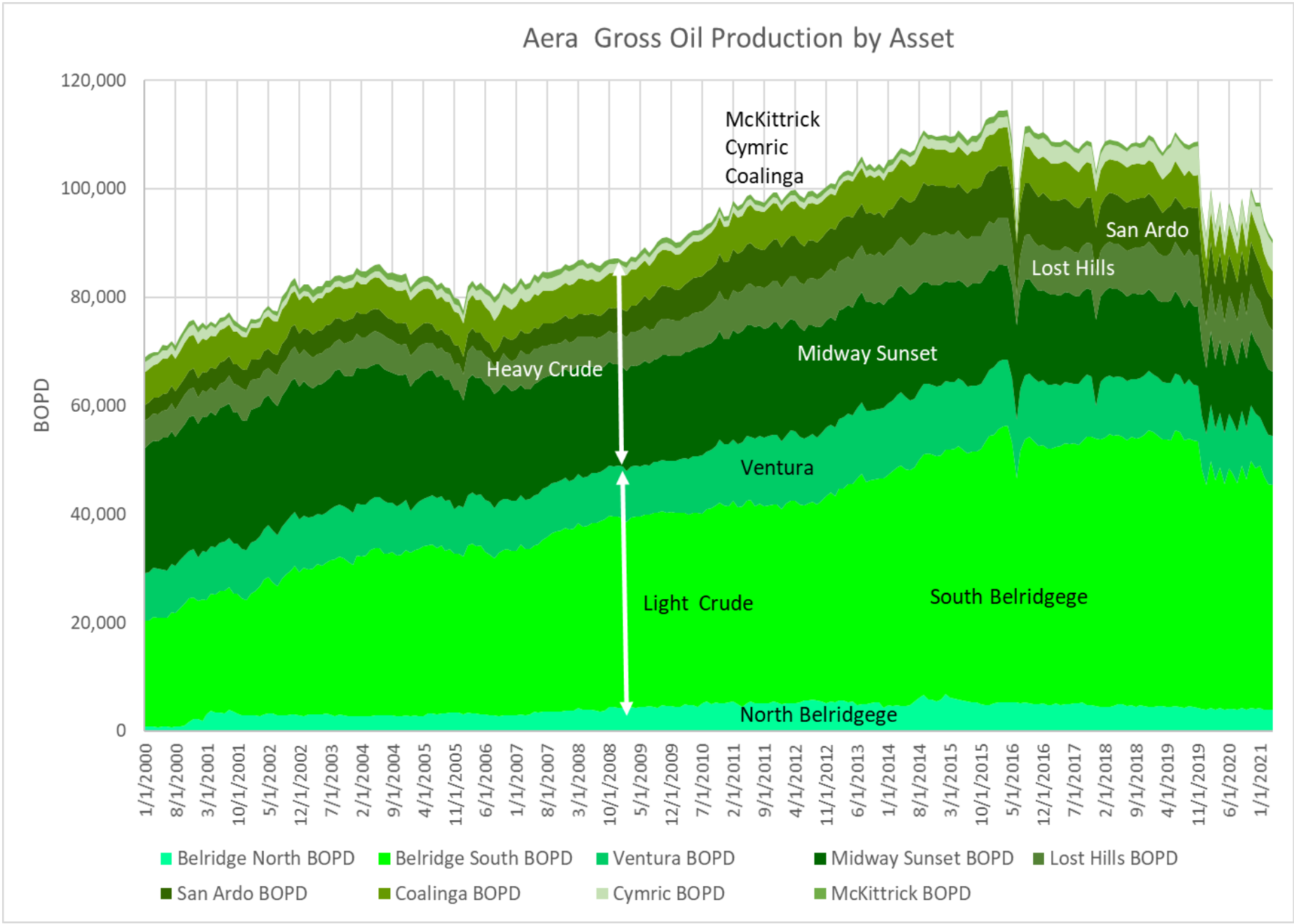
- Light 30° API oil produced using waterflood and artificial lift.

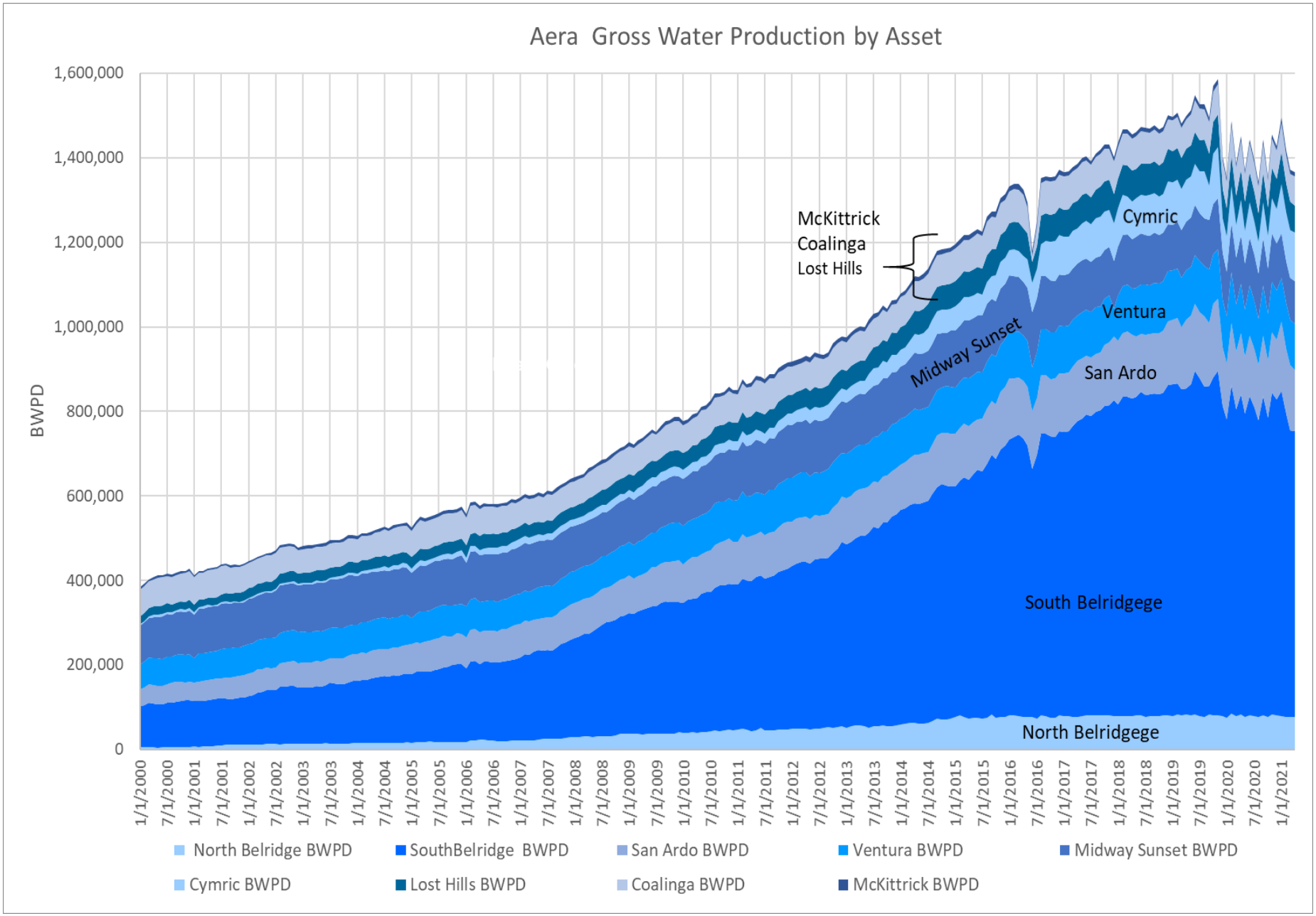
*Infrastructure at Belridge complex includes hundreds of miles of roads, pipelines, and power lines, 10 oil and water treating plants, 100 steam generators, 2 cogeneration plants, 1 gas processing plant, and state-of-the-art water softening plant designed to treat 300,000 bbl/d of water.

Aera Assets


San Ardo
Belridge Producing Complex
Lost Hills
Belridge North
Belridge South
Cymric
McKittrick
Midway Sunset
MAP LEGEND
AOIS
Ventura
Midway Sunset
McKittrick
Cymric
Belridge South
Belridge North
Lost Hills
San Ardo
Colinga
SHAPEFILES
Field_Boundaries
LANDTRAC LEASE
Grantee Alias
AERA ENERGY
OTHER
RIGS
Rigs
Location of active drilling rigs
Field Outlines
20 km
10 mi


Aera Historical Production
BOPD Mscfg/d and Well Count
BWPD
140,000
120,000
100,000
80,000
60,000
40,000
20,000
0
1,800,000
1,600,000
1,400,000
1,200,000
1,000,000
800,000
600,000
400,000
200,000
0
1/1/1977
8/1/1978
3/1/1980
10/1/1981
5/1/1983
12/1/1984
7/1/1986
2/1/1988
9/1/1989
4/1/1991
11/1/1992
6/1/1994
1/1/1996
8/1/1997
3/1/1999
10/1/2000
5/1/2002
12/1/2003
7/1/2005
2/1/2007
9/1/2008
4/1/2010
11/1/2011
6/1/2013
1/1/2015
8/1/2016
3/1/2018
10/1/2019
Oil
Gas
Well Count
Water


Aera Gross Oil Production by Asset
BOPD
120,000
100,000
80,000
60,000
40,000
20,000
0
McKittrick
Cymric
Coalinga
San Ardo
Lost Hills
Midway Sunset
Heavy Crude
Ventura
Light Crude
South Belridgege
North Belridgege
1/1/2000
8/1/2000
3/1/2001
10/1/2001
5/1/2002
12/1/2002
7/1/2003
2/1/2004
9/1/2004
4/1/2005
11/1/2005
6/1/2006
1/1/2007
8/1/2007
3/1/2008
10/1/2008
5/1/2009
12/1/2009
7/1/2010
2/1/2011
9/1/2011
4/1/2012
11/1/2012
6/1/2013
1/1/2014
8/1/2014
3/1/2015
10/1/2015
5/1/2016
12/1/2016
7/1/2017
2/1/2018
9/1/2018
4/1/2019
11/1/2019
6/1/2020
1/1/2021
Belridge North BOPD
Belridge South BOPD
Ventura BOPD
Midway Sunset BOPD
Lost Hills BOPD
San Ardo BOPD
Coalinga BOPD
Cymric BOPD
McKittrick BOPD


Aera Gross Water Production by Asset
BWPD
1,600,000
1,400,000
1,200,000
1,000,000
800,000
600,000
400,000
200,000
0
McKittrick
Coalinga
Lost Hills
Cymric
Ventura
Midway Sunset
San Ardo
South Belridgege
North Belridgege
1/1/2000
7/1/2000
1/1/2001
7/1/2001
1/1/2002
7/1/2002
1/1/2003
7/1/2003
1/1/2004
7/1/2004
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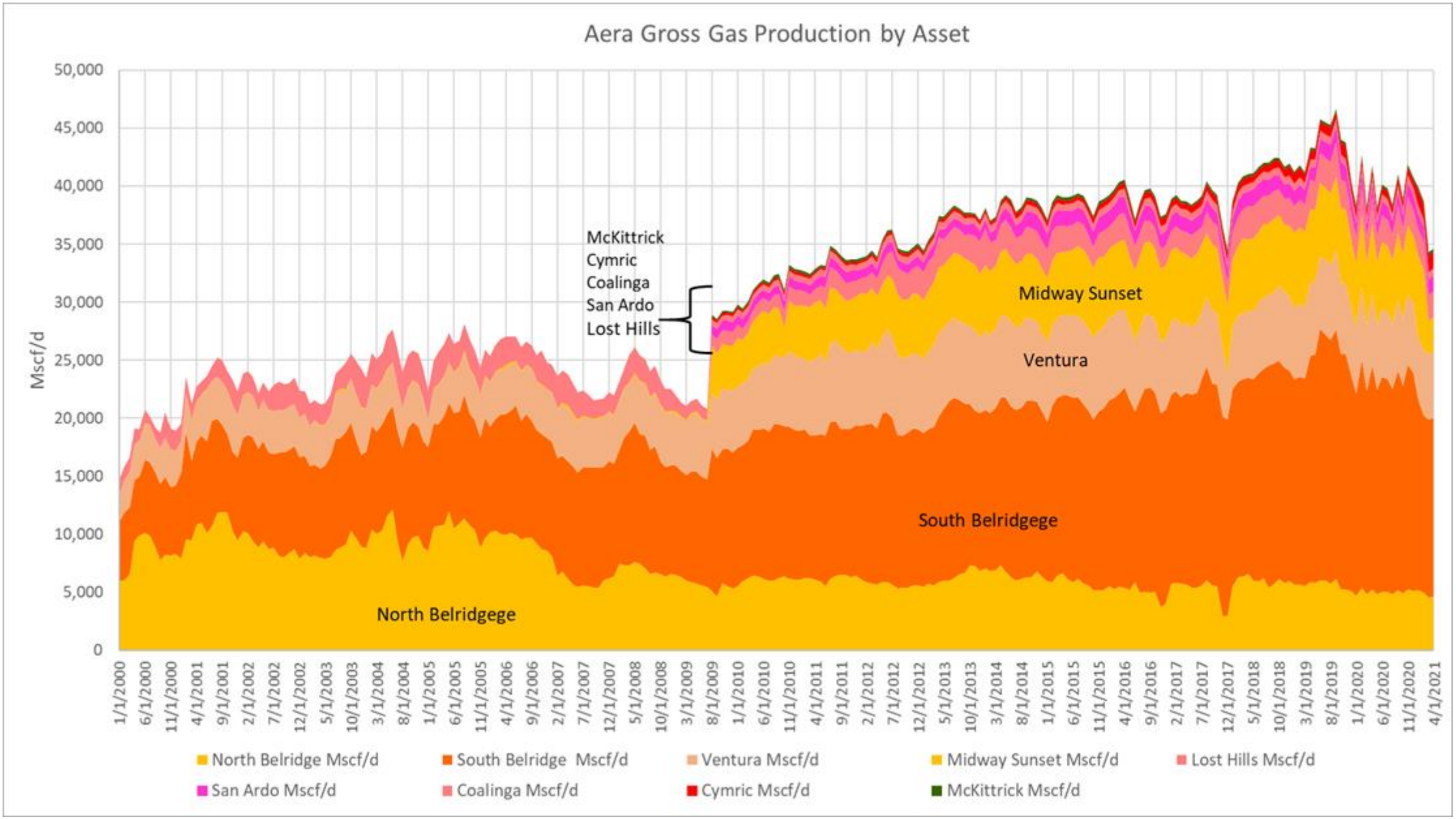
1/1/2016
7/1/2016
1/1/2017
7/1/2017
1/1/2018
7/1/2018
1/1/2019
7/1/2019
1/1/2020
7/1/2020
1/1/2021
North Belridge BWPD
SouthBelridge BWPD
San Ardo BWPD
Ventura BWPD
Midway Sunset BWPD
Cymric BWPD
Lost Hills BWPD
Coalinga BWPD
McKittrick BWPD


Aera Gross Gas Production by Asset
Mscf/d
50,000
45,000
40,000
35,000
30,000
25,000
20,000
15,000
10,000
5,000
0
McKittrick
Cymric
Coalinga
San Ardo
Lost Hills
Midway Sunset
Ventura
South Belridgege
North Belridgege
1/1/2000
6/1/2000
11/1/2000
4/1/2001
9/1/2001
2/1/2002
7/1/2002
12/1/2002
5/1/2003
10/1/2003
3/1/2004
8/1/2004
1/1/2005
6/1/2005
11/1/2005
4/1/2006
9/1/2006
2/1/2007
7/1/2007
12/1/2007
5/1/2008
10/1/2008
3/1/2009
8/1/2009
1/1/2010
6/1/2010
11/1/2010
4/1/2011
9/1/2011
2/1/2012
7/1/2012
12/1/2012
5/1/2013
10/1/2013
3/1/2014
8/1/2014
1/1/2015
6/1/2015
11/1/2015
4/1/2016
9/1/2016
2/1/2017
7/1/2017
12/1/2017
5/1/2018
10/1/2018
3/1/2019
8/1/2019
1/1/2020
6/1/2020
11/1/2020
4/1/2021
North Belridge Mscf/d
South Belridge Mscf/d
Ventura Mscf/d
Midway Sunset Mscf/d
Lost Hills Mscf/d
San Ardo Mscf/d
Coalinga Mscf/d
Cymric Mscf/d
McKittrick Mscf/d

Light Oil PDP (BE) Reserves Estimate

South Belridge				
Reservoir	Cum Oil (MMBO)	PDP from EUR Full (MMBO)	PDP from EUR BE (MMBO)	Oil Gravity API° and Wt Ave of PDP BE
Total	328.4	151.7	156.8	22.5°

Ventura				
Reservoir	Cum Oil (MMBO)	PDP from EUR Full (MMBO)	PDP from EUR BE (MMBO)	Oil Gravity API° and Wt Ave of PDP BE
Total	89.9	20.9	23.0	30.2°

North Belridge				
Reservoir	Cum Oil (MMBO)	PDP from EUR Full (MMBO)	PDP from EUR BE (MMBO)	Oil Gravity API° and Wt Ave of PDP BE
Total	31.0	14.6	15.1	28.3°

Total (MMBO)	**194.9**
Net Shell JV (MMBO)	**101.0**

Links to Field Summaries

BE EUR Oil - Best efforts for oil Estimated Ultimate Recovery
Full Oil EUR - Full-Fit Oil Estimated Ultimate Recovery.

Enverus (Drilling Info) by-well EUR estimates have been used to calculate PDP Reserves. Full definition of DI's Methodology can be found here…
http://nebula.wsimg.com/55c67fab6e5d46de003bf6c2e670353b?AccessKeyId=AF527844B1B38A5CED7D&disposition=0&alloworigin=1

Heavy Oil PDP (BE) Reserves Estimate

Midway Sunset				
Reservoir	Cum Oil (MMBO)	PDP from EUR Full (MMBO)	PDP from EUR BE (MMBO)	Oil Gravity API° and Wt Ave of PDP BE
Total	222.1	35.8	36.7	13.2°

Lost Hills				
Reservoir	Cum Oil (MMBO)	PDP from EUR Full (MMBO)	PDP from EUR BE (MMBO)	Oil Gravity API° and Wt Ave of PDP BE
Total	69.5	27.6	28.1	18.1°

San Ardo				
Reservoir	Cum Oil (MMBO)	PDP from EUR Full (MMBO)	PDP from EUR BE (MMBO)	Oil Gravity API° and Wt Ave of PDP BE
Total	41.9	24.7	24.8	12.8°

Cymric				
Reservoir	Cum Oil (MMBO)	PDP from EUR Full (MMBO)	PDP from EUR BE (MMBO)	Oil Gravity API° and Wt Ave of PDP BE
Total	15.6	17.2	17.8	12.3

Coalinga				
Reservoir	Cum Oil (MMBO)	PDP from EUR Full (MMBO)	PDP from EUR BE (MMBO)	Oil Gravity API° and Wt Ave of PDP BE
Total	82.2	13.8	15.1	14.5

McKittrick				
Reservoir	Cum Oil (MMBO)	PDP from EUR Full (MMBO)	PDP from EUR BE (MMBO)	Oil Gravity API° and Wt Ave of PDP BE
Total	8.5	2.7	2.7	13.6°

Total (MMBO)	**125.3**
Net Shell JV (MMBO)	**64.9**

Links to Field Summaries

(https://www.aeraenergy.com)

Belridge

Belridge Producing Complex

Located in Kern County, Calif. approximately 45 miles west/northwest of Bakersfield, the Belridge Producing Complex covers an area roughly 22 miles long and 2.5 miles wide. The Belridge Producing Complex includes exploration and production (E&P) operations in the North and South Belridge, Lost Hills, Cymric, and McKittrick oil fields.

Oil and gas production includes heavy oil production from the Tulare formation and light oil production from the diatomite formation. Nearly 80,000 barrels of oil equivalent per day are produced at Belridge.

More than 1,600 people work at the Belridge Producing Complex, including approximately 350 employees and 1,250 contractors. Belridge field operations are centered in the Belridge Oasis headquarters building.

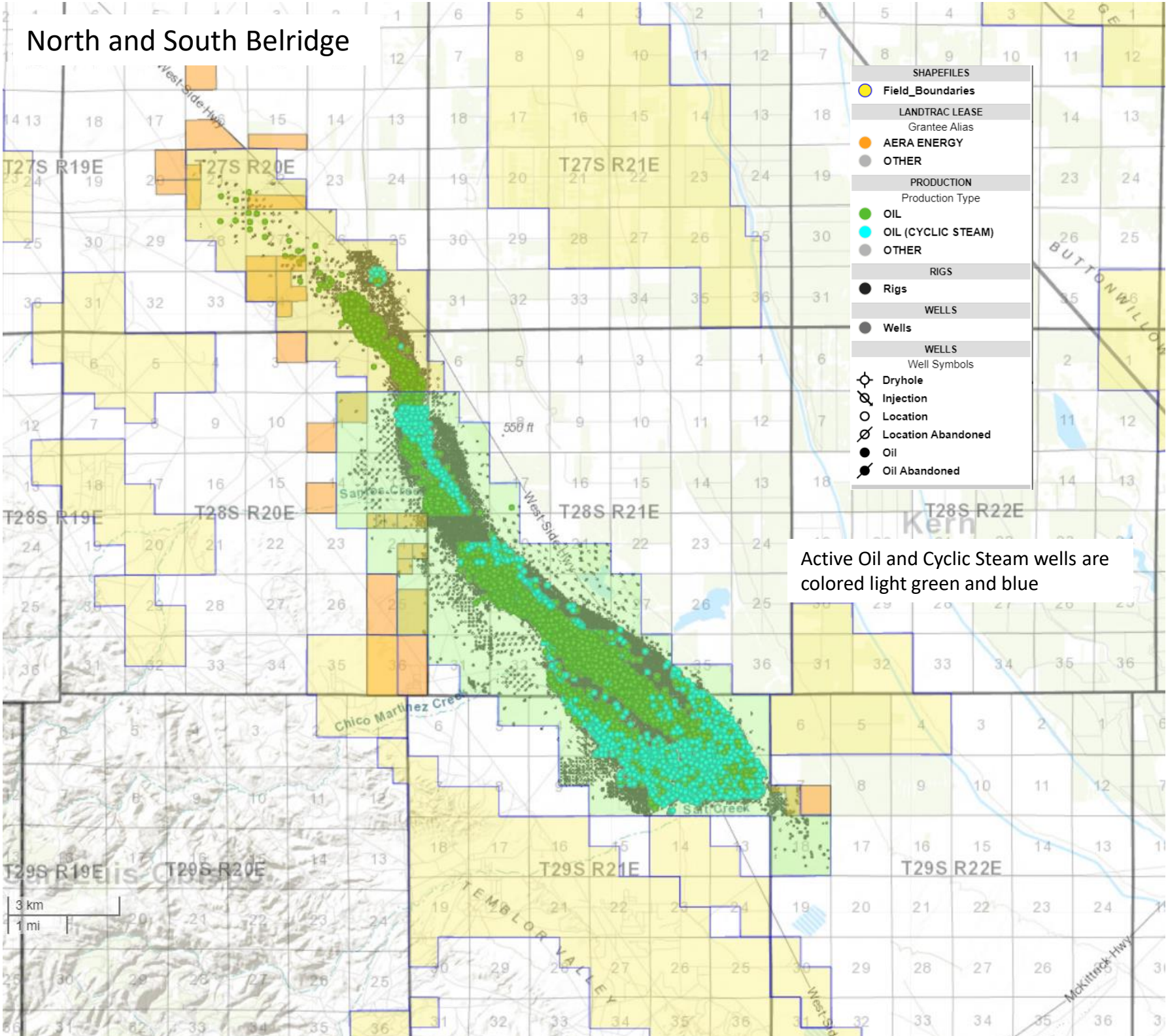
The infrastructure of the Belridge Producing Complex is a very large, concentrated, interdependent system consisting of thousands of wells; hundreds of miles of roads, pipelines, and power lines; ten oil and water treating plants; 100 steam generators; two cogeneration plants; and one gas processing plant. Additionally, Belridge has completed construction of a

state-of-the-art water softening plant designed to treat 300,000 barrels of water per day. The cogeneration capacity of the complex provides enough electricity to power all of the field's operations as well as providing steam to supplement steam injection requirements.

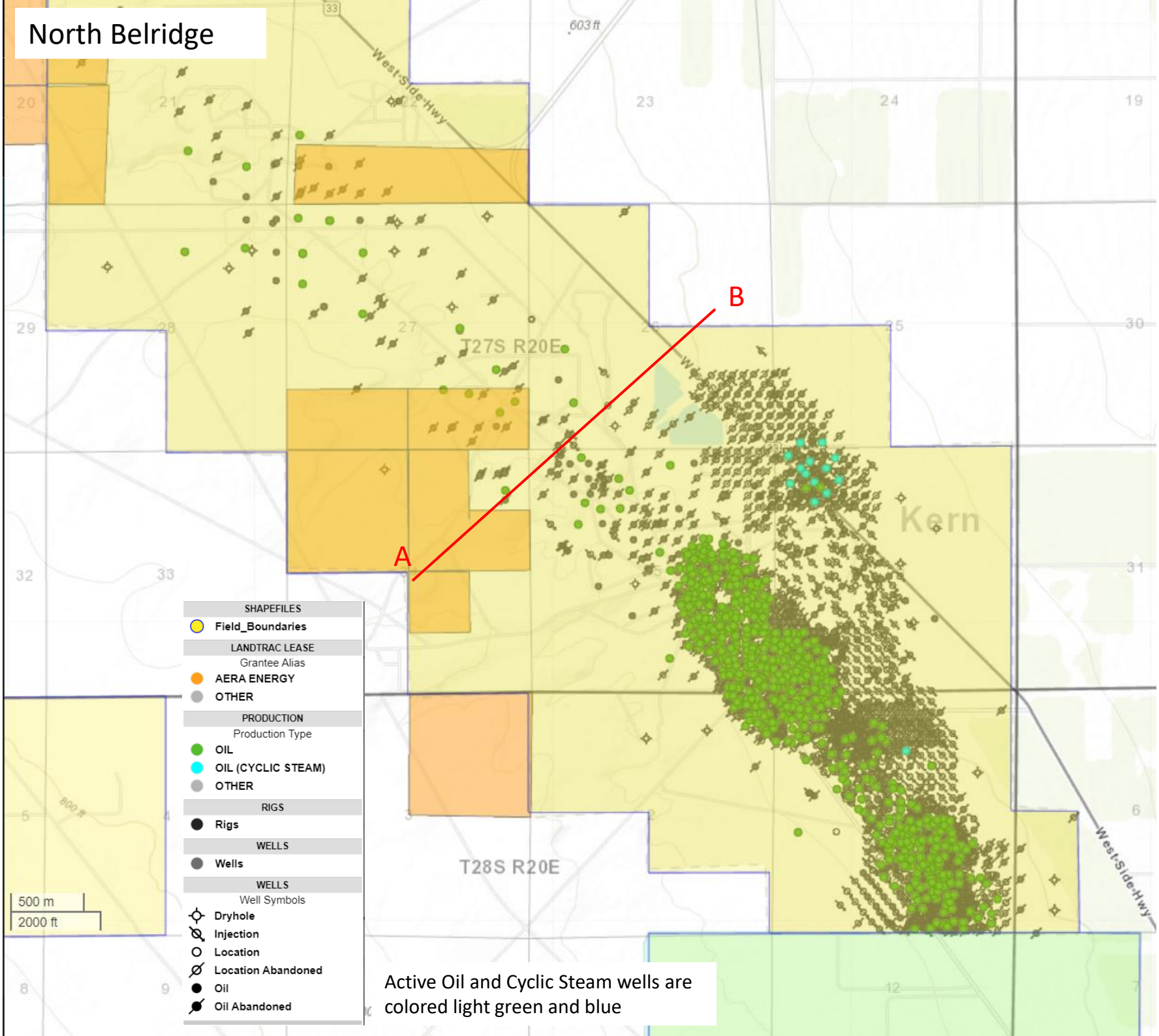
Crude oil is sold on the premises and is transported to refineries in California for processing into gasoline and other fuels.

Aera and its predecessors have operated in the North and South Belridge fields since 1916, and is the largest producer in those fields. The South Belridge field is the third most productive field in the United States. The Lost Hills Field is the sixth largest producing field in California.

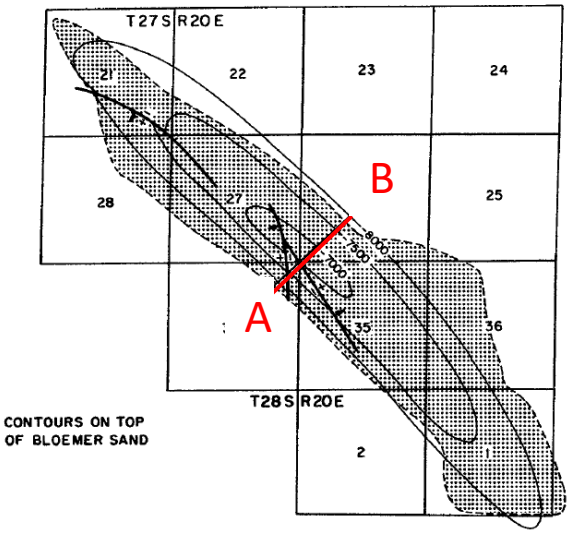
North and South Belridge

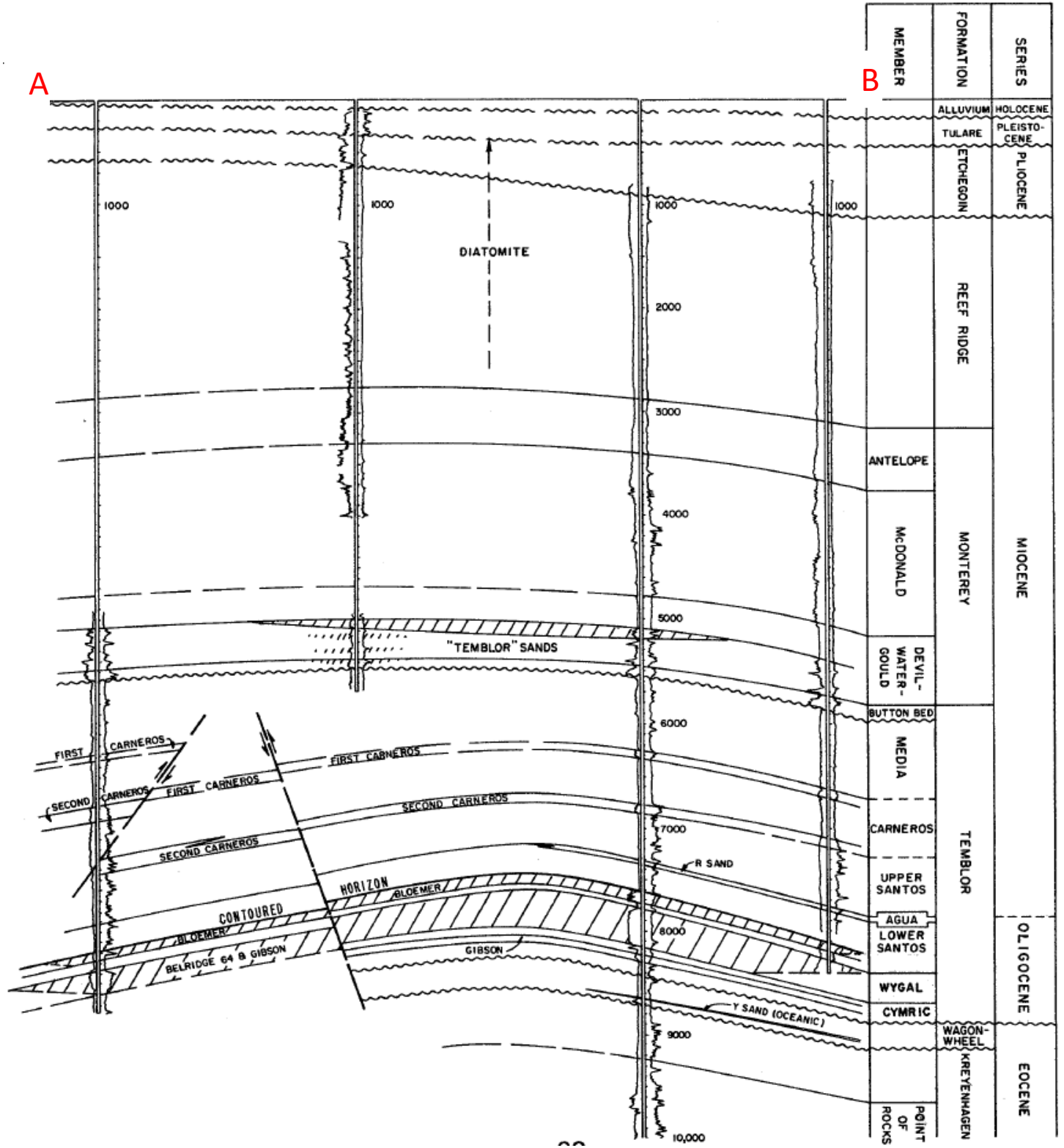


Active Oil and Cyclic Steam wells are colored light green and blue


North Belridge
A
B
T27S R20E
T28S R20E
Kern
West Side Hwy
603 ft
800 ft
SHAPEFILES
Field_Boundaries
LANDTRAC LEASE
Grantee Alias
AERA ENERGY
OTHER
PRODUCTION
Production Type
OIL
OIL (CYCLIC STEAM)
OTHER
RIGS
Rigs
WELLS
Wells
WELLS
Well Symbols
Dryhole
Injection
Location
Location Abandoned
Oil
Oil Abandoned
500 m
2000 ft
Active Oil and Cyclic Steam wells are colored light green and blue

North Belridge





COUNTY: KERN

BELRIDGE, NORTH, OIL FIELD

DISCOVERY WELL AND DEEPEST WELL

	Present operator and well designation	Original operator and well designation	Sec. T. & R.	B.&M.	Total depth (feet)	Pool (zone)	Strata & age at total depth
Discovery well	CalResources LLC "M.M." 1	Mannell-Minor Petroleum Co. "M.M." 1	35 27S 20E	MD	3,025	fractured shale	
Deepest well	CalResources LLC 11X-26	Shell California Production Inc. 11X-26	26 27S 20E	MD	11,783		kreyenhagen Eocene

POOL DATA

ITEM	TULARE-ETCHEGOIN	DIATOMITE	FRACTURED SHALE	TEMBLOR SAND	CARNEROS d/	FIELD OR AREA DATA
Discovery date	September 1917	July 1978 c/	1912	October 1930	June 1966	
Initial production rates						
Oil (bbl/day)	10	258	b/	3,014	668	
Gas (Mcf/day)	-	48	-	50,000	2,160	
Flow pressure (psi)	-	145/145	-	800/1,600	710/1,215	
Bean size (in.)	-	-	-	4 @1	-	
Initial reservoir pressure (psi)	0-200	500-600	1,100**	2,650	3,300**	
Reservoir temperature (°F)	100	104	150	205	230	
Initial oil content (STB/ac.-ft.)	1,500-2,200**	600-2,400**		1,087	400**	
Initial gas content (MSCF/ac.-ft.)		70-260**		1,450	750**	
Formation	Tulare-Etchegoin	Etch.-Reef Ridge	R. Ridge-Monterey	Monterey-Temblor	Temblor	
Geologic age	Pleisto.-Pliocene	Pliocene-Miocene	Miocene	Miocene	Miocene	
Average depth (ft.)	600	2,200	3,500	5,000	6,700	
Average net thickness (ft.)	100	1,320	400	500	80	
Maximum productive area (acres)	-	-	-	600	-	
RESERVOIR ROCK PROPERTIES						
Porosity (%)	35-39	45**	fractured shale	25	17**	
Soi (%)	56-80	20-78	-	71	55**	
Swi (%)	20-44	22-80	-	26	45**	
Sgi (%)						
Permeability to air (md)	2,500	16-2,400	-	1,100**	30**	
RESERVOIR FLUID PROPERTIES						
Oil:						
Oil gravity (°API)	13	24-31	10-32	40	39	
Sulfur content (% by wt.)	1.14	-	-	0.69	-	
Initial solution GOR (SCF/STB)	-	110**	-	500	1,060**	
Initial oil FVF (RB/STB)	1.02**	1.06	-	1.32	1.65**	
Bubble point press. (psia)	-	550-620**	-	2,650	3,600**	
Viscosity (cp) @ °F	1,081.0 @ 100	8.0 @ 104	-	0.4 @ 205	-	
Gas:						
Specific gravity (air = 1.0)	0.70	0.79	-	0.65	0.88**	
Heating value (Btu/cu. ft.)	1,250	1,102	-	1,160	-	
Water:						
Salinity, NaCl (ppm)	20,500	28,600	-	40,000	-	
T.D.S. (ppm)	21,400	37,800	-	42,000	-	
R_w (ohm/m) (77°F)	0.42	0.20	-	0.15	-	
ENHANCED RECOVERY PROJECTS						

	ENHANCED RECOVERY PROJECTS					
Enhanced recovery projects **Date started** **Date discontinued**	cyclic steam 1964 active steamflood 1975 active waterflood 1988 active	waterflood 1988 active		gas injection 1936 1957 gas injection 1961 1975		
Peak oil production (bbl) **Year** **Peak gas production, net (Mcf)** **Year**	1,162,952 a/ 1988	2,271,558 1988 3,861,728 1988		2,812,300 1932 35,000,000 1936		

Base of fresh water (ft.): None

Remarks: a/ As of January 1, 1985, the former Shallow Pool statistics will be reported as the Tulare Pool (includes Tulare and Etchegoin sands), or the Diatomite Pool (includes Etchegoin and Reef Ridge diatomite; basal Reef Ridge and Monterey shales).
b/ Initial production unknown. First recorded production was 18 BOPD in December 1915.
c/ The diatomite discovery date constitutes initial production from artificially formed fractures. Production from naturally fractured diatomite was reported as early as 1912.
d/ Production commingled with Agua.

Selected References: Bailey, W.C., 1939, North Belridge Oil Field: Calif. Div. of Oil and Gas, Summary of Operations -- Calif. Oil Fields, Vol. 24, No. 3.
Boezinger, H., 1924, The Minor Oil Fields of Kern County, Part 2, Belridge and North Belridge Oil Field: Calif. State Mining Bureau, Summary of Operations -- Calif. Oil Fields, Vol. 10, No. 1.
North Belridge Oil Field, 1968, AAPG-SEG-SEPM Guidebook, Geology and Oil Fields, West Side Southern San Joaquin Valley, p. 60-61.

DATE: November 1997 **Estimated value

COUNTY: KERN

BELRIDGE, NORTH, OIL FIELD

DISCOVERY WELL AND DEEPEST WELL

	Present operator and well designation	Original operator and well designation	Sec. T. & R.	B.&M.	Total depth (feet)	Pool (zone)	Strata & age at total depth
Discovery well							
Deepest well							

POOL DATA

ITEM	R SAND (AGUA)	BLOEMER, BELRIDGE 64, AND GIBSON	Y SAND			FIELD OR AREA DATA
Discovery date	September 1939	June 1932	May 1942			
Initial production rates						
Oil (bbl/day)	a/	1,173	1,068			
Gas (Mcf/day)	-	75,000	789			
Flow pressure (psi)	-	2,000/3,150	150/950			
Bean size (in.)	-	96/64	96/64			
Initial reservoir pressure (psi)	3,600	4,173	3,925			
Reservoir temperature (°F)	252	235	220			
Initial oil content (STB/ac.-ft.)	450	3,005	500			
Initial gas content (MSCF/ac.-ft.)	700**	5,752	800**			
Formation	Temblor	Temblor	Tumey			
Geologic age	Oligocene	Oligocene	Eocene			
Average depth (ft.)	7,100	7,700	8,550			
Average net thickness (ft.)	150	400	75			
Maximum productive area (acres)						2,265
RESERVOIR ROCK PROPERTIES						
Porosity (%)	16	14	15			
So_i (%)	b/	39	64			
Sw_i (%)	-	19	36			
Sg_i (%)	-	42 c/	-			
Permeability to air (md)	250**	75	30			
RESERVOIR FLUID PROPERTIES						
Oil:						
Oil gravity (°API)	52	30-50	32			
Sulfur content (% by wt.)	0.17	0.17	0.28			
Initial solution GOR (SCF/STB)	140,000	600	700			
Initial oil FVF (RB/STB)	-	1.50	1.49			
Bubble point press. (psia)	3,600	4,125	3,700**			
Viscosity (cp) @ °F	0.2 @ 252	0.4 @ 235	7.2 @ 100			
Gas:						
Specific gravity (air = 1.0)	0.65	0.73	0.65			
Heating value (Btu/cu. ft.)	1,160	1,290	1,160			
Water:						
Salinity, NaCl (ppm)	21,200	18,000-21,500	8,400			
T.D.S. (ppm)	-	18,600-24,000	10,100			
R_w (ohm/m) (77°F)	8.00	-	0.49			
ENHANCED RECOVERY PROJECTS						

	ENHANCED RECOVERY PROJECTS					
Enhanced recovery projects		waterflood	gas injection			
Date started		1955	1949			
Date discontinued		1990	1960			
		gas injection				
		1941				
		1985				
Peak oil production (bbl)	269,000	4,250,000	451,000			5,644,371
Year	1951	1938	1945			1937
Peak gas production, net (Mcf)	21,056,901	22,691,315	844,382			36,079,922
Year	1951	1947	1951			1936

Base of fresh water (ft.):

Remarks:
a/ Initial production commingled with 64 zone.
b/ Condensate pool.
c/ Gas cap and black oil band at discovery.

Selected References:

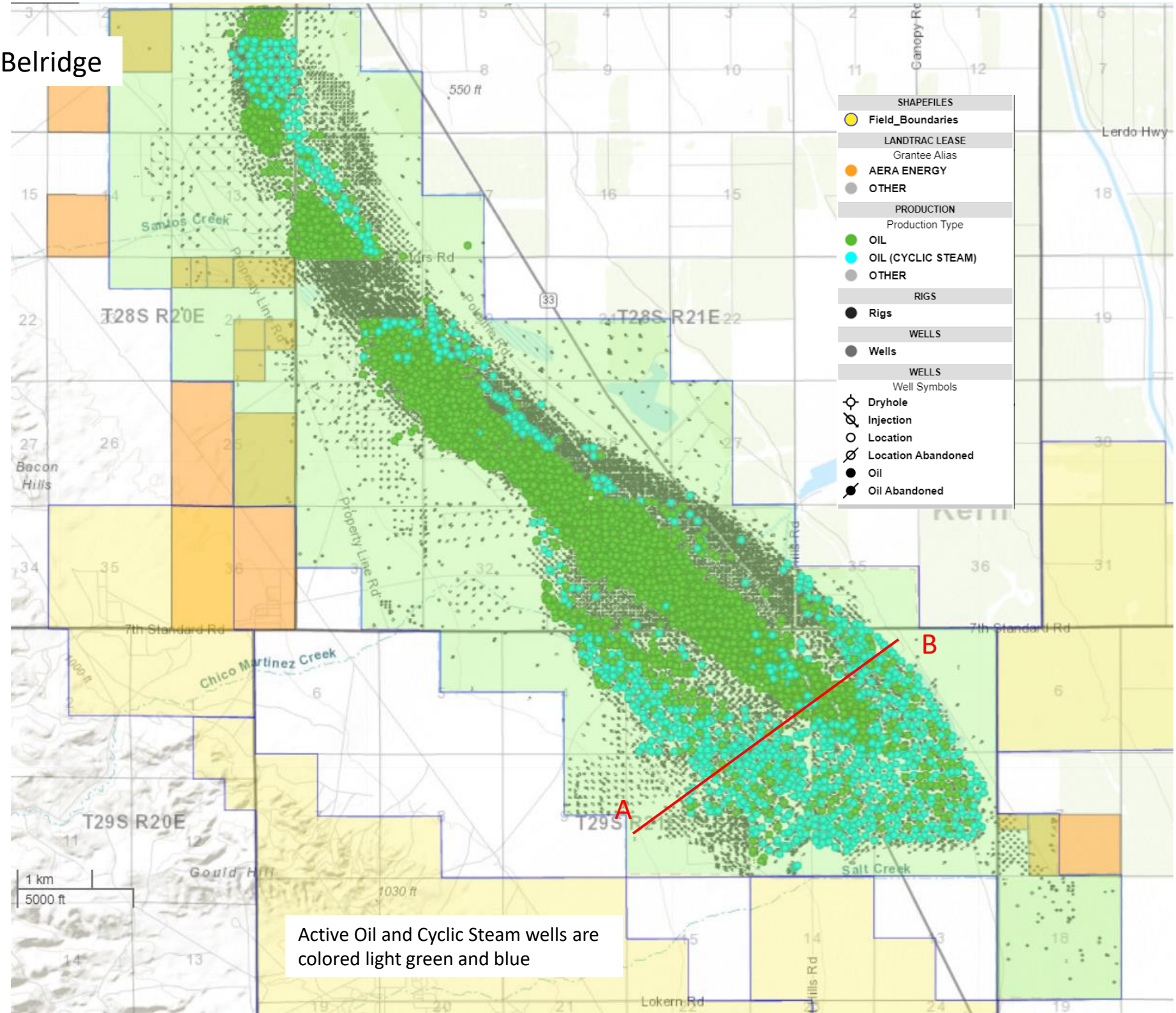
North Belridge Oil Field, 1952, AAPG-SEG-SEPM Guidebook, Oil Fields and Geology, p. 203-205.
Preston, H.M., 1932, Report on North Belridge Oil Field: Calif. Div. of Oil and Gas, Summary of Operations -- Calif. Oil Fields, Vol. 18, No. 1.
Railroad Comm. of the State of Calif., 1946, Estimate of the Natural Gas Reserves of the State of Calif., p. 63-70.
Wharton, J.B., 1943, Belridge Oil Field: Calif. Div. of Mines, Bulletin 118.
Williams, R.N., Jr., 1936, Recent Developments in the North Belridge Oil Field: Calif. Div. of Oil and Gas, Summary of Operations -- Calif. Oil Fields, Vol. 21, No. 4.

DATE: October 1991 **Estimated value

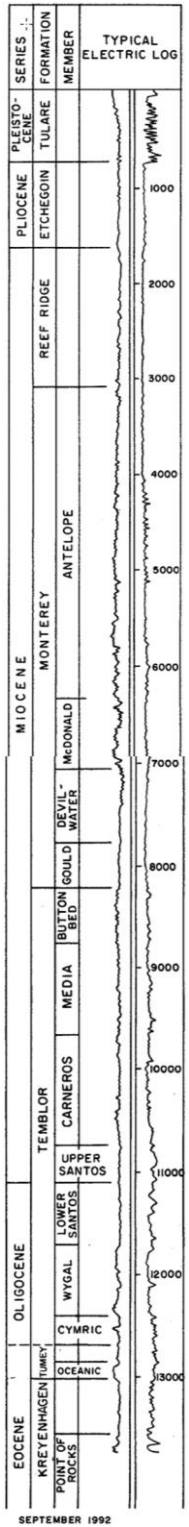
DEPARTMENT OF CONSERVATION / DIVISION OF OIL, GAS, AND GEOTHERMAL RESOURCES

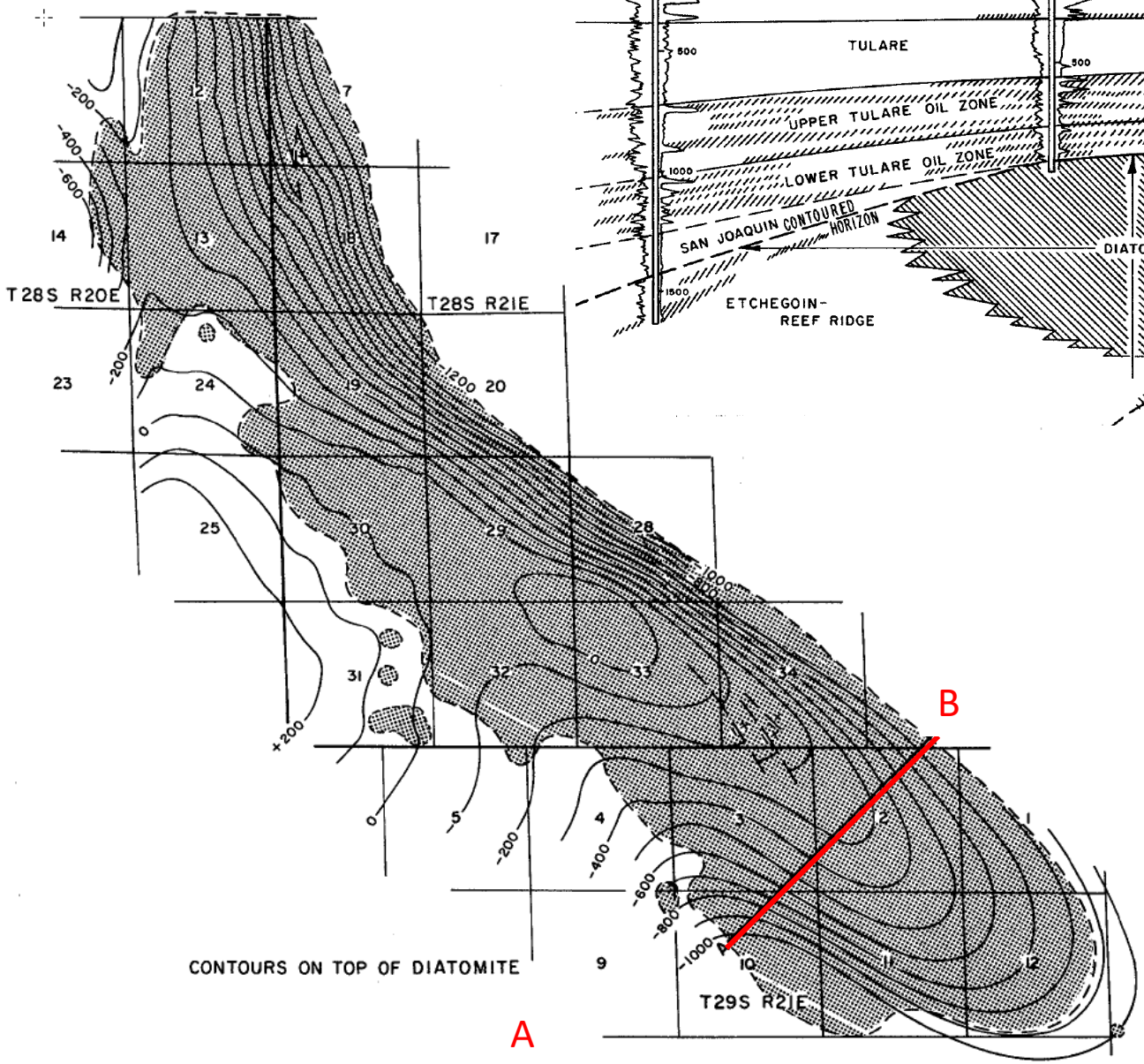
Field Index

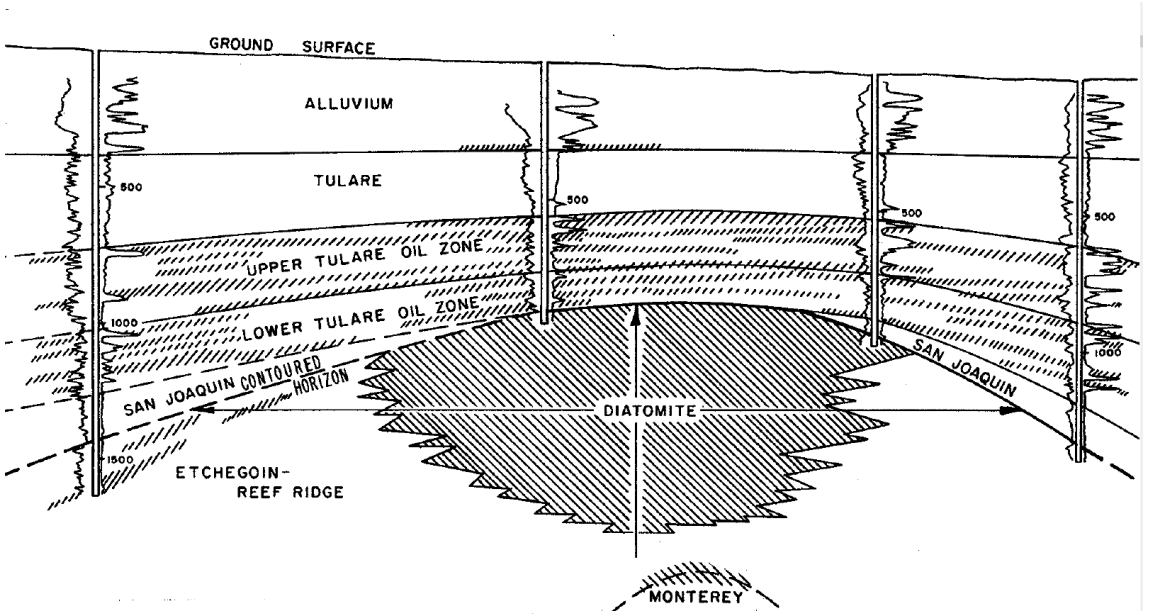
South Belridge



Active Oil and Cyclic Steam wells are colored light green and blue







COUNTY: KERN

BELRIDGE, SOUTH, OIL FIELD

DISCOVERY WELL AND DEEPEST WELL

	Present operator and well designation	Original operator and well designation	Sec. T. & R.	B.&M.	Total depth (feet)	Pool (zone)	Strata & age at total depth
Discovery well	CalResources LLC No. 101	Belridge Oil Co. No. 101	33 28S 21E	MD	782	Tulare & Diatomite	
Deepest well	CalResources LLC No. 51X-33	Kernridge Oil Co. No. 51X-33	33 28S 21E	MD	14,565		Point of Rocks Eocene

POOL DATA

ITEM	TULARE	ETCHEGOIN	DIATOMITE	ANTELOPE SHALE	MCDONALD	FIELD OR AREA DATA
Discovery date	April 1911	May 1943	April 1911	March 1983	February 1982	
Initial production rates						
Oil (bbl/day)	100	171	a/	180	89	
Gas (Mcf/day)	-	-	-	1,658	299	
Flow pressure (psi)	-	-	-	210	-	
Bean size (in.)	on pump	on pump	-	-	-	
Initial reservoir pressure (psi)	200	350	962	2,000	190**	
Reservoir temperature (°F)	87-95	105	128	165	-	
Initial oil content (STB/ac.-ft.)	2,050	2,050	1,455	-	-	
Initial gas content (MSCF/ac.-ft.)	340	340	532	-	-	
Formation	Tulare	Etchegoin	b/	Monterey	Monterey	
Geologic age	Pleistocene	Pliocene	Plio-Miocene	Miocene	Miocene	
Average depth (ft.)	400	1,500	1,000	4,000	6,700	
Average net thickness (ft.)	400	50	500	1,000	346	
Maximum productive area (acres)	-	-	-	-	-	
RESERVOIR ROCK PROPERTIES						
Porosity (%)	35	30	50	41	-	
S_{oi} (%)	77	-	45	20	-	
S_{wi} (%)	20	-	55	70	-	
S_{gi} (%)	3	-	0	10	-	
Permeability to air (md)	3,070.0	100.0	1.5	19.0-29.0	-	
RESERVOIR FLUID PROPERTIES						
Oil:						
Oil gravity (°API)	11-14	13	25-30	26-32	37	
Sulfur content (% by wt.)	0.23	-	-	-	-	
Initial solution GOR (SCF/STB)	35	35	366	3,500	20	
Initial oil FVF (RB/STB)	1.02	1.00	1.20	-	-	
Bubble point press. (psia)	350**	100**	958	-	-	
Viscosity (cp) @ °F	5,500 @ 70	5,500 @ 70	-		-	
Gas:						
Specific gravity (air = 1.0)	0.600	0.700	0.876	-	-	
Heating value (Btu/cu. ft.)	1,090	1,250	1,033	-	-	
Water:						
Salinity, NaCl (ppm)	10,700	24,800	26,000	31,000	-	
T.D.S. (ppm)	13,900	25,600	38,900	-	-	
R_w (ohm/m) (77°F)	0.73	0.23	0.28	-	-	
ENHANCED RECOVERY PROJECTS						

	ENHANCED RECOVERY PROJECTS					
Enhanced recovery projects	steamflood		waterflood			
Date started	1963		1969			
Date discontinued	active		1972			
	fireflood		waterflood			
	1956		1982			
	1996		active			
	waterflood		steamflood			
	1982		1969			
	1995		1975			
			steamflood			
			1969			
			1991			
Peak oil production (bbl)						63,562,322
Year						1987
Peak gas production, net (Mcf)						30,750,790
Year						1987

Base of fresh water (ft.): None

Remarks: a/ Initial Tulare and Diatomite zone production was commingled.
b/ Etchegoin-Reef Ridge-Upper Monterey.

Selected References:

Barger, R.M., 1958, South Belridge Thermal Recovery Experiment: Calif. Div. of Oil and Gas, Summary of Operations -- Vol. 44, No. 2.
Gates, C.F., and H.J. Ramey, Jr., 1985, Field Results of South Belridge Thermal Recovery Experiment: Journal of Petroleum Tech., p. 236-244, Oct. 1985.
Gates, C.F., K.D. Jung & R.A. Surface, 1978, In-Situ Combustion in the Tulare Formation, South Belridge Field, Kern County, California: Journal of Petroleum Technology, p. 798-806, May 1978.
McCabe, R.E., 1924, The Minor Oil Fields of Kern County; Calif. State Mining Bureau, Summary of Operations -- Calif. Oil Fields, Vol. 10, No. 1.
Ritzius, D.E., 1950, South Belridge Oil Field: Calif. Div. of Oil and Gas, Summary of Operations -- Calif. Oil Fields, Vol. 35, No. 1.

DATE: November 1997 **Estimated value

COUNTY: KERN

BELRIDGE, SOUTH, OIL FIELD

DISCOVERY WELL AND DEEPEST WELL

	Present operator and well designation	Original operator and well designation	Sec. T. & R.	B.&M.	Total depth (feet)	Pool (zone)	Strata & age at total depth
Discovery well							
Deepest well							

POOL DATA

ITEM	DEVILWATER-GOULD c/					FIELD OR AREA DATA
Discovery date	July 1980					
Initial production rates						
Oil (bbl/day)	130					
Gas (Mcf/day)						
Flow pressure (psi)	-					
Bean size (in.)						
Initial reservoir pressure (psi)	4,750					
Reservoir temperature (°F)	240					
Initial oil content (STB/ac.-ft.)	565					
Initial gas content (MSCF/ac.-ft.)	1,200**					
Formation	Monterey					
Geologic age	Miocene					
Average depth (ft.)	8,200					
Average net thickness (ft.)	300					
Maximum productive area (acres)	10					9,420
RESERVOIR ROCK PROPERTIES						
Porosity (%)	24					
S_{oi} (%)	50					
S_{wi} (%)	50					
S_{gi} (%)	-					
Permeability to air (md)	110**					
RESERVOIR FLUID PROPERTIES						
Oil:						
Oil gravity (°API)	37					
Sulfur content (% by wt.)	-					
Initial solution GOR (SCF/STB)	2,000					
Initial oil FVF (RB/STB)	1.65					
Bubble point press. (psia)	4,750					
Viscosity (cp) @ °F	0.3 @ 240					
Gas:						
Specific gravity (air = 1.0)	0.7					
Heating value (Btu/cu. ft.)	1,250					
Water:						
Salinity, NaCl (ppm)	40,000					
T.D.S. (ppm)	40,000					
R_w (ohm/m) (77°F)	0.16					
ENHANCED RECOVERY PROJECTS						

	ENHANCED RECOVERY PROJECTS					
Enhanced recovery projects..... Date started..... Date discontinued						
Peak oil production (bbl) Year ..... Peak gas production, net (Mcf) Year						

Base of fresh water (ft.):

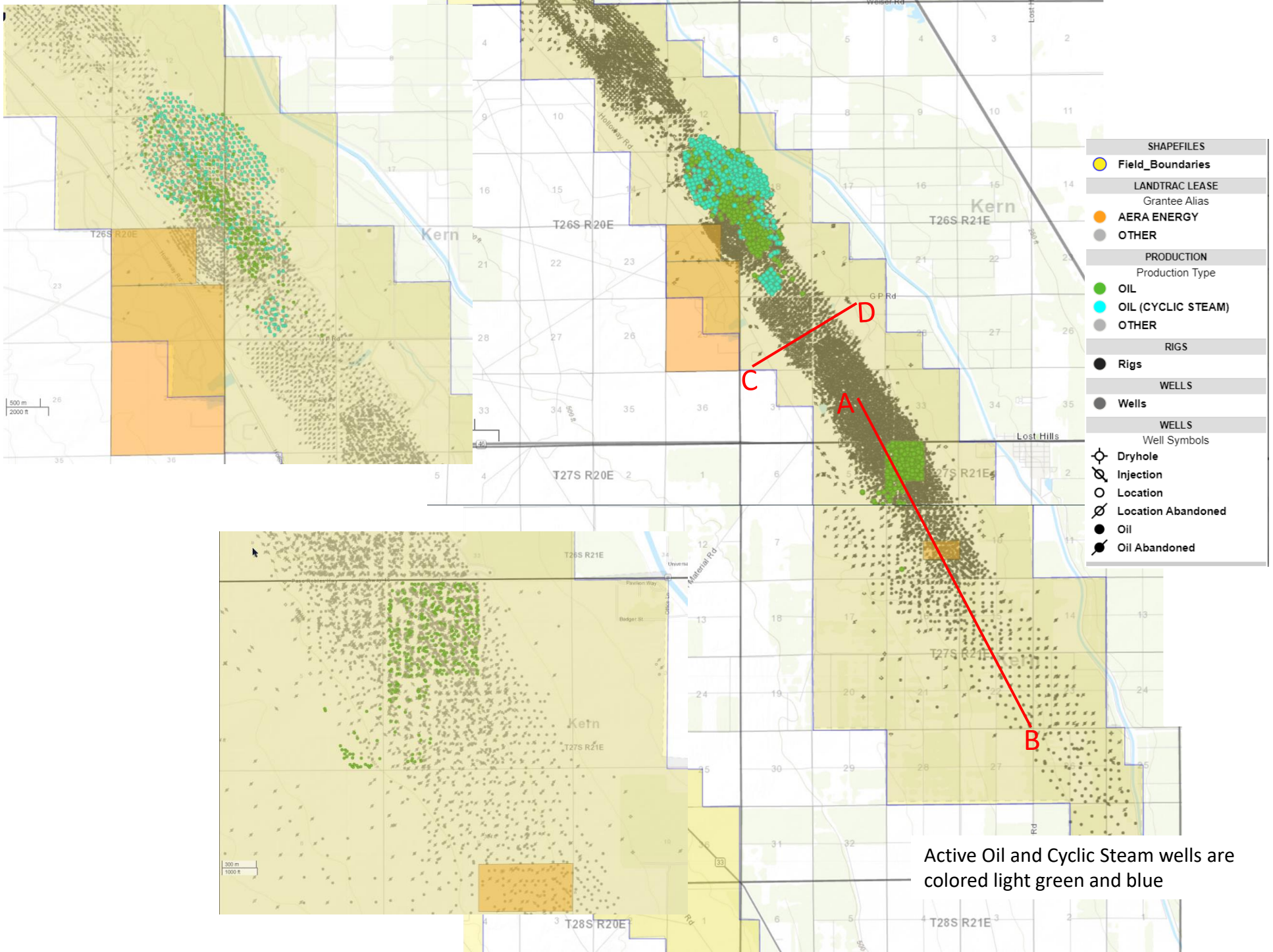
Remarks: c/ Devilwater-Gould zone produced from one well for nine months.

Selected References:

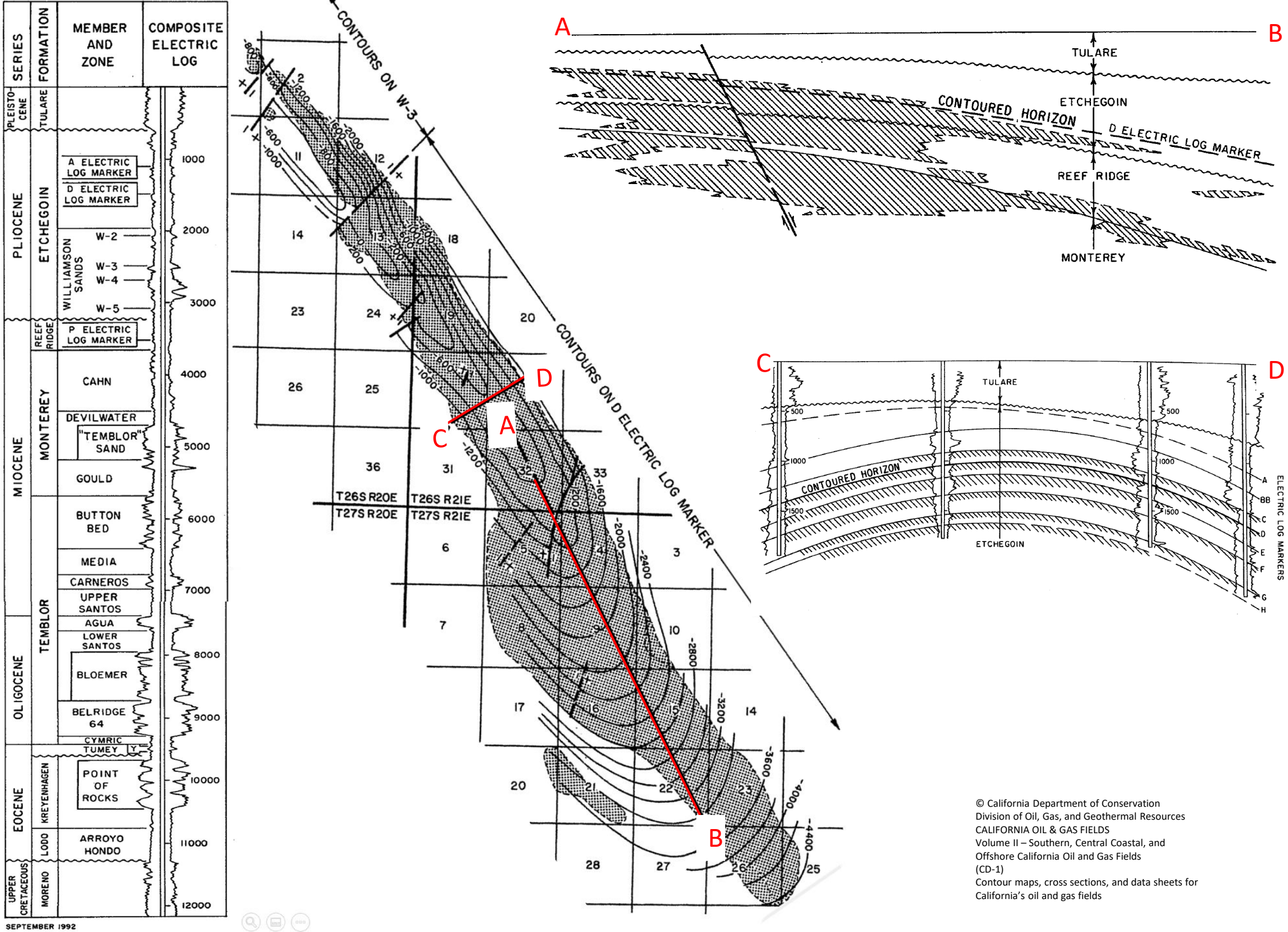
DATE: October 1991 **Estimated value

Field Index

Lost Hills



Active Oil and Cyclic Steam wells are colored light green and blue



SEPTEMBER 1992

COUNTY: KERN

LOST HILLS OIL FIELD
Sheet 1 of 2

DISCOVERY WELL AND DEEPEST WELL

	Present operator and well designation	Original operator and well designation	Sec. T. & R.	B.&M.	Total Depth (feet)	Pool (zone)	Strata & age at total depth
Discovery well	Chevron U.S.A. Inc. No. 1	Martin and Dudley No. 1	30 26S 21E	MD	530	Etchegoin	
Deepest well	Mobil Oil Corp. "Williamson" 33-11	General Petroleum Corp. "Williamson" 33-11	11 26S 20E	MD	11,553		Moreno Late Cretaceous

POOL DATA

ITEM	TULARE	ETCHEGOIN	REEF RIDGE c/	CAHN d/	DEVILWATER	FIELD OR AREA DATA
Discovery date	December 1915	July 1910	-	August 1913	March 8, 1983	
Initial production rates						
Oil (bbl/day)	60 a/	176	-	60	560	
Gas (Mcf/day)	-	-	-	-	1,973	
Flow pressure (psi)	-	-	-	-	2,475	
Bean size (in.)					12/64	
Initial reservoir pressure (psi)	70	50-850	-	3,000	2,510	
Reservoir temperature (^{0}F)	75-82	90-110	110-130	115-200	54	
Initial oil content (STB/ac.-ft.)	1,300-2,400**	660-1,900**	300-1,020	780-1,660	-	
Initial gas content (MSCF/ac.-ft.)	-	-	-	882-1,494	0	
Formation	Tulare	Etchegoin	Reef Ridge	Monterey	Monterey	
Geologic age	Pleistocene	Pliocene	Miocene	Miocene	Miocene	
Average depth (ft.)	200	1,000	1,550	3,200-3,900	4,200	
Average net thickness (ft.)	100-450	300	150	1,500	330	
Maximum productive area (acres)					5	
RESERVOIR ROCK PROPERTIES						
Porosity (%)	35-45	25-45	40-55	20-45	23.9-39.6	
So_i (%)	50-70	35-55	10-75	30-50	1.3-16.9	
Sw_i (%)	30-50	45-65	25-90	50-70	37.2-85.1	
Sg_i (%)						
Permeability to air (md)	1,500-2,000	100-1,200	1-30	1-10	2.3-1,590.0	
RESERVOIR FLUID PROPERTIES						
Oil:						
Oil gravity (^{0}API)	12-18	11-40	20-38	20-40	32	
Sulfur content (% by wt.)	0.70	0.33	-	-	-	
Initial solution GOR (SCF/STB)	-	-	-	900	-	
Initial oil FVF (RB/STB)	1.01	1.03	1.05	1.50	-	
Bubble point press. (psia)	-	-	-	2,900	-	
Viscosity (cp) @ ^{0}F	1,200.0 @ 82	96.0 @ 90	85.0 @ 100	1.4 @ 178	-	
Gas:						
Specific gravity (air = 1.0)	-	-	-	0.722-0.801	-	
Heating value (Btu/cu. ft.)	-	-	-	1,136	-	
Water:						
Salinity, NaCl (ppm)	-	10,000-24,000	-	27,000	10,110	
T.D.S. (ppm)	15,500	33,100-38,000	34,600	34,000	17,480	
R_w (ohm/m) (77^{0}F)	0.36	0.22	0.20	0.20	.04	

ENHANCED RECOVERY PROJECTS

Enhanced recovery projects	steamflood	steamflood	waterflood	waterflood		
Date started	1968	1976	1995	1946		
Date discontinued	active	active	active	1990 e/		
	fireflood	cyclic steam		fireflood		
	1962	1964		1996 e/		
	1996	active		active		
	cyclic steam	waterflood		waterflood and		
	1964	1952, 1981, 1988,		steamflood e/		
	active	1990		1995		
	waterflood	waterflood b/				
	1986	1988				
	1991	active				
		steamflood b/				
		1989				
		1993				
Peak oil production (bbl)		9,275,798		3,362,316	57,024	
Year		1995		1982	1984	
Peak gas production, net (Mcf)		12,723,364		20,573,632	60,508	
Year		1995		1982	1988	

Base of fresh water (ft.): None

Abnormally high pressure and temperature salt water frequently is encountered in the Temblor Formation.

Remarks:

a/ Initial Tulare production commingled with Etchegoin.

b/ Combined Tulare-Echegoin production and injection.

c/ The Reef Ridge zone is locally commingled with either Etchegoin or Cahn. Production is primarily from artificially fractured diatomite. There may be initial free-gas saturation in some portions of the pool.

Selected References:

d/ The Cahn zone is a fractured cherty shale reservoir. Some of the early Cahn wells included diatomite production. The Cahn zone is also referred to as the Fractured Chert and Antelope Shale.

e/ Diatomite.

DATE: November 1997 ** Estimated value

DEPARTMENT OF CONSERVATION / DIVISION OF OIL, GAS, AND GEOTHERMAL RESOURCES

COUNTY: KERN

LOST HILLS OIL FIELD
Sheet 2 of 2

DISCOVERY WELL AND DEEPEST WELL

	Present operator and well designation	Original operator and well designation	Sec. T. & R.	B.&M.	Total Depth (feet)	Pool (zone)	Strata & age at total depth
Discovery well							
Deepest well							

POOL DATA

ITEM	CARNEROS a/					FIELD OR AREA DATA
Discovery date	June 1953					
Initial production rates						
Oil (bbl/day)	53					
Gas (Mcf/day)	32					
Flow pressure (psi)	1,700					
Bean size (in.)						
Initial reservoir pressure (psi)	4,960					
Reservoir temperature (^{0}F)	156					
Initial oil content (STB/ac.-ft.)	1,150**					
Initial gas content (MSCF/ac.-ft.)	1,600**					
Formation	Temblor					
Geologic age	Miocene					
Average depth (ft.)	6,020					
Average net thickness (ft.)	50					
Maximum productive area (acres)						6,785

RESERVOIR ROCK PROPERTIES

Porosity (%)	13-22					
So_i (%)	-					
Sw_i (%)	35**					
Sg_i (%)						
Permeability to air (md)	0.2-17					

RESERVOIR FLUID PROPERTIES

Oil:						
Oil gravity (^{0}API)	32					
Sulfur content (% by wt.)	-					
Initial solution GOR (SCF/STB)	272					
Initial oil FVF (RB/STB)	1.25**					
Bubble point press. (psia)	1,250**					
Viscosity (cp) @ ^{0}F	-					
Gas:						
Specific gravity (air = 1.0)	0.84**					
Heating value (Btu/cu. ft.)	-					
Water:						
Salinity, NaCl (ppm)	-					
T.D.S. (ppm)	-					
R_w (ohm/m) (77^{0}F)	-					

ENHANCED RECOVERY PROJECTS

ENHANCED RECOVERY PROJECTS

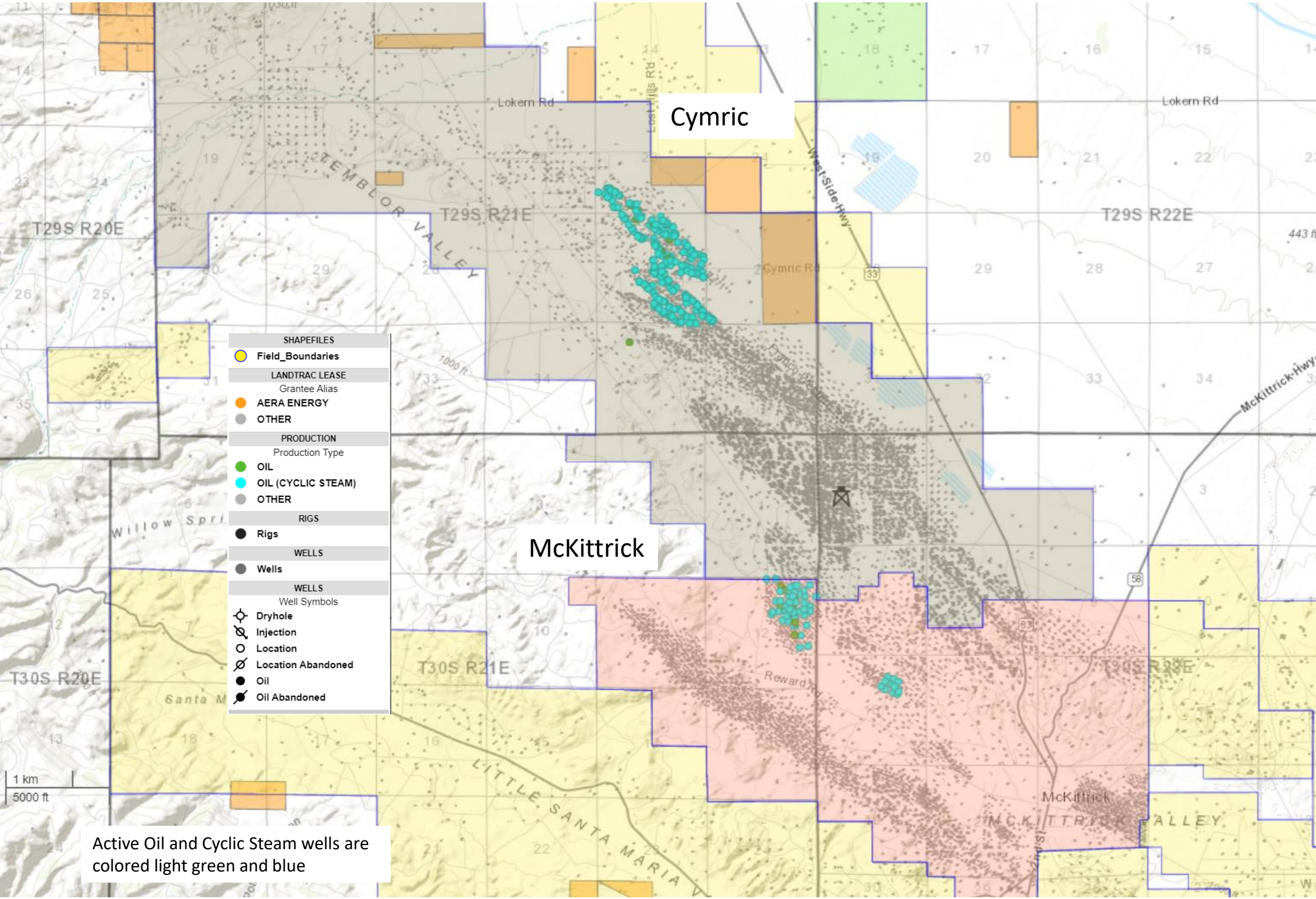
Enhanced recovery projects						
Date started						
Date discontinued						
Peak oil production (bbl)	1,543					11,994,475
Year	1953					1996
Peak gas production, net (Mcf)						25,143,895
Year						1995

Base of fresh water (ft.):

Remarks: a/ One well pool, abandoned in 1966.

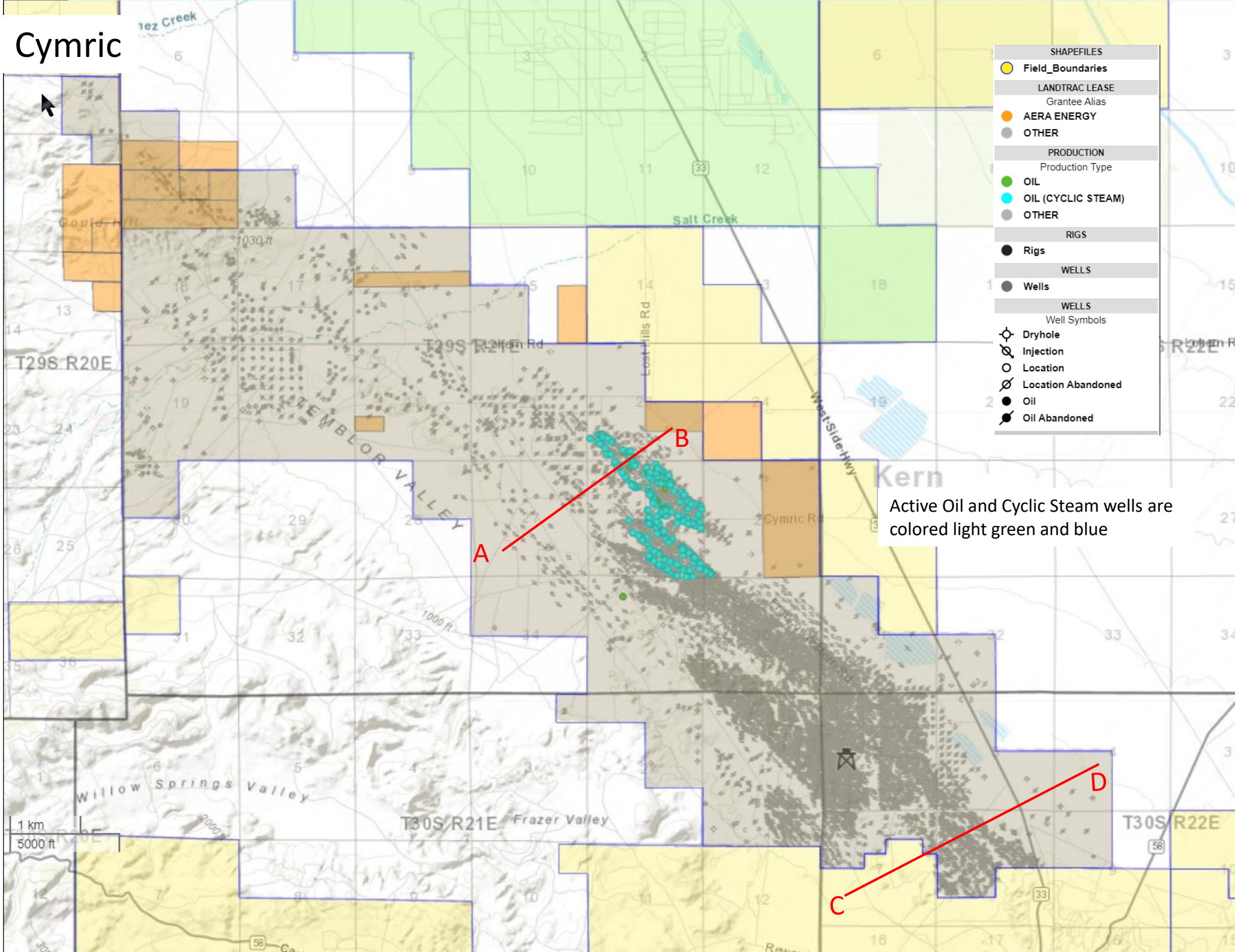
Selected References:

DATE: November 1997 **Estimated value



Active Oil and Cyclic Steam wells are colored light green and blue

Cymric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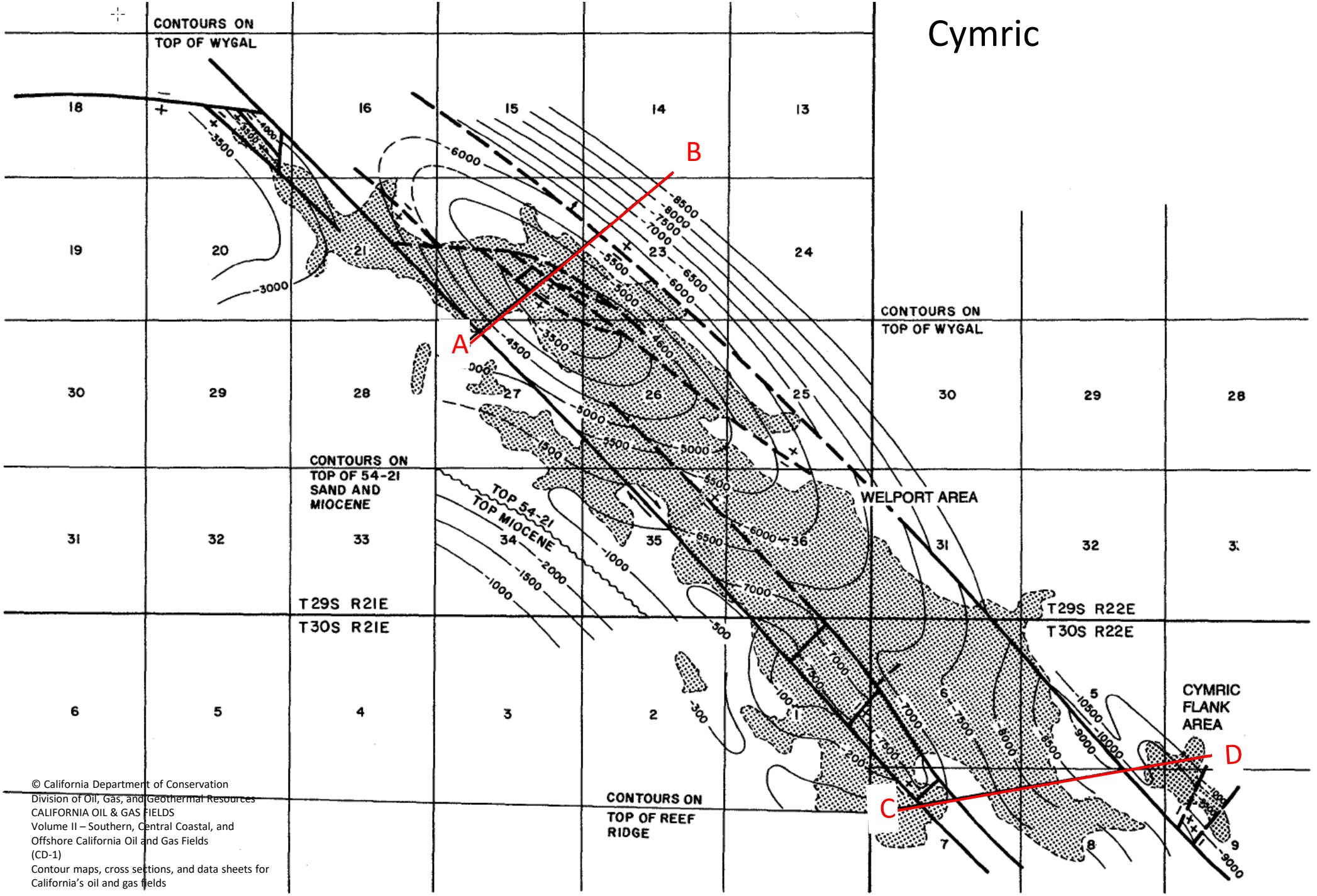
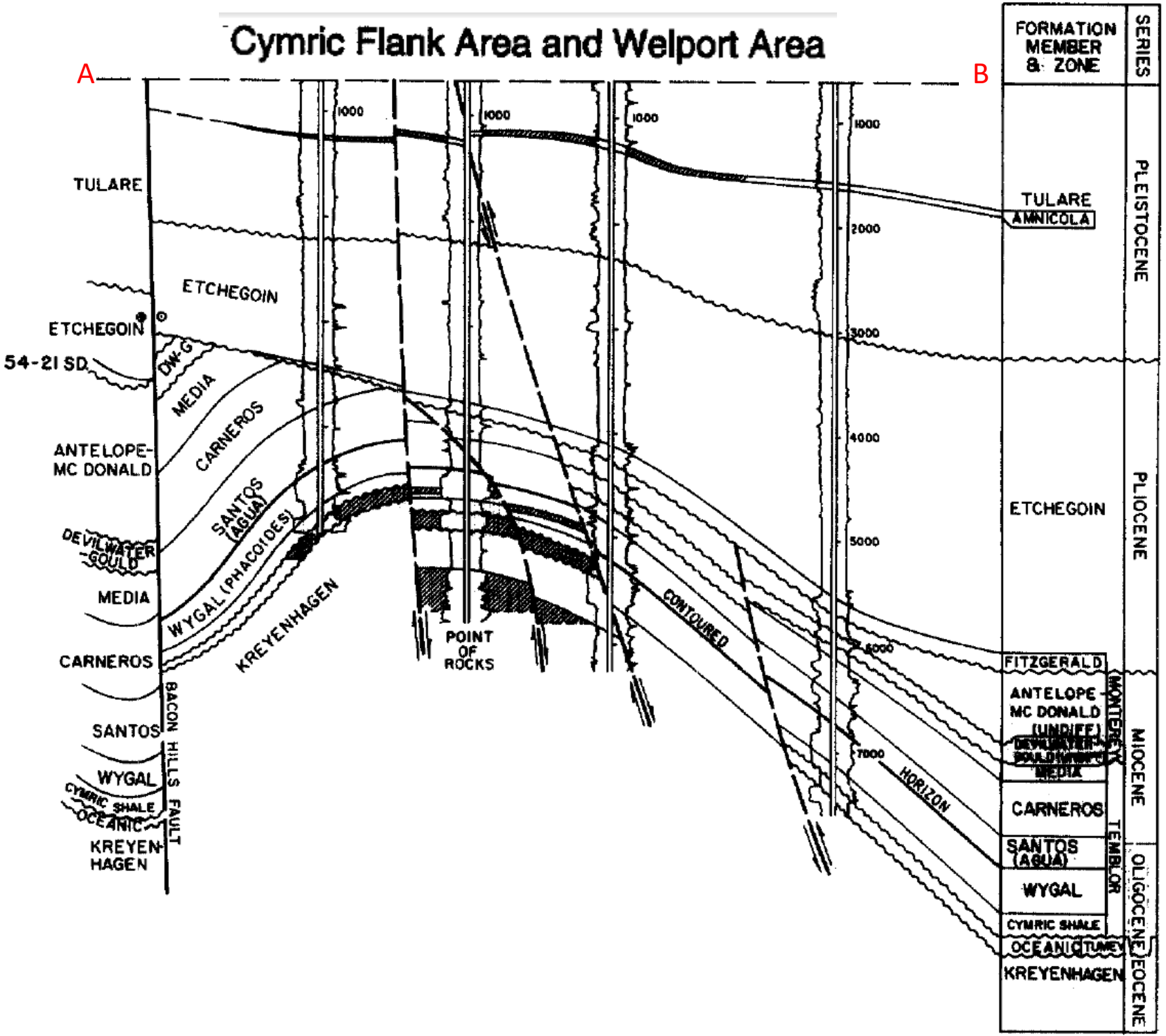
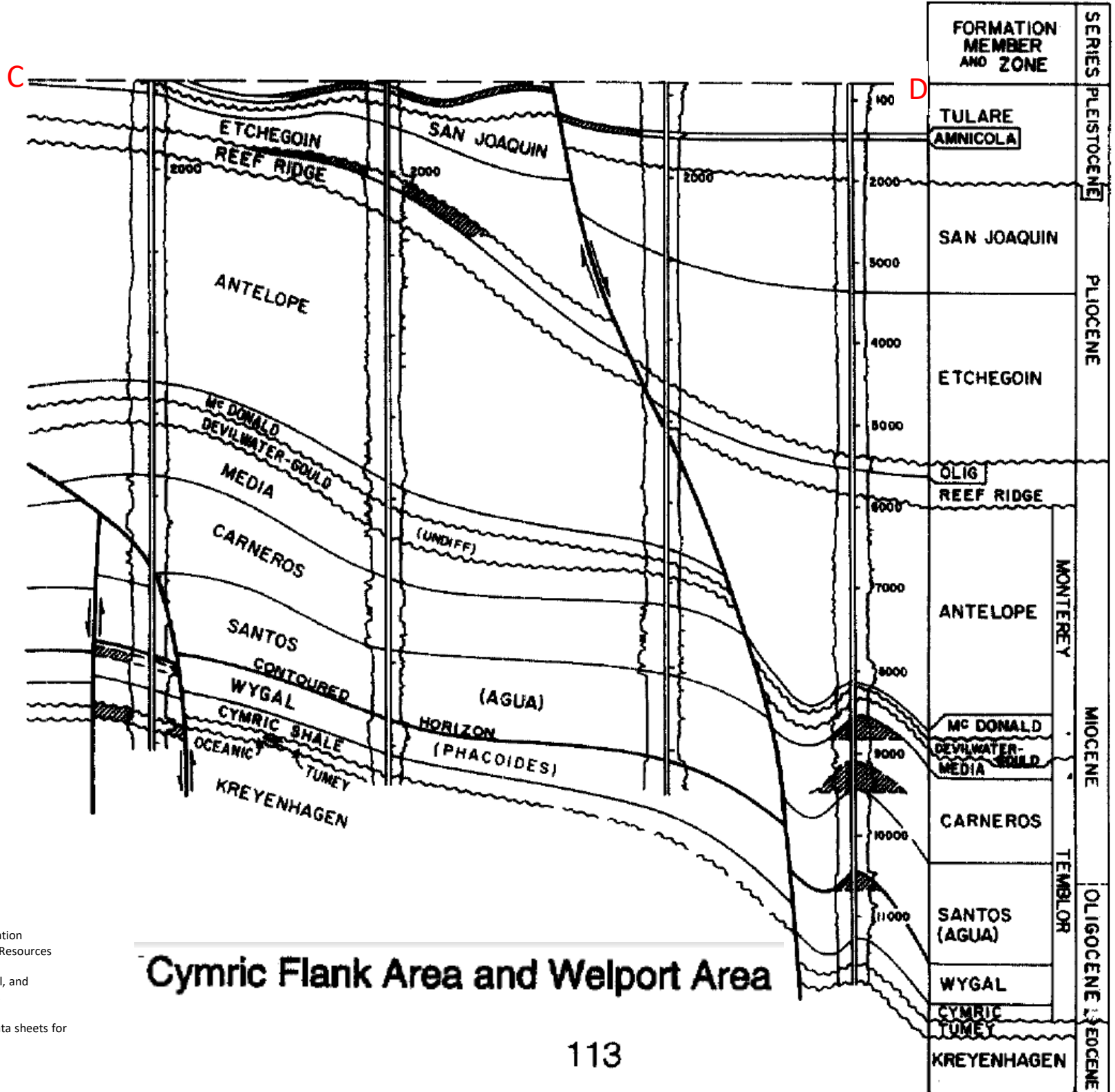
LANDTRAC LEASE
Grantee Alias
AERA ENERGY
OTHER
PRODUCTION
Production Type
OIL
OIL (CYCLIC STEAM)
OTHER
RIGS
Rigs
WELLS
Wells
WELLS
Well Symbols
Dryhole
Injection
Location
Location Abandoned
Oil
Oil Abandoned
Active Oil and Cyclic Steam wells are colored light green and blue
A
B
C
D
T29S R20E
T29S R21E
T30S R21E
T30S R22E
Salt Creek
Lost Hills Rd
West Side Hwy
Kern
Cymric Rd
Temblor Valley
Willow Springs Valley
Frazer Valley
1 km
5000 ft

Cymric



Cymric Flank Area and Welport Area





Cymric Flank Area and Welport Area

COUNTY: KERN

CYMRIC OIL FIELD
CYMRIC FLANK AREA

DISCOVERY WELL AND DEEPEST WELL

	Present operator and well designation	Original operator and well designation	Sec. T. & R.	B.&M.	Total depth (feet)	Pool (zone)	Strata & age at total depth
Discovery well	Chevron U.S.A. Inc. No. 512	Standard Oil Co. of Calif. No. 512	9 30S 22E	MD	11,847	Carneros	Temblor Miocene
Deepest well	Same as above	"	"	"	"	"	"

POOL DATA

ITEM	CARNEROS	PHACOIDES				FIELD OR AREA DATA
Discovery date	April 1967	August 1967				
Initial production rates						
Oil (bbl/day)	1,188	99[a/]				
Gas (Mcf/day)	1,697	100[a/]				
Flow pressure (psi)	550	125/1,050				
Bean size (in.)	25/64	-				
Initial reservoir pressure (psi)	3,919	4,400**				
Reservoir temperature (°F)	260	307				
Initial oil content (STB/ac.-ft.)	300**	450**				
Initial gas content (MSCF/ac.-ft.)						
Formation	Temblor	Temblor				
Geologic age	Miocene	Oligocene				
Average depth (ft.)	8,600	10,145				
Average net thickness (ft.)	250	50				120
Maximum productive area (acres)						
RESERVOIR ROCK PROPERTIES						
Porosity (%)	26	15**				
So_i (%)	12	65**				
Sw_i (%)	65	35**				
Sg_i (%)	23**	-				
Permeability to air (md)	120	20**				
RESERVOIR FLUID PROPERTIES						
Oil:						
Oil gravity (°API)	34-39	33				
Sulfur content (% by wt.)						
Initial solution GOR (SCF/STB)	1,400	1,017				
Initial oil FVF (RB/STB)	2.5**	1.6**				
Bubble point press. (psia)	10,000**	5,500**				
Viscosity (cp) @ °F						
Gas:						
Specific gravity (air = 1.0)	0.65	0.75**				
Heating value (Btu/cu. ft.)	1,340	-				
Water:						
Salinity, NaCl (ppm)	6,100	10,000				
T.D.S. (ppm)	10,835	-				
R_w (ohm/m) (77°F)	0.64	-				
ENHANCED RECOVERY PROJECTS						

	ENHANCED RECOVERY PROJECTS					
Enhanced recovery projects.....						
Date started.....						
Date discontinued						
Peak oil production (bbl)	580,401	4,072				584,473
Year	1968	1968				1968
Peak gas production, net (Mcf)	3,400,932	5,557				3,406,489
Year	1968	1968				1968

Base of fresh water (ft.): None

Remarks: a/ Rates after fracturing.

Selected References: Hardoin, J.L., 1968, Cymric Flank Area of Cymric Oil Field: Calif. Div. of Oil and Gas, Summary of Operations -- Calif. Oil Fields, Vol. 54, No. 2.
Young, R.J., 1968, West Side Oil Fields, Cymric (Cymric Flank): Pacific Section AAPG, 1968 Guidebook.

DATE: October 1991 ** Estimated value

COUNTY: KERN

CYMRIC OIL FIELD
WELPORT AREA

DISCOVERY WELL AND DEEPEST WELL

	Present operator and well designation	Original operator and well designation	Sec. T. & R.	B.&M.	Total depth (feet)	Pool (zone)	Strata & age at total depth
Discovery well	Nuevo Energy Co. "McKittrick Unit" 2-1A	Nacirema Oil Co. No. 1	6 30S 22E	MD	1,127	Tulare	
Deepest well	Mobil Expl. & Prod. N.A. Inc. "Woody" 1A	The Superior Oil Co. "Cymric Unit" 1	22 29S 21E	MD	12,022		Point of Rocks Eocene

POOL DATA

ITEM	TULARE (AMNICOLA)	SAN JOAQUIN a/	ETCHEGOIN	OLIG (REEF RIDGE)	1ST MCKITTRICK	FIELD OR AREA DATA
Discovery date	November 1909	April 1984	November 1945	December 1917	February 1939	
Initial production rates						
Oil (bbl/day)	50	7	40	50	0 b/	
Gas (Mcf/day)	-	0	-	-	1,750	
Flow pressure (psi)	-	-	on pump	-	250/350	
Bean size (in.)						
Initial reservoir pressure (psi)	300-450	60	1,100**	360	438	
Reservoir temperature (°F)	81-125	147	130	95	101	
Initial oil content (STB/ac.-ft.)	1,250-2,000	-	1,050**	1,535	1,100**	
Initial gas content (MSCF/ac.-ft.)	0-60	-	500**	-	100**	
Formation	Tulare	San Joaquin	Etchegoin	Reef Ridge	Reef Ridge	
Geologic age	Pleistocene	Pliocene	Pliocene	Miocene	Miocene	
Average depth (ft.)	1,000-1,200	670	3,400	2,250	1,100	
Average net thickness (ft.)	50-450	233	80	150	100	
Maximum productive area (acres)	-	-	-	160	-	
RESERVOIR ROCK PROPERTIES						
Porosity (%)	32-37	36-57	25**	31-35	20	
S_{oi} (%)	30-73	6-38	65	67	75	
S_{wi} (%)	27-70	48-84	35	33	25	
S_{gi} (%)						
Permeability to air (md)	200-4,000	213*	200**	700**	50**	
RESERVOIR FLUID PROPERTIES						
Oil:						
Oil gravity (°API)	11.0-15.0	12.2	28.0	12.0-20.0	14.0	
Sulfur content (% by wt.)	1.16	-	-	-	-	
Initial solution GOR (SCF/STB)	1	-	340**	500	110**	
Initial oil FVF (RB/STB)	1.00-1.05	-	1.20**	1.05	1.02**	
Bubble point press. (psia)	-	-	1,600**	-	1,100**	
Viscosity (cp) @ °F	1,800 @ 120	-	-	400 @ 100	-	
Gas:						
Specific gravity (air = 1.0)	0.622	-	0.770**	0.600**	0.600**	
Heating value (Btu/cu. ft.)	940-960	-	-	-	960	
Water:						
Salinity, NaCl (ppm)	1,700-13,000	-	20,400	-	8,600	
T.D.S. (ppm)	4,844-17,000	-	24,573	14,448	12,226	
R_w (ohm/m) (77°F)	0.89-1.90	-	0.31	-	0.59	
ENHANCED RECOVERY PROJECTS						

	ENHANCED RECOVERY PROJECTS					
Enhanced recovery projects **Date started** **Date discontinued**	waterflood 1965 1968 cyclic steam 1963 active steamflood 1968 active air injection 1962 1996		cyclic steam 1974 active			
Peak oil production (bbl) **Year** **Peak gas production, net (Mcf)** **Year**	9,512,952 1992		861,782 1996 456,990 1987	1,322,442c/ 1996 383,242c/ 1989		

Base of fresh water (ft.): None

Remarks:
a/ Initial production was commingled with the lower Tulare and the upper Etchegoin.
b/ First oil production was in 1953, after fracturing the zone.
c/ Includes production from 1st and 2nd McKittrick Pools and underlying Antelope.
Effective 1/1/87, limits of the Welport Area were extended to include all of the former McKittrick Front Area and the former 1-Y Area, and a portion of the Sheep Springs Area.

Selected References:

Arndt, J.F., 1968, Cymric Field, Cymric Flank and McKittrick Front Areas: Pacific Section AAPG Guidebook.
Peirce, G.G., 1947, Cymric Oil Field: Calif. Div. of Oil and Gas, Summary of Operations -- Calif. Oil Fields, Vol. 33, No. 2.
Weddle, J.R., 1966, Carneros, Phacoides and Oceanic Pools, McKittrick Front Area of Cymric Oil Field: Calif. Div. of Oil and Gas, Summary of Operations -- Calif. Oil Fields, Vol. 52, No. 2.

COUNTY: KERN

CYMRIC OIL FIELD
WELPORT AREA

DISCOVERY WELL AND DEEPEST WELL

	Present operator and well designation	Original operator and well designation	Sec. T. & R.	B.&M.	Total depth (feet)	Pool (zone)	Strata & age at total depth
Discovery well							
Deepest well							

POOL DATA

ITEM	2ND MCKITTRICK	MCDONALD-DEVILWATER	CARNEROS	AGUA (SANTOS)	PHACOIDES	FIELD OR AREA DATA
Discovery date	April 1953	June 1986	July 1945	January 1956	November 1946	
Initial production rates						
Oil (bbl/day)	0 a/	245 b/	883	290	312	
Gas (Mcf/day)	700	78	685	60	65	
Flow pressure (psi)	-	-	430/800	360/950	535/pkr	
Bean size (in.)	32/64	-	32/64	14/64	13/64	
Initial reservoir pressure (psi)	490**	-	1,850-2,450**	1,600**	1,900**	
Reservoir temperature (°F)	110	125	132-136	119	144-235	
Initial oil content (STB/ac.-ft.)	1,200**	-	400-1,000**	1,150**	650-900**	
Initial gas content (MSCF/ac.-ft.)	150**	-	700**	500**	700**	
Formation	Reef Ridge	Monterey	Temblor	Temblor	Temblor	
Geologic age	Miocene	Miocene	Miocene	Oligocene	Oligocene	
Average depth (ft.)	1,230	4,050	4,150-5,560	3,400	4,300-7,870	
Average net thickness (ft.)	210	550 c/	65-100	85	175-300	
Maximum productive area (acres)	-	5	-	-	-	
RESERVOIR ROCK PROPERTIES						
Porosity (%)	20**	23.3 d/	20-29**	29**	18-21**	
S_{oi} (%)	75**	0.7-30.3(12.7 d/)	31-56**	65**	35-70**	
S_{wi} (%)	25**	63.4-94.2(75.9 d/)	42-44**	35**	28-30**	
S_{gi} (%)	-	2.7-29.4(20.3 d/)	27**	-	37**	
Permeability to air (md)	50**	0.02-1.70(0.67 d/)	115-800**	800**	60-210**	
RESERVOIR FLUID PROPERTIES						
Oil:						
Oil gravity (°API)	14.0	27.3	31.0-33.0	31.0	33.0	
Sulfur content (% by wt.)						
Initial solution GOR (SCF/STB)	123**	-	240	340**	430-1,500**	
Initial oil FVF (RB/STB)	1.02**	-	1.18**	1.20**	1.25-1.50**	
Bubble point press. (psia)	1,200**	-	1,100**	1,300**	1,600-4,400**	
Viscosity (cp) @ °F	-	-	-	-	0.3 @ 235	
Gas:						
Specific gravity (air = 1.0)	0.60**	0.89	0.75-0.84**	0.83**	0.80-0.86**	
Heating value (Btu/cu. ft.)	960	-	1,300	-	1,300	
Water:						
Salinity, NaCl (ppm)	8,600	-	21,400-21,900	21,400	12,000-15,200	
T.D.S. (ppm)	12,226	-	25,176-25,967	23,334	14,232-17,228	
R_w (ohm/m) (77°F)	0.59	-	0.26-0.27	0.28	0.37-0.45	
ENHANCED RECOVERY PROJECTS						

	ENHANCED RECOVERY PROJECTS					
Enhanced recovery projects						
Date started						
Date discontinued						
Peak oil production (bbl)		95,968		100,341		
Year		1995		1956		
Peak gas production, net (Mcf)		100,874		99,305		
Year		1994		1956		

Base of fresh water (ft.): None

Remarks:
a/ First oil production was in 1953, after fracturing the zone.
b/ Initial production from a deeper set of perforations in the Devilwater was 100% water.
c/ Net open perforations in both zones.
d/ Average value for deeper Devilwater interval only. No data available on upper Devilwater or McDonald.
Mercury is associated with production from Phacoides, Oceanic, and Point of Rocks sands, in isolated fault blocks.
In some wells, production from the Etchegoin is commingled with production from the underlying Antelope.
Chevron U.S.A. Inc. "McPhee" 2, Sec. 36, T.29S., R.21E., produced minor amounts of oil from the Antelope Shale.
The discovery date was September 1918.

Selected References:

DATE: November 1997 **Estimated value

COUNTY: KERN

CYMRIC OIL FIELD
WELPORT AREA

DISCOVERY WELL AND DEEPEST WELL

	Present operator and well designation	Original operator and well designation	Sec. T. & R.	B.&M.	Total depth (feet)	Pool (zone)	Strata & age at total depth
Discovery well							
Deepest well							

POOL DATA

ITEM	OCEANIC	POINT OF ROCKS				FIELD OR AREA DATA
Discovery date	October 1945	March 1946				
Initial production rates						
Oil (bbl/day)	956	60				
Gas (Mcf/day)	500	4,000				
Flow pressure (psi)	780-1,080	2,300/pkr				
Bean size (in.)	20/64	-				
Initial reservoir pressure (psi)	2,700-3,389	2,900				
Reservoir temperature (°F)	146-209	174				
Initial oil content (STB/ac.-ft.)	550-950**	750**				
Initial gas content (MSCF/ac.-ft.)	1,000**	700**				
Formation	Tumey	Kreyenhagen				
Geologic age	Eocene	Eocene				
Average depth (ft.)	4,900-8,570	5,400				
Average net thickness (ft.)	140-150	300				
Maximum productive area (acres)						4,715
RESERVOIR ROCK PROPERTIES						
Porosity (%)	13-27	20**				
S_{oi} (%)	42-60**	65**				
S_{wi} (%)	20-40**	35**				
S_{gi} (%)	38**	-				
Permeability to air (md)	11-250**	40**				
RESERVOIR FLUID PROPERTIES						
Oil:						
Oil gravity (°API)	31-52	48				
Sulfur content (% by wt.)	0.23-0.40	-				
Initial solution GOR (SCF/STB)	2,100-3,800	-				
Initial oil FVF (RB/STB)	1.3	1.3**				
Bubble point press. (psia)	1,500**	1,200**				
Viscosity (cp) @ °F	28 @ 225	-				
Gas:						
Specific gravity (air = 1.0)	0.669-0.920**	1.110**				
Heating value (Btu/cu. ft.)	1,157-1,280	-				
Water:						
Salinity, NaCl (ppm)	10,300-19,000	21,400**				
T.D.S. (ppm)	13,668-19,686	21,400				
R_w (ohm/m) (77°F)	0.32-0.49	0.33				
ENHANCED RECOVERY PROJECTS						

	ENHANCED RECOVERY PROJECTS					
Enhanced recovery projects **Date started** **Date discontinued**						
Peak oil production (bbl) **Year** **Peak gas production, net (Mcf)** **Year**		165,800 1946 5,856,705 1946				11,403,834 1996

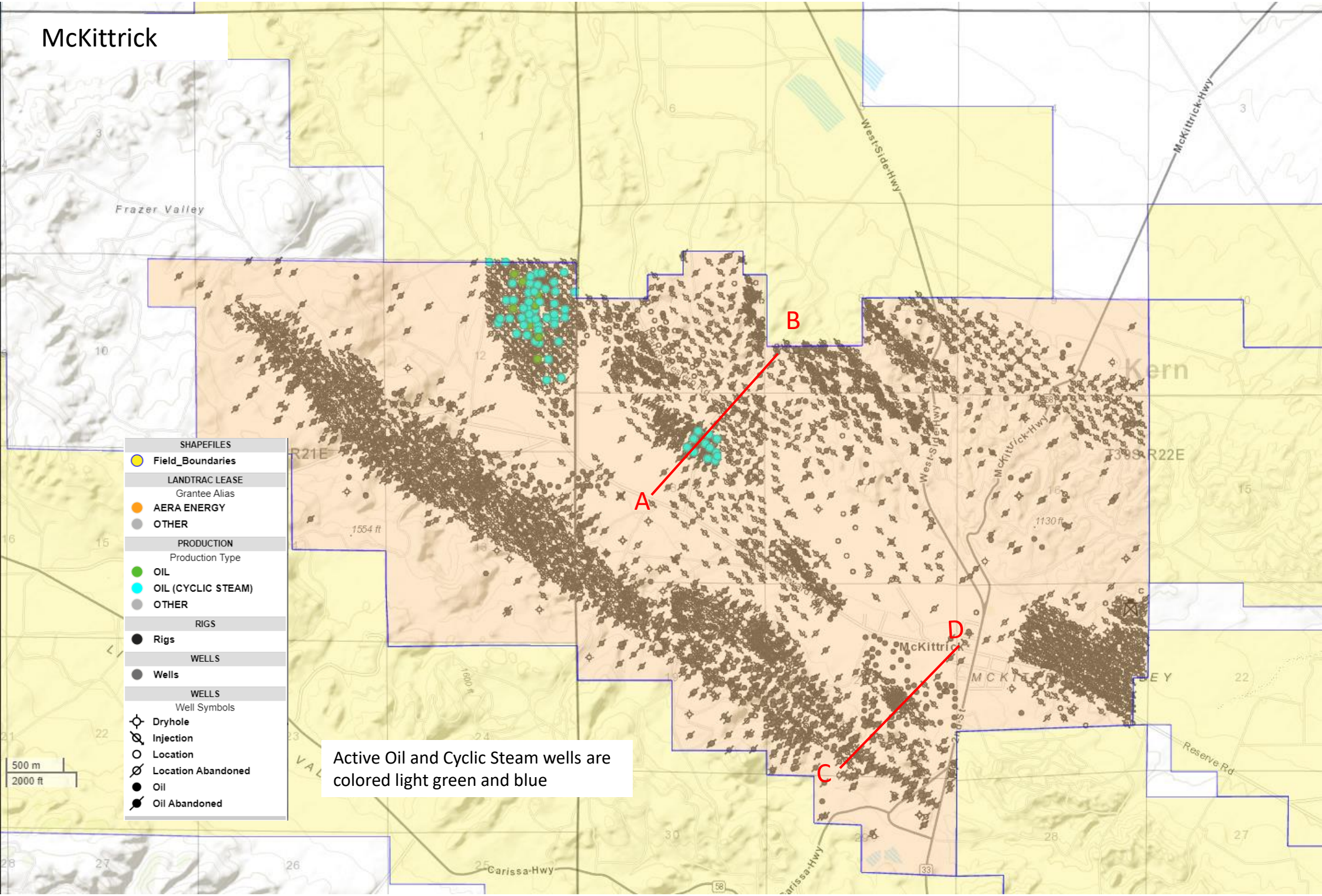
Base of fresh water (ft.):

Remarks:

Selected References:

DATE: November 1997 **Estimated value

Field Index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Field_Boundaries
LANDTRAC LEASE
Grantee Alias
AERA ENERGY
OTHER
PRODUCTION
Production Type
OIL
OIL (CYCLIC STEAM)
OTHER
RIGS
Rigs
WELLS
Wells
WELLS
Well Symbols
Dryhole
Injection
Location
Location Abandoned
Oil
Oil Abandoned
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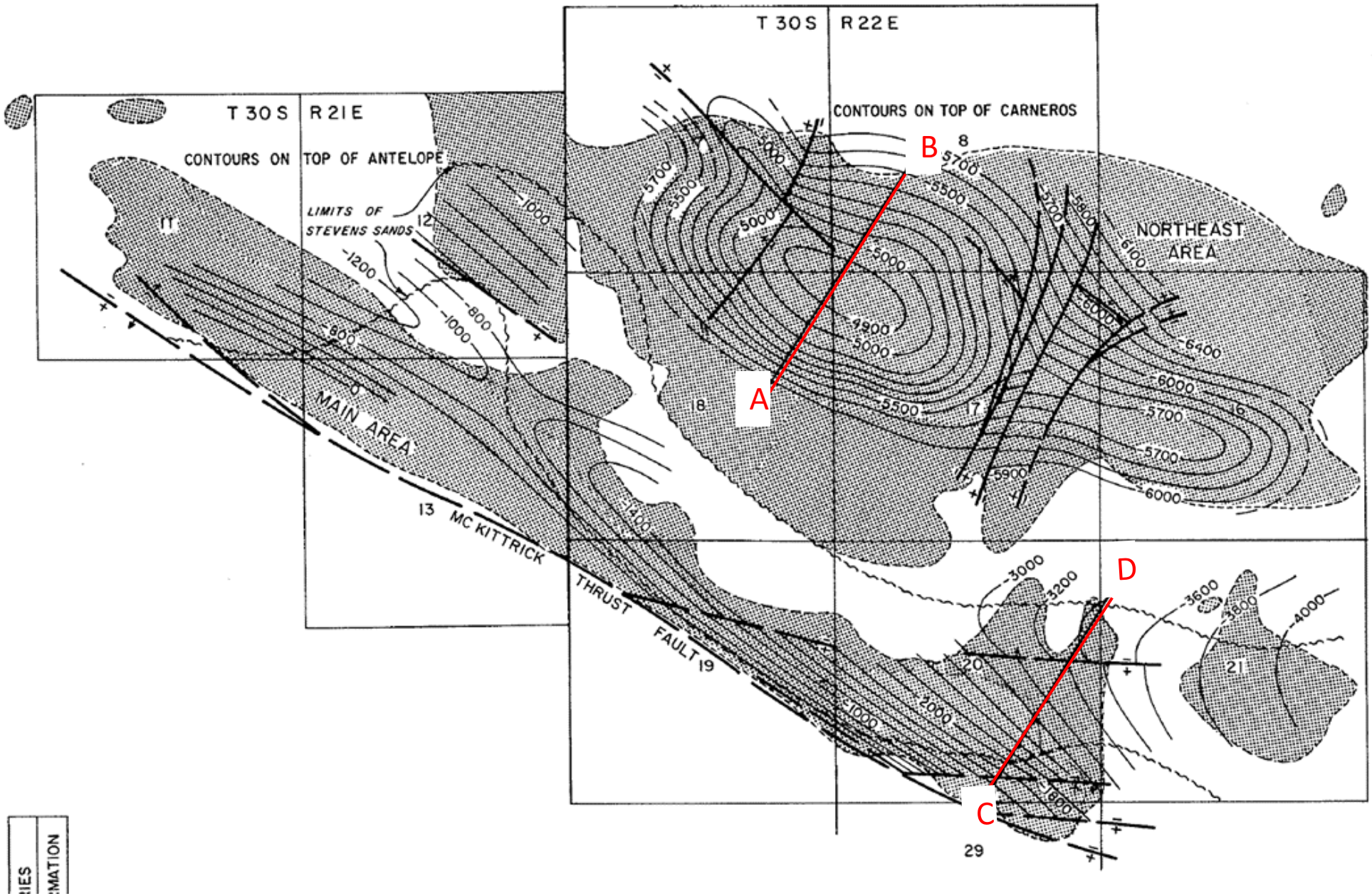
2000 ft
A
B
C
D
Active Oil and Cyclic Steam wells are colored light green and blue
Frazer Valley
West Side Hwy
McKittrick-Hwy
Kern
R21E
T30S R22E
McKittrick
Reserve Rd
Carissa Hwy
1554 ft
1130 ft
1600 ft


T 30 S R 21 E
CONTOURS ON TOP OF ANTELOPE
LIMITS OF STEVENS SANDS
MAIN AREA
MC KITTRICK THRUST FAULT
T 30 S R 22 E
CONTOURS ON TOP OF CARNEROS
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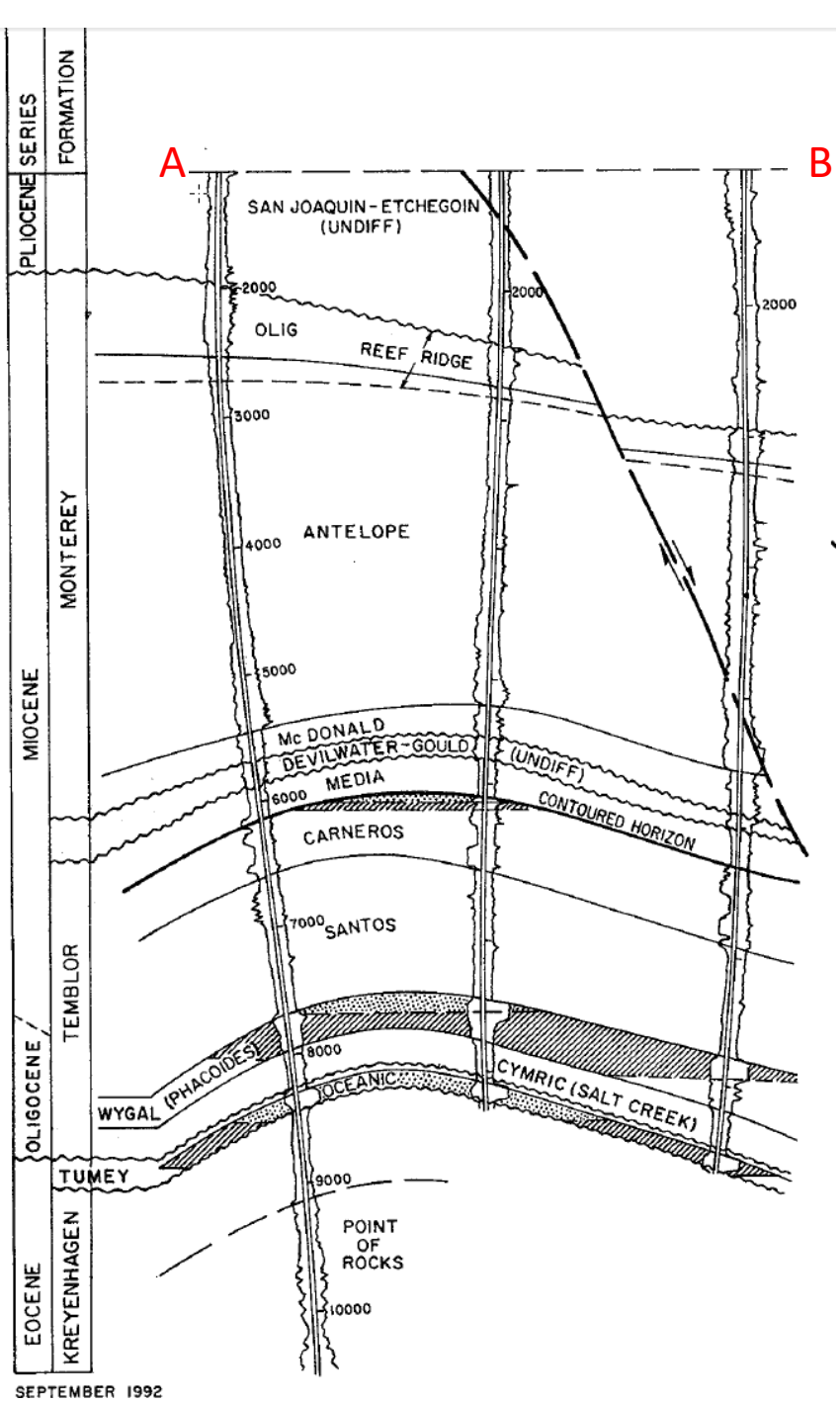
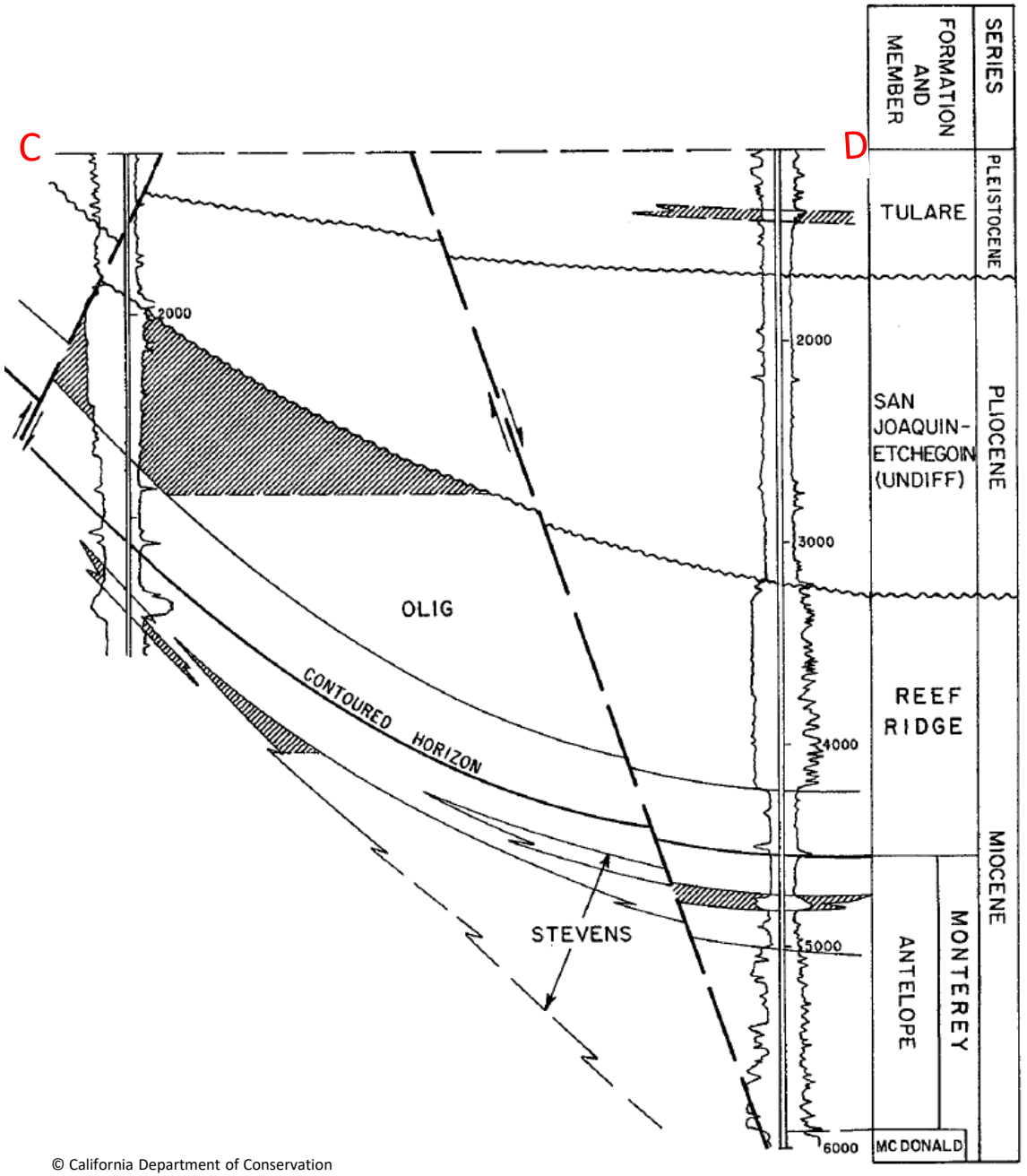




SEPTEMBER 1992

COUNTY: KERN

MCKITTRICK OIL FIELD

(SEE AREAS FOR ADDITIONAL INFORMATION)

DISCOVERY WELL AND DEEPEST WELL

	Present operator and well designation	Original operator and well designation	Sec. T. & R.	B.&M.	Total depth (feet)	Pool (zone)	Strata & age at total depth
Discovery well	Unknown a/					Tulare	
Deepest well	Chevron U.S.A. Inc. "Jacobson" 572R	Standard Oil Co. of Calif. "Jacobson" 572	18 30S 22E	MD	10,864		Kreyenhagen Eocene

POOL DATA

ITEM	TULARE-SAN JOAQUIN					FIELD OR AREA DATA
Discovery date	Unknown					
Initial production rates						
Oil (bbl/day)						
Gas (Mcf/day)						
Flow pressure (psi)						
Bean size (in.)						
Initial reservoir pressure (psi)	300-600					
Reservoir temperature (°F)	97-100					
Initial oil content (STB/ac.-ft.)	2,000					
Initial gas content (MSCF/ac.-ft.)	b/					
Formation	c/					
Geologic age	500-1,000					
Average depth (ft.)	300-500					
Average net thickness (ft.)	300					
Maximum productive area (acres)						3,970
RESERVOIR ROCK PROPERTIES						
Porosity (%)	25-35					
S_{oi} (%)	60-80					
S_{wi} (%)	20-40					
S_{gi} (%)	10-2,500					
Permeability to air (md)						
RESERVOIR FLUID PROPERTIES						
Oil:						
Oil gravity (°API)	12-19					
Sulfur content (% by wt.)	0.96					
Initial solution GOR (SCF/STB)	1.01					
Initial oil FVF (RB/STB)						
Bubble point press. (psia)	4,000-5,000 @ 100					
Viscosity (cp) @ °F						
Gas:						
Specific gravity (air = 1.0)	0.65					
Heating value (Btu/cu. ft.)	900					
Water:						
Salinity, NaCl (ppm)	1,500-10,000					
T.D.S. (ppm)	2,000-13,000					
R_w (ohm/m) (77°F)	0.53-3.3					
ENHANCED RECOVERY PROJECTS						

	ENHANCED RECOVERY PROJECTS					
Enhanced recovery projects	cyclic steam					
Date started	1962					
Date discontinued	active					
	steamflood					
	(Amnicola)					
	1977					
	active					
	waterflood					
	1986					
	active					
Peak oil production (bbl)						11,425,935
Year						1966
Peak gas production, net (Mcf)						20,758,150
Year						1967

Base of fresh water (ft.): None

Remarks:

a/ In the early 1860s, pits and test holes were dug into bituminous outcrops from which aspaltum was bailed. Beginning in 1867, several shallow low-volume oil wells were drilled. Circa 1896, Klondike Oil Co. brought in the "Shamrock" well, a 1,300 barrels-of-oil-per-day gusher.

b/ Tulare-San Joaquin

c/ Pleistocene-Pliocene

Selected References:

COUNTY: KERN

MCKITTRICK OIL FIELD
MAIN AREA

DISCOVERY WELL AND DEEPEST WELL

	Present operator and well designation	Original operator and well designation	Sec. T. & R.	B.&M.	Total depth (feet)	Pool (zone)	Strata & age at total depth
Discovery well	Unknown					Tulare	
Deepest well	Berry Petroleum Co. No. 32-X	Circle Exploration, Inc. No. 32-X	21 30S 22E	MD	10,456	Oceanic	Tumey Eocene

POOL DATA

ITEM	TULARE-SAN JOAQUIN	OLIG	BASAL REEF RIDGE	STEVENS	ANTELOPE SHALE	FIELD OR AREA DATA
Discovery date	Unknown	about 1896	February 1944	January 1964	November 1978	
Initial production rates						
Oil (bbl/day)	-	1,300**	4	280	4	
Gas (Mcf/day)	-	-	on pump	on pump	on pump	
Flow pressure (psi)	-	(open flow)	-	-		
Bean size (in.)						
Initial reservoir pressure (psi)	300-600	100-360	100	855	1,100	
Reservoir temperature (°F)	97-100	100	115	130-140	110	
Initial oil content (STB/ac.-ft.)	2,000	1,600	1,300	1,700		
Initial gas content (MSCF/ac.-ft.)	-	-	-	1,020		
Formation	Tulare-San Joaq. a/	Reef Ridge	Reef Ridge	Monterey	Monterey	
Geologic age		Miocene	Miocene	Miocene	Miocene	
Average depth (ft.)	500-1,000	800	1,500	2,000-4,750	2,800	
Average net thickness (ft.)	300-500	500	400	175	300-1,500	
Maximum productive area (acres)	300	1,400	60	400	20	1,920
RESERVOIR ROCK PROPERTIES						
Porosity (%)	25-35	30	30	32	fractured shale	
S_{oi} (%)	60-80	80	60	85	-	
S_{wi} (%)	20-40	20	40	15	-	
S_{gi} (%)						
Permeability to air (md)	10-2,500	3,000	1,000-2,500	451	-	
RESERVOIR FLUID PROPERTIES						
Oil:						
Oil gravity (°API)	12-19	12-16	14-21	19-32	12	
Sulfur content (% by wt.)	0.96	-	-	-	-	
Initial solution GOR (SCF/STB)	-	10**	20**	600	-	
Initial oil FVF (RB/STB)	1.01	1.01	1.02	1.3	-	
Bubble point press. (psia)	-	-	-	3,200	-	
Viscosity (cp) @ °F	4,000-5,000 @100	2,000 @ 100	1,757 @ 100	2.5 @ 153		
Gas:						
Specific gravity (air = 1.0)	0.65	0.53**	0.60**	0.65	-	
Heating value (Btu/cu. ft.)	900	-	-	905	-	
Water:						
Salinity, NaCl (ppm)	1,500-10,000	7,600	9,100	20,600	-	
T.D.S. (ppm)	2,000-13,000	11,600	-	27,600	-	
R_w (ohm/m) (77°F)	0.53-3.30	0.95	-	0.25	-	
ENHANCED RECOVERY PROJECTS						

	ENHANCED RECOVERY PROJECTS					
Enhanced recovery projects	cyclic steam	cyclic steam				
Date started	1962	1962				
Date discontinued	active	active				
	steamflood	steamflood				
	(Amnicola)	1965				
	1977	active				
	active	waterflood				
		1980				
		active				
Peak oil production (bbl)	5,807,360 b/			2,204,903	2,129	5,807,360
Year	1909			1966	1980	1909
Peak gas production, net (Mcf)				2,967,411	2,869	3,106,374 b/
Year				1966	1987	1966

Base of fresh water (ft.):

Remarks: An oil-bearing diatomite shale (in the Antelope Shale of the Monterey Formation) crops out in a part of the Main Area and is estimated to be up to 1,200 feet thick. If mining operations now in the planning stages prove successful, an estimated 360 million barrels of heavy oil are expected to be recovered.

a/ Pleistocene - Pliocene.

b/ Upper-pool production, consisting of Tulare - San Joaquin, Olig, and Basal Reef Ridge.

Selected References:

Hardoin, J.L., 1966, Stevens Pool of the Main Area of McKittrick Oil Field: Calif. Div. of Oil and Gas, Summary of Operations -- Calif. Oil Fields, Vol. 52, No. 1.

Hewitt, R.L., 1962, McKittrick Oil Field: AAPG-SEG-SEPM Guidebook, p. 234-236, March 1962.

Stevens, J.B., 1943, McKittrick Area of McKittrick Oil Field: State Div. Mines Bull. 118, p. 510-511.

Zulberti, J.L., 1956, McKittrick Oil Field: Calif. Div. of Oil and Gas, Summary of Operations -- Calif. Oil Fields, Vol. 42, No. 1.

1968 Guidebook, Geology and Oil Fields - Westside Southern San Joaquin Valley, Pacific Sections AAPG SEG-SEGM, p. 76-77.

DATE: October 1991 **Estimated value

COUNTY: KERN

MCKITTRICK OIL FIELD
NORTHEAST AREA

DISCOVERY WELL AND DEEPEST WELL

	Present operator and well designation	Original operator and well designation	Sec. T. & R.	B.&M.	Total depth (feet)	Pool (zone)	Strata & age at total depth
Discovery well	Chevron U.S.A. Inc. No. 113	Standard Oil Co. of Calif. No. 113	7 30S 22E	MD	2,110	Olig	
Deepest well	Chevron U.S.A. Inc. "Jacobson" 572R	Standard Oil Co. of Calif. "Jacobson" 572	18 30S 22E	MD	10,864		Kreyenhagen Eocene

POOL DATA

ITEM	TULARE (AMNICOLA)	SAN JOAQUIN	OLIG	ANTELOPE	CARNEROS	FIELD OR AREA DATA
Discovery date	July 1948	June 1975	January 1944	January 1964	July 1964	
Initial production rates						
Oil (bbl/day)	65	65	28	57	556	
Gas (Mcf/day)					225	
Flow pressure (psi)	on pump	on pump	on pump	on pump	800	
Bean size (in.)	-	-	-	-	18/64	
Initial reservoir pressure (psi)	250**	350	600**	600	3,170	
Reservoir temperature (°F)	97	110	120	148	220	
Initial oil content (STB/ac.-ft.)	1,600	1,600	1,500	-	830	
Initial gas content (MSCF/ac.-ft.)	650	-	-	-	637-1,074 b/	
Formation	Tulare	San Joaquin	Reef Ridge	Monterey	Temblor	
Geologic age	Pleistocene	Pliocene	Miocene	Miocene	Miocene	
Average depth (ft.)	650	900-1,200	1,900	3,600	6,500	
Average net thickness (ft.)	50-200	50	60	2,400	100	
Maximum productive area (acres)	2,100	50	15	100	390	
RESERVOIR ROCK PROPERTIES						
Porosity (%)	25-40	35	26	fractured shale	21	
S_{oi} (%)	70	65	75		77	
S_{wi} (%)	30	35	25		23	
S_{gi} (%)					c/	
Permeability to air (md)	2,500	10-4,000	3,000		95	
RESERVOIR FLUID PROPERTIES						
Oil:						
Oil gravity (°API)	11-25	12	15	22-28	33-39	
Sulfur content (% by wt.)	0.96	-	-	1.18	-	
Initial solution GOR (SCF/STB)	40	10**	10**	600	767	
Initial oil FVF (RB/STB)	1.03	1.02**	1.02**	1.28**	1.51	
Bubble point press. (psia)	800	-	-	-	2,998	
Viscosity (cp) @ °F	4,000-9,000 @ 100	-	700 @ 100	-	-	
Gas:						
Specific gravity (air = 1.0)	0.70	0.50**	0.55**	0.70	0.71	
Heating value (Btu/cu. ft.)	950-1,000	-	-	1,125	1,165	
Water:						
Salinity, NaCl (ppm)	1,200-1,700	5,100-10,700	7,600	24,500	21,000	
T.D.S. (ppm)	2,000-11,800	6,400-13,000	11,600	28,200	25,100	
R_w (ohm/m) (77°F)	0.62-3.30	0.53-1.10	0.95	0.24	0.26	
ENHANCED RECOVERY PROJECTS						

	ENHANCED RECOVERY PROJECTS					
Enhanced recovery projects	fireflood	cyclic steam				
Date started	1966	1975				
Date discontinued	1970	active				
	cyclic steam					
	1969					
	active					
	steamflood					
	1968					
	active					
	waterflood					
	1986					
	active					
Peak oil production (bbl)		2,177,612 a/		44,096	330,209	
Year		1985		1965	1967	
Peak gas production, net (Mcf)		67,589		107,978	3,815,899	
Year		1966		1965	1968	

Base of fresh water (ft.): None

Remarks:
a/ Upper pool production, consisting of Tulare, San Joaquin, and Olig.
b/ In gas cap.
c/ Gas cap in some fault blocks.

Selected References:

Bertholf, H.W., 1962, Northeast Area of McKittrick Oil Field: Calif. Div. of Oil and Gas, Summary of Operations -- Calif. Oil Fields, Vol. 48, No. 1.
Weddle, J.R., 1965, Northeast Area of McKittrick Oil Field: Calif. Div. of Oil & Gas, Summary of Operations -- Calif. Oil Fields, Vol. 51, No. 2.
1968 Guidebook, Geology and Oilfields, Westside Southern San Joaquin Valley, Pacific Section AAPG-SEG-SEPM, p. 72-75.

DATE:
October 1991 **Estimated value

COUNTY: KERN

MCKITTRICK OIL FIELD
NORTHEAST AREA

DISCOVERY WELL AND DEEPEST WELL

	Present operator and well designation	Original operator and well designation	Sec. T. & R.	B.&M.	Total depth (feet)	Pool (zone)	Strata & age at total depth
Discovery well							
Deepest well							

POOL DATA

ITEM	PHACOIDES (WYGAL)	OCEANIC	POINT OF ROCKS b/			FIELD OR AREA DATA
Discovery date	July 1964	January 1965	May 1965			
Initial production rates						
Oil (bbl/day)	541	20	c/			
Gas (Mcf/day)	300	6,700	-			
Flow pressure (psi)	900	2,200	gas lift			
Bean size (in.)	19/64	1/4	-			
Initial reservoir pressure (psi)	3,550	3,800	4,100**			
Reservoir temperature (°F)	230	245	260			
Initial oil content (STB/ac.-ft.)	683	562	350**			
Initial gas content (MSCF/ac.-ft.)	512-1,110 a/	483-3,800 a/	500**			
Formation	Temblor	Tumey	Kreyenhagen			
Geologic age	Oligocene	Eocene	Eocene			
Average depth (ft.)	7,900	8,300	9,100			
Average net thickness (ft.)	300	125	1,400			
Maximum productive area (acres)	970	550	10			2,050
RESERVOIR ROCK PROPERTIES						
Porosity (%)	17	15	12			
S_{oi} (%)	77	72	-			
S_{wi} (%)	23	28	45**			
S_{gi} (%)	77 a/	72 a/	-			
Permeability to air (md)	140	10-50	3			
RESERVOIR FLUID PROPERTIES						
Oil:						
Oil gravity (°API)	33	36	24			
Sulfur content (% by wt.)						
Initial solution GOR (SCF/STB)	750	859	520**			
Initial oil FVF (RB/STB)	1.50	1.49	1.35**			
Bubble point press. (psia)	3,550	3,737	0.69**			
Viscosity (cp) @ °F	0.27 @ 100	-	-			
Gas:						
Specific gravity (air = 1.0)	0.79	0.77	0.68**			
Heating value (Btu/cu. ft.)	1,235	1,240	-			
Water:						
Salinity, NaCl (ppm)	9,700	11,600	22,600			
T.D.S. (ppm)	13,300	14,100	23,000			
R_w (ohm/m) (77°F)	0.51	0.45	0.28			
ENHANCED RECOVERY PROJECTS						

	ENHANCED RECOVERY PROJECTS					
Enhanced recovery projects **Date started** **Date discontinued**	waterflood 1970 1982					
Peak oil production (bbl) **Year** **Peak gas production, net (Mcf)** **Year**	5,642,864 1966 12,540,215 1969	1,219,699 1966 5,757,446 1967	b/			7,366,546 1966 19,475,228 1969

Base of fresh water (ft.): None

Remarks:
a/ In gas cap.
b/ Point of Rocks zone abandoned in 1966.
c/ Initial Point of Rocks production commingled with Phacoides (estimated 20 barrels per day).

Selected References:

Field Index

(https://www.aeraenergy.com)

Coalinga

Aera and its predecessor companies have been producing heavy crude oil in Coalinga since 1913

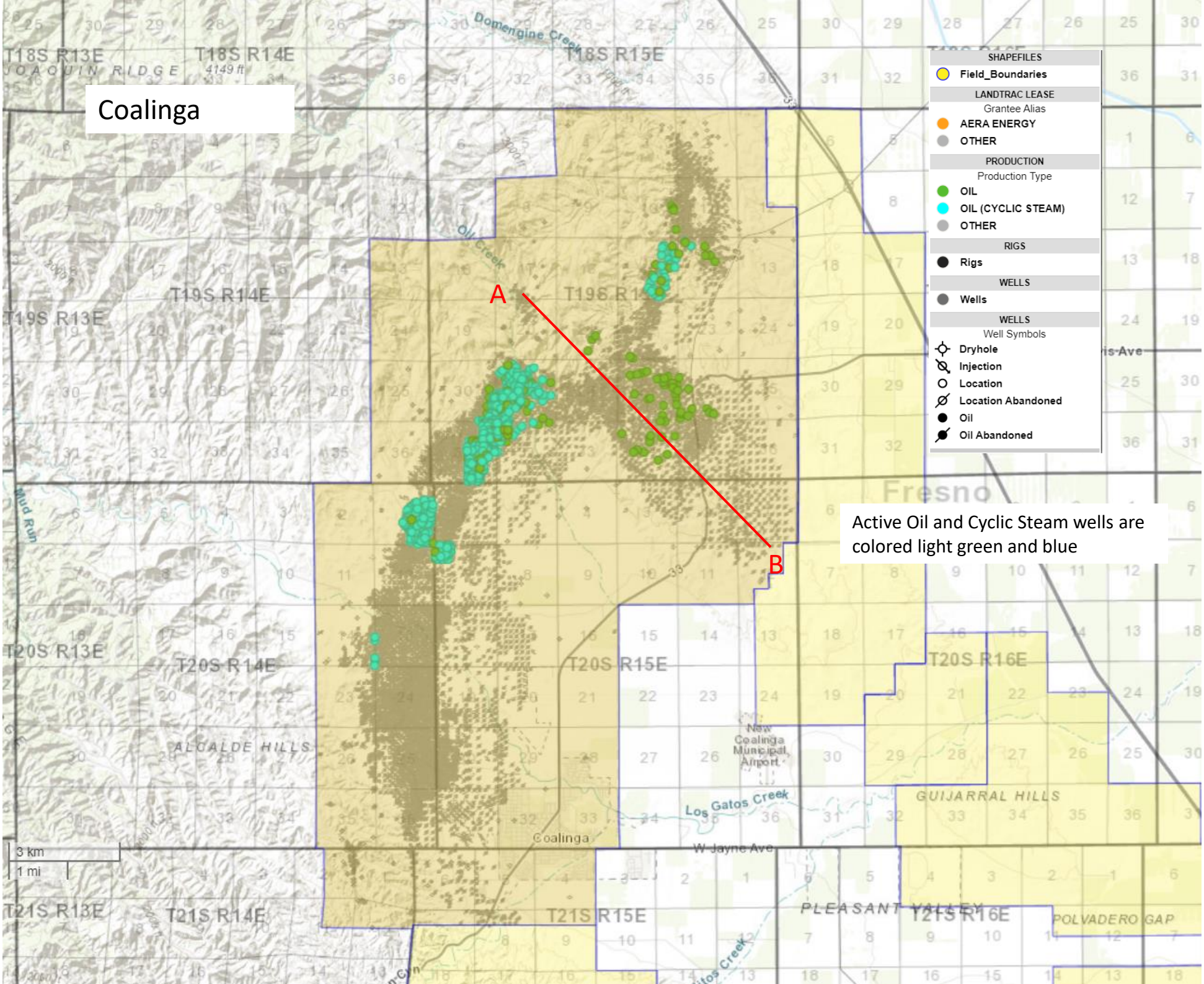
Our Coalinga operations cover approximately 15 square miles in Fresno County about nine miles northwest of the City of Coalinga, just west of Interstate 5. Approximately 7,000 barrels of heavy crude oil are produced by the Coalinga unit each day. Crude oil is sold on the premises and is transported to refineries in California for processing into gasoline and other fuels.

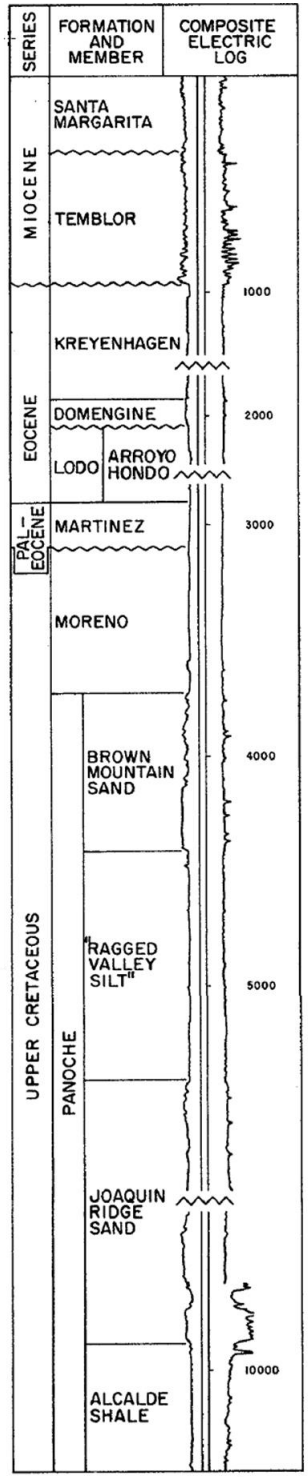
In the community, Aera is a longtime member of the Coalinga Chamber of Commerce and serves as a sponsor of the annual Horned Toad Derby celebration. Aera was an inaugural sponsor of the community's National Night Out in 2017 and has long supported career programs at Coalinga High School.

Additionally in 2017, our Coalinga operation donated the equivalent of more than 20,000 pounds of food through employee and company contributions to the Community Food Bank in Fresno County. Team Aera volunteers helped the food bank at local food distribution sites in Coalinga. Coalinga employees also sponsor "Santa for Seniors," a holiday program which supports the activities of residents at two local senior care facilities.

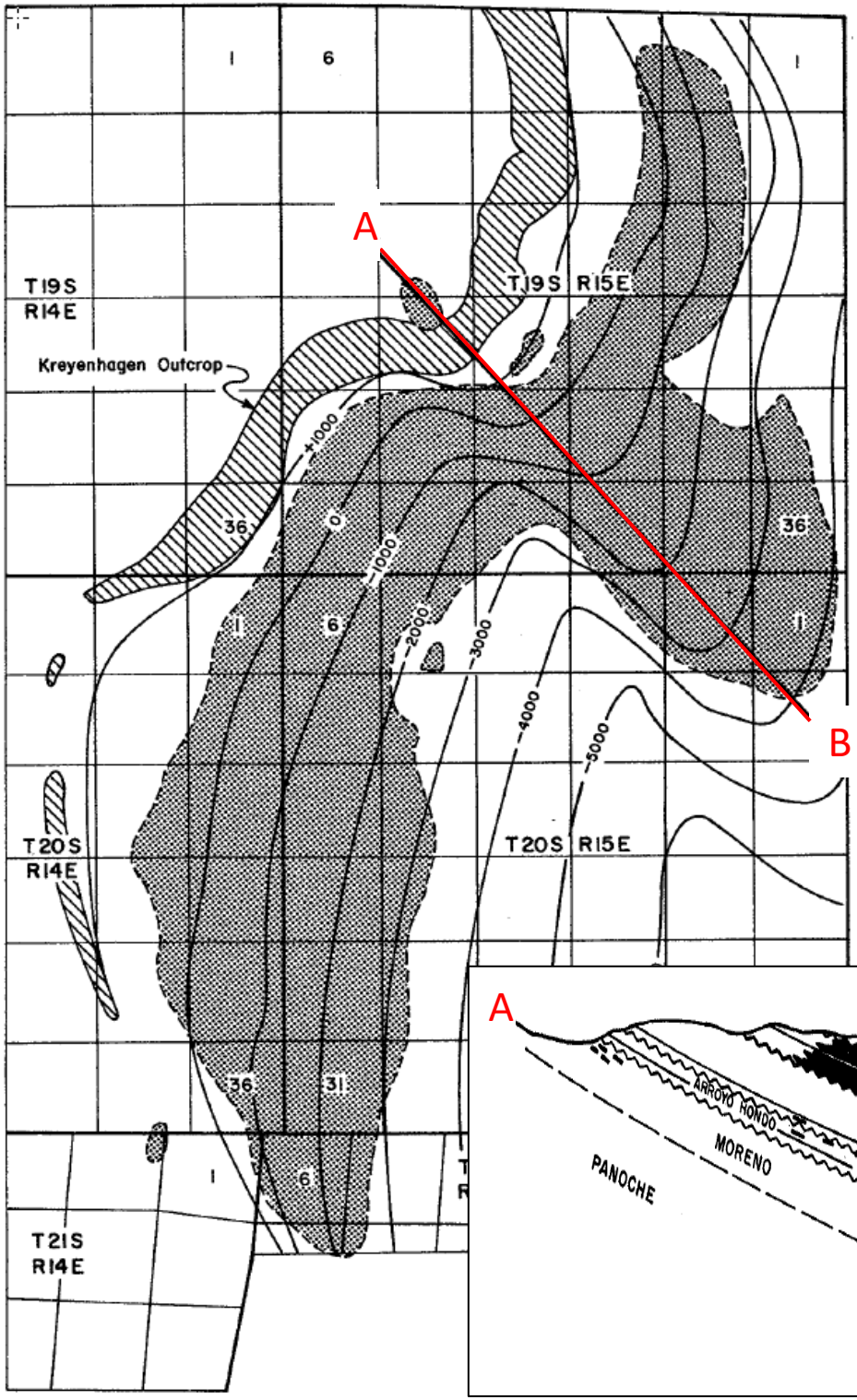
Aera and its predecessor companies have been producing heavy crude oil in Coalinga since 1913.

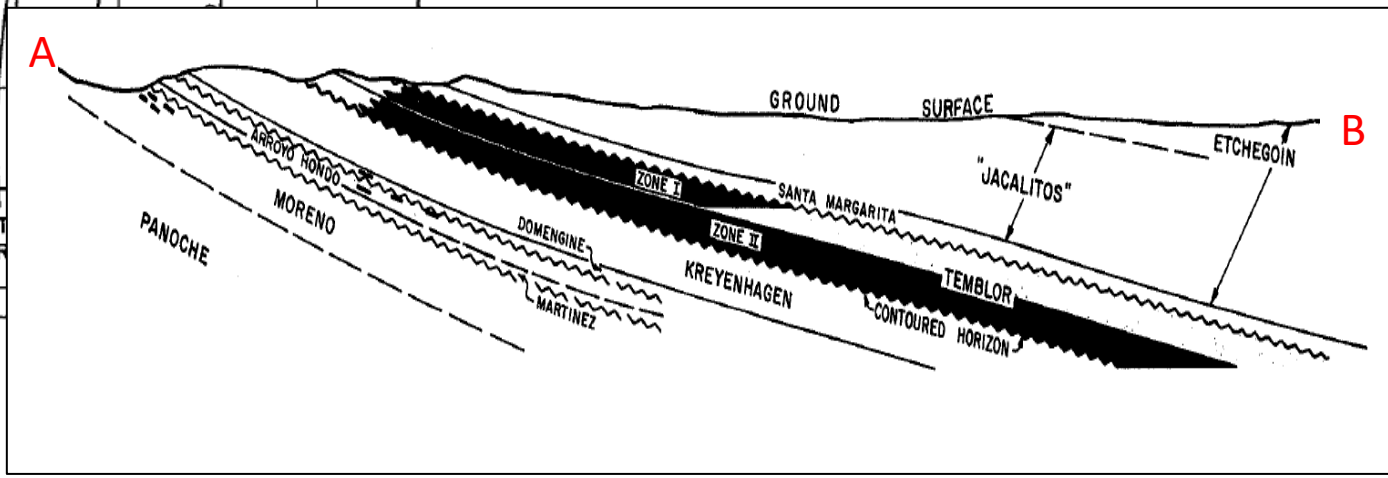
10000 Ming Avenue, Bakersfield, CA 93311-1302 / (661) 665-5000 (tel:6616655000)


Coalinga
A
B
SHAPEFILES
Field_Boundaries
LANDTRAC LEASE
Grantee Alias
AERA ENERGY
OTHER
PRODUCTION
Production Type
OIL
OIL (CYCLIC STEAM)
OTHER
RIGS
Rigs
WELLS
Wells
WELLS
Well Symbols
Dryhole
Injection
Location
Location Abandoned
Oil
Oil Abandoned
Active Oil and Cyclic Steam wells are colored light green and blue
T18S R13E
T18S R14E
T18S R15E
T19S R13E
T19S R14E
T20S R13E
T20S R14E
T20S R15E
T20S R16E
T21S R13E
T21S R14E
T21S R15E
T21S R16E
ALCALDE HILLS
GUIJARRAL HILLS
PLEASANT VALLEY
POLVADERO GAP
Domengine Creek
Oil Creek
Los Gatos Creek
Coalinga
New Coalinga Municipal Airport
W Jayne Ave
Fresno
3 km
1 mi



APRIL 1983





COUNTY: FRESNO

COALINGA OIL FIELD

DISCOVERY WELL AND DEEPEST WELL

	Present operator and well designation	Original operator and well designation	Sec. T. & R.	B.&M.	Total depth (feet)	Pool (zone)	Strata & age at total depth
Discovery well	Coast Range Oil Co. "Stocker Discovery" 4	Coast Range Oil Co. "Stocker Discovery" 4	17 19S 15E	MD	1,200	Cretaceous (Oil City)	
Deepest well	CalResources LLC 363X	Shell Oil Co. 363X	15 19S 15E	MD	10,414		Alcalde Late Cretaceou

POOL DATA

ITEM	ETCHEGOIN-TEMBLOR (WESTSIDE)	TEMBLOR (EASTSIDE)	EOCENE	CRETACEOUS (OIL CITY)		FIELD OR AREA DATA
Discovery date	1990	1900	1912	1887-1888		
Initial production rates						
Oil (bbl/day)	20	-	-	10		
Gas (Mcf/day)						
Flow pressure (psi)						
Bean size (in.)						
Initial reservoir pressure (psi)	1,435	1,771	-	-		
Reservoir temperature (°F)	90-130	100-110	-	-		
Initial oil content (STB/ac.-ft.)	951-1,277	1,400-1,723	-	-		
Initial gas content (MSCF/ac.-ft.)						
Formation	Etchegoin-Temblor	Temblor	a/	Moreno		
Geologic age	Pliocene-Miocene	Miocene	Eocene-Paleo.	Late Cretaceous		
Average depth (ft.)	500-3,500	700-4,600	0-2,500	700		
Average net thickness (ft.)	200	250	100	140		
Maximum productive area (acres)						20,216
RESERVOIR ROCK PROPERTIES						
Porosity (%)	25-35	27-33	-	-		
S_{oi} (%)	40-50	31-70	-	-		
S_{wi} (%)	40-55	20-50	-	-		
S_{gi} (%)	0-4.5	0-19.0	-	-		
Permeability to air (md)	385-10,000	300-10,000	-	-		
RESERVOIR FLUID PROPERTIES						
Oil:						
Oil gravity (°API)	11-18	12-30	29	33-40		
Sulfur content (% by wt.)	0.75	0.64	0.45	-		
Initial solution GOR (SCF/STB)	0-190	0-6	-	-		
Initial oil FVF (RB/STB)	1.02-1.06	1.02-1.08	-	-		
Bubble point press. (psia)						
Viscosity (cp) @ °F	10-300 @ 100	10-2,500 @ 100	-	-		
Gas:						
Specific gravity (air = 1.0)						
Heating value (Btu/cu. ft.)	765	765	-	-		
Water:						
Salinity, NaCl (ppm)	1,600	2,600	-	-		
T.D.S. (ppm)	5,700-6,800	3,300-9,400	-	-		
R_w (ohm/m) (77°F)	1.46	1.01	-	-		
ENHANCED RECOVERY PROJECTS						

	ENHANCED RECOVERY PROJECTS					
Enhanced recovery projects	steamflood	waterflood				
Date started	1961	1952-1961				
Date discontinued	active	1958-1976				
	cyclic steam	steamflood				
	1962	1965				
	1969	1970				
	waterflood	polymer flood				
	1964	1978				
	1967	1978				
	fireflood	waterflood				
	1964	1991				
	1966	1992				
	hot waterflood					
	1962					
	1966					
	waterflood					
	1988					
	active					
	hot waterflood					
	1988					
	active					
Peak oil production (bbl)						19,500,000
Year						1912
Peak gas production, net (Mcf)						
Year						

Base of fresh water (ft.): 0-1,300

Remarks: Major development started after the discovery of the Temblor pools in 1900. Much of the early drilling in the Eastside and Oil City areas was near the numerous oil seeps and tar sand outcrops.

a/ Kreyenhagen, Domengine, Lobo, and Martinez

Selected References:

Arnold, R., and R. Anderson, 1910, The Geology and Oil Resources of the Coalinga District, Calif: U.S. Geol. Survey Bulletin 398.
Kaplow, E.J., 1945, Coalinga Oil Field: Calif. Div. of Oil and Gas, Summary of Operations -- Calif. Oil Fields, Vol. 31, No. 2.

Field Index

(https://www.aeraenergy.com)

Midway Sunset

Midway Sunset Field

Aera's oilfield operations in the Midway Sunset field in southwestern Kern County are centered in the company's North Midway Sunset and South Midway Sunset units. Aera is the largest operator in the Midway Sunset field, which in turn is the largest producing onshore oilfield in the lower 48 states.

The North Midway Sunset unit is located along Highway 33 north of the town of Fellows. Oil production here averages 7,000 barrels of oil equivalent per day. Aera's South Midway Sunset unit is located between Taft and Maricopa, and produces an average of nearly 12,000 barrels of oil equivalent per day. Crude oil is sold on the premises and is transported to refineries in California for processing into gasoline and other fuels.

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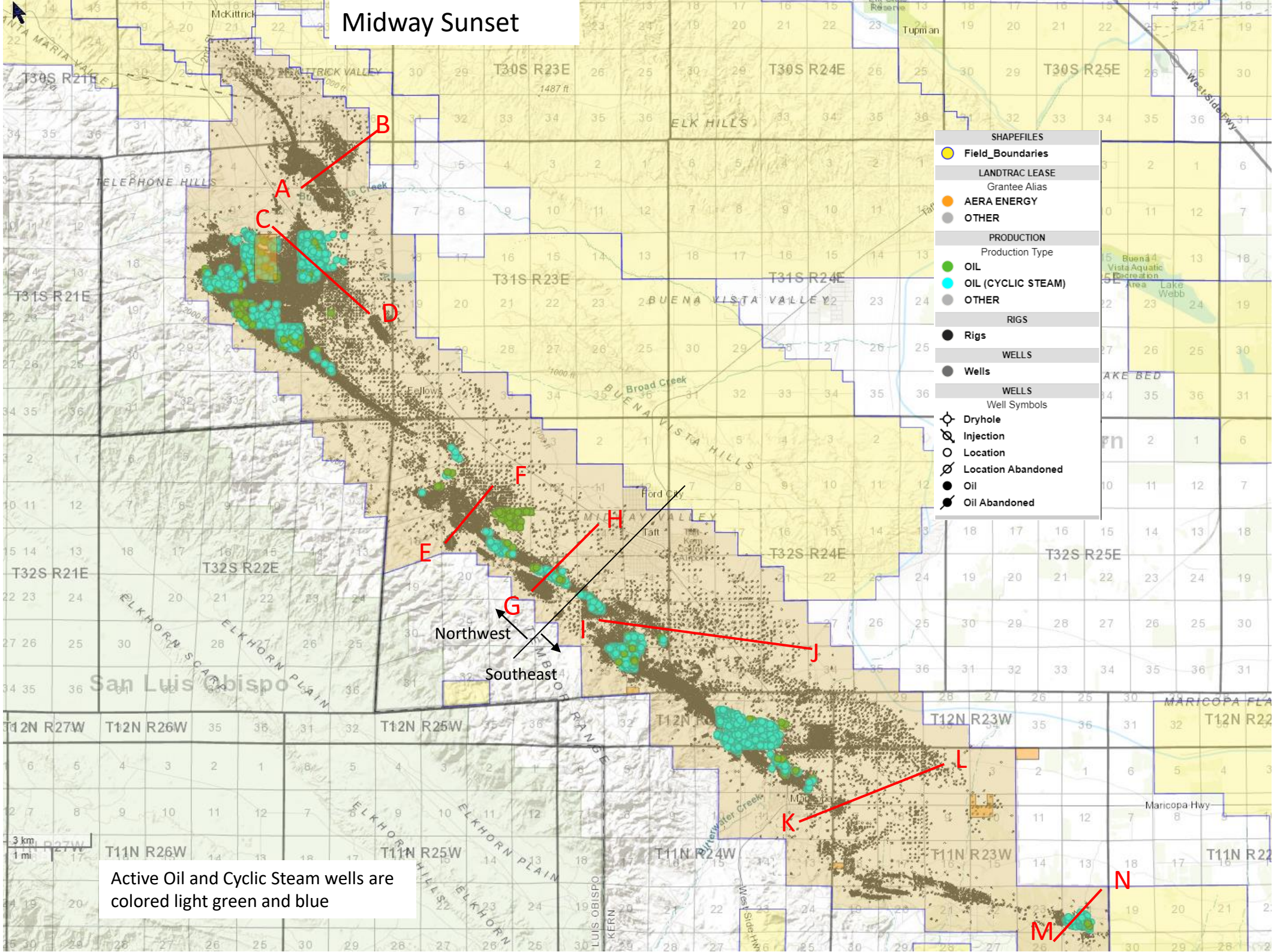
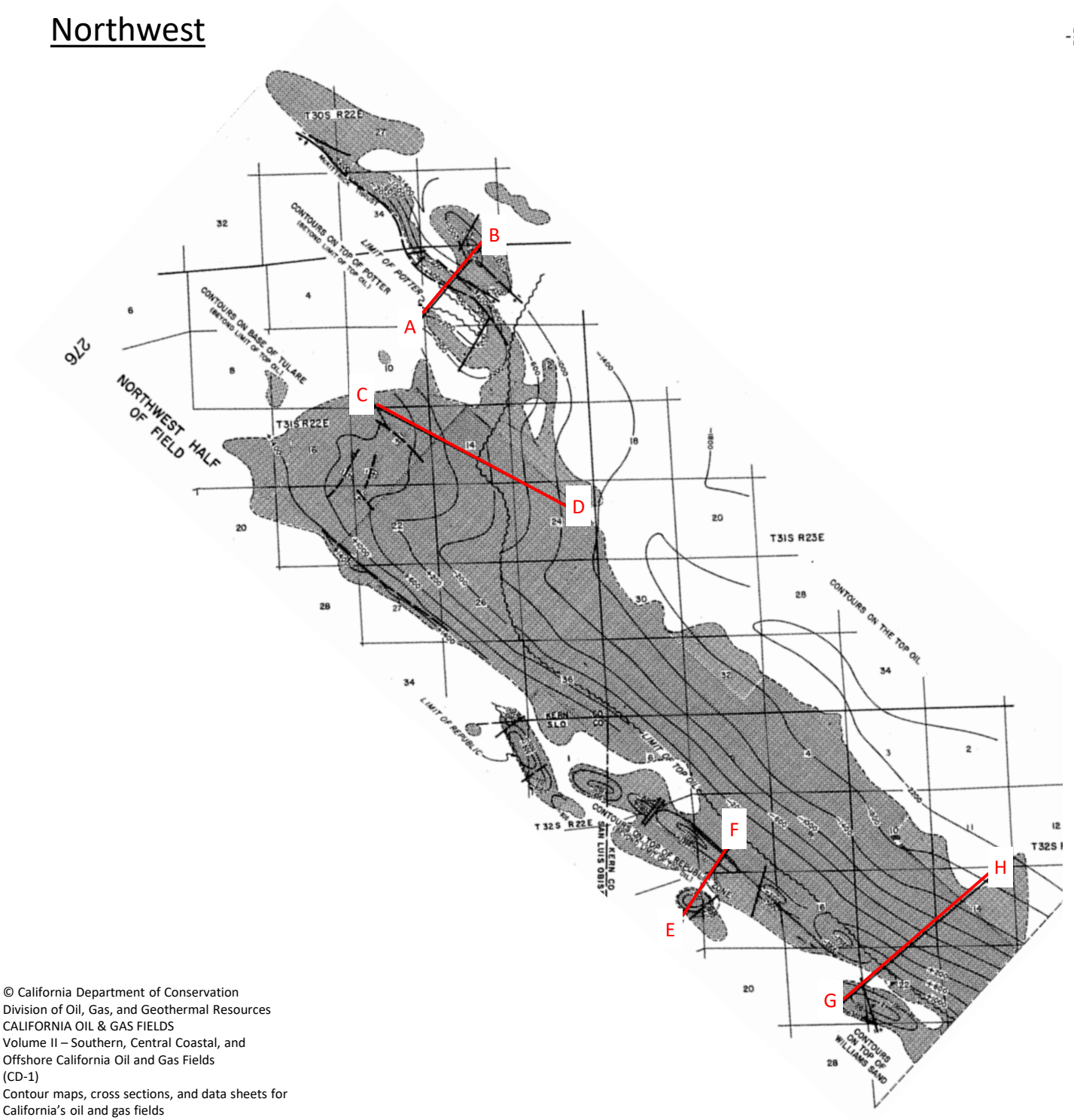
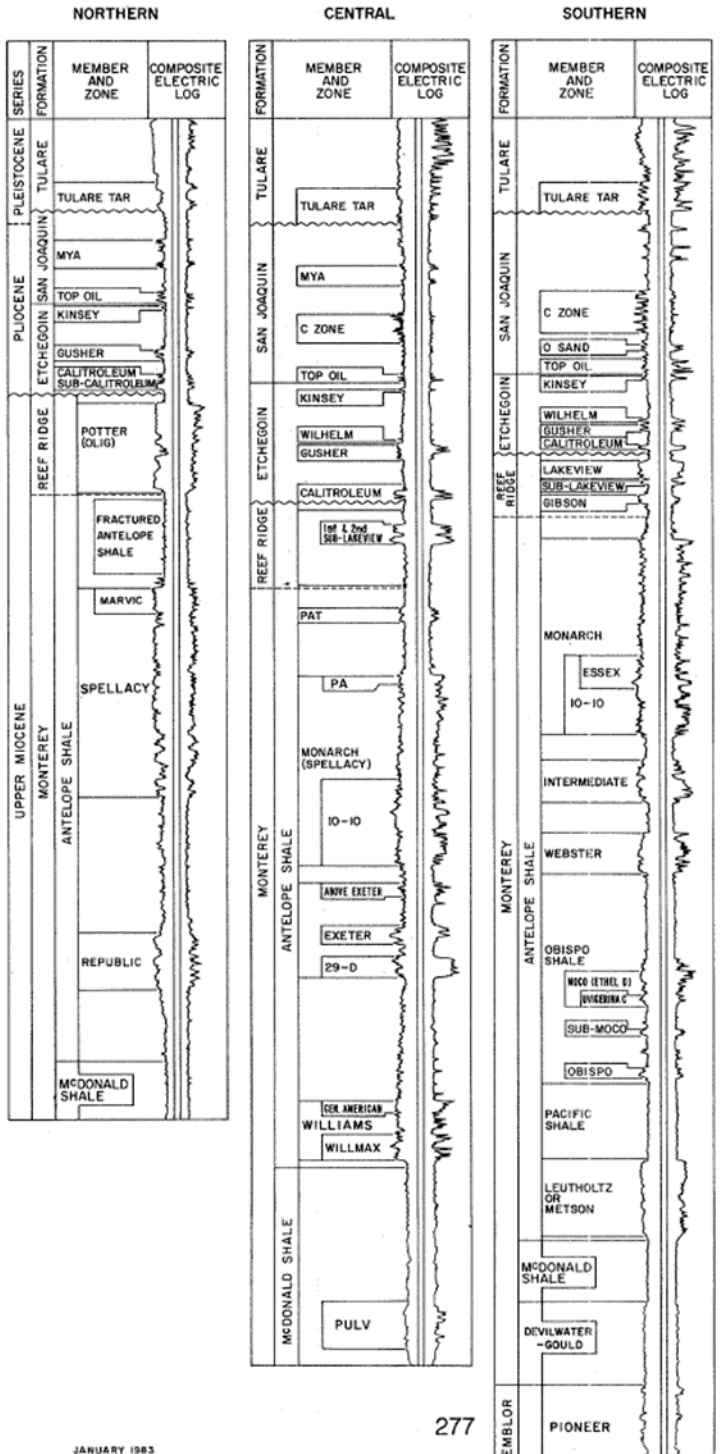
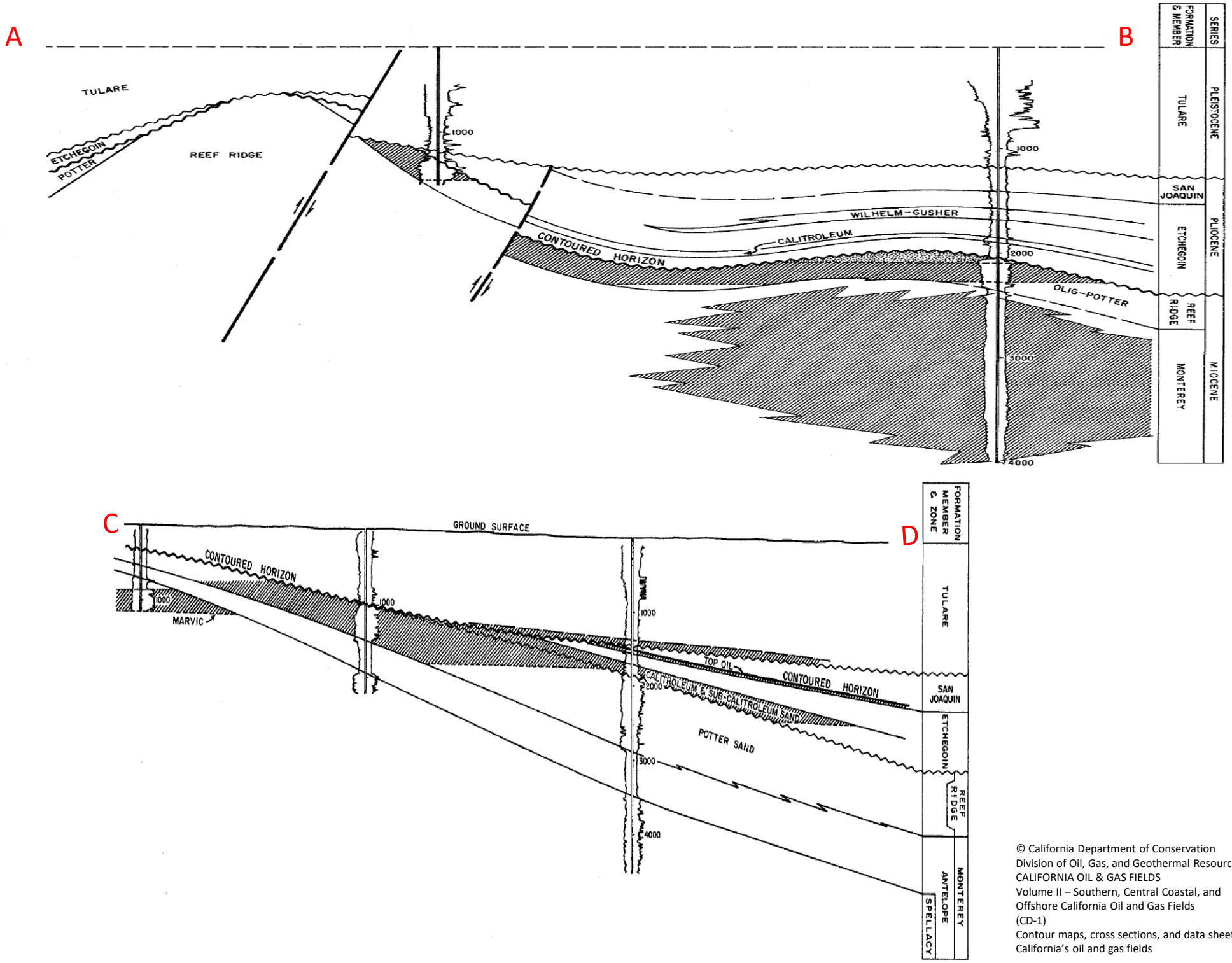
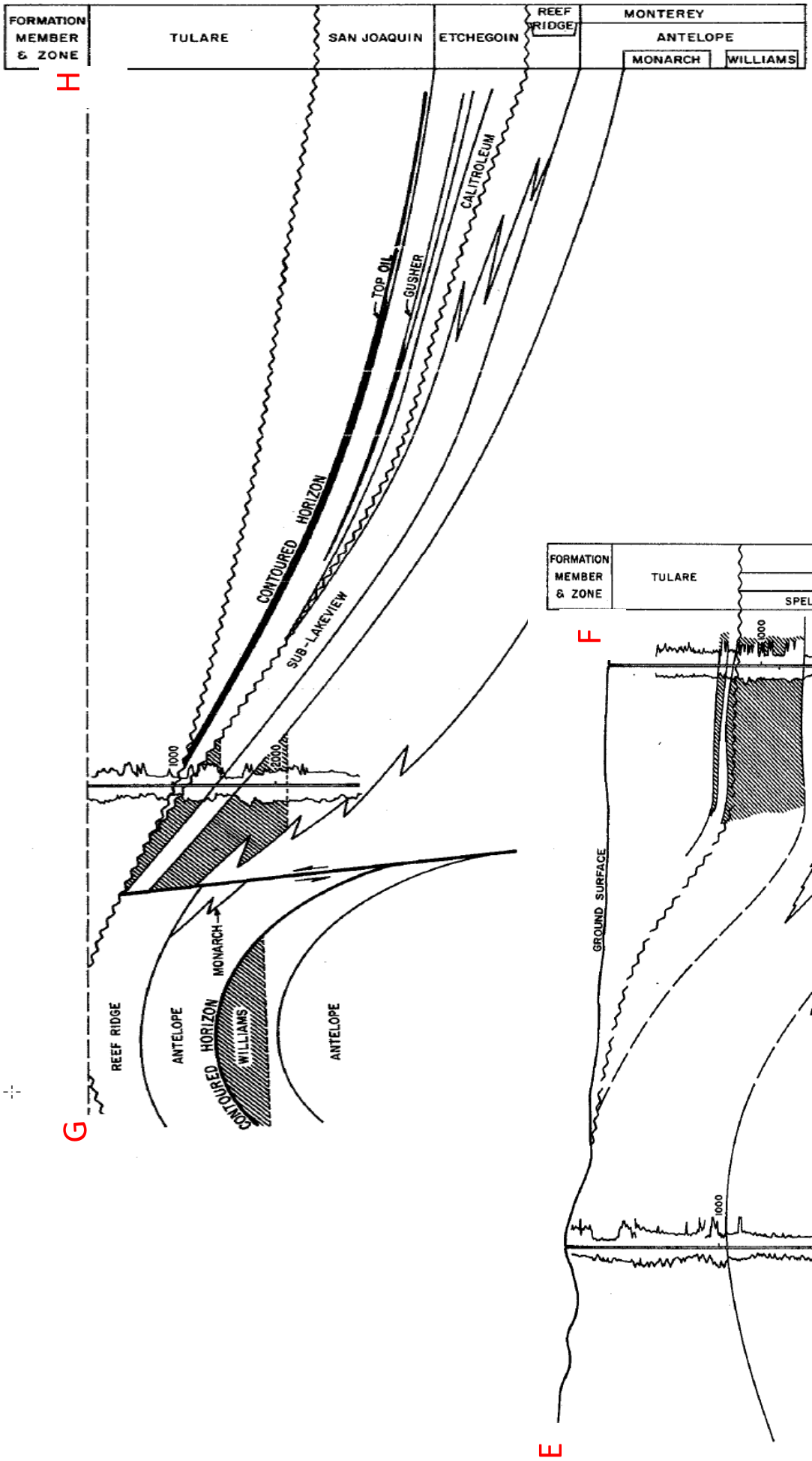

Midway Sunset
A
B
C
D
E
F
G
H
I
J
K
L
M
N
Northwest
Southeast
SHAPEFILES
Field_Boundaries
LANDTRAC LEASE
Grantee Alias
AERA ENERGY
OTHER
PRODUCTION
Production Type
OIL
OIL (CYCLIC STEAM)
OTHER
RIGS
Rigs
WELLS
Wells
WELLS
Well Symbols
Dryhole
Injection
Location
Location Abandoned
Oil
Oil Abandoned
Active Oil and Cyclic Steam wells are colored light green and blue

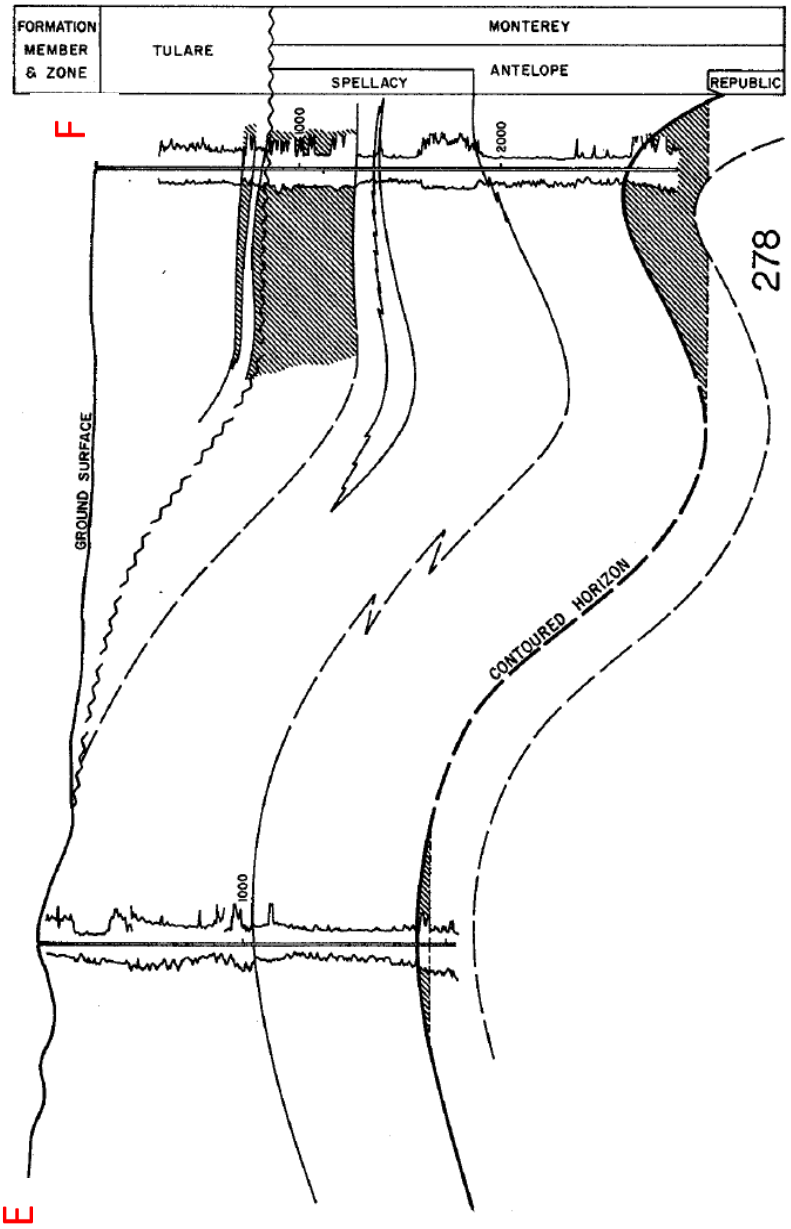
Northwest





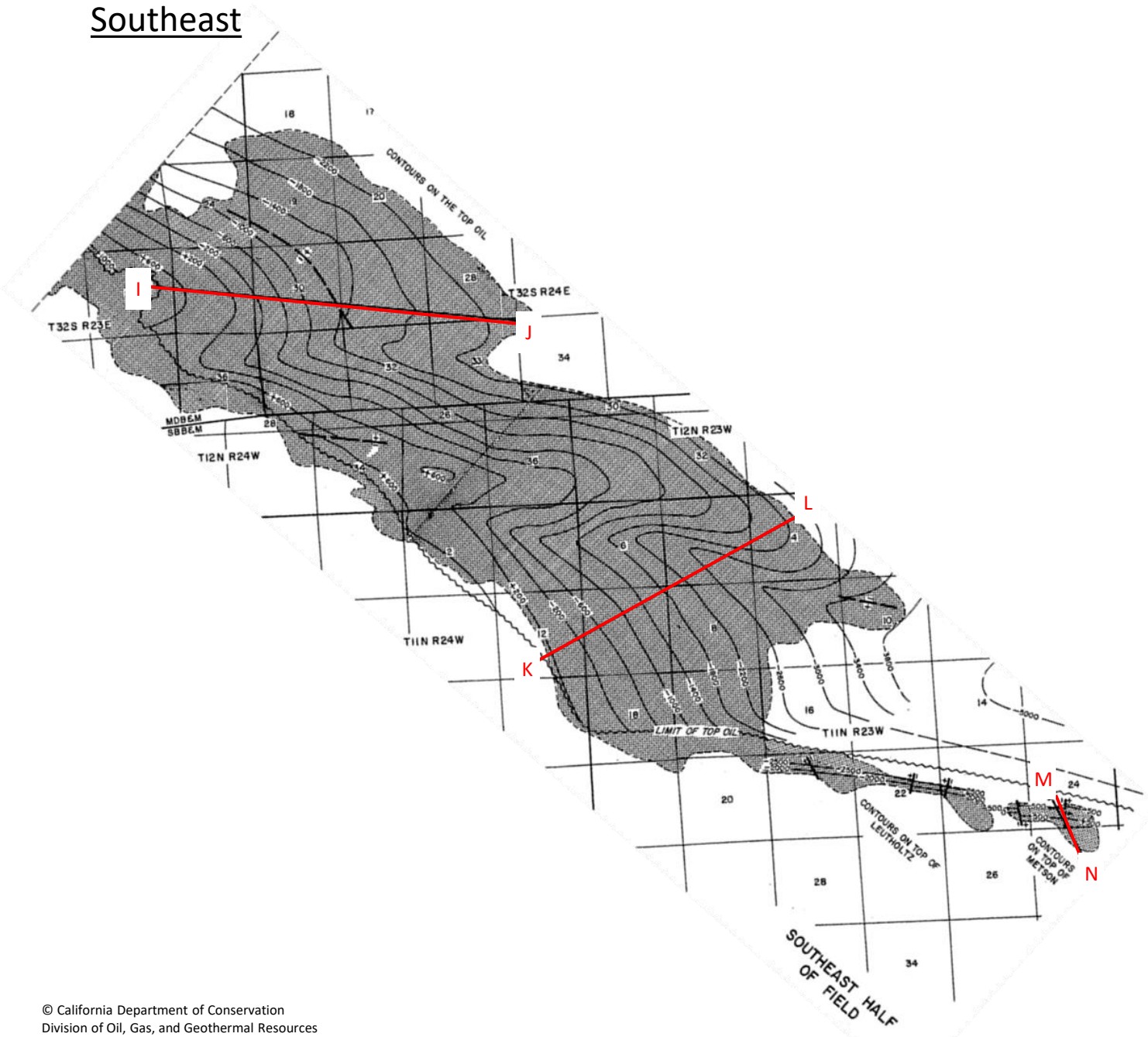


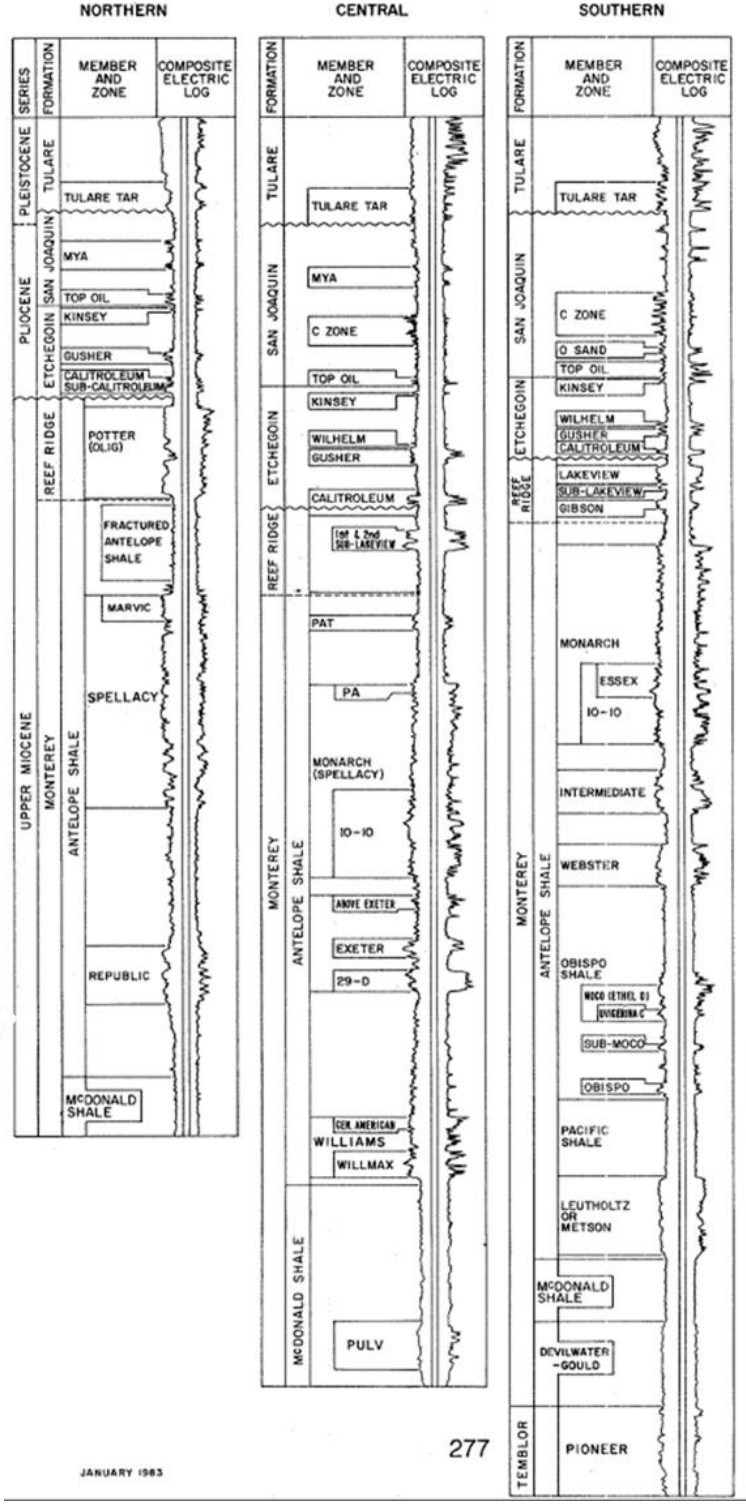


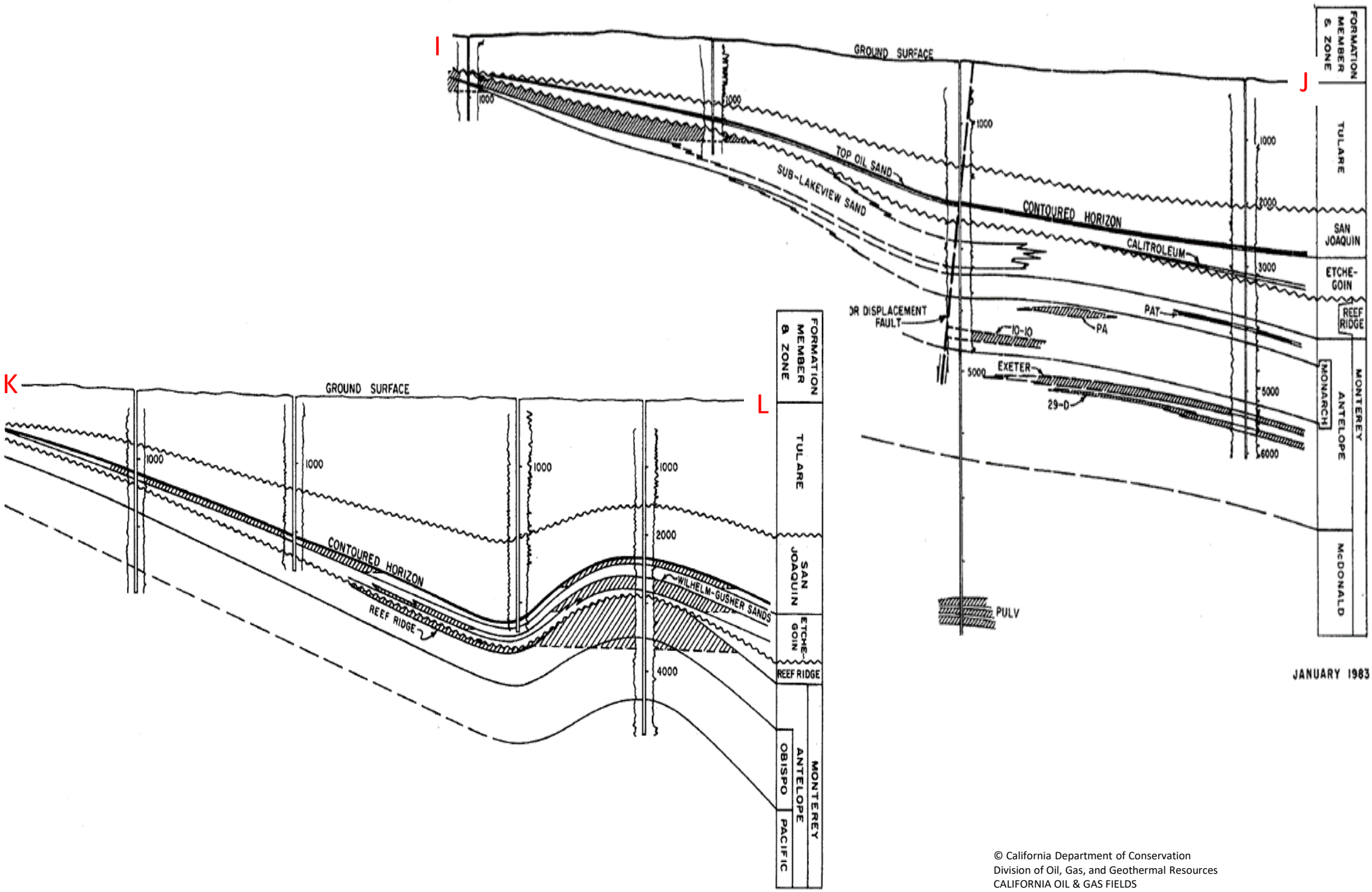


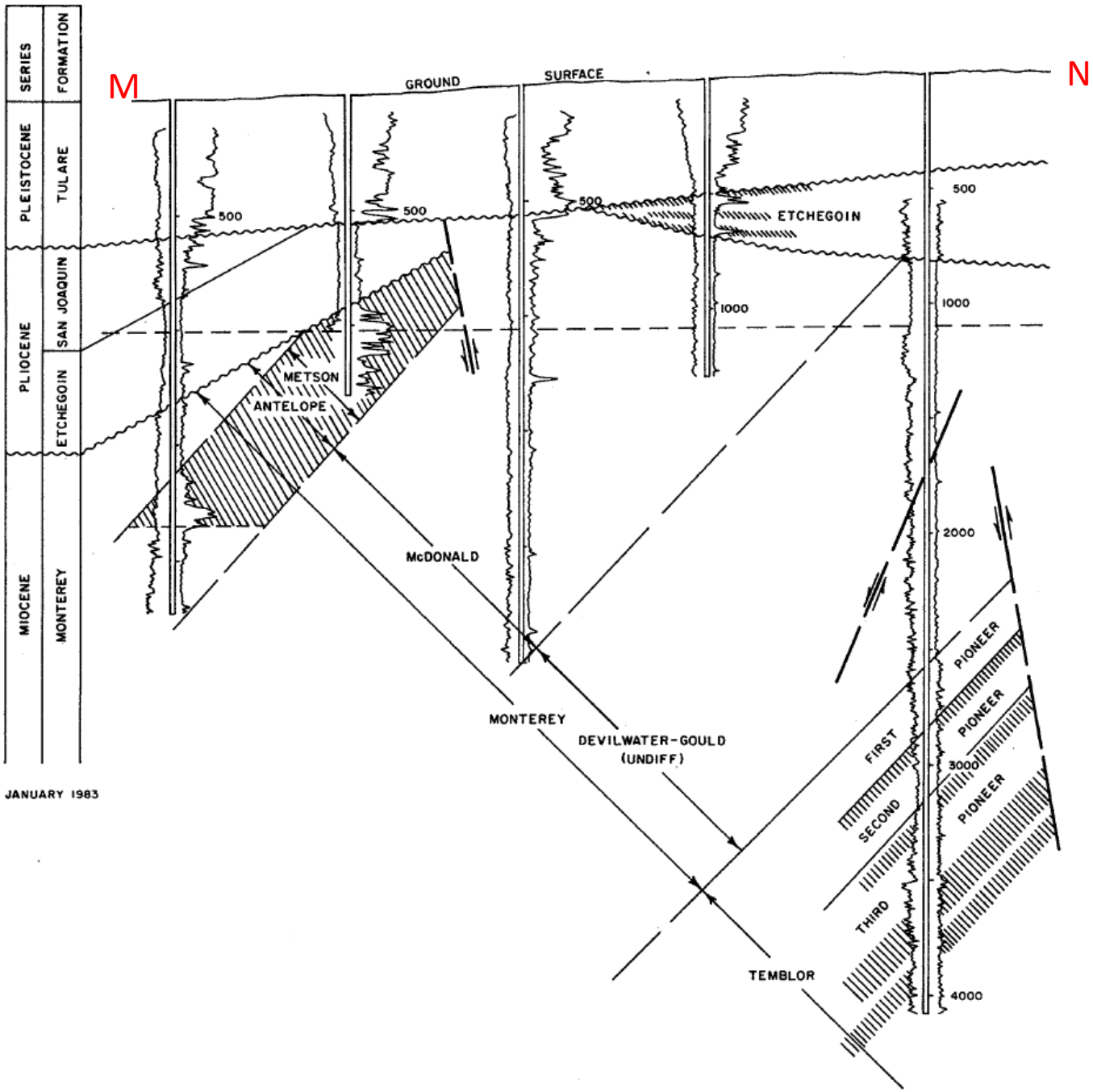
JANUARY 1983

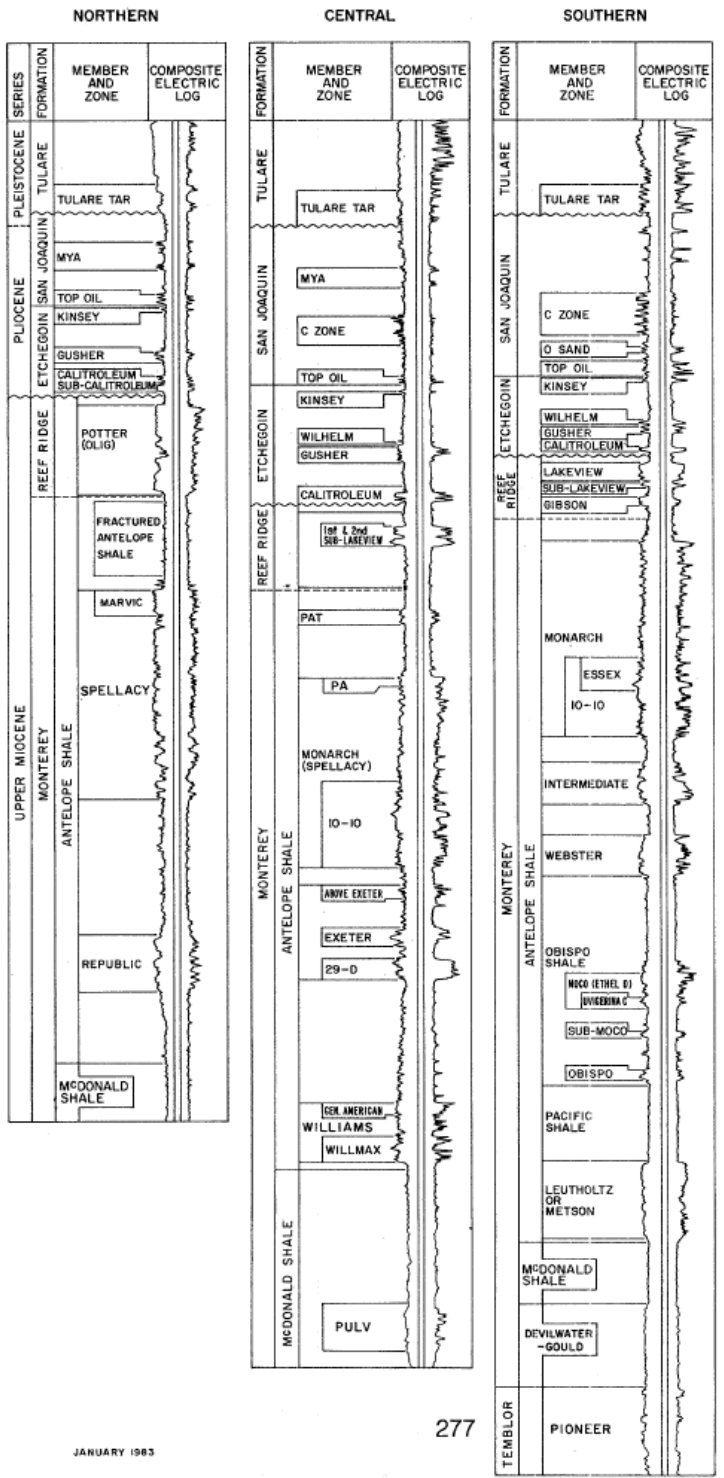
Southeast








SERIES
FORMATION
PLEISTOCENE
TULARE
PLIOCENE
SAN JOAQUIN
ETCHEGOIN
MIOCENE
MONTEREY
M
N
GROUND SURFACE
500
500
500
ETCHEGOIN
500
1000
1000
METSON
ANTELOPE
McDONALD
2000
MONTEREY
DEVILWATER-GOULD
(UNDIFF)
FIRST
SECOND
THIRD
PIONEER
PIONEER
PIONEER
3000
TEMBLOR
4000
JANUARY 1983



JANUARY 1983

COUNTY: KERN AND SAN LUIS OBISPO

MIDWAY-SUNSET OIL FIELD

DISCOVERY WELL AND DEEPEST WELL

	Present operator and well designation	Original operator and well designation	Sec. T. & R.	B.&M.	Total depth (feet)	Pool (zone)	Strata & age at total depth
Discovery well	Unknown		21 11N 23W	SB		Tulare	
Deepest well	Mobil Explo. & Prod. N.A. Inc. "C.W.O.D." 58-21	The Superior Oil Co. "C.W.O.D." 58-21	21 32S 23E	MD	14,504		Lower Santos Oligocene

POOL DATA

ITEM	TULARE	MYA TAR	TOP OIL	KINSEY	WILHELM	FIELD OR AREA DATA
Discovery date	about 1890	January 1920	-	-	-	
Initial production rates						
Oil (bbl/day)	-	10	-	-	-	
Gas (Mcf/day)						
Flow pressure (psi)	on pump	on pump	-	-	-	
Bean size (in.)						
Initial reservoir pressure (psi)	0-150**	150-1,030**	1,030**	1,030**	650	
Reservoir temperature (°F)	95-110**	92-120	92-125	120-135	120-135	
Initial oil content (STB/ac.-ft.)	900-1,400**	1,160**	1,460**	1,458**	1,703	
Initial gas content (MSCF/ac.-ft.)	-	-	400**	400**	200**	
Formation	Tulare	San Joaquin	San Joaquin	Etchegoin	Etchegoin	
Geologic age	Pleistocene	Pliocene	Pliocene	Pliocene	Pliocene	
Average depth (ft.)	200-1,400	1,100	500-2,500	2,000-3,600	2,000-3,600	
Average net thickness (ft.)	50-200	150	20-50	15-175	50-100	
Maximum productive area (acres)	5,000	300	-	-	-	
RESERVOIR ROCK PROPERTIES						
Porosity (%)	33	35	32	32	30	
S_{oi} (%)	60	50	64**	64**	70**	
S_{wi} (%)	40	50	36	36	30	
S_{gi} (%)						
Permeability to air (md)	400-8,200	300-3,000	450	450	600**	
RESERVOIR FLUID PROPERTIES						
Oil:						
Oil gravity (°API)	10-12	12-16	15-23	14-26	14-26	
Sulfur content (% by wt.)	1.2	1.32	-	-	-	
Initial solution GOR (SCF/STB)	-	-	165	112	10**	
Initial oil FVF (RB/STB)	1.05**	1.05**	1.09	1.09	1.04	
Bubble point press. (psia)	-	-	1,400**	900**	-	
Viscosity (cp) @ °F	3,500 @ 100**	11 @ 120	24 @ 120	24 @ 120	-	
Gas:						
Specific gravity (air = 1.0)	-	-	0.65**	0.68**	0.53**	
Heating value (Btu/cu. ft.)						
Water:						
Salinity, NaCl (ppm)	3,000-17,000	4,400	25,000-37,000	25,500-32,000	29,000-36,000	
T.D.S. (ppm)	4,000-21,000	8,300	27,000-38,000	26,500-34,000	30,000-37,000	
R_w (ohm/m) (77°F)	0.34-1.50	0.98	0.17-0.24	0.20-0.24	0.16	
ENHANCED RECOVERY PROJECTS						

	ENHANCED RECOVERY PROJECTS					
Enhanced recovery projects	cyclic steam	cyclic steam	cyclic steam	cyclic steam		
Date started	1963	1963	1979	1965		
Date discontinued	active	active	1982	1965		
	steamflood		steamflood	steamflood		
	1966		1963	1966		
	active		1994	active		
	fireflood		fireflood	waterflood		
	1962		1961	1962		
	active		1981	1966		
	waterflood		waterflood			
	1985		1966			
	1991		1972			
Peak oil production (bbl)						
Year						
Peak gas production, net (Mcf)						
Year						

Base of fresh water (ft.): None, except for the extreme southeast tip of field, in the Santiago Creek area, where surface fresh water exists down to approximately 500 feet. The alluvium, and possibly Tulare, are probably in hydraulic continuity with fresh waters in the Maricopa Flats Area, Midway Valley, and at the head of Buena Vista Valley.

Remarks: Cumulative oil production exceeded 1 billion barrels in 1968 and 2 billion barrels in 1991.
Several zones in Midway-Sunset consist of multiple pools with widely varying conditions.

Selected References:

COUNTY: KERN AND SAN LUIS OBISPO

MIDWAY-SUNSET OIL FIELD

DISCOVERY WELL AND DEEPEST WELL

	Present operator and well designation	Original operator and well designation	Sec. T. & R.	B.&M.	Total depth (feet)	Pool (zone)	Strata & age at total depth
Discovery well							
Deepest well							

POOL DATA

ITEM	GUSHER	CALITROLEUM	LAKEVIEW	SUB-LAKEVIEW	POTTER	FIELD OR AREA DATA
Discovery date	November 1909	October 1922	March 1910	June 1936	January 1910	
Initial production rates						
Oil (bbl/day)	3,000 a/	-	68,000 b/	254 c/	100	
Gas (Mcf/day)	-	-	13,600	-	-	
Flow pressure (psi)	-	-	-	on pump	on pump	
Bean size (in.)				-	-	
Initial reservoir pressure (psi)	650	1,050	1,300**	450	410**	
Reservoir temperature (°F)	100-115	100-130	117	105-117	85-110	
Initial oil content (STB/ac.-ft.)	1,700-2,480	1,180	1,776	1,350-2,250	1,350-2,100	
Initial gas content (MSCF/ac.-ft.)	300**	300**	355**	170**	200**	
Formation	Etchegoin	Etchegoin	Reef Ridge	Reef Ridge	Reef Ridge	
Geologic age	Pliocene	Pliocene	Miocene	Miocene	Miocene	
Average depth (ft.)	2,000-3,000	1,500-4,500	1,700-3,300	400-3,100	200-2,500	
Average net thickness (ft.)	75	80	10-250	10-300	60-500	
Maximum productive area (acres)	-	-	700	-	3,000	
RESERVOIR ROCK PROPERTIES						
Porosity (%)	30-45	28	33	30-40	30-33	
Soi (%)	60-70	30	75	75	60-85	
Swi (%)	30-40	65	25	25	15-40	
Sgi (%)	-	5	-	-	-	
Permeability to air (md)	1,000	223	3,655	1,000-3,000	500-6,500	
RESERVOIR FLUID PROPERTIES						
Oil:						
Oil gravity (°API)	14.0-26.0	14.0-26.0	22.5	22.0	11.0-15.0	
Sulfur content (% by wt.)	0.75	-	0.85	-	1.00-1.47	
Initial solution GOR (SCF/STB)	60**	80**	140**	50**	10-55	
Initial oil FVF (RB/STB)	1.04	1.06**	1.11	1.04	1.03	
Bubble point press. (psia)	-	-	1,050**	-	-	
Viscosity (cp) @ °F	20.1 @ 60	19.0 @ 120	124.0 @ 68	1,500 @ 90	200-2,750 @ 100	
Gas:						
Specific gravity (air = 1.0)	0.65**	0.65**	0.68**	0.69**	0.50**	
Heating value (Btu/cu. ft.)						
Water:						
Salinity, NaCl (ppm)	24,500-27,000	27,000-35,000	28,600	7,500	50-7,000	
T.D.S. (ppm)	25,000-31,000	29,000-35,200	31,100	12,500	1,550-10,800	
R_w (ohm/m) (77°F)	0.25	0.19-0.25	0.22	0.59	0.50-5.50	
ENHANCED RECOVERY PROJECTS						

	ENHANCED RECOVERY PROJECTS					
Enhanced recovery projects		waterflood		cyclic steam	cyclic steam	
Date started		1954		1963	1963	
Date discontinued		1964		active	active	
		waterflood		steamflood	steamflood	
		1982		1972	1968	
		1983		active	active	
				fireflood	fireflood	
				1976	1968	
				active	active	
				waterflood	waterflood	
				1991	1969	
				active	active	
Peak oil production (bbl)						
Year						
Peak gas production, net (Mcf)						
Year						

Base of fresh water (ft.):

Remarks:

a/ Estimated flow from uncontrolled gusher - Chanslor-Canfield Midway Oil Company Well No. 2, Sec. 6, T.32S., R.23E., M.D.B.& M.
b/ Estimated flow from uncontrolled gusher - Lake View Oil Company Well No. 1, Sec. 25, T.12N., R.24W., S.B.B.&M.
c/ Initial Sub-Lakeview production commingled with Lakeview.

Selected References:

DATE: November 1997 **Estimated value

COUNTY: KERN AND SAN LUIS OBISPO

MIDWAY-SUNSET OIL FIELD

DISCOVERY WELL AND DEEPEST WELL

	Present operator and well designation	Original operator and well designation	Sec. T. & R.	B.&M.	Total depth (feet)	Pool (zone)	Strata & age at total depth
Discovery well							
Deepest well							

POOL DATA

ITEM	MARVIC	ANTELOPE SHALE	MONARCH (SPELLACY)	WEBSTER	MOCO	FIELD OR AREA DATA
Discovery date	May 1941	February 1975	October 1900	December 1913	July 1957	
Initial production rates						
Oil (bbl/day)	72	76	-	35	188	
Gas (Mcf/day)	-	-	-	-	20**	
Flow pressure (psi)	on pump	on pump	-	-	40/660	
Bean size (in.)	-	-	-	-	open	
Initial reservoir pressure (psi)	500	550**	350-1,860	910	1,000	
Reservoir temperature (°F)	105	135	85-105	100-113	125	
Initial oil content (STB/ac.-ft.)	1,305-1,940	-	1,200-1,900	1,100-1,700	1,980	
Initial gas content (MSCF/ac.-ft.)	200**	-	400**	350**	400**	
Formation	Monterey	Monterey	Monterey	Monterey	Monterey	
Geologic age	Miocene	Miocene	Miocene	Miocene	Miocene	
Average depth (ft.)	1,000	3,800	600-2,000	1,500-1,800	2,100-2,700	
Average net thickness (ft.)	200	1,000-2,500	50-400	50-250	70-450	
Maximum productive area (acres)						
RESERVOIR ROCK PROPERTIES						
Porosity (%)	20-35	fractured shale	27-35	28-33	26	
S_{oi} (%)	55	-	60-80	54-66	75	
S_{wi} (%)	45	-	20-40	26-46	25	
S_{gi} (%)	-	-	0-2	0-8	-	
Permeability to air (md)	200-2,500	-	520-4,000	2,000	1,575	
RESERVOIR FLUID PROPERTIES						
Oil:						
Oil gravity (°API)	13	20-28	13-17	14	15	
Sulfur content (% by wt.)	-	-	0.71-1.32	-	-	
Initial solution GOR (SCF/STB)	15**	110**	40**	20**	40**	
Initial oil FVF (RB/STB)	1.02**	1.06**	1.05**	1.05**	1.06	
Bubble point press. (psia)	-	800**	-	-	-	
Viscosity (cp) @ °F	-	109 @ 60	a/	600 @ 113	110 @ 125	
Gas:						
Specific gravity (air = 1.0)	0.45**	0.72**	0.65	0.5**	0.55**	
Heating value (Btu/cu. ft.)	4,300	-	949	-	-	
Water:						
Salinity, NaCl (ppm)	700	18,941	800-23,500	2,120	16,800	
T.D.S. (ppm)	5,600	21,904	4,000-27,800	2,789	21,200	
R_w (ohm/m) (77°F)	1.90	0.33	0.25-2.20	2.30	0.40	
ENHANCED RECOVERY PROJECTS						

	ENHANCED RECOVERY PROJECTS					
Enhanced recovery projects **Date started** **Date discontinued**	cyclic steam 1963 active steamflood 1986 active		cyclic steam 1965 active steamflood 1965 active fireflood 1962 active waterflood 1957 1965 waterflood 1985 1992	cyclic steam 1963 active steamflood 1965 active fireflood 1962 1996	fireflood 1960 active steamflood 1965 active	
Peak oil production (bbl) **Year** **Peak gas production, net (Mcf)** **Year**						

Base of fresh water (ft.):

Remarks: a/ 800 @ 85 and 1,500 @ 105.

Selected References:

COUNTY: KERN AND SAN LUIS OBISPO

MIDWAY-SUNSET OIL FIELD

DISCOVERY WELL AND DEEPEST WELL

	Present operator and well designation	Original operator and well designation	Sec. T. & R.	B.&M.	Total Depth (feet)	Pool (zone)	Strata & age at total depth
Discovery well							
Deepest well							

POOL DATA

ITEM	OBISPO	PACIFIC	LEUTHOLTZ (METSON)	REPUBLIC	McDONALD SHALE	FIELD OR AREA DATA
Discovery date	September 1925	June 1947	August 1945	March 1928	April 1984	
Initial production rates						
Oil (bbl/day)	6,000	1,078	1,021	1,114	12	
Gas (Mcf/day)	-	414	120	350	20	
Flow pressure (psi)	-	400	300	220		
Bean size (in.)	open flow	27/64	32/64	1/2		
Initial reservoir pressure (psi)	1,560**	1,600**	100-1,400**	1,200**	1,650	
Reservoir temperature (°F)	130-135	136	100-117	115-170	140	
Initial oil content (STB/ac.-ft.)	-	-	1,660	1,500**	350	
Initial gas content (MSCF/ac.-ft.)	-	-	400**	400**		
Formation	Monterey	Monterey	Monterey	Monterey	Monterey	
Geologic age	Miocene	Miocene	Miocene	Miocene	Miocene	
Average depth (ft.)	3,600	3,700	1,200-3,200	1,300-4,900	4,125-4,900	
Average net thickness (ft.)	50-1,500	50-300	40-400	150	300	
Maximum productive area (acres)						

RESERVOIR ROCK PROPERTIES

Porosity (%)	fractured shale	fractured shale	30-34	31	35	
So_i (%)	-	-	75	-	15*	
Sw_i (%)	-	-	25	30**	67*	
Sg_i (%)					18*	
Permeability to air (md)	-	-	1,900	150	0.1-1.0	

RESERVOIR FLUID PROPERTIES

Oil:						
Oil gravity (°API)	14-27	15-17	8-24	12-24	11-22	
Sulfur content (% by wt.)	-	-	-	0.82		
Initial solution GOR (SCF/STB)	120**	100**	120**	160**		
Initial oil FVF (RB/STB)	1.08**	1.08**	1.08**	1.10**		
Bubble point press. (psia)	1,000**	1,100**	900**	1,300**		
Viscosity (cp) @ °F	-	-	3M-7M @ 100 a/	-	12.5 @ 140	
Gas:						
Specific gravity (air = 1.0)	0.65**	0.58**	0.72**	0.72**		
Heating value (Btu/cu. ft.)	-	-	-	950		
Water:						
Salinity, NaCl (ppm)	16,600	10,300	3,100-13,500	1,150	-	
T.D.S. (ppm)	21,600	14,100	7,200-17,600	6,600	10,000	
R_w (ohm/m) (77°F)	0.35	0.50	0.50-1.10	2.20	-	

ENHANCED RECOVERY PROJECTS

ENHANCED RECOVERY PROJECTS

Enhanced recovery projects ..... **Date started .....** **Date discontinued .....**			cyclic steam 1965 active steamflood 1970 active			
Peak oil production (bbl) **Year .....** **Peak gas production, net (Mcf)** **Year .....**						

Base of fresh water (ft.):

Remarks: a/ M = one thousand

Selected References:

DATE: January 1983 *Average value **Estimated value

DEPARTMENT OF CONSERVATION / DIVISION OF OIL, GAS, AND GEOTHERMAL RESOURCES

COUNTY: KERN AND SAN LUIS OBISPO

MIDWAY-SUNSET OIL FIELD

DISCOVERY WELL AND DEEPEST WELL

	Present operator and well designation	Original operator and well designation	Sec. T. & R.	B.&M.	Total Depth (feet)	Pool (zone)	Strata & age at total depth
Discovery well							
Deepest well							

POOL DATA

ITEM	PULV a/	PIONEER b/				FIELD OR AREA DATA
Discovery date	November 1979	January 1977				
Initial production rates						
Oil (bbl/day)	61	20				
Gas (Mcf/day)	63	50				
Flow pressure (psi)	-	on pump				
Bean size (in.)	-					
Initial reservoir pressure (psi)	2,700**	1,300**				
Reservoir temperature (°F)	225	115-122				
Initial oil content (STB/ac.-ft.)	650**					
Initial gas content (MSCF/ac.-ft.)	800**					
Formation	Monterey	Temblor				
Geologic age	Miocene	Miocene				
Average depth (ft.)	8,700	2,800-3,800				
Average net thickness (ft.)	65	300				
Maximum productive area (acres)						28,775

RESERVOIR ROCK PROPERTIES

Porosity (%)	20-23	20-25				
So_i (%)	-					
Sw_i (%)	45**	40*				
Sg_i (%)						
Permeability to air (md)	1-23	50-250				

RESERVOIR FLUID PROPERTIES

Oil:						
Oil gravity (°API)	32.5	35				
Sulfur content (% by wt.)	-					
Initial solution GOR (SCF/STB)	620**					
Initial oil FVF (RB/STB)	1.35**					
Bubble point press. (psia)	2,750**					
Viscosity (cp) @ °F	-					
Gas:						
Specific gravity (air = 1.0)	0.82**					
Heating value (Btu/cu. ft.)	-					
Water:						
Salinity, NaCl (ppm)	-					
T.D.S. (ppm)	-					
R_w (ohm/m) (77°F)	-					

ENHANCED RECOVERY PROJECTS

ENHANCED RECOVERY PROJECTS

Enhanced recovery projects						
Date started						
Date discontinued						
Peak oil production (bbl)						61,351,120
Year						1991
Peak gas production, net (Mcf)						15,217,729
Year						1918

Base of fresh water (ft.):

Remarks:

a/ Only one well was completed in this zone, which was abandoned in December 1980.
b/ Only one well was completed in this zone, which was abandoned in October 1982.

Selected References:

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Field Index

(https://www.aeraenergy.com)

San Ardo

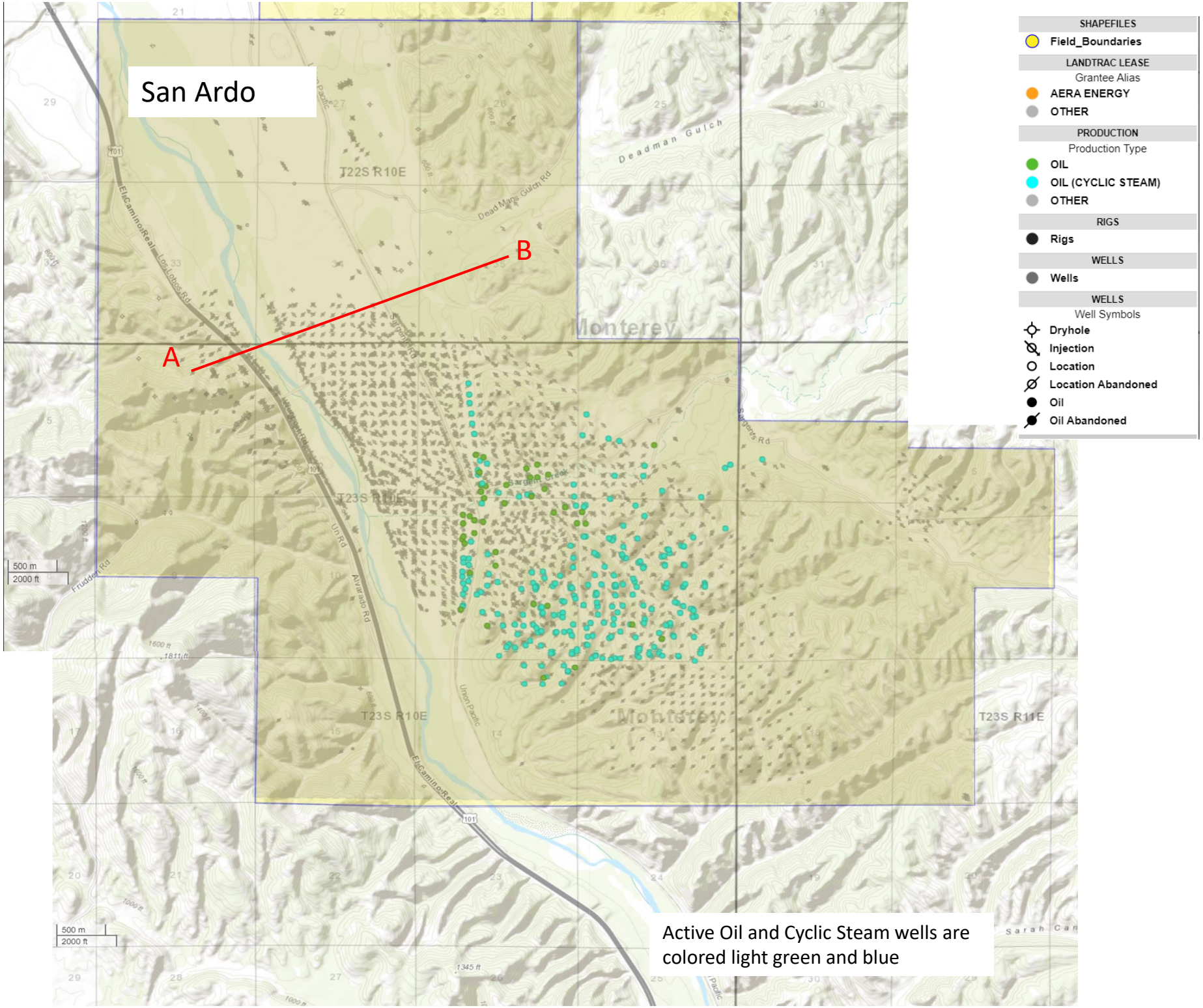
San Ardo Field

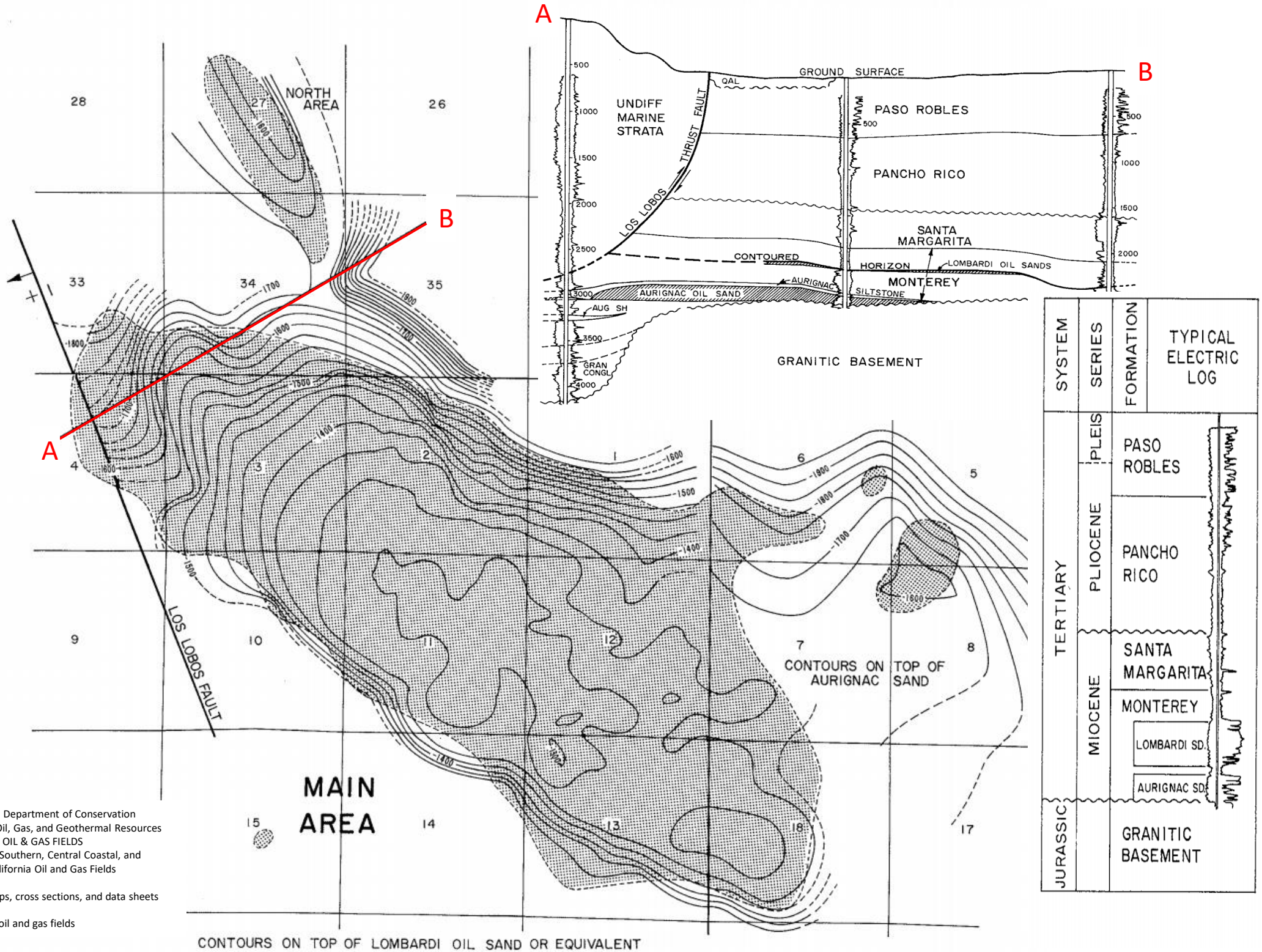
Aera and its predecessor companies have been producing heavy crude oil in San Ardo since 1952.

Our oil operations in San Ardo cover approximately seven square miles and are located 30 miles north of Paso Robles, just east of State Route 101. Aera's San Ardo field produces an average of 10,000 barrels of heavy crude oil per day. Crude oil is sold on the premises and is transported to refineries in California for processing into gasoline and other fuels.

Through the company's Partnership A.E.R.A. program, San Ardo employees have for more than a decade been involved with students and teachers in the San Ardo Union Elementary School District. This involvement includes sponsorship of field trips and teacher mini-grants. Many of our employees live in northern San Luis Obispo County, and Aera's community outreach extends to support of local schools, as well as the United Way and other health and human services agencies in Paso Robles and nearby communities.

10000 Ming Avenue, Bakersfield, CA 93311-1302 / (661) 665-5000 (tel:6616655000)


San Ardo
A
B
SHAPEFILES
Field_Boundaries
LANDTRAC LEASE
Grantee Alias
AERA ENERGY
OTHER
PRODUCTION
Production Type
OIL
OIL (CYCLIC STEAM)
OTHER
RIGS
Rigs
WELLS
Wells
WELLS
Well Symbols
Dryhole
Injection
Location
Location Abandoned
Oil
Oil Abandoned
T22S R10E
T23S R10E
T23S R11E
Monterey
Deadman Gulch
Dead Mans Gulch Rd
El Camino Real
Los Lobos Rd
Union Pacific
Alvarado Rd
Sargents Rd
Frudden Rd
500 m
2000 ft
Active Oil and Cyclic Steam wells are colored light green and blue



COUNTY: MONTEREY

SAN ARDO OIL FIELD

(SEE AREAS FOR ADDITIONAL INFORMATION)

DISCOVERY WELL AND DEEPEST WELL

	Present operator and well designation	Original operator and well designation	Sec. T. & R.	B.&M.	Total depth (feet)	Pool (zone)	Strata & age at total depth
Discovery well	Texaco Inc. "N.L.U." 1	The Texas Co. "Lombardi" 1	27 22S 10E	MD	2,158	Lombardi	
Deepest well	Texaco Inc. "Labarere" 3-15	Same as present	15 23S 10E	MD	5,004 a/		Monterey Miocene

POOL DATA

ITEM	LOMBARDI					FIELD OR AREA DATA
Discovery date	November 1947					
Initial production rates						
Oil (bbl/day)	155					
Gas (Mcf/day)						
Flow pressure (psi)						
Bean size (in.)						
Initial reservoir pressure (psi)	828					
Reservoir temperature (°F)	108					
Initial oil content (STB/ac.-ft.)	1,746					
Initial gas content (MSCF/ac.-ft.)						
Formation	Monterey					
Geologic age	Miocene					
Average depth (ft.)	2,100					
Average net thickness (ft.)	40					
Maximum productive area (acres)						4,390
RESERVOIR ROCK PROPERTIES						
Porosity (%)	23-38					
S_{oi} (%)	61					
S_{wi} (%)	39					
S_{gi} (%)						
Permeability to air (md)	2,000-8,000					
RESERVOIR FLUID PROPERTIES						
Oil:						
Oil gravity (°API)	10-13					
Sulfur content (% by wt.)	2.37					
Initial solution GOR (SCF/STB)	80					
Initial oil FVF (RB/STB)	1.055					
Bubble point press. (psia)						
Viscosity (cp) @ °F	11,000 @ 100					
Gas:						
Specific gravity (air = 1.0)						
Heating value (Btu/cu. ft.)						
Water:						
Salinity, NaCl (ppm)	6,000					
T.D.S. (ppm)						
R_w (ohm/m) (77°F)						
ENHANCED RECOVERY PROJECTS						

	ENHANCED RECOVERY PROJECTS					
Enhanced recovery projects	fireflood cyclic steam					
Date started	1963 1964					
Date discontinued	1967 1966					
Peak oil production (bbl)						18,184,267
Year						1967
Peak gas production, net (Mcf)						6,135,603
Year						1955

Base of fresh water (ft.): See areas

a/ Directional well; true vertical depth is 4,953 feet.

Remarks:

Selected References:

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DATE: January 1989

CALIFORNIA DIVISION OF OIL AND GA

COUNTY: MONTEREY

SAN ARDO OIL FIELD
MAIN AREA

DISCOVERY WELL AND DEEPEST WELL

	Present operator and well designation	Original operator and well designation	Sec. T. & R.	B.&M.	Total depth (feet)	Pool (zone)	Strata & age at total depth
Discovery well	Mobil Oil Corp. "Orradre" 1-12	Jergens Oil Co. "Orradre" 1	12 23S 10E	MD	2,225	Lombardi (gas)	
Deepest well	Texaco Inc. "Labarere" 3-15	Same as present	15 23S 10E	MD	5,004 a/		Monterey Miocene

POOL DATA

ITEM	LOMBARDI GAS	LOMBARDI	AURIGNAC			FIELD OR AREA DATA
Discovery date	July 1948	July 1948	December 1948			
Initial production rates						
Oil (bbl/day)	-	125	152			
Gas (Mcf/day)	4,075	3	-			
Flow pressure (psi)	683	-	-			
Bean size (in.)	32/64	-	-			
Initial reservoir pressure (psi)	884	750	970-1,000			
Reservoir temperature (°F)	100-120	115-119	102-135			
Initial oil content (STB/ac.-ft.)	-	1,834	1,834-1,846			
Initial gas content (MSCF/ac.-ft.)						
Formation	Monterey	Monterey	Monterey			
Geologic age	Miocene	Miocene	Miocene			
Average depth (ft.)	2,100	2,000	2,400			
Average net thickness (ft.)	170	150	120			
Maximum productive area (acres)						4,320
RESERVOIR ROCK PROPERTIES						
Porosity (%)	23-38	23-37	34-39			
S_{oi} (%)	-	63-73	68-73			
S_{wi} (%)	18-30	27-37	27-32			
S_{gi} (%)	70-82	-	-			
Permeability to air (md)	2,000-6,000	2,000-3,000	4,000-8,000			
RESERVOIR FLUID PROPERTIES						
Oil:						
Oil gravity (°API)	-	9-11	13			
Sulfur content (% by wt.)	-	2.02-2.37	2.25			
Initial solution GOR (SCF/STB)	-	63	-			
Initial oil FVF (RB/STB)	-	1.05	1.05			
Bubble point press. (psia)						
Viscosity (cp) @ °F	-	195 @ 180	3,100 @125			
Gas:						
Specific gravity (air = 1.0)	1,000	1,000	-			
Heating value (Btu/cu. ft.)						
Water:						
Salinity, NaCl (ppm)	6,000	6,000	1,700			
T.D.S. (ppm)	-	-	4,300			
R_w (ohm/m) (77°F)						
ENHANCED RECOVERY PROJECTS						

	ENHANCED RECOVERY PROJECTS					
Enhanced recovery projects		fireflood	steamflood			
Date started		1963	1966			
Date discontinued		1976	active			
		steamflood	cyclic steam			
		1967	1963			
		active	active			
		cyclic steam	waterflood			
		1964	1984			
		active	active			
		gas injection	fireflood			
		1955	1959			
		1955	1984			
Peak oil production (bbl)						18,112,807
Year						1967
Peak gas production, net (Mcf)						
Year						

Base of fresh water (ft.): 1,000

Remarks: The zone underlying the Lombardi in the eastern portion of the area was originally named Orradre. Subsequent development work showed Aurignac and Orradre to be the same zone. The main area was originally divided into the "Aurignac" area to the west, the "Campbell" area and the "Superior" area to the east. Santa Margarita zone pressure exceeds normal hydrostatic pressure in portions of this area.
a/ Directional well; true vertical depth is 4,953 feet.

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DATE: January 1989

CALIFORNIA DIVISION OF OIL AND GAS

COUNTY: MONTEREY

SAN ARDO OIL FIELD
NORTH AREA (ABD)

DISCOVERY WELL AND DEEPEST WELL

	Present operator and well designation	Original operator and well designation	Sec. T. & R.	B.&M.	Total depth (feet)	Pool (zone)	Strata & age at total depth
Discovery well	Texaco Inc. "N.L.U." 1	The Texas Co. "Lombardi" 1	27 22S 10E	MD	2,158	Lombardi	
Deepest well	Texaco Inc. "Rosenberg (NCT-1)" 174	The Texas Co. "Rosenberg (NCT-1)" 174	28 22S 10E	MD	2,781		Jurassic

POOL DATA

ITEM	LOMBARDI					FIELD OR AREA DATA
Discovery date	November 1947					
Initial production rates						
Oil (bbl/day)	155					
Gas (Mcf/day)						
Flow pressure (psi)						
Bean size (in.)						
Initial reservoir pressure (psi)	828					
Reservoir temperature (°F)	108					
Initial oil content (STB/ac.-ft.)	1,746					
Initial gas content (MSCF/ac.-ft.)						
Formation	Monterey					
Geologic age	Miocene					
Average depth (ft.)	2,100					
Average net thickness (ft.)	40					
Maximum productive area (acres)	70					
RESERVOIR ROCK PROPERTIES						
Porosity (%)	23-38					
So_i (%)	61					
Sw_i (%)	39					
Sg_i (%)						
Permeability to air (md)	2,000-8,000					
RESERVOIR FLUID PROPERTIES						
Oil:						
Oil gravity (°API)	10-13					
Sulfur content (% by wt.)	2.37					
Initial solution GOR (SCF/STB)	80					
Initial oil FVF (RB/STB)	1.055					
Bubble point press. (psia)						
Viscosity (cp) @ °F	11,000 @ 100					
Gas:						
Specific gravity (air = 1.0)						
Heating value (Btu/cu. ft.)						
Water:						
Salinity, NaCl (ppm)	6,000					
T.D.S. (ppm)						
R_w (ohm/m) (77°F)						
ENHANCED RECOVERY PROJECTS						

	ENHANCED RECOVERY PROJECTS					
Enhanced recovery projects	fireflood					
Date started	1963					
Date discontinued	1967					
	cyclic steam					
	1964					
	1966					
Peak oil production (bbl)	71,460					
Year	1967					
Peak gas production, net (Mcf)						
Year						

Base of fresh water (ft.): 950

Remarks: The North area was originally referred to as the Lombardi or North Lombardi area. The area was abandoned in 1986. Cumulative production is 306,000 bbl of oil. Santa Margarita zone pressure exceeds normal hydrostatic pressure.

Selected References:

Dolman, S.G., 1947, Operations in District No. 3: Calif. Div. of Oil and Gas, Summary of Operations--Calif. Oil Fields, Vol. 33, No. 2.
Hart, E.W., 1963, Mines and Mineral Resources of Monterey County, Calif.: Div. of Mines and Geology, County Report No. 5, p. 77.
Vander Leck, L., 1921, Petroleum Resources of California: Calif. State Mining Bureau Bull. 89, p. 90.

Field Index

(https://www.aeraenergy.com)

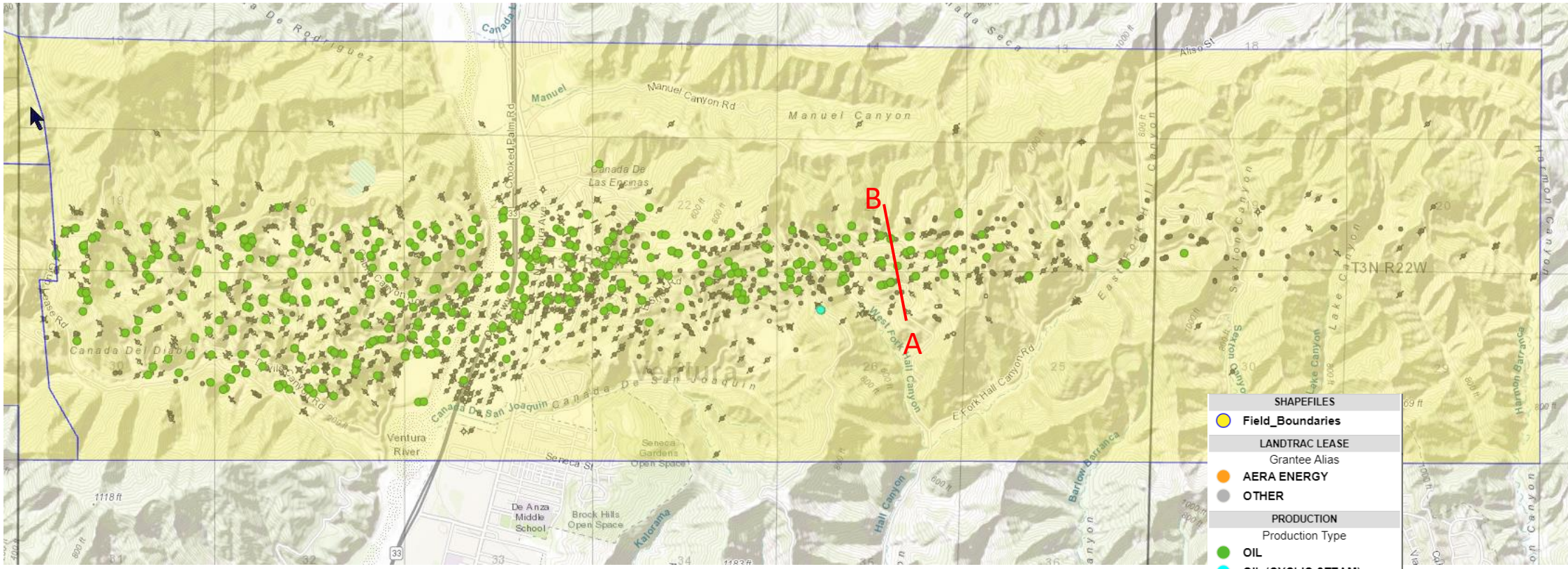
Ventura

Aera is the largest onshore oil producer in Ventura County

Aera is the largest onshore oil producer in Ventura County, with oil and gas operations covering approximately 4,300 acres located largely in an unincorporated area just to the northwest of the city of Ventura. Production averages 12,000 barrels per day of crude oil and seven mmcf per day of natural gas. Oil is transported to refineries in the Los Angeles basin; natural gas is shipped to Southern California Gas Co.

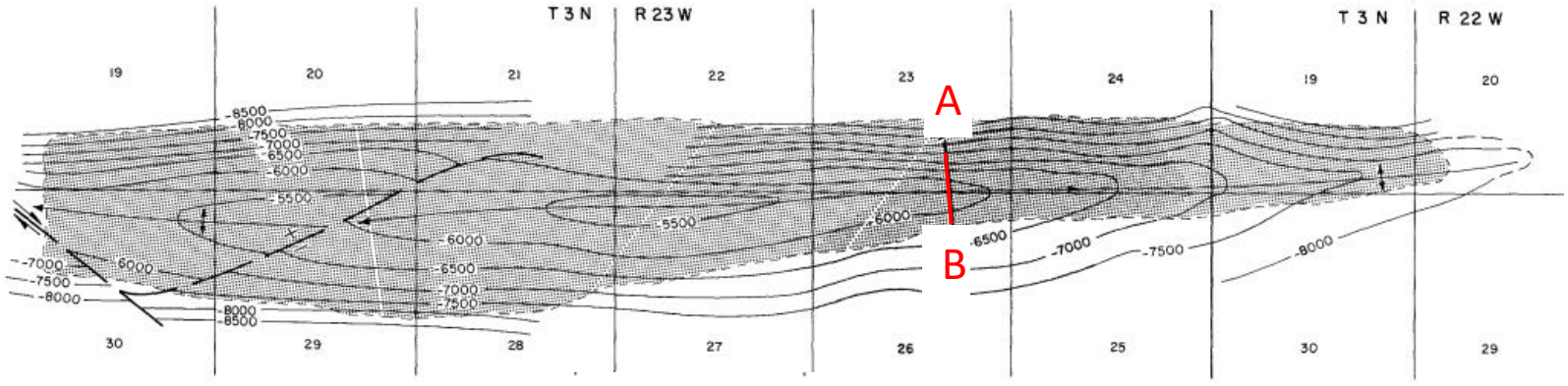
Aera and its forerunner companies have been actively producing crude oil in Ventura County since the 1920s. Much of the operation is now in secondary recovery water injection.

Aera and its employees in Ventura are actively involved in the local community. Our company is a longtime member of both the Ventura Chamber of Commerce and the Ventura County Economic Development Association.



Ventura County

Active Oil and Cyclic Steam wells are colored light green and blue



CONTOURS ON AO ELECTRIC LOG MARKER
SCALE 1" = 4800'

COURTESY OF SHELL OIL COMPANY AND PACIFIC SECTION, AAPG

COUNTY: VENTURA

VENTURA OIL FIELD

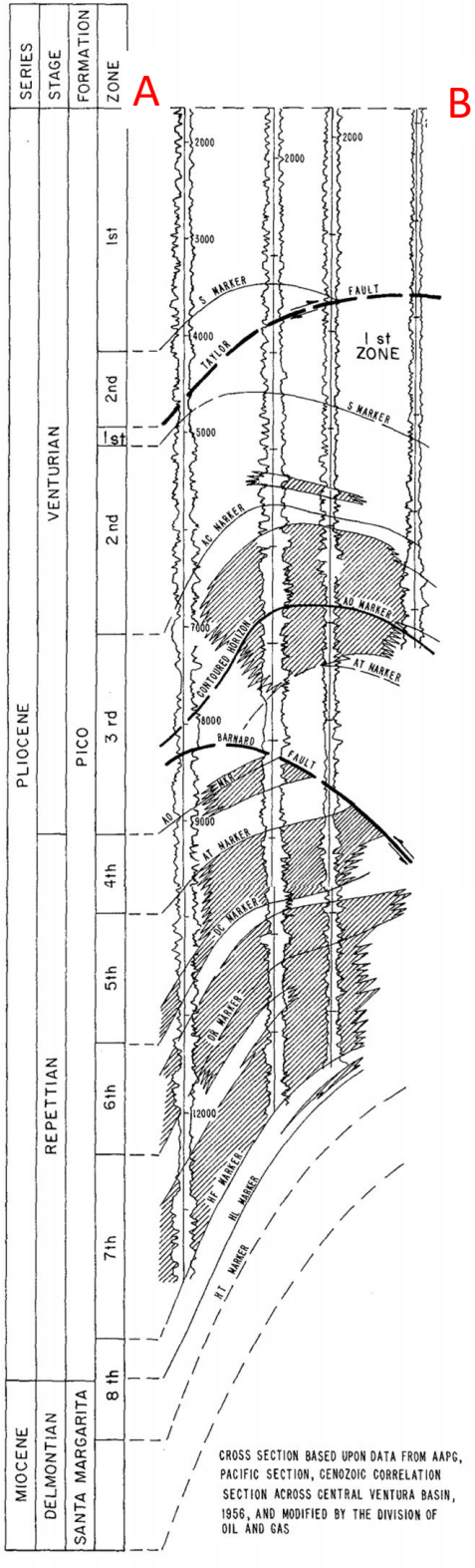
Sheet 1 of 2

DISCOVERY WELL AND DEEPEST WELL

	Present operator and well designation	Original operator and well designation	Sec. T. & R.	B.&M.	Total depth (feet)	Pool (zone)	Strata & age at total depth
Discovery well	Shell Western Expl. & Prod. Inc. "Gosnell" 1	Shell Oil Co. "Gosnell" 1	28 3N 23W	SB	3,498	2nd	
Deepest well	Shell Western Expl. & Prod. Inc. "Taylor" P.T. 653	Shell Oil Co. "Taylor" P.T. 653	21 3N 23W	SB	21,500		Monterey Miocene

POOL DATA

ITEM	1ST	2ND	3RD	4TH	5TH	FIELD OR AREA DATA
Discovery date	March 1922	March 1919	December 1924	September 1925	November 1929	
Initial production rates						
Oil (bbl/day)	911	120	560	2,817	883a/	
Gas (Mcf/day)	0	0	0	0	0	
Flow pressure (psi)						
Bean size (in.)						
Initial reservoir pressure (psi)	-	2,600	4,000	5,350	5,860	
Reservoir temperature (°F)	-	145	180	300	215	
Initial oil content (STB/ac.-ft.)	-	780	620	590	640	
Initial gas content (MSCF/ac.-ft.)						
Formation	Pico	Pico	Pico	Pico	Pico	
Geologic age	Pliocene	Pliocene	Pliocene	Pliocene	Pliocene	
Average depth (ft.)	3,680	5,180	7,815	9,150	10,140	
Average net thickness (ft.)	250	1,170	960	650	670	
Maximum productive area (acres)						
RESERVOIR ROCK PROPERTIES						
Porosity (%)	-	20.0	18.0	17.6	17.0	
Soi (%)	-	65	62	61	67	
Swi (%)	-	35	38	39	33	
Sgi (%)						
Permeability to air (md)	-	48.0	17.0	22.3	20.0	
RESERVOIR FLUID PROPERTIES						
Oil:						
Oil gravity (°API)	30	30	30	29	30	
Sulfur content (% by wt.)	1.0	1.0	1.0	1.0	1.0	
Initial solution GOR (SCF/STB)	-	550	750	750	750	
Initial oil FVF (RB/STB)	-	1.29	1.39	1.40	1.39	
Bubble point press. (psia)						
Viscosity (cp) @ °F	-	3.0 @ 145	1.6 @ 180	0.9 @ 300	0.9 @ 215	
Gas:						
Specific gravity (air = 1.0)						
Heating value (Btu/cu. ft.)						
Water:						
Salinity, NaCl (ppm)	21,375	23,085	20,520	22,230	20,178	
T.D.S. (ppm)						
R_w (ohm/m) (77°F)						
ENHANCED RECOVERY PROJECTS						



CROSS SECTION BASED UPON DATA FROM AAPG, PACIFIC SECTION, CENOZOIC CORRELATION SECTION ACROSS CENTRAL VENTURA BASIN, 1956, AND MODIFIED BY THE DIVISION OF OIL AND GAS

	ENHANCED RECOVERY PROJECTS					
Enhanced recovery projects		waterflood	waterflood	waterflood	waterflood	
Date started		1956	1968	1969	1966	
Date discontinued		active	active	active	active	
Peak oil production (bbl)						
Year						
Peak gas production, net (Mcf)						
Year						

Base of fresh water (ft.): 250 - 750

Remarks: About 1903, seven gas wells were drilled to depths of 400 - 800 feet and produced gas for a utility company. No other information is available regarding these wells.

a/ Production from the 5th and 6th zones was commingled.

Selected References: Hacker, R.N., 1969, Ventura Avenue Oil Field: Am. Assoc. Petroleum Geologists, Pacific Section, 44th Annual Meeting and Field Trip, pp. 22-29.

DATE: May 1983

CALIFORNIA DIVISION OF OIL AND GAS

COUNTY: VENTURA

VENTURA OIL FIELD

DISCOVERY WELL AND DEEPEST WELL

	Present operator and well designation	Original operator and well designation	Sec. T. & R.	B.&M.	Total depth (feet)	Pool (zone)	Strata & age at total depth
Discovery well							
Deepest well							

POOL DATA

ITEM	6TH	7TH	8TH			FIELD OR AREA DATA
Discovery date	November 1949	September 1937	November 1952			
Initial production rates						
Oil (bbl/day)	-	1,600	1,160			
Gas (Mcf/day)	-	1,355	890			
Flow pressure (psi)						
Bean size (in.)						
Initial reservoir pressure (psi)	6,300	8,000	-			
Reservoir temperature (°F)	230	240	-			
Initial oil content (STB/ac.-ft.)	590	490	-			
Initial gas content (MSCF/ac.-ft.)						
Formation	Pico	Pico	Pico-Santa Margarita			
Geologic age	Pliocene	Pliocene	Pliocene-1 Miocene			
Average depth (ft.)	10,580	12,000	12,010			
Average net thickness (ft.)	650	1,010	870			
Maximum productive area (acres)						3,410
RESERVOIR ROCK PROPERTIES						
Porosity (%)	16	15	-			
So_i (%)	65	58	-			
Sw_i (%)	35	42	-			
Sg_i (%)						
Permeability to air (md)	13.0	8.8	-			
RESERVOIR FLUID PROPERTIES						
Oil:						
Oil gravity (°API)	30	30	30			
Sulfur content (% by wt.)	1.0	1.0	1.0			
Initial solution GOR (SCF/STB)	720	800	-			
Initial oil FVF (RB/STB)	1.37	1.39	-			
Bubble point press. (psia)						
Viscosity (cp) @ °F	0.70 @ 230	0.58 @ 240	-			
Gas:						
Specific gravity (air = 1.0)						
Heating value (Btu/cu. ft.)						
Water:						
Salinity, NaCl (ppm)	20,520	17,100	15,219			
T.D.S. (ppm)						
R_w (ohm/m) (77°F)						
ENHANCED RECOVERY PROJECTS						

	ENHANCED RECOVERY PROJECTS					
Enhanced recovery projects **Date started** **Date discontinued**	waterflood 1966 active	waterflood 1979 active				
Peak oil production (bbl) **Year** **Peak gas production, net (Mcf)** **Year**						31,129,118 1954 60,712,823 1955

Base of fresh water (ft.):

Remarks:

Selected References:

DATE: May 1983

CALIFORNIA DIVISION OF OIL AND GAS

Field Index