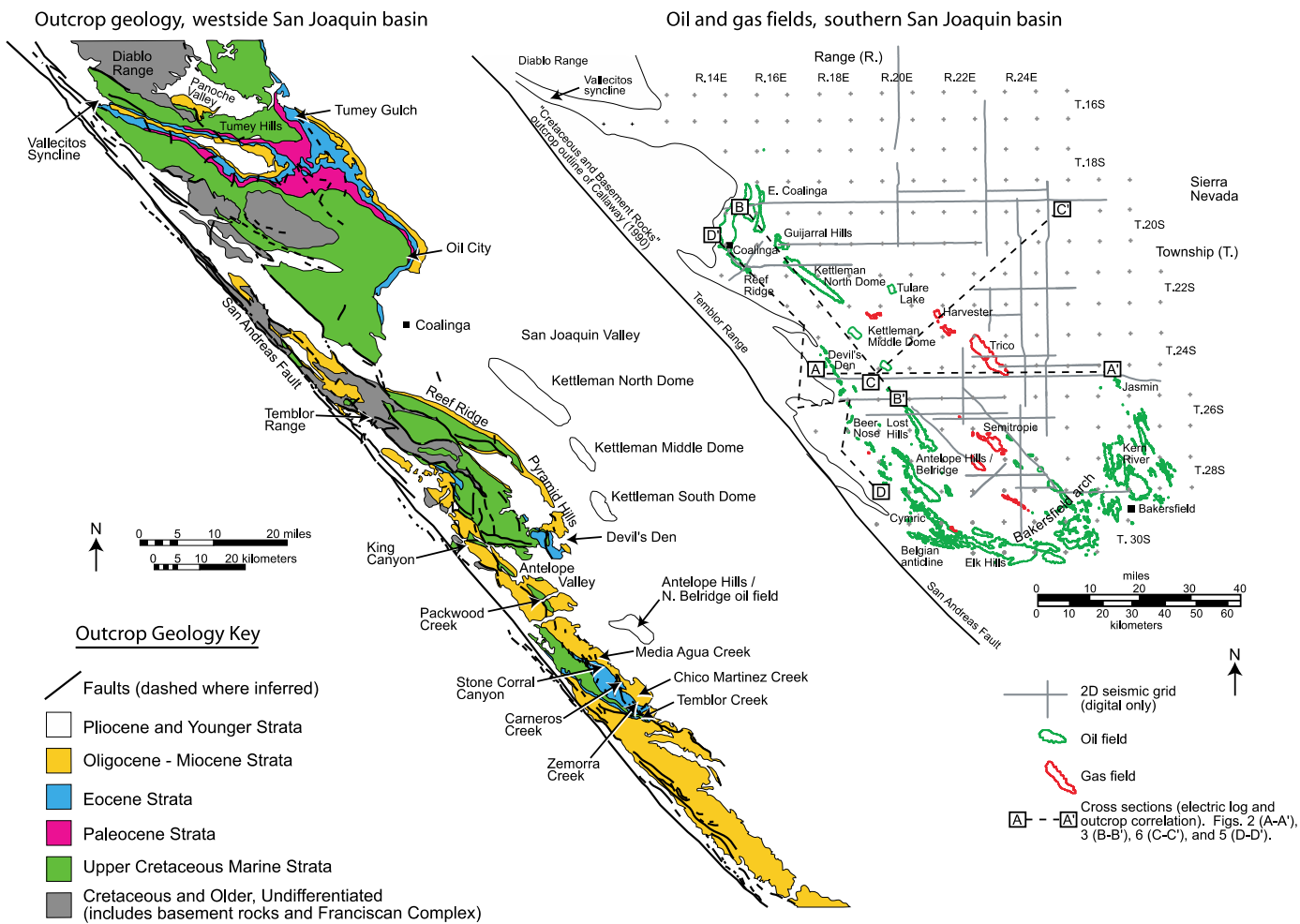


Background information



Johnson and Graham, 2006

SAN JOAQUIN BASIN PROVINCE

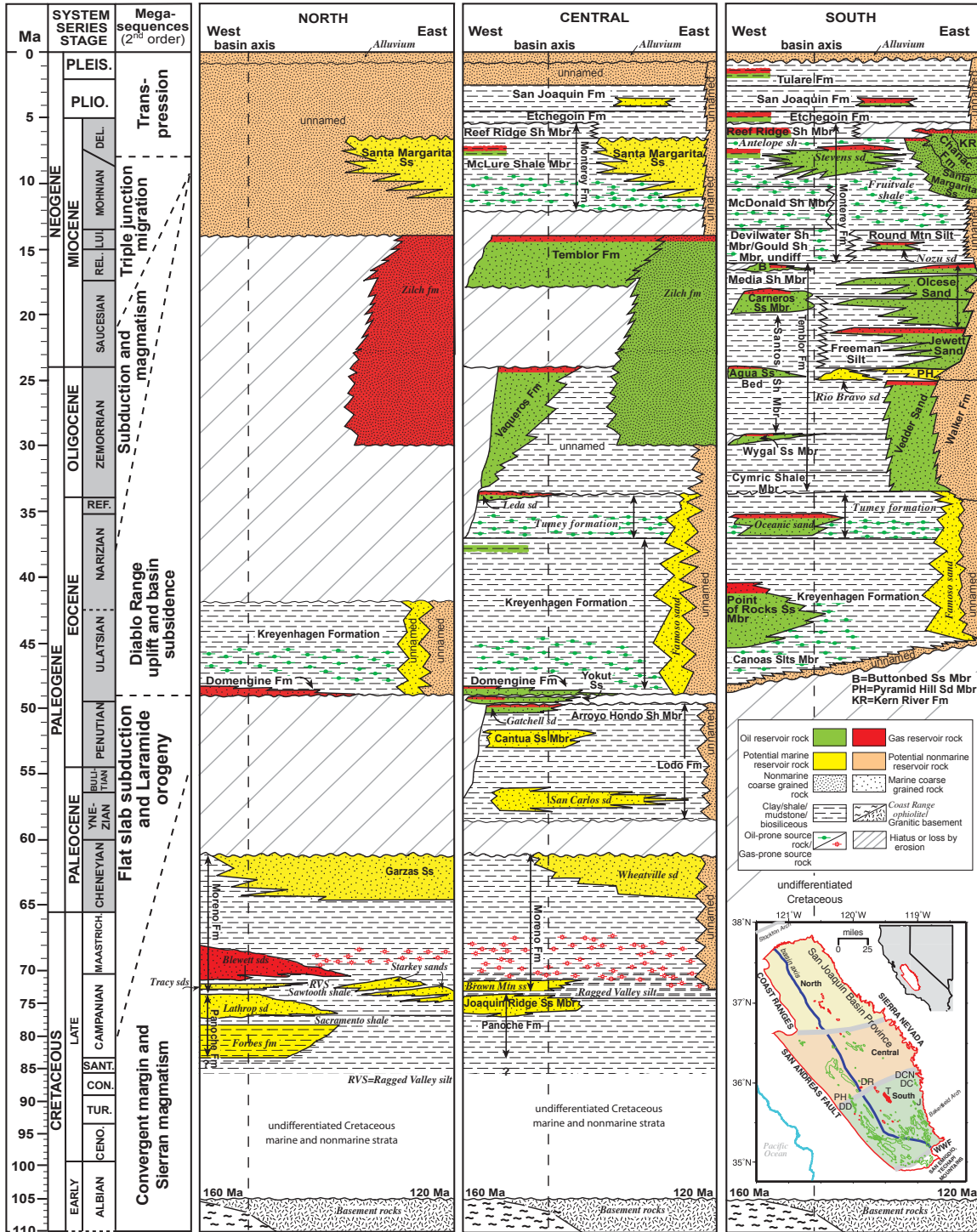
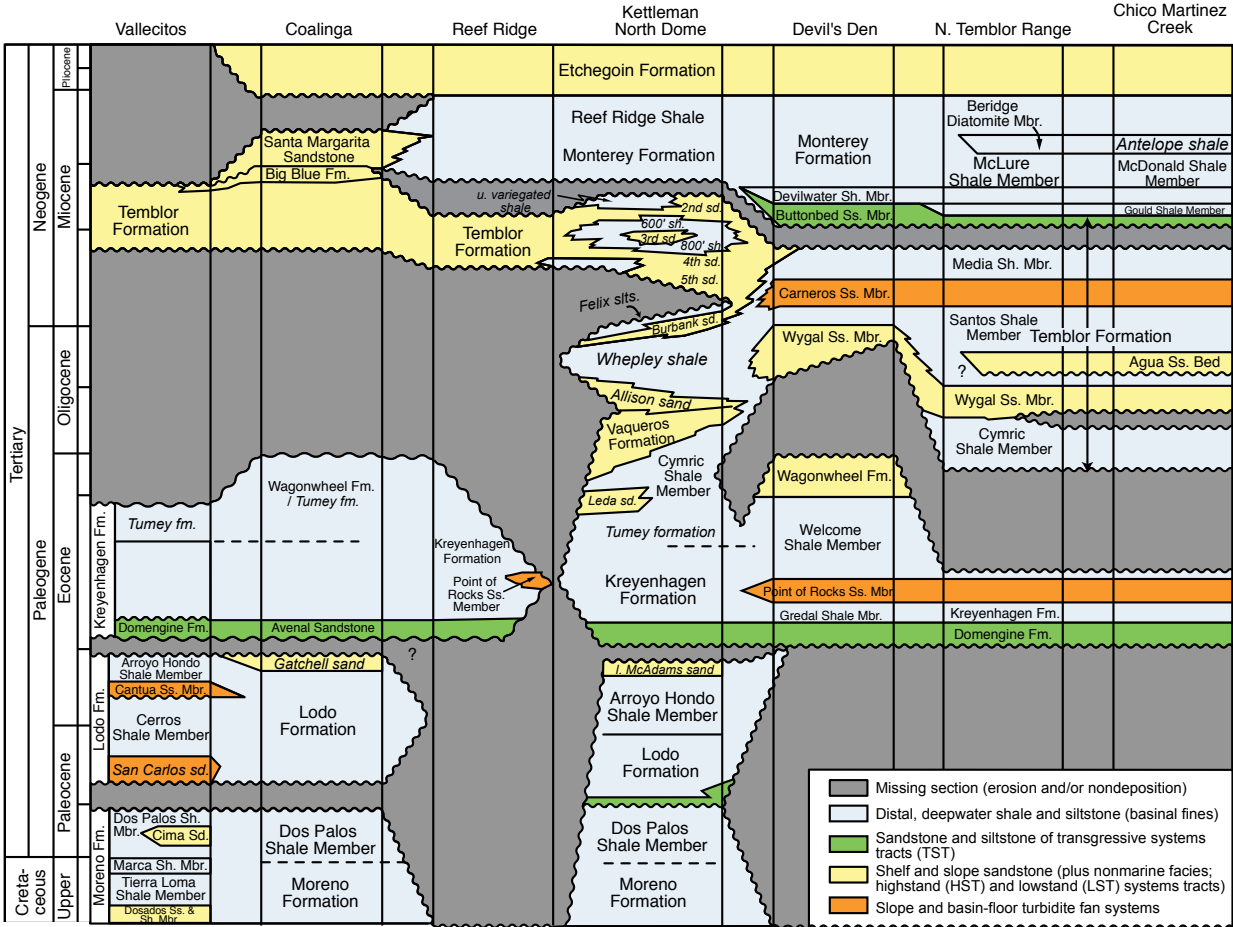


Figure 5.1a

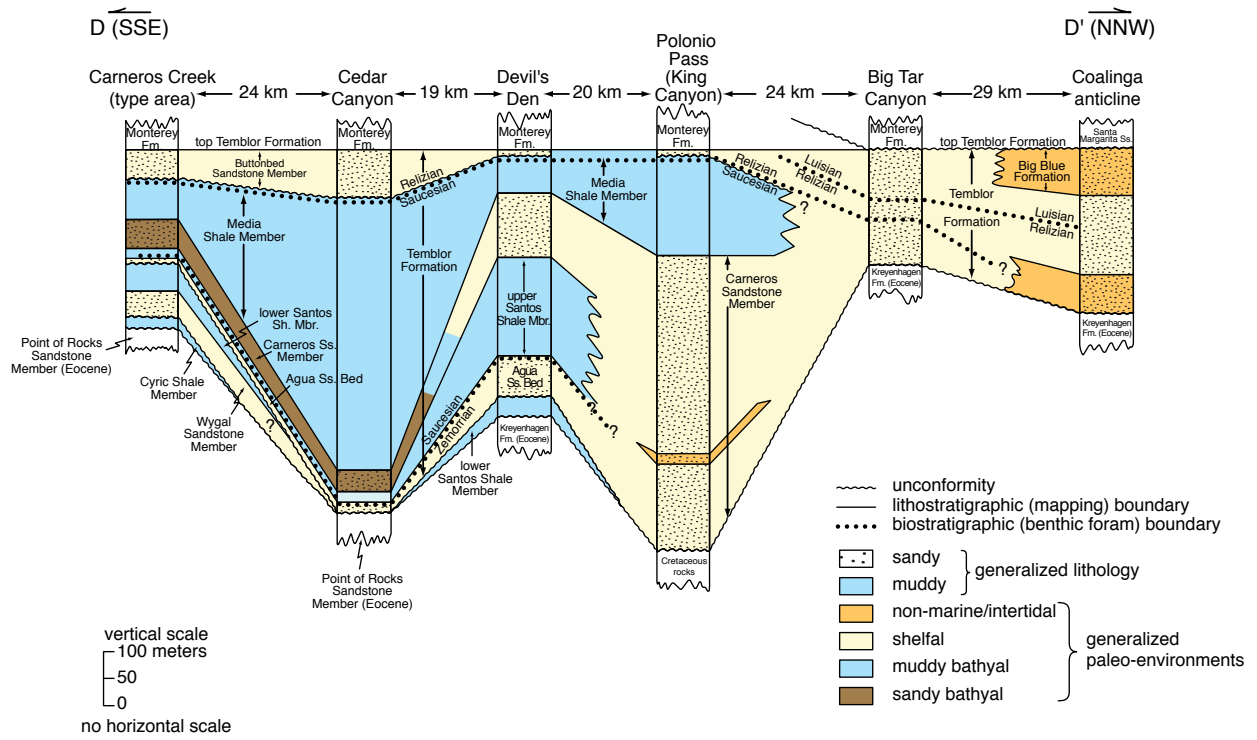
Scheirer and Magoon, 2006

Northwest

Southeast



Johnson & Graham, 2006



Johnson & Graham, 2006

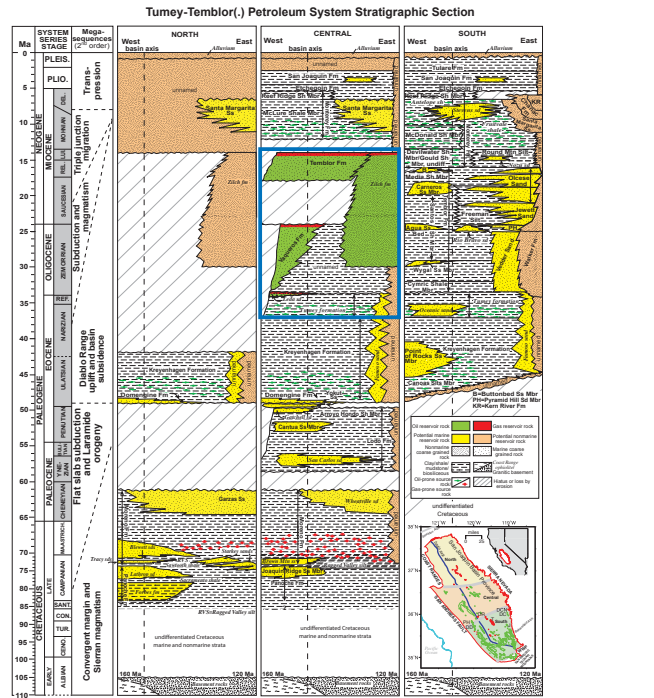
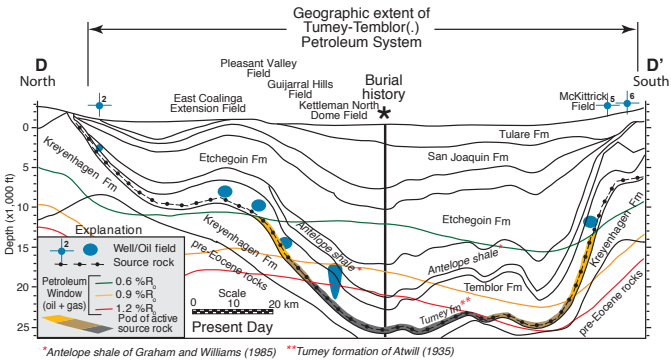
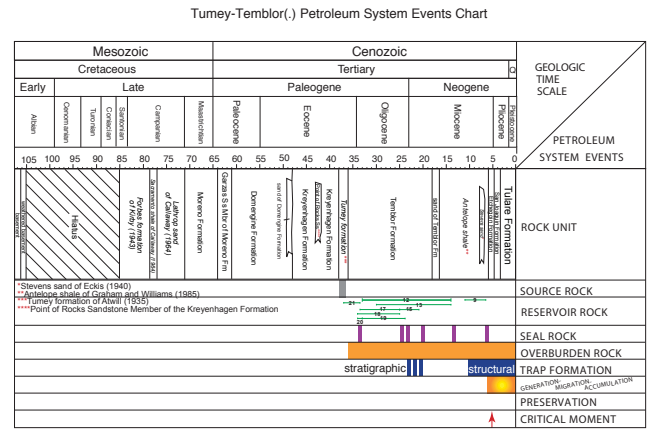
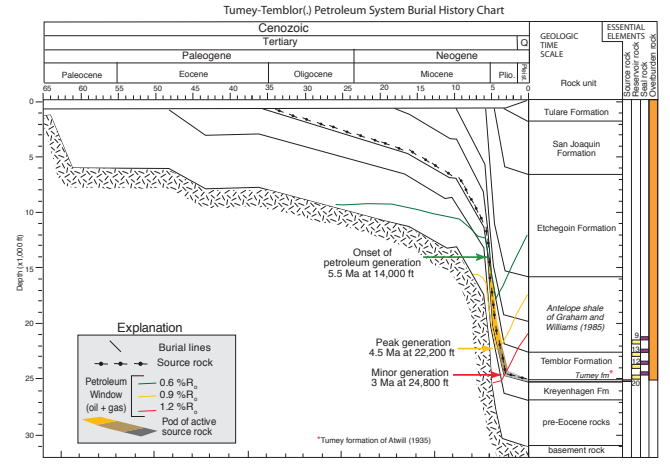
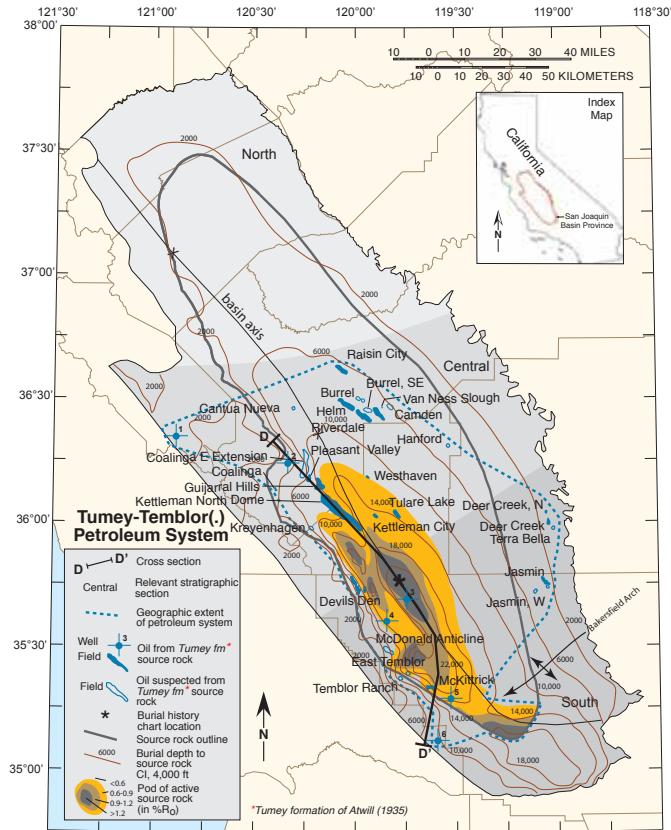


Table 8.8. Tumey-Temblor(.) petroleum system petroleum volumes by reservoir rock. (Data from appendix 8.1 and appendix 8.2. Res No., Reservoir Number corresponding to column 8 in appendix 8.1; Ma, million years ago; EUR Oil, Estimated ultimate recovery of oil; Mbo, thousands of barrels of oil; EUR Gas, Estimated ultimate recovery of gas; MMcf/g, millions of cubic feet of gas; GOR, gas-to-oil ratio; cfb/bo, cubic feet of gas per barrel of oil; Boe, Barrel of oil equivalent; NA, Not Applicable; zz-undesignated, unknown reservoir rock. ** and yellow shading highlight the major reservoir rock for the petroleum system; * and green shading highlight source rock interval for the petroleum system)

Res No.	Reservoir Rock Unit	Age Range (Ma)	Number of Pools	EUR Oil (Mbo)	EUR Gas (MMcf/g)	GOR (cfb/bo)	Oil (%)	Gas (%)	EUR Boe (Mbo)	Boe (%)
9	Santa Margarita Sandstone	11-6.5	3	3,352	7	2	0.5	0.0	3,353	0.3
10	Stevens sand of Eckis (1940)	9.5-7	1	0	0	0	0.0	0.0	0	0.0
12	Tumey Formation**	33-14	32	485,214	1,976,597	4,074	75.2	93.3	814,647	84.3
13	Zich formation of Loken (1959)	30-14	9	78,989	62,500	791	12.9	3.0	89,406	9.3
15	Jewett Sand	25-21	1	2	0	0	0.0	0.0	2	0.0
17	Vedder Sand	33.5-25	1	4,005	5	1	0.7	0.0	4,006	0.4
18	Walker Formation	25-34	1	71	0	0	0.0	0.0	71	0.0
19	Vaqueros Formation	33-24	3	27,339	49,114	1,795	4.5	2.3	35,525	3.7
20	Leda sand of Sullivan (1962)	34-33	2	10,240	22,758	2,222	1.7	1.1	14,033	1.5
21	Tumey formation of Atwill (1935)*	37-33.5	4	173	889	5,139	0.0	0.0	321	0.0
34	zz-undesignated	NA	1	3,617	5,998	1,658	0.6	0.3	4,617	0.5
	Total		58	613,002	2,117,868	3,455	100.0	100.0	965,980	100.0

Tumey-Temblor(.) Folio Sheet

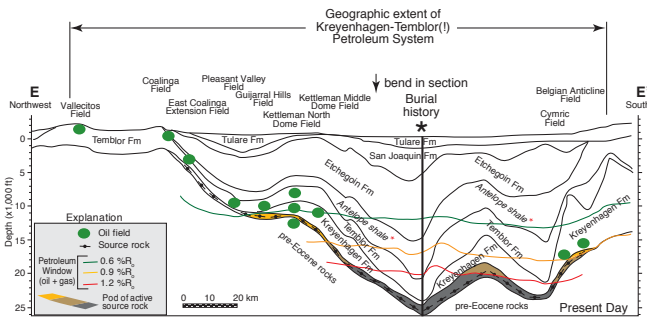
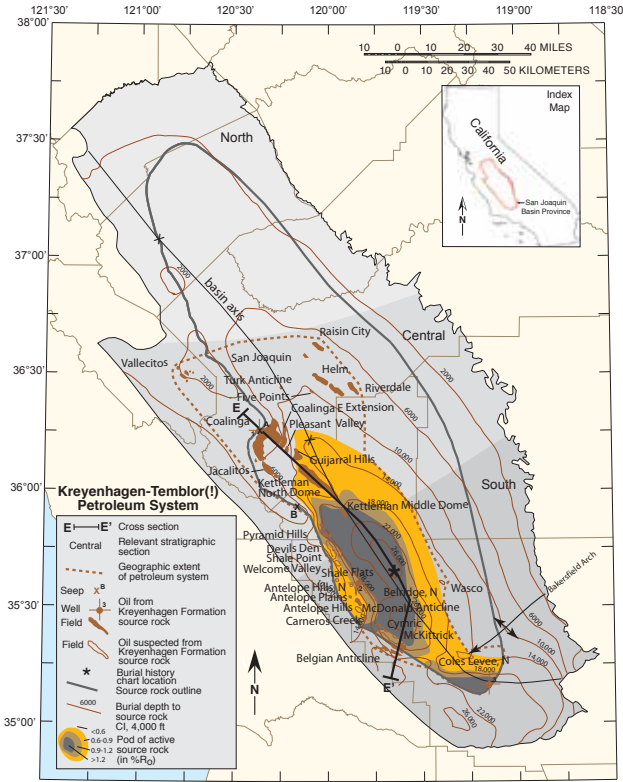
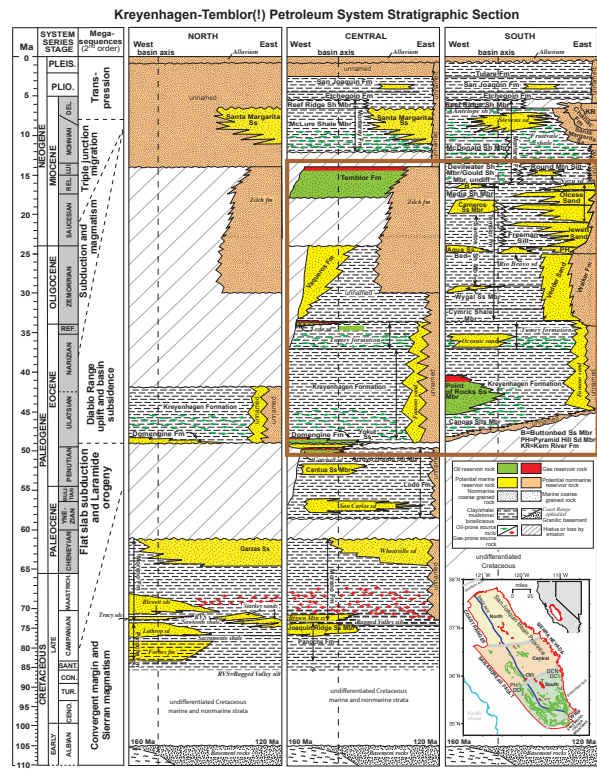
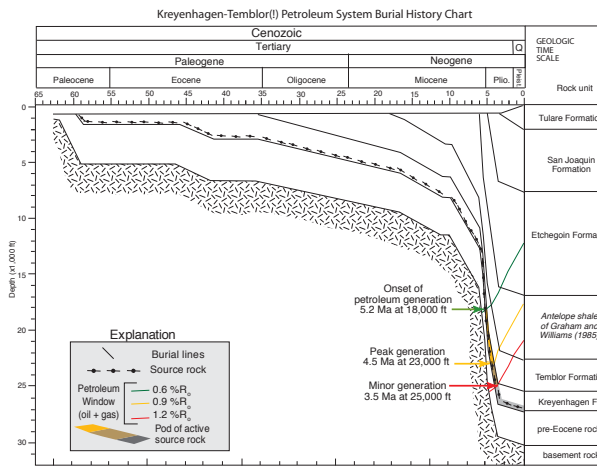
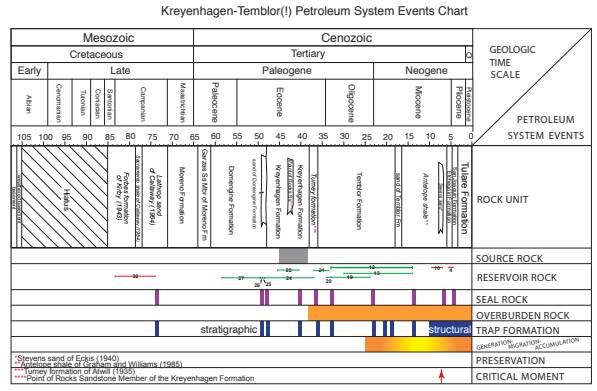


Table 8.9. Kreyenhagen-Temblo(!) petroleum system petroleum volumes by reservoir rock.
 [Data from appendix 8.1 and appendix 8.2. Res No., Reservoir Number corresponding to column 8 in appendix 8.1; Ma, million years ago; EUR Oil, Estimated ultimate recovery of oil; Mbo, thousands of barrels of oil; EUR Gas, Estimated ultimate recovery of gas; MMcf, millions of cubic feet of gas; GOR, gas-to-oil ratio; cftg/bo, cubic feet of gas per barrel of oil; Boe, Barrel of oil equivalent; Ss, Sandstone; Mbr, Member; Fm, Formation; NA, Not Applicable; zz-undesignated, unknown reservoir rock; ** and yellow shading highlight the major reservoir rock for the petroleum system; * and green shading highlight source rock interval for the petroleum system]

Res No.	Reservoir Rock Unit	Age Range (Ma)	Number of Pools	EUR Oil (Mbo)	EUR Gas (MMcf)	GOR (cftg/bo)	Oil (%)	Gas (%)	EUR Boe (Mbo)	Boe (%)
4	Etchegon Formation	5.5-4.5	2	3	403	134,333	0.0	0.0	70	0.0
10	Stevens sand of Ekls (1940)	9.5-7	2	0	586	NA	0.0	0.0	98	0.0
12	Temblo Formation**	33-14	23	1,069,169	906,423	848	60.2	30.0	1,220,240	53.5
13	Zlich formation of Loken (1959)	30-14	2	784	1,247	1,591	0.0	0.0	992	0.0
19	Vaqueros Formation	33-24	1	2	12	6,000	0.0	0.0	4	0.0
20	Leda sand of Sullivan (1962)	34-33	2	23,702	32,704	1,380	1.3	1.1	29,153	1.3
21	Tumey formation of Atwill (1935)	37-33.5	8	31,886	94,172	2,953	1.8	3.1	47,581	2.1
22	Point of Rocks Ss Mbr, Kreyenhagen Fm	45.5-40.5	26	15,069	82,994	5,508	0.8	2.7	28,901	1.3
24	Kreyenhagen Formation**	48.5-37	4	761	848	1,114	0.0	0.0	902	0.0
25	Domengine Formation	49-48.5	6	23,555	74,105	3,146	1.3	2.5	35,906	1.6
26	Yokut Sandstone	49.5-49	3	5,351	5,622	1,051	0.3	0.2	6,288	0.3
27	Lodo Formation	58.5-49.5	16	556,719	1,661,893	2,985	31.3	55.0	833,701	36.6
30	Moreno Formation	71-61	1	0	0	0	0.0	0.0	0	0.0
32	Panoche Formation	83.5-74	1	0	8	NA	0.0	0.0	1	0.0
34	zz-undesignated	NA	2	49,710	159,610	3,211	2.8	5.3	76,312	3.3
	Total		99	1,776,710	3,020,627	1,700	100.0	100.0	2,280,149	100.0

Kreyenhagen-Temblo(!) Folio Sheet



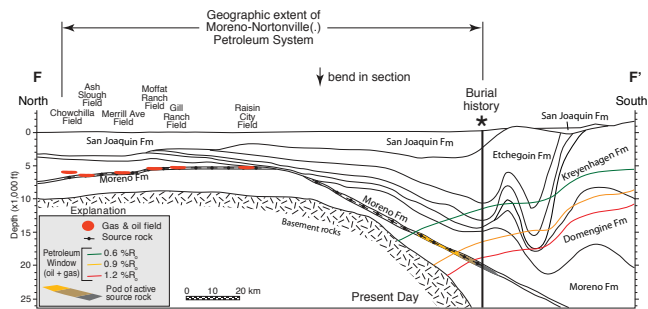
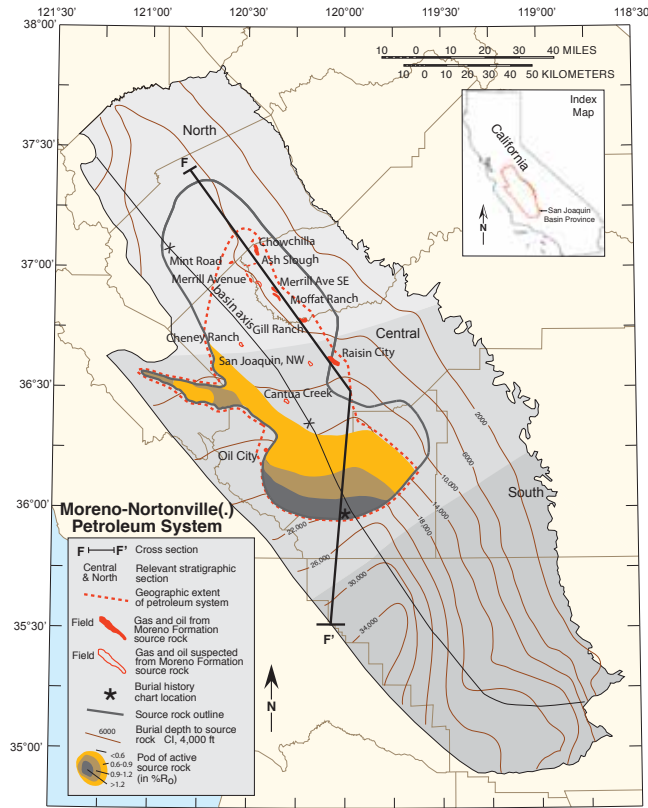
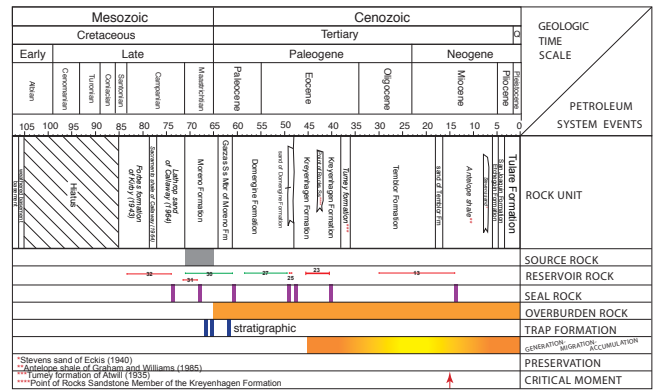


Table 8.10. Moreno-Nortonville(.) petroleum system gas and oil volumes by reservoir rock. (Data from appendix 8.1 and appendix 8.2. Res No., Reservoir Number corresponding to column 8 in appendix 8.1; Ma, million years ago; EUR Oil, Estimated ultimate recovery of oil; Mbo, thousands of barrels of oil; EUR Gas, Estimated ultimate recovery of gas; MMcf/g, millions of cubic feet of gas; GOR, gas-to-oil ratio; cftg/bo, cubic feet of gas per barrel of oil; Boe, Barrel of oil equivalent; NA, Not Applicable. ** and yellow shading highlight the major reservoir rock for the petroleum system; * and pink shading highlight source rock interval for the petroleum system)

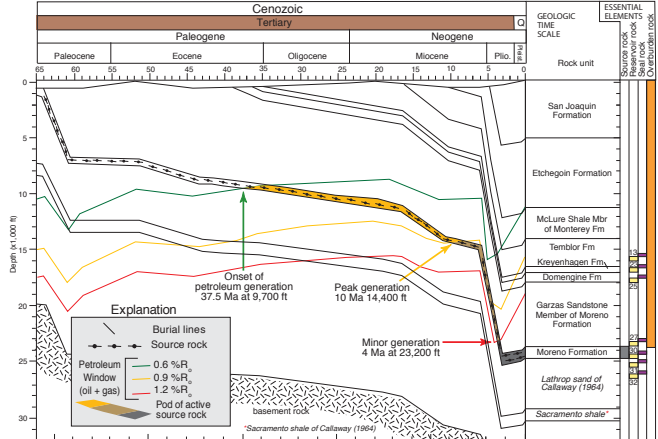
Res No.	Reservoir Rock Unit	Age Range (Ma)	Number of Pools	EUR Oil (Mbo)	EUR Gas (MMcf/g)	GOR (cftg/bo)	Oil (%)	Gas (%)	EUR Boe (Mbo)	Boe (%)
13	Zlich formation of Loken (1959)	30-14	3	0	5,968	NA	0.0	3.3	995	3.2
23	Nortonville sand of Frame (1950)**	45.5-40.5	4	0	74,067	NA	0.0	40.5	12,345	40.3
25	Domingue Formation	49-45.5	2	0	2,435	NA	0.0	1.3	406	1.3
27	Lodo Formation	58.5-49.5	1	40	801	20,025	25.3	0.4	174	0.6
30	Moreno Formation*	71-61	4	118	4742	40,186	74.7	2.6	908	3.0
31	Blewett sands of Hoffman (1964)	71.5-68.5	4	0	3,4905	NA	0.0	19.1	9,818	19.0
32	Panoche Formation	83.5-74	3	0	59,856	NA	0.0	32.7	9,976	32.6
	Total		21	158	182,774	1,156,797	100.0	100.0	30620	100.0

Moreno-Nortonville(.) Folio Sheet

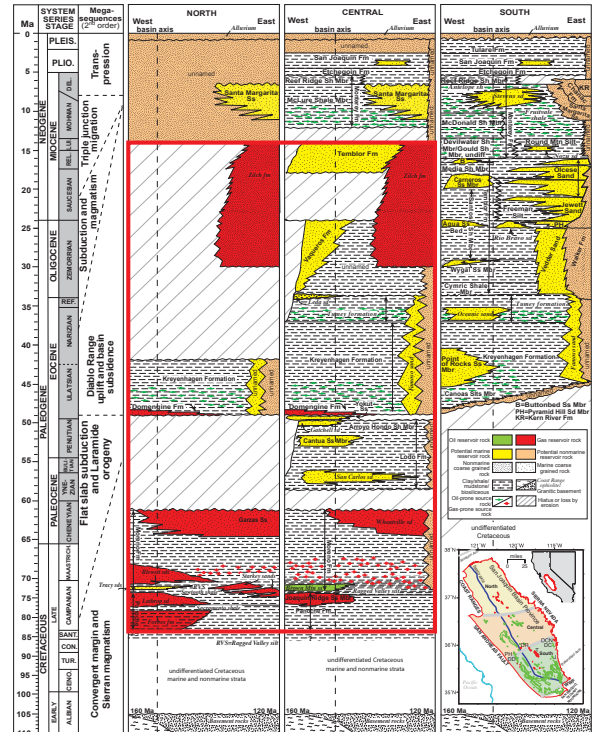
Moreno-Nortonville(.) Petroleum System Events Chart

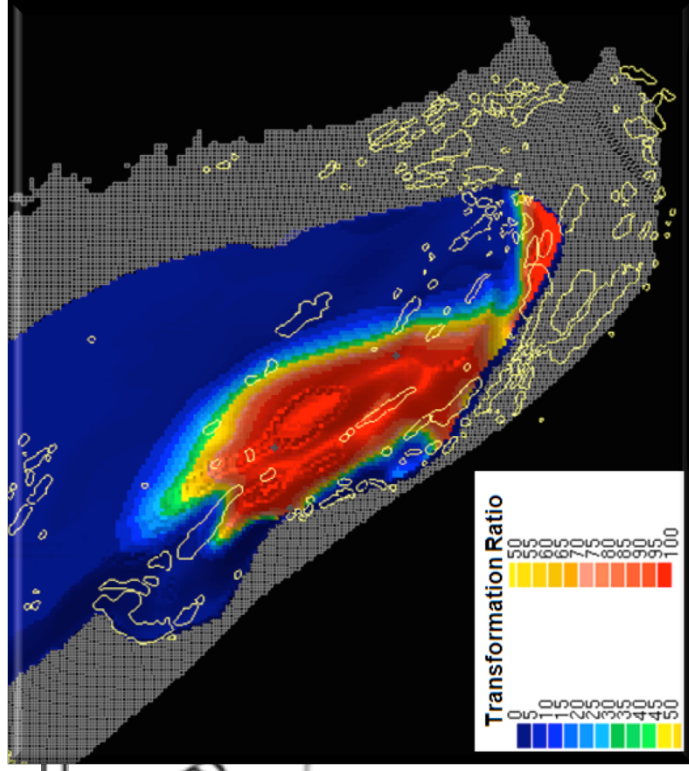


Moreno-Nortonville(.) Petroleum System Burial History Chart

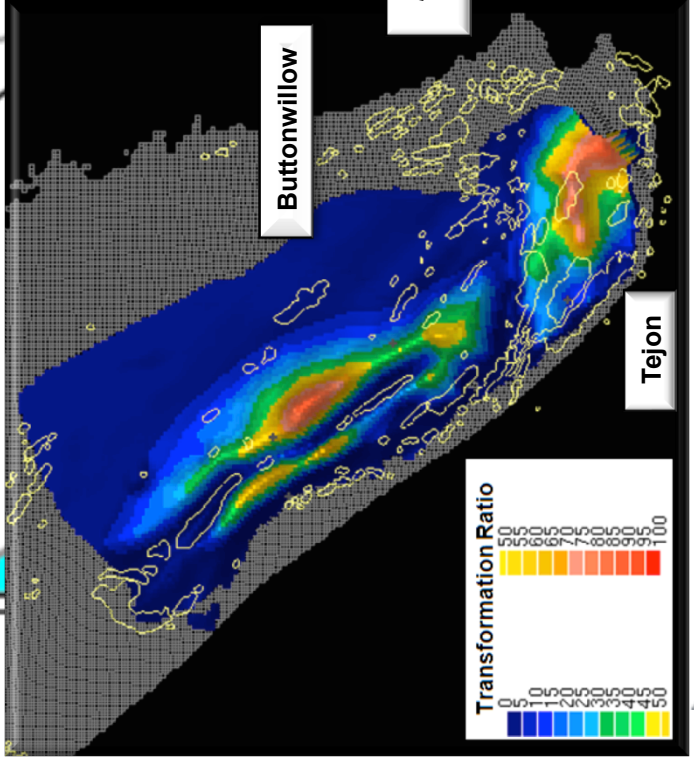
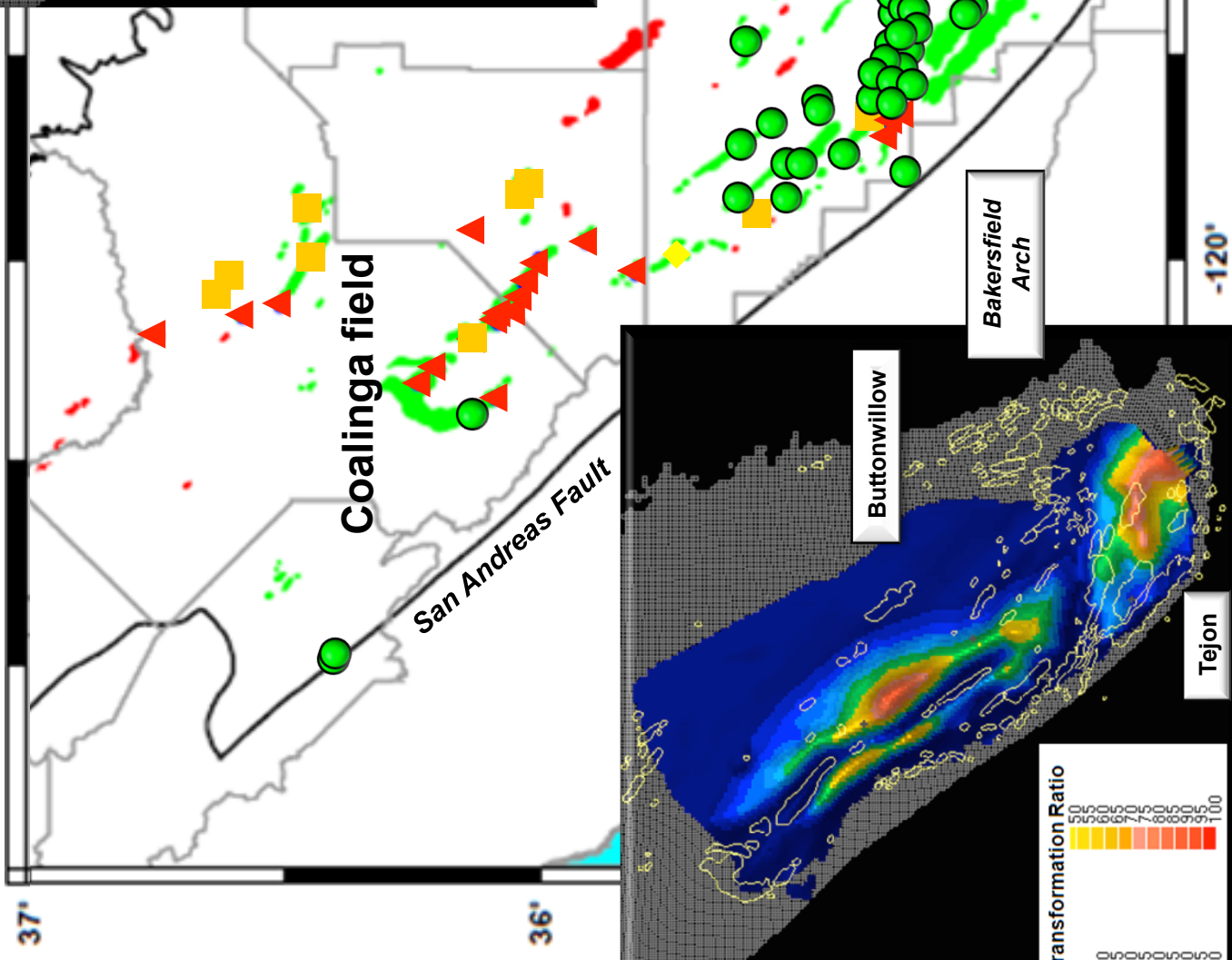


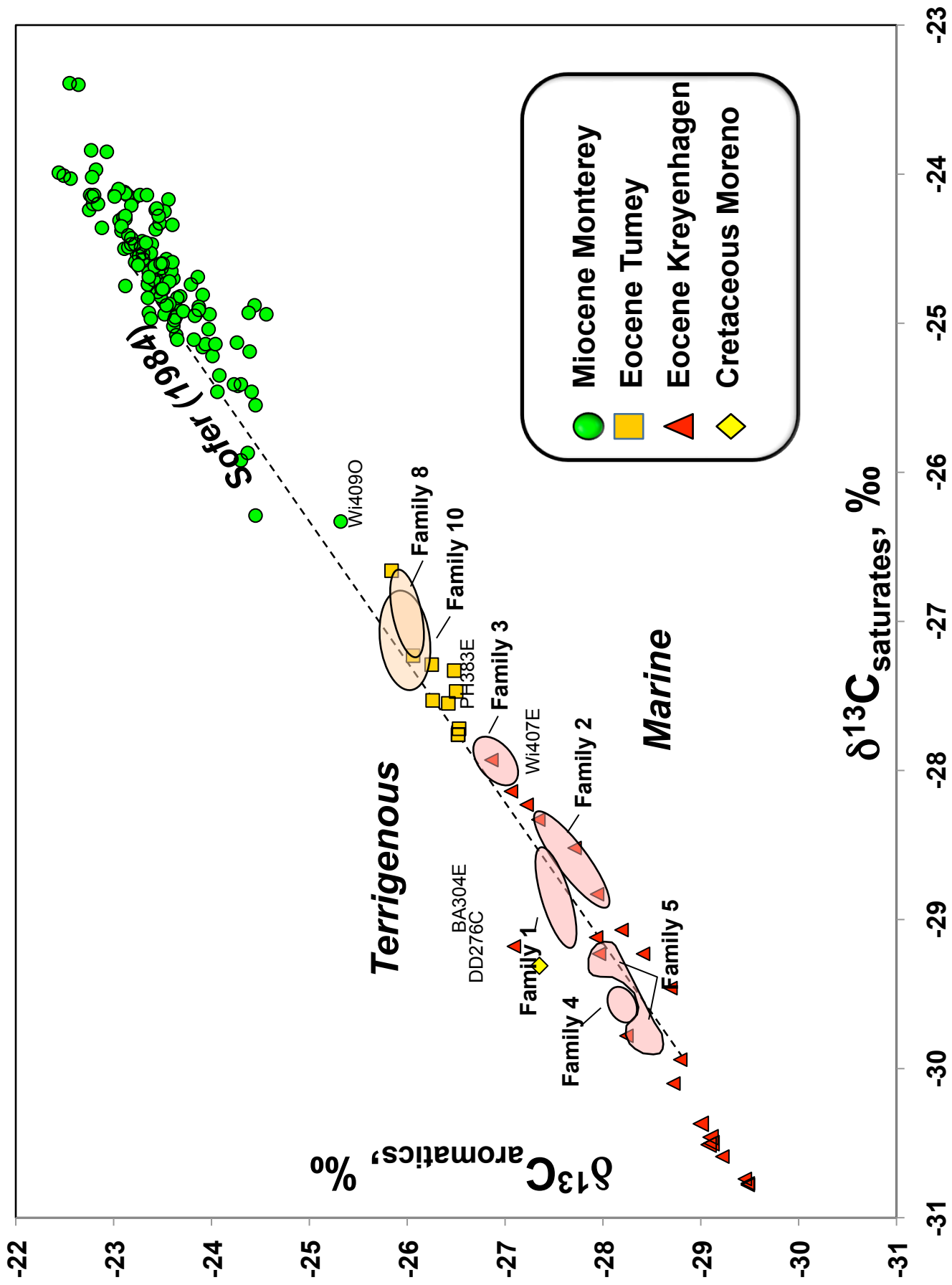
Moreno-Nortonville(.) Petroleum System Stratigraphic Section



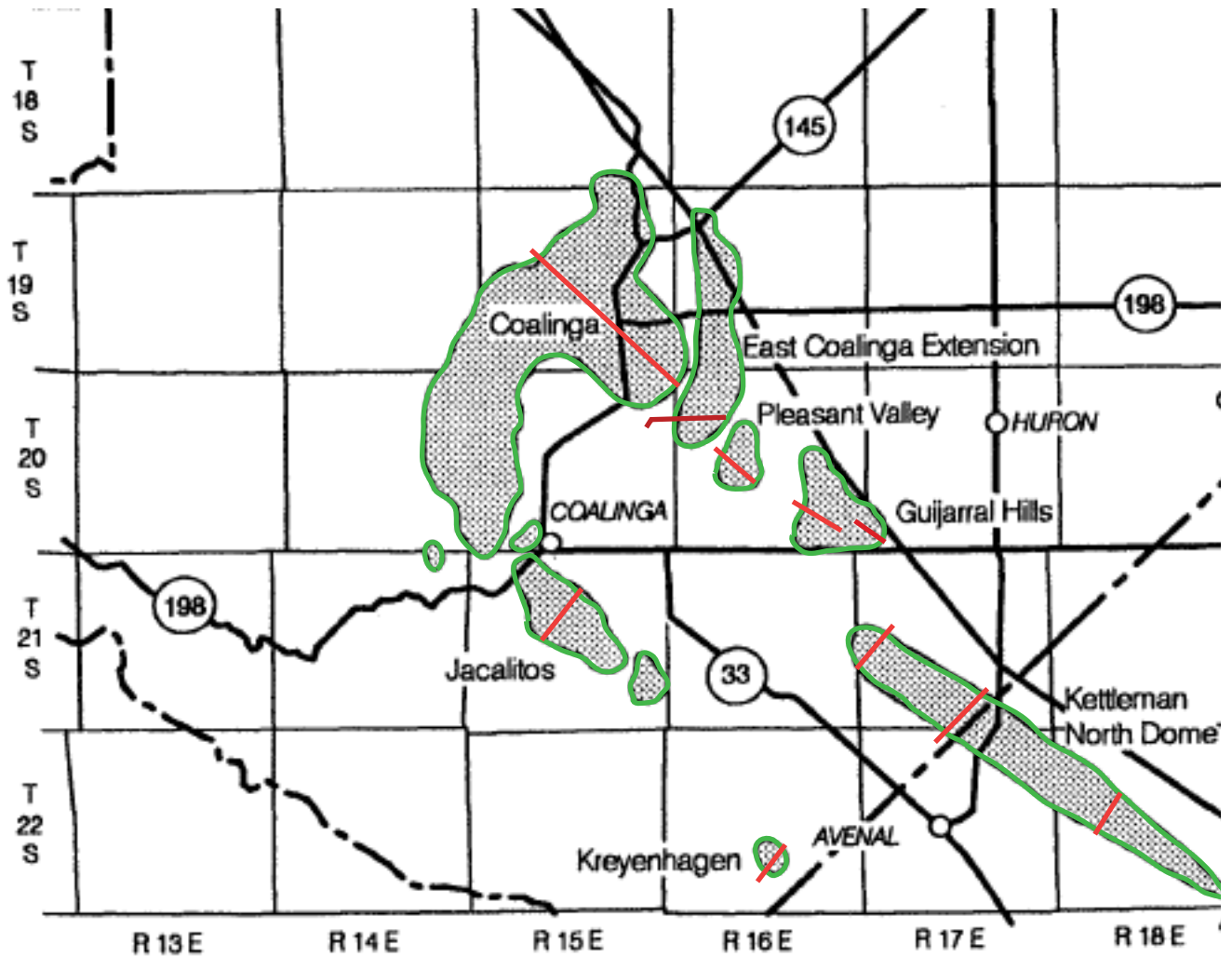


- Miocene Monterey
- Eocene Tumej
- Eocene
- Kreyenhagen
- Cretaceous Moreno





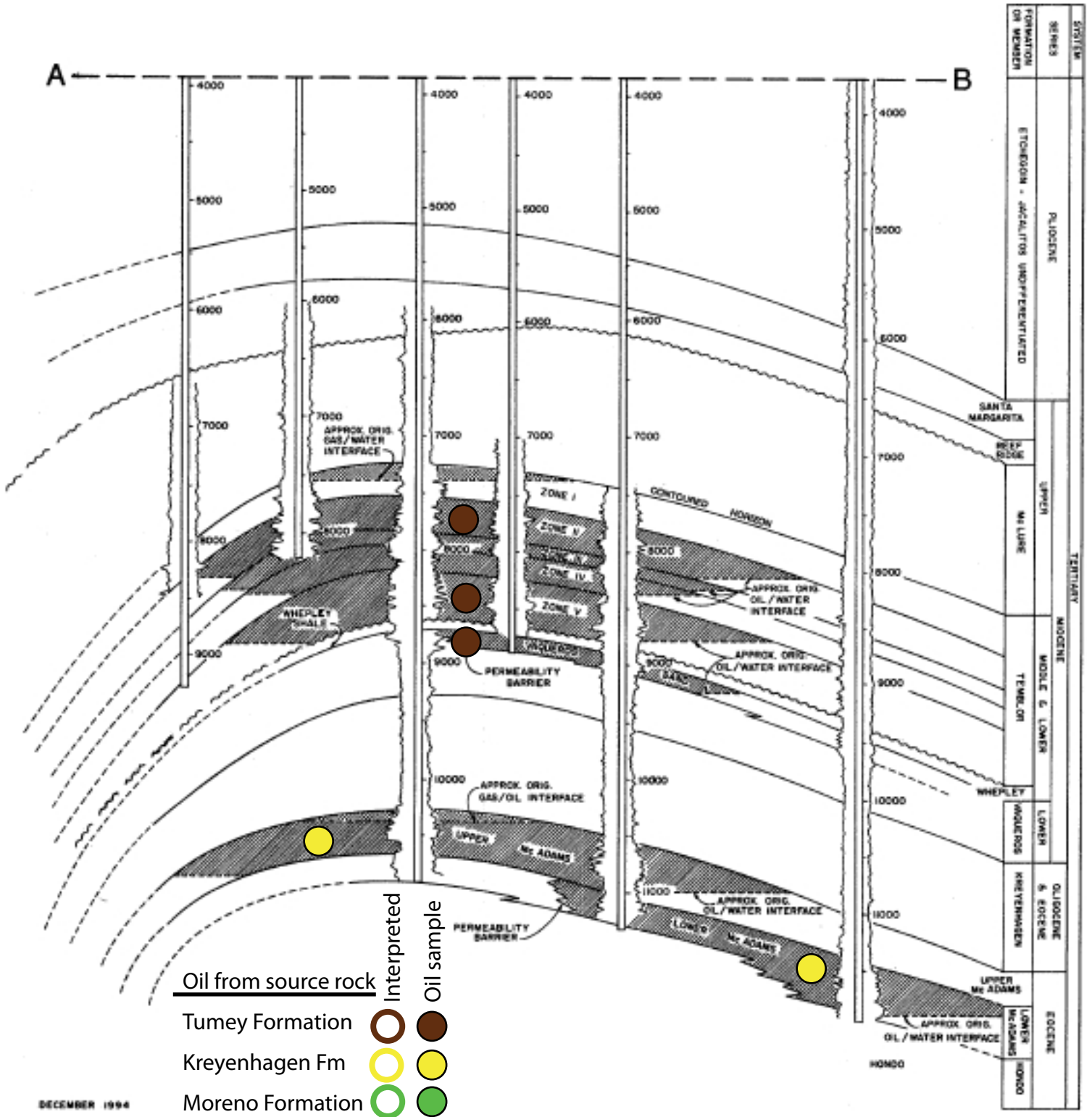
Oil Types on Oil Field Maps and Cross Sections



Three oil types are shown on the field maps and cross sections above to demonstrate the migration route of the petroleum from the Buttonwillow deep to the Coalinga field. The farthest south field, Kettleman North Dome is first followed by Gujarral Hills, Pleasant Valley, East Coalinga Extension and ends with the Coalinga field. Jacalitos and Kreyenhagen fields are on this migration path to Coalinga.

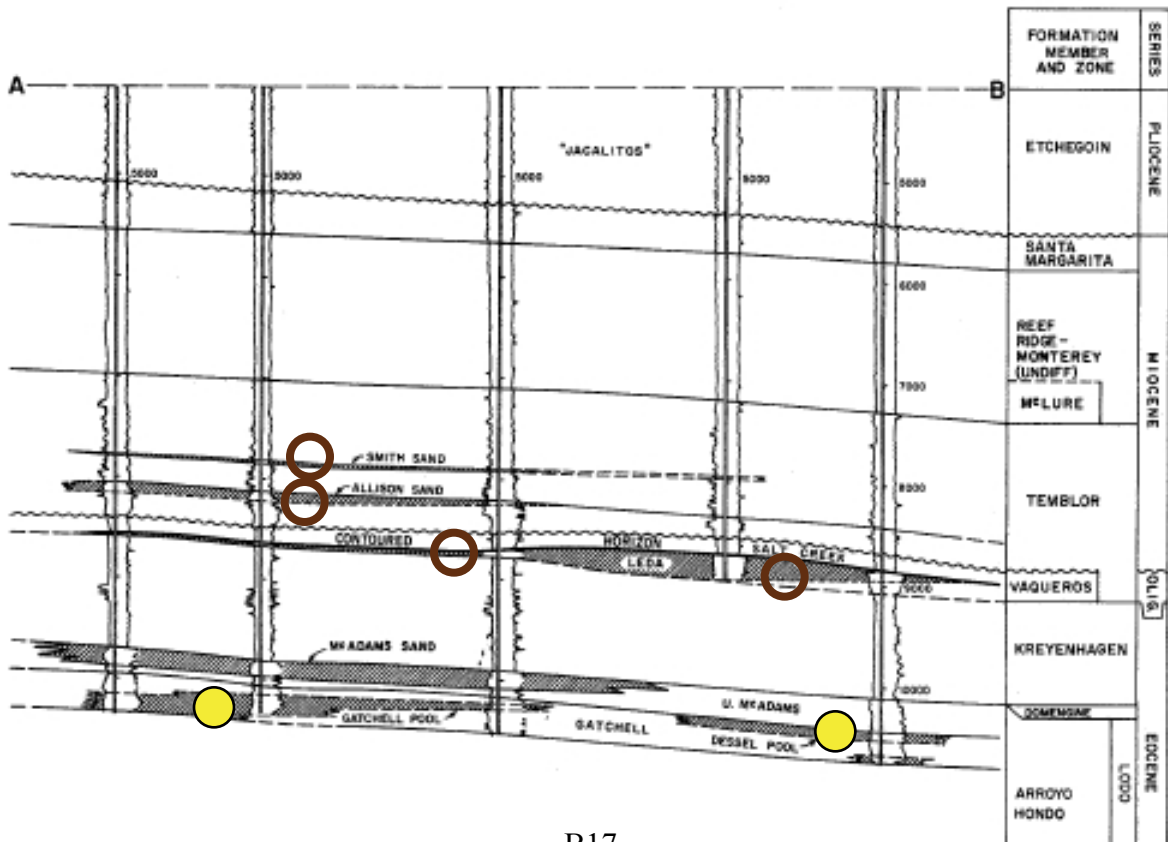
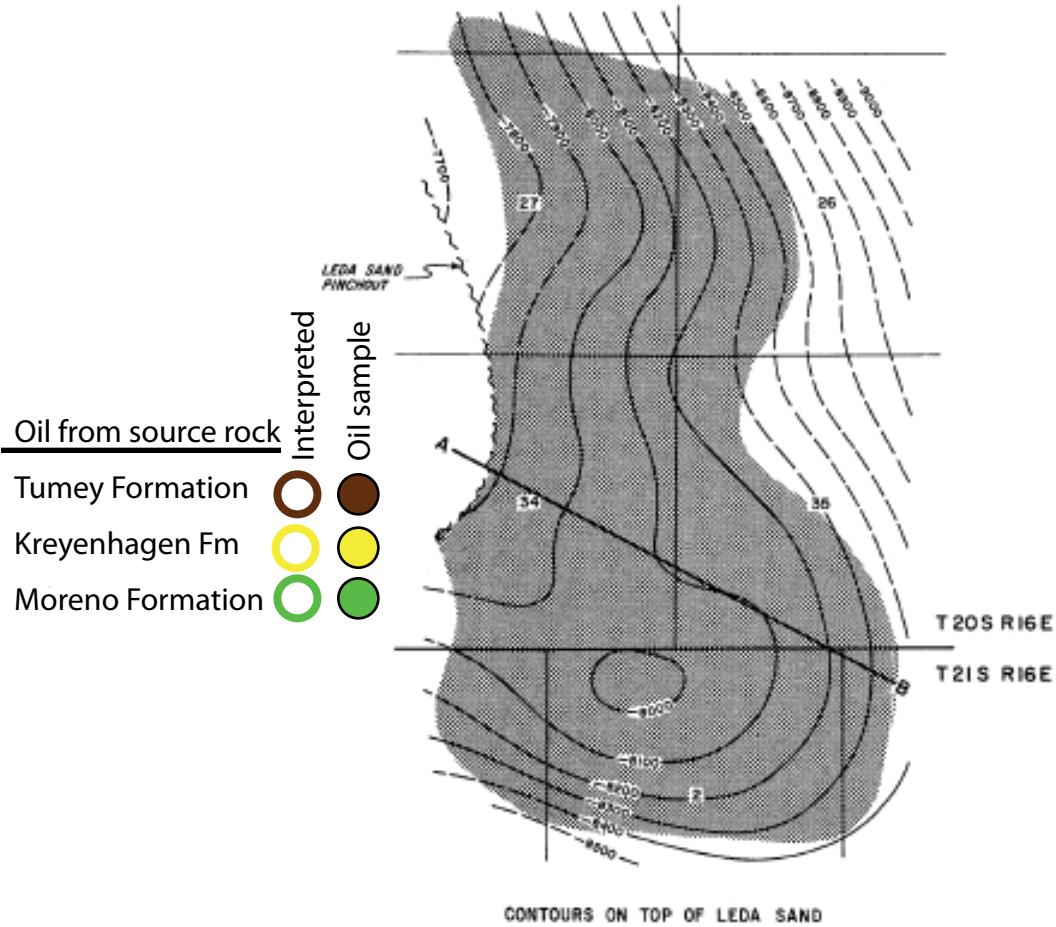
The three oil types area as follows. The Moreno oil type is interpreted to come from the Moreno source rock and is part of the gas prone petroleum system the Moreno-Nortonville(.). The Kreyenhagen oil type originates from the basal portion of the Kreyenhagen Formation and is the source rock in the Kreyenhagen-Temblor(!). The last oil type is the Tumey which is the source rock in the Tumey-Temblor(.). The notation on the maps and cross sections show a solid colored circle because the geochemistry of an oil sample was used to type the oil, whereas an open colored circle indicates that the oil type is interpreted based on stratigraphy.

KETTLEMAN NORTH DOME OIL FIELD

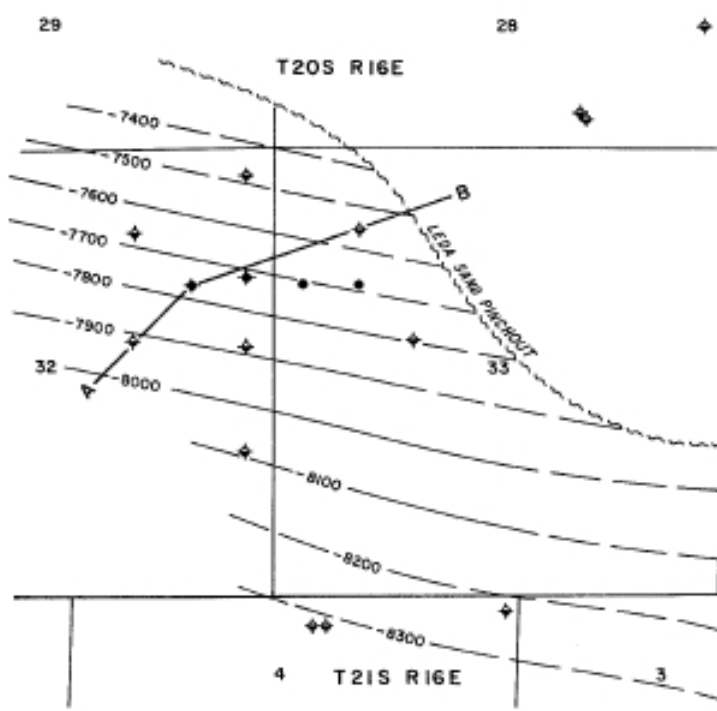


DECEMBER 1994

GUIJARRAL HILLS OIL FIELD Main Area



GUIJARRAL HILLS OIL FIELD West Area



CONTOURS ON TOP OF LEDA SAND

Oil from source rock

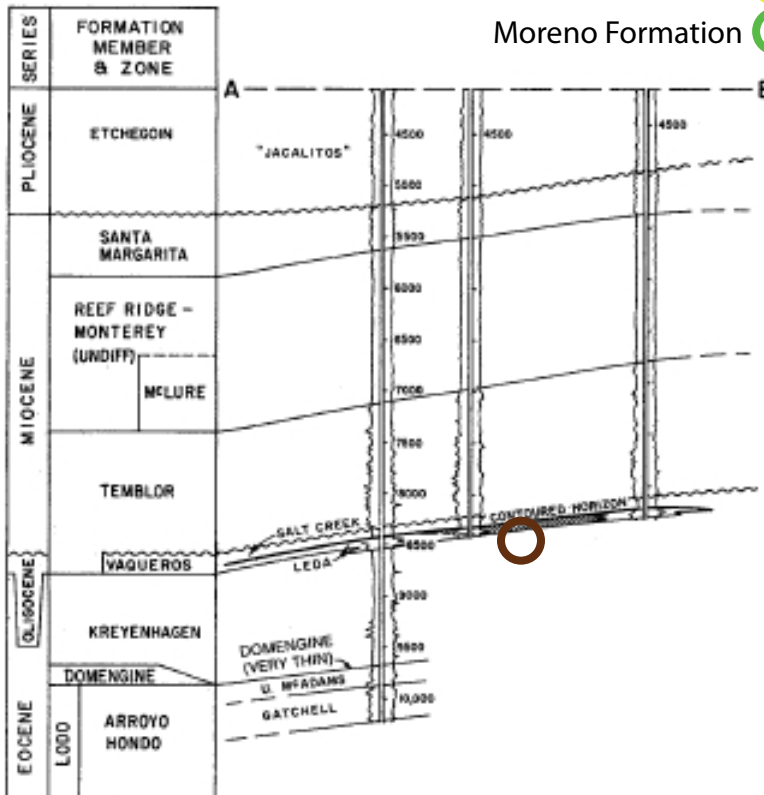
Tumey Formation

Kreyenhagen Fm

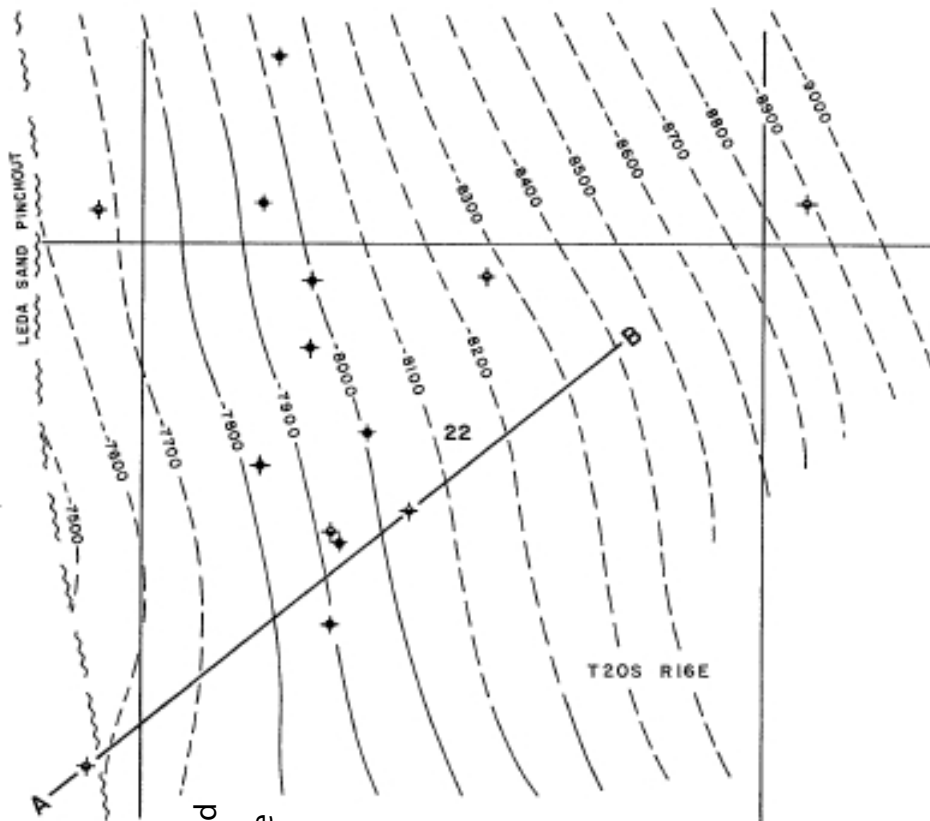
Moreno Formation

Interpreted

Oil sample



GUIJARRAL HILLS OIL FIELD Northwest Area (Abandoned)



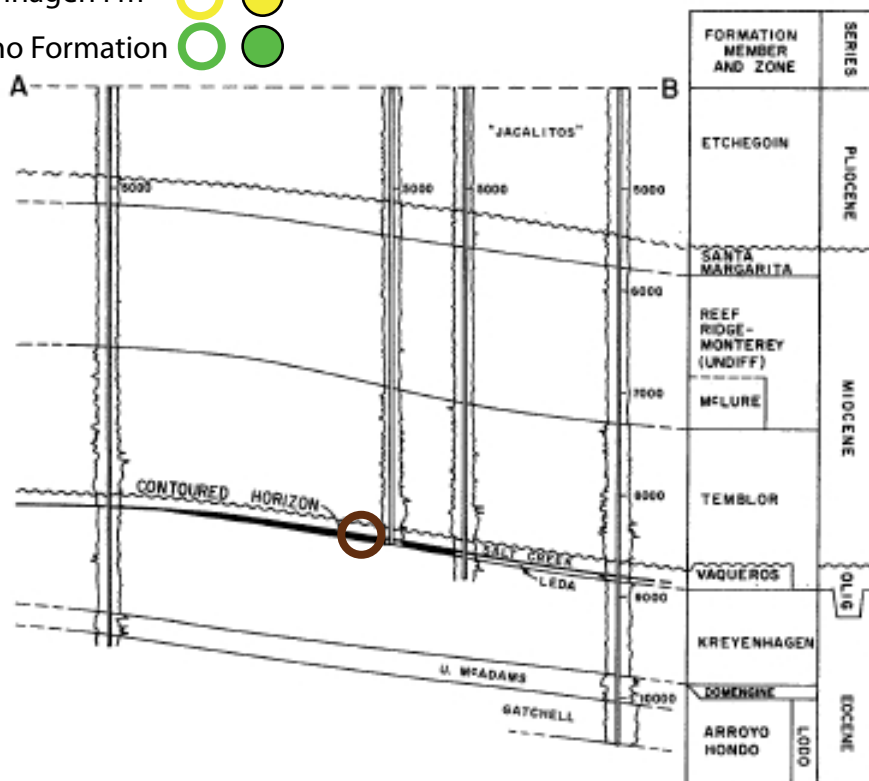
CONTOURS ON TOP OF LEDA SAND

Oil from source rock

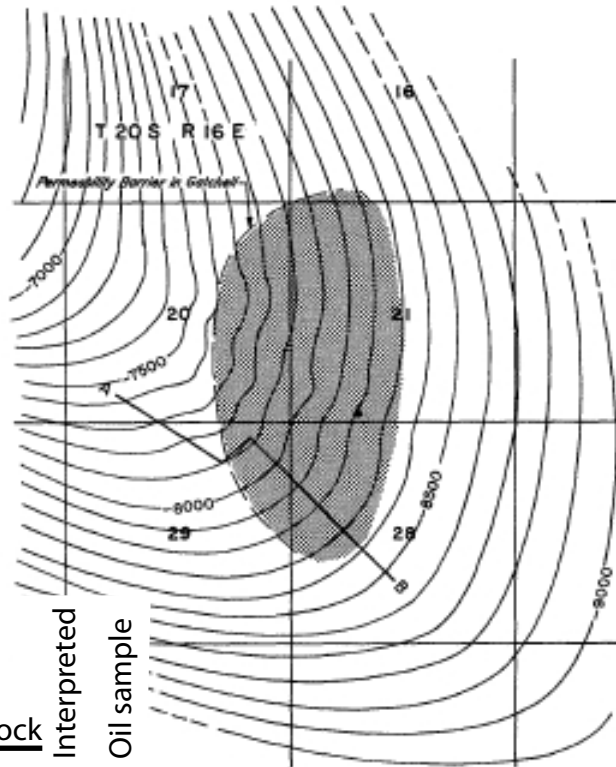
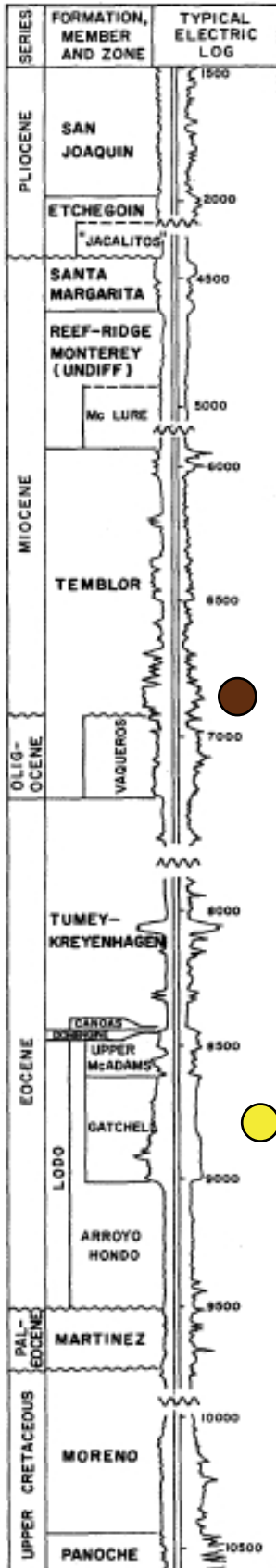
Interpreted

Oil sample

- Tumey Formation
- Kreyenhagen Fm
- Moreno Formation



PLEASANT VALLEY OIL FIELD



Oil from source rock

Tumey Formation

Kreyenhagen Fm

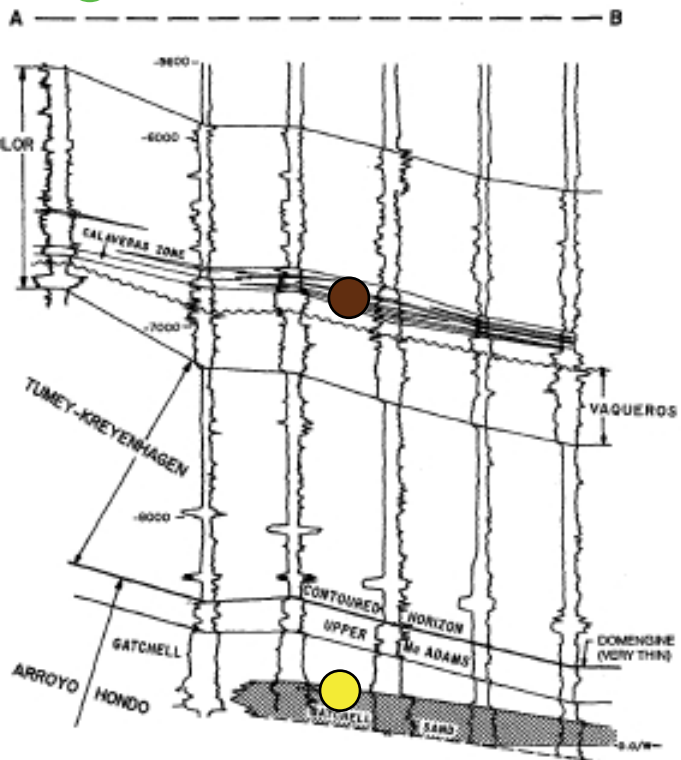
Moreno Formation

Interpreted

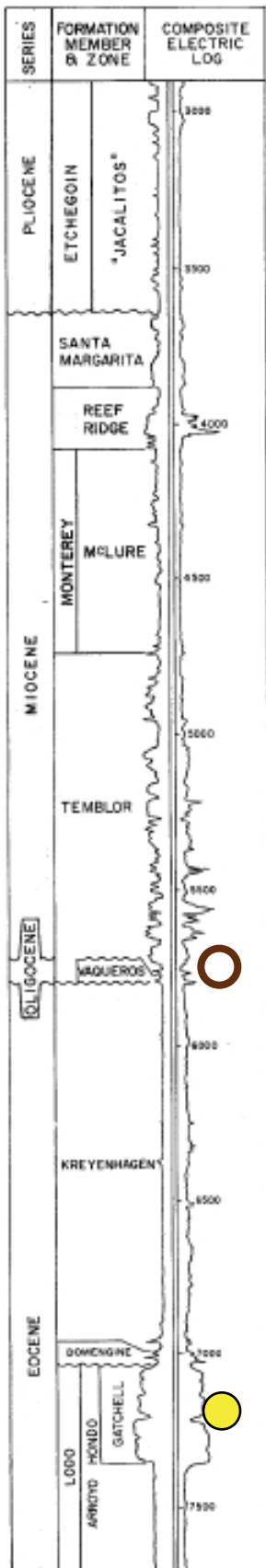
Oil sample



INTOURS ON TOP OF DOMENGINE



EAST COALINGA EXTENSION OIL FIELD



Oil from source rock

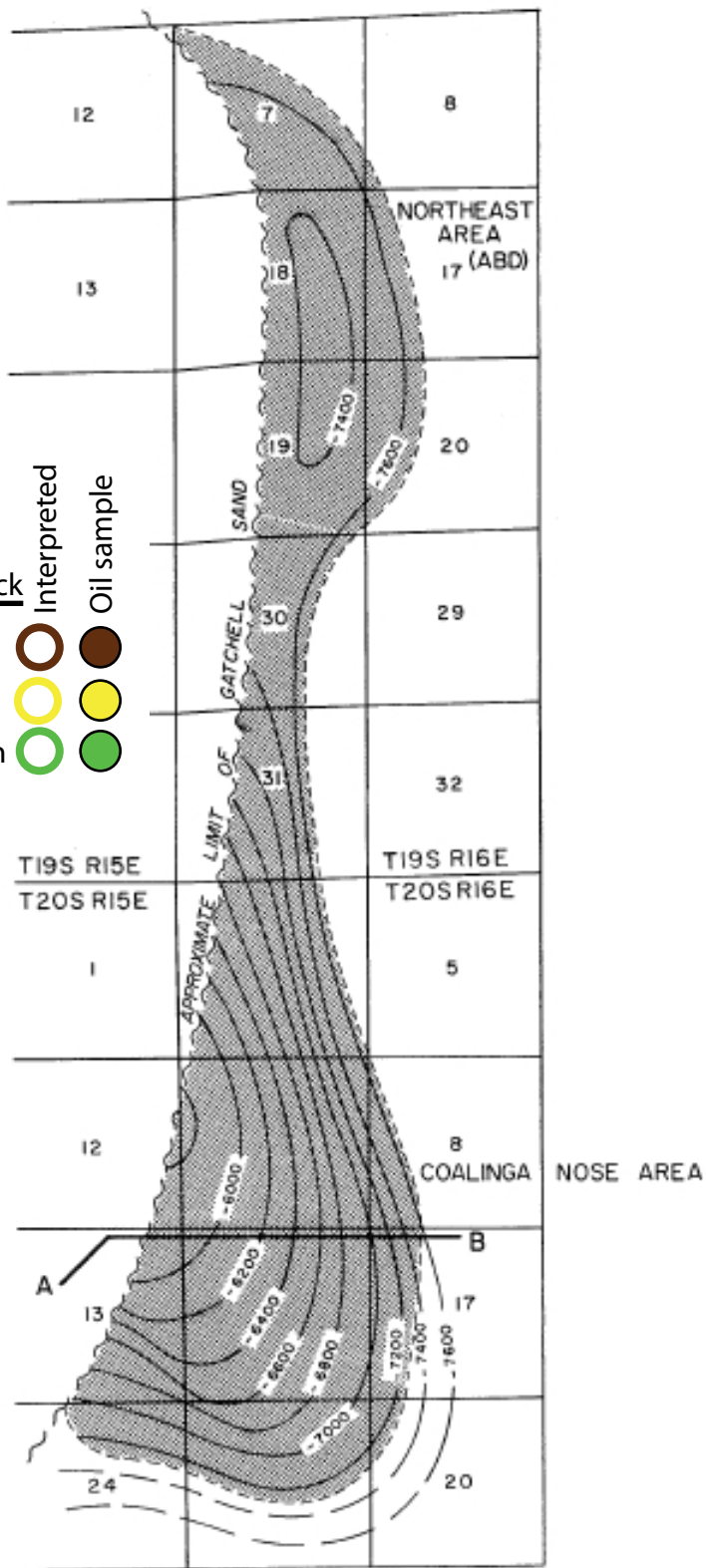
Tumey Formation

Kreyenhagen Fm

Moreno Formation

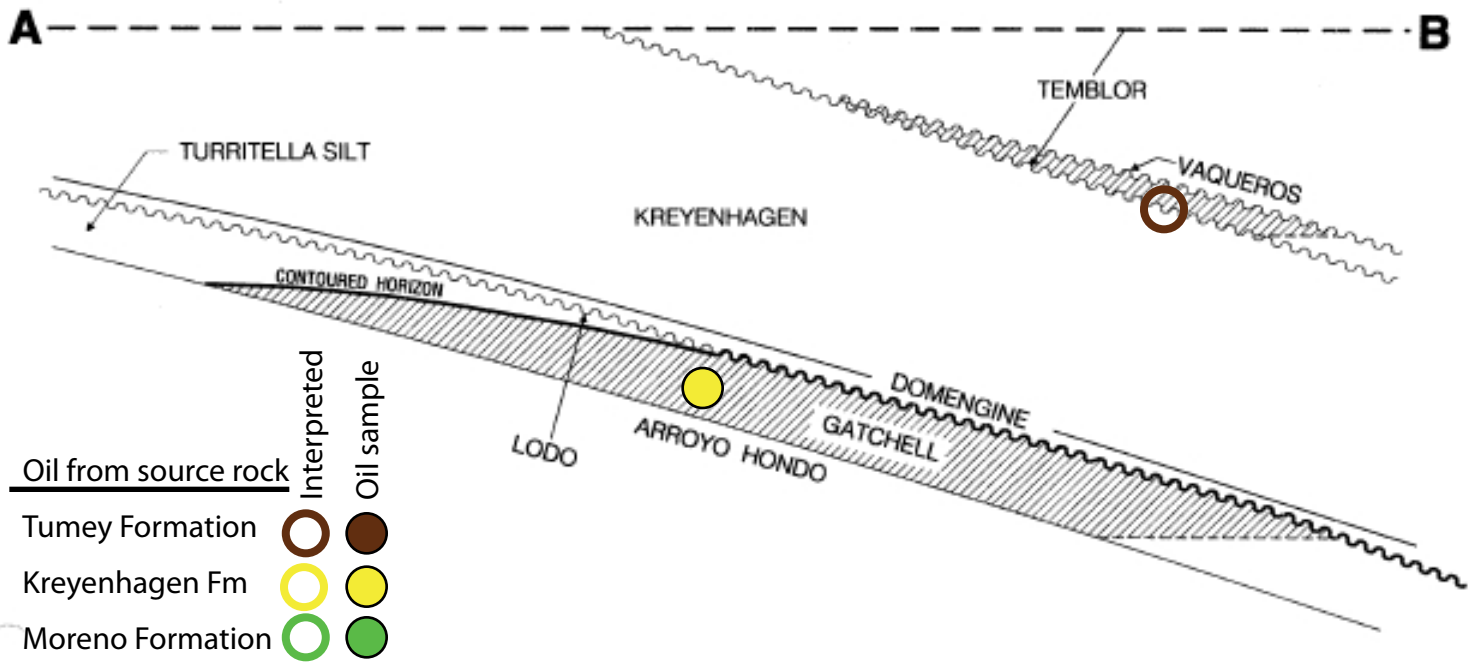
Interpreted

Oil sample

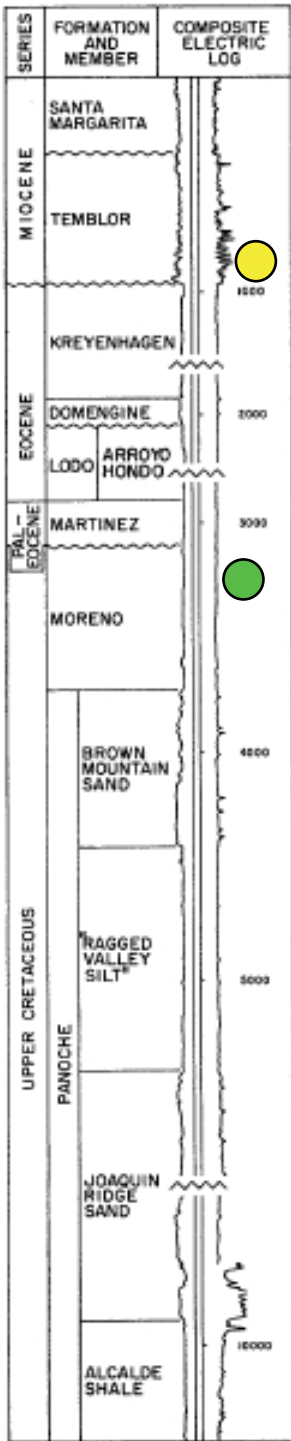


CONTOURS ON TOP OF GATCHELL SAND

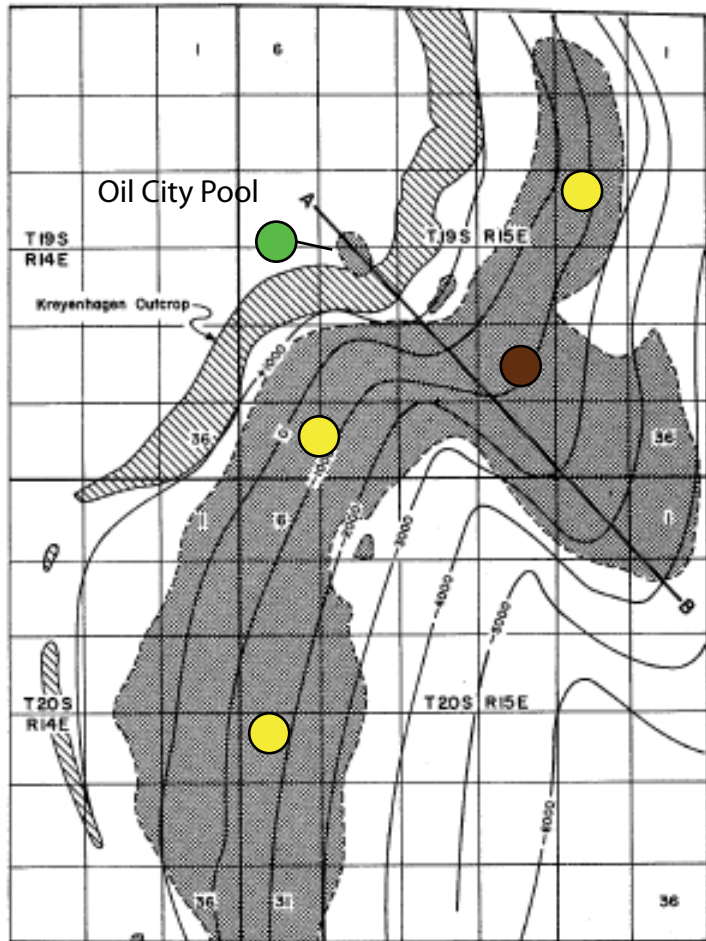
EAST COALINGA EXTENSION OIL FIELD



COALINGA OIL FIELD



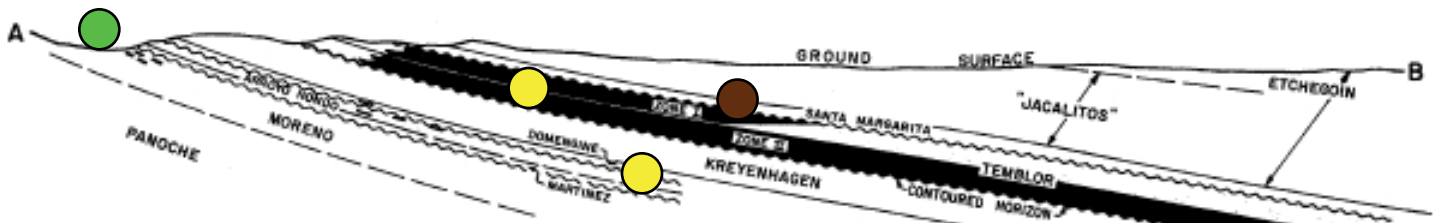
Contours on top of Kreyenhagen Fm



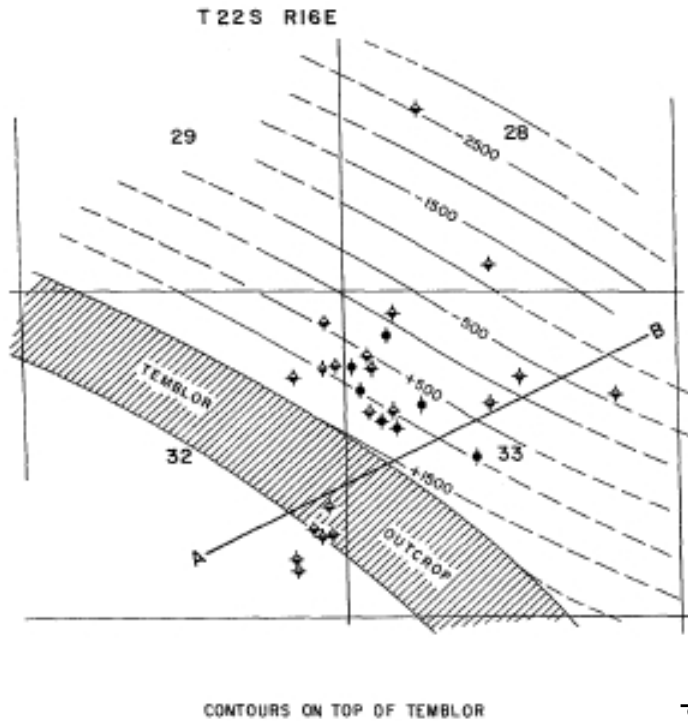
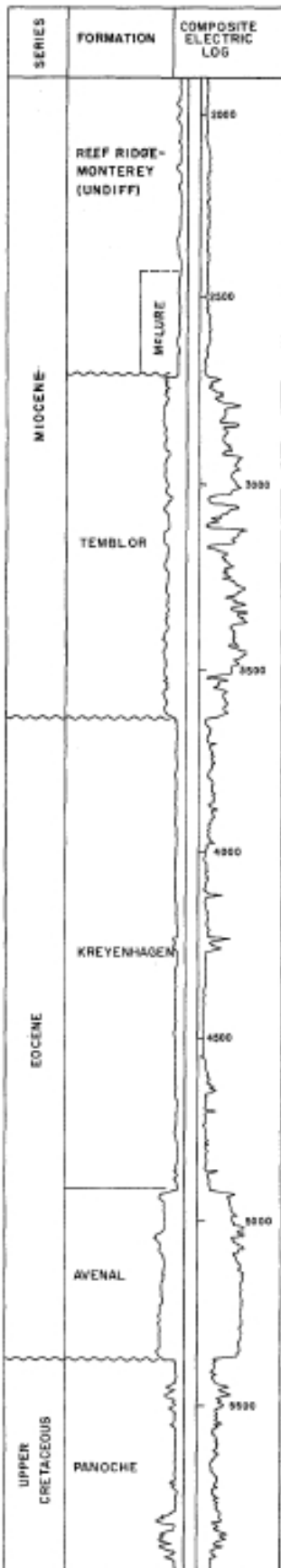
- Oil from source rock
- Tumey Formation
 - Kreyenhagen Fm
 - Moreno Formation
- Interpreted
- Oil sample

APRIL 1983

Oil City Pool

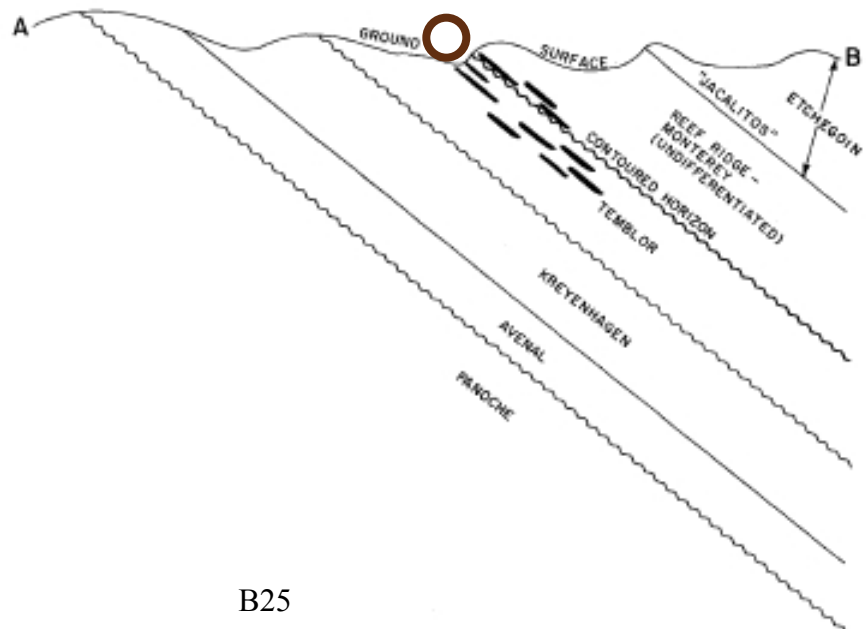


KREYENHAGEN OIL FIELD

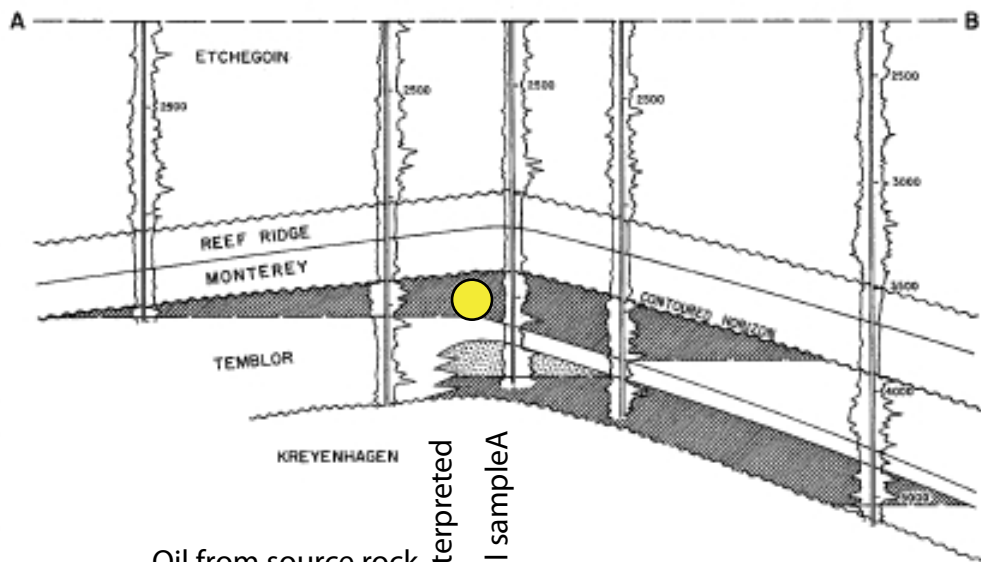
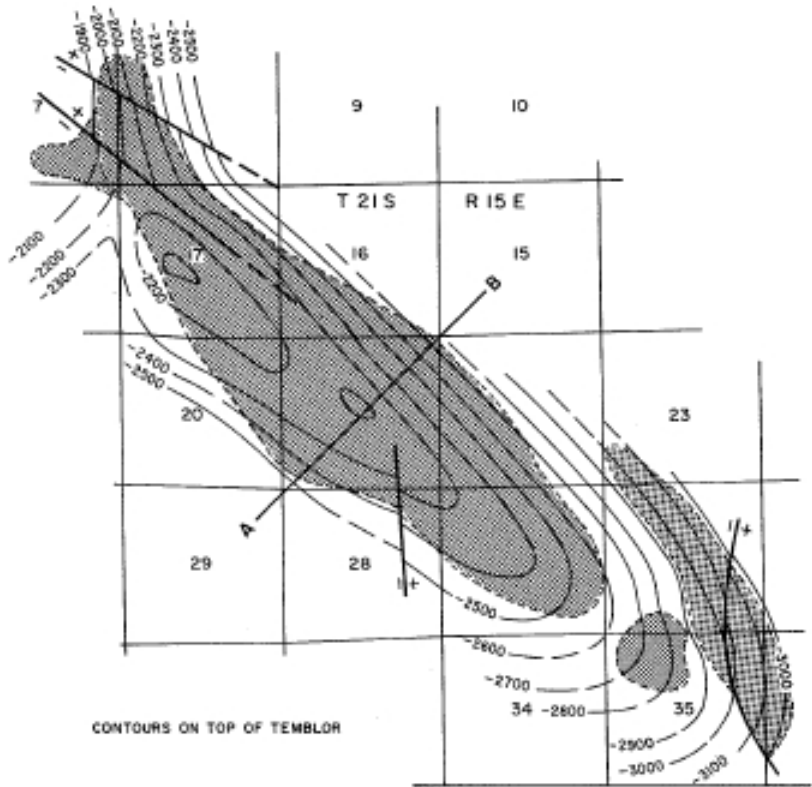
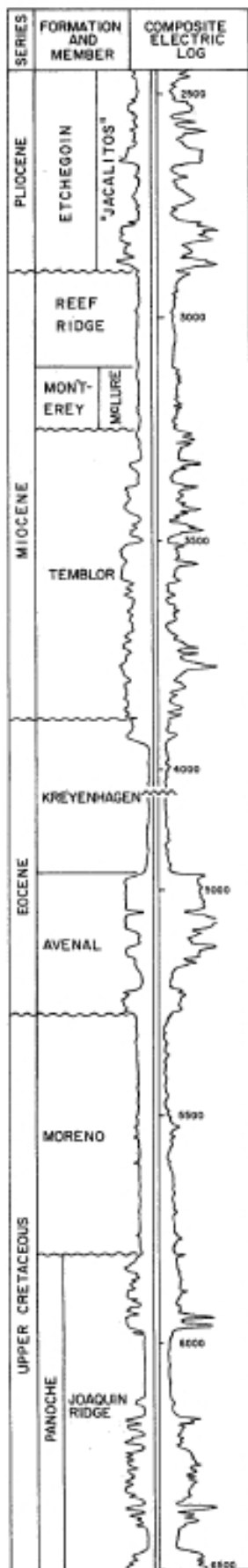


Oil from source rock

- Tumey Formation
- Kreyenhagen Fm
- Moreno Formation



JACALITOS OIL FIELD



Oil from source rock

Tumey Formation

Kreyenhagen Fm

Moreno Formation

Interpreted

Oil sample

