Ferrel, Mimi

From: Nicole Levin <nicole.levin@sierraclub.org>
Sent: Friday, October 15, 2021 5:23 PM
To: Public Comment at Culver City
Subject: Written Comment for Monday's Meeting
Attachments: HEALTH STUDIES AND REPORTS THAT SUPPORT CULVER CITY'S MOTION TO PHASE OUT OIL DRILLING.pdf

To whom it may concern,

I am writing in support of Culver City's motion to phase out existing oil wells in Culver City (item PH-1). Our members in Culver City have experienced health effects from living near oil and gas drilling ranging from asthma to cancer. We believe that it is essential that Culver City phases out its portion of the Inglewood Oil Field so that the rest of LA County can do the same.

Attached is a list of studies that support Culver City's motion to phase out oil drilling.

Best,

Nicole Levin

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Nicole Levin (*Pronouns: she/her/hers*)
Campaign Representative
Beyond Dirty Fuels Campaign
nicole.levin@sierraclub.org
707-688-9275 (C)

HEALTH STUDIES AND REPORTS THAT SUPPORT CULVER CITY'S MOTION TO PHASE OUT OIL DRILLING

HEALTH IMPACTS

- A substantial body of national and California-based scientific research documents deleterious health impacts resulting from close proximity to oil drilling operations, including asthma, headaches, rashes, cardiovascular disease, nausea, nosebleeds and reproductive harm;
    - Upstream oil and gas production and ambient air pollution in California by Stanford (2021)
    - Residential Proximity to Oil and Gas Development and Birth Outcomes in California: A Retrospective Cohort Study of 2006–2015 Births (News article) by University of California Environmental Health Perspectives (2020)
    - Oil and gas production and spontaneous preterm birth in the San Joaquin Valley, CA (News article)by Stanford University (2020)
    - Oil and Gas Extraction in Los Angeles and Public Health Evidence by Healthcare Professionals (2019)
    - Human Health and Oil and Gas Development in the City of Los Angeles by Physicians, Scientists, and Engineers (PSE) for Healthy Energy (2019)
    - Public Health and Safety Risks of Oil and Gas Drilling in Los Angeles by LA County Department of Public Health (February 2018)
    - Danger Next Door: The Top 12 Air Toxics Used for Neighborhood Oil Drilling in Los Angeles by Center for Biological Diversity (2017)
    - Air Pollution Is Slashing off the Lives of Billions (Guardian, 2021)
    - The Public Health Dimensions of Oil and Gas Development in California by PSE Healthy Energy (2017)
- New scientific research published in 2020 documents harmful reproductive impacts from two studies conducted in California, specifically, evidence of low birth weight infants (UC Berkeley) and pre-term births (Stanford University);
- New scientific research published in June 2021 documents significant decreased lung and pulmonary function from living proximate to both active and inactive drill sites in South Los Angeles, specifically the Jefferson and Allenco drill sites (Department of Preventive Medicine, Keck School of Medicine, USC; and Department of Urban and Environmental Policy, Occidental College);
- "In the U.S., 15% of COVID-19 mortality is specifically attributable to fossil fuel-related air pollution, showing that fossil fuel-related air pollution contributes significantly to overall U.S. air emissions." (American Lung Association, 2021)
- One recent study estimated that approximately 34,000 Californians died prematurely due to fossil fuel pollution in 2018

CLIMATE IMPACTS

- “Oil and gas facilities emit large quantities of methane, a potent climate change pollutant. Climate change already impacts the health of millions of Americans, from extreme heat, increased air pollution, worsened wildfires, and more.” (American Lung Association, 2019)
- “Methane is a greenhouse gas more than 80 times more potent than carbon dioxide in the short term.” (American Lung Association, 2019)
- “Oil and gas facilities also emit highly reactive pollutants called volatile organic compounds (VOCs) that can cause cancer and other harmful health impacts. VOCs also react with other pollutants to form dangerous ozone pollution.” (American Lung Association, 2019)
- The dangers presented by oil drilling operations and associated well-to-wheel impacts from fossil fuels, including toxic emissions, smog-forming chemicals, odors, greenhouse gases, hazardous chemical transport, and climate impacts, cannot be treated separately, as if they exist in a vacuum.
- Continued oil extraction in the LA Basin could release climate emissions about equal to annual emissions from 19 coal plants or 16.7 million passenger vehicles
    - (The estimates are based on the estimate of proved crude oil reserves -- EIA as of 12/31/2019 -- in the LA onshore basin. Proved reserves of crude oil as of December 31 of the report year are the estimated quantities of all liquids defined as crude oil, which geological and engineering data demonstrate with reasonable certainty to be recoverable in future years from known reservoirs under existing economic and operating conditions.Source: EIA, https://www.eia.gov/dnav/pet/pet_crd_pres_dcu_RCAL_a.htm)

2021 IPCC REPORT

- As California was scorched by wildfires, drought and extreme heat, the Intergovernmental Panel on Climate Change (IPCC) issued their Working Group 1 report signaling code red in addressing the climate crisis.
- Some key points:
    - Climate change is widespread, intensifying and many changes are unprecedented in thousands of years of Earth history
    - It’s “unequivocal” that humans are warming the world – and at a rate faster than anything during at least the past 2,000 years
    - The last decade’s global temperatures were likely the hottest it’s been on Earth in 125,000 years.
    - The world already has warmed by more than a degree Celsius since the 19th century.
    - The recent rate of sea level rise has nearly tripled compared with 1901-1971
    - Carbon dioxide emissions in 2019 were higher than any time in at least 2 million years

    - Many climate harms are long-lived, lasting for centuries to millennia because carbon dioxide is so long-lived—especially threats to oceans including ocean warming and acidification, ice sheet and glacier melting, and sea level rise
- The report highlights that we can still prevent the worst damages of the climate crisis (limiting warming to 1.5) but we must act now. We need immediate transformative change from our federal and state governments to end new fossil fuel projects, phase-out existing fossil fuel extraction and use, and speed a just transition to clean, renewable energy.
- Note: Also strong statements on the report on the need to phase-out fossil fuels from the UN Secretary General.

ENVIRONMENTAL JUSTICE IMPACTS

- 72 percent of people living near oil and gas drilling in Los Angeles County are people of color. (Table from Drilling Down)

Demographic Characteristics in Selected Areas Hosting Oil Production Facilities

LOCATION	PEOPLE OF COLOR	200% POVERTY	RENTERS	LINGUISTI-CALLY ISOLATED	LESS THAN HIGH SCHOOL EDUCATION
L.A. County	72.6%	37.3%	46.9%	12.4%	27.0%
L.A. City	72.9%	44.5%	56.2%	18.7%	30.8%
Within 1,500 ft. of an active L.A. City well	74.4%	42.3%	55.7%	18.5%	30.3%
University Park: Allenco	87.0%	72.6%	90.6%	50.0%	42.5%
Historic West Adams: Jefferson	83.4%	73.5%	70.9%	27.0%	48.5%
Historic West Adams: Murphy	89.7%	60.2%	73.4%	21.8%	35.5%
Wilmington: Warren E&P	99.7%	53.6%	76.6%	42.4%	54.3%
Baldwin Hills: Inglewood Oil Field	78.8%	45.2%	34.9%	2.0%	30.1%

Analysis by authors using the 2010 US Census.

- Studies make clear that Latinx, Black, Indigenous, other people of color are hardest hit by the negative environmental impacts exacerbated by climate change:
    - Racial Disparities and Climate Change — PSCI; (Princeton, 2020)

- ENVIRONMENTAL JUSTICE THROUGH THE EYE OF HURRICANE KATRINA (Stanford, 2008)
- Urban Heat Management and the Legacy of Redlining. (Wilson, 2020)
- Drilling in California: Who's at Risk? by Natural Resources Defense Council (2014)

Inglewood Oil Field Specific

- Culver City includes the largest urban oil field in the country, the Inglewood Oil Field (IOF)
- The Inglewood oil field covers about 1,000 acres in Los Angeles County around Culver City, Baldwin Hills, Ladera Heights, View Park, and other neighboring communities.
- Oil was discovered in the field in 1924, and currently there are a total of about 900 new, active, or idle wells. On average, 2.5 – 3.1 million barrels of oil are produced each year. The Inglewood Oil Field is operated by Sentinel Peak Resources. It is the largest urban oil field in the U.S., with more than one million people living within five miles of the site.
- There is a long legacy of spills and disasters at the Inglewood Oil Field. In April 2021, a pipeline leaked 1,600 gallons of oil on the field. In a July 2021 Community Advisory Panel, oil operators alerted the public to a 60 barrel contaminated water leak after members of the public filled odor complaints. And in March 2021, oil operators alerted the public to a possible methane leak that is currently ongoing.
- On April 1, 2019, a oil spill ran down a hill, along the gutter and down into a storm drain. Investigation into this spill is currently pending.
- On November 22, 2018, Thanksgiving night, a tank containing an oil-water mixture overflowed and caused a benzene exposure estimated at 7 times the legal limit set by the EPA. Benzene is a known carcinogen and may have extended as far as 4,100 feet from the spill location. Many residents called in complaints of noxious odors to the air board hotline (800-CUT-SMOG).
- In October 2010, a local park was closed because of methane gas leaks from the field. In 2005 and 2006, major toxic releases forced residents to evacuate their homes. On December 14, 1963, the Baldwin Hills Dam breached and resulted in five deaths and $11 million in property damage.
- Neighbors to the Inglewood Oil Field have raised concerns for years about exposure to toxic chemicals and smog-forming gases. Many suffer from heart and lung disease, leukemia, lymphoma, lung cancer, nervous system damage, birth defects, and premature death.

OTHER RELEVANT STUDIES AND REPORTS

Polling: Californian's Overwhelmingly Want Action on Oil Hazards, Just Transition by Change Research (202o)

Killer Crude: How California Produces some of the Dirtiest, Most Dangerous Oil in the World, by Center for Biological Diversity. (2021)

California Oil and Gas Waste Report: The failure to safely manage oil and gas waste by Earthworks (2021)

How limiting oil production could help California meet its climate goals by Stockholm Environment Institute (2018)

Oil Stain: How Crude Oil Undercuts California's Climate Progress by Center for Biological Diversity (2017)

Fracking and Dangerous Drilling in California Briefing Book by Center for Biological Diversity (2017)

Still in the Pits: Oil and Gas Wastewater Disposal in California – Clean Water Action (2016)

Well Stimulation in California by California Council on Science and Technology (July 2015)

The Environmental Risks and Oversight of Enhanced Oil Well Recovery in the United States by Clean Water Fund (2017)

Study of Neighborhood Air near Petroleum Sources by California Air Resources Board

The Risk of Unplugged Wells for California's Taxpayers: California Resources Corporation—A Case Study, Sierra Club (October 2020)

Orphan Wells in California, California Council on Science and Technology CCST, (January 2020)

An Oil And Gas Setback in Los Angeles Would Not Create Billions in Liability (Legal Planet, 2019)

Urban Oil and Gas Production in LA County by University of Southern California Environmental Health Centers (2019)

Ferrel, Mimi

From: Nicole Levin <nicole.levin@sierraclub.org>
Sent: Monday, October 18, 2021 11:40 AM
To: Fisch, Alex; Lee, Daniel; Eriksson, Goran; Vera, Albert; Imani.Mcmorrin@culvercity.org
Cc: Baker, Heather; Public Comment at Culver City
Subject: Re: Written Comment for Tonights Meeting
Attachments: Culver City Group Letter .pdf

Apologies, attached is the letter.

Best,

Nicole

On Mon, Oct 18, 2021 at 11:14 AM Nicole Levin <nicole.levin@sierraclub.org> wrote:

> Dear Mayor Fisch, Vice-Mayor Lee, and Councilmembers,
>
> Ahead of tonight's meeting, I would like to resubmit this letter signed by many community groups in support of the motion to phase out and clean up oil wells in Culver City.
>
> Best,
>
> Nicole Levin
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> --
>
> **Nicole Levin** (*Pronouns: she/her/hers*)
> Campaign Representative
> Beyond Dirty Fuels Campaign
> nicole.levin@sierraclub.org
> 707-688-9275 (C)

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Nicole Levin (*Pronouns: she/her/hers*)
Campaign Representative
Beyond Dirty Fuels Campaign
nicole.levin@sierraclub.org
707-688-9275 (C)

June 15, 2021

Mayor Alex Fisch
Vice-Mayor Daniel Lee
Council Member Goran Eriksson
Council Member Yasmine-Imani McMorrin
Council Member Albert Vera
9770 Culver Blvd.
Culver City, CA 90232

Re: SUPPORT for City-Initiated Zoning Code Amendment to Chapter 17.610 (Nonconforming Uses, Structures and Parcels), Section 17.610.010.D (Nonconforming Oil Use), to terminate and phase out over a five-year period (by July 28, 2026) the closure and removal of nonconforming oil and gas activities within Culver City, including the Culver City portion of the Inglewood Oil Field ("Ordinance")

Dear Mayor Fisch, Vice-Mayor Lee, and Council Members:

On behalf of the undersigned organizations, which represent tens of thousands of people living, working, and recreating in and around Culver City, we write in full support of Culver City's plan to phase out and clean up oil drilling throughout its portion of the Inglewood

Oil Field (IOF). To that end, we urge you to approve the proposed Ordinance at the public hearing on June 17.

This action is urgent and necessary because oil drilling is a proven public health and safety risk. Numerous studies link proximity to oil and gas wells to a host of health problems, including increased risk of preterm births and high-risk pregnancies, asthma and other respiratory illnesses, depression and other adverse mental health outcomes, and some types of cancer. Also, oil spills and leaks at well sites threaten local ecosystems and waterways. Over the last few years, we have seen multiple oil spills and leaks at the IOF, including one this past April that involved a release of 1,600 gallons of oil.

Culver City also has a chance to start the process of correcting a serious and long-standing environmental injustice. As a result of decades of redlining, environmental racism, and the indifference of politicians, most oil fields in the Los Angeles region -- including the IOF -- are situated in close proximity to low-income Black and Latinx communities. By phasing out oil drilling in a portion of the IOF, Culver City would be taking the lead in undoing years of racist land use decisions that have directly harmed BIPOC communities in South Los Angeles.

With this proposed Ordinance and direction to the Subcommittee and staff to continue to work on “just transition” strategies, Culver City has an unprecedented opportunity to create high-quality jobs in the plugging and abandonment of active oil wells, the remediation of the well sites and their surroundings, and the repurposing of the area for beneficial reuse. We would urge that any agreements covering the “just transition” require good-quality jobs, in terms of prevailing wage compensation, benefits (health care, paid sick leave, retirement, etc.), access to union representation (including card check agreements), and training opportunities as needed. Local and targeted hire provisions are necessary to ensure equitable access by race and gender to these expanding job opportunities, and should prioritize fossil fuel workers and frontline community members. We support strong consideration of project labor agreements and community benefit agreements. We further encourage strategies to support any fossil fuel workers who may be displaced with safety nets such as healthcare, wage replacement, retraining and high-quality job placement.

At the same time, processes and mechanisms must be put in place to ensure that current and previous operators of the IOF are held responsible for the costs of well plugging and abandonment, remediation, and cleanup. Taxpayers should not have to bail out the oil industry for any pollution resulting from oil operations. Furthermore, during the phase-out period, robust monitoring and inspection protocols must be established to ensure that, while oil operations remain, strict regulatory standards are followed to minimize the chances of a catastrophic accident, spill, or exposure. For example, any agreements with the operator should include funding mechanisms to cover the costs of monitoring and potential mishaps so these potential future costs do not fall on City taxpayers.

Looking ahead, Culver City residents and neighboring communities should be engaged to help determine future uses at the IOF. We encourage Culver City to consider a public process

that allows locally impacted residents to provide meaningful input into the site's future uses. Also, we feel strongly that free, prior and informed consent must be obtained from the local Indigenous communities regarding future uses. Consideration should be given to reserving a significant portion of the IOF as parkland and open space for community use, and/or as wildlife habitat or a wildlife corridor, as well as using the land for distributed renewable energy resources, including generation and storage, to help the City and its residents become more energy resilient.

We support the prohibition of new drilling, redrilling, and deepening after July 28, 2021 and the five-year plugging and remediation timeline in the Ordinance. Urgency dictates that phase-out must be initiated and completed as soon as possible. Our communities have suffered and our health and wellbeing have been put at risk for far too long. We urge you to consider the shortest possible phase-out timeline, given the impacts of neighborhood oil drilling on our health, environment, and climate. The plugging, capping, abandonment, and remediation of the wells and immediate surrounding areas should be undertaken as quickly as possible.

Thank you for considering our comments.

Sincerely,

Martha Dina Arguello, Executive Director, Physicians for Social Responsibility-Los Angeles and Co-Chair, STAND-LA Coalition
Eric Romann, STAND-LA Coalition Coordinator
Alison Hahm, Associate Attorney, Communities for a Better Environment
Richard Parks, President Redeemer Community Partnership
Rabeya Sen, Policy Director, Esperanza Community Housing
Reverend Louis Chase, Holman United Methodist Church
Sonya Vasquez, Chief Operations Officer, Community Health Councils
David Haake, M.D., Chair, Clean Break Committee, Angeles Chapter, Sierra Club
Nicole Levin, Campaign Representative, Beyond Dirty Fuels, Sierra Club
Damon Nagami, Senior Attorney, Natural Resources Defense Council
Ethan Senser, Southern California Organizer, Food & Water Watch
Liz Jones, Staff Attorney, Center for Biological Diversity

Ferrel, Mimi

From: Consoli, Julia <Julia.Consoli@alston.com>
Sent: Monday, October 18, 2021 12:45 PM
To: Clerk, City; Public Comment at Culver City
Cc: Carlsen, Nicki; Wickersham, Matt; Berlin, Greg
Subject: Sentinel Peak Resources Comments on Proposed Ordinance
Attachments: 2021-10-18 Sentinel Peak Comment Letter to City.pdf; 2021-10-18 - AM Response Letter.pdf; 2021-10-12 - Monterey case.pdf; State Map.pdf

Good afternoon,

On behalf of Sentinel Peak Resources, please see the attached comment letter and attachments submitted in advance of the October 18, 2021 City Council Meeting regarding the proposed ordinance terminating nonconforming oil uses.

Please let me know if you have any issues opening or accessing these documents.

Thank you,

Julia Consoli-Tiensvold | Associate | ALSTON & BIRD
333 South Hope Street, 16th Floor | Los Angeles, CA 90071
Julia.Consoli@Alston.com | t: 213.576.2517 | c: 619.504.8007

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Nicki Carlsen Direct Dial: **213-576-1128** Email: **nicki.carlsen@alston.com**

October 18, 2021

VIA EMAIL

City of Culver City
City Council for the City of Culver City
9770 Culver Boulevard
Culver City, CA 90232
public.comment@culvercity.org

Re: Proposed Zoning Code Amendment P2021-0036-ZCA –
City Council October 18, 2021 Public Hearing

Dear Mayor, Vice Mayor and Honorable Council Members:

We represent Sentinel Peak Resources California, LLC ("Sentinel") and are writing in opposition to the City of Culver City's ("City") reintroduction of its proposed Zoning Code Amendment, Ordinance P2021-0036-ZCA entitled, "Nonconforming Oil Use, to Terminate Nonconforming Oil and Gas Uses by November 24, 2026" (the "proposed Ordinance").

Despite taking four months to bolster its position, amending the proposed Ordinance and preparing a 40-page long CEQA document with various reports, the City has utterly failed to substantively address the comments in Sentinel's June 17, 2021 letter to the City in opposition to the proposed Ordinance (the "June Letter"). Not only this, but the City now provides the community a mere week to consider and respond to its new materials, upending due process protections. However, last Tuesday (October 12), the California Court of Appeal issued a published decision on State preemption, which eviscerates the validity of the City's proposed action.

As described in detail below and in the June Letter, incorporated herein by reference, the City's proposed action is illegal and improper, and the City Council must reject the proposed Ordinance.

1. Factual Background

Sentinel is the operator of the oil and gas facilities of the entire Inglewood Oil Field ("IOF"), which is located predominantly within the unincorporated area of Los Angeles County ("County") along with a small section in the jurisdiction of the City. The IOF, which is the most stringently regulated oil field in California, is operated as an integrated whole pursuant to the Baldwin Hills Community Standards District ("CSD") and the 2011 Settlement Agreement and Mutual Release regarding the CSD between the City, Community Health Councils, Inc., Natural Resources Defense

Council, Mark Salkin, Citizens Coalition for a Safe Community, and Concerned Citizens of South Central Los Angeles, and the County along with the operator at the time, Plains Exploration & Production Company ("Settlement Agreement"). The requirements for the County CSD by nature embrace the oil field in its entirety and therefore are implemented at the City portion of the IOF and have been so implemented since 2008.

2. Recently Decided Case Law Confirms that the Proposed Ordinance is Preempted by State Law

Local laws conflict with general law if the local laws duplicate, contradict, or enter an area fully occupied by general law. *Morehart v. County of Santa Barbara*, 7 Cal. 4th 725 (1994). As Sentinel informed the City in its June Letter, the proposed Ordinance conflicts with California law regarding the production of oil and gas, including drill, operations, abandonment, and maintenance and is therefore preempted. A recently decided case certified for publication in the Sixth District Court of Appeal confirms this. The City entirely fails to respond to Sentinel's preemption argument in its October 18, 2021 Staff Report (the "Staff Report").

In *Chevron U.S.A., Inc. v. County of Monterey*, attached hereto, the County of Monterey ("Monterey") enacted Measure Z, which would prohibit "[l]and Uses … in support of oil and gas wastewater injection or oil and gas wastewater impoundment" throughout the County's unincorporated areas. *Chevron U.S.A., Inc. v. County of Monterey*, No. H045791, 2021 Cal. App. LEXIS 844, at *4 2021 WL 4743024 (Ct. App. Oct. 12, 2021) ("*Chevron*"). Measure Z would also prohibit "[l]and uses in support of drilling new oil and gas wells" anywhere in Monterey's unincorporated area. *Id.* Like the City's proposed Ordinance, Measure Z provided for "a reasonable amortization period" for phasing out uses that were inconsistent with Measure Z's provisions. *Id*. Unlike the City's proposed Ordinance, Measure Z authorized the Board of Supervisors to grant an exception to a property owner if the application of Measure Z would result in an unconstitutional taking.

Petitioner Chevron U.S.A., Inc. ("Petitioner") argued that Measure Z was preempted under State law because it conflicts with Article XI, section 7 of the California Constitution. In response, Monterey presented a variety of theories. First, the Monterey argued that "Measure Z is not preempted by state law because 'California oil and gas statutes and regulations expressly acknowledge and affirm local authority, precluding a finding that the state has completely occupied the field,' and 'state law addresses only specific technical aspects of oil and gas production, leaving local governments free to exercise their traditional authority over land use, health, and safety to protect communities from harm.'" *Id.* at *10-*11. The court disagreed, analyzing the legislative history of Section 3106 of the Public Resources Code ("PRC") and stating that Section 3106 "makes no mention whatsoever of any reservation to local entities of any power to limit the State's authority to permit well operators to engage in these 'methods and practices.'" *Id.* at 14.

Second, Monterey argued that Measure Z's provisions are not preempted because "the state's oil and gas rules narrowly address only the manner in which operations are carried out, not whether or where oil and gas resources should be developed." *Id.* at 22. Again, the court disagreed, reasoning that the provisions of Measure Z did not regulate "where and whether" oil drilling would occur on the land, but rather *what* and *how* oil drilling operations could proceed. The court found that this was improper. The court continued that, "[t]he fact that Measure Z repeatedly uses the words 'use of land' and 'land use' does not obliterate the inescapable fact that Measure Z would ban specific oil and gas operation methods." *Id*. at 24. Ultimately, the court held that Measure Z was preempted by California law.

Similarly, here, the City frames its prohibitions on oil and gas activity as limited to regulating "land use." This argument is contradicted by *Chevron*. The City's proposed Ordinance improperly seeks to prohibit most oil and gas activity, including the drilling and redrilling, or deepening of existing wells and to prohibit the erection of any derrick, structure, or equipment related to oil and gas operations, all of which conflict with the State's laws and regulations. [Proposed Zoning Code Amendment, section D.] In addition, the proposed Ordinance attempts to control the process by which closure of the oil operations must occur. [Proposed Zoning Code Amendment, section D.d.] This is in direct conflict with Section 3106(a) of the PRC, as well as the reasoning in *Chevron*. *Chevron U.S.A., Inc. v. County of Monterey*, 2021 Cal. App. LEXIS 844, at *23 ("These provisions did not regulate 'where and whether' oil drilling would occur on land … but rather *what* and *how* any oil drilling operations could proceed."); PRC, section 3106(a) ("The supervisor shall so supervise the drilling, operation, maintenance, ***and abandonment*** of well and the operation, maintenance, and ***removal or abandonment*** of tanks and facilities attending to oil and gas production …") (emphasis added).

The City's proposed ordinance also seeks to eliminate all oil and gas operations in the City IOF by November 24, 2026, which directly conflicts with the State's mandate to produce oil and gas resources in the State. [Proposed Zoning Code Amendment, section D; PRC, section 3106(b).] The court in *Chevron* supports this when it found Measure Z to be preempted because it banned activities that Section 3106 "not only promotes and encourages, but also explicitly places the authority to permit in the hands of the state." *Monterey*, 2021 Cal. App. LEXIS 844, at *23-*24.

The City attempts to avoid potential preemption by including language in the proposed Ordinance regarding its coordination with CalGEM, stating that the termination process will be "overseen by the California Geologic Energy Management Division ("CalGEM") and in strict accordance with all the other applicable local, state, and federal laws, regulations, rules and standards." [Proposed Zoning Code Amendment, section D.2.c.] This is of no matter. The City intends to approve the termination program, not CalGEM. The fact that CalGEM is going to oversee the process of termination does not allow the City to escape the fact that its proposed Ordinance directly conflicts with State law.

3. The Closure of Sentinel's Jefferson Drill Site Does Not Support the City's Determination That Five Years is a Reasonable and Appropriate Time Period to Close the City IOF

The City contends that Sentinel's agreement with the City of Los Angeles to close Sentinel's Jefferson Drill Site, located at 1371 W. Jefferson Boulevard (the "Jefferson Drill Site"), within three years is evidence of the legitimacy and feasibility of the City's five-year phase out plan. [Staff Report, p. 11.] This comparison is misguided.

By way of background, on January 25, 2018, the South Los Angeles Area Planning Commission made the determination to require corrective measures and methods and additional conditions for the oil drilling and production operations at the Jefferson Drill Site. Sentinel filed a lawsuit challenging this determination (LASC Case No. BS173410) on April 24, 2018. While the lawsuit was pending, on August 13, 2018, Sentinel applied to the City of Los Angeles for a modification of the determination. Ultimately, Sentinel voluntarily agreed to abandon the wells at the Jefferson Drill Site within a 3-year period between 2019 and 2021. The circumstances and considerations that made it feasible for Sentinel to commit to this timeframe were vastly different than the circumstances here.

The City claims that because Sentinel will be able to close the wells at the Jefferson Drill Site at a pace of 12 wells a year, it should be able to do the same at the City IOF. This claim ignores the size, terrain, and topographical differences between the two sites. First, the Jefferson Drill Site is a mere 1.75 acres in size, whereas the City IOF is a 77-acre site. This alone creates its own set of difficulties. Setting aside the difference in size, the terrain and topography of the City IOF, a largely undeveloped area with a sloped terrain, would make it challenging to safely close all 41 wells within five years.

Moreover, Sentinel's decision made with respect to the Jefferson Drill Site was a voluntary one, based on discussions with the City of Los Angeles regarding the objectives and capabilities of both entities and the future use of the site. While Sentinel would like to come to a similarly amicable resolution with the City here, it cannot in the timeframe that the City demands.

4. The City's References to Recent Local Oil Field Incidents Do Not Provide Support for Its Position

The City attempts to justify the proposed Ordinance by referencing a litany of recent local incidents in the vicinity of the City IOF. [Staff Report, pp. 10-11.] However, minor impacts resulted from these incidents, and several of the incidents cannot even be attributed to Sentinel's oil operations at the City IOF. First, the City describes a small brush fire that occurred on October 3, 2021, the spread of which was quickly halted by the Culver City Fire Department within an hour after it was identified. There were no injuries and no structures or equipment were damaged. The City admits that there is no evidence indicating that Sentinel's operations caused the incident, stating that the "fire's specific ignition source is undetermined." [Staff Report, p. 10.] In fact, it was later determined that the fire was caused by a faulty overhead electrical line, which is controlled by another entity and not Sentinel. In light of this, it is unclear why the City even

referenced this incident. The incident was apparently resolved in full compliance with all regulatory and government requirements.

The City next describes an oil-water leak in the vicinity of Culver City Park, however, the leak did not occur within the City limits. This leak was discovered at 8:31 a.m., confirmed by Sentinel at 8:53 a.m., and contained a mere seven minutes later. The spill was quickly cleaned up, and no leaked fluids entered the La Ballona Creek. Although the source of the leak was determined to be from a high-impact puncture to a 2-inch diameter pipe flow line, the cause of the rupture remains unknown. Again, the incident was apparently resolved in full compliance with all regulatory and government requirements.

The City then goes on to describe three additional incidents, with at least one of them attributable to a different oil operator and two of them not within the boundaries of the City. The referenced E&B Pipeline Open-Valve Leak that occurred on April 6, 2021 was not the responsibility of Sentinel.

Further, the City references another incident that occurred only within the City of Los Angeles' jurisdiction – the Stocker Line Leak. There was no oil involved in this leak, and it was reported to the California Governor's Office of Emergency Services as is standard protocol, as well as CalGEM. The produced water flowed off of Sentinel's site exclusive into the curb and gutter and back onto Sentinel's site on the northeast side of La Cienega Boulevard and Stocker Street. The produced water line shutdown was immediately repaired in the days following the occurrence, and the subsequent hydrotest of the line was witnessed by a CalGEM representative.

The BC Tank Flow Failure Spill that occurred on November 11, 2018 also occurred within the City of Los Angeles' boundaries. This spill resulted in 14 calls from local residents concerning a petroleum odor; the calls were received over a time period of less than an hour. The tank overflow was caused by a faulty level controller on a wash tank. All liquids were captured within the tank system containment, however, the vapor space on the tank was released to the atmosphere and carried by an east to west wind into the Ladera Heights neighborhood immediately west of the City IOF. The vapor quickly dispersed and lasted for a few minutes. As a long-term response to the spill, Sentinel has installed redundant control systems on all wash tanks, which were completed by the end of 2019. The incident was resolved in satisfaction of all regulatory and government requirements, and there has been no follow-up to date from the South Coast Air Quality Management District.

Oil and gas operations are highly regulated. These regulations have been put in place to address and protect the health and safety of the public. Indeed, Sentinel has fully complied with these regulations which has resulted in minimal impact to the public health and safety. Sentinel operates in full compliance pursuant to the CSD, as shown in the 2015 and 2019 CSD periodic review documents submitted with the June Letter, as well as the FM O&G Inglewood Oil Field, Safety Inspection, Maintenance and Quality Assurance Program Safety Audits (July 2016 and August 2018) and Environmental Quality Assurance Program Report, 2011-2020, also submitted with the June Letter.

In short, the incidents presented by the City are not proof that the City IOF must be closed.

5. The Methodology Used in the City's Capital Investment Amortization Study is Flawed

The City attempts to recast the 5-year amortization period as a "termination" period instead, erroneously claiming that a "return on the original investment of capital was accomplished years ago." [Staff Report, p. 4.] It further claims that because Sentinel's future costs to close the oil wells happen post-amortization, these costs should not be included in the calculation of the time to achieve amortization because capital expenditures and investments are normally accounted for at the time funds are invested and capitalized. This makes no sense. The City cannot artificially define the amortization period based on the exclusion of costs which must be amortized. A detailed response to the October 8, 2021 report by Baker & O'Brien (the "B&O October Report") is attached hereto as the October 18, 2021 Alvarez & Marsal Disputes and Investigations, LLC. Response to the Baker & O'Brien Letter Dated October 8, 2021 (the "A&M October Response").

As an initial matter, the implementation of an amortization program to avoid paying compensation for existing property rights in general is improper in the context of oil fields. This is because the utility of an oil field depends on its productivity, which requires ongoing infrastructure investment. The amortization concept is based upon the idea that the property owner must be given an opportunity to recoup its investment and be made whole. The concept is most generally applied with respect to billboards, which do not require ongoing investment. *Nat'l Adver. Co. v. County of Monterey*, 1 Cal. 3d 875 (1970); *People ex rel. Dept. Pub. Wks. V. Adco Advertisers*, 35 Cal. App. 3d 507 (1973). The application of the concept to oil fields does not achieve the same goals.

Even if amortization were possible, amortization has not already occurred. An Amortization of Capital Investment ("ACI") calculation must first establish the amount of capital investment as of a certain date and then project future cash flows from that date to determine when sufficient cash flows have been generated to cover both the capital investment and a "reasonable" rate of return to the investor. The June 17, 2021 report of A&M ("A&M June Report"), attached to the June Letter, and the A&M October Response provide a detailed analysis of this based on information specific to and provided by Sentinel regarding its business model, whereas the June 8, 2021 report by Baker & O'Brien (the "B&O June Report") and the B&O October Report, relied on by the City are based upon inaccurate information. Despite the fact that Sentinel had provided accurate information in its A&M June Report that B&O could have incorporated into the analysis in its B&O October Report, it failed to.

Additionally, B&O's calculation of the ACI based on a scenario that evaluates amortization of the initial capital investment made by historical operators dating back to 1925 for wells located in the City IOF is an irrelevant analysis in which B&O essentially seeks to draw the conclusion that since the City IOF must have reached ACI decades ago, then the City is justified in requiring Sentinel to cease operations. This disregards the fact that Sentinel did not realize any returns that were generated by the City IOF for periods dating back to 1925 and impacts the amortization period. [A&M October Response, pp. 4-5.]

Further, B&O's claims that A&M's use of a target rate of return of 16% is incorrect because it is "unreasonably high." [B&O October Report, p. 24.] B&O has confused A&M's use of a 16% discount rate in the calculation of the value of the City IOF, on the one hand, with a "reasonable rate of return" allowed under the ACI methodology, on the other hand. [A&M October Response, p. 3.] While these two things are associated, the use of a higher discount rate results in a lower valuation, which therefore results in a smaller damage quantification. [*Id.*] A&M's determination of a 16% rate of return correctly accounts for the asset specific risk of the City IOF when compared with Sentinel's broader oil and gas holdings. [*Id.*] B&O's criticism of the 16% rate of return actually does a disservice to the City, because the use of B&O's 8% rate of return would increase damages by approximately $925,000. [*Id*., p. 3-4.]

Based on the fact that amortization has not already occurred, the future costs for closure must be considered in determining the amortization period and must be considered in an ACI study. Closure costs represent a significant capital investment to be incurred in the future. In any case, Sentinel rejects the idea that closure costs may only be accounted for if they were incurred during an amortization period that excludes them. The life cycle of an oil well includes closure of the oil well, as required by State law. 14 CCR §1723.1; 14 CCR 1745.1. Because these operation costs to close the wells are required by State law, they have to be considered whether amortization has occurred or not. Further, as described in the various A&M reports, closing costs are factored in at the time of acquisition. To exclude closing costs in the City's calculations is a ploy to reach the termination outcome of its choosing – this method is not valid and it violates the Constitution's protections against takings.

6. Because the City IOF Cannot Be Amortized in the Time Period Set by the City, the Proposed Ordinance Constitutes a Taking of Sentinel's Property

The City attempts to avoid providing Sentinel just compensation for the taking of its property by implementing an amortization period. Because the City IOF would not amortize until at least 2036, any forced closure of the City IOF before then constitutes a taking of vested rights held by Sentinel and the landowners and mineral rights holders in violation of the U.S. Constitution and California Constitution.

Contrary to the City's assertions, Sentinel's vested rights to develop and produce oil and gas resources are not limited to the production value of the existing well, and instead, includes all prudent and feasible means to develop and produce oil and gas resources as contemplated by State law. *See Hansen Bros. Enters. v. Bd. of Supervisors*, 12 Cal. 4th 533 (1996). The proposed Ordinance infringes on the full extent of Sentinel's vested rights.

The City's proposed elimination of oil and gas related activities is not based on scientific evidence regarding the oil and gas resources in the IOF, nor is it based on input from Sentinel or the landowners. Additionally, if all oil and gas operations in the City IOF were to be terminated, the City would be denying Sentinel all economically viable use of its property. *Lucas v. S.C. Coastal Council*, 505 U.S. 1003, 1015 (1992) ("[T]he Fifth Amendment is violated when land-use regulation . . . denies an owner economically viable use of his land.").

The City's attempted imposition of a "Termination Fee" that reflects the City's "reasonable costs" for an expanded staff role under the proposed Ordinance also ignores the legal authorities protecting against regulatory takings, including takings in the form of unconstitutional monetary exactions. [Staff Report, p. 12-13.] The California Supreme Court has already determined that there must exist a rough proportionality between the magnitude of a fiscal exaction and the effects of the proposed development. *Ehrlich v. City of Culver City*, 12 Cal. 4th 854 (1996). The requisite "rough proportionality" does not exist here.

7. There Can Be No Zoning Ordinance or General Plan Consistency Without a Valid General Plan

The City entirely fails to respond to or acknowledge its failure to have a valid General Plan or to perform the required "Focused Special Study" needed to identify the applicable land uses for the area as required by State law (Gov't Code § 65302(a)), nor does it "address the potential for appropriate open space, residential, commercial and industrial uses and access." [*See* June Letter, p. 2.] Indeed, the City's Staff Report eliminates the majority of its discussion of the General Plan from its Staff Report, perhaps in an attempt to bury this issue.

The City is required to designate land uses for this area, and its failure to do so results in an invalid General Plan. *Camp v. Bd. of Supervisors*, 123 Cal. App. 3d 334, 348 (1981). As explained in detail in the June letter, without a valid General Plan, the proposed Ordinance would be void ab initio or invalid when passed. *Lesher Communications, Inc. v. City of Walnut Creek,* 52 Cal.3d 531, 541 (1990).

Further, State law requires that zoning ordinances be consistent with the general plan. Gov't Code § 65860. Because the City cannot make consistency findings based on the invalid General Plan, the City cannot adopt the proposed Ordinance. The City cannot claim that the proposed Ordinance will "improve the City's ability to implement the goals, objectives, and policies of the General Plan for the affected areas because it will resolve a nonconforming land use that is a barrier to accomplishing those goals."[1] [Staff Report, p. 7.] The City does not even attempt to expand on this statement. This is because these goals, objectives, and policies do not exist. As described in full in the June Letter, the City ignores the most relevant and critical sections of the General Plan, Policy 27.F and Measure 3, which require the City to prepare a Focused Special Study for the area.

8. The Conclusions of the City's CEQA Exemption Review Are Not Supported by Substantial Evidence

As described in detail in the June Letter, the City's determination that the proposed Ordinance is exempt from CEQA ignores the environmental effects of closing the IOF. In response,

[1] The City also states that the proposed Ordinance will "acknowledge and affirm" the role of the City's comprehensive General Plan Update. [Proposed Ordinance, p. 5.] The proposed Ordinance cannot "affirm" a General Plan that is invalid. As stated in *Lesher*: "The tail does not wag the dog." *Lesher*, 52 Cal.3d at 541.

the City prepared a flawed CEQA exemption analysis, again concluding that the proposed Ordinance is exempt from CEQA under the common sense exemption and various categorical exemption classes – Existing Facilities (Class 1), Minor Alterations to Land (Class 4), and Actions by Regulatory Agencies for the Protection of the Environment (Class 8). None of these exemptions apply, either because the exemption does not apply on its own terms, or because the "unusual circumstances" exception applies. The proposed Ordinance is not exempt from CEQA.

In order to conduct a proper CEQA review, the City must set forth a stable, finite, and accurate project description. The City has not done so. As described above, the City does not have a valid General Plan. Without a valid General Plan, by implementing the proposed Ordinance, the City terminates one use without identifying what use will be allowable on the property in the future. This is improper. *Bozung v. Local Agency Formation Com.*, 13 Cal. 3d 263 (1975) (holding that the annexation of land which involved the change of land use was a "project" that needed to be studied under CEQA); *see also City of Santa Clara v. Local Agency Formation Com.*, 139 Cal. App. 3d 923 (1983) (holding that an agency was correct in requiring CEQA review of an annexation based upon the consideration that CEQA requires a lead agency to consider the ultimate use of a property in its environmental review). Therefore, the CEQA analysis of the proposed Ordinance must also analyze an amendment to the General Plan that delineates the land use designation for the area. To fail to analyze these two together constitutes improper piecemealing.

Furthermore, the City has evaluated some fabricated set of physical activities to terminate oil and gas operations in the City IOF, although the City is not the operator and the City has no specific knowledge regarding the actual physical activities that would be required to terminate oil and gas operations. This simple fact alone undermines the City's use of any exemption, either on their own terms or the "unusual circumstances" exception to the application of exemptions. 14 CCR § 15300.2(c).

Even if the City did have an accurate project description, the Class 8 exemption involving actions by regulatory agencies for the protection of the environment does not apply. The Class 8 exemption only applies "where the regulatory process involves ***procedures*** for protection of the environment." 19 CCR § 15308 (emphasis added). This exemption expressly excludes projects that involve "construction activities." *Id*. Because the proposed Ordinance would require physical work in order to close the City IOF, it involves more than just "procedures for protection of the environment," and therefore the Class 8 exemption does not apply. Moreover, the Class 1 exemption regarding existing facilities also does not apply. This exemption applies to the "operation, repair, maintenance permitting, leasing, licensing, or minor alteration of existing public or private structures." 19 CCR 15301. The closure of the City IOF is none of these things.

Additionally, the common-sense exemption does not apply to the proposed Ordinance. The common-sense exemption only applies "[w]here it can be seen with certainty that there is no possibility that the activity in question may have a significant effect on the environment." 14 CCR § 15061(b)(3). Because the City has not and cannot analyze potential future uses of the City IOF, nor has the City evaluated the actual physical activities to be performed to terminate oil and gas uses, it cannot be seen with certainty that there is no possibility that the proposed Ordinance may have a significant effect on the environment.

Lastly, the City's conclusion that the proposed Ordinance will have no impact on the availability of a known mineral resource of value to the region and state residents and will have no impact on the availability of a locally important mineral recovery site delineated on a land use plan is not supported by the evidence. First, the closure of the City IOF would result in the loss of availability of a known mineral resource that is of value to the region and residents of the State. CalGEM is directed to produce these mineral resources from identified fields, the City IOF being one of them, consistent with State law. [*See* State Map of Southern, Central Coastal, and Offshore California Oil and Gas Fields ("State Map"), attached hereto.] Further, the policy that promotes the "the wise development of oil and gas resources" is embodied in State law. PRC, § 3106(d).

Additionally, reduced domestic production of oil will increase environmental impacts caused by the necessary importation of oil. Because oil and gas producers in other states and countries are not required to adhere to California's environmental standards, increasing oil and gas import would increase GHG emissions and impact global environmental quality. The City's exemption analysis fails to take into account the air quality impacts associated with favoring imported oil over oil produced in the City.

Second, the City IOF is a locally-important mineral resource recovery site delineated by a land use plan. The City IOF is located in the City, making it locally important, and it is delineated in the State Map on pages 16, 18, 19, 192-194.

9. Conclusion

The City's proposed action is illegal and improper. Based on the foregoing, as well as the June Letter and the attachments included thereto, the City Council must reject the proposed Ordinance.

Sincerely,

Nicki Carlsen

Attachments:
October 18, 2021 A&M Response to the Baker & O'Brien Letter Dated October 8, 2021
Chevron Case
State Map of Southern, Central Coastal, and Offshore California Oil and Gas Fields

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October 18, 2021

To: Ms. Heather S. Baker
Assistant City Attorney
City of Culver City
9770 Culver Boulevard
Culver City, CA 90230-0507

Subject: Alvarez & Marsal's Response to the Baker & O'Brien Letter Dated October 8, 2021

I. EXECUTIVE SUMMARY

1. Alvarez & Marsal ("A&M") was retained on behalf of Sentinel Peak Resources California LLC ("SPR") in a matter related to the Inglewood oil field in the City of Culver City (the "City" or the "City IOF"). I issued reports dated August 13, 2020 and June 17, 2021. I continue to stand by the opinions expressed in those reports.

2. I was provided with Baker & O'Brien Inc.'s ("B&O") letter dated October 8, 2021 (the "B&O Letter") and was asked to provide a response. First, B&O's assertion that I only performed a valuation of the City IOF and have not performed an amortization of capital investment ("ACI") analysis is false.[1] Opinion 1 from my June 2021 report describes my ACI calculations and the fact that the City IOF has not presently reached ACI.[2] Second, while I do not agree with many of the statements and conclusions in the B&O Letter, the main point of disagreement is the treatment of the field closure costs in an ACI calculation.

3. B&O's position is that field closure costs are "not relevant to a cash flow analysis, which is used to determine the time to achieve ACI…"[3] B&O essentially ignores the field closure costs altogether. This is arbitrary, absurd, and does not make rational economic sense.

4. Field closure costs refer to all amounts that must be expended by the operator to remove the wellbore and surface facilities and return the well site to its original condition.

[1] Baker & O'Brien, Inc.'s Letter dated October 8, 2021, pg. 10.
[2] Report of Robert Lang dated June 17, 2021, pgs. 10-21.
[3] Baker & O'Brien, Inc.'s Letter dated October 8, 2021, pg. 2.

These costs, just like any other costs, must be accounted for in any evaluation of the cash flows of an oil and gas property in order to determine the actual return or profitability of a project. My June 2021 report included an estimate of the field closure costs that ranged from $9.4 million to $10.7 million.[4]

5. Should the City Council commence an Amortization Program and set an end date to remove all oil field related equipment and facilities, SPR will be required to expend the field closure costs. Logically, these costs should be included in any calculation of the return realized by SPR.

6. B&O's exclusion of the field closure costs is similar to financing a car with a large balloon payment at the end of the term but not considering the final payment in the total cost of the car. The final balloon payment will be due and is very much a part of the total cost of the car and the cash flows the purchaser necessarily has to make. In the same way, the field closure costs are cash flows SPR will incur and therefore those cash outflows must be considered in the calculation of ACI.

7. Should the City Council terminate SPR's oil and gas operations in the City IOF, SPR will be required to nearly immediately pay the field closure costs. Logically, those costs drastically change the return SPR has realized on the City IOF. While B&O refers to the field closure costs as "non-cash future liabilities"[5], those amounts immediately become due if the City should amortize the field and are cash amounts SPR will be required to pay. If the purpose of an ACI calculation is to allow the investor to realize a reasonable rate of return, all significant cash outflows must be considered in the rate of return calculation, else the investor has not actually realized the calculated rate of return.

8. Based on my analysis in the June 2021 report, SPR has presently realized a negative return on its investment and SPR's investment does not yield a positive return until 2030 or 2034 (depending on the price of oil) after factoring in the field closure costs.[6] SPR will be required to expend the field closure costs whenever it is either no longer allowed to operate the City IOF or at the end of the actual economic life of the field. To ignore these costs (as B&O has done) in a calculation of SPR's rate of return is inappropriate.

9. Any determination by City Council that SPR's investment has presently reached ACI would not be based upon the appropriate consideration of all expected and required costs associated with the City IOF.

[4] Report of Robert Lang dated June 17, 2021, Exhibit 1, Exhibit 2, and Table 3 (pg. 24).
[5] Baker & O'Brien, Inc.'s Letter dated October 8, 2021, pg. 7.
[6] Report of Robert Lang dated June 17, 2021, Exhibit 1 and 2.

II. OTHER ITEMS ADDRESSED IN THE B&O LETTER

10. While B&O's exclusion of field closure costs constitutes the largest error in their analysis, there are additional deficiencies in the latest letter. In general, B&O's points and criticisms are either based on errors or inaccuracies, or the issue raised does not result in a meaningful difference between their analysis and mine. Several of the items raised by B&O are addressed below.

11. First, B&O takes issue with the operating expenses I utilized in my June 2021 report. As stated in my report, the historical LOEs for the City IOF averaged approximately $28 per BOE from January 2017 through May 2021.[7] The B&O Letter claims that my analysis projects "much higher operating costs after 2021 than historical operating costs" with "operating costs after 2021 that range from about $46 per barrel to more than $60 per barrel, ***based on production volumes used in the [B&O Report dated May 29, 2020]***."[8] This statement is incorrect. My projected operating expenses average approximately $29 per barrel and $34 per barrel for 2021 forward based on the strip price case and the $75 price case, respectively. B&O arrives at the $46 and $60 per barrel amounts by inappropriately taking operating expenses from one source and dividing them by volumes from another source. B&O appears to divide the total operating costs included in *my June 2021 report* by the total projected volumes from the *B&O report in May 2020*. B&O's volumes apparently do not match the volumes projected by SPR (and used in my June 2021 report), which causes B&O to calculate incorrect per barrel amounts. As B&O's entire analysis of my alleged per barrel operating expenses is based on inaccurate and incorrect data, any comments by B&O related to "unreasonably high" projected operating expenses in my analysis should be disregarded.

12. Second, B&O takes issue with my calculation of a 16 percent discount rate, which B&O refers to as the 'target rate of return'.[9] B&O has confused my use of a 16 percent discount rate in the calculation of the value of the City IOF, on the one hand, with a 'reasonable rate of return' allowed under the ACI methodology, on the other hand. While those two items are associated, the use of a higher discount rate results in a lower valuation, which therefore results in a smaller damage quantification. In my determination of the discount rate (as part of the calculation of the weighted average cost of capital), I have included additional consideration for the asset specific risk of the City IOF when compared with SPR's broader oil and gas holdings. If I were to use the 8

[7] Report of Robert Lang dated June 17, 2021, pg. 18, par. 52.
[8] Baker & O'Brien, Inc.'s Letter dated October 8, 2021, pg. 19. Emphasis added.
[9] Baker & O'Brien, Inc.'s Letter dated October 8, 2021, pg. 14.

percent rate that B&O argues, my valuation of the City IOF would ***increase*** damages by approximately $925,000.

13. Third, B&O takes issue with my calculation of depreciation, depletion, and amortization ("DD&A").[10] To be clear, I am not deducting DD&A from the cash flows.[11] I considered DD&A only in the determination and calculation of income taxes (as DD&A is an allowed expense when calculating taxable income), as I did deduct income taxes from the cash flows. I utilized DD&A of 5 percent of revenue as a proxy for DD&A over the life of the field based on input from SPR. It is somewhat unclear in the B&O Letter, but it appears that B&O believes that my depreciation is understated and therefore the time to reach ACI is overstated. Even if I were to change my DD&A calculation to equal 15 percent of revenue, the time to reach ACI does not materially change. This appears to be a criticism of B&O's that does not cause a material difference between our analyses.

14. Additionally, B&O addresses items like income tax rates, ad valorem taxes, severance taxes, and SPR's purchase price.[12] B&O also takes issue with the crude and natural gas prices and differentials[13], even though pricing was based upon SPR's actual realized prices and contractual differentials and adjustments. Further, B&O discusses general and administrative costs but appears to again overstate the per barrel amount which overstates their conclusion of the total G&A costs.[14] Regardless, even according to B&O, the differences between their analysis and mine for these inputs does not result in a "material change in time required to achieve ACI."[15,16]

15. Lastly, B&O continues to reference performing an ACI calculation based on a scenario that evaluates amortization of the initial capital investment made by historical operators dating back to 1925 for wells located in the City IOF.[17] This is an irrelevant analysis in which B&O essentially seeks to draw the conclusion that since the City IOF must have reached ACI decades ago, then the City is justified in requiring the current operator, SPR, to cease operations. First, this disregards the fact that SPR was not the operator prior to 2017 and did not realize any returns that were generated by the City

[10] Baker & O'Brien, Inc.'s Letter dated October 8, 2021, pg. 6.
[11] Depreciation is a non-cash item and, therefore, it would be inappropriate to deduct depreciation from any cash flow analysis.
[12] Baker & O'Brien, Inc.'s Letter dated October 8, 2021, pg. 15-17.
[13] Baker & O'Brien, Inc.'s Letter dated October 8, 2021, pg. 17-18.
[14] Baker & O'Brien, Inc.'s Letter dated October 8, 2021, pg. 20.
[15] Baker & O'Brien, Inc.'s Letter dated October 8, 2021, pg. 15-18.
[16] To be clear, this letter does not contain an exhaustive list of items for which I disagree with the B&O Letter.
[17] Baker & O'Brien, Inc.'s Letter dated October 8, 2021, pg. 7 and 10.

IOF for periods dating back to 1925.[18] The reality is that SPR purchased the City IOF in 2017 and has only realized cash flows since that time. Basing an ACI determination on estimates of amounts prior operators may have earned decades ago, and ignoring the current operator's actual cash flows, is absurd.

III. CONCLUSION

16. In summary, I disagree with B&O's conclusion that SPR's investment in the City IOF has reached ACI.[19] As described above, many of the bases for B&O's conclusions are flawed, factually inaccurate, and result in an ACI analysis by B&O that is unreliable and incorrect. Importantly, any calculation of a reasonable rate of return must include the field closure costs.

17. I stand by the analysis contained in my June 2021 report that shows that SPR's investment in the City IOF has not currently amortized and is not likely to amortize until 2036 or after.[20] Nothing within the B&O Letter has caused me to revise or update my prior analysis or conclusions.

18. Further, should the City terminate the oil and gas operations of the City IOF in the next five years as a result of B&O's purported ACI calculation, the financial damages to SPR would include (but are not limited to) the loss in market value and the accelerated end of life costs. As of June 2021, these damages were estimated to be approximately $14.6 million to $15.9 million.[21]

Kind Regards,

Robert Lang

[18] Furthermore, even if an ACI analysis dating back decades was relevant, by B&O's own admission, detailed information is not available and B&O simply "estimated" or "back-casted" a majority of the inputs needed to develop its cash flow model (Baker & O'Brien, Inc.'s Capital Investment Amortization Study Report dated May 29, 2020, pgs. 31-32).

[19] It is SPR's position that an ACI calculation is not appropriate for oil and gas investments. I was asked to perform an ACI calculation as if it was appropriate.

[20] See Opinion 1 in the Report of Robert Lang dated June 17, 2021.

[21] See Opinion 2 in the Report of Robert Lang dated June 17, 2021.

Filed 10/12/21

CERTIFIED FOR PUBLICATION

IN THE COURT OF APPEAL OF THE STATE OF CALIFORNIA

SIXTH APPELLATE DISTRICT

CHEVRON U.S.A., INC. et al., Plaintiffs and Respondents, v. COUNTY OF MONTEREY, Defendant; PROTECT MONTEREY COUNTY et al., Interveners and Appellants.	H045791 (Monterey County Super. Ct. No. 16CV003978)

Appellant Protect Monterey County (PMC) appeals from the trial court's judgment striking down a County ordinance banning "land uses in support of" new oil and gas wells and "land uses in support of" wastewater injection in unincorporated areas of Monterey County. These ordinances were enacted as part of Measure Z, an initiative sponsored by PMC and passed by Monterey County voters. The trial court upheld, in part, a challenge to Measure Z by plaintiffs, numerous oil companies and other mineral rights holders in Monterey County.[1] PMC contends that the trial court erroneously

[1] Six separate actions were consolidated below. One was brought by Aera Energy LLC (Aera). A second action was brought by Chevron U.S.A. Inc. and a group of other entities, which we will refer to collectively as Chevron. A third action was brought by California Resources Corporation (CRC). The fourth action was brought by National Association of Royalty Owners-California, Inc. and various individuals and entities, which we will refer to collectively as NARO. A fifth action was brought by Eagle Petroleum, LLC (Eagle). The sixth action was brought by Trio Petroleum LLC and

concluded that these two components of Measure Z were preempted by state and federal laws and that they constituted a facial taking of the property of some plaintiffs. PMC also contends that the trial court made prejudicially erroneous evidentiary rulings.

We find that the trial court correctly concluded that these two components of Measure Z are preempted by Public Resources Code section 3106.[2] Section 3106 explicitly provides that it is the State of California's oil and gas supervisor who has the authority to decide whether to permit an oil and gas drilling operation to drill a new well or to utilize wastewater injection in its operations. These operational aspects of oil drilling operations are committed by section 3106 to the State's discretion and therefore local regulation of these aspects would conflict with section 3106. Our narrow holding does not in any respect call into question the well-recognized authority of local entities to regulate the location of oil drilling operations, a matter not addressed by section 3106 or Measure Z.

Because we uphold the trial court's decision on the grounds of state law preemption, we need not consider whether Measure Z is also preempted by federal law or constituted a facial taking of plaintiffs' property. We also need not address PMC's challenge to the trial court's evidentiary rulings as those rulings play no role in the resolution of the state law preemption issue, which is an entirely legal issue. We affirm the trial court's judgment.

I. MEASURE Z

Measure Z was a citizens' initiative on the November 2016 Monterey County ballot entitled: "Protect Our Water: Ban Fracking and Limit Risky Oil Operations Initiative." It proposed to amend Monterey County's general plan to add three new land

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two other corporations, which we will refer to collectively as Trio. The six actions were consolidated by the trial court for the Phase 1 trial.

[2] All further statutory references are to the Public Resources Code unless otherwise indicated.

use policies. LU-1.21, which is not at issue in this appeal, would prohibit "Land Uses . . . in support of well stimulation treatments" throughout the County's unincorporated areas.[3] LU-1.22 would prohibit "Land Uses . . . in support of oil and gas wastewater injection or oil and gas wastewater impoundment" throughout the County's unincorporated areas. LU-1.23 would prohibit "Land Uses in Support of Drilling New Oil and Gas Wells" anywhere in the County's unincorporated area. Measure Z also would amend Monterey County's local coastal program and its Ford Ord Master Plan to add identical prohibitions.

Measure Z contained a section setting forth "exemptions" for "any person or entity exercising a vested right obtained pursuant to State law" and provided for "a reasonable amortization period" for phasing out uses that were inconsistent with Measure Z's provisions. Measure Z also stated that its provisions would not be applied to the extent "that they would violate the constitution or laws of the United States or the State of California." Measure Z authorized the Board of Supervisors to grant an exception to a property owner if the application of Measure Z would result in an unconstitutional taking.

Measure Z identified its purpose as "protect[ing] Monterey County's water, agricultural lands, air quality, scenic vistas, and quality of life" by "prohibit[ing] and phas[ing] out land uses in support of oil and gas wastewater . . . disposal using injection wells or disposal ponds in the County's unincorporated area" and "prohibit[ing] drilling new oil and gas wells in the County's unincorporated area." Measure Z asserted that

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[3] Chevron conceded at the outset of the Phase 1 trial that it was not using well stimulation techniques or hydraulic fracturing at the San Ardo Field, where Chevron's Monterey County drilling operations were located. However, Chevron argued that "the possibility that Chevron might in the future use well stimulation or may need to or may decide to, that's enough for standing." NARO also conceded that "nobody's using hydrofracturing at the moment and probably—maybe never again in the County of Monterey." The trial court ultimately rejected plaintiffs' challenges to LU-1.21 based on its finding that they lacked standing to challenge that aspect of Measure Z. That ruling is not at issue in this appeal.

these policies would "promote[] and protect[] the health, safety, welfare, and quality of life of County residents . . . ." Measure Z was passed by the voters in November 2016.

II. PROCEDURAL BACKGROUND

Beginning in December 2016, plaintiffs filed multiple mandate petitions and complaints for declaratory and injunctive relief and for inverse condemnation against defendant County of Monterey (the County).[4] Plaintiffs alleged that Measure Z was preempted by state and federal law and would result in an unconstitutional taking of their property. The court stayed the effective date of Measure Z after the County and plaintiffs stipulated to a stay. PMC intervened in the actions.[5]

After a multi-day trial that consisted entirely of argument by counsel based on voluminous declarations and exhibits, the court issued an extensive statement of decision. The court found that plaintiffs lacked standing to challenge LU-1.21 because no plaintiff was using or proposing to use any well stimulation treatments in Monterey County. The court found that LU-1.21 was severable from LU-1.22 and LU-1.23.

The court proceeded to plaintiffs' challenge to LU-1.22, which barred wastewater injection and impoundment. The court credited plaintiffs' arguments that this aspect of Measure Z was preempted by state law. The court rejected PMC's claim that Measure Z was simply a "land use" prohibition. The court characterized this argument as "clearly a pretextual attempt to do indirectly what it cannot do directly." The court focused on the lack of any "meaningful distinction between wastewater injection and impoundment on the one hand, and surface equipment and activities in support of wastewater injection and

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[4] The court consolidated the six cases filed by plaintiffs for purposes of the "Phase 1" trial, which was to resolve the facial challenges to Measure Z, including preemption and takings. The County has not appeared in this appeal.

[5] The Center for Biological Diversity (the Center) also sought to intervene. The trial court denied the Center's motion, but granted PMC's motion to intervene. The court also permitted PMC's spokesperson, Dr. Laura Solorio, to intervene. We will refer to PMC and Solorio collectively as PMC.

impoundment on the other." The court eschewed the distinction between surface and subsurface activities and instead concluded that the key issue was whether Measure Z "regulates the *conduct* of oil and gas operations or their permitted *location*." The court viewed LU-1.22 as "regulat[ing] a specific *production technique* . . . ." The court found it significant that "Measure Z is a ban on specific production techniques *not* a total ban on oil operations." Because, in the trial court's view, state law "fully occupies the area of the manner of oil and gas production," and LU-1.22 "seeks to regulate the manner of oil and gas production," the court found that LU-1.22 was preempted. The court also found that LU-1.22 conflicted with section 3106. In addition, the court found that LU-1.22 conflicted with the state's authority under the federal Safe Drinking Water Act (SDWA) because the State, not local authorities, was authorized to make the findings that Measure Z purported to make regarding whether underground wastewater injection would endanger drinking water sources. Thus, the SDWA also preempted LU-1.22.

The court proceeded to LU-1.23. It found that the ban on new wells conflicted with the SDWA because LU-1.23 necessarily banned wastewater injection. It also found that the new well ban was preempted because it would prevent plaintiffs from maintaining the "steam chest" that was "necessary to their profitable operation" and from drilling new wells for wastewater disposal purposes as permitted by section 3106.

The court then addressed the facial takings claim. The court found that the exemption procedure provided for in Measure Z violated due process so plaintiffs were not required to exhaust administrative remedies. The court found that LU-1.22 and LU-1.23 would cause a facial taking as to those plaintiffs who had no active wells, but no remedy was necessary because those two provisions were preempted. As to those plaintiffs who had active wells, the court found no facial taking.

The court entered judgment and issued a writ of mandate directing the County to invalidate LU-1.22 and LU-1.23. PMC timely filed a notice of appeal from the judgment.[6]

III. DISCUSSION

A. State Law Preemption

PMC contends that the trial court erred in finding that LU-1.22 and LU-1.23 are preempted. Plaintiffs maintain that Measure Z[7] is preempted under state law because it conflicts with section 3106.

"Under article XI, section 7 of the California Constitution, '[a] county or city may make and enforce within its limits all local, police, sanitary, and other ordinances and regulations *not in conflict with general laws*.' [¶] 'If otherwise valid local legislation conflicts with state law, it is preempted by such law and is void.' [Citations.] [¶] 'A conflict exists if the local legislation " 'duplicates, contradicts, or enters an area fully occupied by general law, either expressly or by legislative implication.' " ' [Citations.] [¶] Local legislation is 'duplicative' of general law when it is coextensive therewith. [Citation.] [¶] Similarly, local legislation is 'contradictory' to general law when it is inimical thereto. [Citation.] [¶] Finally, local legislation enters an area that is 'fully occupied' by general law when the Legislature has expressly manifested its intent to 'fully occupy' the area [citation], or when it has impliedly done so in light of one of the following indicia of intent: '(1) the subject matter has been so fully and completely covered by general law as to clearly indicate that it has become exclusively a matter of state concern; (2) the subject matter has been partially covered by general law couched in

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[6] Some of the other parties also filed notices of appeal, but all of them subsequently dismissed their appeals.

[7] We refer to these two policies as Measure Z in our analysis for ease of reference, even though Measure Z also encompasses LU-1.21, which is not at issue in this appeal and which the trial court did not find preempted. Our references to Measure Z should not be misunderstood to include LU-1.21.

such terms as to indicate clearly that a paramount state concern will not tolerate further or additional local action; or (3) the subject matter has been partially covered by general law, and the subject is of such a nature that the adverse effect of a local ordinance on the transient citizens of the state outweighs the possible benefit to the' locality [citations]." (*Sherwin-Williams Co. v. City of Los Angeles* (1993) 4 Cal.4th 893, 897-898, fn. omitted, italics added.) "The party claiming that general state law preempts a local ordinance has the burden of demonstrating preemption." (*Big Creek Lumber Co. v. County of Santa Cruz* (2006) 38 Cal.4th 1139, 1149 (*Big Creek*).) "Whether state law preempts a local ordinance is a question of law that is subject to de novo review." (*Roble Vista Associates v. Bacon* (2002) 97 Cal.App.4th 335, 339.)

The trial court found that Measure Z is preempted by state law because, among other things, Measure Z *conflicts* with section 3106, which not only *permits* and *encourages* the drilling of new wells and the use of wastewater injection but explicitly *vests in the State the authority to permit* this conduct.[8] Since Measure Z *prohibits* all wastewater injection and bans new well drilling, the trial court found that section 3106 preempts Measure Z.

PMC argues that Measure Z is not preempted by state law because "California oil and gas statutes and regulations expressly acknowledge and affirm local authority, precluding a finding that the state has completely occupied the field," and "state law addresses only specific, technical aspects of oil and gas production, leaving local governments free to exercise their traditional authority over land use, health, and safety to protect communities from harm."

Plaintiffs' position, on the other hand, is that section 3106 "*mandate*[*s*] that oil and gas producers *be allowed* to undertake wastewater injection projects properly approved

[8] As we determine that Measure Z *conflicts* with section 3106, we need not consider plaintiffs' claim that the State has preempted the *field* of oil and gas regulation.

by the Oil and Gas Supervisor and also be *allowed* to undertake oil and gas well drilling projects properly approved by the Oil and Gas Supervisor."

We begin with the text of section 3106:

"(a) The [State Oil and Gas] supervisor[9] shall so supervise the drilling, operation, maintenance, and abandonment of wells and the operation, maintenance, and removal or abandonment of tanks and facilities attendant to oil and gas production, including pipelines not subject to regulation pursuant to Chapter 5.5 (commencing with [s]ection 51010) of Part 1 of Division 1 of Title 5 of the Government Code that are within an oil and gas field, so as to prevent, as far as possible, damage to life, health, property, and natural resources; damage to underground oil and gas deposits from infiltrating water and other causes; loss of oil, gas, or reservoir energy, and damage to underground and surface waters suitable for irrigation or domestic purposes by the infiltration of, or the addition of, detrimental substances. [¶] (b) The supervisor shall also supervise the drilling, operation, maintenance, and abandonment of wells so as to permit the owners or operators of the wells to utilize all methods and practices known to the oil industry for the purpose of increasing the ultimate recovery of underground hydrocarbons and which, in the opinion of the supervisor, are suitable for this purpose in each proposed case. To further the elimination of waste by increasing the recovery of underground hydrocarbons, it is hereby declared as a policy of this state that the grant in an oil and gas lease or contract to a lessee or operator of the right or power, in substance, to explore for and remove all hydrocarbons from any lands in the state, in the absence of an express provision to the contrary contained in the lease or contract, is deemed to allow the lessee or contractor, or the lessee's or contractor's successors or assigns, to do what a prudent operator using reasonable diligence would do, having in mind the best interests of the lessor, lessee, and the state in producing and removing hydrocarbons, including, but not

[9] Section 3004 provides: " 'Supervisor' means the State Oil and Gas Supervisor."

limited to, the injection of air, gas, water, or other fluids into the productive strata, the application of pressure heat or other means for the reduction of viscosity of the hydrocarbons, the supplying of additional motive force, or the creating of enlarged or new channels for the underground movement of hydrocarbons into production wells, when these methods or processes employed have been approved by the supervisor, except that nothing contained in this section imposes a legal duty upon the lessee or contractor, or the lessee's or contractor's successors or assigns, to conduct these operations. [¶] (c) The supervisor may require an operator to implement a monitoring program, designed to detect releases to the soil and water, including both groundwater and surface water, for aboveground oil production tanks and facilities. [¶] (d) To best meet oil and gas needs in this state, the supervisor shall administer this division so as to encourage the wise development of oil and gas resources." (§ 3106.)

We agree with plaintiffs that the text of section 3106 supports the trial court's preemption finding. Section 3106 identifies the State's *policy* as "*encourag*[*ing*] the wise development of oil and gas resources," and expressly provides that *the State* will supervise the drilling of oil wells "so as to *permit*" the use of "*all*" practices that will increase the recovery of oil and gas. (§ 3106, italics added.) In doing so, section 3106 plainly lodges the authority to permit "all methods and practices" firmly in *the State's hands*. Section 3106 makes no mention whatsoever of any reservation to local entities of any power to limit the State's authority to permit well operators to engage in these "methods and practices."

The legislative history of section 3106 is consistent with our understanding of the statute's text. Section 3106 was originally enacted in 1939 when the Public Resources Code was first created. (Stats. 1939, ch. 93, § 3106.) At that time, section 3106 provided: "The supervisor shall so supervise the drilling, operation, maintenance, and abandonment of wells as to prevent, as far as possible, damage to underground oil and gas deposits from infiltrating water and other causes, loss of oil and gas, and damage to

underground and surface waters suitable for irrigation or domestic purposes by the infiltration of, or the addition of, detrimental substances, by reason of the drilling, operation, maintenance, or abandonment of wells." (Stats. 1939, ch. 93, § 3106, p. 1112.) We see no indication in this original version of section 3106 of any preemption of local authority.

However, the language of subdivision (b) of section 3106, which is the critical one for our purposes, was added in 1961.[10] (Stats. 1961, ch. 2074, § 1.) It read essentially as it reads today. Subdivision (a) was amended in 1970 to require the supervisor to "*prevent, as far as possible, damage to life, health, property, and natural resources . . .* " (Stats. 1970, ch. 799, § 1, italics added.) While the 1970 amendment acknowledged the potential for negative local impacts from oil drilling operations, section 3106 continued to lodge the power to supervise these operations in the hands of the State.

In 1972, the text that is now subdivision (d) was added. (Stats. 1972, ch. 898, § 7.) The legislative history identifies the purpose of this amendment as "strengthen[ing] the role" of the California Department of Conservation's Division of Oil, Gas, and Geothermal Resources (DOGGR),[11] the State entity supervising oil drilling and operations, "in dealing with environmental problems." (Resources Agency's Enrolled Bill Rep. on Sen. Bill No. 1022 (1972 Reg. Sess.) August 11, 1972.) There have been no subsequent material amendments to section 3106.[12]

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[10] A 1957 amendment added "or reservoir energy" after "loss of oil, gas". (Stats. 1957, ch. 405, § 7.) It made no other change.

[11] DOGGR became the Division of Geologic Energy Management (CalGEM) on January 1, 2020. (§ 3002.) We continue to refer to it as DOGGR in this opinion as the trial court and the parties have done.

[12] The 1989 amendment added additional methods to the second paragraph, and added a third paragraph, before the final sentence, giving the supervisor authority to impose a monitoring program. (Stats. 1989, ch. 1383, § 2.) The 1994 amendment granted the supervisor authority over tanks, pipelines, and other facilities. (Stats. 1994, ch. 523, §3.)

PMC argues that, despite the language of section 3106 lodging the authority to supervise and permit oil and gas operational "methods and practices" throughout the State, the State's statutes and regulations have "explicitly recognized and preserved local authority." Yet none of the statutes identified by PMC as preserving local authority reflect that the authority vested in the State by section 3106 to decide whether to permit oil and gas operational "methods and practices" is to be shared with local entities.[13]

PMC first points to section 3012, which provides: "The provisions of this division apply to any land or well situated within the boundaries of an incorporated city in which the drilling of oil wells is now or may hereafter be prohibited, until all wells therein have been abandoned as provided in this chapter." (§ 3012.) We note that section 3012 predates the enactment of subdivision (b) of section 3106. (Stats. 1939, ch. 93, § 3012, p. 1110.) What is important to observe about section 3012 is that while it recognizes that a city may ban oil operations entirely, at the same time it mandates that *the State* continue to exercise authority over any existing oil wells. It therefore provides no support for PMC's argument that the State has ceded to local entities any of the State's authority over oil drilling operational methods and practices.

PMC also directs our attention to section 3690, which provides: "This chapter [(chapter 3.5)] shall not be deemed a preemption by the state of any existing right of cities and counties to enact and enforce laws and regulations regulating the conduct and location of oil production activities, including, but not limited to, zoning, fire prevention,

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[13] Division 3 of the Public Resources Code contains a large number of statutes regulating oil and gas. Chapter 1, article 3 regulates well stimulation treatments. (§§ 3150-3161.) Article 4 regulates the operation of oil and gas wells. (§§ 3200-3238.) Section 3203 authorizes the supervisor to approve the drilling of a well. Article 4.4 regulates oil and gas production facilities. (§§ 3270-3270.6.) Article 6 establishes an administrative appeal process for challenging orders by the supervisor. (§§ 3350-3359.) Chapter 3 regulates the spacing of wells. (§§ 3600-3609.) Chapter 3.5 deals with "unit operations."

public safety, nuisance, appearance, noise, fencing, hours of operation, abandonment, and inspection." Although this language on its face might seem to provide some support for PMC's argument, its limitation to chapter 3.5 reflects otherwise. Chapter 3.5 concerns "unit operations," and consists of sections 3630 through 3690, which obviously does not include section 3106. Thus, section 3690's provision that *chapter 3.5* does not preempt local regulations provides no support for the proposition that *section 3106* does not preempt local regulation of oil drilling operational methods and practices.

PMC argues that the Legislature's 2013 enactment of Senate Bill No. 4 demonstrates that section 3106 does not preempt local authority over oil and gas drilling operational methods and practices. Senate Bill No. 4 addressed only "hydraulic fracturing and other well stimulation treatments," which are not at issue in this appeal. (Stats. 2013, ch. 313, § 1.) PMC identifies two provisions of Senate Bill No. 4 that, in PMC's view, preserved local authority. Section 3160, subdivision (n) provides: "This article [(article 3, sections 3150 through 3161, which concern well stimulation)] does not relieve the division or any other agency from complying with any other provision of existing laws, regulations, and orders." Section 3161, subdivision (b)(1)(C) concerns environmental review of an oil well operator's use of well stimulation pending the adoption of state regulations addressing well stimulation. Section 3161 provides that the environmental review of such use is to be done by DOGGR, but this subdivision provides that "[t]his paragraph does not prohibit a local lead agency from conducting its own EIR."

PMC claims that section 3160, subdivision (n) requires compliance with local regulations, thereby implying that local entities retain the power to regulate oil drilling operational methods and practices. The narrow scope of section 3160, subdivision (n) belies this claim. That subdivision applies only to well stimulation and concerns the obligations of DOGGR and other agencies. Nothing in that subdivision implicates the provisions of section 3106, subdivision (b) that we find preempt Measure Z. Similarly,

section 3161, subdivision (b)(1)(C) is also limited to well stimulation and does not explicitly or implicitly grant local entities the power to regulate anything other than well stimulation, which is not at issue in this appeal. Clearly, the Legislature may choose to carve out some oil drilling operational methods and practices for the exercise of shared regulatory power between local entities and the State. At most, these statutes may show that the Legislature carved out well stimulation methods and practices as an area of shared regulatory authority.

PMC also suggests that there is no preemption because provisions in plaintiffs' leases require them to comply with local laws. The leases themselves are not state laws and cannot conflict with state laws. We see nothing in these standard lease provisions, requiring the operators to comply with all laws and regulations, to suggest that *the State* was ceding all or part of its authority under section 3106, subdivision (b) to local entities.

PMC and the amici make much of a line of authority affirming that local regulation of oil and gas drilling is *within the police power* of local entities, and they argue that this line of authority rebuts any preemption claim.

California courts have long viewed local zoning regulation of oil and gas drilling to be within a local entity's police power. Nearly a century ago, the California Supreme Court reversed the dismissal of an action by an oil company against a city because the local regulation had targeted one oil company's land but not that of its competitors, but the court acknowledged that local regulation of "the business of operating oil wells" was properly within the local entity's police power. "A municipality is not permitted, under the guise of regulating business and segregating it to a particular district, to grant a monopoly to business establishments and enterprises already situated in unrestricted districts. [Citation.] The City of Huntington Beach has the unquestioned right to regulate the business of operating oil wells within its city limits, and to prohibit their operation within delineated areas and districts, if reason appears for so doing." (*Pacific Palisades Asso. v. City of Huntington Beach* (1925) 196 Cal. 211, 216-217.)

In *Beverly Oil Co. v. City of Los Angeles* (1953) 40 Cal.2d 552, an oil company challenged a city's ordinance banning new oil wells and prohibiting redrilling of existing wells to new depths. The California Supreme Court rejected the challenge. "It must be deemed to be well settled that the enactment of an ordinance which limits the owner's property interest in oil bearing lands located within the city is not of itself an unreasonable means of accomplishing a legitimate objective *within the police power of the city*." (*Id.* at p. 558, italics added.)

In *Higgins v. City of Santa Monica* (1964) 62 Cal.2d 24, the California Supreme Court considered whether a 1939 City of Santa Monica initiative prohibiting oil drilling could properly be applied to tidelands that the State had explicitly granted power over to the city. (*Id.* at pp. 26-28.) The *Higgins* court rejected the argument that state laws had *preempted the field* with respect to oil drilling *on tidelands*. It found that state laws limited to tidelands had expressly vested discretion in the city to decide whether there should be oil drilling on the tidelands. (*Id.* at p. 32.)

Hermosa Beach Stop Oil Coalition v. City of Hermosa Beach (2001) 86 Cal.App.4th 534 involved, among other things, whether a citizens' initiative banning oil drilling in the city was a valid exercise of the city's police power. (*Id.* at pp. 543-545, 548.) The court held: "Enactment of a city ordinance prohibiting exploration for and production of oil, unless arbitrary, is a valid exercise of the municipal police power." (*Id.* at p. 555.)

The mere fact that *some* local regulation of oil and gas drilling is within a local entity's police power does not resolve the question of whether a particular local regulation is *preempted* by a particular state law. If a local regulation conflicts with a state law, the local regulation exceeds the local entity's power. (Cal. Const. art. XI, § 7 ["A county or city may make and enforce within its limits all local, police, sanitary, and other ordinances and regulations not in conflict with general laws"].) With the exception of *Higgins*, none of these cases even considered whether an otherwise valid local

regulation was preempted by state law. *Pacific Palisades* predated the enactment of the Public Resources Code, and *Beverly Oil* predated the addition of the language that now appears in section 3106, subdivision (b). While *Hermosa Beach* came after the language that became subdivision (b) was added to section 3106, the Court of Appeal did not consider whether the local regulation was preempted. "[I]t is axiomatic that cases are not authority for propositions not considered." (*People v. Alvarez* (2002) 27 Cal.4th 1161, 1176.) *Higgins* considered a preemption argument, but that argument was limited to specific state laws concerning tidelands over which the State, in that case, had expressly granted the local entity full authority. We find no support for PMC's argument in this line of authority.

PMC contends that Measure Z's provisions are not preempted because "the state's oil and gas rules narrowly address only the manner in which operations are carried out, not whether or where oil and gas resources should be developed." PMC asserts that "state law's exclusive focus on the technical manner in which oil and gas production occurs leaves ample room for the exercise of local police power and land use authority." PMC argues that Measure Z controls only "where and whether" oil drilling occurs, which it contends are outside the purview of the State's laws.

PMC's myopic view of Measure Z's provisions cannot be reconciled with the actual import of those provisions. The trial court found that Measure Z "regulates the *conduct* of oil and gas operations" and "specific *production technique*[*s*]" rather than the use of land. We agree. Measure Z did not identify *any* locations *where* oil drilling may or may not occur. Instead, it permitted continued operation of existing wells but barred new wells and wastewater injection even if the new wells and wastewater injection would be on the same land as the existing operation. These provisions did not regulate "where and whether" oil drilling would occur on land in the unincorporated areas of the County

but rather *what* and *how* any oil drilling operations could proceed.[14] Operations could proceed only if they involved no new wells and no wastewater injection, which are operational methods and practices.

An accurate characterization of Measure Z's provisions is at the crux of the dispute between PMC and plaintiffs. While Measure Z does not regulate many of the technical aspects of oil drilling operations addressed by the voluminous state statutes and regulations, it does ban activities that section 3106 not only promotes and encourages, but also explicitly places the authority to permit in the hands of the State. Consequently, Measure Z conflicts with section 3106. The fact that Measure Z repeatedly uses the words "use of land" and "land use" does not obliterate the inescapable fact that Measure Z would ban specific oil and gas drilling operational methods and practices that section 3106 places solely under the authority of the State.

PMC insists that Measure Z does not conflict with section 3106.[15] It cites *City of Dublin v. County of Alameda* (1993) 14 Cal.App.4th 264 for the proposition that a state law that "permits but does not require" a particular practice does not preempt a local

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[14] We decline to resolve the parties' dispute over whether Measure Z regulates "subsurface" activity as the resolution of that specific dispute is unnecessary to our analysis. We also see no need to rely on the 1976 Attorney General's opinion that the parties both rely on as we review this legal issue de novo. Nevertheless, we note that the 1976 Attorney General's opinion is consistent with our view. It found that "certain phases of oil and gas activities are of statewide rather than local concern and that any local regulation in conflict with those phases would therefore be ineffective; in our view, the state has so fully occupied these certain phases that there is no room left for local regulation." (59 Ops.Cal.Atty.Gen. 461, 477.) Having different regulations in different locations would be particularly problematic where oil and gas deposits extended under the boundaries of multiple local jurisdictions. (*Ibid.*) The Attorney General concluded that this preemption of local control extended to anything that the supervisor had approved. (*Id.* at p. 478.)

[15] The parties argue at length over whether Measure Z is entitled to a presumption against preemption. We see no need to address these competing arguments as any presumption was amply rebutted in this case. Preemption is established as a matter of law.

entity from banning that practice. (*Id.* at p. 278.) In *Dublin*, a County initiative banned incineration and promoted recycling. A state law permitted incineration. The Court of Appeal found no preemption because "several sections of the [state] Act demonstrate that the decision to permit or disallow incineration is a matter for the discretion of each city or county." (*Ibid*.) The same cannot be said here. Although PMC argues otherwise, it has failed to identify any provision of state law that, contrary to section 3106, reflects that the Legislature intended to reserve all or part of the authority to make decisions about whether an oil drilling operation should be permitted to drill new wells or utilize wastewater injection for the discretion of local entities. Instead, section 3106 explicitly encouraged all methods that would increase oil production, including wastewater injection, and, crucially, placed the decision-making power in the State.

PMC also relies on *People ex rel. Deukmejian v. County of Mendocino* (1984) 36 Cal.3d 476 (*Mendocino*). In that case, the California Supreme Court found that a local ordinance was not preempted because the state laws required compliance with local regulations and lodged "wide discretion" in local authorities, a situation which is not present here. (*Id.* at pp. 486-487.) The *Mendocino* case also did not involve a *conflict* between local and state law, but instead a question of *field* preemption. (*Id.* at pp. 486-488.)

PMC contends that conflict preemption does not apply here because section 3106 does not "demand" what Measure Z "forbids." It argues that Measure Z "does not require the Supervisor to permit any specific practice." PMC misreads the authorities it cites.

In *T-Mobile West LLC v. City and County of San Francisco* (2019) 6 Cal.5th 1107, the California Supreme Court observed: " 'The "contradictory and inimical" form of preemption does not apply unless the ordinance directly requires what the state statute forbids or prohibits what the state enactment demands.' [Citations.] '[N]o inimical conflict will be found where it is reasonably possible to comply with both the state and

local laws.' " (*Id*. at p. 1121.) In *T-Mobile*, unlike here, the state statutes made no mention of the subject matter addressed by the local ordinance so there was no conflict. Here, section 3106 specifically addresses the drilling of wells and the injection of wastewater, encourages both practices, and, critically, explicitly places the authority to permit these methods and practices in the hands of the State. It is not possible for the authority to permit these methods and practices to rest in the State's hands if the local ordinance forbids these methods and practices. As the two laws conflict with respect to who controls the use of these methods and practices, the local ordinance must yield to the supreme state law.

PMC's reliance on *Big Creek* is also misplaced. The state law in *Big Creek* contained an *express* preemption clause that was limited to " 'the *conduct* of timber operations,' " while at the same time "general forestry law . . . expressly recognize[d] local zoning authority." (*Big Creek*, *supra*, 38 Cal.4th at pp. 1151, 1157, italics added.) The local zoning ordinance limited timber operations to certain zoning districts. (*Id.* at p. 1157.) The California Supreme Court, noting that state law expressly favored permitting local entities " ' "the maximum degree of control over local zoning matters," ' " held that the local zoning ordinance was not expressly preempted because it did not involve the "conduct" of timber operations. (*Id.* at pp. 1151-1157.) The court proceeded to consider whether the local zoning ordinance was impliedly preempted and decided that it was not. (*Id*. at p. 1157.)

PMC relies on the following passage: "[A] local ordinance is not impliedly preempted by conflict with state law unless it 'mandate[s] what state law expressly forbids, [or] forbid[s] what state law expressly mandates.' [Citation.] That is because, when a local ordinance 'does not prohibit what the statute commands or command what it prohibits,' the ordinance is not 'inimical to' the statute. [Citation.] Here, County's ordinances are not impliedly preempted by conflict with state forestry law because it is reasonably possible for a timber operator to comply with both. [¶] The zone district

ordinance does not mandate what general forestry law forbids or forbid[] what general forestry law mandates. While the forestry laws generally encourage 'maximum sustained production of high-quality timber products . . . while giving consideration to' competing values (§ 4513), they do not require that every harvestable tree be cut. Accordingly, County's zoning ordinance does not conflict with state law simply because it may have the effect of placing some trees, at least temporarily, off limits to logging. Nor does it appear the Board has adopted for Santa Cruz, or any other county, rules that comprehensively address appropriate geographical locations within the county for timber harvesting." (*Big Creek*, *supra*, 38 Cal.4th at p. 1161, fn. omitted.)

Big Creek is not inconsistent with our analysis. Section 3106, unlike the state forestry laws in *Big Creek*, explicitly places the authority to permit new wells and wastewater injection in the hands of the State, while Measure Z bans those methods and practices. Measure Z is not a local zoning ordinance that simply regulates the location of oil drilling operations. Instead, it bans particular methods and practices. Thus, Measure Z forbids the State from permitting certain methods and practices, while section 3106 encourages those methods and practices and mandates that the State be the entity deciding whether to permit those methods and practices. The conflict here, unlike the situation in *Big Creek*, is not limited to a general State policy encouraging oil drilling and a local ordinance restricting where drilling may take place.

The fact that state law leaves room for *some* local regulation of oil drilling, such as zoning regulations identifying *where* oil drilling will be permitted in a locality, does not mean that the County has the authority to ban all new wells and all wastewater injection under Measure Z.[16] "[W]hen a statute or statutory scheme seeks to promote a certain activity and, at the same time, permits more stringent local regulation of that activity,

[16] Nothing in this opinion should be construed to cast any doubt on the validity of local regulations requiring permits for oil drilling operations or restricting oil drilling operations to particular zoning districts. This case involves no such regulations.

local regulation cannot be used to completely ban the activity or otherwise frustrate the statute's purpose." (*Great Western Shows, Inc. v. County of Los Angeles* (2002) 27 Cal.4th 853, 868.) Here, section 3106's provisions placing the authority to permit certain oil and gas drilling operational methods and practices in the hands of the State would be entirely frustrated by Measure Z's ban on some of these methods and practices. We conclude that Measure Z is preempted by state law. It follows that we need not consider PMC's challenges to the trial court's rulings that Measure Z is invalid on federal preemption and takings grounds.[17]

B. Evidentiary Issues

PMC contends that the trial court denied it "a fair trial" because the court admitted irrelevant evidence proffered by plaintiffs and denied PMC and the County the opportunity to "contest Plaintiffs' evidence through discovery and cross-examination."

At the outset of the case, the court expressed the view that "discovery on the validity and preemption issues" was not "necessary" because these were "questions of law." PMC expressly agreed. When the court decided to have a Phase 1 trial that would "be limited to challenges to the validity of the ordinance on its face," which included the preemption and takings issues, the court envisioned little need for discovery or evidence. Plaintiffs sought to provide "some information about our operations." They argued that evidence was essential to show that Measure Z would take "all the economically viable use" of the property. The County and PMC disagreed. Their position was that such information would be beyond the scope of a facial challenge. The court suggested that there was a middle ground that could be addressed by means of a stipulated set of facts, since it needed "a basic understanding of what . . . the permits that are issued allow." At the same time, the court took the position that "I don't need testimony at this phase."

[17] Because we do not reach these issues, we deny Chevron's April 2019 request for judicial notice, as it concerns only the federal preemption issue.

Plaintiffs filed many declarations and requests for judicial notice in support of their Phase 1 arguments along with many exhibits.[18] The County filed a declaration and a request for judicial notice in support of its Phase 1 opposition argument. PMC filed a request for judicial notice of 13 items in support of its Phase 1 opposition argument.

PMC also filed written objections to plaintiffs' declarations.[19] PMC complained generally that, due to the lack of discovery, it had been deprived of the opportunity to challenge the information in the declarations. PMC also made voluminous specific objections based on lack of foundation, relevancy, improper legal opinion, speculation, the secondary evidence rule, "inadmissible opinion," and "improper opinion." The County joined in those objections and made some of its own. Plaintiffs challenged these objections. They also objected to some of the evidence offered by the County and PMC.

The Phase 1 trial was limited to standing, preemption, facial takings, due process procedural and vagueness challenges (to the procedures for resolving takings claims), a single-subject challenge, and general plan consistency challenges.[20] At the commencement of the trial in November 2017, the court noted that it had "read voluminous materials about 2 feet thick" that included not only opening statements but also "deeds to property and mineral rights; declarations from geologists and petroleum engineers; materials from the Environmental Protection Agency, [DOGGR], and the state

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[18] Aera filed three declarations in support of its Phase 1 arguments. CRC filed five declarations and numerous exhibits in support of its Phase 1 arguments. CRC also made a request for judicial notice. NARO filed two declarations along with their accompanying exhibits. Chevron submitted six declarations and their accompanying exhibits. Chevron also submitted a glossary of terms. Eagle submitted two declarations with exhibits. Plaintiffs also submitted a joint request for judicial notice of 80 exhibits.

[19] Plaintiffs also filed supplemental declarations and additional judicial notice requests. PMC and the County also objected to plaintiffs' supplemental declarations and supplemental requests for judicial notice.

[20] The court rejected the single-subject rule challenge and the general plan consistency challenges, and those rulings are not challenged on appeal.

Water Resources Control Board; declarations from former officials with [DOGGR]; ballot measure materials and photos of campaign materials and news clips, which is not to say that all of the above are admissible." The court noted that much of this material was related to standing. The court "reassure[d]" PMC "that you're not waiving your objections by failing to repeat them here in the court. We don't need to take the time to do that." The court made specific rulings on the evidentiary objections in its statement of decision, sustaining some and overruling others. The court pointed out that much of plaintiffs' evidence was needed only because PMC had ultimately contested standing.

As PMC concedes, "[p]reemption presents a pure question of law." Indeed, PMC asks us to disregard the evidence to which it objects and decide the issues as a matter of law. None of the evidence to which PMC objects has any relevance to the state law preemption issue that we find dispositive in this case. Consequently, PMC's claims that the trial court erred in admitting irrelevant evidence and denying discovery and cross-examination could not provide a basis for reversal because PMC could not have been prejudiced by any of the evidentiary or discovery rulings that it challenges. It follows that we need not devote any analysis to these contentions as we have disregarded this evidence and decided this case as a matter of law.

IV. DISPOSITION

The judgment is affirmed.

_____

ELIA, J.

WE CONCUR:

_____

GREENWOOD, P.J.

_____

BAMATTRE-MANOUKIAN, J.

Chevron v. County of Monterey
H045791

Trial Court:	Monterey County Superior Court Superior Court No.: 16CV003978
Trial Judge:	Honorable Thomas W. Wills
Counsel for Plaintiffs and Respondents: CHEVRON U.S.A., INC. et al.	Jeffrey David Dintzer Alston & Bird Theodore Joseph Boutrous Gibson Dunn & Crutcher Todd Welden Smith Ragghianti Freitas
Counsel for Plaintiff and Respondent: AERA ENERGY LLC	Andrew A. Bassak Hanson Bridgett
Counsel for Plaintiff and Respondent: CALIFORNIA RESOURCES CORPORATION	Matthew Thomas Kline Heather A. Welles O'Melveny & Myers Barton Hurst Thompson
Counsel for Plaintiff and Respondent: EAGLE PETROLEUM, LLC	Donald Charles Oldaker Clifford and Brown
Counsel for Plaintiff and Respondent: TRIO PETROLEUM, LLC	Jason Stuart Retterer JRG Attorneys at Law
Counsel for Plaintiff and Respondent: NATIONAL ASSOCIATION OF ROYALTY OWNERS-CALIFORNIA, INC.	Edward Shield Renwick Hanna and Morton Jacqueline M. Zischke

Counsel for Interveners and Appellants: PROTECT MONTEREY COUNTY et al.,	Michael Geibelson Bernice Conn Lucas A. Messenger Robins Kaplan Deborah A. Sivas Alicia E. Thesing Mills Legal Clinic at Stanford Law School Hollin N. Kretzmann Center for Biological Diversity Catherine Engberg Kevin Patrick Bundy Aaron M. Stanton Shute, Mihaly & Weinberger
Counsel for Amicus Curiae: COMMUNITIES FOR A BETTER ENVIRONMENT	Katherine S. Hoff Shana D.G. Lazerow
Counsel for Amicus Curiae: CENTER ON RACE, POVERTY & THE ENVIRONMENT; COMMITTEE FOR A BETTER ARVIN	Paulina Nicole Torres
Counsel for Amicus Curiae: LEAGUE OF CALIFORNIA CITIES; CALIFORNIA STATE ASSOCIATION OF COUNTIES	Sean Bernard Hecht UCLA School of Law Benjamin Avi Harris Chambers of Judge Stephen V. Wilson

CALIFORNIA OIL & GAS FIELDS

Volume II – Southern, Central Coastal, and Offshore California Oil and Gas Fields

(CD-1)

Contour maps, cross sections, and data sheets for California's oil and gas fields

Data for these fields are published in the following volumes
(and may be purchased in CD format):
Volume I, 1998, 499 pages (Central California)
Volume II, 1992, 645 pages (Southern, Central, and Offshore California)
Volume III, 1982, 330 pages (Northern California)

A USERS GUIDE

Geological and statistical data are available in this document for most oil and gas fields in California. For each field, a contour map and a cross section page will appear, followed by a page of statistical data. Most fields have two pages of information, but larger fields have more. The information is current to the date at the foot of each page.

Oil and gas field information can be accessed with the alphabetized list of oil and gas fields (next page). Oil and gas fields are accessible by clicking on the name of the appropriate field.

VOLUME II – SOUTHERN, CENTRAL COASTAL, AND OFFSHORE
CALIFORNIA OIL AND GAS FIELDS

Southern & Central Coastal California

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Alondra
Anaheim
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Bandini
Bardsdale
Barham Ranch
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Bouquet Canyon
Boyle Heights
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Buena Park, West
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Castaic Junction
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Chaffee Canyon
Charlie Canyon
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Wilmington Offshore

Publication No. TR12

CALIFORNIA OIL AND GAS FIELDS

VOLUME II

Southern, Central Coastal, and Offshore California

Sacramento

Third Edition 1991
Reprinted 1982
Second Edition 1974
First Edition 1960

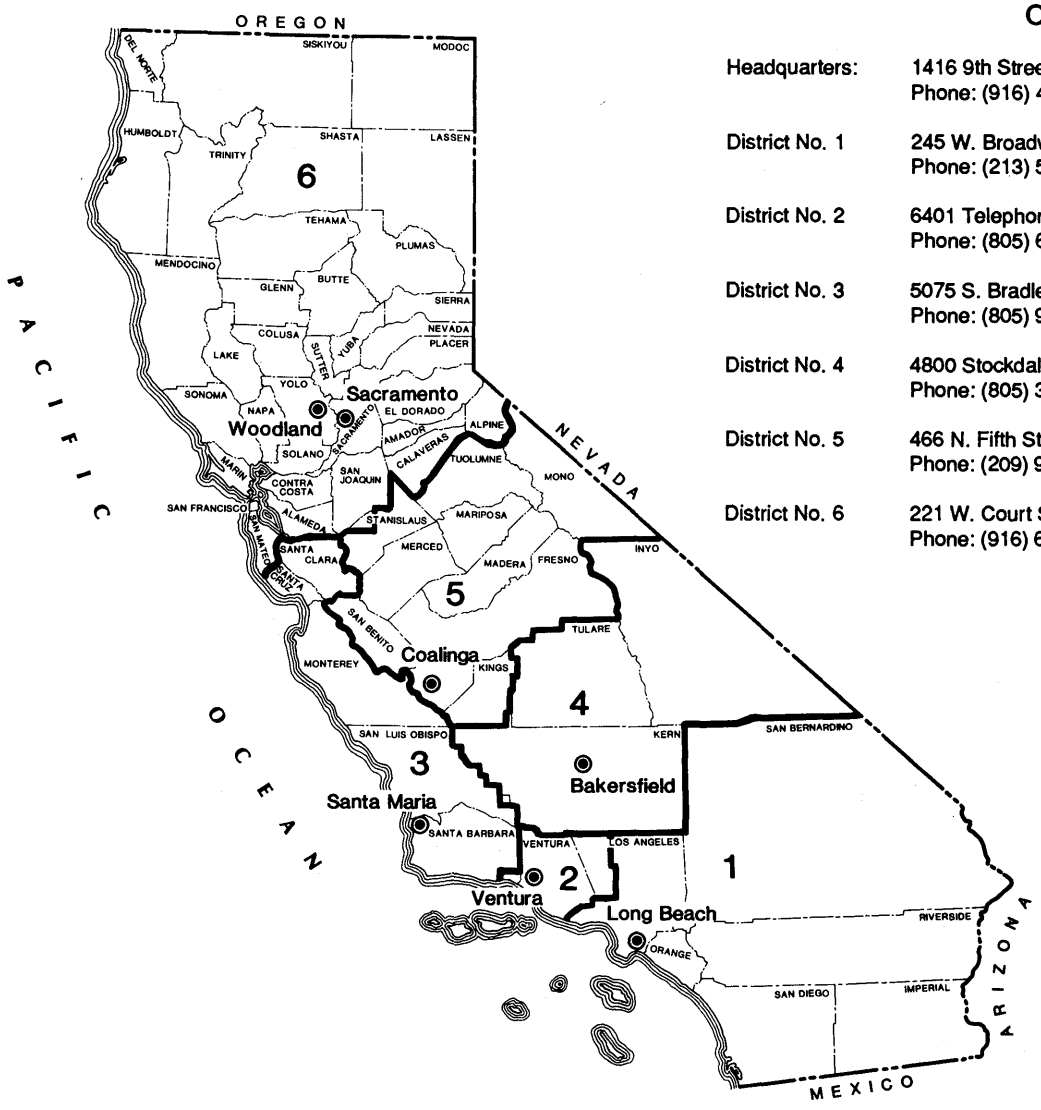
Division of Oil and Gas

RESOURCES AGENCY
DOUGLAS P. WHEELER, *Secretary*

STATE OF CALIFORNIA
PETE WILSON, *Governor*

DEPARTMENT OF CONSERVATION
EDWARD G. HEIDIG, *Director*

OIL AND GAS DISTRICT BOUNDARIES
of the
Division of Oil and Gas



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DIVISION OF OIL AND GAS

M. G. MEFFERD, *State Oil and Gas Supervisor*

DATA SHEETS

Discovery Well and Deepest Well Data - The discovery well listed is the discovery well for the field or area. The total depth for the deepest well is the drilled depth. If the well is directional, the true vertical depth is given under the remarks section.

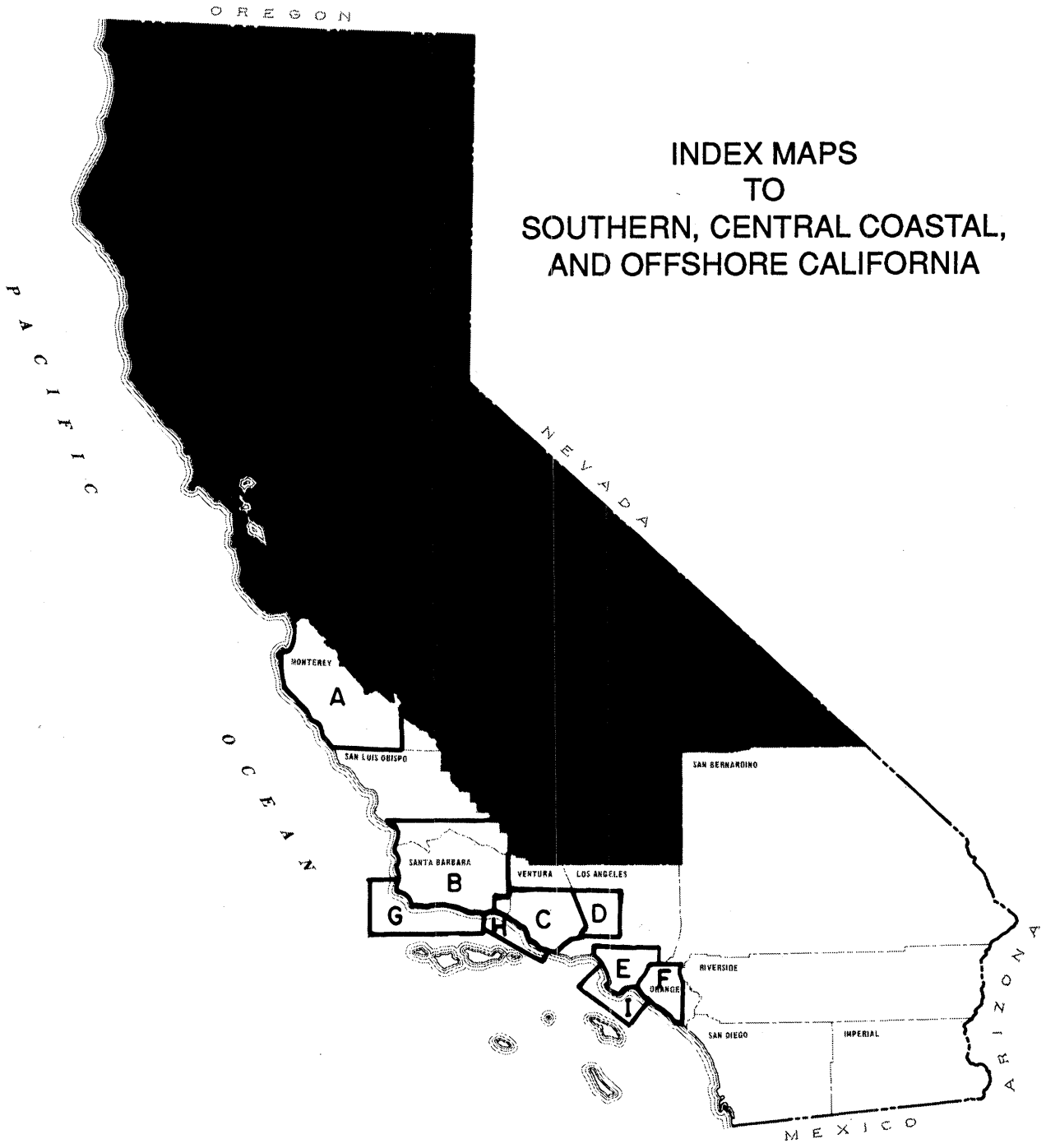
Pool or Zone Data - Pools are listed in stratigraphic sequence, from left to right. Properties that are not available on a pool basis are listed under the field or area column. The average depth means the *average* area or field depth to the *top* of the productive zone. The average net thickness means the average *productive* thickness of the zone and is only an approximation.

Reservoir Rock and Fluid Properties - Values calculated from logs are footnoted as such. Values without footnotes are derived from core or sidewall sample data. Ranges are given where applicable.

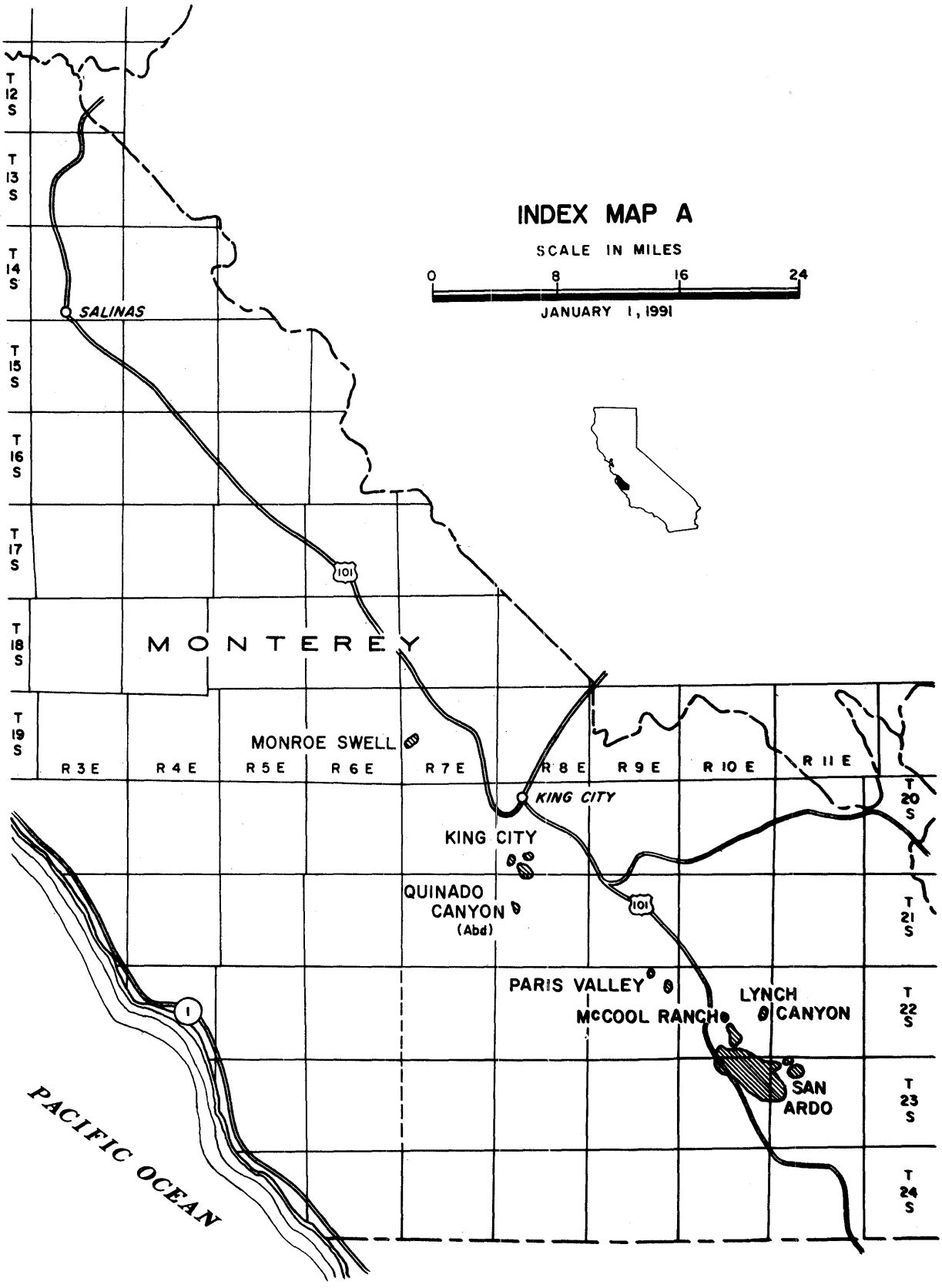
DATA SHEET ABBREVIATIONS

abd.	abandoned
B&M	Base and Meridian
bbl	barrel of oil (42 U.S. gallons)
Btu	British thermal unit
Btu/cu. ft.	British thermal units per cubic foot
cem.	cemented
cp	centipoise
Cret.	Cretaceous
E or e	early
Eo.	Eocene
°F	degrees Fahrenheit
ft.	foot
FVF	formation volume factor
GOR	gas-oil ratio
gr/gal	grains per gallon
H	Humboldt
Holo.	Holocene
in.	inch
Jur.	Jurassic
L or l	late
M or m	middle
Mcf	1,000 cubic feet
md	millidarcies
MD	Mount Diablo
Mio.	Miocene
MSCF/ac.-ft.	1,000 standard cubic feet per acre-foot
N.A.	not available
– –	not applicable
ohm/m	ohm-meter
Olig.	Oligocene
Paleoc.	Paleocene
Pleis.	Pleistocene
Plio.	Pliocene
ppm	parts per million
psig	pounds per square inch (gauge)
R_w	water resistivity, ohm-meter
RB/STB	reservoir barrels per stock tank barrel
SB	San Bernardino
SCF/STB	standard cubic feet per stock tank barrel
Sg_i	initial gas saturation
So_i	initial oil saturation
STB/ac.-ft.	stock tank barrels per acre-foot
Sw_i	initial water saturation
undiff.	undifferentiated
wt.	weight

INDEX MAPS TO SOUTHERN, CENTRAL COASTAL, AND OFFSHORE CALIFORNIA



INDEX MAPS AND GENERALIZED CROSS SECTIONS, CENTRAL COASTAL CALIFORNIA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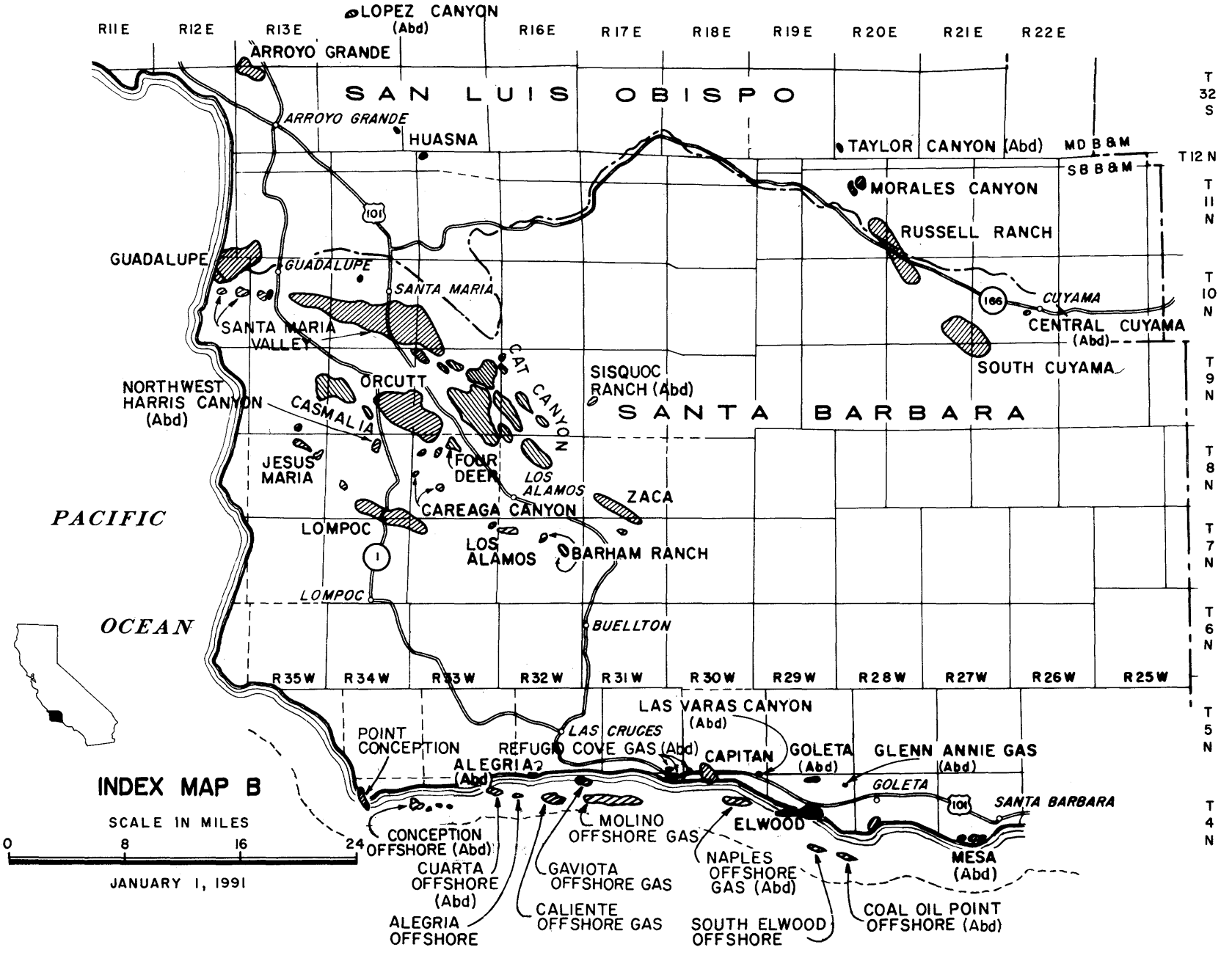
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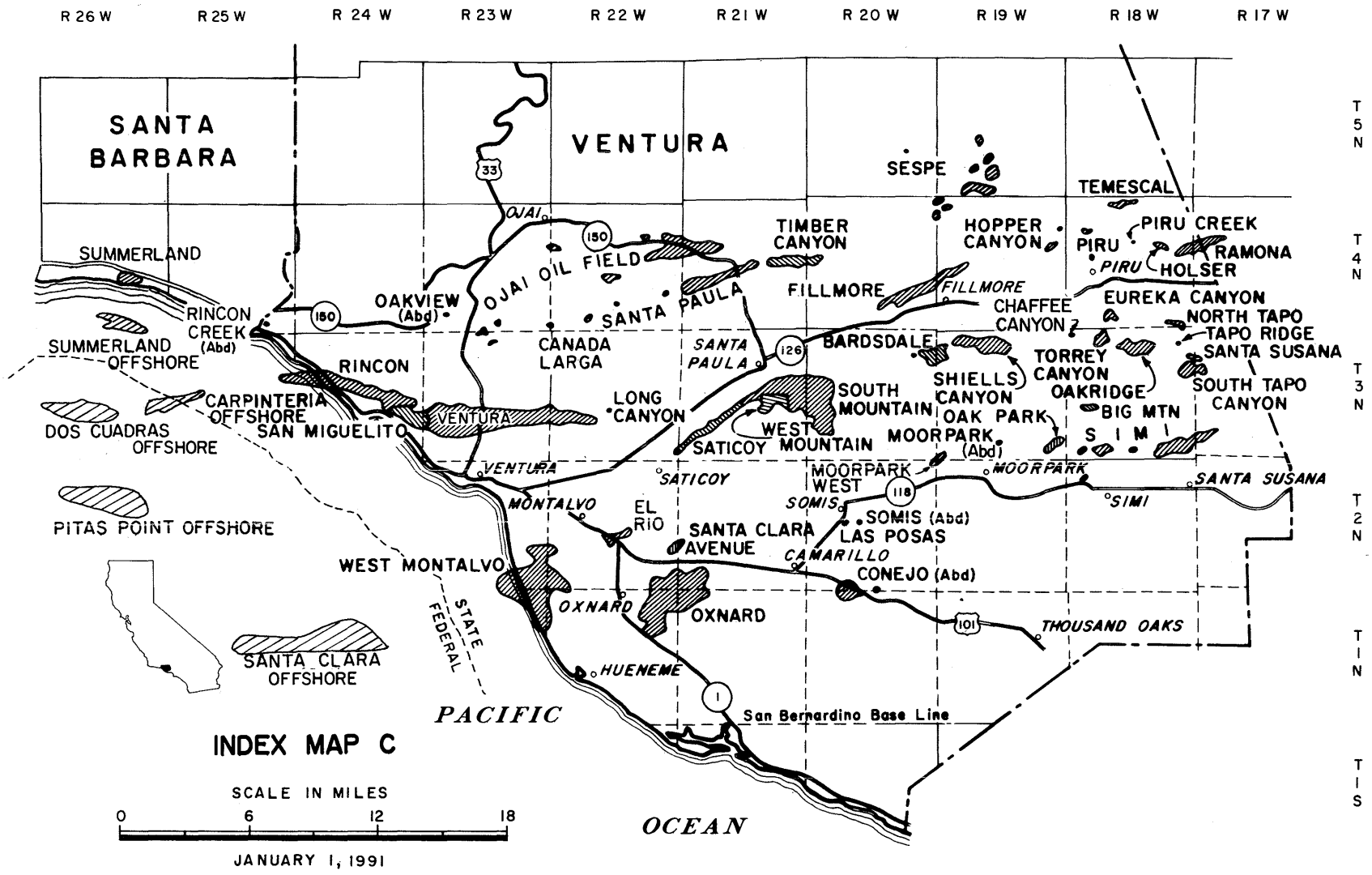
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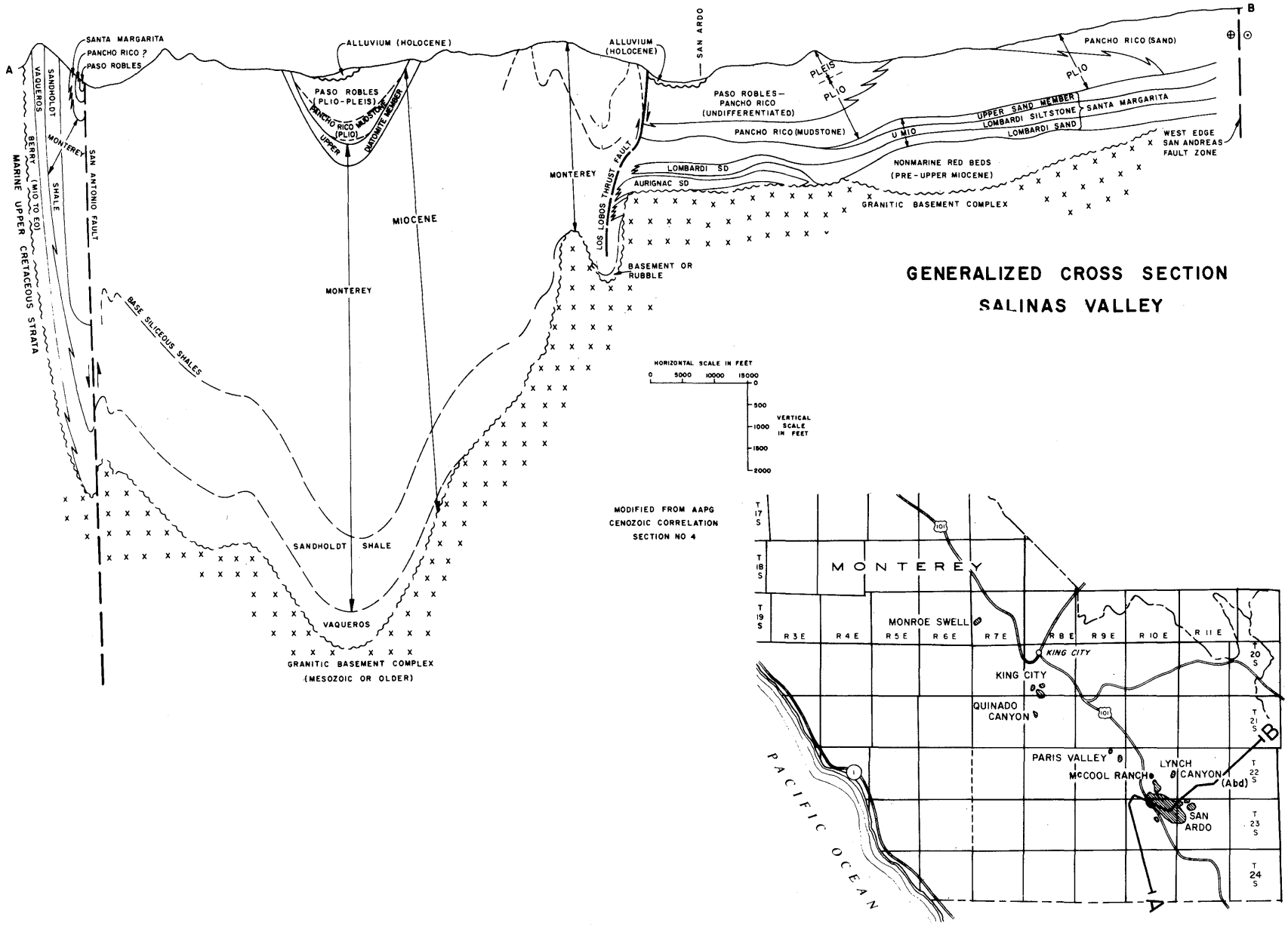

GENERALIZED CROSS SECTION
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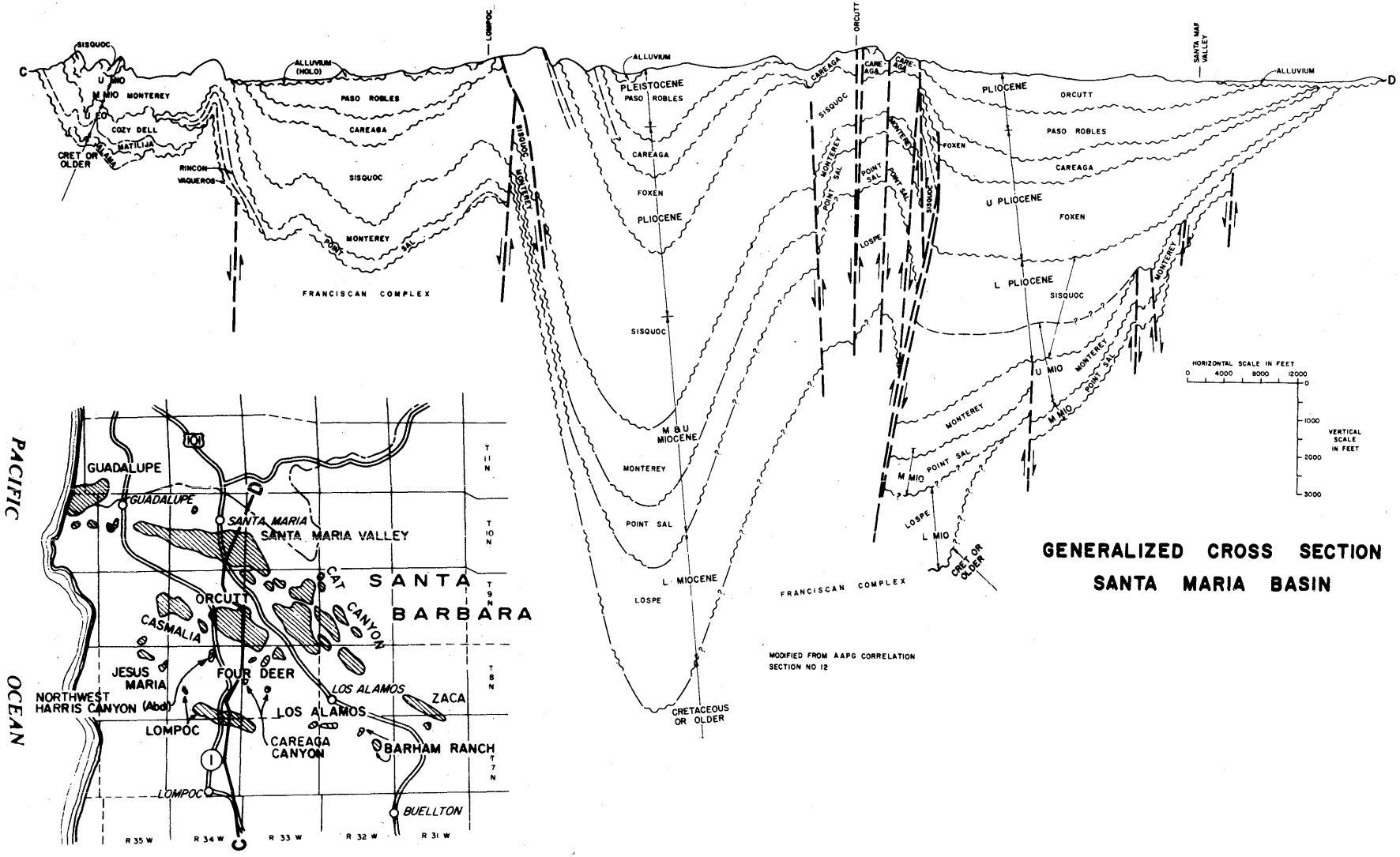

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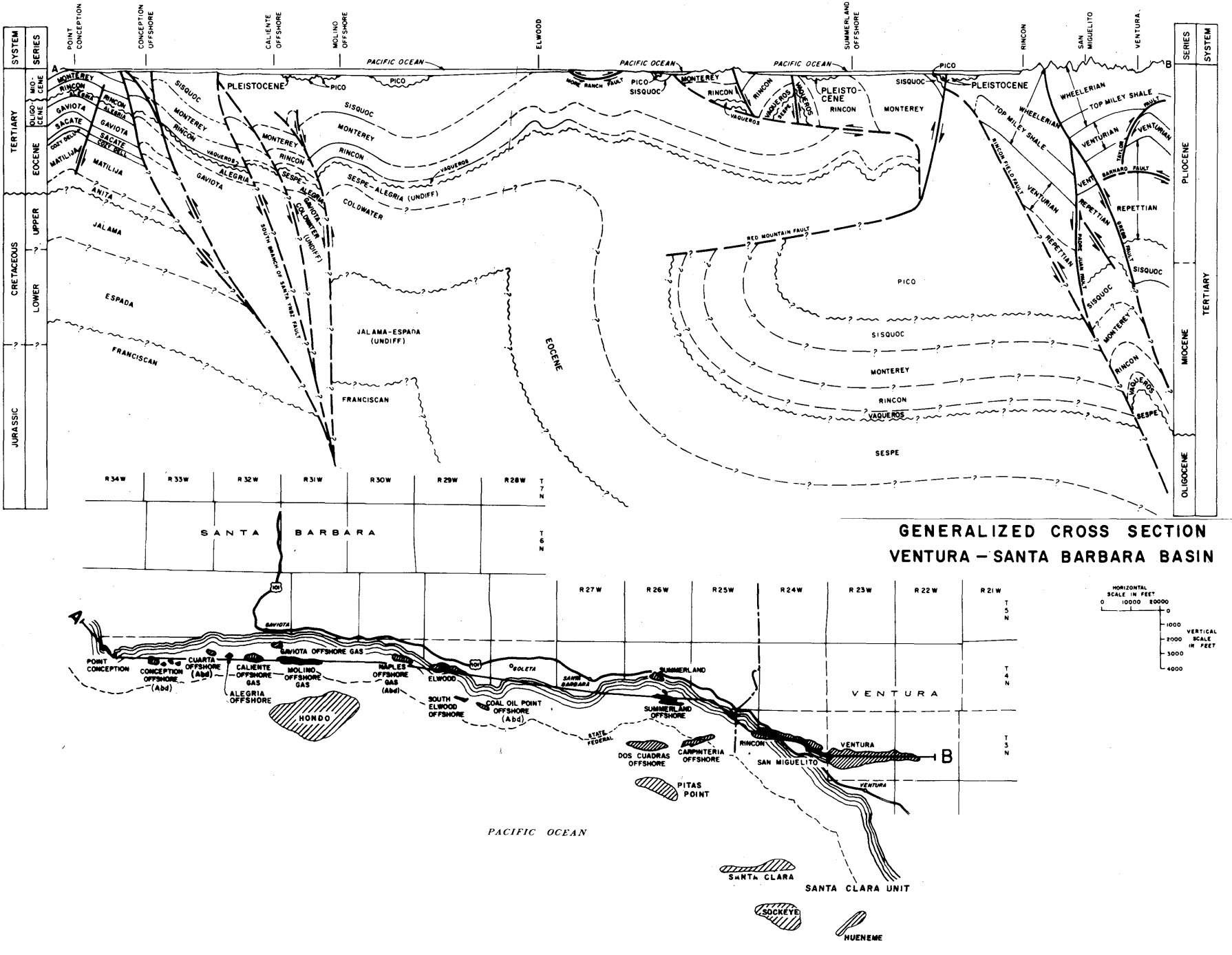
GENERALIZED CROSS SECTION
SANTA MARIA BASIN



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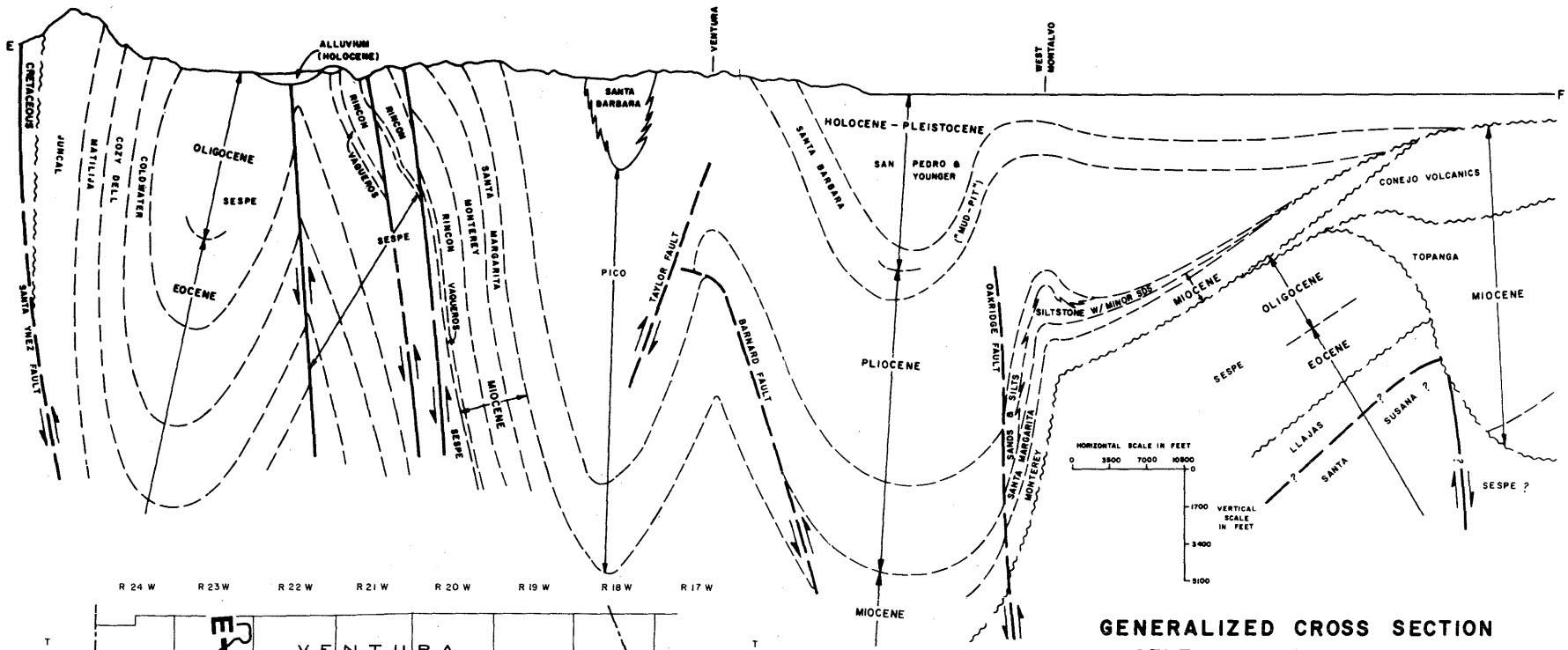
VENTURA – SANTA BARBARA BASIN



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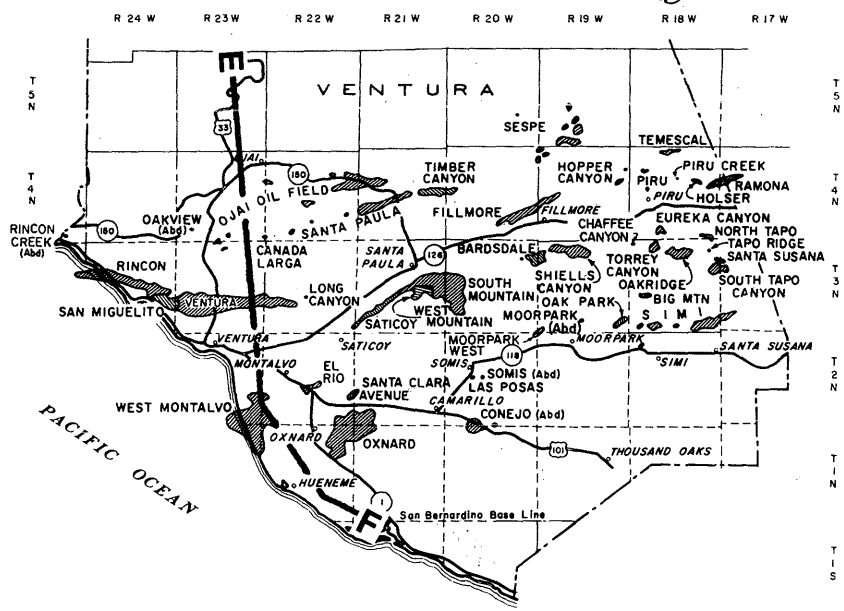

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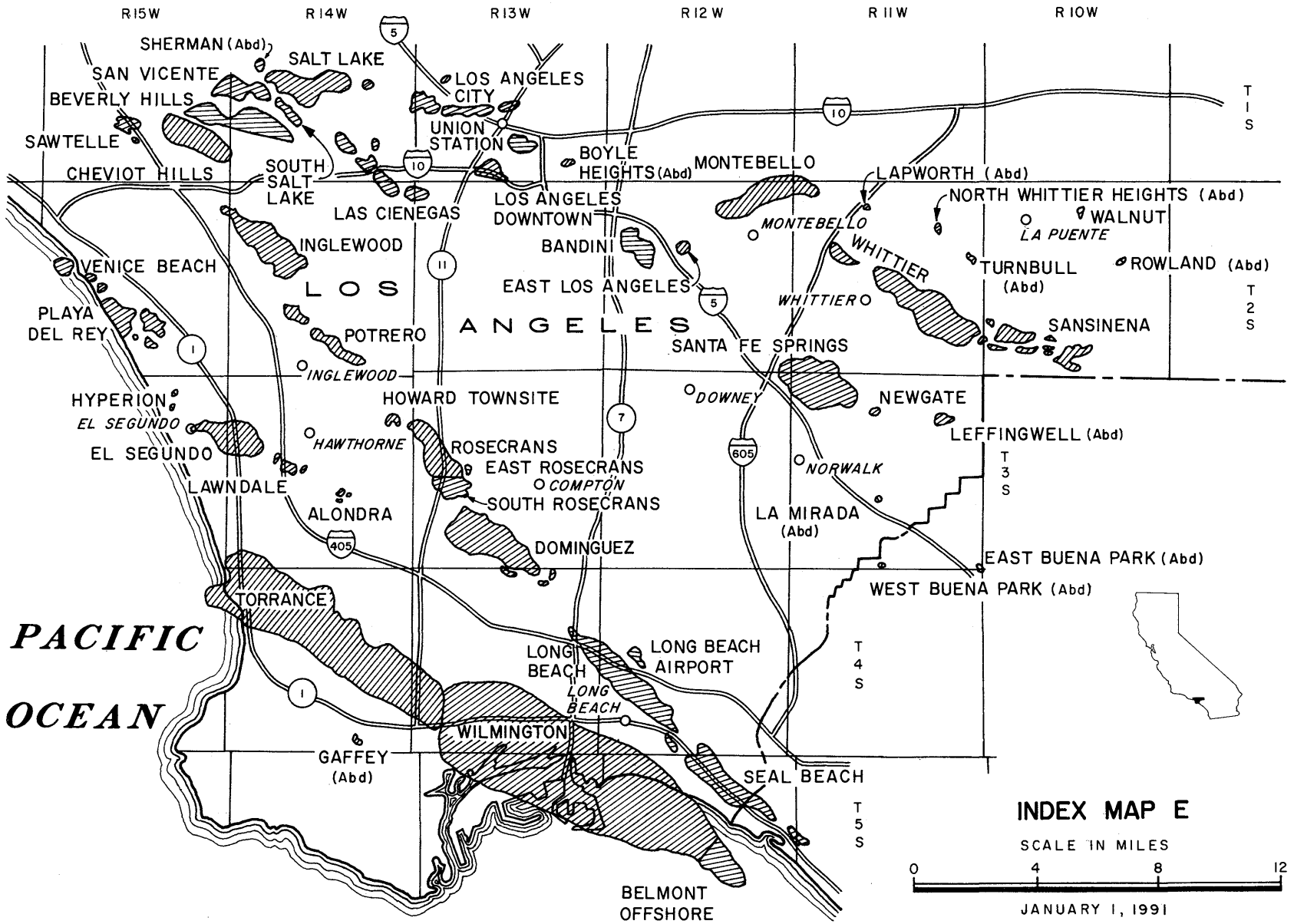
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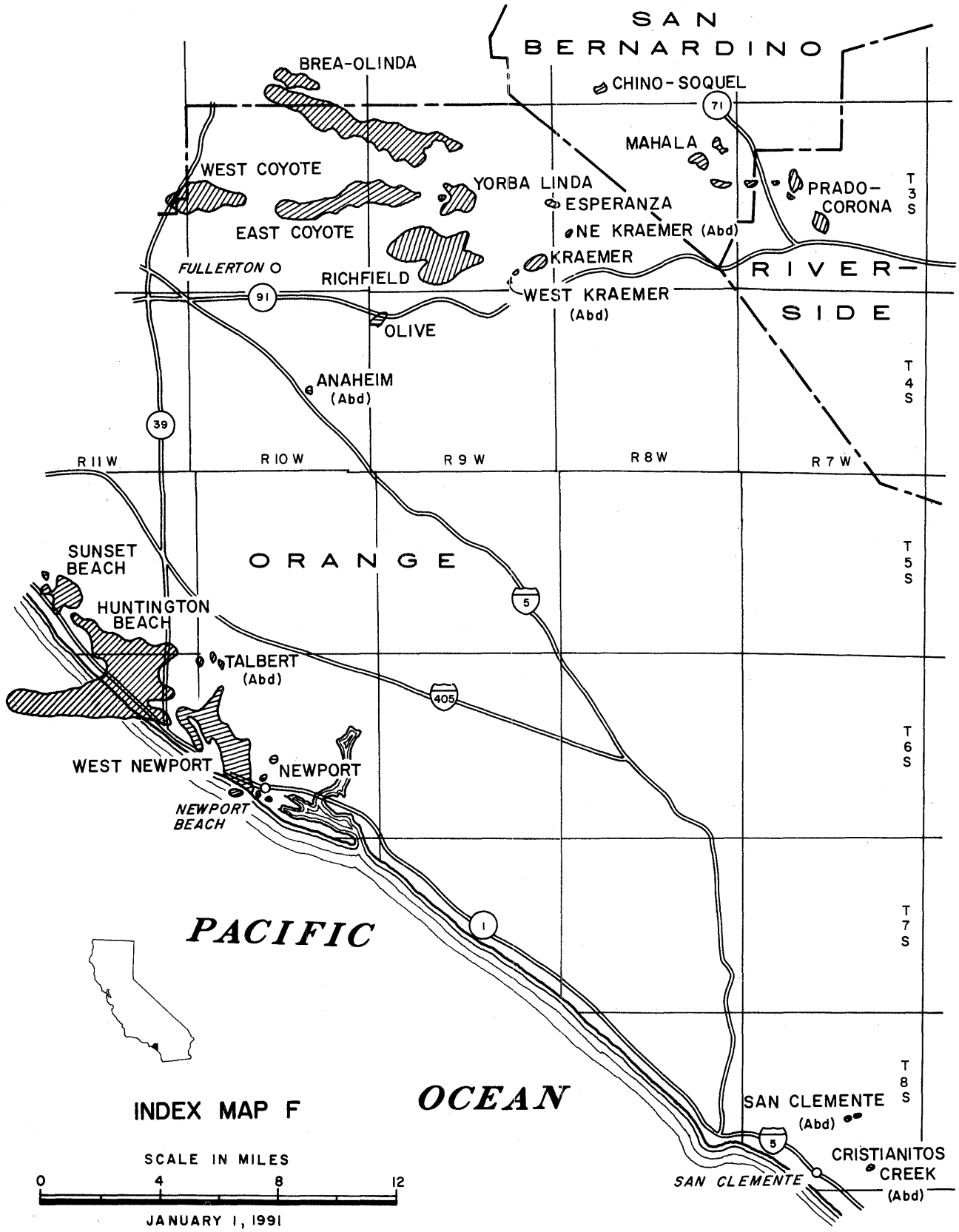
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OCEAN
INDEX MAP F
SCALE IN MILES
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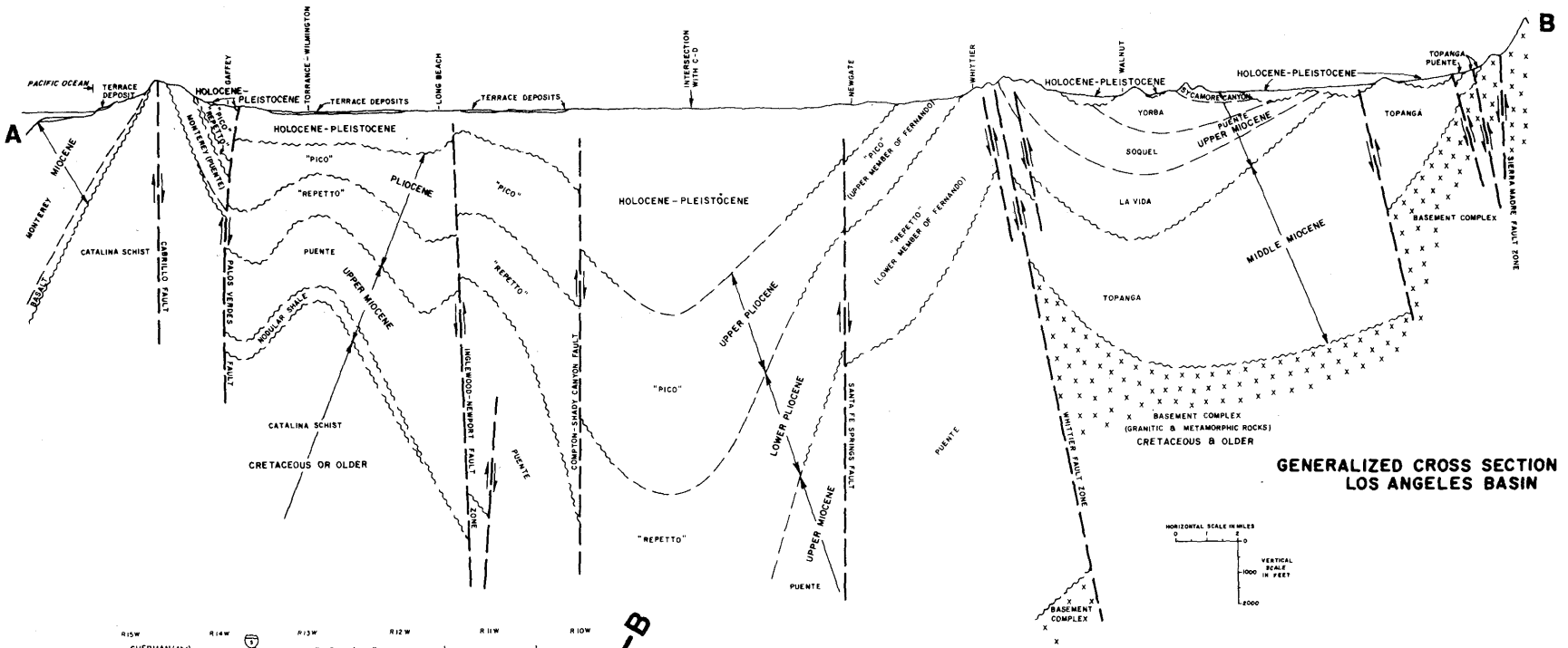
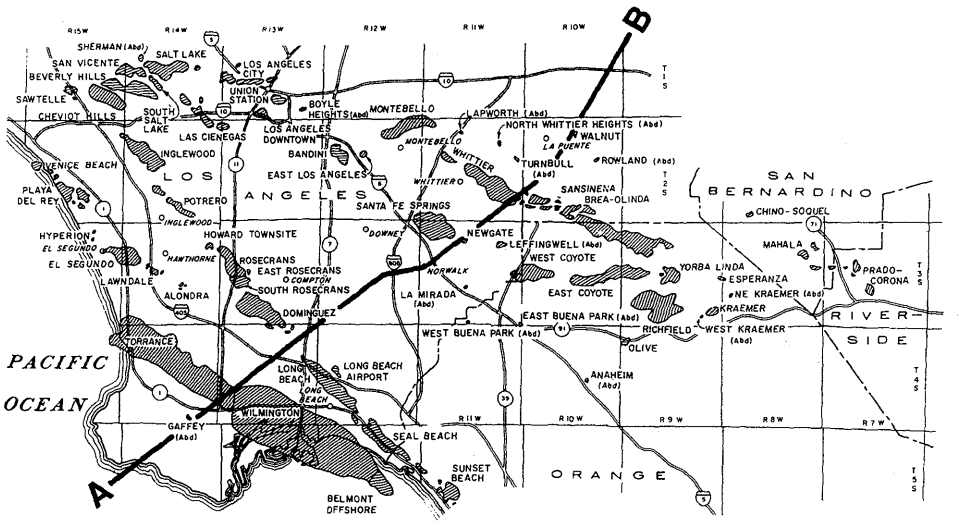
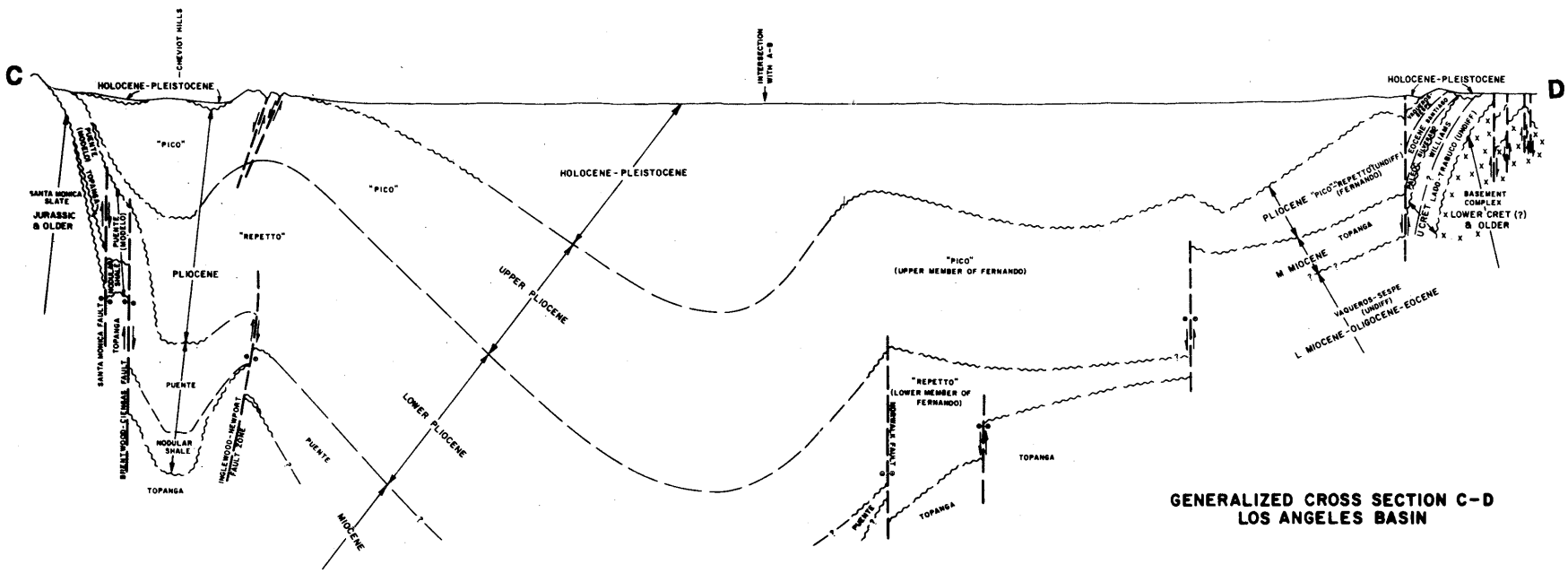
JANUARY 1, 1991

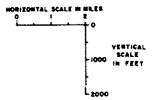


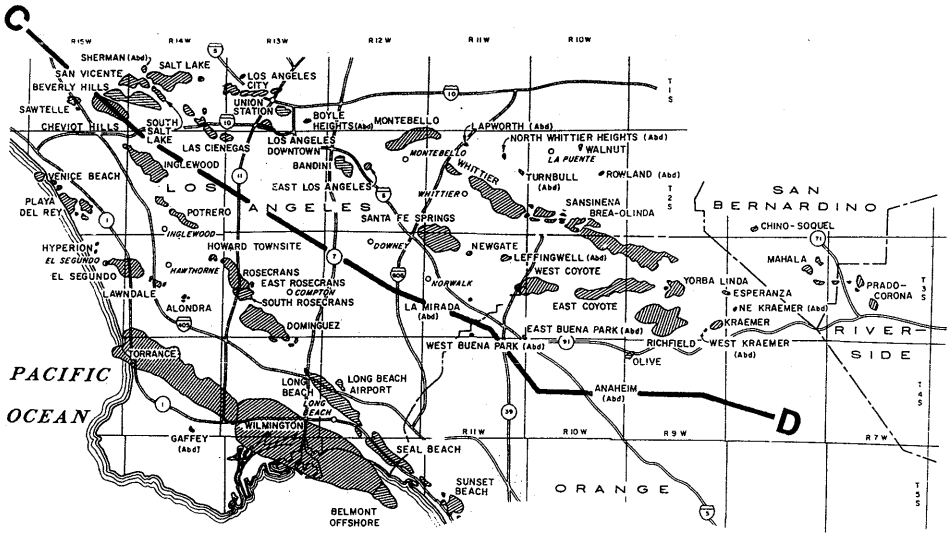
GENERALIZED CROSS SECTION A-B
LOS ANGELES BASIN

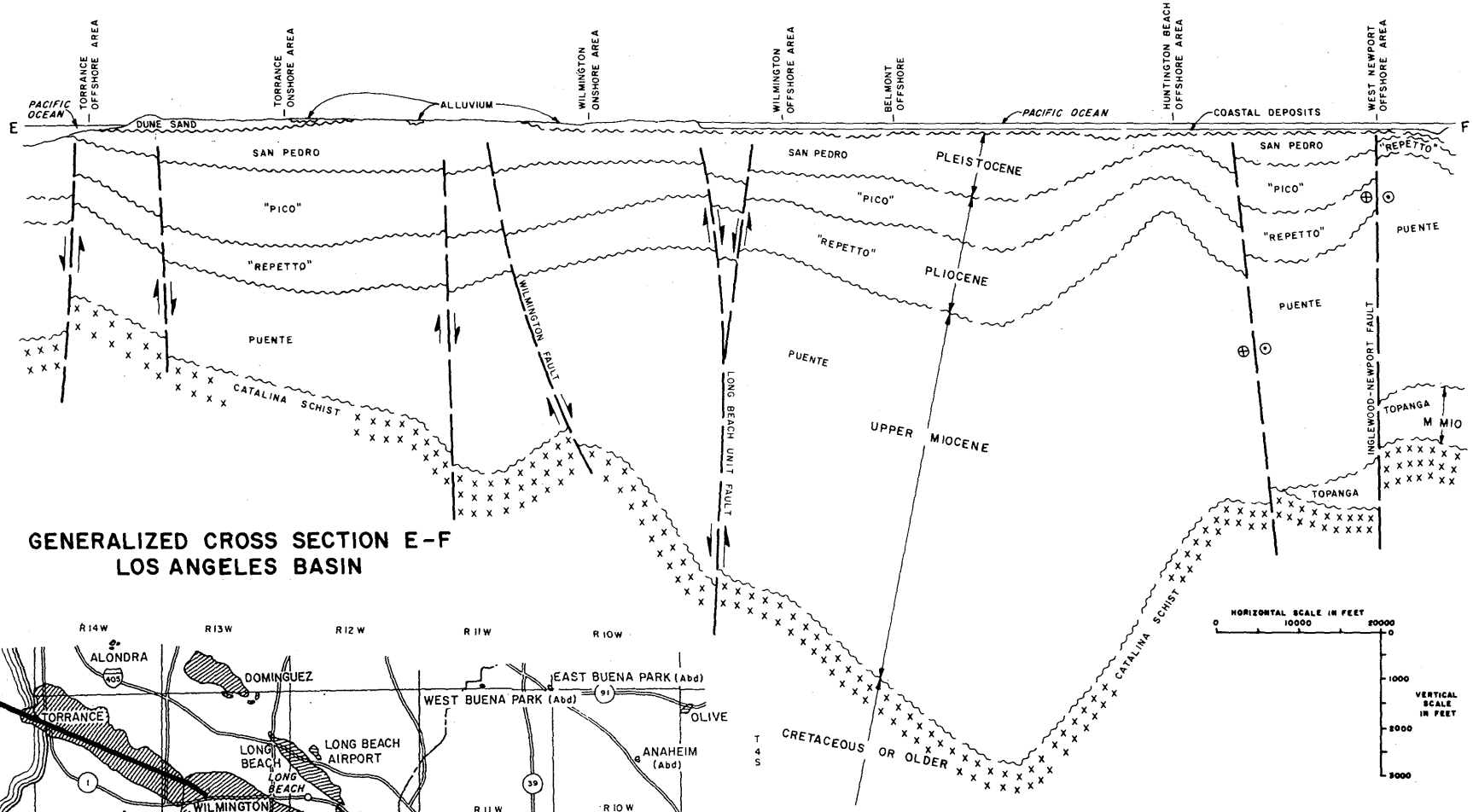




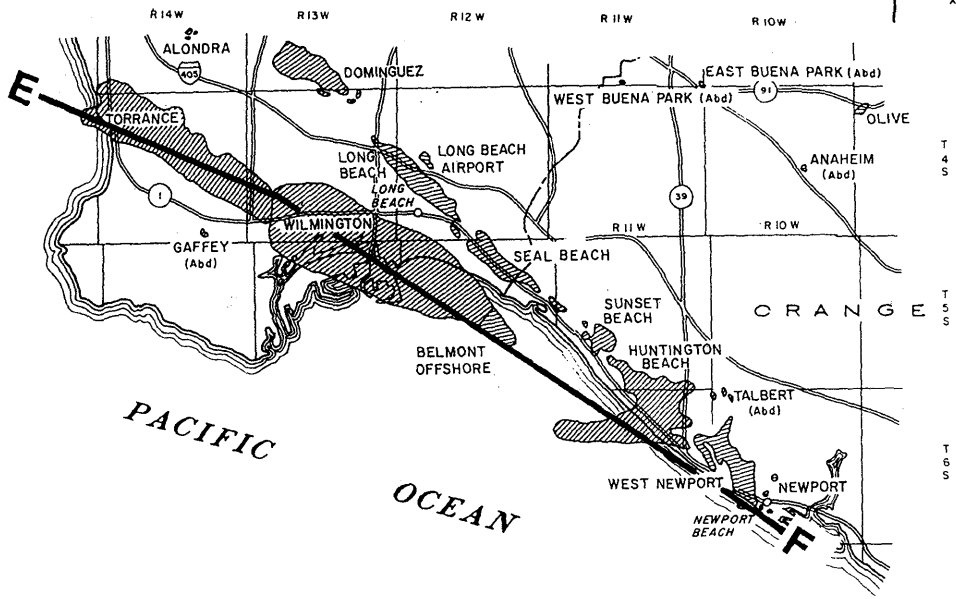
GENERALIZED CROSS SECTION C-D
LOS ANGELES BASIN







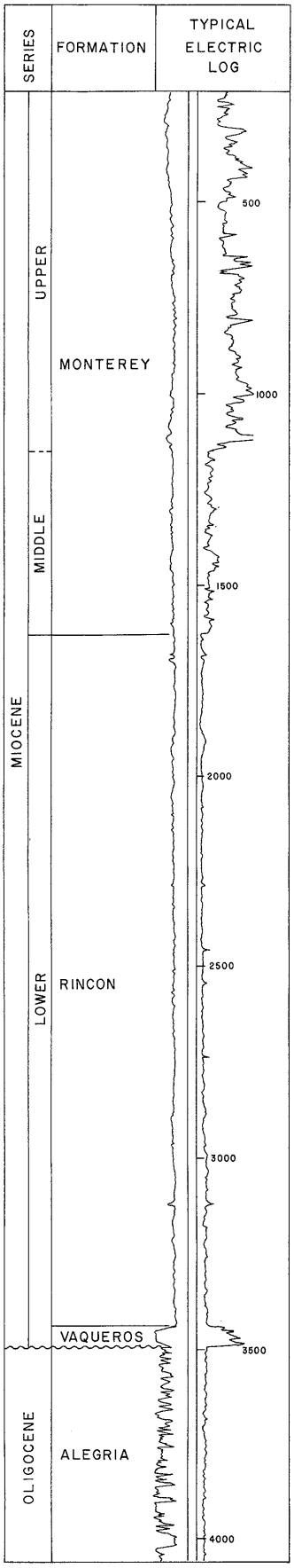
GENERALIZED CROSS SECTION E-F
LOS ANGELES BASIN

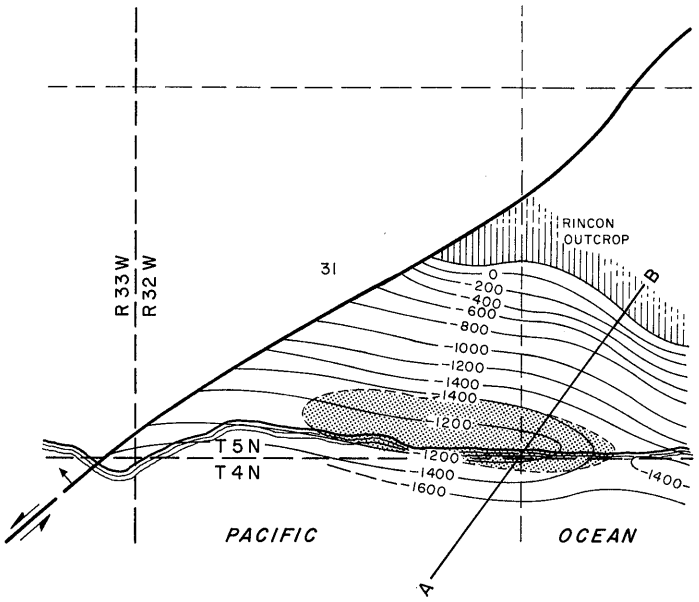


SOUTHERN AND CENTRAL COASTAL CA. MAPS AND DATA SHEETS

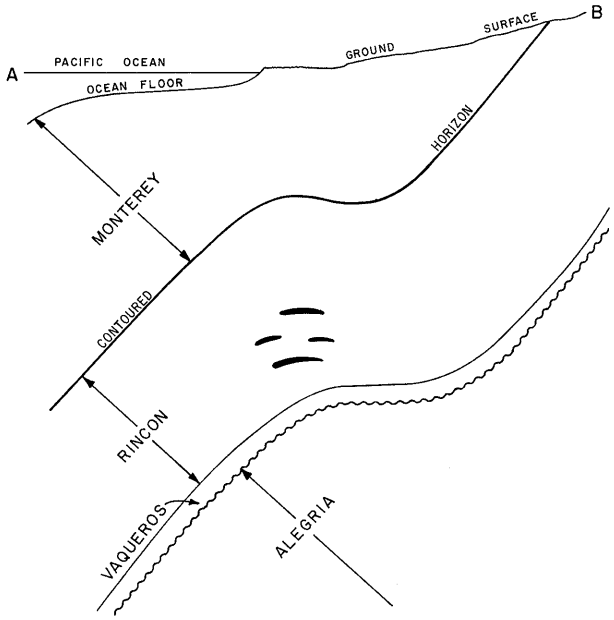
ALEGRIA OIL FIELD

(Abandoned)





CONTOURS ON TOP OF RINCON



COUNTY: SANTA BARBARA

ALEGRIA OIL FIELD (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	Cal-L Exploration Corp. "Alegria" 3	L.E. Broadhurst "Mercedes-Fox" 2	31 5N 32W	SB	4,063 a/	Rincon	
Deepest well	Cal-L Exploration Corp. "Alegria" 2	Barnwell Drilling Co., Inc. "Hollister" 2	31 5N 32W	SB	6,974		Sacate Eocene

POOL DATA

ITEM	RINCON					FIELD OR AREA DATA
Discovery date	December 1958					
Initial production rates						
Oil (bbl/day)	112					
Gas (Mcf/day)						
Flow pressure (psi)						
Bean size (in.)						
Initial reservoir pressure (psi)	400					
Reservoir temperature (°F)						
Initial oil content (STB/ac.-ft.)						
Initial gas content (MSCF/ac.-ft.)						
Formation	Rincon					
Geologic age	early Miocene					
Average depth (ft.)	1,890-2,350					
Average net thickness (ft.)	50-100					
Maximum productive area (acres)	30					
RESERVOIR ROCK PROPERTIES						
Porosity (%)	15-30**					
So_i (%)	30-60***					
Sw_i (%)	40-70***					
Sg_i (%)						
Permeability to air (md)	400-800**					
RESERVOIR FLUID PROPERTIES						
Oil:						
Oil gravity (°API)	12-25					
Sulfur content (% by wt.)						
Initial solution GOR (SCF/STB)						
Initial oil FVF (RB/STB)						
Bubble point press. (psia)						
Viscosity (cp) @ °F						
Gas:						
Specific gravity (air = 1.0)						
Heating value (Btu/cu. ft.)						
Water:						
Salinity, NaCl (ppm)	30,816					
T.D.S. (ppm)						
R_w (ohm/m) (77°F)						
ENHANCED RECOVERY PROJECTS						
Enhanced recovery projects						
Date started						
Date discontinued						
Peak oil production (bbl)	3,398					
Year	1965					
Peak gas production, net (Mcf)	9,056					
Year	1966					

Base of fresh water (ft.): 100

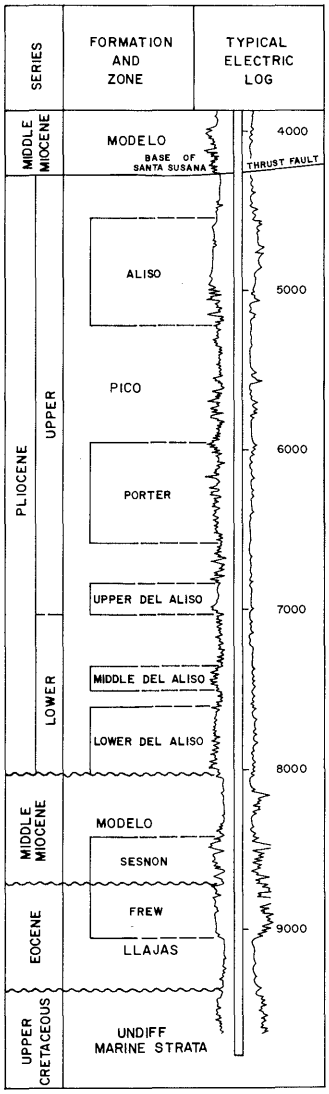
Remarks: Field was abandoned in December 1974. Cumulative production is 7,362 bbl of oil and 12,929 Mcf of gas.
a/ Directional well; true vertical depth on present hole is unavailable; no survey on file.

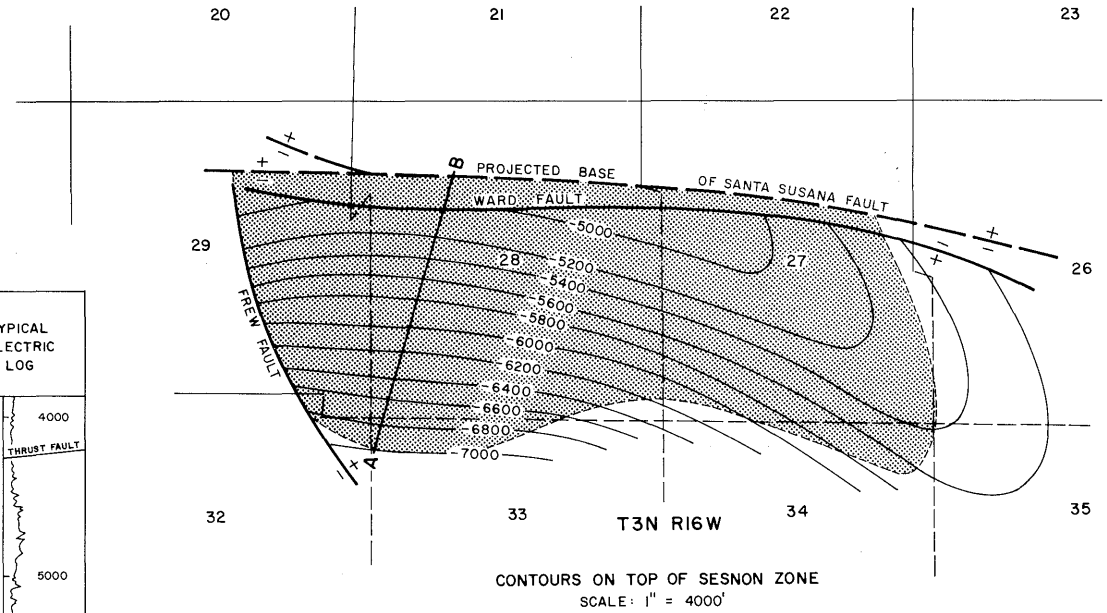
Selected References: Barton, C.L., 1965, Operations in District No. 3: Calif. Div. of Oil and Gas, Summary of Operations -- Calif. Oil Fields, Vol. 51, No. 2.
Yerkes, R.F., Wagner, H.C., and Yenne, K.A., 1969, Petroleum Development in the Region of the Santa Barbara Channel: U.S. Geol. Survey Prof. Paper 679B, p. 19.

DATE: January 1989 **Estimated value *** Representative values for area, formation, and depth

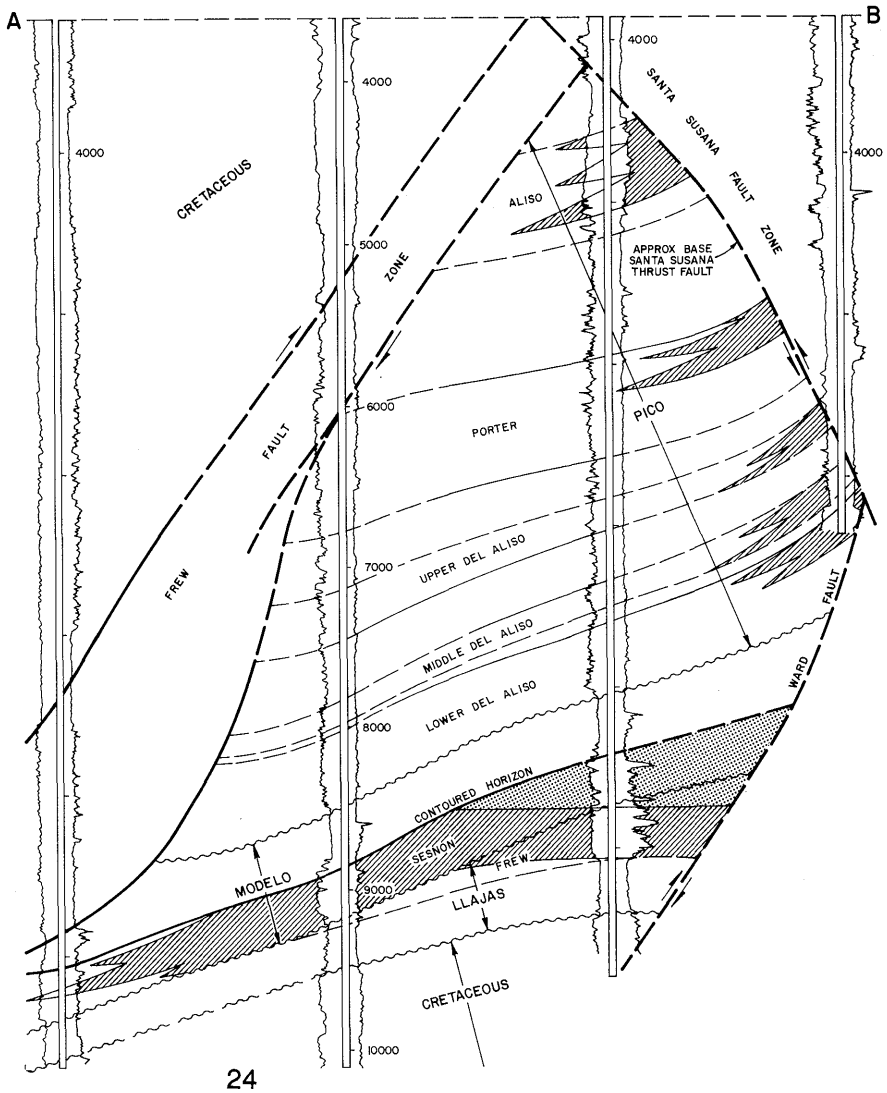
CALIFORNIA DIVISION OF OIL AND GAS

ALISO CANYON OIL FIELD





CONTOURS ON TOP OF SESNON ZONE
SCALE: 1" = 4000'



COUNTY: LOS ANGELES

ALISO CANYON 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	Texaco Producing Inc. "Porter" 1	Tidewater Associated Oil Co. "Porter" 1	27 3N 16W	SB	5,393	Porter Sesnon	
Deepest well	Southern California Gas Co. "SFZU" SS-17	Tidewater Associated Oil Co. "Standard Sesnon" 1-17	28 3N 16W	SB	12,417		undiff. Marine Cretaceous

POOL DATA

ITEM	ALISO	ALISO, WEST	PORTER-DEL ALISO A-36	PORTER, WEST	MISSION-ADRIAN	FIELD OR AREA DATA
Discovery date	April 1950	November 1950	October 1938	1938	Prior to 1950	
Initial production rates						
Oil (bbl/day)	510	-	700	-	-	
Gas (Mcf/day)	154	-	200	-	-	
Flow pressure (psi)						
Bean size (in.)						
Initial reservoir pressure (psi)	1,260	-	1,795	1,780	-	
Reservoir temperature (°F)	130	-	144	145	-	
Initial oil content (STB/ac.-ft.)	1,206	-	1,160	-	-	
Initial gas content (MSCF/ac.-ft.)	664	-	1,040	-	-	
Formation	Pico	Pico	Pico	Pico	Pico	
Geologic age	Pliocene	Pliocene	Pliocene	Pliocene	Pliocene	
Average depth (ft.)	4,150	5,179	5,050	5,673	7,100	
Average net thickness (ft.)	89	-	160	150	400	
Maximum productive area (acres)						
RESERVOIR ROCK PROPERTIES						
Porosity (%)	21.3-29.0	-	21.3-22.7	26.4	-	
So_i (%)	-	-	51	-	-	
Sw_i (%)	36	-	22	27	-	
Sg_i (%)	-	-	27	-	-	
Permeability to air (md)	765	-	67-89	485	-	
RESERVOIR FLUID PROPERTIES						
Oil:						
Oil gravity (°API)	14.5	11.0	23.5	23.9	29.0	
Sulfur content (% by wt.)	0.94	-	-	-	-	
Initial solution GOR (SCF/STB)	550	-	900**	-	-	
Initial oil FVF (RB/STB)	1.07	-	1.14	1.13	-	
Bubble point press. (psia)	2,230	-	1,640	1,644	-	
Viscosity (cp) @ °F	69.0 @ 130	-	4.5 @ 144	4.5 @ 144	-	
Gas:						
Specific gravity (air = 1.0)	0.60	-	0.70	0.70	-	
Heating value (Btu/cu. ft.)	1,027	-	1,050	-	-	
Water:						
Salinity, NaCl (ppm)	8,900	-	14,000	-	-	
T.D.S. (ppm)	9,670	17,000	15,000	-	-	
R_w (ohm/m) (77°F)						
ENHANCED RECOVERY PROJECTS						
Enhanced recovery projects			waterflood			
Date started			1976			
Date discontinued			active			
Peak oil production (bbl)						2,845,485
Year						1955
Peak gas production, net (Mcf)						9,162,055
Year						1971

Base of fresh water (ft.): 100 - 800

Remarks: Storage of gas in the Sesnon-Frew zones began in 1973.

Selected References:

Hodges, F.C., and E.R. Murray-Aaron, 1943, Newhall-Potrero, Aliso Canyon, Del Valle, and Oak Canyon Oil Fields: Calif. Div. of Oil and Gas, Summary of Operations -- Calif. Oil Fields, Vol. 29, No. 1.

Ingram, W.L., 1959, Aliso Canyon Oil Field: Calif. Div. of Oil and Gas, Summary of Operations -- Calif. Oil Fields, Vol. 45, No. 1.

DATE: May 1983 **Estimated value

CALIFORNIA DIVISION OF OIL AND GAS

COUNTY: LOS ANGELES

ALISO CANYON 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	SESNON-FREW	FAULTED-SESNON				FIELD OR AREA DATA
Discovery date	1940	prior to 1966				
Initial production rates						
Oil (bbl/day)	40	-				
Gas (Mcf/day)	13,500	-				
Flow pressure (psi)						
Bean size (in.)						
Initial reservoir pressure (psi)	3,595	-				
Reservoir temperature (°F)	175	-				
Initial oil content (STB/ac.-ft.)	612**	-				
Initial gas content (MSCF/ac.-ft.)	530**	-				
Formation	Modelo-Llajas	Modelo				
Geologic age	Miocene-Eocene	Miocene				
Average depth (ft.)	9,000	7,437				
Average net thickness (ft.)	159	-				
Maximum productive area (acres)						970
RESERVOIR ROCK PROPERTIES						
Porosity (%)	17.3-30.3	-				
So_i (%)	30**	-				
Sw_i (%)	35**	-				
Sg_i (%)	35**	-				
Permeability to air (md)	234*	-				
RESERVOIR FLUID PROPERTIES						
Oil:						
Oil gravity (°API)	37	20-24				
Sulfur content (% by wt.)						
Initial solution GOR (SCF/STB)	462	-				
Initial oil FVF (RB/STB)	1,177	-				
Bubble point press. (psia)	3,210	-				
Viscosity (cp) @ °F	1.84 @ 60	-				
Gas:						
Specific gravity (air = 1.0)	0.64	-				
Heating value (Btu/cu. ft.)	1,081	-				
Water:						
Salinity, NaCl (ppm)	2,900	-				
T.D.S. (ppm)	14,280	-				
R_w (ohm/m) (77°F)	1.8**	-				
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.):

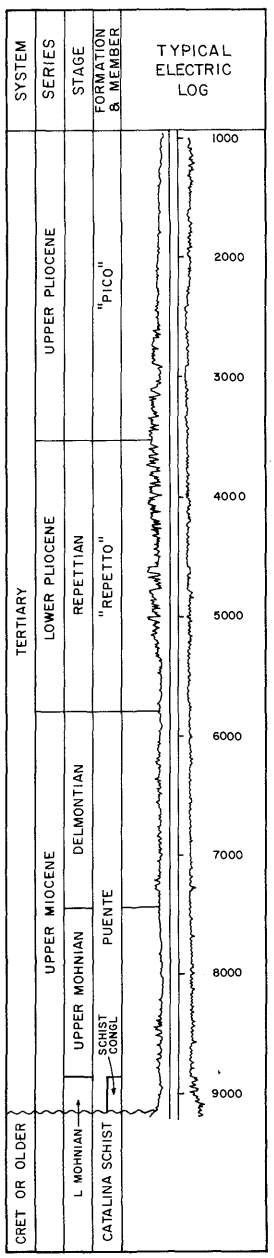
Remarks:

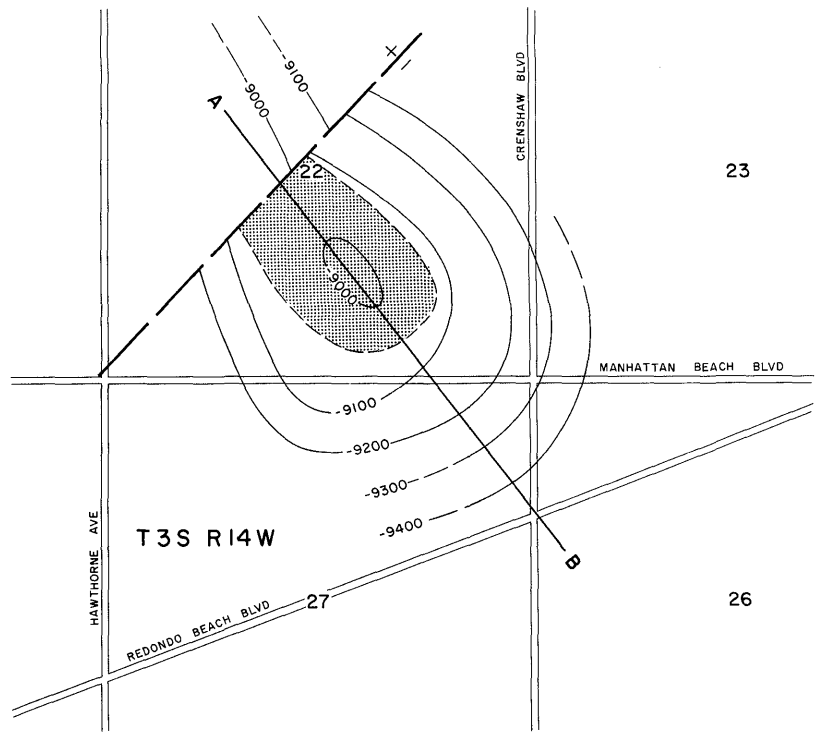
Selected References:

DATE: May 1983 *Average value **Estimated value

CALIFORNIA DIVISION OF OIL AND GAS

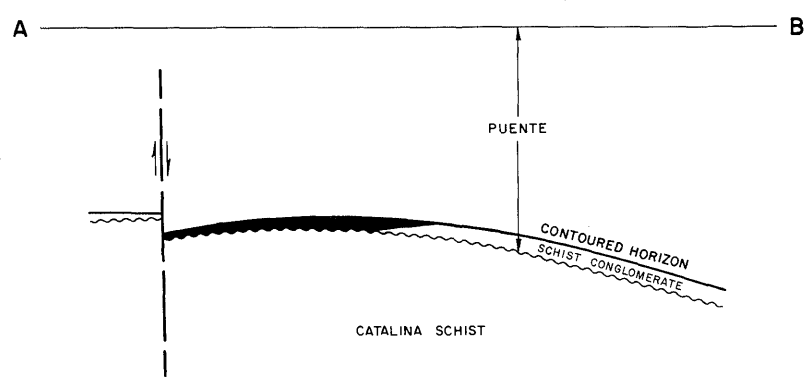
ALONDRA OIL FIELD





CONTOURS ON TOP OF SCHIST CONGLOMERATE

SCALE: 1" = 2400'



COUNTY: LOS ANGELES

ALONDRA 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	Pauley Petroleum Inc. "Bodger" 1	The British-American Oil Producing Co. "Bodger" 1	22 3S 14W	SB	9,154	Schist conglomerate	
Deepest well	Pauley Petroleum Inc. "Village Community" 2	The British-American Oil Producing Co. "Village Community" 2 a/	22 3S 14W	SB	9,472		Catalina Schist Cret. or older

POOL DATA

ITEM	SCHIST CONGLOMERATE					FIELD OR AREA DATA
Discovery date	August 1946					
Initial production rates						
Oil (bbl/day)	897					
Gas (Mcf/day)	295					
Flow pressure (psi)	1,060					
Bean size (in.)	11/32					
Initial reservoir pressure (psi)	3,902					
Reservoir temperature (°F)	275					
Initial oil content (STB/ac.-ft.)	1,000**					
Initial gas content (MSCF/ac.-ft.)	565**					
Formation	Puente					
Geologic age	late Miocene					
Average depth (ft.)	9,000					
Average net thickness (ft.)	45					
Maximum productive area (acres)	75					
RESERVOIR ROCK PROPERTIES						
Porosity (%)	22					
So_i (%)	76					
Sw_i (%)	24					
Sg_i (%)						
Permeability to air (md)	1,000**					
RESERVOIR FLUID PROPERTIES						
Oil:						
Oil gravity (°API)	26-29					
Sulfur content (% by wt.)	1.8					
Initial solution GOR (SCF/STB)	565					
Initial oil FVF (RB/STB)	1.3					
Bubble point press. (psia)	3,060					
Viscosity (cp) @ °F	9.7 @ 122					
Gas:						
Specific gravity (air = 1.0)	0.875					
Heating value (Btu/cu. ft.)						
Water:						
Salinity, NaCl (ppm)	20,000					
T.D.S. (ppm)	21,000					
R_w (ohm/m) (77°F)	0.29					
ENHANCED RECOVERY PROJECTS						
Enhanced recovery projects						
Date started						
Date discontinued						
Peak oil production (bbl)	330,888					
Year	1947					
Peak gas production, net (Mcf)	199,458					
Year	1947					

Base of fresh water (ft.): 2,250

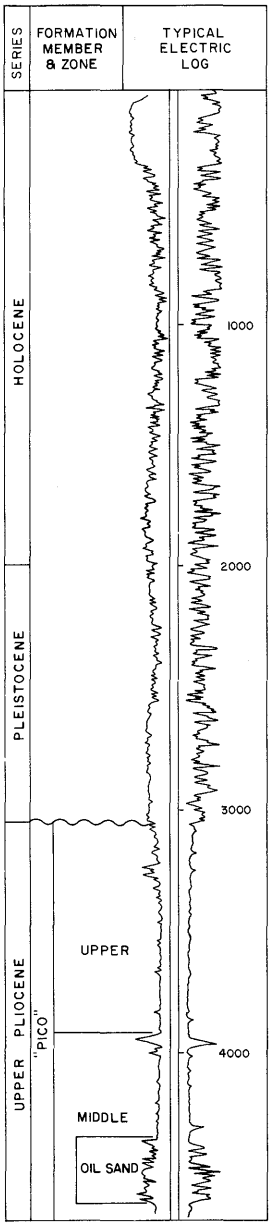
Remarks: a/ Directional well; true vertical depth is 9,295 feet.

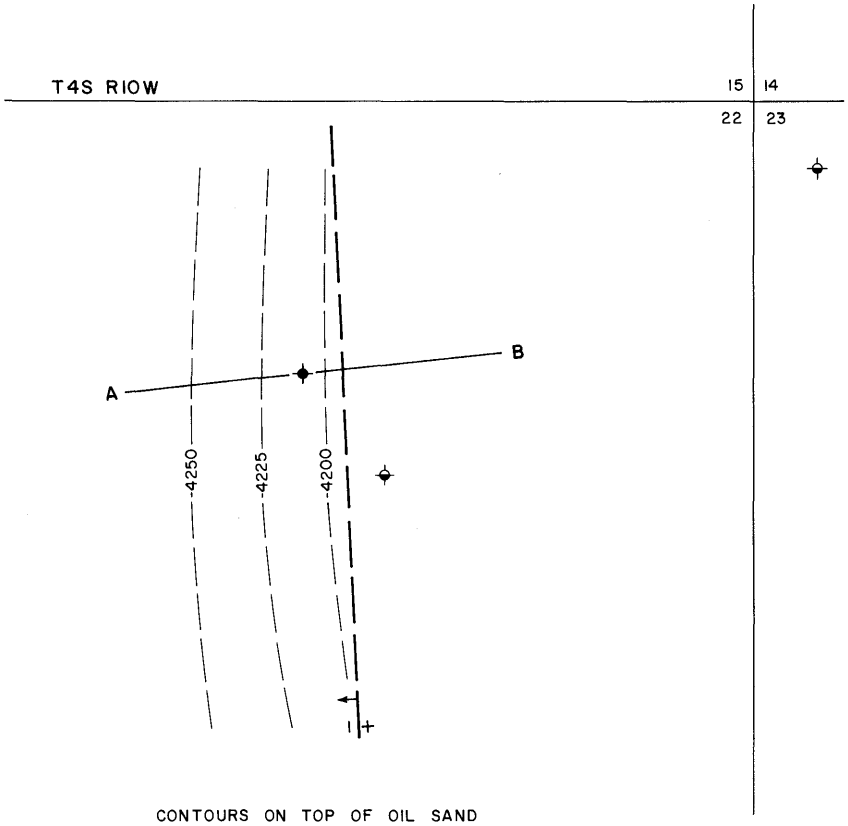
Selected References: White, J.L., 1950, Lawndale Oil Field and Alondra Area: Calif. Div. of Oil and Gas, Summary of Operations -- Calif. Oil Fields, Vol. 36 No. 2.

DATE: July 1983 **Estimated value

CALIFORNIA DIVISION OF OIL AND GAS

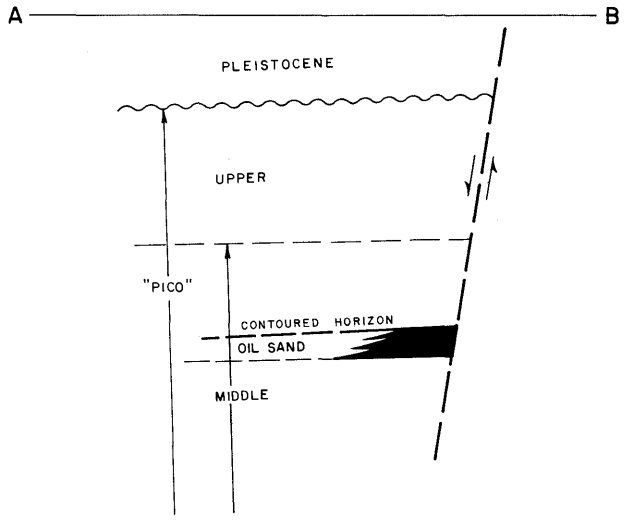
ANAHEIM OIL FIELD
(Abandoned)





CONTOURS ON TOP OF OIL SAND

SCALE: 1" = 650'



COUNTY: **ORANGE**

ANAHEIM OIL FIELD (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	McVicar-Rood-Hall "Holsinger" 1	Patrick A. Doheny "Holsinger" 1	22 4S 10W	SB	4,631	oil sand	
Deepest well	Sun Oil Co. "Foiles" 1	Sunray Oil Corporation "Foiles" 1	22 4S 10W	SB	4,700		"Pico" late Pliocene

POOL DATA

ITEM	OIL SAND					FIELD OR AREA DATA
Discovery date	January 1951					
Initial production rates						
Oil (bbl/day)	49					
Gas (Mcf/day)	0					
Flow pressure (psi)						
Bean size (in.)						
Initial reservoir pressure (psi)						
Reservoir temperature (°F)	105**					
Initial oil content (STB/ac.-ft.)						
Initial gas content (MSCF/ac.-ft.)						
Formation	"Pico"					
Geologic age	late Pliocene					
Average depth (ft.)	4,350					
Average net thickness (ft.)	130					
Maximum productive area (acres)	10					
RESERVOIR ROCK PROPERTIES						
Porosity (%)						
So_i (%)						
Sw_i (%)						
Sg_i (%)						
Permeability to air (md)						
RESERVOIR FLUID PROPERTIES						
Oil:						
Oil gravity (°API)	11					
Sulfur content (% by wt.)						
Initial solution GOR (SCF/STB)						
Initial oil FVF (RB/STB)						
Bubble point press. (psia)						
Viscosity (cp) @ °F						
Gas:						
Specific gravity (air = 1.0)						
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						
Date started						
Date discontinued						
Peak oil production (bbl)	3,856					
Year	1951					
Peak gas production, net (Mcf)						
Year						

Base of fresh water (ft.): 3,050

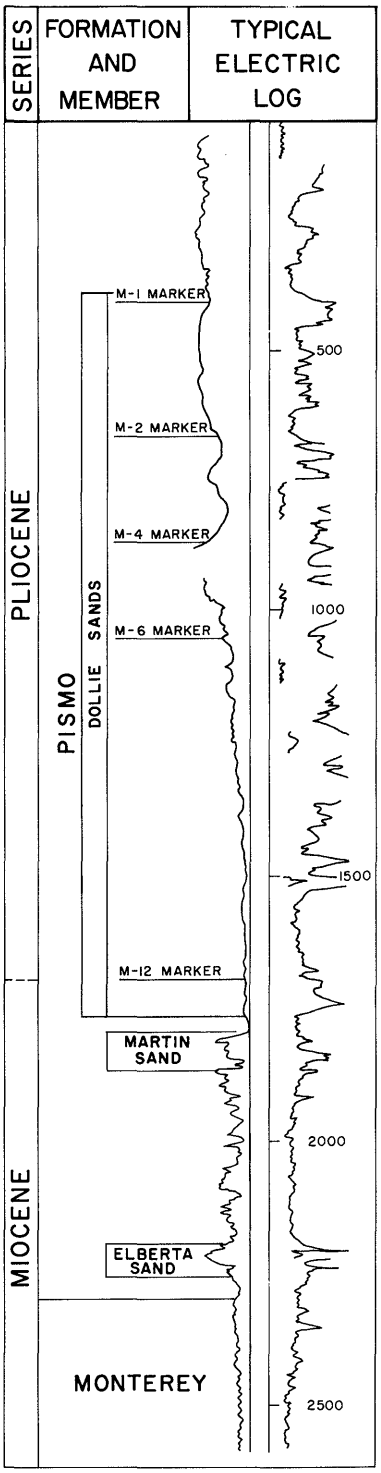
Remarks: The last production was in June 1951. The field was abandoned in 1952. Cumulative production is 4,000 bbl of oil and no gas.

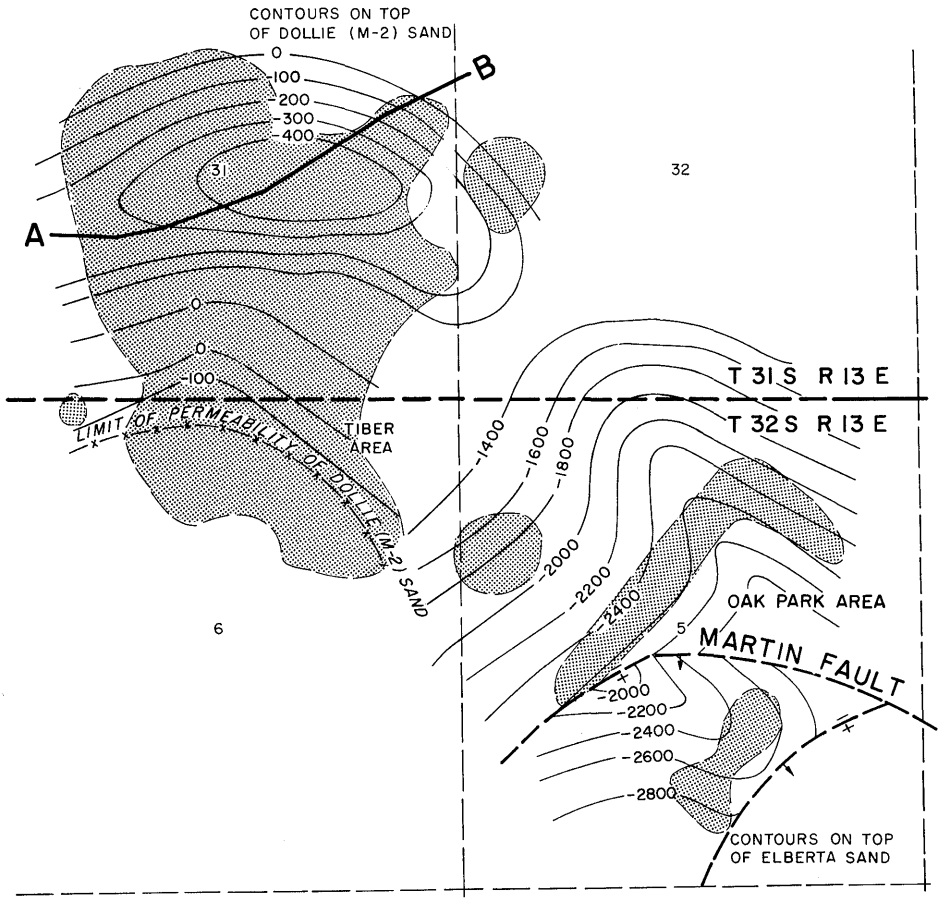
Selected References:

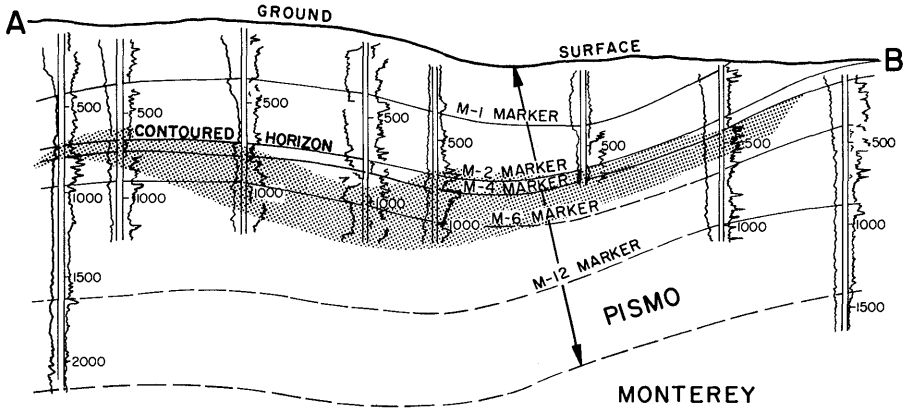
DATE: January 1989 **Estimated value

CALIFORNIA DIVISION OF OIL AND GAS

ARROYO GRANDE OIL FIELD







COUNTY: SAN LUIS OBISPO

ARROYO GRANDE 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	Grace Petroleum Corp. "Tiber" 1	Tiber Pacific Oil Co. "Tiber" 1	6 32S 13E	MD	3,172	Dollie	
Deepest well	C.W. Colgrove "Elberta" 1-5	Same as present	5 32S 13E	MD	10,142		Monterey Miocene

POOL DATA

ITEM	DOLLIE					FIELD OR AREA DATA
Discovery date	July 1906					
Initial production rates						
Oil (bbl/day)	a/					
Gas (Mcf/day)						
Flow pressure (psi)						
Bean size (in.)						
Initial reservoir pressure (psi)	250					
Reservoir temperature (°F)	90-100					
Initial oil content (STB/ac.-ft.)						
Initial gas content (MSCF/ac.-ft.)						
Formation	Pismo					
Geologic age	Pliocene-Miocene					
Average depth (ft.)	750					
Average net thickness (ft.)	300-400					
Maximum productive area (acres)						690
RESERVOIR ROCK PROPERTIES						
Porosity (%)	22-35**					
So_i (%)	29-38**					
Sw_i (%)	62-71**					
Sg_i (%)						
Permeability to air (md)	750-1,000					
RESERVOIR FLUID PROPERTIES						
Oil:						
Oil gravity (°API)	13-15					
Sulfur content (% by wt.)						
Initial solution GOR (SCF/STB)						
Initial oil FVF (RB/STB)						
Bubble point press. (psia)						
Viscosity (cp) @ °F	870 @ 150					
Gas:						
Specific gravity (air = 1.0)	0.734					
Heating value (Btu/cu. ft.)						
Water:						
Salinity, NaCl (ppm)	2,000-5,000					
T.D.S. (ppm)	2.78					
R_w (ohm/m) (77°F)						
ENHANCED RECOVERY PROJECTS						
Enhanced recovery projects	waterflood					
Date started	1949					
Date discontinued	1979					
	cyclic steam					
	1965					
	active					
	steamflood					
	1980					
	active					
Peak oil production (bbl)						514,755
Year						1981
Peak gas production, net (Mcf)						
Year						

Base of fresh water (ft.): See areas

a/ Initial production unknown. First recorded production is 8 BOPD in January 1920.

Remarks:

Selected References:

Adams, E.W. and W.E. Beatty, 1962, Bituminous Rocks in California: Calif. Div. of Mines and Geology, Vol. 15, No. 4, p. 1.

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McLaughlin. R.P. and C.A. Waring, 1914, Petroleum Industry of California: Calif. Mining Bureau Bull. 69, p. 430.

Page, B.M. and others, 1944, Geology of the Bituminous Sandstone Deposits Near Edna, San Luis Obispo County, Calif.: U.S. Geol. Survey Oil and Gas Inv. Prelim. Map 16.

Shea, G.B. and R.V. Higgins, 1945, Laboratory Study of Hot-Water Process for Separating Hydrocarbons From Surface Deposits of Bituminous Sandstones near Edna, California: U.S. Bur. Mines Rpt. Inv. 4246.

Vander Leck, L., 1921, Petroleum Resources of California: Calif. State Mining Bureau Bull. 89, p. 95.

DATE: January 1989 **Estimated value

CALIFORNIA DIVISION OF OIL AND GAS

COUNTY: SAN LUIS OBISPO

ARROYO GRANDE OIL FIELD
OAK PARK 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	Deuel Petroleum Co., Inc. "Rauschenplat" 6	McKeon Drilling Co., Inc. "Elberta" 2	5 32S 13E	MD	3,586	Martin	
Deepest well	C.W. Colgrove "Elberta" 1-5	Same as present	5 32S 13E	MD	10,142		Monterey Miocene

POOL DATA

ITEM	MARTIN	ELBERTA				FIELD OR AREA DATA
Discovery date	May 1929	May 1930				
Initial production rates						
Oil (bbl/day)	80	a/				
Gas (Mcf/day)						
Flow pressure (psi)						
Bean size (in.)						
Initial reservoir pressure (psi)	650**	800**				
Reservoir temperature (°F)	108	112				
Initial oil content (STB/ac.-ft.)						
Initial gas content (MSCF/ac.-ft.)						
Formation	Pismo	Pismo				
Geologic age	Pliocene-Miocene	Pliocene-Miocene				
Average depth (ft.)	2,890	3,100				
Average net thickness (ft.)	50	50				
Maximum productive area (acres)						160
RESERVOIR ROCK PROPERTIES						
Porosity (%)	30**	35**				
So_i (%)						
Sw_i (%)						
Sg_i (%)						
Permeability to air (md)	1,000	1,000				
RESERVOIR FLUID PROPERTIES						
Oil:						
Oil gravity (°API)	13-17	15				
Sulfur content (% by wt.)						
Initial solution GOR (SCF/STB)						
Initial oil FVF (RB/STB)						
Bubble point press. (psia)						
Viscosity (cp) @ °F	450 @ 108	230 @ 112				
Gas:						
Specific gravity (air = 1.0)						
Heating value (Btu/cu. ft.)						
Water:						
Salinity, NaCl (ppm)	-	19,260				
T.D.S. (ppm)						
R_w (ohm/m) (77°F)						
ENHANCED RECOVERY PROJECTS						
Enhanced recovery projects	fireflood					
Date started	1964					
Date discontinued	1964					
Peak oil production (bbl)						36,406
Year						1958
Peak gas production, net (Mcf)						
Year						

Base of fresh water (ft.): 700 - 1,200

Remarks: The water in the Elberta sand contains 26 ppm boron and is unsuitable for irrigation.
a/ No early production recorded.

Selected References:

DATE: January 1989 **Estimated value

CALIFORNIA DIVISION OF OIL AND GAS

COUNTY: SAN LUIS OBISPO

ARROYO GRANDE OIL FIELD
TIBER 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	Grace Petroleum Corp. "Tiber" 1	Tiber Pacific Oil Co. "Tiber" 1	6 32S 13E	MD	3,172	Dollie	
Deepest well	Taft Well Drilling Co. Well No. 4	Dollie Adams Well No. 4	31 31S 13E	MD	4,297 a/		Monterey Miocene

POOL DATA

ITEM	DOLLIE	MARTIN	ELBERTA			FIELD OR AREA DATA
Discovery date	July 1906	November 1908	November 1908			
Initial production rates						
Oil (bbl/day)	b/	80	c/			
Gas (Mcf/day)						
Flow pressure (psi)						
Bean size (in.)						
Initial reservoir pressure (psi)	250	650**	800**			
Reservoir temperature (°F)	90-100	108	112			
Initial oil content (STB/ac.-ft.)						
Initial gas content (MSCF/ac.-ft.)						
Formation	Pismo	Pismo	Pismo			
Geologic age	Pliocene-Miocene	Pliocene-Miocene	Pliocene-Miocene			
Average depth (ft.)	750	2,000	2,500			
Average net thickness (ft.)	300-400	100	100			
Maximum productive area (acres)						530
RESERVOIR ROCK PROPERTIES						
Porosity (%)	22-35**	30*	35*			
So_i (%)	29-38**	-	-			
Sw_i (%)	62-71**	-	-			
Sg_i (%)						
Permeability to air (md)	750-1,000	1,000	1,000			
RESERVOIR FLUID PROPERTIES						
Oil:						
Oil gravity (°API)	13-15	13-20	13-15			
Sulfur content (% by wt.)	-	1.3*	1.3*			
Initial solution GOR (SCF/STB)						
Initial oil FVF (RB/STB)						
Bubble point press. (psia)						
Viscosity (cp) @ °F	870 @ 150	450 @ 108	230 @ 112			
Gas:						
Specific gravity (air = 1.0)	0.734	-	-			
Heating value (Btu/cu. ft.)						
Water:						
Salinity, NaCl (ppm)						
T.D.S. (ppm)	2,000-5,000	-	19,125			
R_w (ohm/m) (77°F)	2.78	-	-			
ENHANCED RECOVERY PROJECTS						
Enhanced recovery projects	waterflood					
Date started	1949					
Date discontinued	1979					
	cyclic steam					
	1965					
	active					
	steamflood					
	1980					
	active					
Peak oil production (bbl)						502,832
Year						1981
Peak gas production, net (Mcf)						
Year						

Base of fresh water (ft.): 700 - 1,200

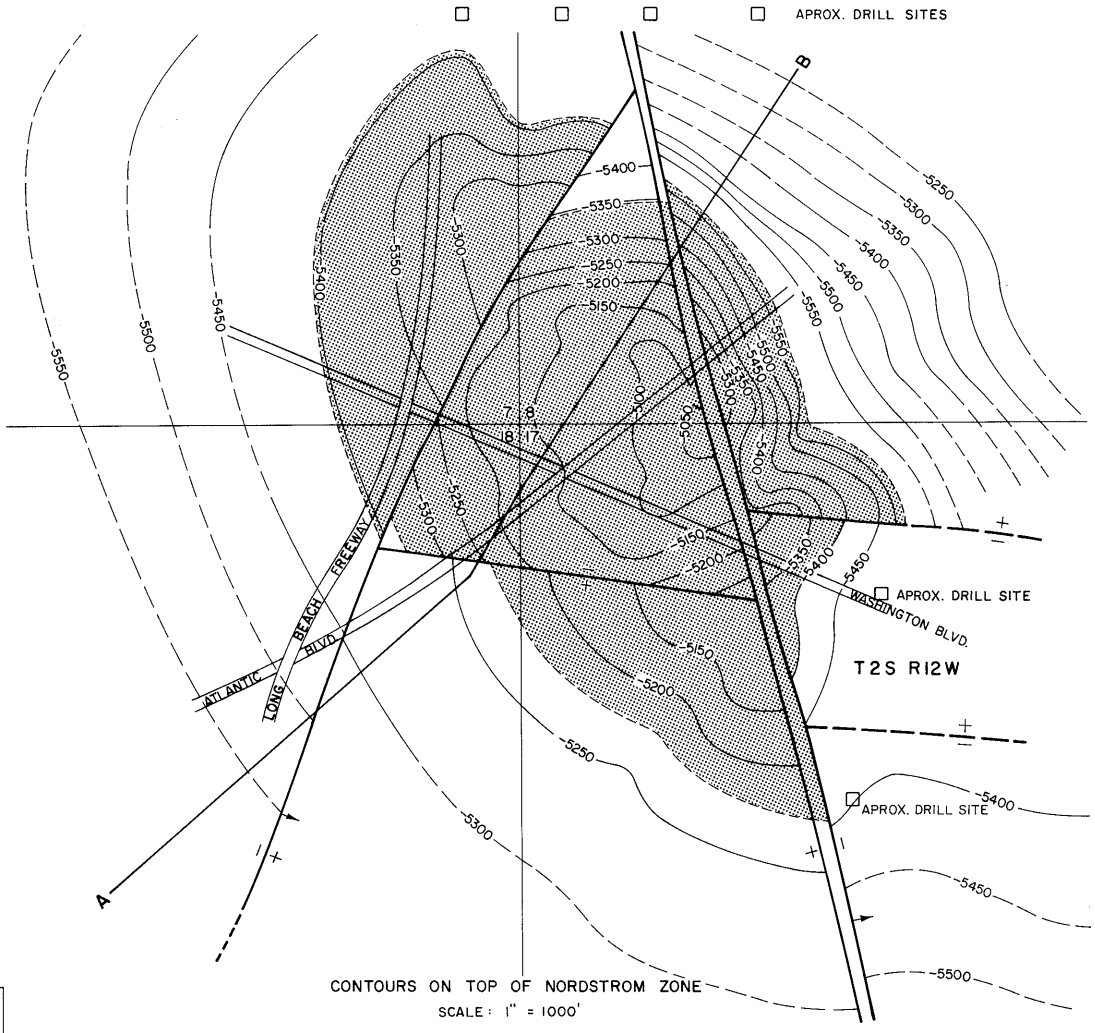
Remarks: Monterey Fm. was used for water disposal purposes in this area.
Produced water from the Dollie zone has a high concentration of sodium bicarbonate.
a/ Originally drilled to a total depth of 899 feet in 1934, and later deepened in 1939 (?).
b/ Early production not recorded.
c/ Commingled with production from the Martin zone.

Selected References:

DATE: January 1989 *Average value **Estimated value

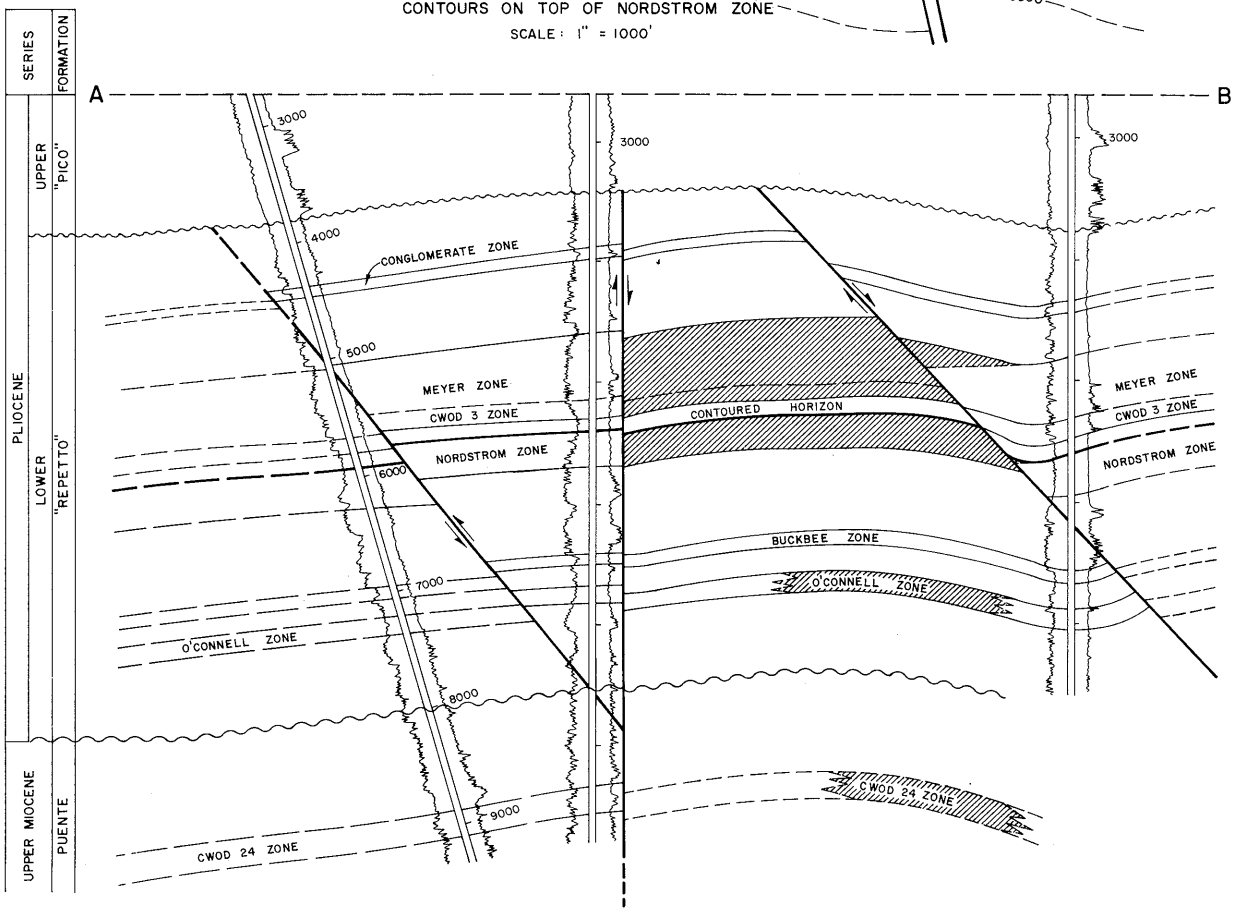
CALIFORNIA DIVISION OF OIL AND GAS

BANDINI OIL FIELD



CONTOURS ON TOP OF NORDSTROM ZONE

SCALE: 1" = 1000'



COUNTY: **LOS ANGELES**

BANDINI 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	General Exploration Co. "C.W.O.D." 1	General Exploration Co. of Calif. "C.C.M.O." 1	17 2S 12W	SB	6,766	a/ Buckbee	
Deepest well	General Exploration Co. "C.W.O.D." 25	General Exploration Co. of Calif. "C.W.O.D." 25	17 2S 12W	SB	9,912	b/	Puente late Miocene

POOL DATA

ITEM	CONGLOMERATE c/	MEYER	C.W.O.D. 3	NORDSTROM	BUCKBEE	FIELD OR AREA DATA
Discovery date	March 1957	April 1956	September 1956	May 1954	September 1953	
Initial production rates						
Oil (bbl/day)	325	339	1,560	285	519	
Gas (Mcf/day)	125	205	400	960	330	
Flow pressure (psi)	400	660	350	1,060	745	
Bean size (in.)	16/64	14/64	20/64	20/64	16/64	
Initial reservoir pressure (psi)						
Reservoir temperature (°F)	140**	140**	145**	160**	175**	
Initial oil content (STB/ac.-ft.)						
Initial gas content (MSCF/ac.-ft.)						
Formation	"Repetto"	"Repetto"	"Repetto"	"Repetto"	"Repetto"	
Geologic age	early Pliocene	early Pliocene	early Pliocene	early Pliocene	early Pliocene	
Average depth (ft.)	4,200	4,500	5,000	5,300	6,200	
Average net thickness (ft.)	70	300	175	200	100	
Maximum productive area (acres)						
RESERVOIR ROCK PROPERTIES						
Porosity (%)	29	29	29	32***	24	
So_i (%)	-	78	76***	76***	76***	
Sw_i (%)	-	22	24***	24***	24***	
Sg_i (%)						
Permeability to air (md)	509	735	372	700**	300	
RESERVOIR FLUID PROPERTIES						
Oil:						
Oil gravity (°API)	32	38	39	40	39	
Sulfur content (% by wt.)						
Initial solution GOR (SCF/STB)						
Initial oil FVF (RB/STB)						
Bubble point press. (psia)						
Viscosity (cp) @ °F						
Gas:						
Specific gravity (air = 1.0)						
Heating value (Btu/cu. ft.)						
Water:						
Salinity, NaCl (ppm)	26,000	32,000	32,000	32,000		
T.D.S. (ppm)						
R_w (ohm/m) (77°F)						
ENHANCED RECOVERY PROJECTS						
Enhanced recovery projects				waterflood		
Date started				1968		
Date discontinued				1969		
Peak oil production (bbl)						
Year						
Peak gas production, net (Mcf)						
Year						

Base of fresh water (ft.): 1,100

Remarks: The majority of wells are directionally drilled from one site.
a/ Directional well, true vertical depth is 6,746 feet.
b/ Directional well, true vertical depth is 9,173 feet.
c/ Initial production commingled with Meyer.

Selected References: Dosch, M.W., and W.J. Hunter, 1958, Bandini Oil Field: Calif. Div. of Oil and Gas, Summary of Operations -- Calif. Oil Fields, Vol. 44 No. 1.

DATE: July 1983 **Estimated value ***Representative value for area, formation, and depth

CALIFORNIA DIVISION OF OIL AND GAS

COUNTY: LOS ANGELES

BANDINI 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	O'CONNELL a/	C.W.O.D. 24				FIELD OR AREA DATA
Discovery date	May 1955	January 1957				
Initial production rates						
Oil (bbl/day)	224	120				
Gas (Mcf/day)	560	70				
Flow pressure (psi)	725	60				
Bean size (in.)	16/64	14/64				
Initial reservoir pressure (psi)						
Reservoir temperature (°F)	188**	190**				
Initial oil content (STB/ac.-ft.)						
Initial gas content (MSCF/ac.-ft.)						
Formation	"Repetto"	Puente				
Geologic age	early Pliocene	late Miocene				
Average depth (ft.)	6,500	8,400				
Average net thickness (ft.)	100	225				
Maximum productive area (acres)						
RESERVOIR ROCK PROPERTIES						
Porosity (%)	25	19				
So_i (%)	73**	65**				
Sw_i (%)	27**	35**				
Sg_i (%)						
Permeability to air (md)	299	27				
RESERVOIR FLUID PROPERTIES						
Oil:						
Oil gravity (°API)	38	36				
Sulfur content (% by wt.)						
Initial solution GOR (SCF/STB)						
Initial oil FVF (RB/STB)						
Bubble point press. (psia)						
Viscosity (cp) @ °F						
Gas:						
Specific gravity (air = 1.0)						
Heating value (Btu/cu. ft.)						
Water:						
Salinity, NaCl (ppm)	11,000	12,000				
T.D.S. (ppm)						
R_w (ohm/m) (77°F)						
ENHANCED RECOVERY PROJECTS						
Enhanced recovery projects						
Date started						
Date discontinued						
Peak oil production (bbl)						760,958
Year						1956
Peak gas production, net (Mcf)						2,155,780
Year						1957

Base of fresh water (ft.): 1,100

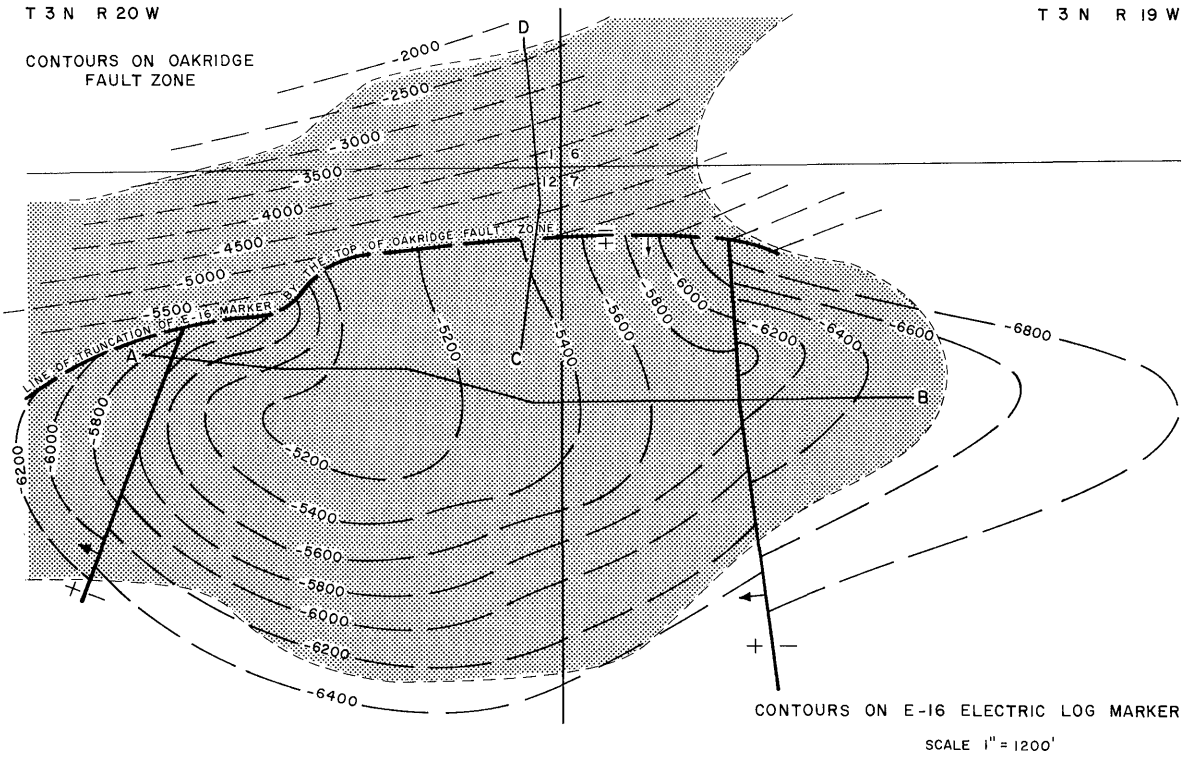
Remarks: a/ Initial production commingled with Buckbee zone.

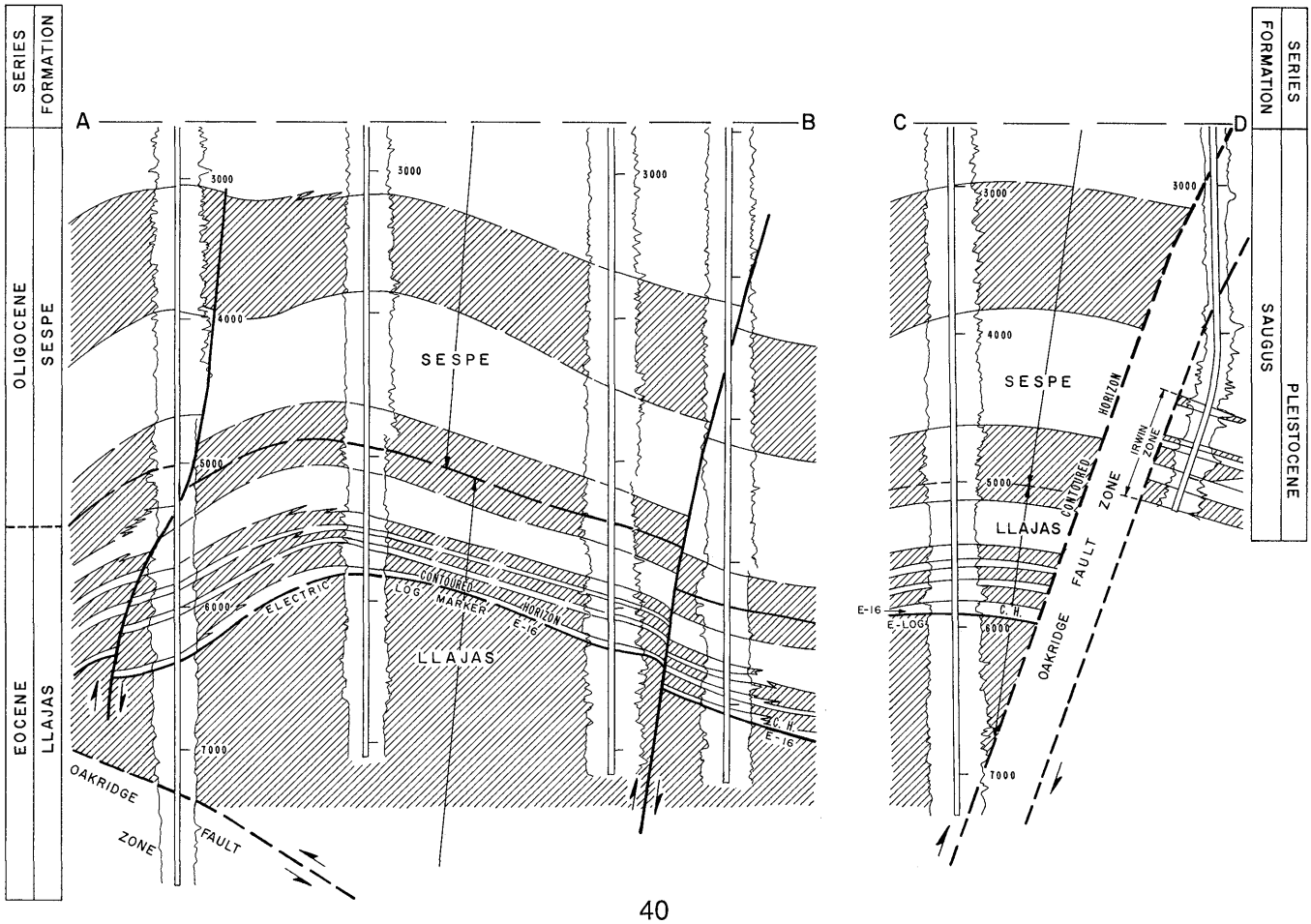
Selected References:

DATE: July 1983 **Estimated value

CALIFORNIA DIVISION OF OIL AND GAS

BARDSDALE OIL FIELD





COUNTY: VENTURA

BARDSDALE 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	Union Oil Co. of Calif. "Robertson" 2	Same as present	12 3N 20W	SB	685	Sespe	
Deepest well	Union Oil Co. of Calif. "Irwin-Berylwood" 5	Same as present	1 3N 20W	SB	16,457		Pico Pliocene

POOL DATA

ITEM	SESPE	IRWIN	EOCENE			FIELD OR AREA DATA
Discovery date	March 1892	September 1956	December 1936			
Initial production rates						
Oil (bbl/day)	25	626	148			
Gas (Mcf/day)	-	450	200			
Flow pressure (psi)						
Bean size (in.)						
Initial reservoir pressure (psi)						
Reservoir temperature (°F)						
Initial oil content (STB/ac.-ft.)						
Initial gas content (MSCF/ac.-ft.)						
Formation	Sespe	Saugus	Llajas			
Geologic age	Oligocene	Pleistocene	Eocene			
Average depth (ft.)	2,000-4,000	5,500	6,500			
Average net thickness (ft.)	1,300-2,100	600	2,450			
Maximum productive area (acres)						490
RESERVOIR ROCK PROPERTIES						
Porosity (%)						
So_i (%)						
Sw_i (%)						
Sg_i (%)						
Permeability to air (md)						
RESERVOIR FLUID PROPERTIES						
Oil:						
Oil gravity (°API)	27.2	26.7	33.6			
Sulfur content (% by wt.)						
Initial solution GOR (SCF/STB)	3,816	559	7,268			
Initial oil FVF (RB/STB)						
Bubble point press. (psia)						
Viscosity (cp) @ °F						
Gas:						
Specific gravity (air = 1.0)						
Heating value (Btu/cu. ft.)						
Water:						
Salinity, NaCl (ppm)	33,300	5,100	32,500			
T.D.S. (ppm)						
R_w (ohm/m) (77°F)						
ENHANCED RECOVERY PROJECTS						
Enhanced recovery projects						
Date started						
Date discontinued						
Peak oil production (bbl)						704,721
Year						1951
Peak gas production, net (Mcf)						2,072,943
Year						1953

Base of fresh water (ft.): None south of the Oakridge fault; 550 feet deep north of the Oakridge fault.

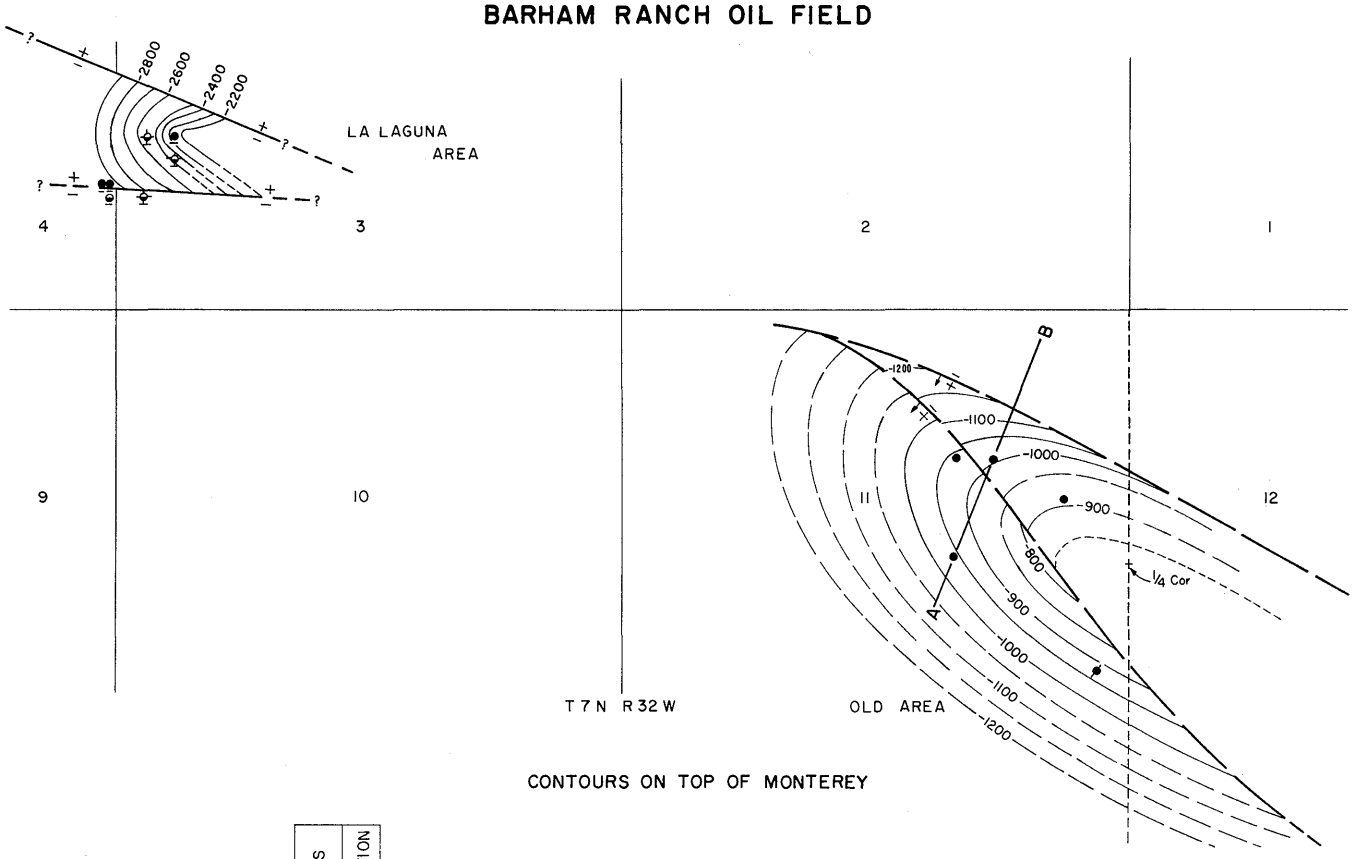
Remarks:

Selected References: Godde, H.A., 1924, Oil Fields of Ventura County: Calif. Div. of Oil and Gas, Summary of Operations -- Calif. Oil Fields, Vol. 10, No. 5.

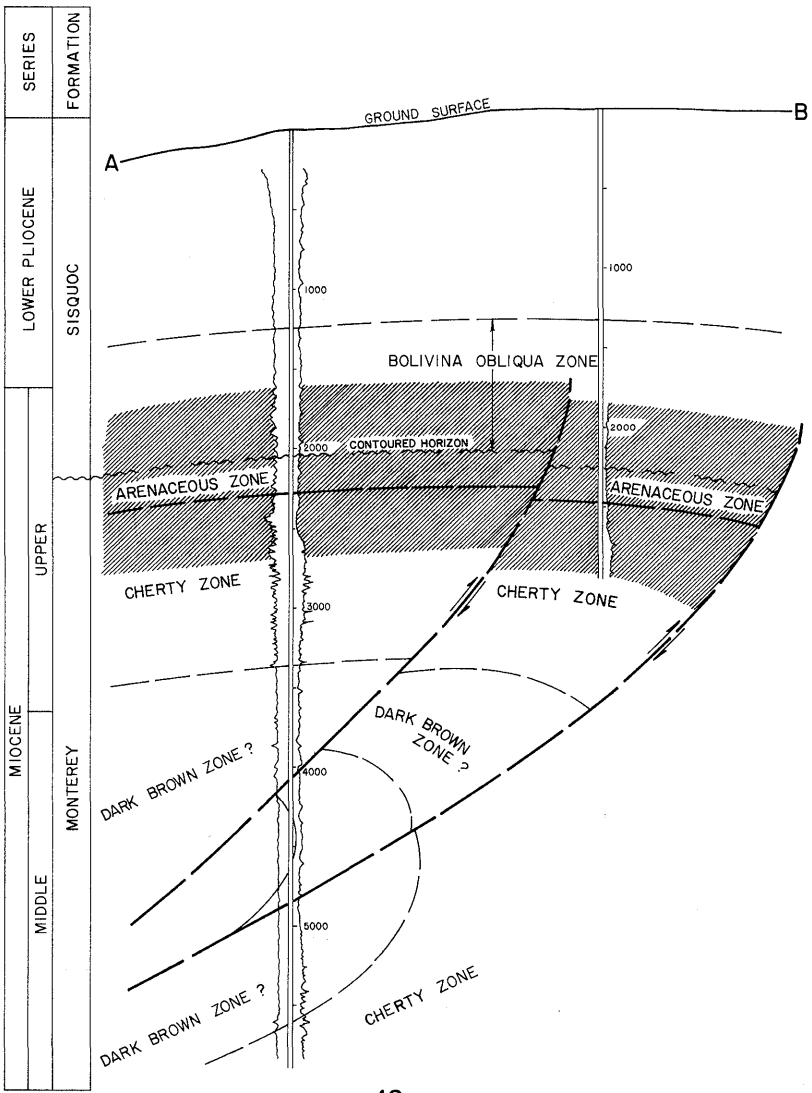
DATE: May 1983

CALIFORNIA DIVISION OF OIL AND GAS

BARHAM RANCH OIL FIELD



CONTOURS ON TOP OF MONTEREY



COUNTY: SANTA BARBARA

BARHAM RANCH 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	Barham-Boyne Oil Co., Inc. "Barham" 1	Whittier Associates "Barham" 1	11 7N 32W	SB	4,847	Monterey a/	
Deepest well	Oryx Energy Co. "Blair" 5	Sun Exploration and Production Co. "Blair" 5	4 7N 32W	SB	12,500 b/		Monterey Miocene

POOL DATA

ITEM	MONTEREY a/					FIELD OR AREA DATA
Discovery date	October 1943					
Initial production rates						
Oil (bbl/day)	10					
Gas (Mcf/day)						
Flow pressure (psi)	450-700					
Bean size (in.)	1					
Initial reservoir pressure (psi)	750					
Reservoir temperature (°F)	100					
Initial oil content (STB/ac.-ft.)						
Initial gas content (MSCF/ac.-ft.)						
Formation	Monterey					
Geologic age	late Miocene					
Average depth (ft.)	2,800					
Average net thickness (ft.)	200-400					
Maximum productive area (acres)						100
RESERVOIR ROCK PROPERTIES						
Porosity (%)	fractured shale					
So_i (%)						
Sw_i (%)						
Sg_i (%)						
Permeability to air (md)						
RESERVOIR FLUID PROPERTIES						
Oil:						
Oil gravity (°API)	14.1					
Sulfur content (% by wt.)	1.3					
Initial solution GOR (SCF/STB)						
Initial oil FVF (RB/STB)						
Bubble point press. (psia)						
Viscosity (cp) @ °F						
Gas:						
Specific gravity (air = 1.0)						
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						
Date started						
Date discontinued						
Peak oil production (bbl)						200,322
Year						1989
Peak gas production, net (Mcf)						125,442
Year						1989

Base of fresh water (ft.): None

Remarks: a/ Includes the Arenaceous and Cherty zones.
b/ Directional well; true vertical depth is 12,212 feet.

Selected References:

DATE: January 1990

CALIFORNIA DIVISION OF OIL AND GAS

COUNTY: SANTA BARBARA

BARHAM RANCH OIL FIELD
LA LAGUNA 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	Triton Oil and Gas Corp. "Blair" 1	American Pacific International, Inc. "Blair" 1	3 7N 32W	SB	5,187 a/	Monterey	
Deepest well	Oryx Energy Co. "Blair" 5	Sun Exploration and Production Co. "Blair" 5	4 7N 32W	SB	12,500 b/		Monterey Miocene

POOL DATA

ITEM	MONTEREY					FIELD OR AREA DATA
Discovery date	December 1983					
Initial production rates						
Oil (bbl/day)	108					
Gas (Mcf/day)	100					
Flow pressure (psi)	40					
Bean size (in.)						
Initial reservoir pressure (psi)	1,000					
Reservoir temperature (°F)						
Initial oil content (STB/ac.-ft.)						
Initial gas content (MSCF/ac.-ft.)						
Formation	Monterey					
Geologic age	Miocene					
Average depth (ft.)	4,000					
Average net thickness (ft.)	200					
Maximum productive area (acres)						70
RESERVOIR ROCK PROPERTIES						
Porosity (%)	fractured shale					
S_{oi} (%)						
S_{wi} (%)						
S_{gi} (%)						
Permeability to air (md)						
RESERVOIR FLUID PROPERTIES						
Oil:						
Oil gravity (°API)	30-33					
Sulfur content (% by wt.)						
Initial solution GOR (SCF/STB)						
Initial oil FVF (RB/STB)						
Bubble point press. (psia)						
Viscosity (cp) @ °F						
Gas:						
Specific gravity (air = 1.0)						
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						
Date started						
Date discontinued						
Peak oil production (bbl)						193,665
Year						1989
Peak gas production, net (Mcf)						125,442
Year						1989

Base of fresh water (ft.): None

Remarks: a/ Directional well; true vertical depth is 5,094 feet.
b/ Directional well; true vertical depth is 12,212 feet.

Selected References:

DATE: January 1990

CALIFORNIA DIVISION OF OIL AND GAS

COUNTY: SANTA BARBARA

BARHAM RANCH OIL FIELD
OLD 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	Barham-Boyne Oil Co., Inc. "Barham" 1	Whittier Associates "Barham" 1	11 7N 32W	SB	4,847	Monterey b/	
Deepest well	Northern Michigan Exploration Co. "Barham Ranch" 1-11	Same as present	11 7N 32W	SB	6,928 a/		Pt. Sal Miocene

POOL DATA

ITEM	BASAL SISQUOC	MONTEREY b/				FIELD OR AREA DATA
Discovery date	March 1945	October 1943				
Initial production rates						
Oil (bbl/day)	10-19	10				
Gas (Mcf/day)	2	-				
Flow pressure (psi)	-	450-700				
Bean size (in.)	-	1				
Initial reservoir pressure (psi)	750	750				
Reservoir temperature (°F)	85	100				
Initial oil content (STB/ac.-ft.)						
Initial gas content (MSCF/ac.-ft.)						
Formation	Sisquoc	Monterey				
Geologic age	Pliocene-Miocene	late Miocene				
Average depth (ft.)	1,400	2,800				
Average net thickness (ft.)	500	200-400				
Maximum productive area (acres)						40
RESERVOIR ROCK PROPERTIES						
Porosity (%)	20-30***	fractured shale				
S_{oi} (%)	35-45***	-				
S_{wi} (%)	55-65***	-				
S_{gi} (%)						
Permeability to air (md)	300-500	-				
RESERVOIR FLUID PROPERTIES						
Oil:						
Oil gravity (°API)	14.0-16.0	14.1				
Sulfur content (% by wt.)	1.3	1.3				
Initial solution GOR (SCF/STB)						
Initial oil FVF (RB/STB)						
Bubble point press. (psia)						
Viscosity (cp) @ °F						
Gas:						
Specific gravity (air = 1.0)						
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						
Date started						
Date discontinued						
Peak oil production (bbl)						17,776
Year						1965
Peak gas production, net (Mcf)						
Year						

Base of fresh water (ft.): None

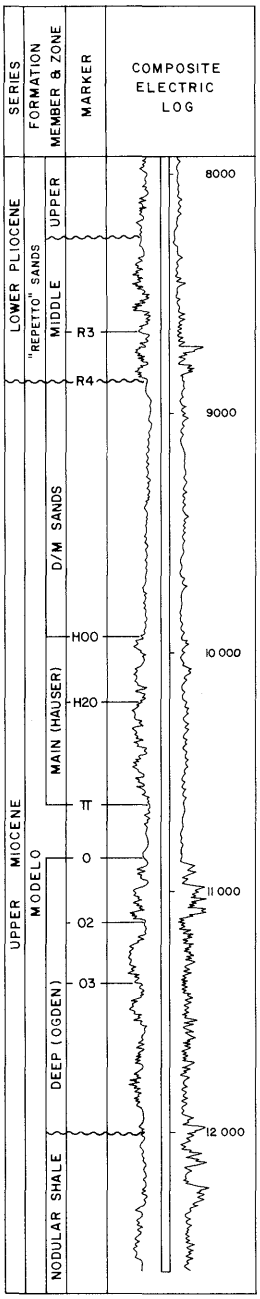
Remarks: a/ Directional well; true vertical depth is 6,897 feet.
b/ Includes the Arenaceous and Cherty zones.

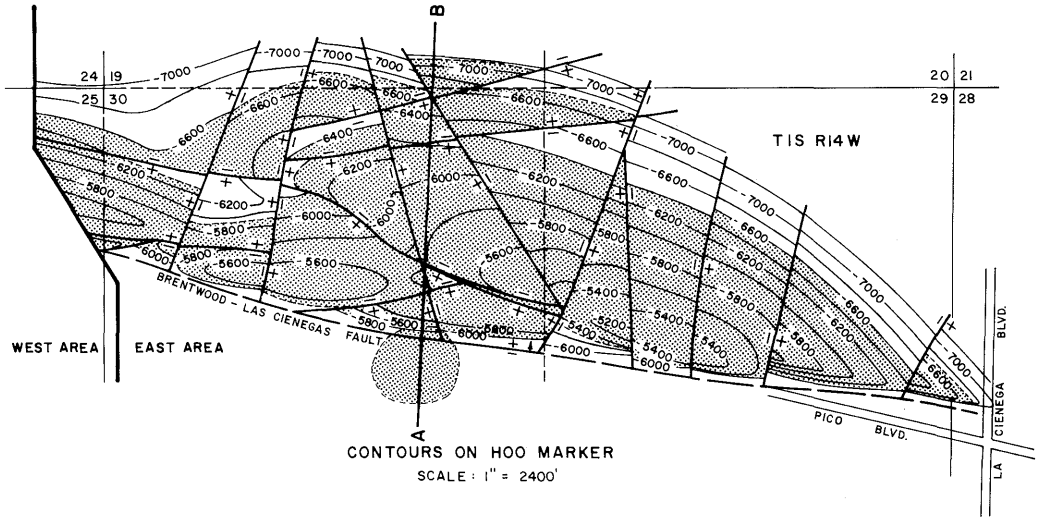
Selected References: Wilkinson, E.R., 1968, Barham Ranch Oil Field: Calif. Div. of Oil and Gas, Summary of Operations -- Calif. Oil Fields, Vol. 54, No. 1.

DATE: January 1989 ***Representative values for area, formation, and depth

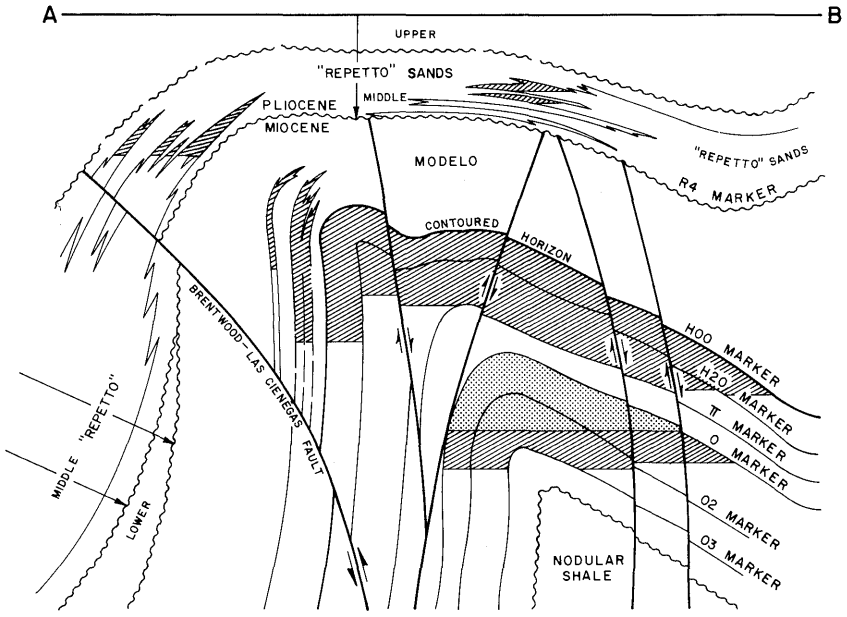
CALIFORNIA DIVISION OF OIL AND GAS

BEVERLY HILLS OIL FIELD
East Area





CONTOURS ON H00 MARKER
SCALE: 1" = 2400'



GENERALIZED CROSS SECTION (COURTESY OCCIDENTAL PETROLEUM CORP)

COUNTY: LOS ANGELES

BEVERLY HILLS 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	W.W. Orcutt, Well number unknown	Same as present	25 or 26 1S 15W	SB	unk.	Wolfskill	
Deepest well	Chevron U.S.A. Inc. "S-54"	Standard Oil Co. of Calif. "S-54"	29 1S 14W	SB	12,683		Modelo late Miocene

POOL DATA

ITEM	WOLFSKILL					FIELD OR AREA DATA
Discovery date	July 1900					
Initial production rates						
Oil (bbl/day)	-					
Gas (Mcf/day)						
Flow pressure (psi)						
Bean size (in.)						
Initial reservoir pressure (psi)	990					
Reservoir temperature (°F)	110					
Initial oil content (STB/ac.-ft.)	839					
Initial gas content (MSCF/ac.-ft.)						
Formation	"Repetto"					
Geologic age	early Pliocene					
Average depth (ft.)	2,500					
Average net thickness (ft.)	250					
Maximum productive area (acres)						1,230
RESERVOIR ROCK PROPERTIES						
Porosity (%)	21.1					
S_{oi} (%)	67.3					
S_{wi} (%)	32.7					
S_{gi} (%)						
Permeability to air (md)	50					
RESERVOIR FLUID PROPERTIES						
Oil:						
Oil gravity (°API)	33-60					
Sulfur content (% by wt.)	2.3					
Initial solution GOR (SCF/STB)	567					
Initial oil FVF (RB/STB)	1,349					
Bubble point press. (psia)						
Viscosity (cp) @ °F	20 @ 77					
Gas:						
Specific gravity (air = 1.0)	0.692					
Heating value (Btu/cu. ft.)	1,222					
Water:						
Salinity, NaCl (ppm)	15,000-18,000					
T.D.S. (ppm)	34,000					
R_w (ohm/m) (77°F)						
ENHANCED RECOVERY PROJECTS						
Enhanced recovery projects						
Date started						
Date discontinued						
Peak oil production (bbl)						12,550,605
Year						1968
Peak gas production, net (Mcf)						32,070,759
Year						1969

Base of fresh water (ft.): See areas

Remarks: See areas

Selected References: See areas

DATE: August 1983

CALIFORNIA DIVISION OF OIL AND GAS

COUNTY: **LOS ANGELES**

BEVERLY HILLS OIL FIELD
EAST 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	Occidental Petroleum Corp. "West Pico" 7	Same as present	30 1S 14W	SB	8,467	"Repetto" sands	
Deepest well	Chevron U.S.A. Inc. "S-54"	Standard Oil Co. of Calif. "S-54"	29 1S 14W	SB	12,683		Modelo late Miocene

POOL DATA

ITEM	"REPETTO" SANDS	D/M SANDS	MAIN (HAUSER)	DEEP (OGDEN)		FIELD OR AREA DATA
Discovery date	January 1967	July 1967	April 1966	June 1967		
Initial production rates						
Oil (bbl/day)	827	1,601a/	519	397		
Gas (Mcf/day)	690	885	352	6,714		
Flow pressure (psi)						
Bean size (in.)						
Initial reservoir pressure (psi)	2,327	3,450	2,523	2,920		
Reservoir temperature (°F)	189	220	209	200		
Initial oil content (STB/ac.-ft.)	1,160.2	-	1,124.1	770.0		
Initial gas content (MSCF/ac.-ft.)						
Formation	"Repetto"	Modelo	Modelo	Modelo		
Geologic age	early Pliocene	late Miocene	late Miocene	late Miocene		
Average depth (ft.)	4,800	9,000	9,900	10,800		
Average net thickness (ft.)	350	200	700	800		
Maximum productive area (acres)						870
RESERVOIR ROCK PROPERTIES						
Porosity (%)	26.0	23.0	26.6	18.0		
S_{oi} (%)	78.0	65.0	74.3	65.0		
S_{wi} (%)	22.0	35.0	25.7	35.0		
S_{gi} (%)						
Permeability to air (md)	193.0	107.0	76.7	-		
RESERVOIR FLUID PROPERTIES						
Oil:						
Oil gravity (°API)	35	27	30-35	23-60		
Sulfur content (% by wt.)	-	-	2.17	2.17		
Initial solution GOR (SCF/STB)	631	43,436	577	600		
Initial oil FVF (RB/STB)	1.356	1.132	1.364	1.300		
Bubble point press. (psia)	2,327	-	2,523	-		
Viscosity (cp) @ °F	-	-	69 @ 90	75 @ 90		
Gas:						
Specific gravity (air = 1.0)	0.91	0.70	1.01	0.75		
Heating value (Btu/cu. ft.)	1,300	-	1,300	1,200		
Water:						
Salinity, NaCl (ppm)	16,000	20,621	16,000	17,000		
T.D.S. (ppm)	21,500	21,980	21,750	-		
R_w (ohm/m) (77°F)	0.38	-	0.38	0.28		
ENHANCED RECOVERY PROJECTS						
Enhanced recovery projects	waterflood	waterflood	waterflood			
Date started	1970	1968	1968			
Date discontinued	active	active	active			
Peak oil production (bbl)						11,816,162
Year						1968
Peak gas production, net (Mcf)						30,848,195
Year						1969

Base of fresh water (ft.): 500

Remarks: a/ D/M and Main zone production commingled.
All present drilling is done from sound-proofed urban drillsites.

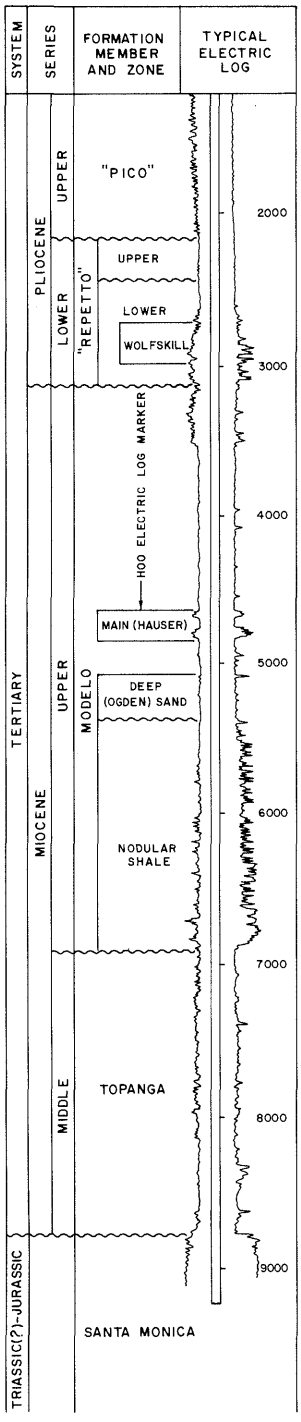
Selected References:

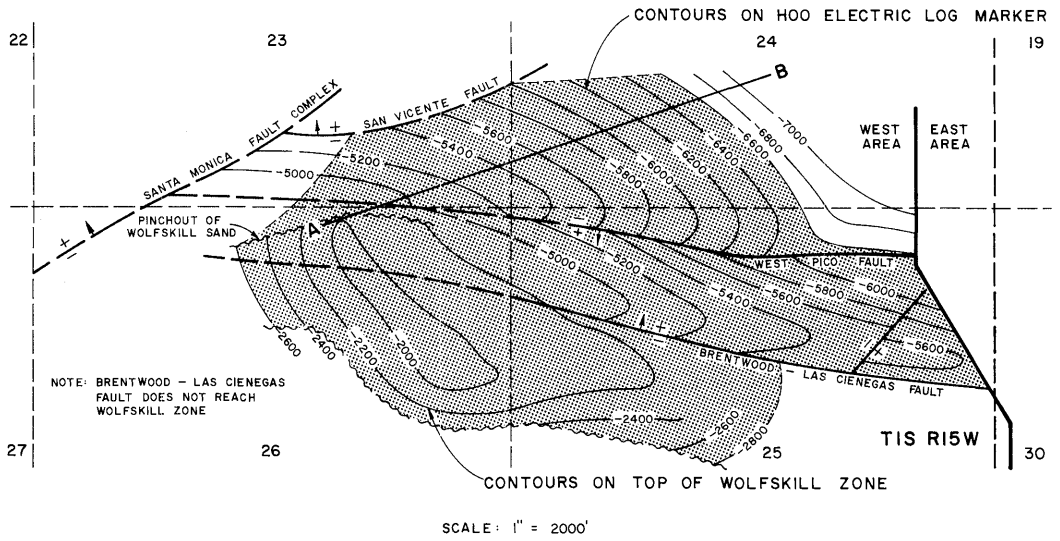
DATE: January 1989

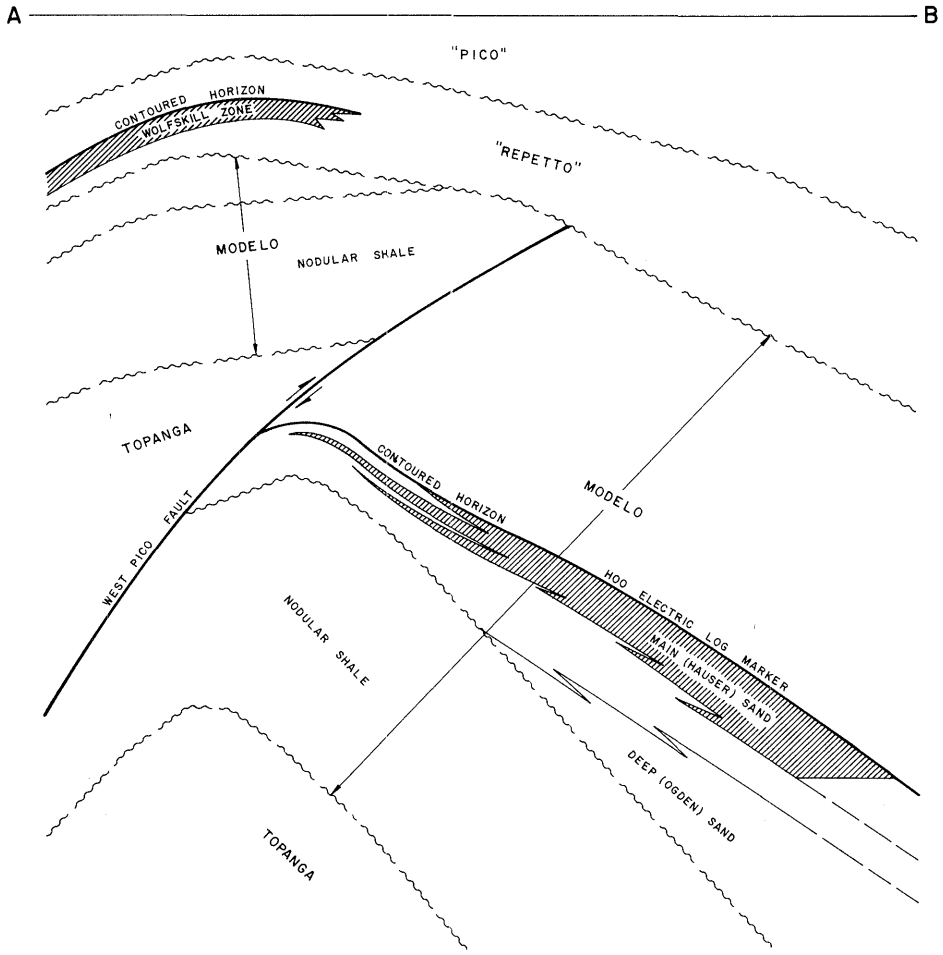
CALIFORNIA DIVISION OF OIL AND GAS

BEVERLY HILLS OIL FIELD

West Area







COUNTY: **LOS ANGELES**

BEVERLY HILLS OIL FIELD
WEST 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	W.W. Orcutt, well number unknown	Same as present	25 or 26 1S 15W	SB	unk.	Wolfskill	
Deepest well	Chevron U.S.A. Inc. "Twentieth Century Fox" 27-F	Gulf Oil Corp. of Calif. "Aladdin" 27 E	26 1S 15W	SB	12,000		Modelo late Miocene

POOL DATA

ITEM	WOLFSKILL	MAIN (HAUSER)				FIELD OR AREA DATA
Discovery date	July 1900	February 1954				
Initial production rates						
Oil (bbl/day)	unknown	unknown				
Gas (Mcf/day)						
Flow pressure (psi)						
Bean size (in.)						
Initial reservoir pressure (psi)	990	-				
Reservoir temperature (°F)	110	195				
Initial oil content (STB/ac.-ft.)	839	817				
Initial gas content (MSCF/ac.-ft.)	-	463				
Formation	"Repetto"	Modelo				
Geologic age	early Pliocene	late Miocene				
Average depth (ft.)	2,500	4,500				
Average net thickness (ft.)	250	100				
Maximum productive area (acres)						360
RESERVOIR ROCK PROPERTIES						
Porosity (%)	31.0	21.1				
S_{oi} (%)	39.0	67.3				
S_{wi} (%)	56.0	32.7				
S_{gi} (%)	5.0	-				
Permeability to air (md)	-	50				
RESERVOIR FLUID PROPERTIES						
Oil:						
Oil gravity (°API)	15-22	23-60				
Sulfur content (% by wt.)	-	2.3				
Initial solution GOR (SCF/STB)	-	567				
Initial oil FVF (RB/STB)	1.110	1.349				
Bubble point press. (psia)						
Viscosity (cp) @ °F	-	20 @ 77				
Gas:						
Specific gravity (air = 1.0)	-	0.692				
Heating value (Btu/cu. ft.)	-	1,222				
Water:						
Salinity, NaCl (ppm)	24,000-26,000	15,000-18,000				
T.D.S. (ppm)	30,000	34,000				
R_w (ohm/m) (77°F)						
ENHANCED RECOVERY PROJECTS						
Enhanced recovery projects						
Date started						
Date discontinued						
Peak oil production (bbl)						3,717,262
Year						1961
Peak gas production, net (Mcf)						17,645,142
Year						1961

Base of fresh water (ft.): 500

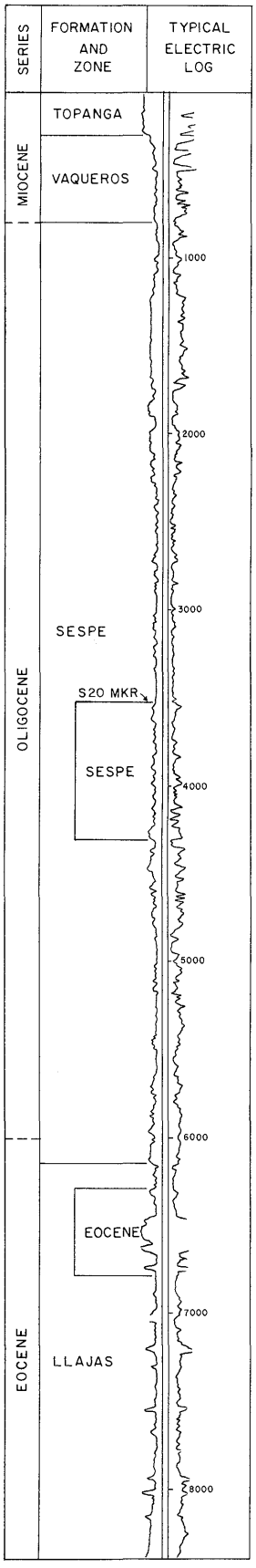
Remarks: Nearly all recent wells have been directionally drilled from sound-proofed drillsites.

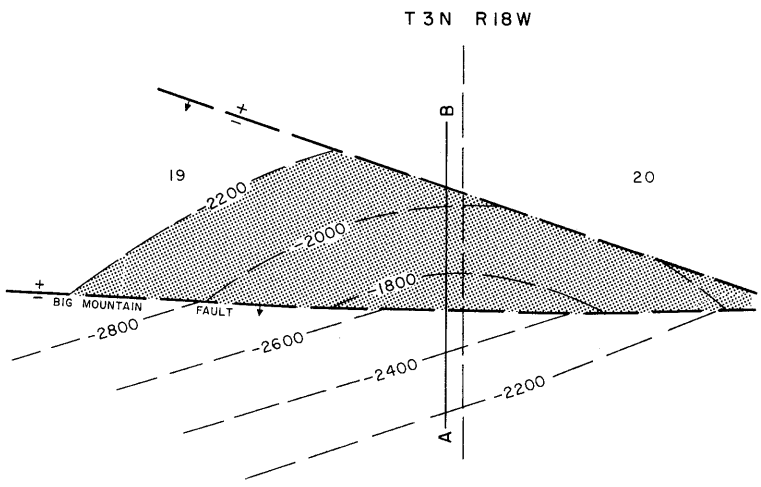
Selected References:

DATE: August 1989

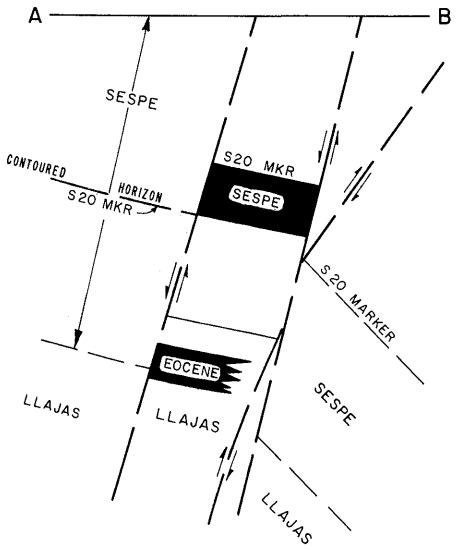
CALIFORNIA DIVISION OF OIL AND GAS

BIG MOUNTAIN OIL FIELD





CONTOURS ON S20 MARKER
SCALE: 1"=3000'



COUNTY: VENTURA

BIG MOUNTAIN 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	Union Oil Co. of Calif. "Union-Getty-Tapo-Simi" 2	Same as present	19 3N 18W	SB	6,997	Sespe	
Deepest well	Union Oil Co. of Calif. "Big Mountain A" 1-19	Same as present	19 3N 18W	SB	9,435		Llajas Eocene

POOL DATA

ITEM	SESPE	EOCENE				FIELD OR AREA DATA
Discovery date	November 1966	November 1966				
Initial production rates						
Oil (bbl/day)	150	160				
Gas (Mcf/day)	170	160				
Flow pressure (psi)						
Bean size (in.)						
Initial reservoir pressure (psi)	1,580	-				
Reservoir temperature (°F)						
Initial oil content (STB/ac.-ft.)						
Initial gas content (MSCF/ac.-ft.)						
Formation	Sespe	Llajas				
Geologic age	Oligocene	Eocene				
Average depth (ft.)	3,800	6,200				
Average net thickness (ft.)	976	700				
Maximum productive area (acres)						60
RESERVOIR ROCK PROPERTIES						
Porosity (%)	24-35	-				
S_{oi} (%)						
S_{wi} (%)						
S_{gi} (%)						
Permeability to air (md)	50-250	-				
RESERVOIR FLUID PROPERTIES						
Oil:						
Oil gravity (°API)	20.3	30.0				
Sulfur content (% by wt.)						
Initial solution GOR (SCF/STB)	150-1,150	-				
Initial oil FVF (RB/STB)						
Bubble point press. (psia)						
Viscosity (cp) @ °F						
Gas:						
Specific gravity (air = 1.0)						
Heating value (Btu/cu. ft.)						
Water:						
Salinity, NaCl (ppm)	23,900	27,400				
T.D.S. (ppm)						
R_w (ohm/m) (77°F)						
ENHANCED RECOVERY PROJECTS						
Enhanced recovery projects	waterflood					
Date started	1970					
Date discontinued	1980					
Peak oil production (bbl)						159,945
Year						1968
Peak gas production, net (Mcf)						164,300
Year						1972

Base of fresh water (ft.): None

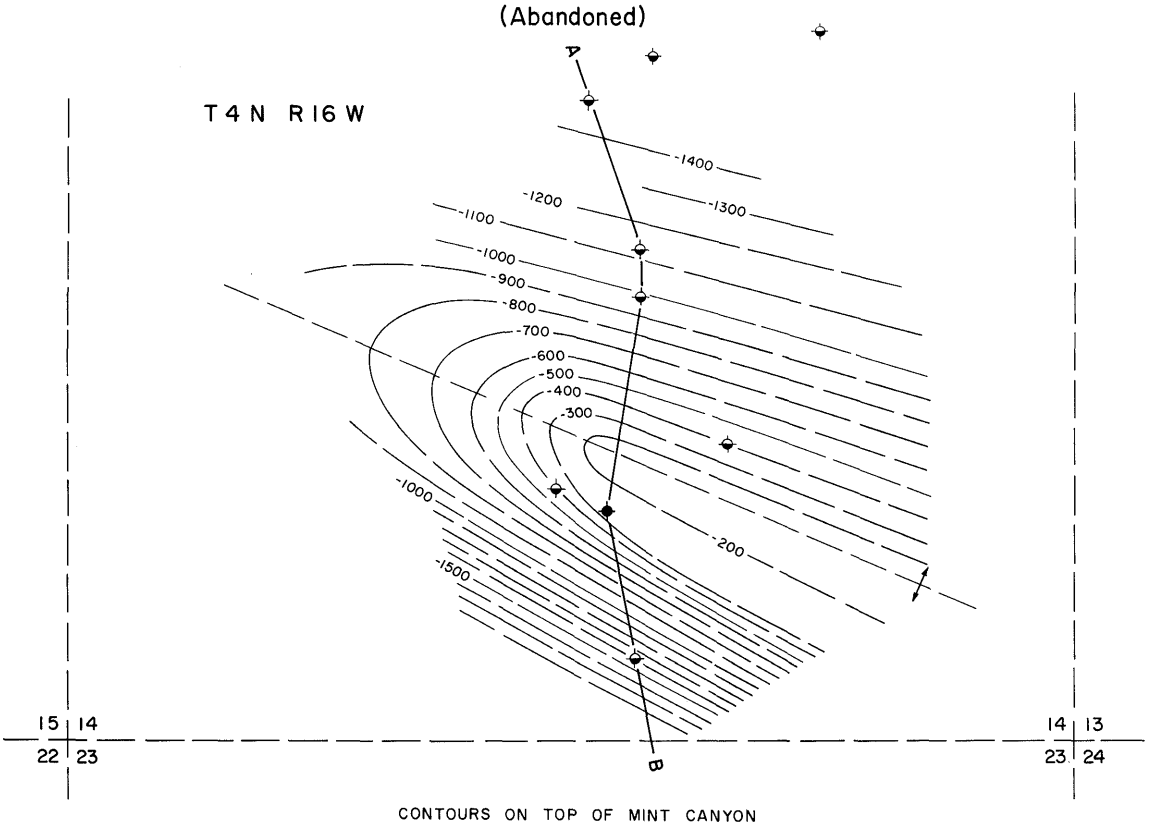
Remarks:

Selected References:

DATE: May 1983

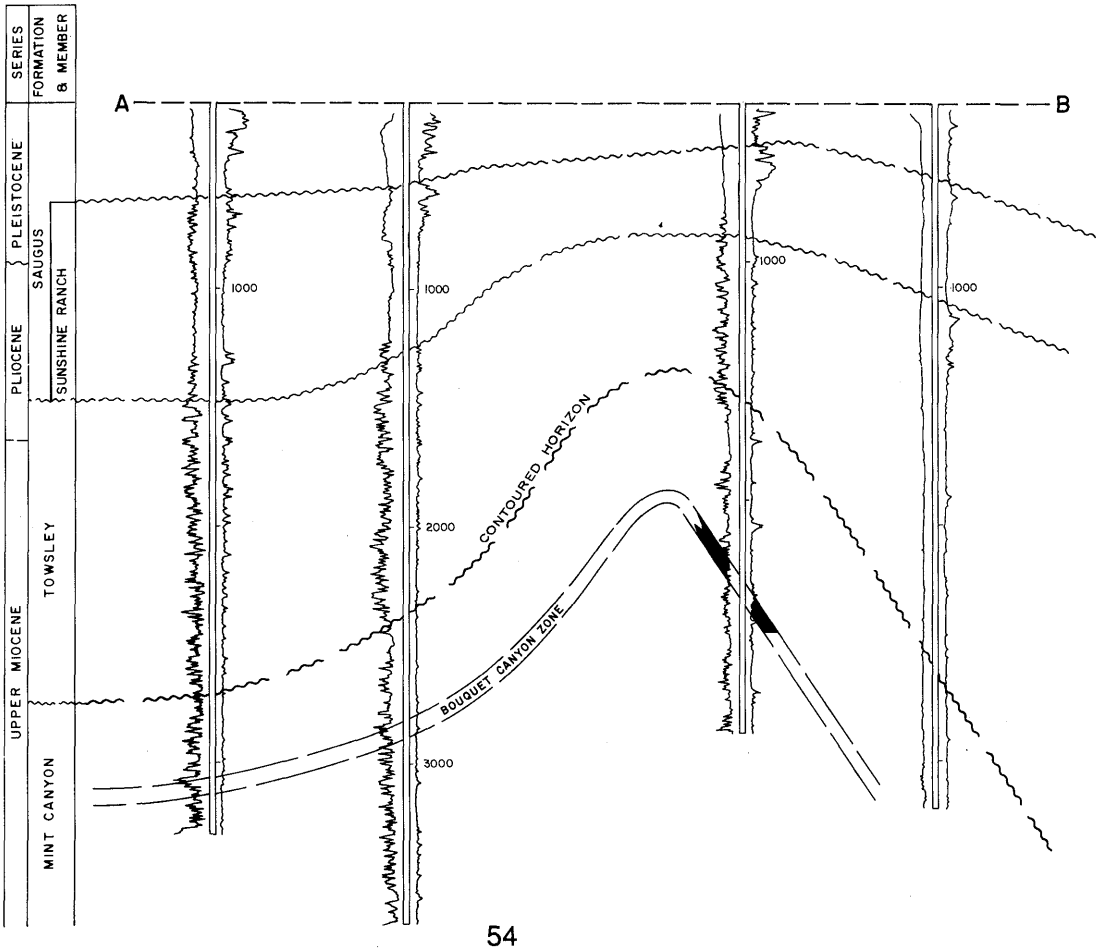
CALIFORNIA DIVISION OF OIL AND GAS

BOUQUET CANYON OIL FIELD
(Abandoned)



CONTOURS ON TOP OF MINT CANYON

SCALE: 1" = 1000'



COUNTY: LOS ANGELES

BOUQUET CANYON OIL FIELD
(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	Edward Lustgarten "Lucky Lusty" 1	Same as present	14 4N 16W	SB	2,982	Bouquet Canyon	
Deepest well	Edward Lustgarten "Lucky Lusty" 4	Same as present	14 4N 16W	SB	5,473		Mint Canyon late Miocene

POOL DATA

ITEM	BOUQUET CANYON					FIELD OR AREA DATA
Discovery date	June 1958					
Initial production rates						
Oil (bbl/day)	29					
Gas (Mcf/day)	0					
Flow pressure (psi)						
Bean size (in.)						
Initial reservoir pressure (psi)						
Reservoir temperature (°F)						
Initial oil content (STB/ac.-ft.)						
Initial gas content (MSCF/ac.-ft.)						
Formation	Mint Canyon					
Geologic age	late Miocene					
Average depth (ft.)	2,340					
Average net thickness (ft.)	70					
Maximum productive area (acres)	10					
RESERVOIR ROCK PROPERTIES						
Porosity (%)						
So_i (%)						
Sw_i (%)						
Sg_i (%)						
Permeability to air (md)						
RESERVOIR FLUID PROPERTIES						
Oil:						
Oil gravity (°API)	39					
Sulfur content (% by wt.)						
Initial solution GOR (SCF/STB)						
Initial oil FVF (RB/STB)						
Bubble point press. (psia)						
Viscosity (cp) @ °F						
Gas:						
Specific gravity (air = 1.0)						
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						
Date started						
Date discontinued						
Peak oil production (bbl)	1,514					
Year	1962					
Peak gas production, net (Mcf)						
Year						

Base of fresh water (ft.): 700

Remarks: Field abandoned in 1971. Cumulative production is 8,528 bbl of oil.

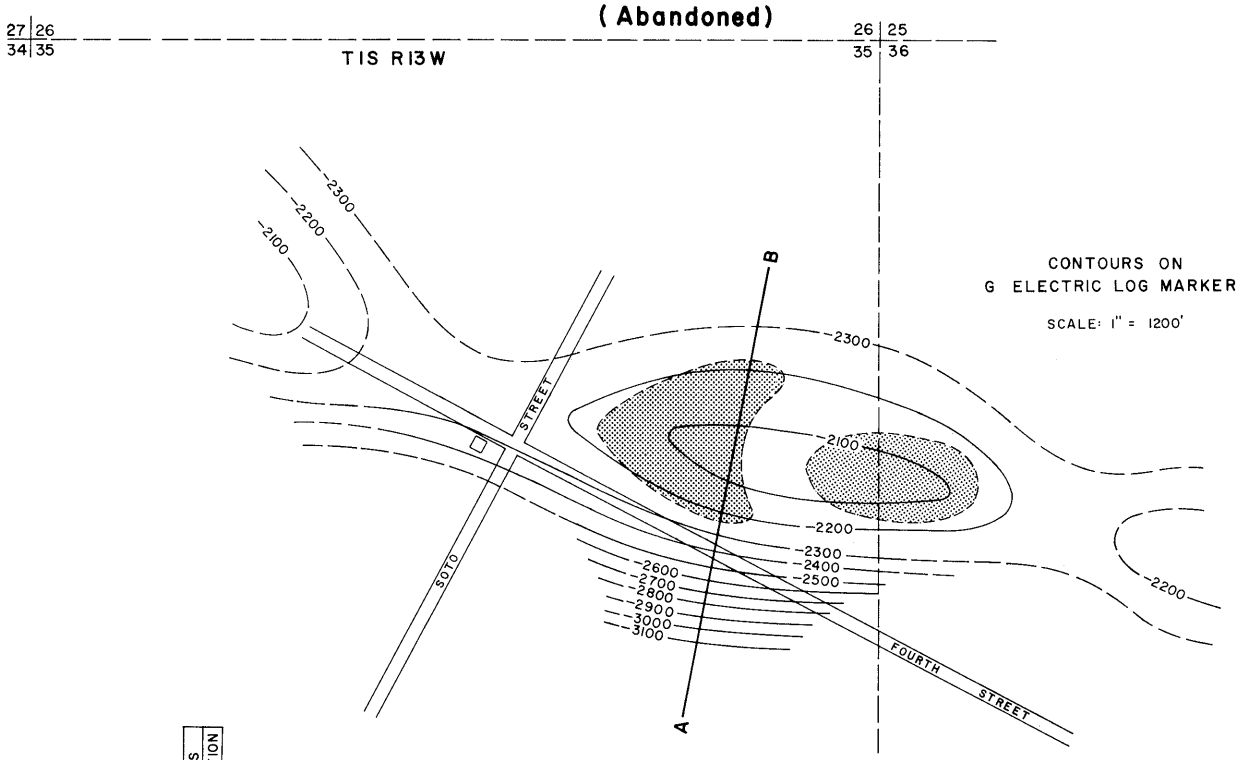
Selected References: Zulberti, J.L., 1967, Bouquet Canyon Oil Field: Calif. Div. of Oil and Gas, Summary of Operations -- Calif. Oil Fields, Vol. 53, No. 2, Part 2.

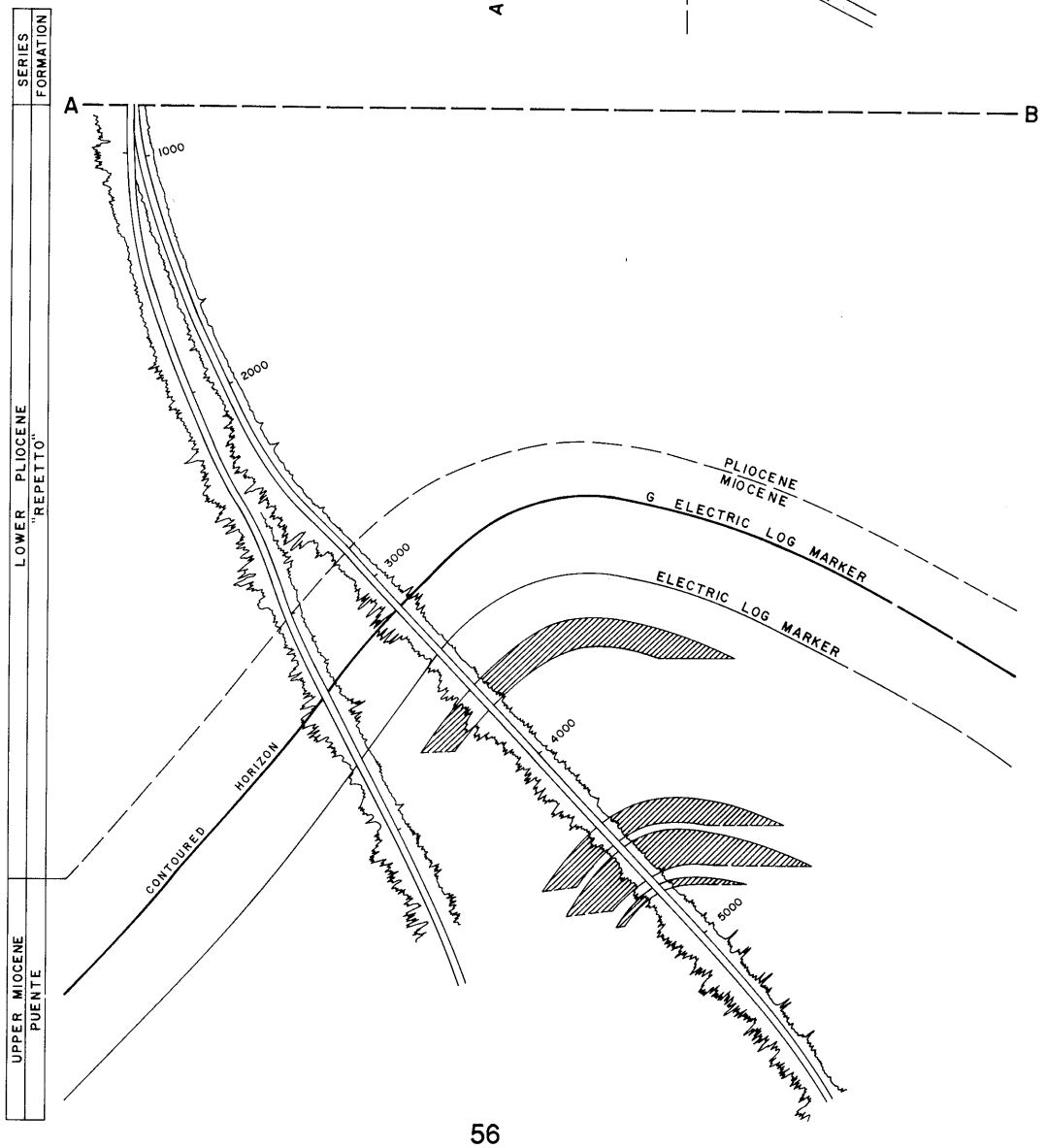
DATE: May 1983

CALIFORNIA DIVISION OF OIL AND GAS

BOYLE HEIGHTS OIL FIELD

(Abandoned)





COUNTY: LOS ANGELES

BOYLE HEIGHTS OIL FIELD (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	ARCO Oil and Gas Co. "Industrial Community" 1-1	Richfield Oil Corp. "Boyle Indistrial" 1	35 1S 13W	SB	3,492	Puente sands	
Deepest well	ARCO Oil and Gas Co. "Evergreen" 1	Richfield Oil Corp. "Industrial Community" 1A-1	35 1S 13W	SB	4,360		Puente late Miocene

POOL DATA

ITEM	PUENTE SANDS					FIELD OR AREA DATA
Discovery date	December 1955					
Initial production rates						
Oil (bbl/day)	200					
Gas (Mcf/day)						
Flow pressure (psi)						
Bean size (in.)	12/64					
Initial reservoir pressure (psi)						
Reservoir temperature (°F)						
Initial oil content (STB/ac.-ft.)						
Initial gas content (MSCF/ac.-ft.)						
Formation	Puente					
Geologic age	late Miocene					
Average depth (ft.)	2,500					
Average net thickness (ft.)	400					
Maximum productive area (acres)	30					
RESERVOIR ROCK PROPERTIES						
Porosity (%)						
So_i (%)						
Sw_i (%)						
Sg_i (%)						
Permeability to air (md)						
RESERVOIR FLUID PROPERTIES						
Oil:						
Oil gravity (°API)	26					
Sulfur content (% by wt.)						
Initial solution GOR (SCF/STB)	360**					
Initial oil FVF (RB/STB)						
Bubble point press. (psia)						
Viscosity (cp) @ °F						
Gas:						
Specific gravity (air = 1.0)						
Heating value (Btu/cu. ft.)						
Water:						
Salinity, NaCl (ppm)	25,000					
T.D.S. (ppm)						
R_w (ohm/m) (77°F)						
ENHANCED RECOVERY PROJECTS						
Enhanced recovery projects						
Date started						
Date discontinued						
Peak oil production (bbl)	42,311					
Year	1957					
Peak gas production, net (Mcf)	30,950					
Year	1957					

Base of fresh water (ft.): 200

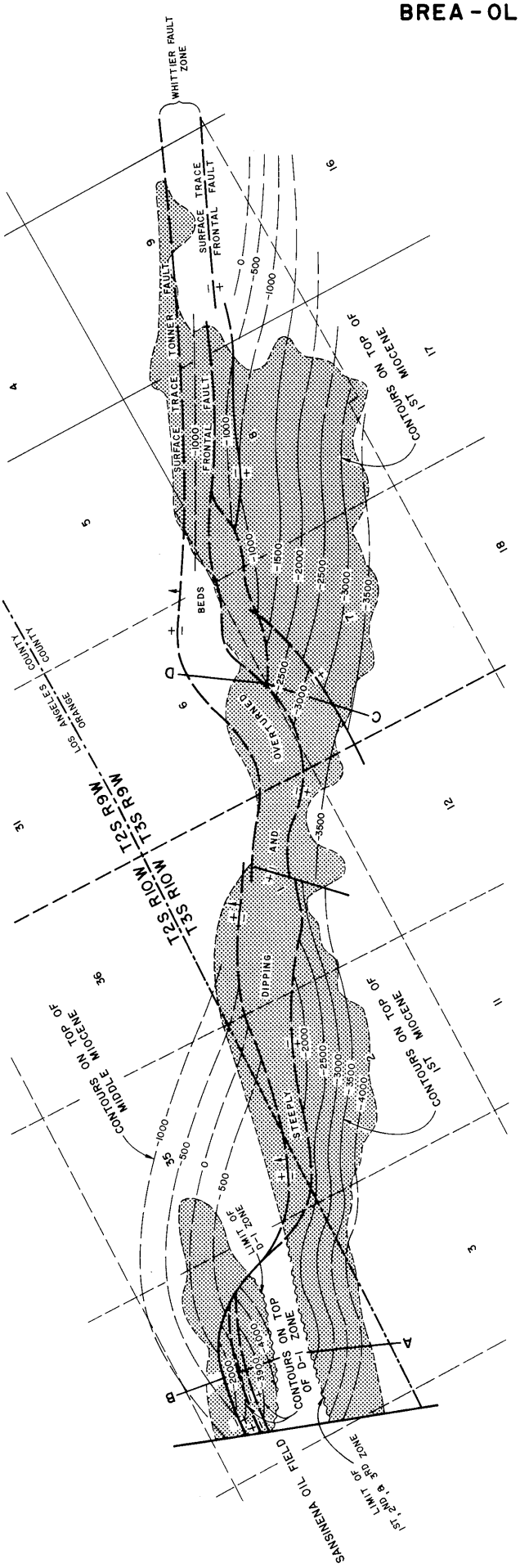
Remarks: Last production was in September 1973. The field was abandoned in December 1973. Cumulative production is 273,000 bbl of oil and 113,000 Mcf of gas.

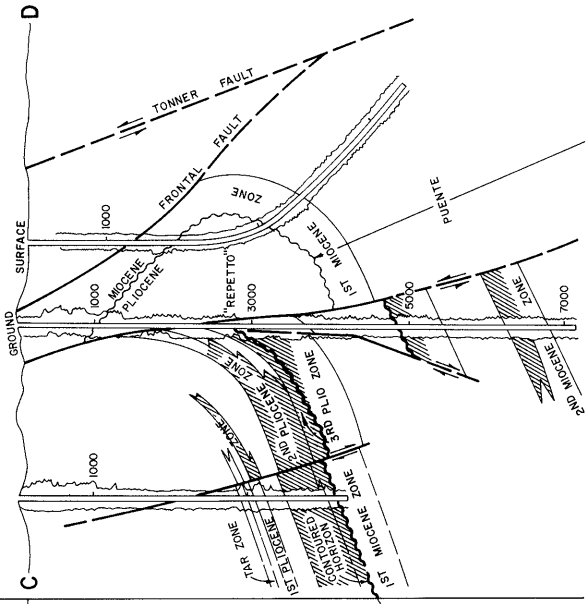
Selected References: A.A.P.G.-S.E.P.M. Guidebook, 1958 Joint Annual Meeting, Los Angeles, Calif.

DATE: July 1983 **Estimated value

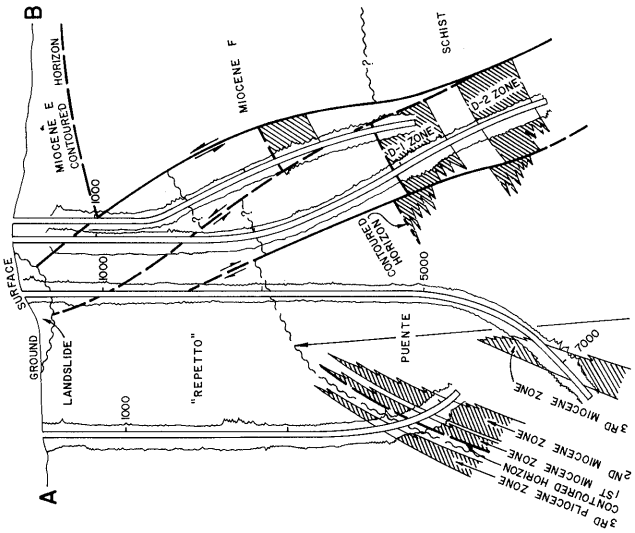
CALIFORNIA DIVISION OF OIL AND GAS

BREA - OLINDA OIL FIELD





SERIES	FORMATION & MEMBER
UPPER MIOCENE	PUENTE
LOWER PLIOCENE	"REPETTO"
	YORBA



COUNTY: LOS ANGELES AND ORANGE COUNTIES

BREA - OLINDA 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	Operator and well number unknown	Puente Oil Co. and Rowland & Lacy well number unknown	35 2S 10W	SB	unk.	E, F	
Deepest well	Shell Oil Co. "Menchego" 36	Same as present	1 3S 10W	SB	12,012		Puente late Miocene

POOL DATA

ITEM	1ST, 2ND, 3RD PLIOCENE	1ST, 2ND, 3RD MIOCENE	D-1, D-2	E, F		FIELD OR AREA DATA
Discovery date	1897	unknown	January 1954	1880		
Initial production rates						
Oil (bbl/day)	-	-	54	15		
Gas (Mcf/day)	-	-	110	-		
Flow pressure (psi)						
Bean size (in.)						
Initial reservoir pressure (psi)	900	1,050-2,500	2,200	-		
Reservoir temperature (°F)	105	108	175	-		
Initial oil content (STB/ac.-ft.)	1,283	1,283	735	-		
Initial gas content (MSCF/ac.-ft.)						
Formation	"Repetto"	Puente	Puente	Puente-Topanga		
Geologic age	early Pliocene	late Miocene	late Miocene	Miocene		
Average depth (ft.)	1,800	4,000	5,000	1,200		
Average net thickness (ft.)	350	770	700	300		
Maximum productive area (acres)						
RESERVOIR ROCK PROPERTIES						
Porosity (%)	28	28	21	-		
S_{oi} (%)	65	65	60	-		
S_{wi} (%)	35	35	40	-		
S_{gi} (%)						
Permeability to air (md)	130	123	50	-		
RESERVOIR FLUID PROPERTIES						
Oil:						
Oil gravity (°API)	15-18	23-31	28	18-28		
Sulfur content (% by wt.)						
Initial solution GOR (SCF/STB)						
Initial oil FVF (RB/STB)	1.10	1.10	1.33	-		
Bubble point press. (psia)						
Viscosity (cp) @ °F						
Gas:						
Specific gravity (air = 1.0)	0.662	0.662	-	-		
Heating value (Btu/cu. ft.)	1,067	1,067	-	-		
Water:						
Salinity, NaCl (ppm)	-	9,000	-	-		
T.D.S. (ppm)						
R_w (ohm/m) (77°F)	1.0-1.5	0.3-0.5	-	-		
ENHANCED RECOVERY PROJECTS						
Enhanced recovery projects	steamflood	cyclic steam				
Date started	1973	1964				
Date discontinued	active	active				
		fireflood				
		1972				
		active				
		steamflood				
		1964				
		active				
		waterflood				
		1964				
		active				
Peak oil production (bbl)						8,540,338
Year						1953
Peak gas production, net (Mcf)						8,179,999
Year						1953

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

Remarks:

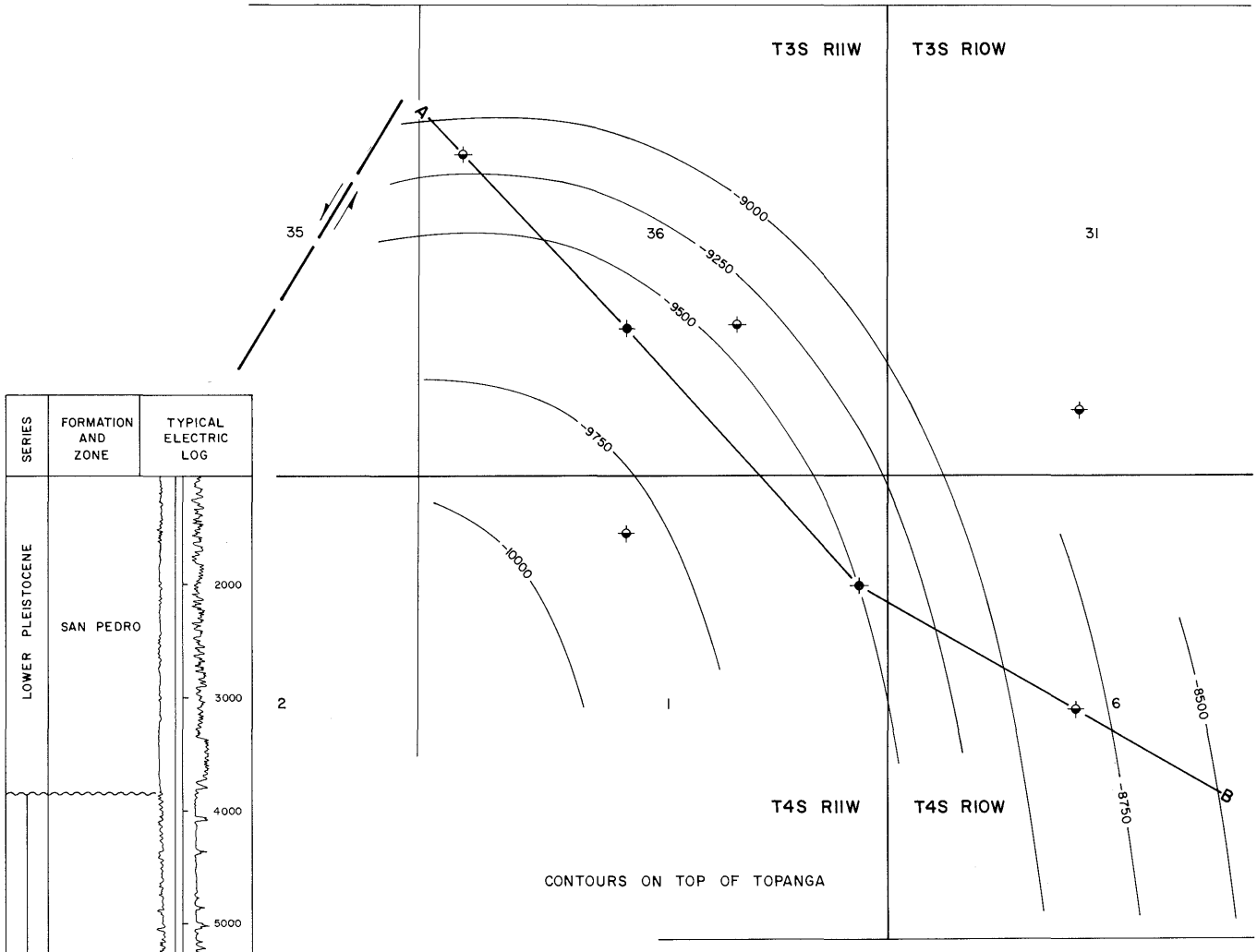
Selected References: Gaede, V.F., R.V. Rothermel, and L.H. Axtell, 1967, Brea-Olinda Oil Field: Div. of Oil and Gas, Summary of Operations -- Calif. Oil Fields, Vol. 53, No. 2, Part 2.

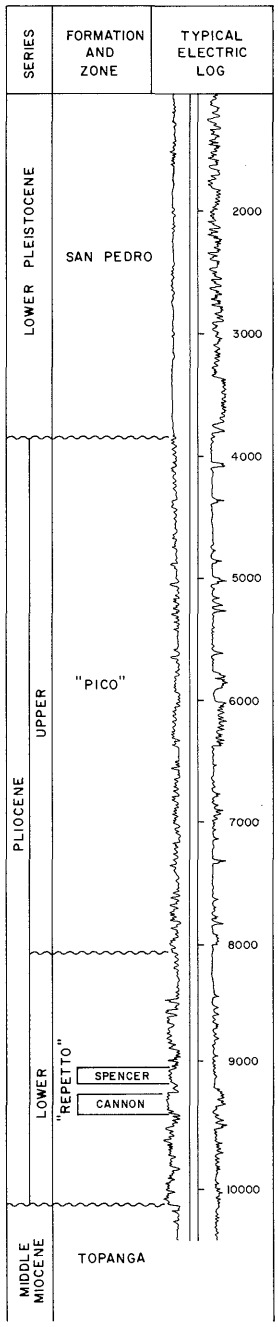
DATE: August 1983

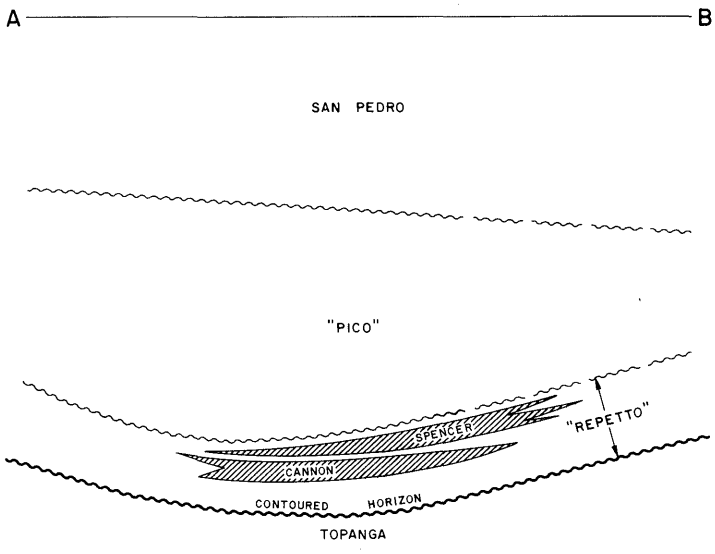
CALIFORNIA DIVISION OF OIL AND GAS

EAST BUENA PARK OIL FIELD

(Abandoned)







COUNTY: ORANGE

BUENA PARK, EAST, OIL FIELD (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. "Spencer" 1	The Texas Company "Spencer" 1	1 4S 11W	SB	9,660	Spencer	
Deepest well	Texaco Inc. "Stern" 1	The Texas Company "Stern" 1	1 4S 11W	SB	10,431		Topanga middle Miocene

POOL DATA

ITEM	SPENCER	CANNON				FIELD OR AREA DATA
Discovery date	February 1942	August 1942				
Initial production rates						
Oil (bbl/day)	97	432				
Gas (Mcf/day)	-	50				
Flow pressure (psi)						
Bean size (in.)						
Initial reservoir pressure (psi)						
Reservoir temperature (°F)						
Initial oil content (STB/ac.-ft.)						
Initial gas content (MSCF/ac.-ft.)						
Formation	"Repetto"	"Repetto"				
Geologic age	early Pliocene	early Pliocene				
Average depth (ft.)	8,900	9,240				
Average net thickness (ft.)	32	75				
Maximum productive area (acres)						20
RESERVOIR ROCK PROPERTIES						
Porosity (%)						
So_i (%)						
Sw_i (%)						
Sg_i (%)						
Permeability to air (md)						
RESERVOIR FLUID PROPERTIES						
Oil:						
Oil gravity (°API)	21	22				
Sulfur content (% by wt.)						
Initial solution GOR (SCF/STB)						
Initial oil FVF (RB/STB)						
Bubble point press. (psia)						
Viscosity (cp) @ °F						
Gas:						
Specific gravity (air = 1.0)						
Heating value (Btu/cu. ft.)						
Water:						
Salinity, NaCl (ppm)	13,700	17,100				
T.D.S. (ppm)						
R_w (ohm/m) (77°F)						
ENHANCED RECOVERY PROJECTS						
Enhanced recovery projects						
Date started						
Date discontinued						
Peak oil production (bbl)						48,237
Year						1943
Peak gas production, net (Mcf)						1,820
Year						1943

Base of fresh water (ft.): 3,100

Remarks: The last production was in July 1952. The field was abandoned in 1954. Cumulative production is 197,000 bbl of oil and 20,000 Mcf of gas.

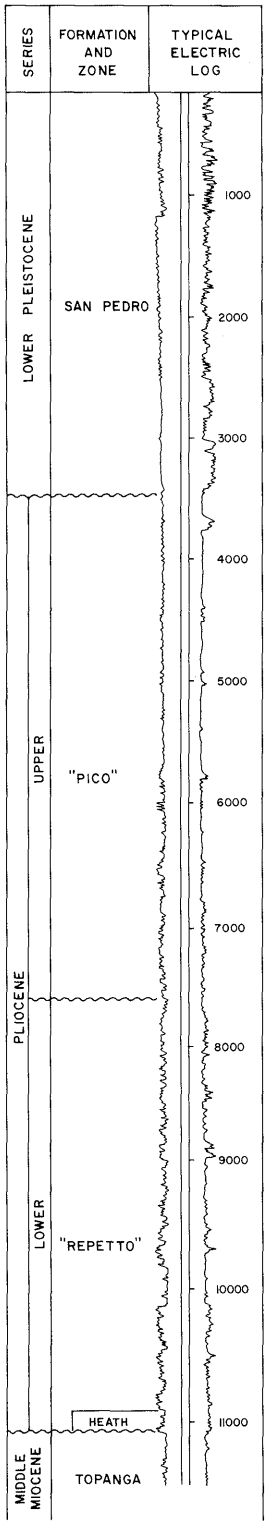
Selected References:

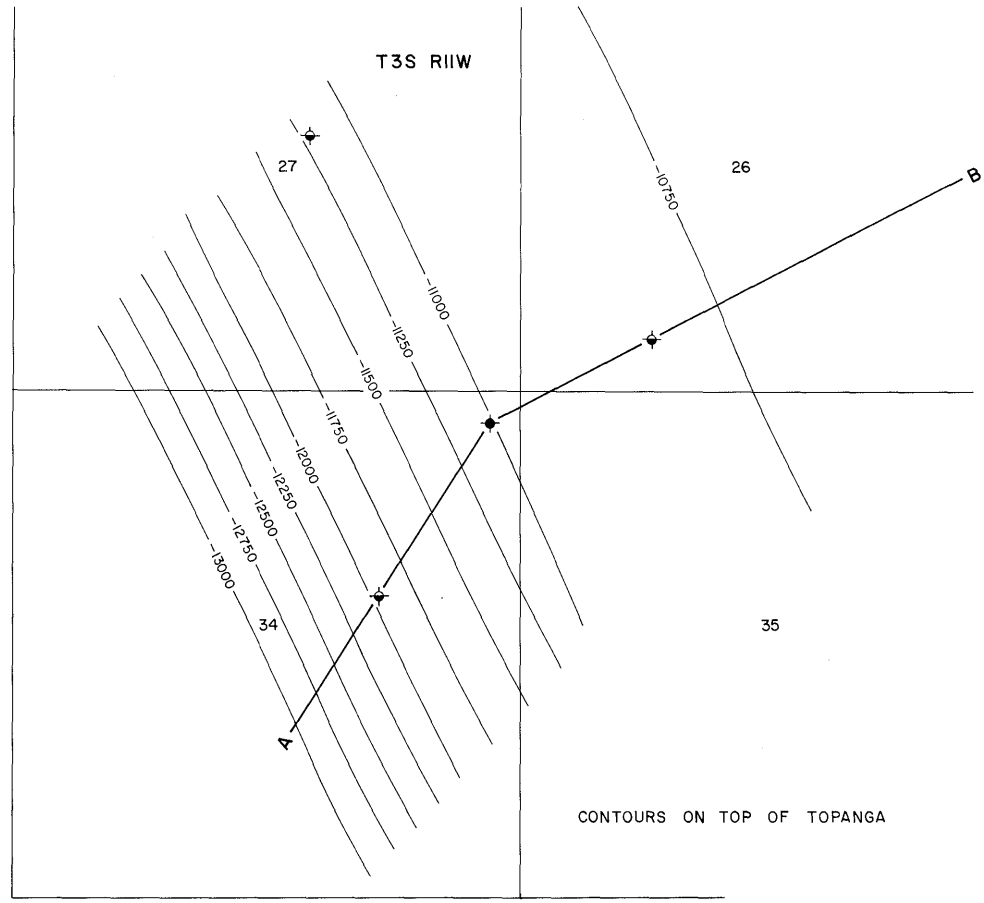
DATE: January 1989

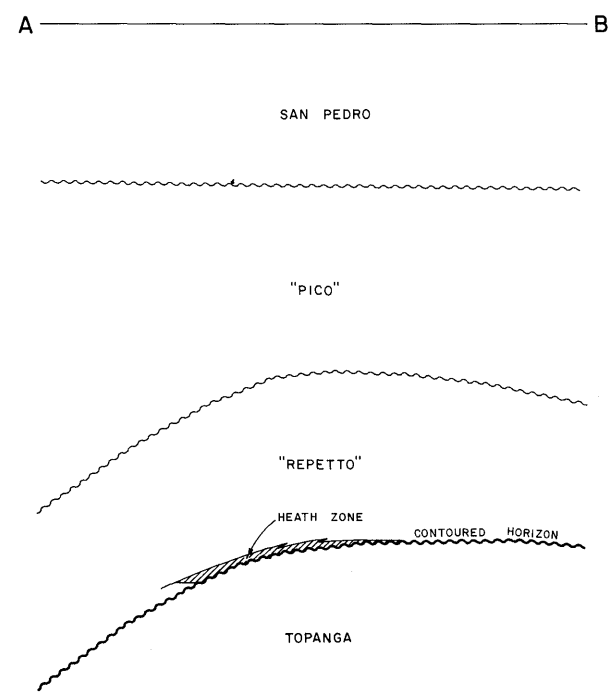
CALIFORNIA DIVISION OF OIL AND GAS

WEST BUENA PARK OIL FIELD

(Abandoned)







COUNTY: **ORANGE**

BUENA PARK, WEST, OIL FIELD (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	Mobil Oil Corp. "Heath" 1	General Petroleum Corp. of California "Heath" 1	34 3S 11W	SB	11,422	Heath	Topanga middle Miocene
Deepest well	Same as above	"	"	"	"	"	"

POOL DATA

ITEM	HEATH					FIELD OR AREA DATA
Discovery date	September 1944					
Initial production rates						
Oil (bbl/day)	135					
Gas (Mcf/day)	37					
Flow pressure (psi)						
Bean size (in.)						
Initial reservoir pressure (psi)						
Reservoir temperature (°F)						
Initial oil content (STB/ac.-ft.)						
Initial gas content (MSCF/ac.-ft.)						
Formation	"Repetto"					
Geologic age	early Pliocene					
Average depth (ft.)	11,000					
Average net thickness (ft.)	200					
Maximum productive area (acres)	10					
RESERVOIR ROCK PROPERTIES						
Porosity (%)						
So_i (%)						
Sw_i (%)						
Sg_i (%)						
Permeability to air (md)						
RESERVOIR FLUID PROPERTIES						
Oil:						
Oil gravity (°API)	28					
Sulfur content (% by wt.)						
Initial solution GOR (SCF/STB)						
Initial oil FVF (RB/STB)						
Bubble point press. (psia)						
Viscosity (cp) @ °F						
Gas:						
Specific gravity (air = 1.0)						
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						
Date started						
Date discontinued						
Peak oil production (bbl)	16,462					
Year	1945					
Peak gas production, net (Mcf)	5,352					
Year	1945					

Base of fresh water (ft.): 3,100

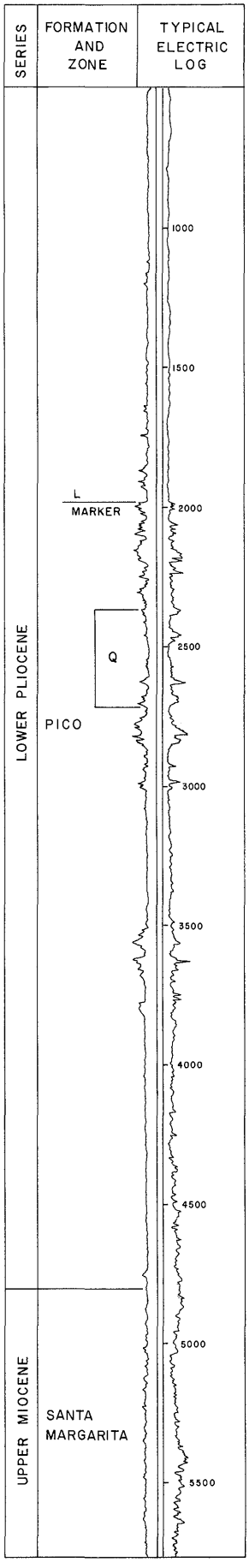
Remarks: Last production was in January 1950. The field was abandoned in November 1950. Cumulative production is 50,000 bbl of oil and 17,000 Mcf of gas. Well "Heath" 1 was the only well in the field.

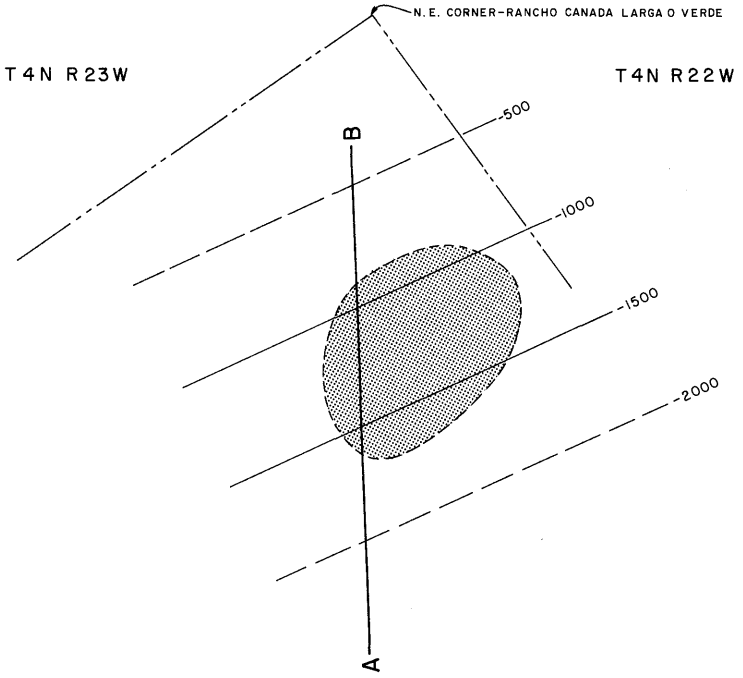
Selected References:

DATE: January 1989

CALIFORNIA DIVISION OF OIL AND GAS

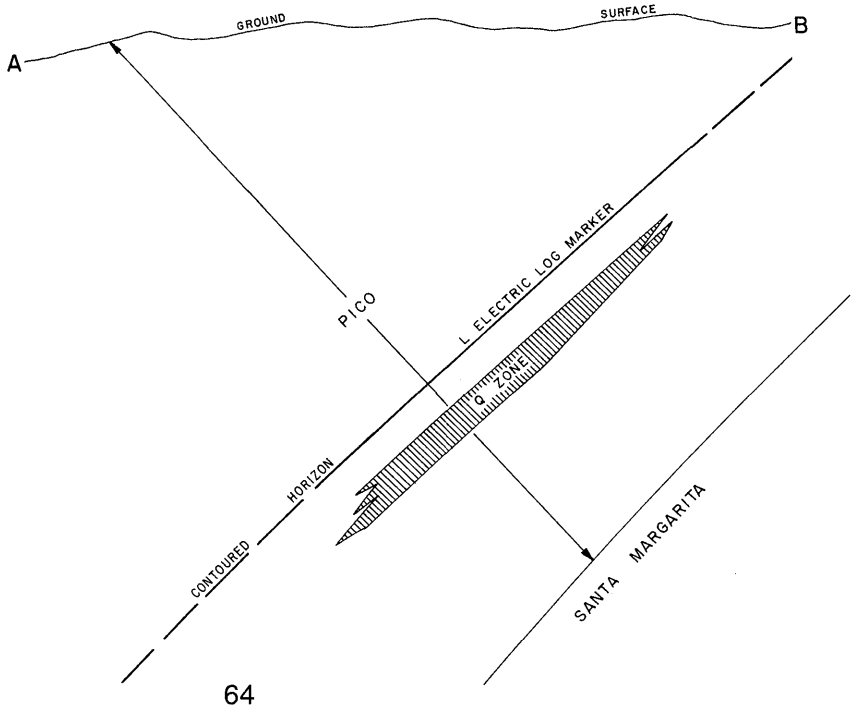
CANADA LARGA OIL FIELD





CONTOURS ON L ELECTRIC LOG MARKER

SCALE 1" = 1050'



COUNTY: VENTURA

CANADA LARGA 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	Estate of R.E. Barrett "A.C.L." 1	Bell and Burden "A.C.L." 1	36 4N 23W	SB	5,770	Q	Santa Margarita late Miocene
Deepest well	Same as above	"	"	"	"	"	"

POOL DATA

ITEM	Q					FIELD OR AREA DATA
Discovery date	July 1955					
Initial production rates						
Oil (bbl/day)	128					
Gas (Mcf/day)						
Flow pressure (psi)						
Bean size (in.)						
Initial reservoir pressure (psi)						
Reservoir temperature (°F)						
Initial oil content (STB/ac.-ft.)						
Initial gas content (MSCF/ac.-ft.)						
Formation	Pico					
Geologic age	early Pliocene					
Average depth (ft.)	2,560					
Average net thickness (ft.)	140					
Maximum productive area (acres)	40					
RESERVOIR ROCK PROPERTIES						
Porosity (%)						
S_{oi} (%)						
S_{wi} (%)						
S_{gi} (%)						
Permeability to air (md)						
RESERVOIR FLUID PROPERTIES						
Oil:						
Oil gravity (°API)	25					
Sulfur content (% by wt.)						
Initial solution GOR (SCF/STB)						
Initial oil FVF (RB/STB)						
Bubble point press. (psia)						
Viscosity (cp) @ °F						
Gas:						
Specific gravity (air = 1.0)						
Heating value (Btu/cu. ft.)						
Water:						
Salinity, NaCl (ppm)	16,000					
T.D.S. (ppm)						
R_w (ohm/m) (77°F)						
ENHANCED RECOVERY PROJECTS						
Enhanced recovery projects						
Date started						
Date discontinued						
Peak oil production (bbl)	7,473					
Year	1956					
Peak gas production, net (Mcf)	31,058					
Year	1956					

Base of fresh water (ft.): 280

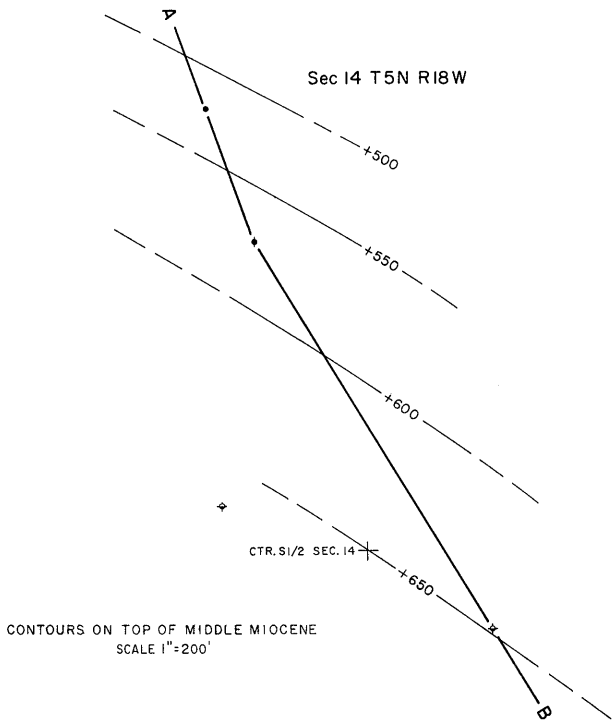
Remarks:

Selected References:

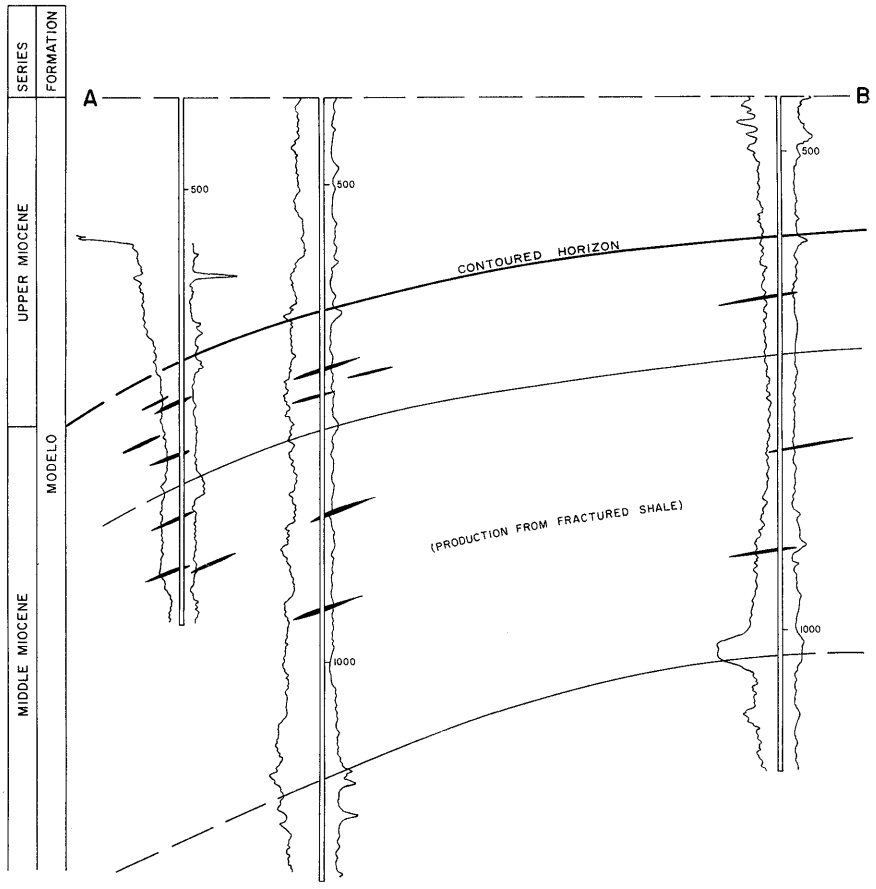
DATE: May 1983

CALIFORNIA DIVISION OF OIL AND GAS

CANTON CREEK OIL FIELD



CONTOURS ON TOP OF MIDDLE MIOCENE
SCALE 1"=200'



COUNTY: LOS ANGELES

CANTON CREEK 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	International Oil & Mining Co. "Engman" 14-2	Harold C. Morton & H.S. Kohlbush "Engman" 1	14 5N 18W	SB	2,775	unnamed	Vaqueros Miocene
Deepest well	Same as above	"	"	"	"	"	"

POOL DATA

ITEM	UNNAMED					FIELD OR AREA DATA
Discovery date	November 1957					
Initial production rates						
Oil (bbl/day)	29					
Gas (Mcf/day)	40					
Flow pressure (psi)						
Bean size (in.)						
Initial reservoir pressure (psi)						
Reservoir temperature (°F)						
Initial oil content (STB/ac.-ft.)						
Initial gas content (MSCF/ac.-ft.)						
Formation	Modelo					
Geologic age	middle Miocene					
Average depth (ft.)	900					
Average net thickness (ft.)	300					
Maximum productive area (acres)	30					
RESERVOIR ROCK PROPERTIES						
Porosity (%)						
So_i (%)						
Sw_i (%)						
Sg_i (%)						
Permeability to air (md)						
RESERVOIR FLUID PROPERTIES						
Oil:						
Oil gravity (°API)	30					
Sulfur content (% by wt.)						
Initial solution GOR (SCF/STB)						
Initial oil FVF (RB/STB)						
Bubble point press. (psia)						
Viscosity (cp) @ °F						
Gas:						
Specific gravity (air = 1.0)						
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						
Date started						
Date discontinued						
Peak oil production (bbl)	5,261					
Year	1958					
Peak gas production, net (Mcf)						
Year						

Base of fresh water (ft.): None

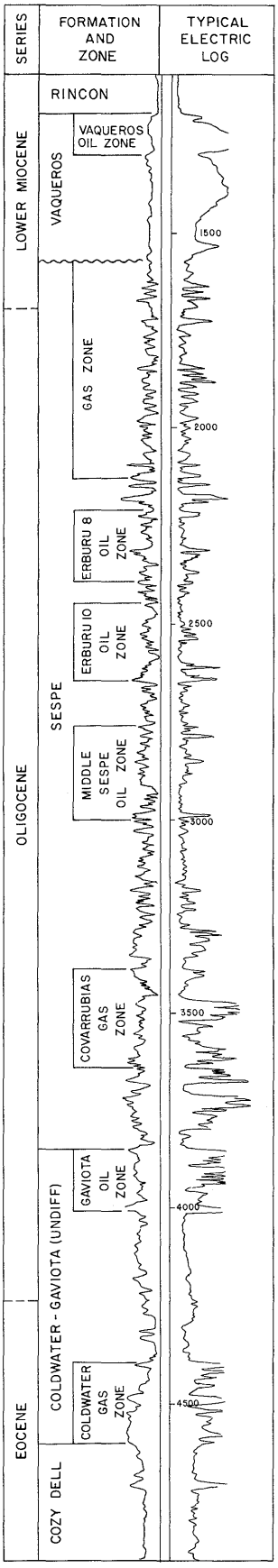
Remarks: The field was abandoned in 1961 and reactivated in 1964.

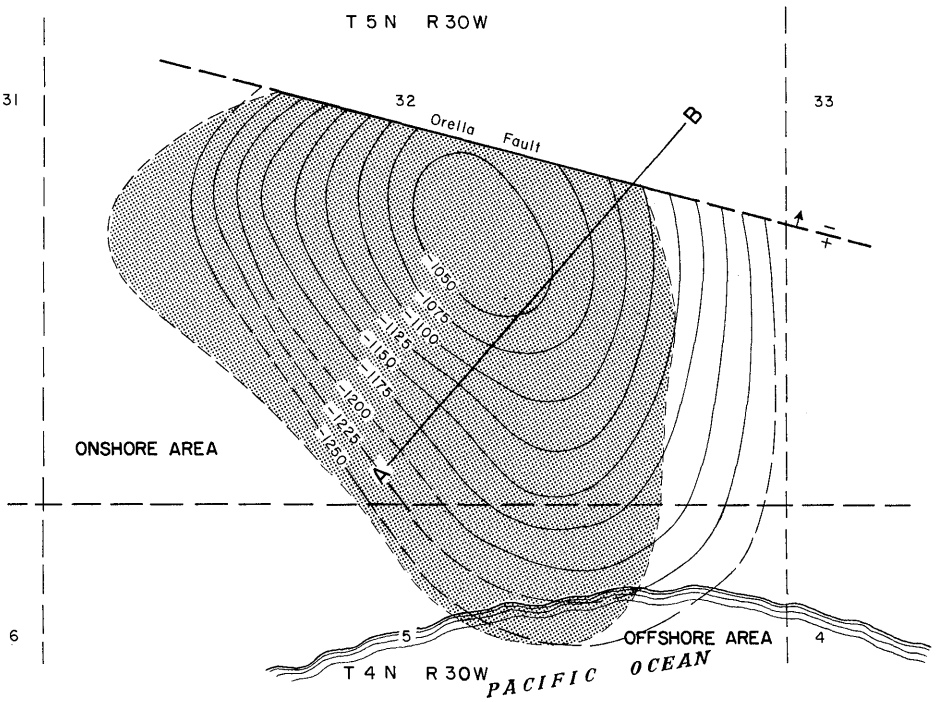
Selected References: Ledingham, G.W., 1968, Canton Creek Oil Field: Calif. Div. of Oil and Gas, Summary of Operations -- Calif. Oil Fields, Vol. 54, No. 2, Part 2.

DATE: May 1983

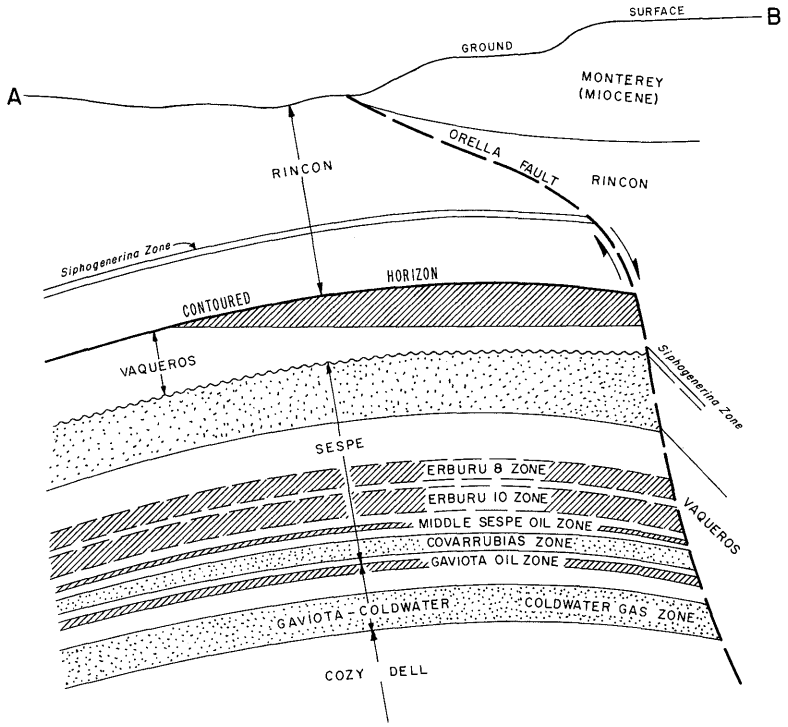
CALIFORNIA DIVISION OF OIL AND GAS

CAPITAN OIL FIELD





CONTOURS ON TOP OF VAQUEROS
SCALE: 1" = 1360'



COUNTY: SANTA BARBARA

CAPITAN 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	Shell Western Expl. & Prod. Inc. "Erburu" 1	General Petroleum Corp. "Erburu" 1	5 4N 30W	SB	1,446	Vaqueros	
Deepest well	Shell Western Expl. & Prod. Inc. "Covarrubias 1" 51	Shell Oil Co. "Covarrubias 1" 51	32 5N 30W	SB	10,216		Sacate Eocene

POOL DATA

ITEM	VAQUEROS					FIELD OR AREA DATA
Discovery date	October 1929					
Initial production rates						
Oil (bbl/day)	216					
Gas (Mcf/day)						
Flow pressure (psi)						
Bean size (in.)						
Initial reservoir pressure (psi)	600					
Reservoir temperature (°F)	98					
Initial oil content (STB/ac.-ft.)	1,040					
Initial gas content (MSCF/ac.-ft.)						
Formation	Vaqueros					
Geologic age	early Miocene					
Average depth (ft.)	1,100					
Average net thickness (ft.)	100					
Maximum productive area (acres)						270
RESERVOIR ROCK PROPERTIES						
Porosity (%)	21					
So_i (%)	67					
Sw_i (%)	33					
Sg_i (%)						
Permeability to air (md)						
RESERVOIR FLUID PROPERTIES						
Oil:						
Oil gravity (°API)	19-23					
Sulfur content (% by wt.)	0.69					
Initial solution GOR (SCF/STB)	1,050					
Initial oil FVF (RB/STB)						
Bubble point press. (psia)						
Viscosity (cp) @ °F						
Gas:						
Specific gravity (air = 1.0)						
Heating value (Btu/cu. ft.)						
Water:						
Salinity, NaCl (ppm)	1,545					
T.D.S. (ppm)	4,227					
R_w (ohm/m) (77°F)	2.10					
ENHANCED RECOVERY PROJECTS						
Enhanced recovery projects	waterflood					
Date started	1967					
Date discontinued	active					
Peak oil production (bbl)						1,265,390
Year						1946
Peak gas production, net (Mcf)						
Year						

Base of fresh water (ft.): See areas

Remarks:

Selected References:

Dolman, S.G., 1929, Operations in District No. 3: Calif. Div. of Oil and Gas, Summary of Operations -- Calif. Oil Fields, Vol. 15, No. 3.

Kribbs, G.R., 1943, Capitan Oil Field: Calif. Div. of Mines Bull. 118, p. 374-376.

Yerkes, R.F., H.C. Wagner, and K.A. Yenne, 1969, Petroleum Development in the Region of the Santa Barbara Channel: U.S. Geol. Survey Prof. Paper 679B, p. 19.

DATE: January 1989

CALIFORNIA DIVISION OF OIL AND GAS

COUNTY: **SANTA BARBARA**

CAPITAN OIL FIELD ONSHORE AREA

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. "Erburu" 1	General Petroleum Corp. "Erburu" 1	5 4N 30W	SB	1,446	Vaqueros	
Deepest well	Shell Western Expl. & Prod. Inc. "Covarrubias 1" 51	Shell Oil Co. "Covarrubias 1" 51	32 5N 30W	SB	10,216		Sacate Eocene

POOL DATA

ITEM	VAQUEROS	SESPE GAS	ERBURU 8	ERBURU 10	M SESPE	FIELD OR AREA DATA
Discovery date	October 1929	May 1931	January 1931	August 1931	May 1935	
Initial production rates						
Oil (bbl/day)	216	-	241	30	305	
Gas (Mcf/day)	-	5,550	-	-	161	
Flow pressure (psi)	-	375	-	-	-	
Bean size (in.)	-	3/4	-	-	5/8-1	
Initial reservoir pressure (psi)	600	675	1,100	1,100	1,100	
Reservoir temperature (°F)	98	110**	120	120	120	
Initial oil content (STB/ac.-ft.)	1,040	-	581	581	581	
Initial gas content (MSCF/ac.-ft.)						
Formation	Vaqueros	Sespe	Sespe	Sespe	Sespe	
Geologic age	early Miocene	Miocene-Oligocene	Oligocene	Oligocene	Oligocene	
Average depth (ft.)	1,100	1,600	2,300	2,475	2,750	
Average net thickness (ft.)	100	650	150	175	250	
Maximum productive area (acres)	-	40	-	-	-	250
RESERVOIR ROCK PROPERTIES						
Porosity (%)	21	18**	18-25	18-25	18-25	
S_{oi} (%)	67	-	50-65	55-65	55-65	
S_{wi} (%)	33	-	35-50	35-45	35-45	
S_{gi} (%)						
Permeability to air (md)	120	115**	115-130	115-130	115-130	
RESERVOIR FLUID PROPERTIES						
Oil:						
Oil gravity (°API)	19-23	-	41	44	45	
Sulfur content (% by wt.)	0.69	-	-	-	-	
Initial solution GOR (SCF/STB)	1,050	-	400	400	400	
Initial oil FVF (RB/STB)	-	-	1.18	1.18	1.18	
Bubble point press. (psia)	-	-	1,875	1,875	1,875	
Viscosity (cp) @ °F	-	-	0.9 @ 120	0.7 @ 120	0.7 @ 120	
Gas:						
Specific gravity (air = 1.0)						
Heating value (Btu/cu. ft.)	-	1,000	-	-	-	
Water:						
Salinity, NaCl (ppm)	1,545	-	3,937[4]	3,937	3,937	
T.D.S. (ppm)	4,227	-	7,630	7,630	7,630	
R_w (ohm/m) (77°F)	2.10	-	-	-	-	
ENHANCED RECOVERY PROJECTS						
Enhanced recovery projects	waterflood		waterflood	waterflood	waterflood	
Date started	1967		1961	1961	1963	
Date discontinued	active		1964	1964	1964	
Peak oil production (bbl)						1,178,521
Year						1943
Peak gas production, net (Mcf)						538,523
Year						1958

Base of fresh water (ft.): 450

Remarks: Well "Erburu" 10 blew out in May 1931, destroying the rig. The Sespe Gas zone tested at 5,550 Mcf/day of gas.

Selected References:

Dolman, S.G., 1929, Operations in District No. 3: Calif. Div. of Oil and Gas, Summary of Operations -- Calif. Oil Fields, Vol. 15, No. 3.

Kribbs, G.R., 1943, Capitan Oil Field: Calif. Div. of Mines, Bull. 118, p. 374-376.

Yerkes, R.F., H.C. Wagner, and K.A. Yenne, 1969, Petroleum Development in the Region of the Santa Barbara Channel: U.S. Geol. Survey Prof. Paper 679B, p. 19.

DATE: January 1989 **Estimated value

CALIFORNIA DIVISION OF OIL AND GAS

COUNTY: SANTA BARBARA

CAPITAN OIL FIELD ONSHORE AREA

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	COVARRUBIAS GAS	GAVIOTA	COLDWATER GAS			FIELD OR AREA DATA
Discovery date	November 1946a/	1945	June 1955			
Initial production rates						
Oil (bbl/day)	-	416	-			
Gas (Mcf/day)	370	710	614			
Flow pressure (psi)	560	1,030	-			
Bean size (in.)	10/64	16/64	12/64			
Initial reservoir pressure (psi)	1,100	1,350	1,550			
Reservoir temperature (°F)	156	156	155			
Initial oil content (STB/ac.-ft.)						
Initial gas content (MSCF/ac.-ft.)	540	-	806			
Formation	Sespe	Gaviota	Coldwater			
Geologic age	Oligocene	Oligocene	Eocene			
Average depth (ft.)	3,400	3,850	4,400			
Average net thickness (ft.)	250	150	250			
Maximum productive area (acres)						
RESERVOIR ROCK PROPERTIES						
Porosity (%)	20-25*	20-30*	22			
So_i (%)	-	50-60	-			
Sw_i (%)	15-25	30-40	25			
Sg_i (%)	75-85	10-20	75			
Permeability to air (md)	130-160	130-150	150			
RESERVOIR FLUID PROPERTIES						
Oil:						
Oil gravity (°API)	-	39	-			
Sulfur content (% by wt.)						
Initial solution GOR (SCF/STB)	-	1,700	-			
Initial oil FVF (RB/STB)						
Bubble point press. (psia)						
Viscosity (cp) @ °F						
Gas:						
Specific gravity (air = 1.0)						
Heating value (Btu/cu. ft.)	1,000	-	1,000			
Water:						
Salinity, NaCl (ppm)	4,000-11,982	-	-			
T.D.S. (ppm)	7,630	-	-			
R_w (ohm/m) (77°F)						
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.):

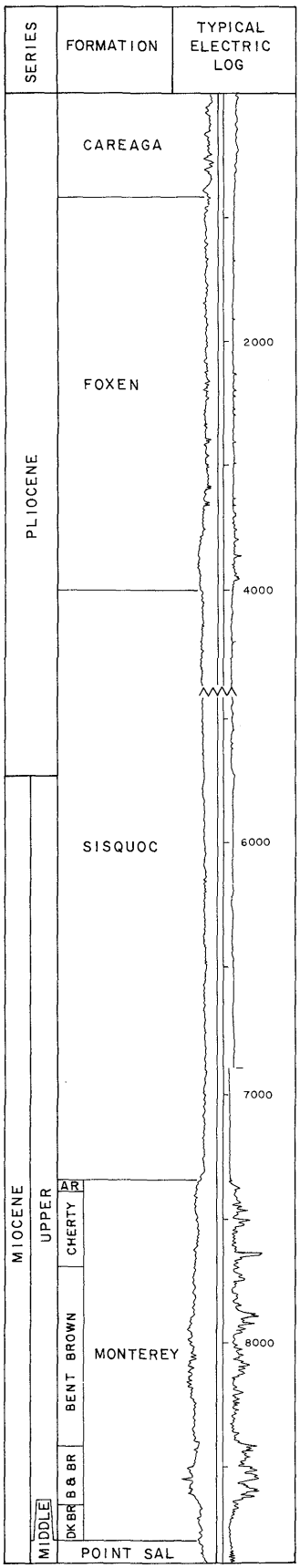
Remarks: a/ Well drilled and open-hole tested in January 1945 at 1,620 bbl/day of oil and 1,200 Mcf/day of gas. Perforated in April 1946 with no reported production, and later reperforated. First production reported in November 1946.

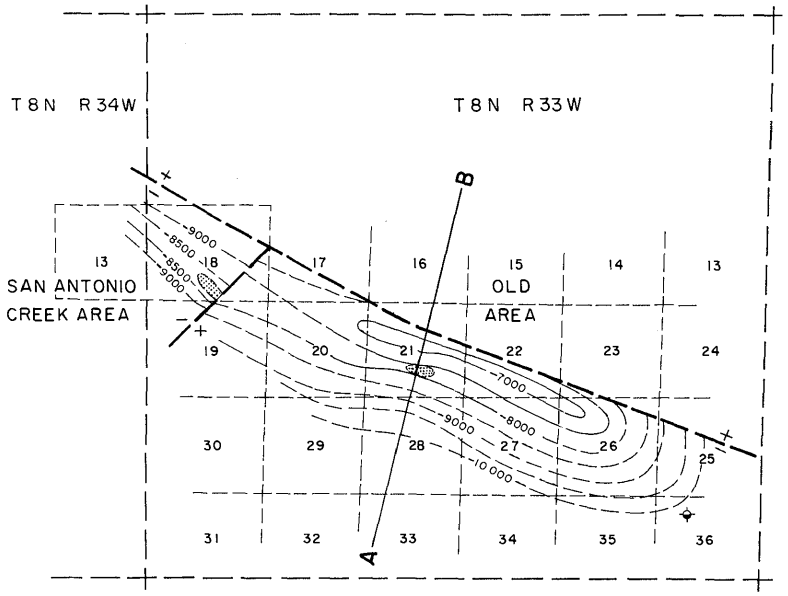
Selected References:

DATE: January 1989 *Average value

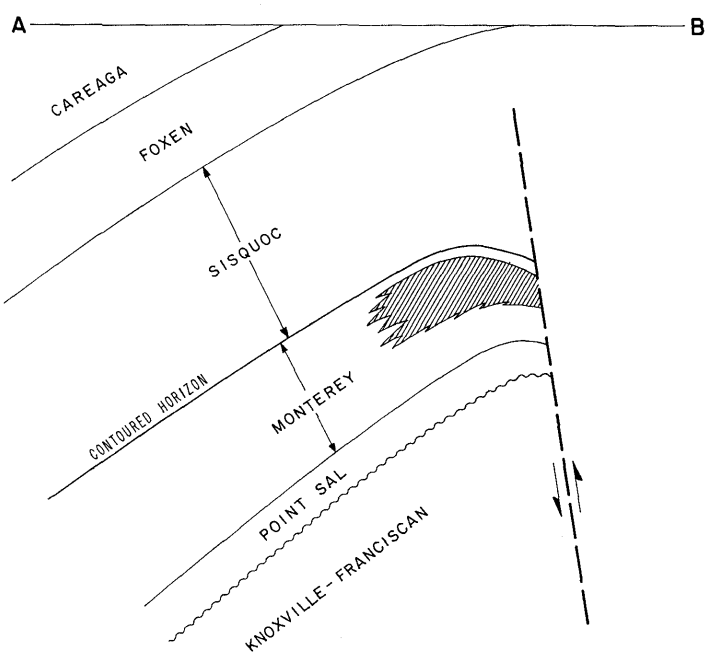
CALIFORNIA DIVISION OF OIL AND GAS

CAREAGA CANYON OIL FIELD





CONTOURS ON TOP OF MONTEREY



COUNTY: SANTA BARBARA

CAREAGA CANYON 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	Kenneth H. Hunter, Jr. "Careaga" 1	Empire State Oil Co. "Careaga" 1	21 8N 33W	SB	9,641	Monterey	
Deepest well	Coastal Oil & Gas Corp. "Sharkey" 1	Same as present	13 8N 34W	SB	12,800 a/		Lospe Miocene

POOL DATA

ITEM	MONTEREY					FIELD OR AREA DATA
Discovery date	August 1976					
Initial production rates						
Oil (bbl/day)	40					
Gas (Mcf/day)						
Flow pressure (psi)						
Bean size (in.)						
Initial reservoir pressure (psi)	3,686					
Reservoir temperature (°F)	158					
Initial oil content (STB/ac.-ft.)	986					
Initial gas content (MSCF/ac.-ft.)						
Formation	Monterey					
Geologic age	Miocene					
Average depth (ft.)	7,960					
Average net thickness (ft.)	690					
Maximum productive area (acres)						90
RESERVOIR ROCK PROPERTIES						
Porosity (%)	fractured shale					
So_i (%)						
Sw_i (%)						
Sg_i (%)						
Permeability to air (md)						
RESERVOIR FLUID PROPERTIES						
Oil:						
Oil gravity (°API)	34					
Sulfur content (% by wt.)	0.20					
Initial solution GOR (SCF/STB)	850					
Initial oil FVF (RB/STB)	1.49					
Bubble point press. (psia)	4,800					
Viscosity (cp) @ °F	2.45 @ 100					
Gas:						
Specific gravity (air = 1.0)	0.73***					
Heating value (Btu/cu. ft.)						
Water:						
Salinity, NaCl (ppm)	9,900					
T.D.S. (ppm)	18,000					
R_w (ohm/m) (77°F)						
ENHANCED RECOVERY PROJECTS						
Enhanced recovery projects						
Date started						
Date discontinued						
Peak oil production (bbl)						151,107
Year						1984
Peak gas production, net (Mcf)						440,000
Year						1984

Base of fresh water (ft.): See areas

Remarks: a/ Directional well; true vertical depth is approximately 12,700 feet.

Selected References:

DATE: January 1989 ***Representative value for area, formation, and depth

CALIFORNIA DIVISION OF OIL AND GAS

COUNTY: SANTA BARBARA

CAREAGA CANYON OIL FIELD
OLD 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	Kenneth H. Hunter, Jr. "Careaga" 1	Empire State Oil Co. "Careaga" 1	21 8N 33W	SB	9,641	Monterey	Point Sal Miocene
Deepest well	Same as above	"	"	"	"	"	"

POOL DATA

ITEM	MONTEREY					FIELD OR AREA DATA
Discovery date	August 1976					
Initial production rates						
Oil (bbl/day)	40					
Gas (Mcf/day)						
Flow pressure (psi)						
Bean size (in.)						
Initial reservoir pressure (psi)	3,686					
Reservoir temperature (°F)	158					
Initial oil content (STB/ac.-ft.)	986					
Initial gas content (MSCF/ac.-ft.)						
Formation	Monterey					
Geologic age	Miocene					
Average depth (ft.)	7,960					
Average net thickness (ft.)	690					
Maximum productive area (acres)	10					
RESERVOIR ROCK PROPERTIES						
Porosity (%)	fractured shale					
So_i (%)						
Sw_i (%)						
Sg_i (%)						
Permeability to air (md)						
RESERVOIR FLUID PROPERTIES						
Oil:						
Oil gravity (°API)	34					
Sulfur content (% by wt.)	0.20					
Initial solution GOR (SCF/STB)	850					
Initial oil FVF (RB/STB)	1.49					
Bubble point press. (psia)	4,800					
Viscosity (cp) @ °F	2.45 @ 100***					
Gas:						
Specific gravity (air = 1.0)	0.73***					
Heating value (Btu/cu. ft.)						
Water:						
Salinity, NaCl (ppm)	9,900***					
T.D.S. (ppm)	18,000***					
R_w (ohm/m) (77°F)						
ENHANCED RECOVERY PROJECTS						
Enhanced recovery projects						
Date started						
Date discontinued						
Peak oil production (bbl)	10,776					
Year	1978					
Peak gas production, net (Mcf)						
Year						

Base of fresh water (ft.): 1,350

Remarks: The only producing well in area was drilled, tested, and suspended by Empire State Oil Co. in 1971-1972. Well was abandoned by Ashland Oil Co. in 1973. Well was reentered and completed by Teal Petroleum Co. in 1976.

Selected References:

DATE: January 1989 ***Representative value for area, formation, and depth

CALIFORNIA DIVISION OF OIL AND GAS

COUNTY: SANTA BARBARA

CAREAGA CANYON OIL FIELD
SAN ANTONIO CREEK 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	Coastal Oil and Gas Corp. "Hunter-Careaga" 1	Same as present	18 8N 33W	SB	10,740	Monterey	
Deepest well	Coastal Oil and Gas Corp. "Sharkey" 1	Same as present	13 8N 34W	SB	12,800 a/		Lospe Miocene

POOL DATA

ITEM	MONTEREY					FIELD OR AREA DATA
Discovery date	December 1983					
Initial production rates						
Oil (bbl/day)	1,573					
Gas (Mcf/day)	9,400					
Flow pressure (psi)	1,300					
Bean size (in.)	28/64					
Initial reservoir pressure (psi)	3,700					
Reservoir temperature (°F)	244					
Initial oil content (STB/ac.-ft.)						
Initial gas content (MSCF/ac.-ft.)						
Formation	Monterey					
Geologic age	Miocene					
Average depth (ft.)	8,400					
Average net thickness (ft.)	235					
Maximum productive area (acres)	80					
RESERVOIR ROCK PROPERTIES						
Porosity (%)	fractured shale					
So_i (%)						
Sw_i (%)						
Sg_i (%)						
Permeability to air (md)						
RESERVOIR FLUID PROPERTIES						
Oil:						
Oil gravity (°API)	34.9					
Sulfur content (% by wt.)	0.47					
Initial solution GOR (SCF/STB)	2,500					
Initial oil FVF (RB/STB)	1.49***					
Bubble point press. (psia)						
Viscosity (cp) @ °F	2.45 @ 100					
Gas:						
Specific gravity (air = 1.0)	0.69					
Heating value (Btu/cu. ft.)	1,115					
Water:						
Salinity, NaCl (ppm)	9,900					
T.D.S. (ppm)	18,000					
R_w (ohm/m) (77°F)						
ENHANCED RECOVERY PROJECTS						
Enhanced recovery projects						
Date started						
Date discontinued						
Peak oil production (bbl)	147,751					
Year	1984					
Peak gas production, net (Mcf)	440,000					
Year	1984					

Base of fresh water (ft.): 1,450 - 1,750

Remarks: a/ Directional well; true vertical depth is approximately 12,700 feet.
The area was abandoned in 1989. Cumulative production is 304,458 bbl of oil and 742,343 Mcf of gas.

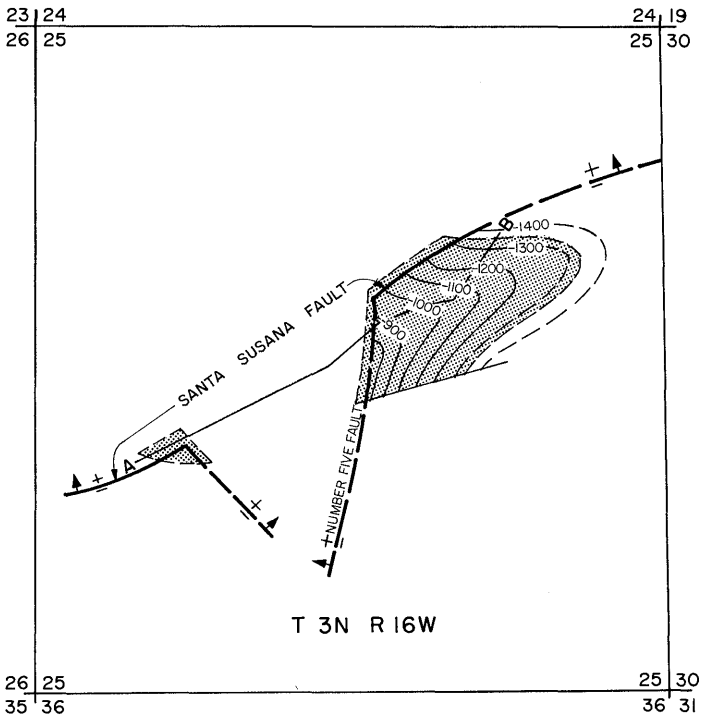
Selected References:

DATE: May 1991

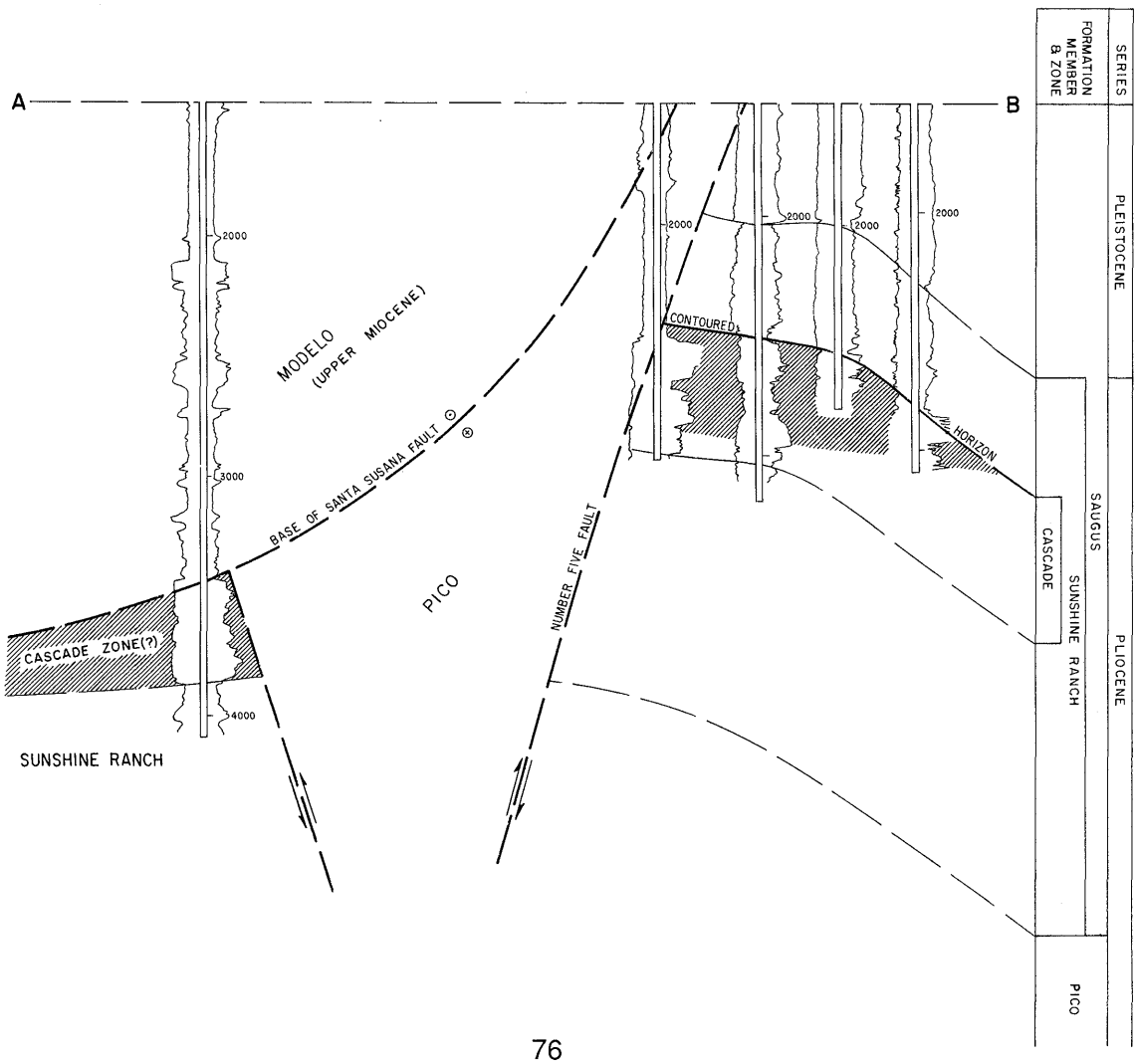
***Representative value for area, formation, and depth

CALIFORNIA DIVISION OF OIL AND GAS

CASCADE OIL FIELD



CONTOURS ON TOP OF CASCADE ZONE



COUNTY: LOS ANGELES

CASCADE 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	MCOR Oil & Gas Corp. "Mission-Visco" 1	C.W. Teater "Teater-Wadley" 1	25 3N 16W	SB	2,766	Cascade	
Deepest well	MCOR Oil & Gas Corp. "Mission-O'Melveny" 12	Same as present	25 3N 16W	SB	10,026		Modelo late Miocene

POOL DATA

ITEM	CASCADE					FIELD OR AREA DATA
Discovery date	November 1954					
Initial production rates						
Oil (bbl/day)	150					
Gas (Mcf/day)	100					
Flow pressure (psi)						
Bean size (in.)						
Initial reservoir pressure (psi)						
Reservoir temperature (°F)	94					
Initial oil content (STB/ac.-ft.)						
Initial gas content (MSCF/ac.-ft.)						
Formation	Saugus					
Geologic age	Pliocene					
Average depth (ft.)	2,733					
Average net thickness (ft.)	395**					
Maximum productive area (acres)	60					
RESERVOIR ROCK PROPERTIES						
Porosity (%)						
So_i (%)						
Sw_i (%)						
Sg_i (%)						
Permeability to air (md)						
RESERVOIR FLUID PROPERTIES						
Oil:						
Oil gravity (°API)	19.5*					
Sulfur content (% by wt.)	0					
Initial solution GOR (SCF/STB)						
Initial oil FVF (RB/STB)						
Bubble point press. (psia)						
Viscosity (cp) @ °F						
Gas:						
Specific gravity (air = 1.0)	0.637*					
Heating value (Btu/cu. ft.)	974.7*					
Water:						
Salinity, NaCl (ppm)	1,400					
T.D.S. (ppm)	3,400					
R_w (ohm/m) (77°F)	2.4 @ 25					
ENHANCED RECOVERY PROJECTS						
Enhanced recovery projects	waterflood					
Date started	1970					
Date discontinued	active					
	cyclic steam					
	1965					
	1965					
Peak oil production (bbl)						143,816
Year						1956
Peak gas production, net (Mcf)						16,103
Year						1956

Base of fresh water (ft.): 950

Remarks: The field name was derived from a nearby aerating spillway of the Los Angeles aqueduct.

Selected References:

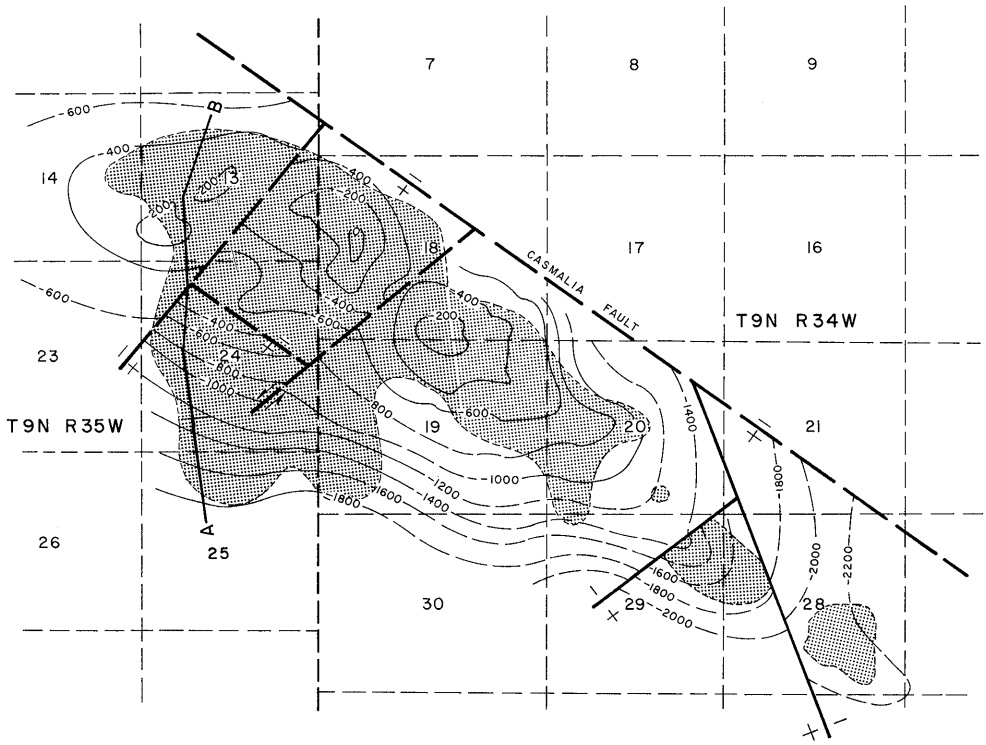
Ingram, W.L., 1963, Cascade Oil Field: Calif. Div. of Oil and Gas, Summary of Operations -- Calif. Oil Fields, Vol. 49, No. 1.

Roth, G.H., 1958, Cascade Oil Field, A Guide to the Geology and Oil Fields of the Los Angeles and Ventura Regions: Pacific Section Am. Assoc. Petroleum Geologists, p. 166-171.

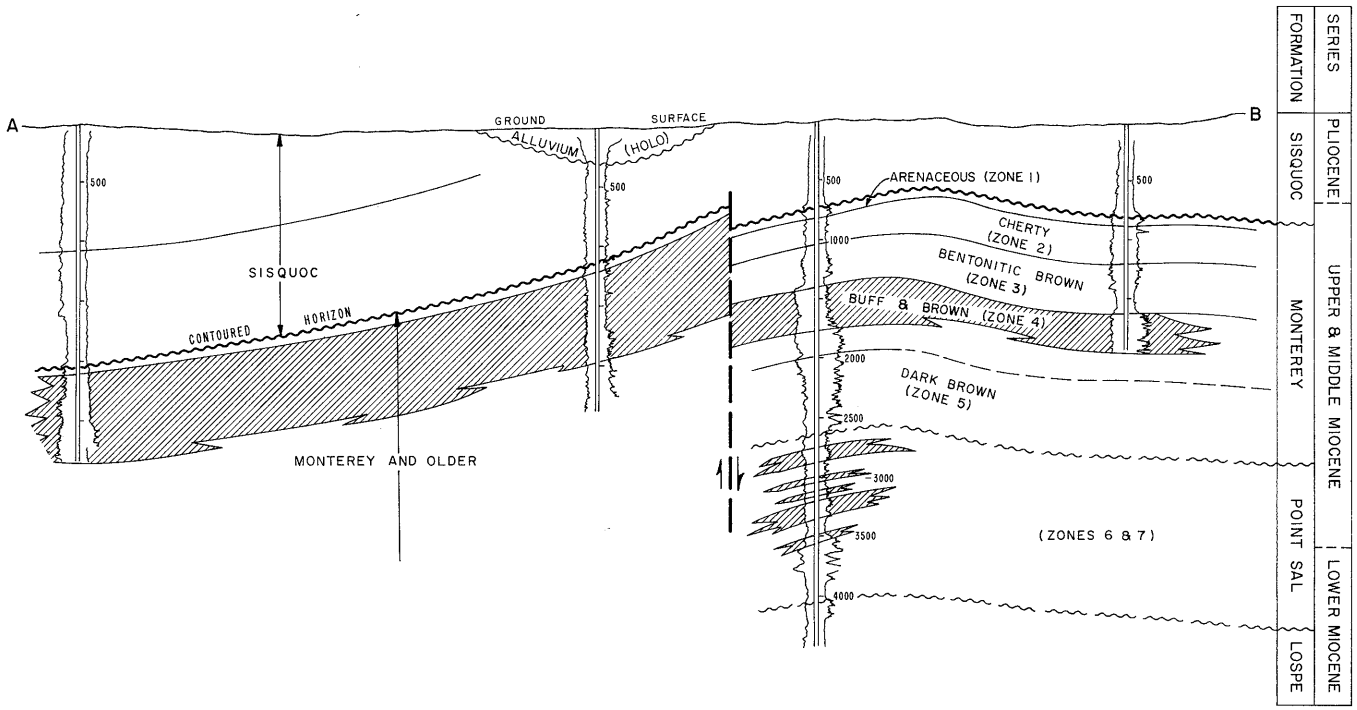
DATE: May 1983 *Average value **Estimated value

CALIFORNIA DIVISION OF OIL AND GAS

CASMALIA OIL FIELD



CONTOURS ON TOP OF MONTEREY



COUNTY: SANTA BARBARA

CASMALIA 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	Kern Trading & Oil Co. "S.P." 1	Same as present	24 9N 35W	SB	2,750	Monterey	
Deepest well	Celeron Oil & Gas Co. "Hartnell" 1-21	Northern Michigan Exploration Co. "Hartnell" 1-21	21 9N 34W	SB	10,700 a/		Point Sal Miocene

POOL DATA

ITEM	MONTEREY	POINT SAL	LOSPE			FIELD OR AREA DATA
Discovery date	May 1905	January 1916	April 1946			
Initial production rates						
Oil (bbl/day)	20-40	-	275			
Gas (Mcf/day)	-	-	103			
Flow pressure (psi)						
Bean size (in.)						
Initial reservoir pressure (psi)	300-1,300	1,500	2,500			
Reservoir temperature (°F)	100-180	140	160			
Initial oil content (STB/ac.-ft.)	400	190	90			
Initial gas content (MSCF/ac.-ft.)						
Formation	Monterey	Point Sal	Lospe			
Geologic age	Miocene	Miocene	Miocene			
Average depth (ft.)	1,275-2,800	2,750	3,953			
Average net thickness (ft.)	300-1,000	500	345			
Maximum productive area (acres)	-	-	-			2,350
RESERVOIR ROCK PROPERTIES						
Porosity (%)	fractured shale	22***	15***			
So_i (%)	-	40*	40*			
Sw_i (%)	-	60*	60*			
Sg_i (%)	-	-	0			
Permeability to air (md)	-	25-300	500-1,000			
RESERVOIR FLUID PROPERTIES						
Oil:						
Oil gravity (°API)	8-25	-	-			
Sulfur content (% by wt.)	2.80	-	-			
Initial solution GOR (SCF/STB)	16	-	-			
Initial oil FVF (RB/STB)						
Bubble point press. (psia)						
Viscosity (cp) @ °F	5-8 @ 177	-	-			
Gas:						
Specific gravity (air = 1.0)	0.78	-	-			
Heating value (Btu/cu. ft.)						
Water:						
Salinity, NaCl (ppm)	3,133-14,000	-	-			
T.D.S. (ppm)	6,278-15,000	-	-			
R_w (ohm/m) (77°F)	1.4	-	-			
ENHANCED RECOVERY PROJECTS						
Enhanced recovery projects						cyclic steam
Date started						1964
Date discontinued						active
Peak oil production (bbl)						1,468,400
Year						1965
Peak gas production, net (Mcf)						
Year						

Base of fresh water (ft.): None

Remarks: a/ Directional well, true vertical depth is 10,638 feet.

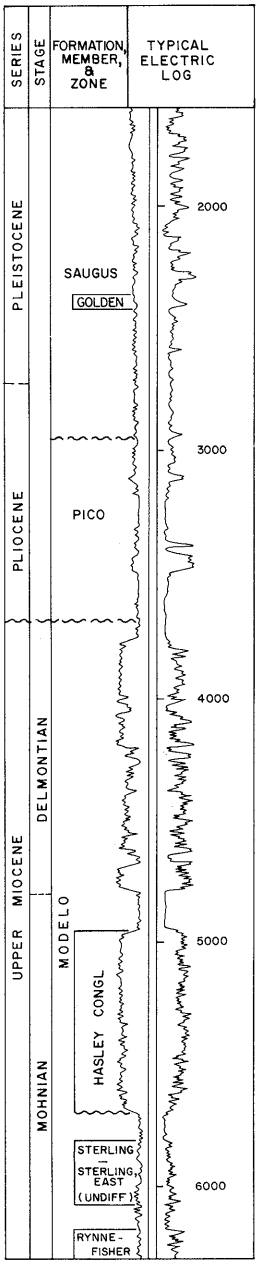
Selected References:

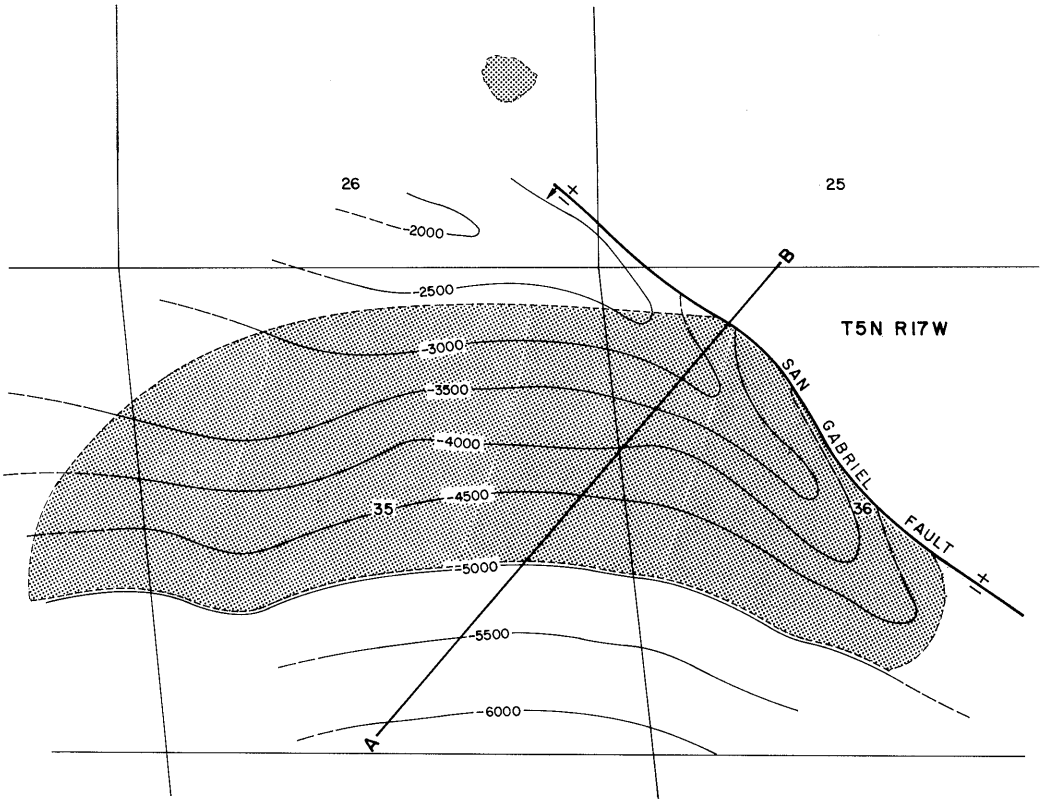
Arnold, R., and R. Anderson, 1907, Geology and Oil Resources of the Santa Maria District, Santa Barbara Co., Calif.: U.S. Geol. Survey Bull. 322, p. 98.
Bell, H.W., 1920, Casmalia Oil Field: Calif. State Mining Bureau, Summary of Operations--Calif. Oil Fields, Vol. 5, No. 10, p. 10.
Bell, H.W., 1918, Santa Barbara, San Luis Obispo, Monterey and Santa Clara Counties: Calif. State Mining Bureau Bull. 84, p. 361.
Gore, F.D., 1922, Method of Handling Heavy Crude in the Casmalia Oil Field: Calif. State Mining Bureau, Summary of Operations--Calif. Oil Fields, Vol. 8, No. 6, p. 5.
Hamilton, F., 1913, Petroleum in Southern California: Calif. State Mining Bureau, Bull. No. 63, p. 342.
Porter, W.W., II, 1941, Casmalia Oil Field: Calif. State Div. of Mines, Bull. 118, p. 430.
Regan, L.J., Jr., and A.W. Hughes, 1949, Fractured Reservoirs of Santa Maria District, Calif.: A.A.P.G. Bull. Vol. 33, No, 1, p. 32.
Woodring, W.P., and M.N. Bramlette, 1950, Geology and Paleontology of the Santa Maria District, Calif.: U.S.G.S. Prof. Paper 222, p.121.

DATE: August 1987 *Average value ***Representative values for area, formation, and depth

CALIFORNIA DIVISION OF OIL AND GAS

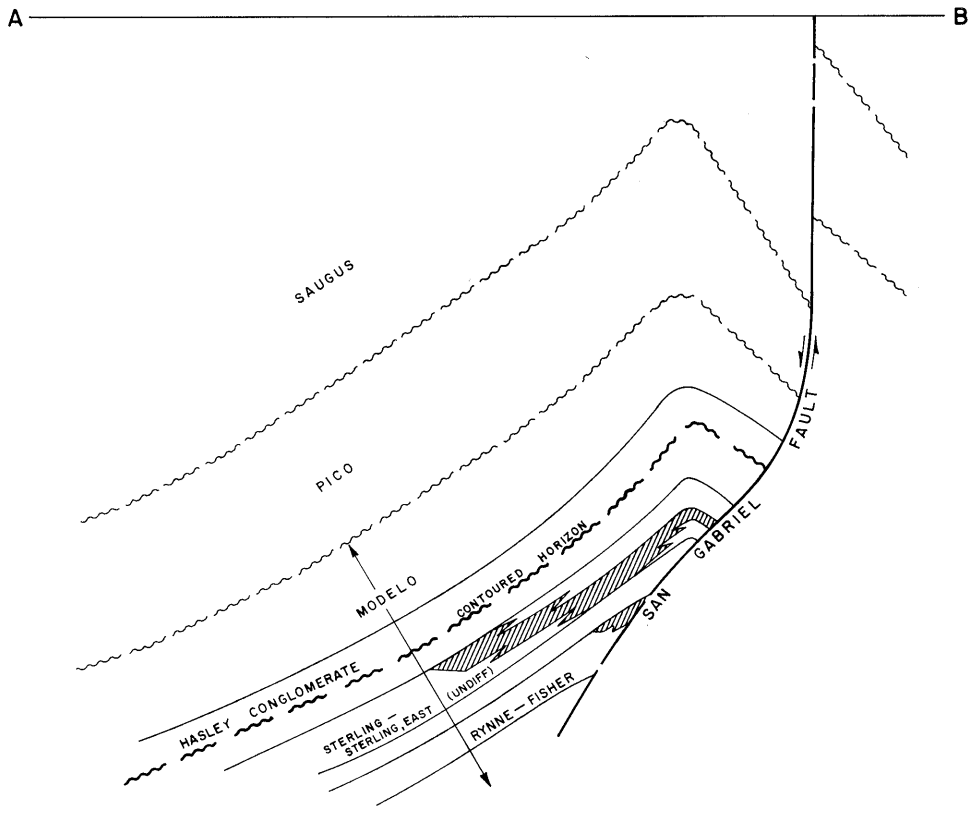
CASTAIC HILLS OIL FIELD





CONTOURS ON BASE OF HASLEY CONGLOMERATE

SCALE: 1" = 2000'



COUNTY: LOS ANGELES

CASTAIC HILLS 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	Decalta International Corp. "CHU" 1-35	Ted Sterling, Operator "Rynne-Fisher" 1	35 5N 17W	SB	4,742	Sterling East	
Deepest well	Decalta International Corp. "CHU" 75-35	Standard Oil Co. of Calif. "Golden" 75-2	35 5N 17W	SB	8,988		Modelo Miocene

POOL DATA

ITEM	GOLDEN	RADOVICH	STERLING	STERLING EAST	RYNNE-FISHER	FIELD OR AREA DATA
Discovery date	January 1955	December 1965	September 1953	September 1951	September 1954	
Initial production rates						
Oil (bbl/day)	22	-	396	233	145	
Gas (Mcf/day)	0	-	185	138	84	
Flow pressure (psi)						
Bean size (in.)						
Initial reservoir pressure (psi)						
Reservoir temperature (°F)	-	100	-	-	-	
Initial oil content (STB/ac.-ft.)	-	-	895	895	-	
Initial gas content (MSCF/ac.-ft.)						
Formation	Saugus	Saugus	Modelo	Modelo	Modelo	
Geologic age	Pleistocene	Pliocene	late Miocene	late Miocene	late Miocene	
Average depth (ft.)	4,000	730	5,500	5,700	6,000	
Average net thickness (ft.)	40	100	80	80	100	
Maximum productive area (acres)	-	40	-	-	-	490
RESERVOIR ROCK PROPERTIES						
Porosity (%)	-	35	23	23	-	
So_i (%)	-	79	66	66	-	
Sw_i (%)	-	21	-	-	-	
Sg_i (%)						
Permeability to air (md)	60-70	2,200	192	192	-	
RESERVOIR FLUID PROPERTIES						
Oil:						
Oil gravity (°API)	9	7-9	29-36	29-36	33	
Sulfur content (% by wt.)	-	-	0.51	0.51	-	
Initial solution GOR (SCF/STB)						
Initial oil FVF (RB/STB)						
Bubble point press. (psia)						
Viscosity (cp) @ °F						
Gas:						
Specific gravity (air = 1.0)						
Heating value (Btu/cu. ft.)						
Water:						
Salinity, NaCl (ppm)	-	-	20,300	20,500	20,500	
T.D.S. (ppm)						
R_w (ohm/m) (77°F)						
ENHANCED RECOVERY PROJECTS						
Enhanced recovery projects		steam injection	waterflood	waterflood		
Date started		1966	1964	1967		
Date discontinued		1978	active	1967		
Peak oil production (bbl)						1,512,700
Year						1953
Peak gas production, net (Mcf)						2,924,548
Year						1954

Base of fresh water (ft.): 300 - 1,100

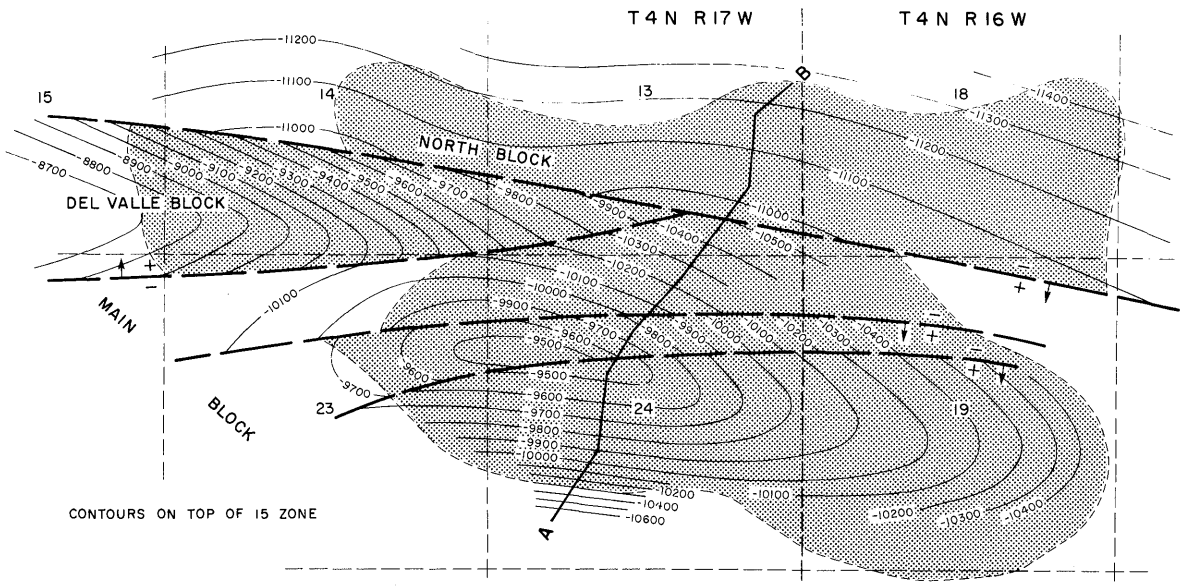
Remarks: Castaic Hills was separated from Honor Rancho field and designated as a separate field on July 1, 1953.

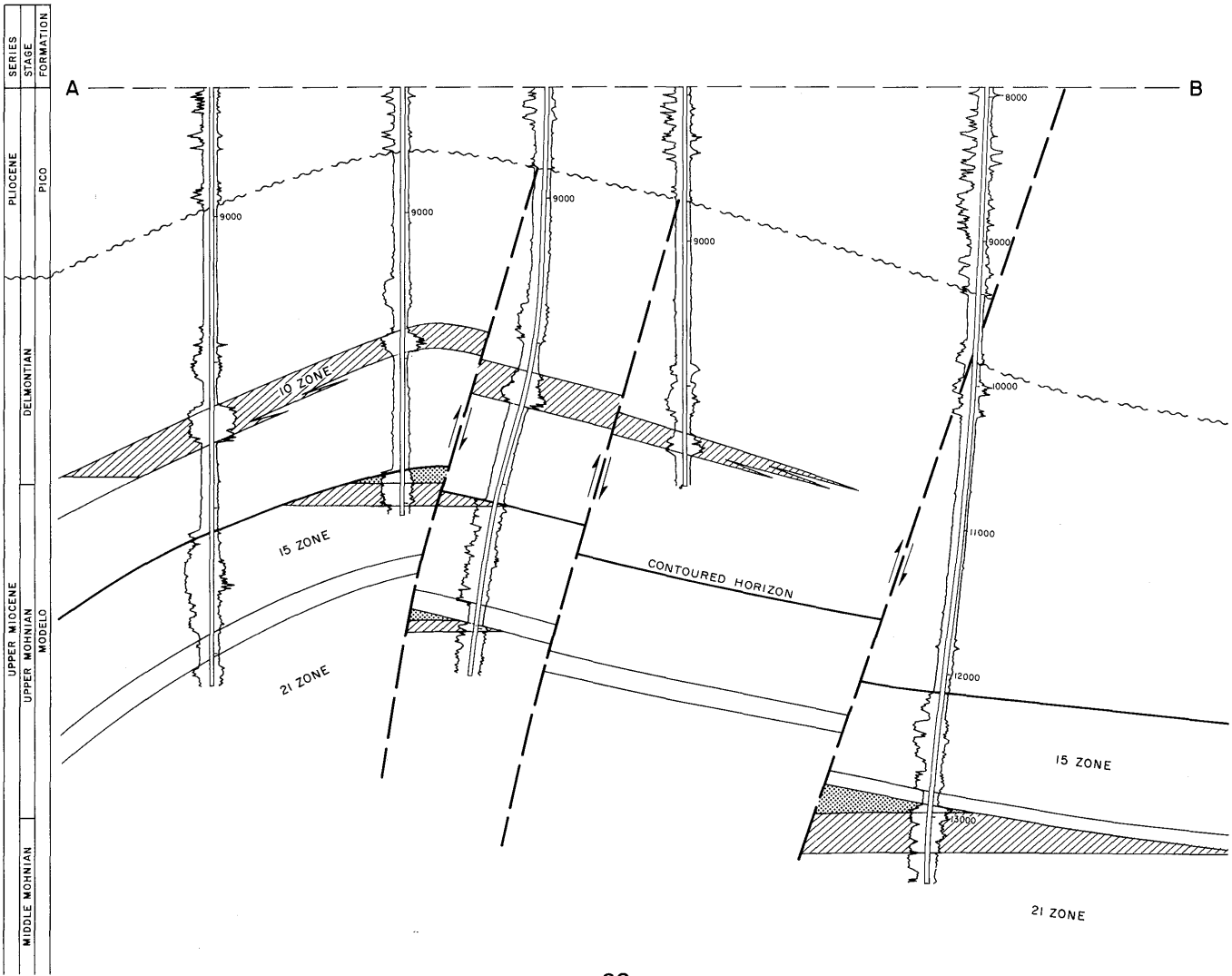
Selected References: Matthews, J.F., Jr., 1953, The Honor Rancho Oil Field: Calif. Div. of Oil and Gas, Summary of Operations -- Calif. Oil Fields, Vol. 39, No. 1.

DATE: May 1983

CALIFORNIA DIVISION OF OIL AND GAS

CASTAIC JUNCTION OIL FIELD





COUNTY: LOS ANGELES

CASTAIC JUNCTION 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	Exxon Corp. "Newhall Land & Farming Co." 64	Humble Oil & Refining Co. "Newhall Land & Farming Co." 1	23 4N 17W	SB	11,952	21 Main	
Deepest well	Exxon Corp. "Newhall Land & Farming Co." 78	Same as present	23 4N 17W	SB	18,856		Modelo late Miocene

POOL DATA

ITEM	10-A	10-B	15	21 DEL VALLE	21 MAIN	FIELD OR AREA DATA
Discovery date	December 1950	December 1950	January 1952	January 1950	January 1950	
Initial production rates						
Oil (bbl/day)	280	-	581	-	-	
Gas (Mcf/day)	140	-	640	-	-	
Flow pressure (psi)						
Bean size (in.)						
Initial reservoir pressure (psi)	4,952	4,952	5,338	6,200	6,000	
Reservoir temperature (°F)	208	212 @ 10,000	228	238	238	
Initial oil content (STB/ac.-ft.)	-	460	780	-	-	
Initial gas content (MSCF/ac.-ft.)	-	175	1,900	862	-	
Formation	Modelo	Modelo	Modelo	Modelo	Modelo	
Geologic age	late Miocene	late Miocene	late Miocene	late Miocene	late Miocene	
Average depth (ft.)	8,400	9,200	9,850	10,800	10,800	
Average net thickness (ft.)	200	116	125	96	41	
Maximum productive area (acres)						
RESERVOIR ROCK PROPERTIES						
Porosity (%)	12.5	9.4-14.8	20.1*	13.6	13.7	
S_{oi} (%)	-	53.2	61.0	-	-	
S_{wi} (%)	36.0	46.8	22.0	31.8	26.8	
S_{gi} (%)	-	0.0*	17.0	68.2	73.2	
Permeability to air (md)	59.0	26.0	273.0*	9.2	140.0	
RESERVOIR FLUID PROPERTIES						
Oil:						
Oil gravity (°API)	18-22	16-22	30	-	-	
Sulfur content (% by wt.)	3.4	trace	0.0	0.0	0.0	
Initial solution GOR (SCF/STB)	424	380	994	-	-	
Initial oil FVF (RB/STB)	1.26	1.23	1.56	-	-	
Bubble point press. (psia)	3,460	3,460	4,900*	-	-	
Viscosity (cp) @ °F	-	2.9 @ 212	7.0 @ 100	-	-	
Gas:						
Specific gravity (air = 1.0)	-	0.65	0.65	0.65	0.77	
Heating value (Btu/cu. ft.)	-	1,075	1,075	1,150	150	
Water:						
Salinity, NaCl (ppm)	-	14,400	14,400	14,400	4,400	
T.D.S. (ppm)						
R_w (ohm/m) (77°F)	-	0.33	0.33	0.33	0.33	
ENHANCED RECOVERY PROJECTS						
Enhanced recovery projects	waterflood	waterflood	waterflood		pressure maintenance	
Date started	1962	1961	1958		1958	
Date discontinued	active pressure maintenance	1978 pressure maintenance	1978 pressure maintenance		1964	
	1954	1954	1958			
	1969	1969	1970			
Peak oil production (bbl)						1,871,399
Year						1960
Peak gas production, net (Mcf)						11,356,600
Year						1966

Base of fresh water (ft.): 400 - 800

Remarks: For reservoir performance evaluations, the 10 zone is divided into two fault-block pools: 10-A and 10-B. Similarly, the 21 zone is broken into three block pools: 21-North, 21-Main, and 21 Del Valle. The 15 zone is not subdivided.

Selected References:

Cordova, S., 1966, Castaic Junction Oil Field: Calif. Div. of Oil and Gas, Summary of Operations -- Calif. Oil Fields, Vol. 52, No. 2, Part 2.

Gaede, V.F., 1953, Castaic Junction Oil Field: Calif. Div. of Oil and Gas, Summary of Operations -- Calif. Oil Fields, Vol. 39, No. 2.

DATE: May 1983 *Average value

CALIFORNIA DIVISION OF OIL AND GAS

COUNTY: LOS ANGELES

CASTAIC JUNCTION 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	21 NORTH					FIELD OR AREA DATA
Discovery date	September 1957					
Initial production rates						
Oil (bbl/day)						
Gas (Mcf/day)						
Flow pressure (psi)						
Bean size (in.)						
Initial reservoir pressure (psi)	6,280					
Reservoir temperature (°F)	250					
Initial oil content (STB/ac.-ft.)	420					
Initial gas content (MSCF/ac.-ft.)	1,230					
Formation	Modelo					
Geologic age	late Miocene					
Average depth (ft.)	12,000					
Average net thickness (ft.)	61					
Maximum productive area (acres)						690
RESERVOIR ROCK PROPERTIES						
Porosity (%)	13.7*					
S_{oi} (%)	73.2					
S_{wi} (%)	26.8					
S_{gi} (%)	0.0					
Permeability to air (md)	15.8					
RESERVOIR FLUID PROPERTIES						
Oil:						
Oil gravity (°API)	30					
Sulfur content (% by wt.)	trace					
Initial solution GOR (SCF/STB)	1,180					
Initial oil FVF (RB/STB)	1.68					
Bubble point press. (psia)	4,868					
Viscosity (cp) @ °F	0.33 @ 250					
Gas:						
Specific gravity (air = 1.0)	0.65					
Heating value (Btu/cu. ft.)	1,150					
Water:						
Salinity, NaCl (ppm)	14,400					
T.D.S. (ppm)						
R_w (ohm/m) (77°F)	0.33					
ENHANCED RECOVERY PROJECTS						
Enhanced recovery projects	waterflood					
Date started	1962					
Date discontinued	1973 pressure maintenance 1963 1971					
Peak oil production (bbl)						
Year						
Peak gas production, net (Mcf)						
Year						

Base of fresh water (ft.):

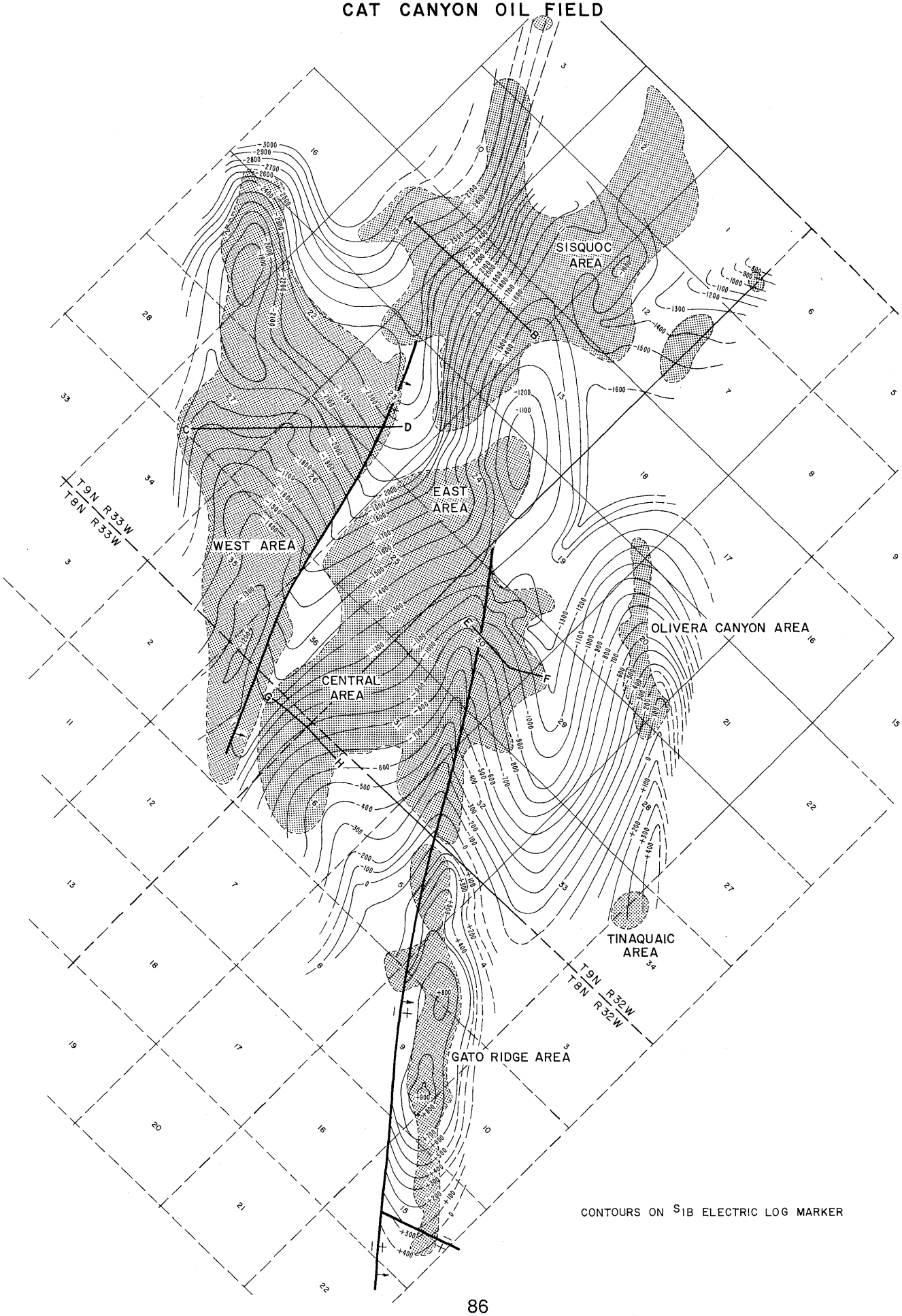
Remarks:

Selected References:

DATE: May 1983 *Average value

CALIFORNIA DIVISION OF OIL AND GAS

CAT CANYON OIL FIELD

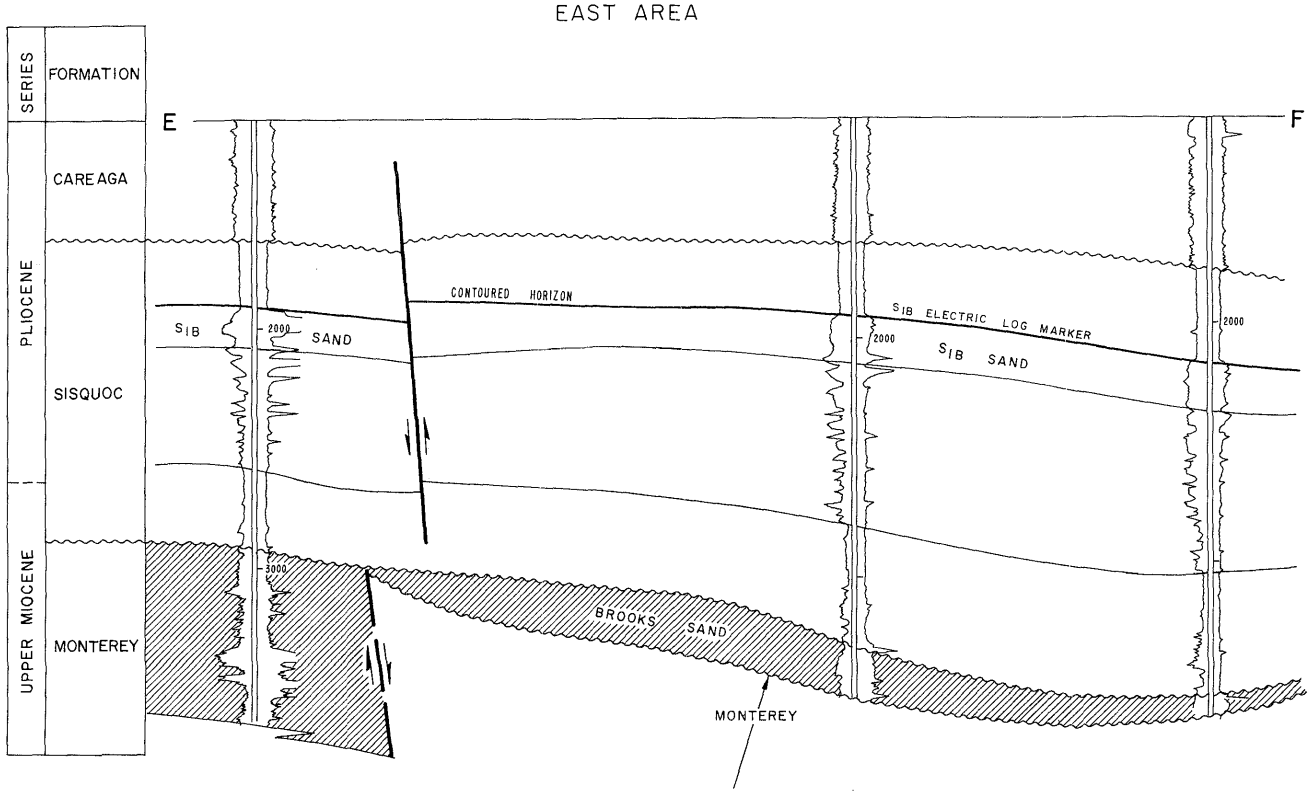


CONTOURS ON S_{1B} ELECTRIC LOG MARKER

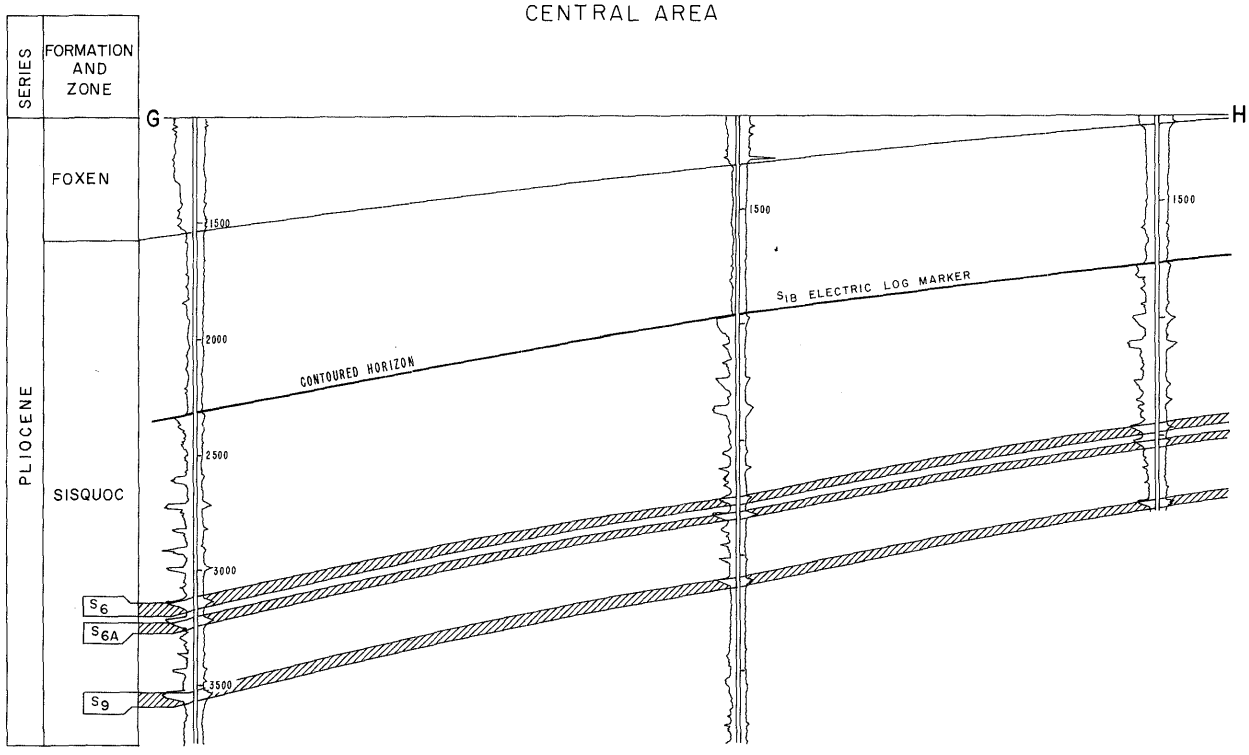
CAT CANYON OIL FIELD

East Area and Central Area

EAST AREA



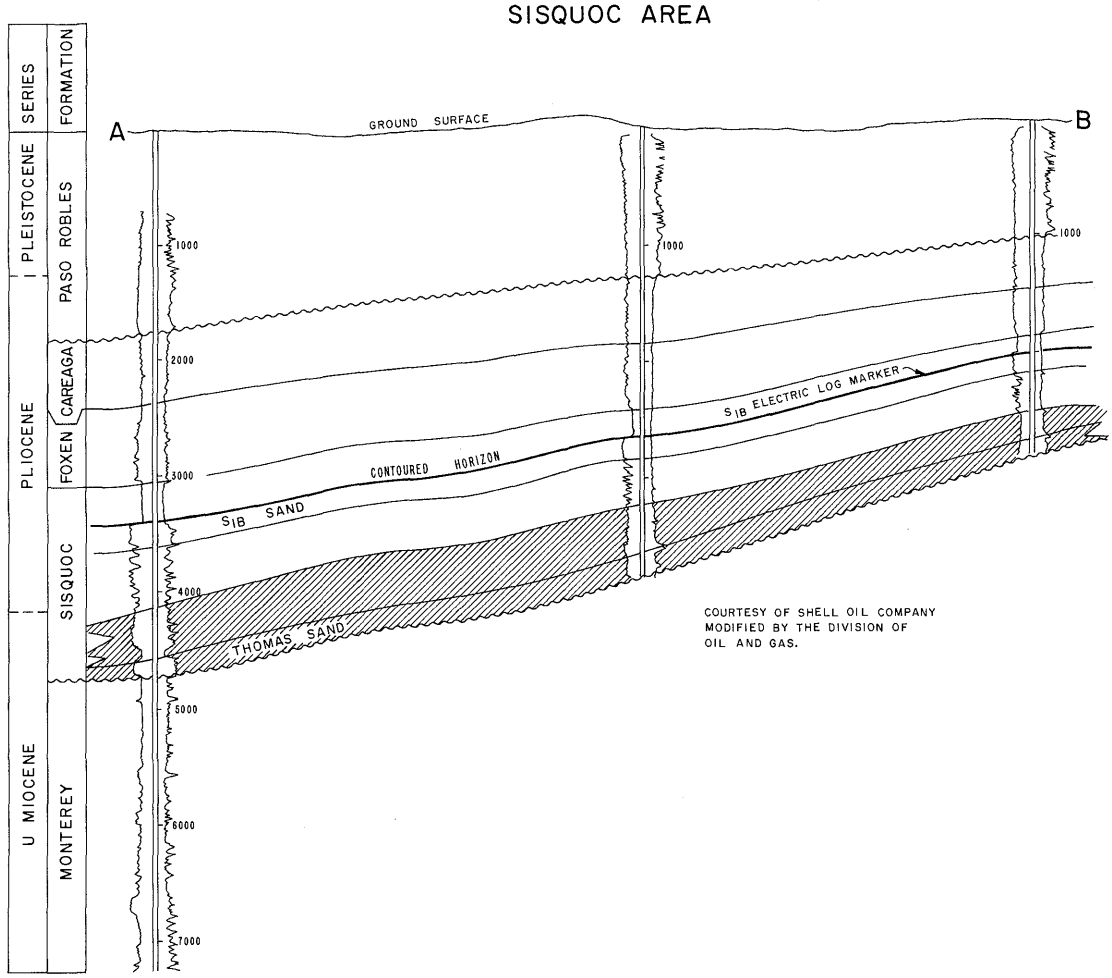
CENTRAL AREA



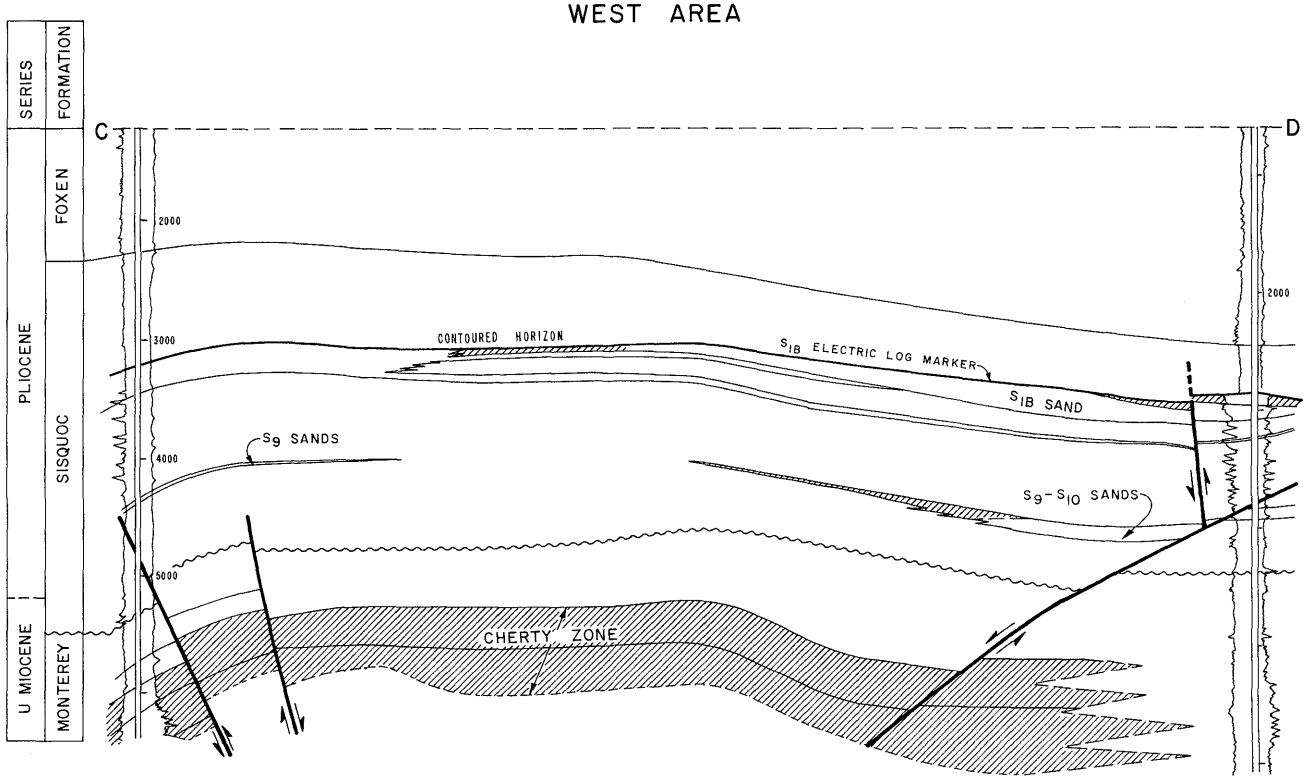
CAT CANYON OIL FIELD

Sisquoc Area and West Area

SISQUOC AREA

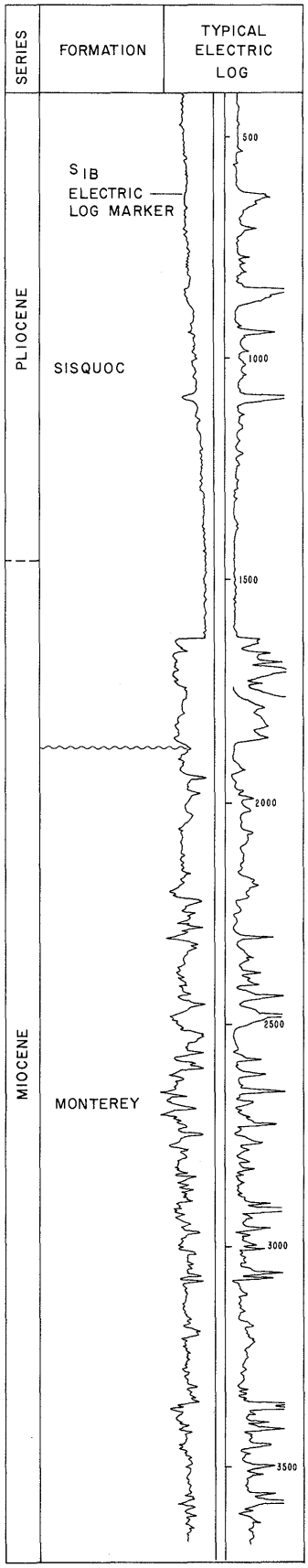


WEST AREA

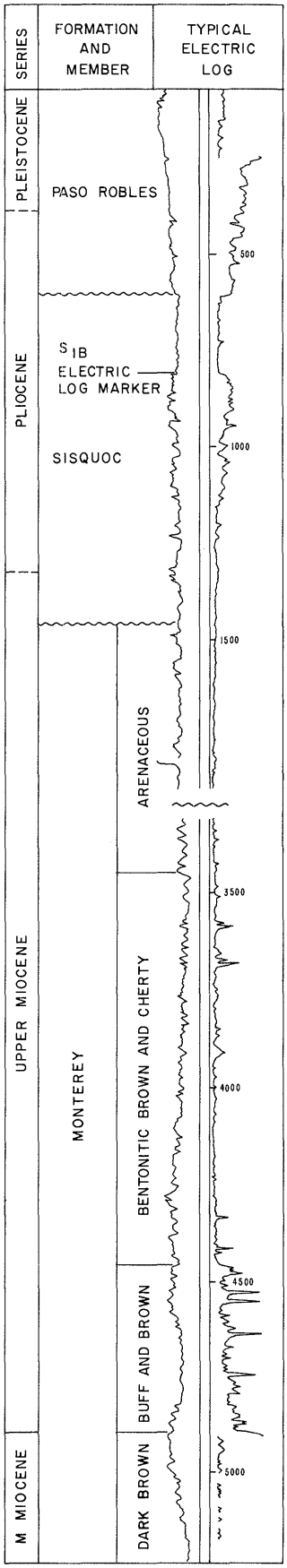


CAT CANYON OIL FIELD

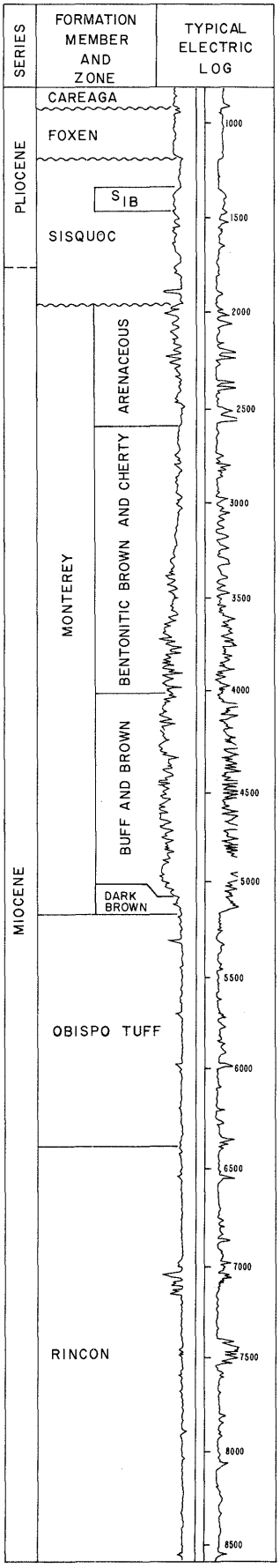
GATO RIDGE AREA



TINAQUAIC AREA



OLIVERA CANYON AREA



COUNTY: SANTA BARBARA

CAT CANYON 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	Union Oil Co. of Calif. "Palmer Stendel" (Old) 1	Palmer Union Oil Co. Well No. 1	26 9N 33W	SB	3,200	Sisquoc	
Deepest well	Shell Western Expl. & Prod. Inc. "Studer" 45-17	Marathon Oil Co. "Studer" 45-17	17 9N 33W	SB	9,887 a/		Monterey Miocene

POOL DATA

ITEM	SISQUOC					FIELD OR AREA DATA
Discovery date	1908					
Initial production rates						
Oil (bbl/day)	150					
Gas (Mcf/day)	-					
Flow pressure (psi)						
Bean size (in.)						
Initial reservoir pressure (psi)	1,000					
Reservoir temperature (°F)	105					
Initial oil content (STB/ac.-ft.)	1,700					
Initial gas content (MSCF/ac.-ft.)	0					
Formation	Sisquoc					
Geologic age	Pliocene					
Average depth (ft.)	2,800					
Average net thickness (ft.)	600					
Maximum productive area (acres)						8,970
RESERVOIR ROCK PROPERTIES						
Porosity (%)	27-31					
So_i (%)	68-70					
Sw_i (%)	30-32					
Sg_i (%)						
Permeability to air (md)	150-500					
RESERVOIR FLUID PROPERTIES						
Oil:						
Oil gravity (°API)	13-15					
Sulfur content (% by wt.)	3.83					
Initial solution GOR (SCF/STB)						
Initial oil FVF (RB/STB)						
Bubble point press. (psia)						
Viscosity (cp) @ °F	90-110 @ 105					
Gas:						
Specific gravity (air = 1.0)						
Heating value (Btu/cu. ft.)						
Water:						
Salinity, NaCl (ppm)	18,000-25,000					
T.D.S. (ppm)	20,000-26,000					
R_w (ohm/m) (77°F)	0.40-0.58					
ENHANCED RECOVERY PROJECTS						
Enhanced recovery projects						
Date started						
Date discontinued						
Peak oil production (bbl)						8,373,328
Year						1953
Peak gas production, net (Mcf)						6,597,998
Year						1967

Base of fresh water (ft.): See areas

Remarks: Four Deer Oil Field was originally classified as an area of Cat Canyon Oil Field.
a/ Directional well; true vertical depth is 9,810 feet.

Selected References:
Prutzman, P.W., 1912, Petroleum in Southern California: Calif. State Mining Bureau Bull. 63.
Woodring, W.P., and M.N. Bramlette, 1950, Geology and Paleontology of the Santa Maria District, California: U.S. Geol. Survey Prof. Paper 222, p. 120.

COUNTY: SANTA BARBARA

CAT CANYON OIL FIELD
EAST 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	Shell Western Expl. & Prod. Inc. "Field Fee" 1	Brooks Oil Co. Well No. 1	31 9N 32W	SB	3,098	Brooks	
Deepest well	Shell Western Expl. & Prod. Inc. "Victory" 20	Palmer Union Oil Co. "Stendel" 20	30 9N 32W	SB	7,200		Knoxville Cretaceous

POOL DATA

ITEM	SISQUOC	BROOKS	MONTEREY			FIELD OR AREA DATA
Discovery date	June 1953	1909	October 1953			
Initial production rates						
Oil (bbl/day)	25	150	7[a/]			
Gas (Mcf/day)	-	-	-			
Flow pressure (psi)						
Bean size (in.)						
Initial reservoir pressure (psi)	1,100	1,150	-			
Reservoir temperature (°F)	100-150	135	-			
Initial oil content (STB/ac.-ft.)	1,600	2,000	-			
Initial gas content (MSCF/ac.-ft.)	231	-	-			
Formation	Sisquoc	Sisquoc	Monterey			
Geologic age	Pliocene	Pliocene	Miocene			
Average depth (ft.)	3,000	3,500	-			
Average net thickness (ft.)	250	150	-			
Maximum productive area (acres)						1,970
RESERVOIR ROCK PROPERTIES						
Porosity (%)	30-35***	35	fractured shale			
S_{oi} (%)	60-70***	85	-			
S_{wi} (%)	30-40***	15	-			
S_{gi} (%)						
Permeability to air (md)	1,480	3,350	-			
RESERVOIR FLUID PROPERTIES						
Oil:						
Oil gravity (°API)	9-18	6-11	6			
Sulfur content (% by wt.)	4.1	6.0	-			
Initial solution GOR (SCF/STB)	700	300	-			
Initial oil FVF (RB/STB)	1.06	-	-			
Bubble point press. (psia)						
Viscosity (cp) @ °F	-	15,000 @ 135	-			
Gas:						
Specific gravity (air = 1.0)						
Heating value (Btu/cu. ft.)						
Water:						
Salinity, NaCl (ppm)	5,485	7,242	5,660			
T.D.S. (ppm)	5,956	8,323	6,631			
R_w (ohm/m) (77°F)	-	0.12	0.13			
ENHANCED RECOVERY PROJECTS						
Enhanced recovery projects	steamflood	steamflood				
Date started	1979	1967				
Date discontinued	1990	1990				
	cyclic steam	cyclic steam				
	1964	1964				
	active	active				
Peak oil production (bbl)						[b/]
Year						
Peak gas production, net (Mcf)						[b/]
Year						

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

Remarks: A portion of this area was formerly known as the Slick-Moorman area.
a/ Commingled with production from the Brooks Sand.
b/ Early production not broken down by area.

Selected References:

Bailey, Wm. C., 1953, Operations in District No. 3: Calif. Div. of Oil and Gas, Summary of Operations--Calif. Oil Fields, Vol. 39, No. 2.
Cross, R.K., 1940, East Cat Canyon Area of the Cat Canyon Oil Field: Calif. State Div. of Mines Bull. 118, p. 435.
Prutzman, P.W., 1912, Petroleum in Southern California: Calif. State Mining Bureau Bull. 63 p. 379.
Vonde, T.R., 1982, Specialized Pumping Techniques Applied to a Very Low Gravity Sand-Laden Crude, Cat Canyon Field, California: SPE Journal of Petroleum Technology, Vol. 34, No. 9, p. 1951.
Woodring, W.P. and M.N. Bramlette, 1950, Geology and Paleontology of the Santa Maria District, Calif.: U.S. Geol. Survey Prof. Paper 222, p. 121.

DATE: January 1991

***Representative values for area, formation, and depth

CALIFORNIA DIVISION OF OIL AND GAS

COUNTY: SANTA BARBARA

CAT CANYON OIL FIELD
CENTRAL 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	Texaco Producing Inc. "Los Alamos" 32	Pacific Western Oil Corp. "Los Alamos" 32	6 8N 32W	SB	5,210	Sisquoc	Monterey Miocene
Deepest well	Same as above	"	"	"	"	"	"

POOL DATA

ITEM	SISQUOC a/					FIELD OR AREA DATA
Discovery date	May 1956					
Initial production rates						
Oil (bbl/day)	184					
Gas (Mcf/day)	-					
Flow pressure (psi)						
Bean size (in.)						
Initial reservoir pressure (psi)	1,100					
Reservoir temperature (°F)	103					
Initial oil content (STB/ac.-ft.)	1,600					
Initial gas content (MSCF/ac.-ft.)						
Formation	Sisquoc					
Geologic age	Pliocene					
Average depth (ft.)	2,800					
Average net thickness (ft.)	45					
Maximum productive area (acres)	620					
RESERVOIR ROCK PROPERTIES						
Porosity (%)	32-37***					
So_i (%)	60-70***					
Sw_i (%)	30-40***					
Sg_i (%)						
Permeability to air (md)	400-2,000***					
RESERVOIR FLUID PROPERTIES						
Oil:						
Oil gravity (°API)	7-15					
Sulfur content (% by wt.)						
Initial solution GOR (SCF/STB)						
Initial oil FVF (RB/STB)						
Bubble point press. (psia)						
Viscosity (cp) @ °F						
Gas:						
Specific gravity (air = 1.0)						
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	waterflood					
Date started	1965					
Date discontinued	1986					
	fireflood					
	1963					
	1965					
	cyclic steam					
	1963					
	active					
Peak oil production (bbl)	b/					
Year						
Peak gas production, net (Mcf)	b/					
Year						

Base of fresh water (ft.): 800 - 1,300

Remarks: a/ Includes the S1b thru S9 sands.
b/ Early production not broken down by areas.

Selected References: Bailey, Wm. C., 1956, Operations in District No. 3: Calif. Div. of Oil and Gas, Summary of Operations--Calif. Oil Fields, Vol. 42, No. 2, p. 93.

DATE: January 1989 ***Representative values for area, formation, and depth

CALIFORNIA DIVISION OF OIL AND GAS

COUNTY: SANTA BARBARA

CAT CANYON OIL FIELD
SISQUOC 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	B.E. Conway "Goodwin" 1	Union Oil Co. of Calif. "Santa Maria Realty" 1	10 9N 33W	SB	5,415 a/	Sisquoc-Monterey	
Deepest well	Chevron U.S.A. Inc. "Fugler" 4-10	Standard Oil Co. of Calif. "Fugler" 4-10	10 9N 33W	SB	7,934		Point Sal Miocene

POOL DATA

ITEM	FOXEN	SISQUOC b/	THOMAS	MONTEREY		FIELD OR AREA DATA
Discovery date	May 1980	December 1944	November 1954	December 1944		
Initial production rates						
Oil (bbl/day)	4 c/	69 d/	89	69		
Gas (Mcf/day)						
Flow pressure (psi)						
Bean size (in.)						
Initial reservoir pressure (psi)	350	820-1,300	1,700-1,900	2,000		
Reservoir temperature (°F)	79	105-120	130-120	180		
Initial oil content (STB/ac.-ft.)	1,580	1,780	-	325		
Initial gas content (MSCF/ac.-ft.)						
Formation	Foxen	Sisquoc	Sisquoc	Monterey		
Geologic age	Pliocene	Pliocene	Pliocene	Miocene		
Average depth (ft.)	1,750	2,750	4,900	4,000		
Average net thickness (ft.)	50	500	70	500		
Maximum productive area (acres)						2,420
RESERVOIR ROCK PROPERTIES						
Porosity (%)	30-35	25-33	20-33	fractured shale		
So_i (%)	68-73†	50-70	30-50	-		
Sw_i (%)	27-32†	20-50	33-60	-		
Sg_i (%)	-	0-10	10-17	-		
Permeability to air (md)	358-1,280	750-2,000	300-500	-		
RESERVOIR FLUID PROPERTIES						
Oil:						
Oil gravity (°API)	9.4	6.0-8.0	8.0-16.0	6.4-11.0		
Sulfur content (% by wt.)	-	4.5	-	-		
Initial solution GOR (SCF/STB)	-	0-100	-	-		
Initial oil FVF (RB/STB)	-	1.072	-	-		
Bubble point press. (psia)						
Viscosity (cp) @ °F	-	325 @ 130	35-40 @ 72	500 @ 180		
Gas:						
Specific gravity (air = 1.0)	-	0.66	0.80	-		
Heating value (Btu/cu. ft.)						
Water:						
Salinity, NaCl (ppm)	9,200+	588-13,332	18,700	10,550-17,300		
T.D.S. (ppm)	-	2,870-14,287	20,604	12,547-20,722		
R_w (ohm/m) (77°F)	0.60+	0.43-3.13	0.30	0.32-0.51		
ENHANCED RECOVERY PROJECTS						
Enhanced recovery projects	cyclic steam	cyclic steam				
Date started	1980	1963				
Date discontinued	active	active				
		steamflood				
		1968				
		1986				
		waterflood				
		1970				
		1971				
		fireflood				
		1973				
		1978				
Peak oil production (bbl)						e/
Year						
Peak gas production, net (Mcf)						e/
Year						

Base of fresh water (ft.): 1,000 - 1,400

Remarks: A portion of this area was formerly known as the Bradley Canyon area.
a/ Original total depth. The well was subsequently redrilled to a total depth of 5,550 feet; true vertical depth is 5,534 feet.
b/ Includes the S_1 thru S_{18} sands.
c/ Commingled with production from the Sisquoc.
d/ Commingled with production from the Monterey.
e/ Early production not broken down by area.

Selected References:
Angrove T.J., 1970, Optimizing High Temperature Steam Stimulation Operations, SPE Paper 3178, presented at the California Regional Meeting of the Society of Petroleum Engineers of AIME, Santa Barbara, Calif., Oct. 28-30.
Bailey, Wm. C., 1954, Operations in District No. 3: Calif. Div. of Oil and Gas, Summary of Operations--Calif. Oil Fields, Vol. 40, No. 2.

DATE: January 1989 †Log derived value

CALIFORNIA DIVISION OF OIL AND GAS

COUNTY: SANTA BARBARA

CAT CANYON OIL FIELD
WEST 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	Union Oil Co. of Calif. "Palmer Stendel" (Old) 1	Palmer Union Oil Co. Well No. 1	26 9N 33W	SB	3,200	Sisquoc	
Deepest well	Shell Western Expl. & Prod. Inc. "Studer" 45-17	Marathon Oil Co. "Studer" 45-17	17 9N 33W	SB	9,887 a/		Monterey Miocene

POOL DATA

ITEM	SISQUOC b/	S_6-S_6A GAS c/	ALEXANDER d/	LOS FLORES		FIELD OR AREA DATA
Discovery date	1908	September 1960	March 1953	August 1938		
Initial production rates						
Oil (bbl/day)	150	-	200	716		
Gas (Mcf/day)	-	500	-	-		
Flow pressure (psi)	-	1,000-1,025	-	-		
Bean size (in.)	-	6/64	-	-		
Initial reservoir pressure (psi)	1,000	-	-	1,600-1,900		
Reservoir temperature (°F)	105	-	-	175-200		
Initial oil content (STB/ac.-ft.)	1,700	-	-	-		
Initial gas content (MSCF/ac.-ft.)	0	-	-	-		
Formation	Sisquoc	Sisquoc	Sisquoc	Monterey		
Geologic age	Pliocene	Pliocene	Pliocene	Miocene		
Average depth (ft.)	2,800	3,405	3,750	6,000		
Average net thickness (ft.)	600	45	200	1,500		
Maximum productive area (acres)	-	40	-	-		2,880
RESERVOIR ROCK PROPERTIES						
Porosity (%)	27-31	27-31	23-30	fractured shale		
So_i (%)	68-70	-	79†	-		
Sw_i (%)	30-32	11-13†	21†	-		
Sg_i (%)	-	87-89†	-	-		
Permeability to air (md)	150-500	150-500	150-400	-		
RESERVOIR FLUID PROPERTIES						
Oil:						
Oil gravity (°API)	13.0-16.5	-	23.0	11.0-22.0		
Sulfur content (% by wt.)	3.03	-	3.13	5.07		
Initial solution GOR (SCF/STB)	800	-	766	1,000-6,300		
Initial oil FVF (RB/STB)						
Bubble point press. (psia)						
Viscosity (cp) @ °F	3,100 @ 100	-	-	1,200 @ 100		
Gas:						
Specific gravity (air = 1.0)						
Heating value (Btu/cu. ft.)						
Water:						
Salinity, NaCl (ppm)	18,000-25,000	-	20,544	9,700-13,000		
T.D.S. (ppm)	20,000-26,000	-	-	15,500-18,000		
R_w (ohm/m) (77°F)	0.25-0.33	-	-	0.39-0.56		
ENHANCED RECOVERY PROJECTS						
Enhanced recovery projects	waterflood			gas injection		
Date started	1954			1947		
Date discontinued	active			1955		
	cyclic steam			waterflood		
	1964			1972		
	active			1974		
Peak oil production (bbl)						e/
Year						
Peak gas production, net (Mcf)		143,086				e/
Year		1961				

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

Remarks: a/ Directional well; true vertical depth is 9,810 feet. b/ Includes the S_1 through S_6 sands; formerly called the Pliocene pool. c/ The zone was abandoned in 1978. Cumulative production is 310,000 Mcf of gas. Only one well, Mobil Oil Corp. "Los Flores" 109-21, produced from this zone. d/ Includes the S_9 thru S_{10} sands. e/ Early production not broken down by area.

Selected References:

Huey, W.F., 1954, West Cat Canyon Area of Cat Canyon Oil Field: Calif. Div. of Oil and Gas, Summary of Operations--Calif. Oil Fields, Vol. 40, No. 1.

Manlove, C., 1938, West Cat Canyon Oil Field: Calif. State Div. of Mines Bull. 118, p. 432.

Prutzman, P.W., 1912, Petroleum in Southern California: Calif. State Mining Bureau Bull. 63, p. 382.

Regan, L.J. Jr., and A.W. Hughes, 1949, Fractured Reservoirs of Santa Maria District, California: Am. Assoc. Petroleum Geologists Bull., Vol. 33, No. 1, p. 32.

Woodring, W.P., and M.N. Bramlette, 1950, Geology and Paleontology of the Santa Maria District, California: U.S. Geol. Survey Prof. Paper 222, p. 120.

DATE: January 1989 †Log derived value

CALIFORNIA DIVISION OF OIL AND GAS

COUNTY: SANTA BARBARA

CAT CANYON OIL FIELD
GATO RIDGE 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	Pinal Dome Corp. Well No. T-2	Pinal Dome Oil Co. Well No. T-2	15 8N 32W	SB	3,400	Monterey	
Deepest well	Gato Corp. "Tognazzini" 1	Barnsdall Oil Co. of Calif. "Tognazzini" 1	9 8N 32W	SB	6,510		Monterey Miocene

POOL DATA

ITEM	SISQUOC	MONTEREY				FIELD OR AREA DATA
Discovery date	March 1937	January 1915				
Initial production rates						
Oil (bbl/day)	580[a/]	50				
Gas (Mcf/day)	-	0				
Flow pressure (psi)						
Bean size (in.)						
Initial reservoir pressure (psi)	-	500**				
Reservoir temperature (°F)	110	110-160**				
Initial oil content (STB/ac.-ft.)						
Initial gas content (MSCF/ac.-ft.)						
Formation	Sisquoc	Monterey				
Geologic age	Pliocene	Miocene				
Average depth (ft.)	2,210	3,800				
Average net thickness (ft.)	200	300				
Maximum productive area (acres)						690
RESERVOIR ROCK PROPERTIES						
Porosity (%)	25-32***	fractured shale				
S_{oi} (%)	65***	-				
S_{wi} (%)	35***	-				
S_{gi} (%)						
Permeability to air (md)	1,000-4,000	-				
RESERVOIR FLUID PROPERTIES						
Oil:						
Oil gravity (°API)	13	9-14				
Sulfur content (% by wt.)	-	5.87				
Initial solution GOR (SCF/STB)						
Initial oil FVF (RB/STB)						
Bubble point press. (psia)						
Viscosity (cp) @ °F	-	1,000 @ 160				
Gas:						
Specific gravity (air = 1.0)						
Heating value (Btu/cu. ft.)						
Water:						
Salinity, NaCl (ppm)	-	7,425				
T.D.S. (ppm)	-	11,500				
R_w (ohm/m) (77°F)						
ENHANCED RECOVERY PROJECTS						
Enhanced recovery projects						
Date started						
Date discontinued						
Peak oil production (bbl)						[b/]
Year						
Peak gas production, net (Mcf)						[b/]
Year						

Base of fresh water (ft.): 0 - 400

Remarks: Pinal Dome Corp. well No. T-2 produced a total of 8,062 bbl of oil from March 1916 to June 1917. This production was not considered commercial at the time, and the well was abandoned in 1920.
a/ Commingled with production from the Monterey.
b/ Early production not broken down by area.

Selected References:

Cross, R.K., 1940, Gato Ridge Area of Cat Canyon Oil Field: State Div. of Mines, Bull. 118, p. 438.
Dolman, S.G., 1931, Operations in District No. 3: Calif. Div. of Oil and Gas, Summary of Operations--Calif. Oil Fields, Vol. 17, No. 3, p. 34.
Woodring, W.P., and M.N. Bramlette, 1950, Geology and Paleontology of the Santa Maria District, California: U.S. Geol. Survey Prof. Paper 222, p. 121.

DATE: January 1989 **Estimated value ***Representative values for area, formation, and depth

CALIFORNIA DIVISION OF OIL AND GAS

COUNTY: SANTA BARBARA

CAT CANYON OIL FIELD
TINAQUAIC 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	Richards Oil Co. "Wickenden" 1	Four-Five-Six Oil Co. "Wickenden" 1	33 9N 32W	SB	4,606	Monterey	
Deepest well	Richards Oil Co. "Wickenden" 5	Continental Oil Co. "Wickenden" 5	33 9N 32W	SB	5,250		Monterey Miocene

POOL DATA

ITEM	MONTEREY					FIELD OR AREA DATA
Discovery date	February 1945[a/]					
Initial production rates						
Oil (bbl/day)	90					
Gas (Mcf/day)	0					
Flow pressure (psi)						
Bean size (in.)						
Initial reservoir pressure (psi)						
Reservoir temperature (°F)	103					
Initial oil content (STB/ac.-ft.)						
Initial gas content (MSCF/ac.-ft.)						
Formation	Monterey					
Geologic age	Miocene					
Average depth (ft.)	2,020-3,180					
Average net thickness (ft.)	1,200-3,200					
Maximum productive area (acres)	70					
RESERVOIR ROCK PROPERTIES						
Porosity (%)	fractured shale					
So_i (%)						
Sw_i (%)						
Sg_i (%)						
Permeability to air (md)						
RESERVOIR FLUID PROPERTIES						
Oil:						
Oil gravity (°API)	6-8					
Sulfur content (% by wt.)						
Initial solution GOR (SCF/STB)						
Initial oil FVF (RB/STB)						
Bubble point press. (psia)						
Viscosity (cp) @ °F						
Gas:						
Specific gravity (air = 1.0)						
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						
Date started						
Date discontinued						
Peak oil production (bbl)	7,342					
Year	1948					
Peak gas production, net (Mcf)						
Year						

Base of fresh water (ft.): 300 - 600

Remarks: a/ The heavy oil could not be produced efficiently using the techniques available at the time, and the well was abandoned in December 1945. The well was reentered, deepened to 4,972 feet, and completed by Foxen Ridge Oil Company in June-July 1948.

Selected References: Dolman, S.G., 1945, Operations in District No. 3: Calif. Div. of Oil and Gas, Summary of Operations--Calif. Oil Fields, Vol. 31, No. 2.

DATE: January 1989

CALIFORNIA DIVISION OF OIL AND GAS

COUNTY: SANTA BARBARA

CAT CANYON OIL FIELD
OLIVERA CANYON 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	Shell Western Expl. & Prod. Inc. "McNee" 2	Union Oil Co. of Calif. "McNee" 2	20 9N 32W	SB	4,034	Monterey	
Deepest well	Shell Western Expl. & Prod. Inc. "McNee" 4	Union Oil Co. of Calif. "McNee" 4	20 9N 32W	SB	9,001		Rincon(?) Miocene

POOL DATA

ITEM	SISQUOC	MONTEREY[a/]				FIELD OR AREA DATA
Discovery date	October 1979	June 1944				
Initial production rates						
Oil (bbl/day)	34	37				
Gas (Mcf/day)						
Flow pressure (psi)						
Bean size (in.)						
Initial reservoir pressure (psi)	1,350***	1,400**				
Reservoir temperature (°F)	-	135**				
Initial oil content (STB/ac.-ft.)						
Initial gas content (MSCF/ac.-ft.)						
Formation	Sisquoc	Monterey				
Geologic age	Pliocene	Miocene				
Average depth (ft.)	2,550	3,000				
Average net thickness (ft.)	20	1,500				
Maximum productive area (acres)						240
RESERVOIR ROCK PROPERTIES						
Porosity (%)	25-32***	fractured shale				
S_{oi} (%)	65***	-				
S_{wi} (%)	35***	-				
S_{gi} (%)						
Permeability to air (md)	1,000-4,000***	-				
RESERVOIR FLUID PROPERTIES						
Oil:						
Oil gravity (°API)	8.4	6.0-8.0				
Sulfur content (% by wt.)						
Initial solution GOR (SCF/STB)						
Initial oil FVF (RB/STB)						
Bubble point press. (psia)		750 @ 135**				
Viscosity (cp) @ °F						
Gas:						
Specific gravity (air = 1.0)						
Heating value (Btu/cu. ft.)						
Water:						
Salinity, NaCl (ppm)	2,605	11,984-24,800				
T.D.S. (ppm)	3,765	17,660-30,002				
R_w (ohm/m) (77°F)	1.80	0.23-0.34				
ENHANCED RECOVERY PROJECTS						
Enhanced recovery projects						
Date started						
Date discontinued						
Peak oil production (bbl)	15,911	369,422				
Year	1981	1953				
Peak gas production, net (Mcf)						
Year						

Base of fresh water (ft.): 600

Remarks: a/ Includes Cherty, Bentonitic Brown, and Buff & Brown zones.

Selected References: Dolman, S.G., 1944, Operations in District No. 3: Calif. Div. of Oil and Gas, Summary of Operations--Calif. Oil Fields, Vol. 30, No. 2, p. 43.

DATE: January 1989 **Estimated value ***Representative values for area, formation, and depth

CALIFORNIA DIVISION OF OIL AND GAS

CHAFFEE CANYON OIL FIELD

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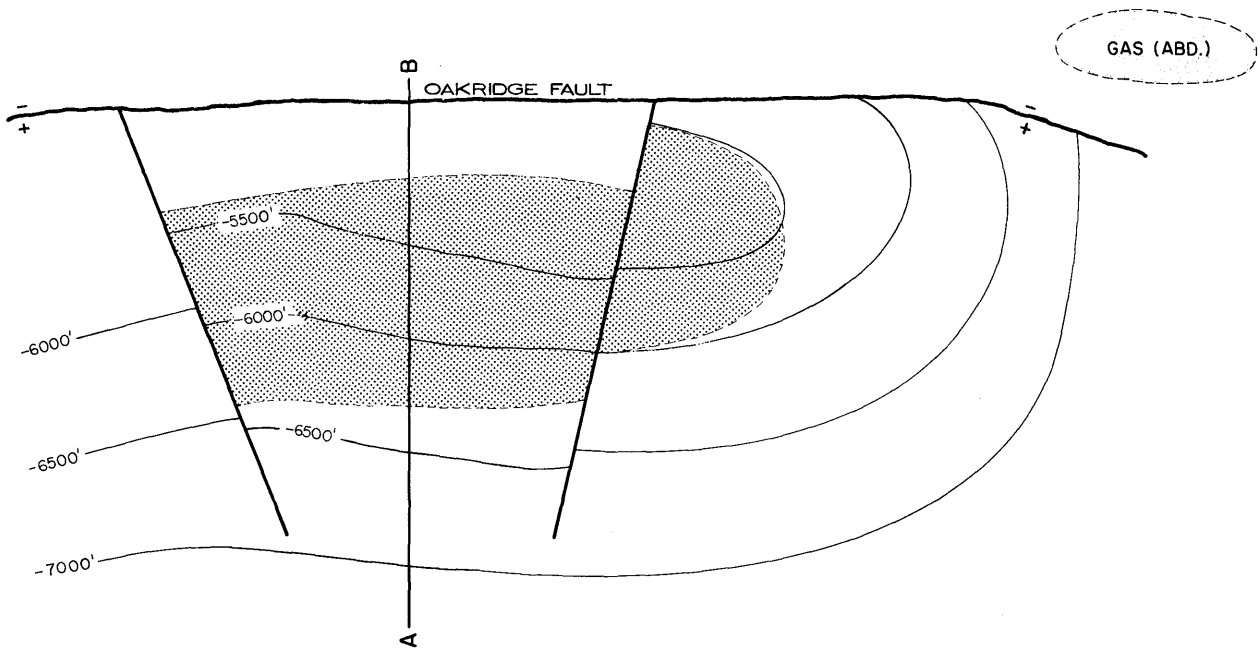
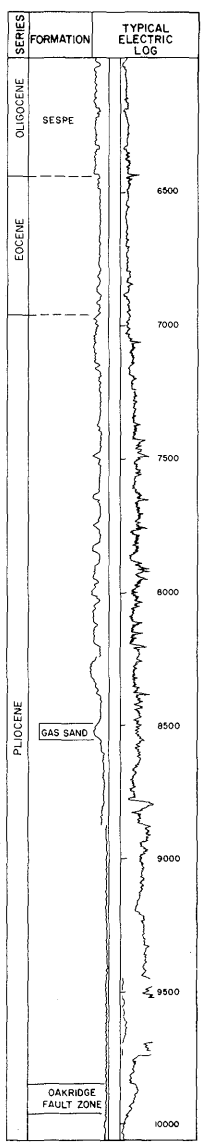
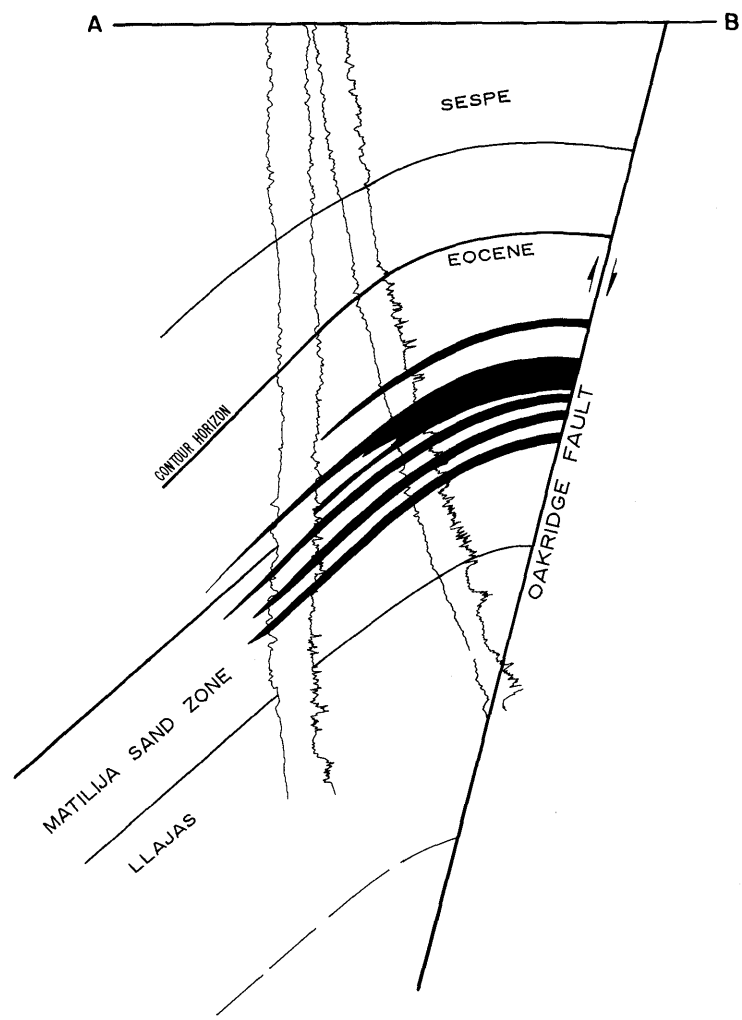
NW COR SEC 1
T 3N R19W



CONTOURS ON TOP OF EOCENE

SCALE
1" = 1320'





COUNTY: VENTURA

CHAFFEE CANYON 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	Chevron U.S.A. Inc. "Hunter" 1	Gulf Oil Corp. "Hunter" 1	6 3N 18W	SB	10,601	Eocene	Pico Pliocene
Deepest well	Same as above	"	"	"	"	"	"

POOL DATA

ITEM	EOCENE	UNNAMED				FIELD OR AREA DATA
Discovery date	October 1980	February 1957				
Initial production rates						
Oil (bbl/day)	315	0				
Gas (Mcf/day)	750	200				
Flow pressure (psi)						
Bean size (in.)	-	8/64				
Initial reservoir pressure (psi)	3,590	3,630				
Reservoir temperature (°F)						
Initial oil content (STB/ac.-ft.)						
Initial gas content (MSCF/ac.-ft.)						
Formation	Matilija	Pico				
Geologic age	Eocene	Pliocene				
Average depth (ft.)	6,330	8,712				
Average net thickness (ft.)	860	43				
Maximum productive area (acres)	60	0				
RESERVOIR ROCK PROPERTIES						
Porosity (%)	10	-				
S_{oi} (%)	30	-				
S_{wi} (%)	70	-				
S_{gi} (%)						
Permeability to air (md)						
RESERVOIR FLUID PROPERTIES						
Oil:						
Oil gravity (°API)	34.5-37.5	-				
Sulfur content (% by wt.)						
Initial solution GOR (SCF/STB)	430	-				
Initial oil FVF (RB/STB)	1.644	-				
Bubble point press. (psia)	3,493	-				
Viscosity (cp) @ °F	1.733 @ 150	-				
Gas:						
Specific gravity (air = 1.0)	0.786	-				
Heating value (Btu/cu. ft.)						
Water:						
Salinity, NaCl (ppm)	30,500	-				
T.D.S. (ppm)	32,000	-				
R_w (ohm/m) (77°F)	0.24	-				
ENHANCED RECOVERY PROJECTS						
Enhanced recovery projects						
Date started						
Date discontinued						
Peak oil production (bbl)	55,438					
Year	1982					
Peak gas production, net (Mcf)	1,313,986	10,820				
Year	1982	1957				

Base of fresh water (ft.): 555

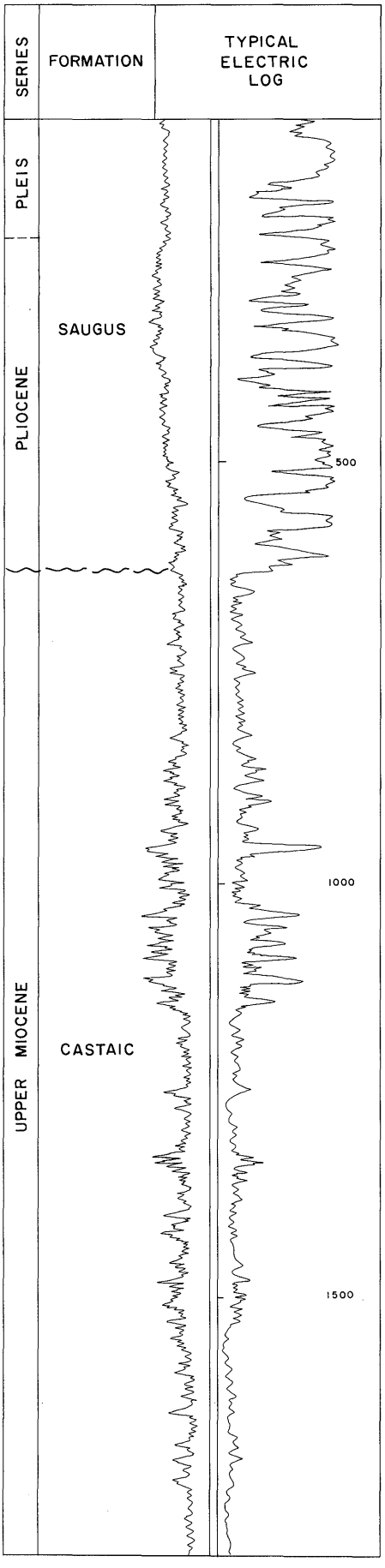
Remarks: The field was originally Chaffee Canyon Gas Field and was abandoned in August 1957. The field was reactivated in October 1980 as an oil field.

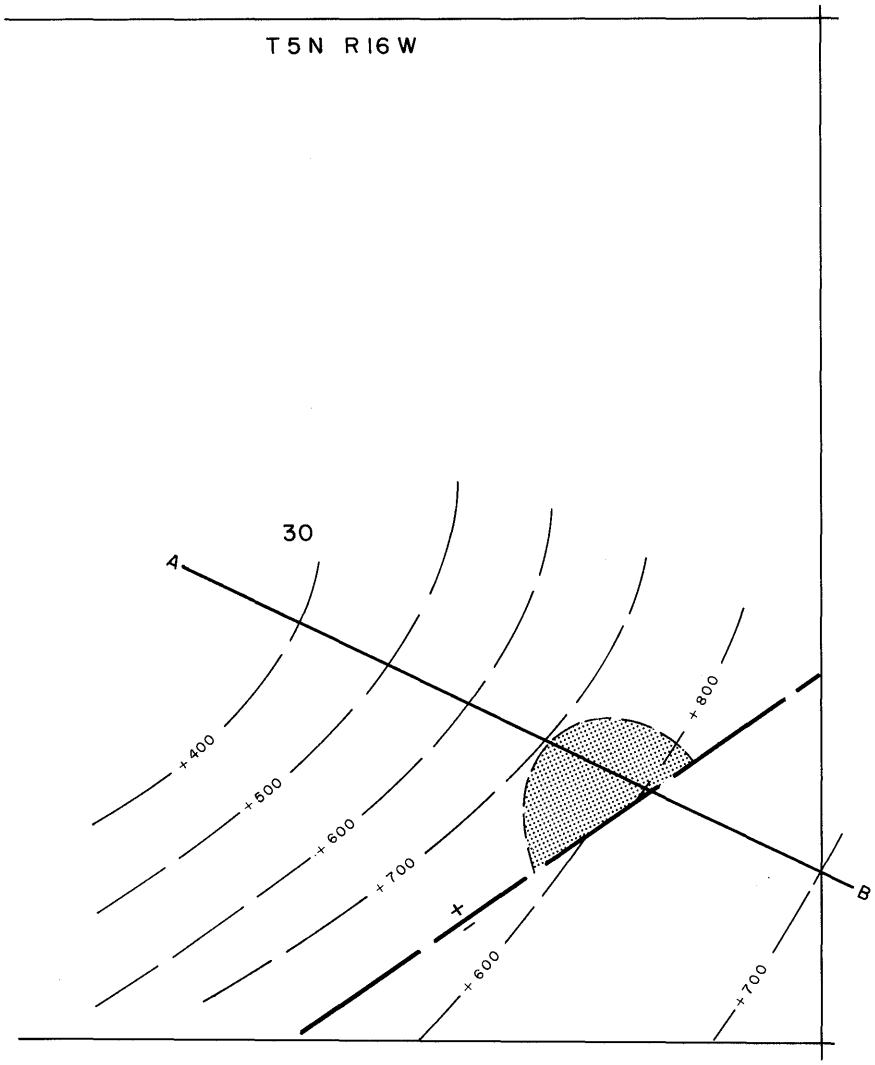
Selected References:

DATE: May 1983

CALIFORNIA DIVISION OF OIL AND GAS

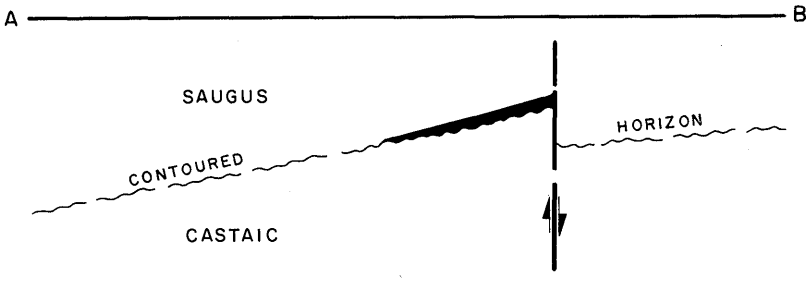
CHARLIE CANYON OIL FIELD
(Abandoned)





CONTOURS ON TOP OF CASTAIC

SCALE 1" = 1000'



COUNTY: LOS ANGELES

CHARLIE CANYON OIL FIELD (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	Philip L. Pike "Howell" 2	Vagabond Oil "Howell" 2	30 5N 16W	SB	647	unnamed	
Deepest well	Dutch Oil Co. "Howell" 1	Vagabond Oil "Howell" 1	30 5N 16W	SB	1,830		Castaic Miocene

POOL DATA

ITEM	UNNAMED					FIELD OR AREA DATA
Discovery date	June 1958					
Initial production rates						
Oil (bbl/day)	5					
Gas (Mcf/day)						
Flow pressure (psi)						
Bean size (in.)						
Initial reservoir pressure (psi)						
Reservoir temperature (°F)						
Initial oil content (STB/ac.-ft.)						
Initial gas content (MSCF/ac.-ft.)						
Formation	Saugus					
Geologic age	Pliocene					
Average depth (ft.)	600					
Average net thickness (ft.)	20					
Maximum productive area (acres)	10					
RESERVOIR ROCK PROPERTIES						
Porosity (%)						
S_{oi} (%)						
S_{wi} (%)						
S_{gi} (%)						
Permeability to air (md)						
RESERVOIR FLUID PROPERTIES						
Oil:						
Oil gravity (°API)	14					
Sulfur content (% by wt.)						
Initial solution GOR (SCF/STB)						
Initial oil FVF (RB/STB)						
Bubble point press. (psia)						
Viscosity (cp) @ °F						
Gas:						
Specific gravity (air = 1.0)						
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						
Date started						
Date discontinued						
Peak oil production (bbl)	195					
Year	1958					
Peak gas production, net (Mcf)						
Year						

Base of fresh water (ft.): 600

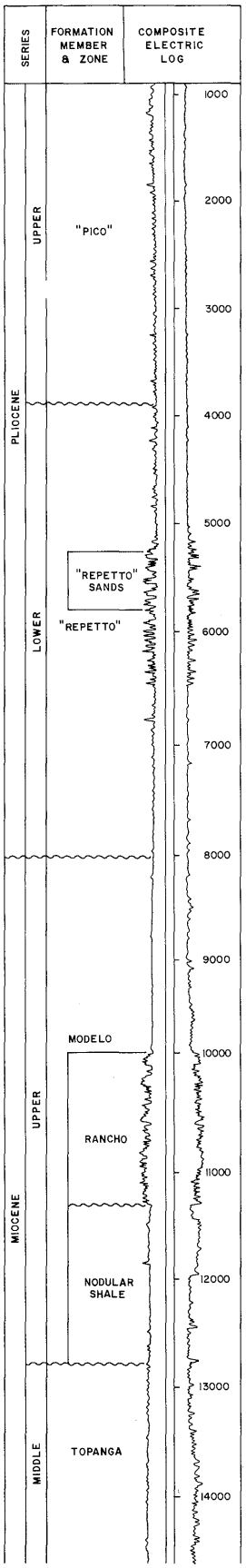
Remarks: Last production was in 1958. Field was abandoned in June 1963. Cumulative production is 195 bbl oil.

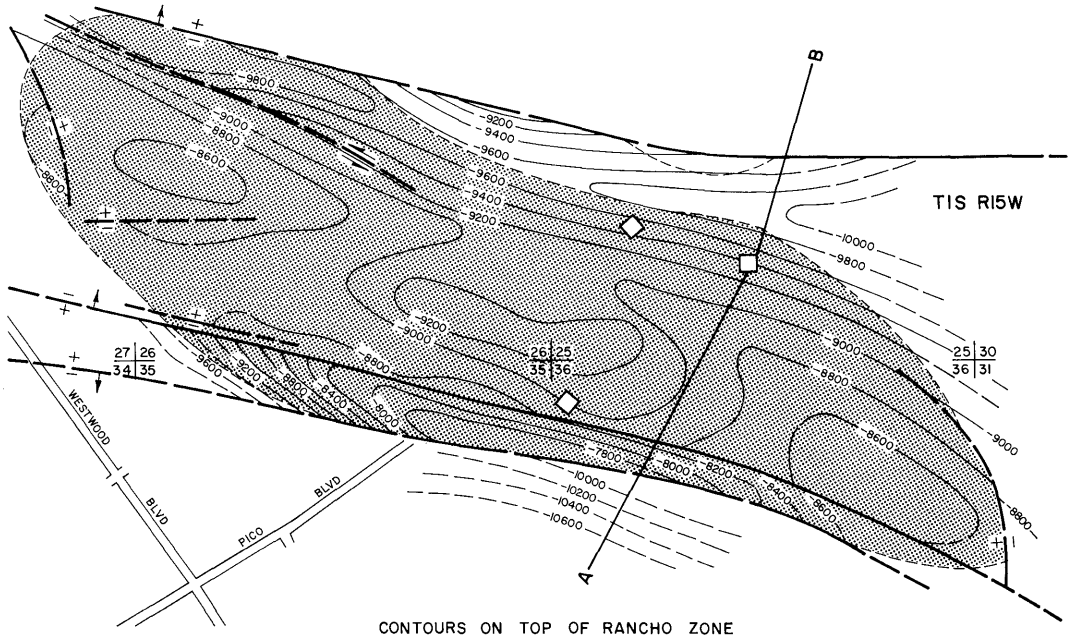
Selected References:

DATE: May 1983

CALIFORNIA DIVISION OF OIL AND GAS

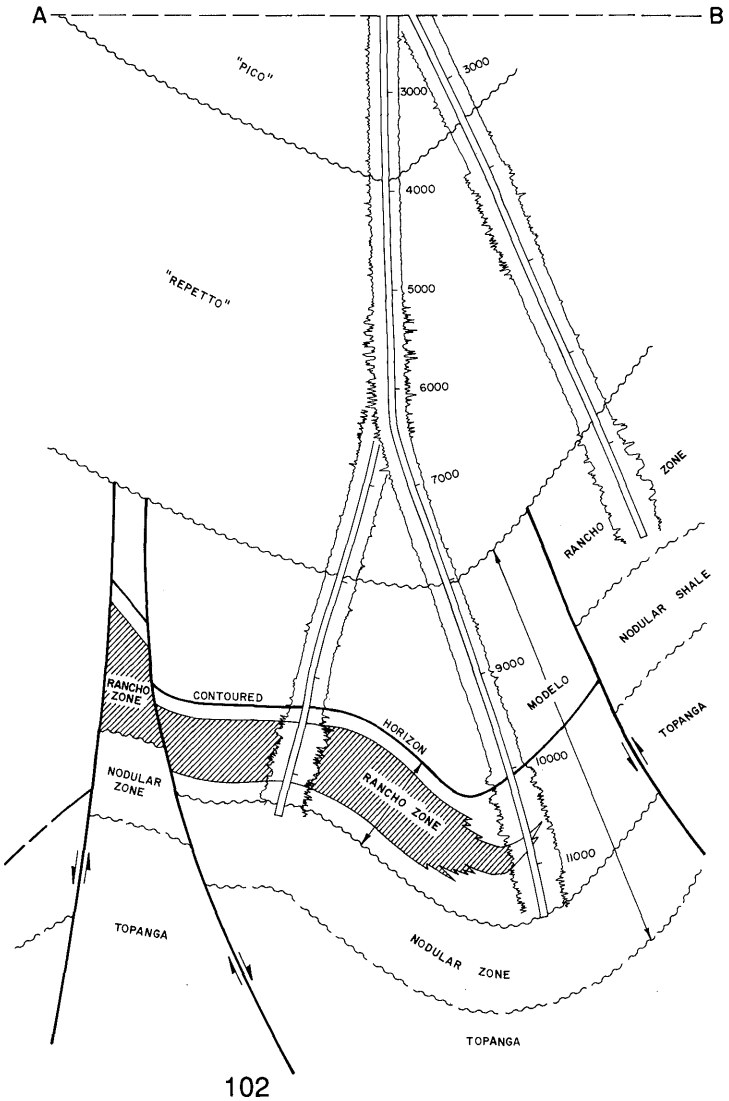
CHEVIOT HILLS OIL FIELD





CONTOURS ON TOP OF RANCHO ZONE

SCALE : 1" = 2400'



COUNTY: LOS ANGELES

CHEVIOT HILLS 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	Hillcrest Beverly Oil Corp. "Rancho Park" 1	Signal Oil and Gas Co. "Signal-Richfield-Rancho" 1	36 1S 15W	SB	12,688	Rancho	Topanga middle Miocene
Deepest well	Same as above	"	"	"	"	"	"

POOL DATA

ITEM	"REPETTO" SANDS	RANCHO	NODULAR SHALE	TOPANGA		FIELD OR AREA DATA
Discovery date	March 1964	September 1958	February 1976a/	July 1975a/		
Initial production rates						
Oil (bbl/day)	114	425	-	-		
Gas (Mcf/day)	-	3,200	-	-		
Flow pressure (psi)						
Bean size (in.)						
Initial reservoir pressure (psi)						
Reservoir temperature (°F)	180	260	-	-		
Initial oil content (STB/ac.-ft.)						
Initial gas content (MSCF/ac.-ft.)						
Formation	"Repetto"	Modelo	Modelo	Topanga		
Geologic age	early Pliocene	late Miocene	late Miocene	middle Miocene		
Average depth (ft.)	4,800	7,800-9,800	9,100	10,200		
Average net thickness (ft.)	250	550	-	-		
Maximum productive area (acres)						820
RESERVOIR ROCK PROPERTIES						
Porosity (%)	29	33	-	-		
So_i (%)	45	60	-	-		
Sw_i (%)	50	32	-	-		
Sg_i (%)	5	8	-	-		
Permeability to air (md)	250	16	-	-		
RESERVOIR FLUID PROPERTIES						
Oil:						
Oil gravity (°API)	22	27-36 & 50-60	-	-		
Sulfur content (% by wt.)						
Initial solution GOR (SCF/STB)	560	2,850-60,000	-	-		
Initial oil FVF (RB/STB)						
Bubble point press. (psia)						
Viscosity (cp) @ °F						
Gas:						
Specific gravity (air = 1.0)	0.700	0.765-0.755	-	-		
Heating value (Btu/cu. ft.)						
Water:						
Salinity, NaCl (ppm)						
T.D.S. (ppm)	25,700	15,100	-	-		
R_w (ohm/m) (77°F)						
ENHANCED RECOVERY PROJECTS						
Enhanced recovery projects						
Date started						
Date discontinued						
Peak oil production (bbl)						3,739,835
Year						1963
Peak gas production, net (Mcf)						21,365,330
Year						1963

Base of fresh water (ft.): 300-700

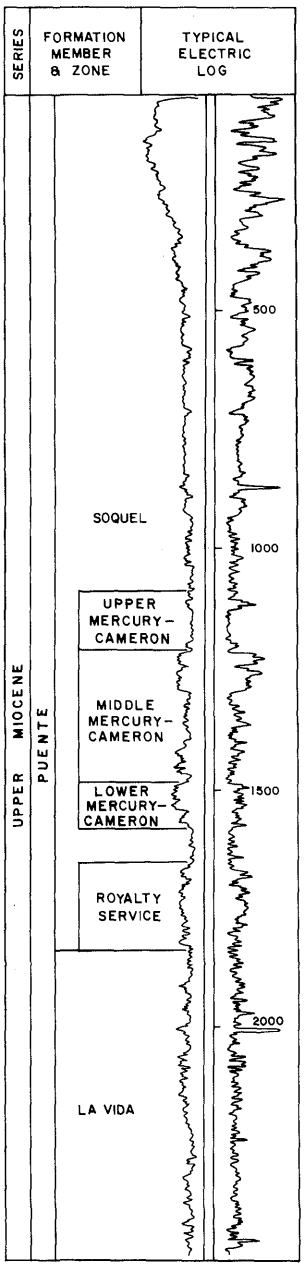
Remarks: All wells drilled from urban drill sites.
a/ Dates of recompletion. Commingled production test in February 1976 yielded 302 B/D oil (20.6 degree API gravity).

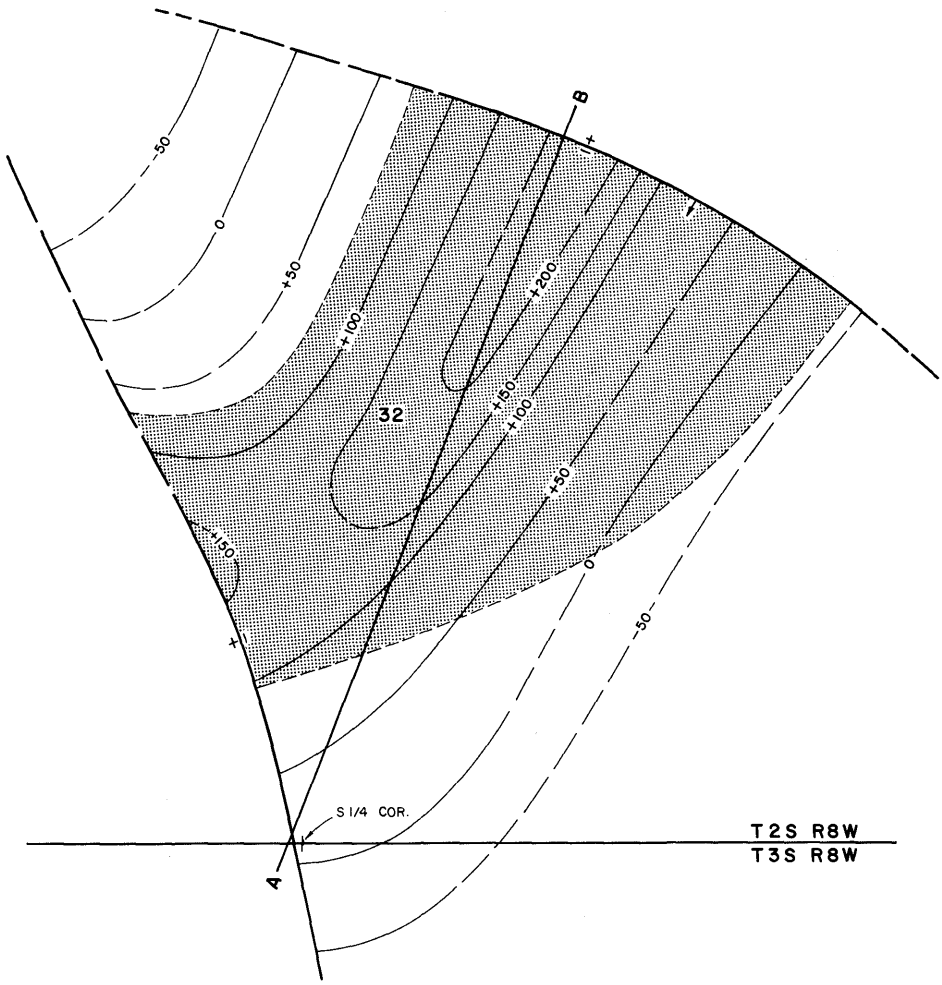
Selected References: Crowder, R.E., 1968, Cheviot Hills Oil Field: Calif. Div. of Oil and Gas, Summary of Operations -- Calif. Oil Fields, Vol. 54, No. 1.

DATE: June 1983

CALIFORNIA DIVISION OF OIL AND GAS

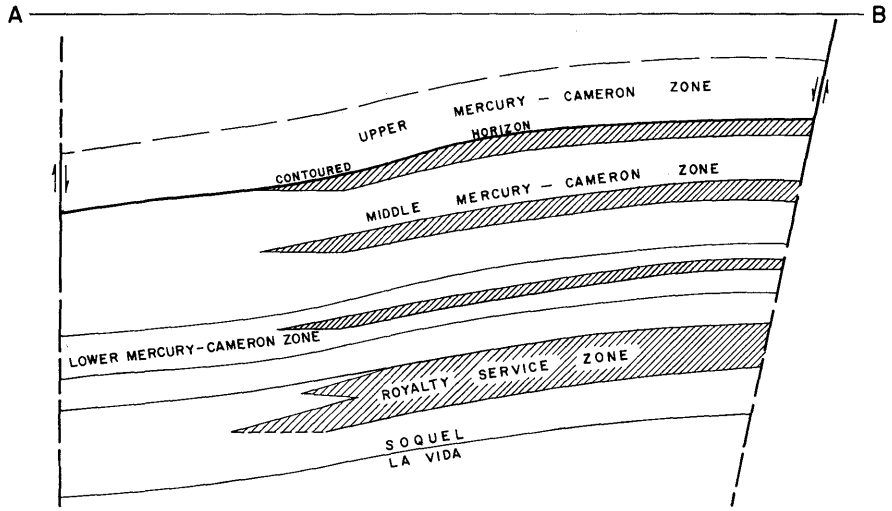
CHINO-SOQUEL OIL FIELD





CONTOURS ON TOP OF MIDDLE MERCURY-CAMERON ZONE

SCALE: 1" = 400'



COUNTY: SAN BERNARDINO

CHINO - SOQUEL 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	Chino Land and Water Co. No. 3	Jennings Bros. No. 3	32 2S 8W	SB	550	Upper Mercury-Cameron	
Deepest well	Pedersen, Pedersen, & Riggs "Roy. Ser." M-8	L.H. Cameron M-8	32 2S 8W	SB	2,463		Puente late Miocene

POOL DATA

ITEM	UPPER MERCURY-CAMERON	MIDDLE MERCURY-CAMERON	LOWER MERCURY-CAMERON	ROYALTY SERVICE		FIELD OR AREA DATA
Discovery date	1902	January 1949	January 1951	April 1950		
Initial production rates						
Oil (bbl/day)	15	6	80	11		
Gas (Mcf/day)						
Flow pressure (psi)						
Bean size (in.)						
Initial reservoir pressure (psi)						
Reservoir temperature (°F)						
Initial oil content (STB/ac.-ft.)						
Initial gas content (MSCF/ac.-ft.)						
Formation	Puente	Puente	Puente	Puente		
Geologic age	late Miocene	late Miocene	late Miocene	late Miocene		
Average depth (ft.)	1,100	1,300	1,700	1,800		
Average net thickness (ft.)	80	70	50	120		
Maximum productive area (acres)						35
RESERVOIR ROCK PROPERTIES						
Porosity (%)	28-32	28-32	28-32	-		
S_{oi} (%)						
S_{wi} (%)						
S_{gi} (%)						
Permeability to air (md)	300-1,000	300-1,000	300-1,000	-		
RESERVOIR FLUID PROPERTIES						
Oil:						
Oil gravity (°API)	24	18-23	18-23	18-23		
Sulfur content (% by wt.)						
Initial solution GOR (SCF/STB)						
Initial oil FVF (RB/STB)						
Bubble point press. (psia)						
Viscosity (cp) @ °F						
Gas:						
Specific gravity (air = 1.0)						
Heating value (Btu/cu. ft.)						
Water:						
Salinity, NaCl (ppm)	17,100	17,100	17,100	17,100		
T.D.S. (ppm)						
R_w (ohm/m) (77°F)						
ENHANCED RECOVERY PROJECTS						
Enhanced recovery projects						
Date started						
Date discontinued						
Peak oil production (bbl)						23,112
Year						1952
Peak gas production, net (Mcf)						
Year						

Base of fresh water (ft.): 700

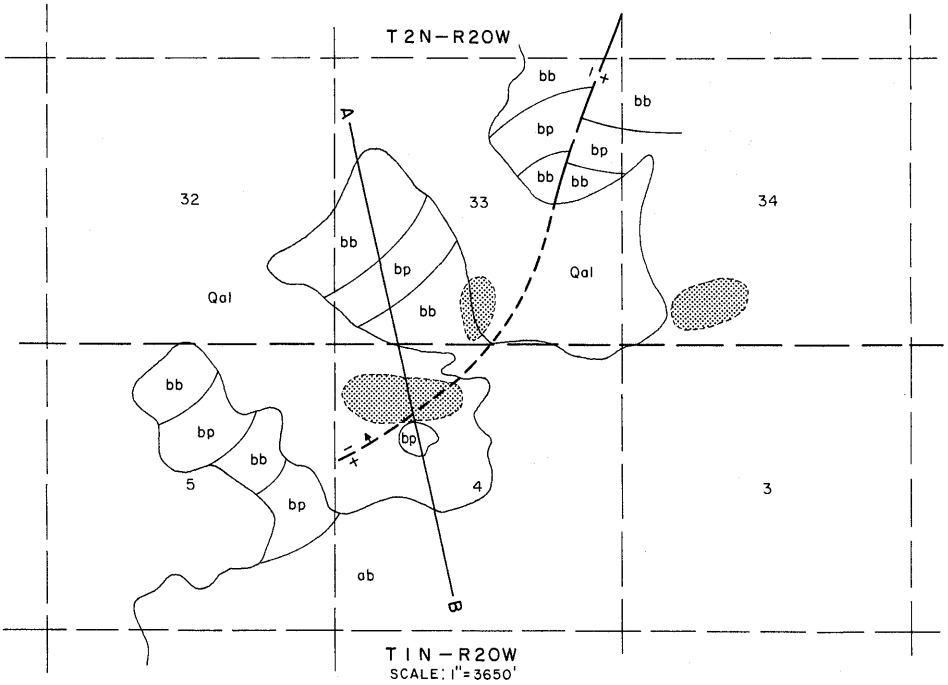
Remarks:

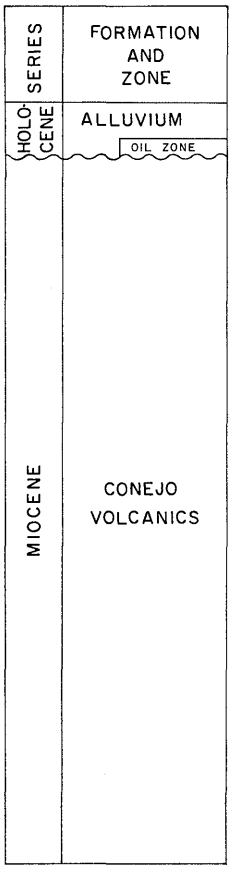
Selected References: Gaede, V., and M. Dosch, 1955, Oil and Gas Development in San Bernardino County: Calif. Div. of Oil and Gas, Summary of Operations -- Calif. Oil Fields, Vol. 41, No. 2.

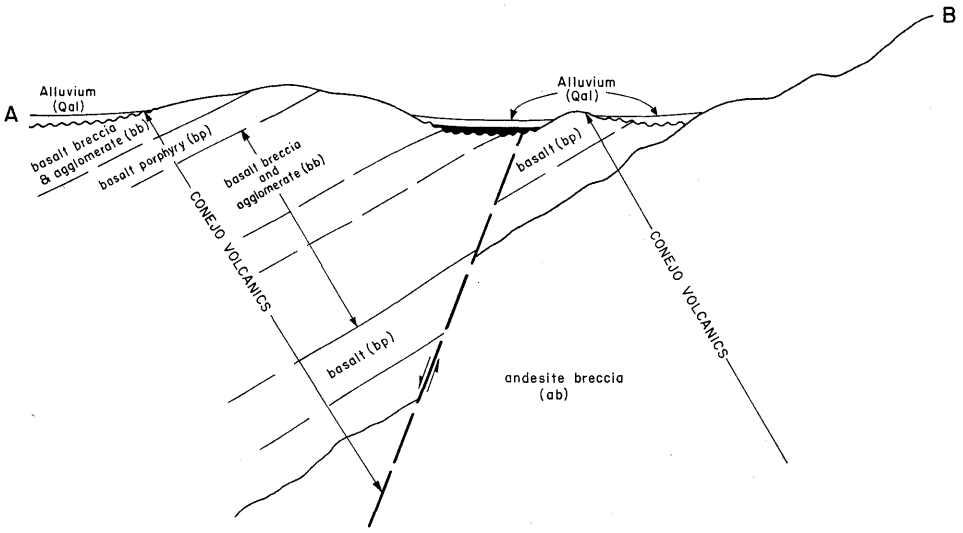
DATE: July 1983

CALIFORNIA DIVISION OF OIL AND GAS

CONEJO OIL FIELD
(Abandoned)







COUNTY: VENTURA

CONEJO OIL FIELD (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	Union Oil Co. of Calif. "Calleguas" 1	unknown	33 2N 20W	SB	unk.	unnamed	
Deepest well	ARCO Oil and Gas Co. "Camarillo" 1	Richfield Oil Corp. "Camarillo" 1	32 2N 20W	SB	11,002		Sespe Oligocene

POOL DATA

ITEM	UNNAMED					FIELD OR AREA DATA
Discovery date	1892					
Initial production rates						
Oil (bbl/day)						
Gas (Mcf/day)						
Flow pressure (psi)						
Bean size (in.)						
Initial reservoir pressure (psi)						
Reservoir temperature (°F)						
Initial oil content (STB/ac.-ft.)						
Initial gas content (MSCF/ac.-ft.)						
Formation	Alluvium					
Geologic age	Holocene					
Average depth (ft.)	150					
Average net thickness (ft.)	90					
Maximum productive area (acres)	90					
RESERVOIR ROCK PROPERTIES						
Porosity (%)						
So_i (%)						
Sw_i (%)						
Sg_i (%)						
Permeability to air (md)						
RESERVOIR FLUID PROPERTIES						
Oil:						
Oil gravity (°API)	18					
Sulfur content (% by wt.)						
Initial solution GOR (SCF/STB)						
Initial oil FVF (RB/STB)						
Bubble point press. (psia)						
Viscosity (cp) @ °F						
Gas:						
Specific gravity (air = 1.0)						
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						
Date started						
Date discontinued						
Peak oil production (bbl)	2,095					
Year	1953					
Peak gas production, net (Mcf)						
Year						

Base of fresh water (ft.): 2,650

Remarks: Early pumping was by windmill. Drilling was done by spring pole, cable tools, and rotary equipment. The field was abandoned in 1971. Cumulative production is 110,083 bbl of oil and 12,000 Mcf of gas.

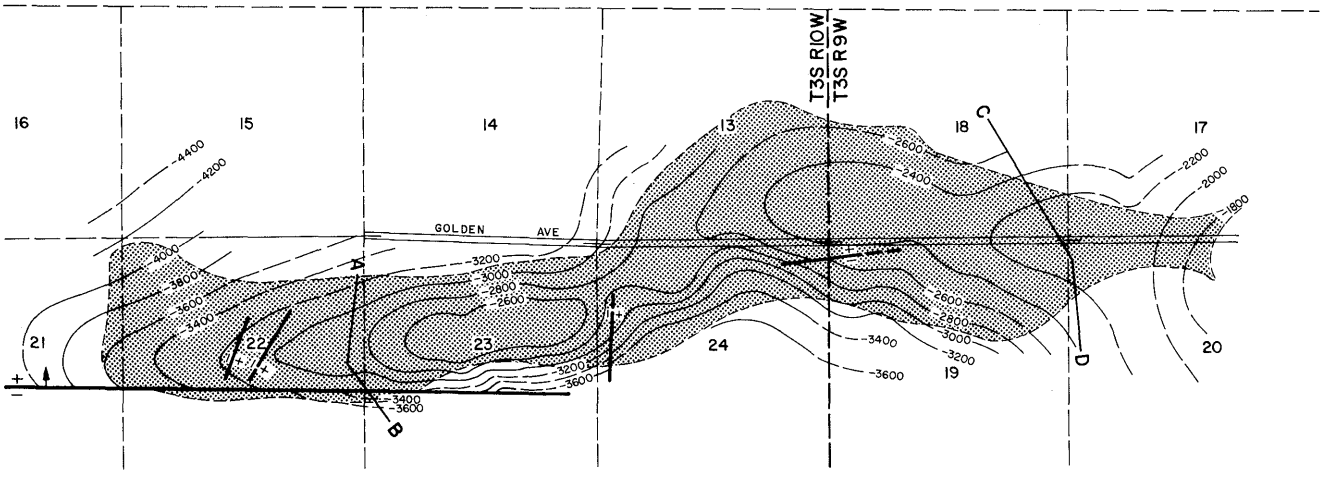
Selected References:

Renke, D.F., 1957, Geology of a Part of the Newbury Park Quadrangle, Ventura County; unpublished thesis, University of California at Los Angeles.

DATE: May 1983

CALIFORNIA DIVISION OF OIL AND GAS

EAST COYOTE OIL FIELD



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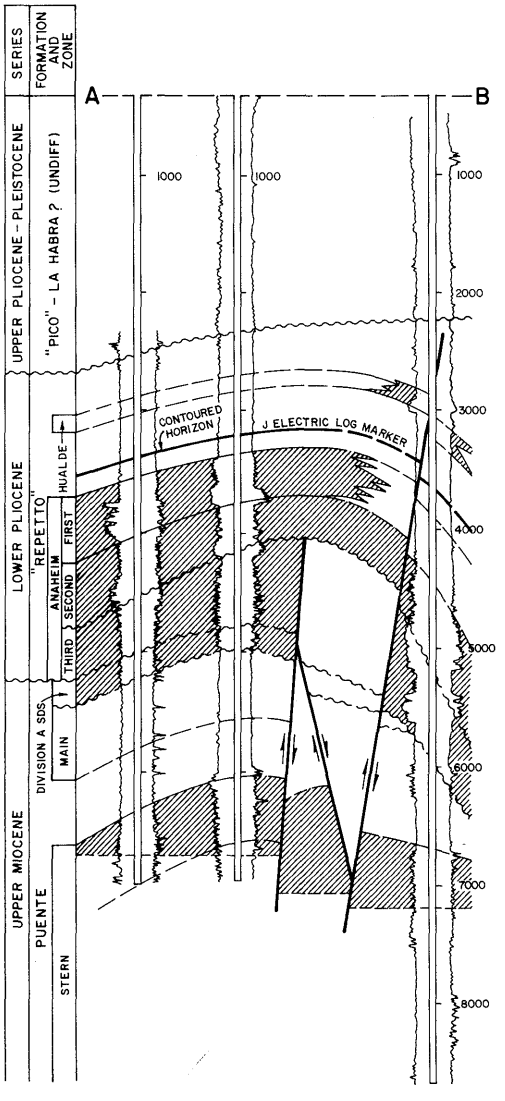
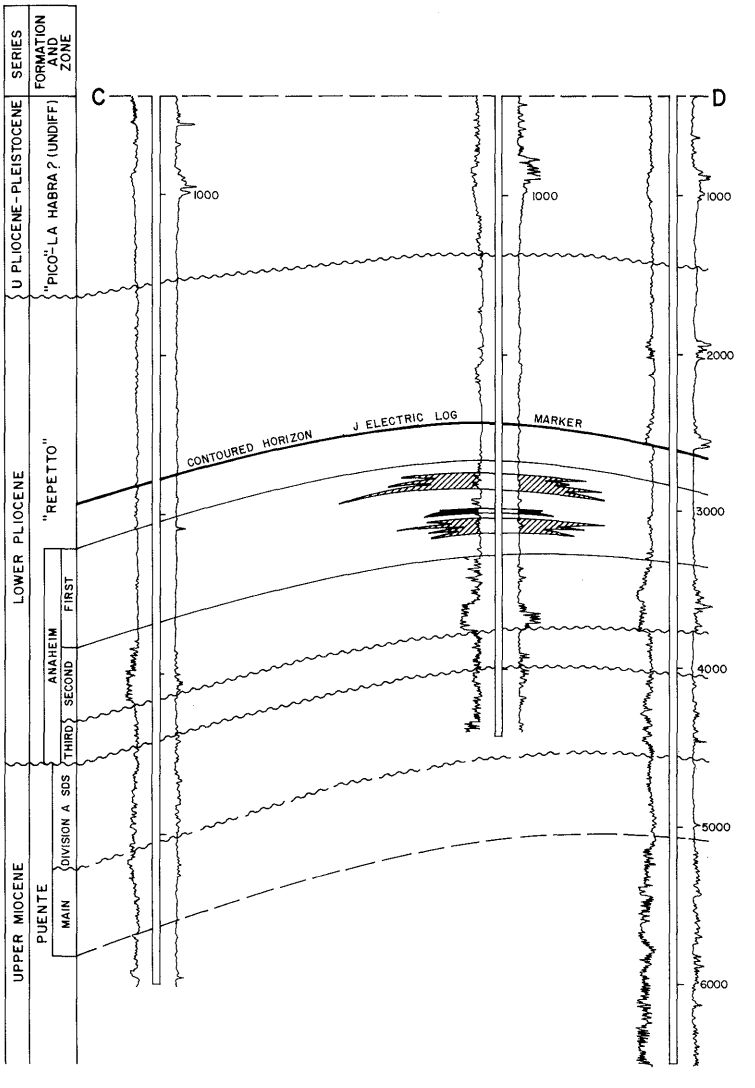




COUNTY: **ORANGE**

COYOTE, EAST, 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	Texaco Producing Inc. "Anaheim" 1	Amalgamated Oil Co. "Anaheim" 1	13 3S 10W	SB	3,353	Hualde	
Deepest well	ARCO Oil and Gas Co. "Edwards" 1	Atlantic Richfield Co. "Edwards" 1	15 3S 10W	SB	9,591		Puente Miocene

POOL DATA

ITEM	HUALDE	1ST ANAHEIM	2ND ANAHEIM	3RD ANAHEIM	DIVISION "A" SANDS	FIELD OR AREA DATA
Discovery date	November 1909	November 1909	January 1913	November 1930	1927	
Initial production rates						
Oil (bbl/day)	700a/	a/	30	90	240	
Gas (Mcf/day)	-	-	-	-	15,000	
Flow pressure (psi)						
Bean size (in.)						
Initial reservoir pressure (psi)						
Reservoir temperature (°F)	115	128	135	150	160	
Initial oil content (STB/ac.-ft.)						
Initial gas content (MSCF/ac.-ft.)						
Formation	"Repetto"	"Repetto"	"Repetto"	"Repetto"	Puente	
Geologic age	early Pliocene	early Pliocene	early Pliocene	early Pliocene	late Miocene	
Average depth (ft.)	2,500	3,100	3,400	4,000	4,600	
Average net thickness (ft.)	50	200	200	250	100	
Maximum productive area (acres)						
RESERVOIR ROCK PROPERTIES						
Porosity (%)	30	28	26	24	22	
So_i (%)						
Sw_i (%)						
Sg_i (%)						
Permeability to air (md)	1,440	840	-	71	52	
RESERVOIR FLUID PROPERTIES						
Oil:						
Oil gravity (°API)	17-20	16-25	16-25	17-27	25	
Sulfur content (% by wt.)	1.80	0.95	0.95	0.95	-	
Initial solution GOR (SCF/STB)						
Initial oil FVF (RB/STB)						
Bubble point press. (psia)	-	7 @ 70	5 @ 70	5 @ 70	5 @ 70	
Viscosity (cp) @ °F						
Gas:						
Specific gravity (air = 1.0)	0.8	0.8	-	-	-	
Heating value (Btu/cu. ft.)						
Water:						
Salinity, NaCl (ppm)	-	10,956	10,956	10,956	17,118	
T.D.S. (ppm)						
R_w (ohm/m) (77°F)	1.40	0.55	0.47	0.47	0.34	
ENHANCED RECOVERY PROJECTS						
Enhanced recovery projects	waterflood	waterflood				
Date started	1975	1969				
Date discontinued	active	active				
	$WAG-CO_2$	$WAG-CO_2$				
	1983	1983				
	active	active				
Peak oil production (bbl)						
Year						
Peak gas production, net (Mcf)						
Year						

Base of fresh water (ft.): 50-1,250

Remarks: a/ Production commingled.

Selected References: Ybarra, R.A., M.W. Dosch and A.D. Stockton, 1960, East Coyote Oil Field: Calif. Div. of Oil and Gas, Summary of Operations -- Calif. Oil Fields, Vol. 46, No. 1.

DATE: May 1991

CALIFORNIA DIVISION OF OIL AND GAS

COUNTY: ORANGE

COYOTE, EAST, 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	MAIN	STERN				FIELD OR AREA DATA
Discovery date	unknown	December 1939				
Initial production rates						
Oil (bbl/day)	-	281				
Gas (Mcf/day)						
Flow pressure (psi)						
Bean size (in.)						
Initial reservoir pressure (psi)						
Reservoir temperature (°F)	-	165				
Initial oil content (STB/ac.-ft.)						
Initial gas content (MSCF/ac.-ft.)						
Formation	Puente	Puente				
Geologic age	late Miocene	late Miocene				
Average depth (ft.)	5,000	5,500				
Average net thickness (ft.)	300	400				
Maximum productive area (acres)						1,505
RESERVOIR ROCK PROPERTIES						
Porosity (%)	-	20				
So_i (%)						
Sw_i (%)						
Sg_i (%)						
Permeability to air (md)	-	34				
RESERVOIR FLUID PROPERTIES						
Oil:						
Oil gravity (°API)	25	23				
Sulfur content (% by wt.)	-	1-44				
Initial solution GOR (SCF/STB)						
Initial oil FVF (RB/STB)						
Bubble point press. (psia)						
Viscosity (cp) @ °F	-	6 @ 70				
Gas:						
Specific gravity (air = 1.0)						
Heating value (Btu/cu. ft.)						
Water:						
Salinity, NaCl (ppm)	17,118	20,542				
T.D.S. (ppm)						
R_w (ohm/m) (77°F)	-	0.40				
ENHANCED RECOVERY PROJECTS						
Enhanced recovery projects		waterflood				
Date started		1968				
Date discontinued		active				
		WAG-CO_2				
		1983				
		active				
Peak oil production (bbl)						2,727,018
Year						1952
Peak gas production, net (Mcf)						
Year						

Base of fresh water (ft.):

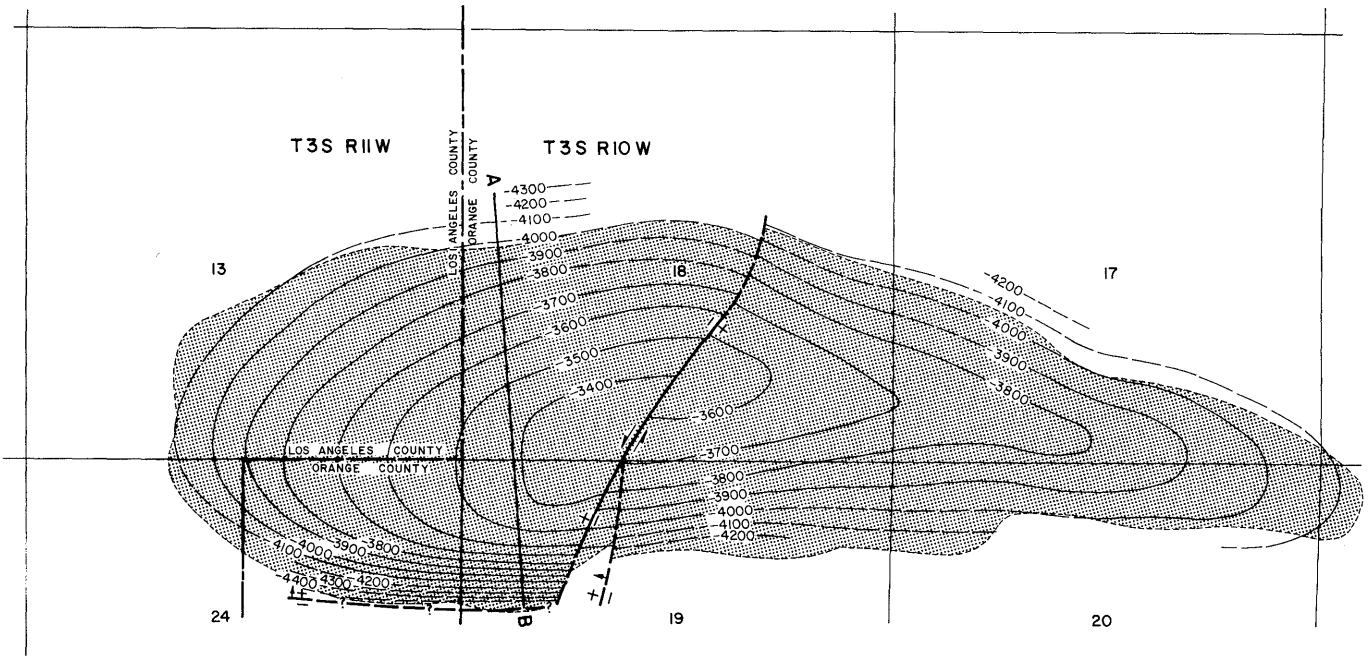
Remarks:

Selected References:

DATE: May 1991

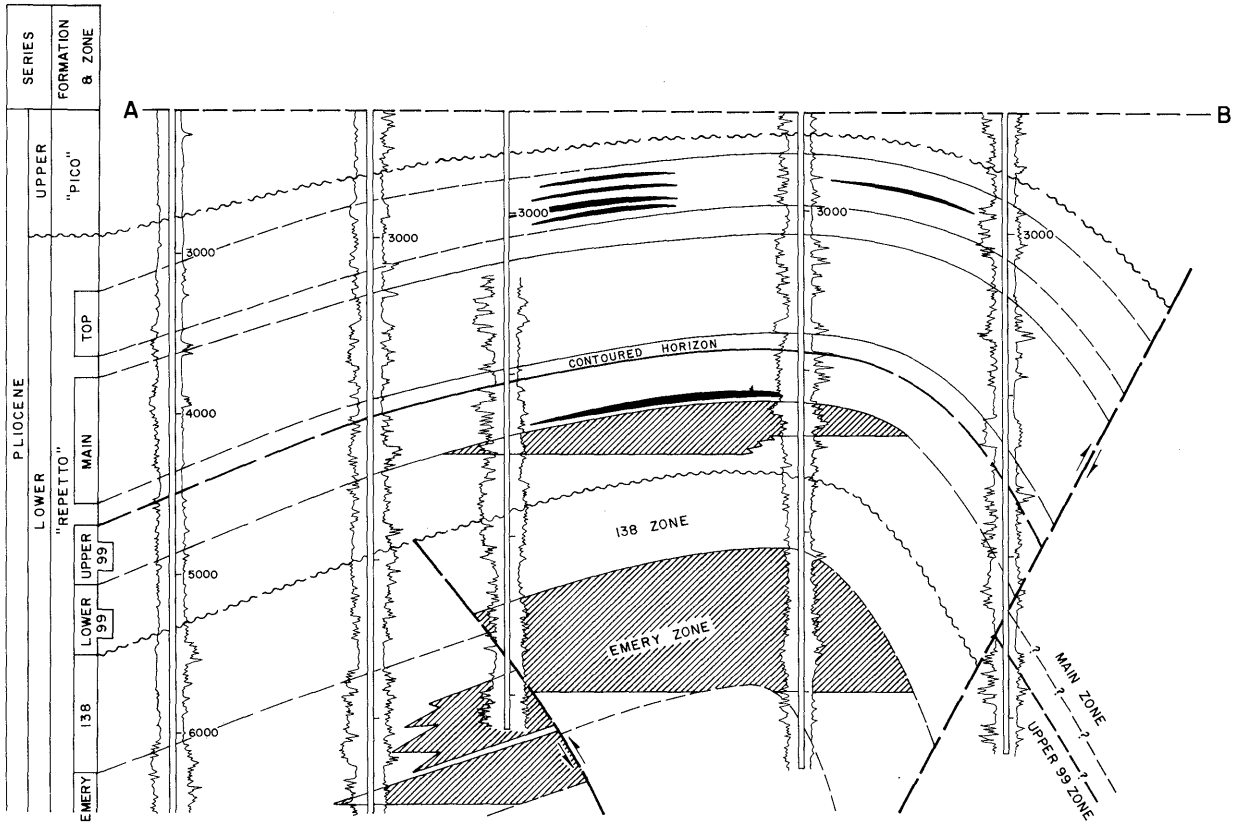
CALIFORNIA DIVISION OF OIL AND GAS

WEST COYOTE OIL FIELD



CONTOURS ON TOP OF UPPER 99 ZONE

SCALE: 1" = 3000'



COUNTY: LOS ANGELES AND ORANGE

COYOTE, WEST, 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	Chevron U.S.A. Inc. "Murphy-Coyote" 3	Murphy Oil Co. "Coyote" 3	17 3S 10W	SB	3,756	Main	
Deepest well	Chevron U.S.A. Inc. "Emery" 92	Standard Oil Co. of Calif. "Emery" 92	13 3S 11W	SB	12,048		Topanga middle Miocene

POOL DATA

ITEM	TOP	MAIN	UPPER 99	LOWER 99	138	FIELD OR AREA DATA
Discovery date	July 1918	April 1909	May 1924	June 1947	June 1947	
Initial production rates						
Oil (bbl/day)	380	-	1,084a/	a/	318a/	
Gas (Mcf/day)	-	-	-	-	30T	
Flow pressure (psi)						
Bean size (in.)						
Initial reservoir pressure (psi)						
Reservoir temperature (°F)						
Initial oil content (STB/ac.-ft.)						
Initial gas content (MSCF/ac.-ft.)						
Formation	"Repetto"	"Repetto"	"Repetto"	"Repetto"	"Repetto"	
Geologic age	e Pliocene	e Pliocene	e Pliocene	e Pliocene	e Pliocene	
Average depth (ft.)	2,900	3,300	4,100	4,400	4,900	
Average net thickness (ft.)	125	800	300	350	250	
Maximum productive area (acres)						
RESERVOIR ROCK PROPERTIES						
Porosity (%)	-	26-30	25-27	23-25	-	
S_{oi} (%)	-	69	72	60	-	
S_{wi} (%)	-	31	28	40	-	
S_{gi} (%)						
Permeability to air (md)	-	300-800	350-450	180-320	-	
RESERVOIR FLUID PROPERTIES						
Oil:						
Oil gravity (°API)	19	26-30	24-34	29	23-28	
Sulfur content (% by wt.)	-	-	1.60	1.21	0.82	
Initial solution GOR (SCF/STB)						
Initial oil FVF (RB/STB)						
Bubble point press. (psia)						
Viscosity (cp) @ °F						
Gas:						
Specific gravity (air = 1.0)						
Heating value (Btu/cu. ft.)						
Water:						
Salinity, NaCl (ppm)		13,010	13,010	13,010	17,118	
T.D.S. (ppm)						
R_w (ohm/m) (77°F)						
ENHANCED RECOVERY PROJECTS						
Enhanced recovery projects		waterflood	gas injection	waterflood	waterflood	
Date started		1952	1945	1952	1965	
Date discontinued		active	1962 waterflood 1952 active	active	active	
Peak oil production (bbl)						
Year						
Peak gas production, net (Mcf)						
Year						

Base of fresh water (ft.): 150-350

Remarks: a/ Production commingled.

Selected References: Mefferd, M.G., and S. Cordova, 1962, West Coyote Oil Field: Calif. Div. of Oil and Gas, Summary of Operations -- Calif. Oil Fields, Vol. 48, No. 1.

DATE: August 1983

CALIFORNIA DIVISION OF OIL AND GAS

COUNTY: LOS ANGELES AND ORANGE

COYOTE, WEST, 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	EMERY					FIELD OR AREA DATA
Discovery date	March 1930					
Initial production rates						
Oil (bbl/day)	1,500					
Gas (Mcf/day)	660					
Flow pressure (psi)						
Bean size (in.)						
Initial reservoir pressure (psi)						
Reservoir temperature (°F)						
Initial oil content (STB/ac.-ft.)						
Initial gas content (MSCF/ac.-ft.)						
Formation	"Repetto"					
Geologic age	early Pliocene					
Average depth (ft.)	5,500					
Average net thickness (ft.)	500					
Maximum productive area (acres)						1,125
RESERVOIR ROCK PROPERTIES						
Porosity (%)	20					
So_i (%)	65					
Sw_i (%)	35					
Sg_i (%)						
Permeability to air (md)	5-800					
RESERVOIR FLUID PROPERTIES						
Oil:						
Oil gravity (°API)	30-35					
Sulfur content (% by wt.)	1.21					
Initial solution GOR (SCF/STB)						
Initial oil FVF (RB/STB)						
Bubble point press. (psia)						
Viscosity (cp) @ °F						
Gas:						
Specific gravity (air = 1.0)						
Heating value (Btu/cu. ft.)						
Water:						
Salinity, NaCl (ppm)	28,502					
T.D.S. (ppm)						
R_w (ohm/m) (77°F)						
ENHANCED RECOVERY PROJECTS						
Enhanced recovery projects	gas injection					
Date started	1949					
Date discontinued	1967					
	waterflood					
	1959					
	active					
Peak oil production (bbl)						9,703,296
Year						1918
Peak gas production, net (Mcf)						17,585,060
Year						1948

Base of fresh water (ft.):

Remarks:

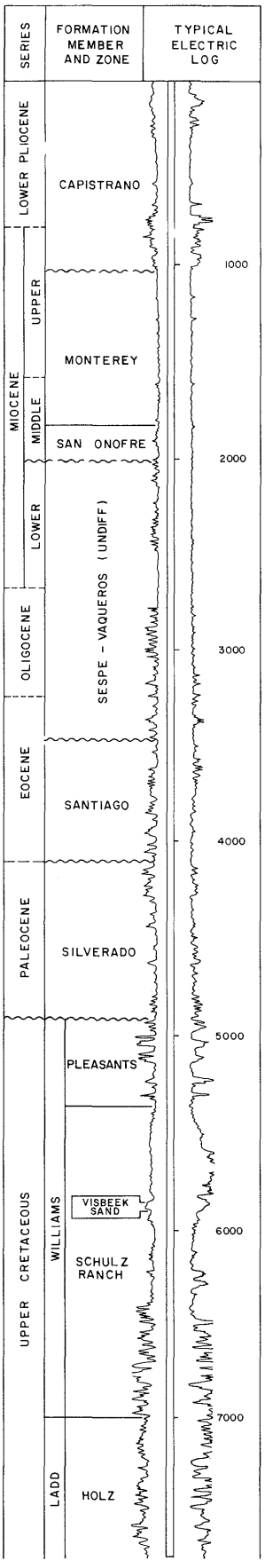
Selected References:

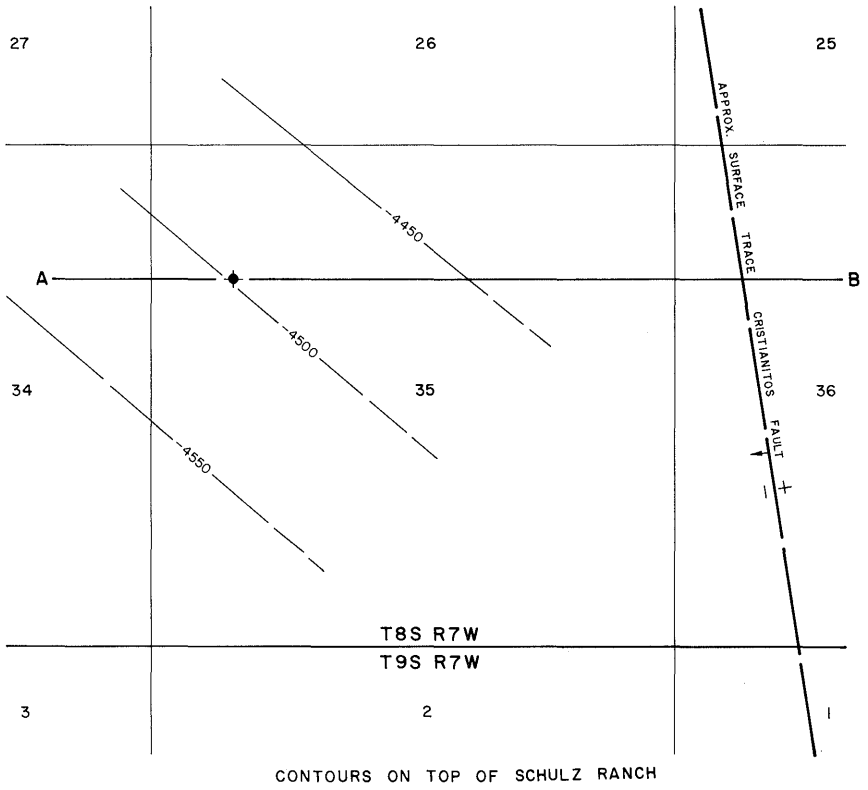
DATE: August 1983

CALIFORNIA DIVISION OF OIL AND GAS

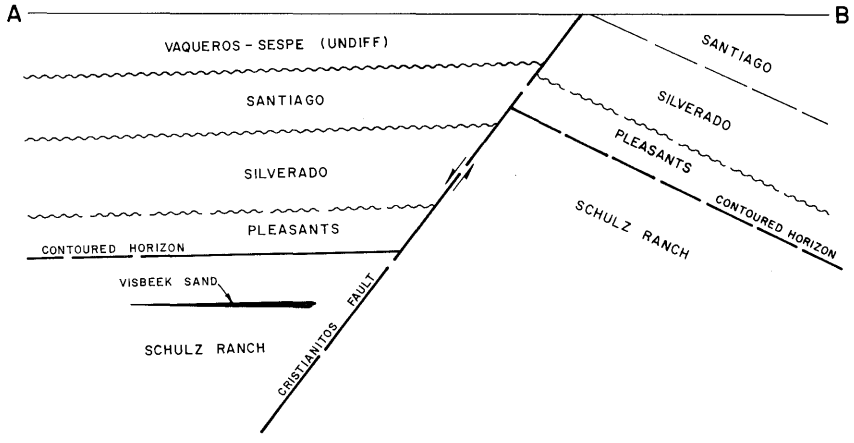
CRISTIANITOS CREEK OIL FIELD

(Abandoned)





CONTOURS ON TOP OF SCHULZ RANCH



COUNTY: ORANGE

CRISTIANITOS CREEK OIL FIELD (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	Exxon Corp. "Roy Visbeek et al" 1	Humble Oil & Refining Co. "Clarence C. Reed et al" 1	35 8S 7W	SB	7,992	Visbeek sand	Williams Late Cretaceous
Deepest well	Same as above	"	"	"	"	"	"

POOL DATA

ITEM	VISBEEK SAND					FIELD OR AREA DATA
Discovery date	October 1959					
Initial production rates						
Oil (bbl/day)	52					
Gas (Mcf/day)	105					
Flow pressure (psi)	40					
Bean size (in.)	3/8					
Initial reservoir pressure (psi)						
Reservoir temperature (°F)	184					
Initial oil content (STB/ac.-ft.)						
Initial gas content (MSCF/ac.-ft.)						
Formation	Williams					
Geologic age	Late Cretaceous					
Average depth (ft.)	5,860					
Average net thickness (ft.)	30					
Maximum productive area (acres)	10					
RESERVOIR ROCK PROPERTIES						
Porosity (%)						
So_i (%)						
Sw_i (%)						
Sg_i (%)						
Permeability to air (md)						
RESERVOIR FLUID PROPERTIES						
Oil:						
Oil gravity (°API)	54.8					
Sulfur content (% by wt.)						
Initial solution GOR (SCF/STB)	2,010					
Initial oil FVF (RB/STB)						
Bubble point press. (psia)						
Viscosity (cp) @ °F						
Gas:						
Specific gravity (air = 1.0)						
Heating value (Btu/cu. ft.)						
Water:						
Salinity, NaCl (ppm)	3,200					
T.D.S. (ppm)						
R_w (ohm/m) (77°F)	1.95					
ENHANCED RECOVERY PROJECTS						
Enhanced recovery projects						
Date started						
Date discontinued						
Peak oil production (bbl)	2,134					
Year	1959					
Peak gas production, net (Mcf)	5,275					
Year	1959					

Base of fresh water (ft.): 900

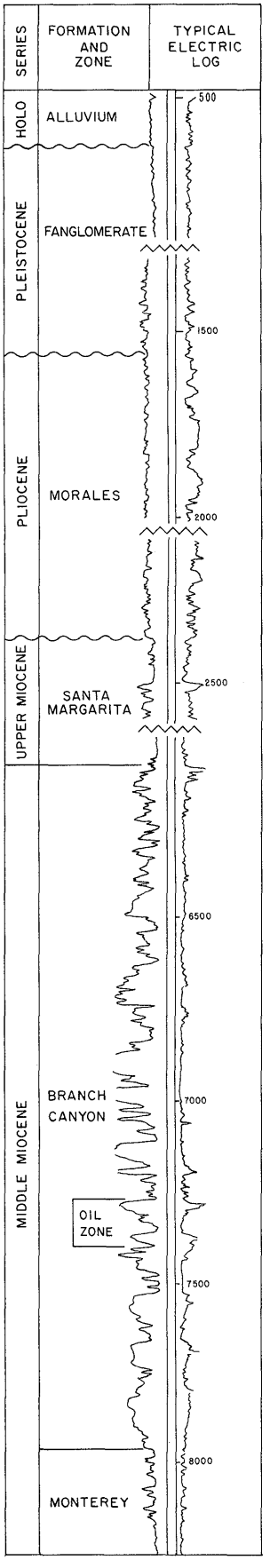
Remarks: Last production was in April 1960. The field was abandoned in 1960. Cumulative production is 3,000 bbl of oil and 11,000 Mcf of gas.

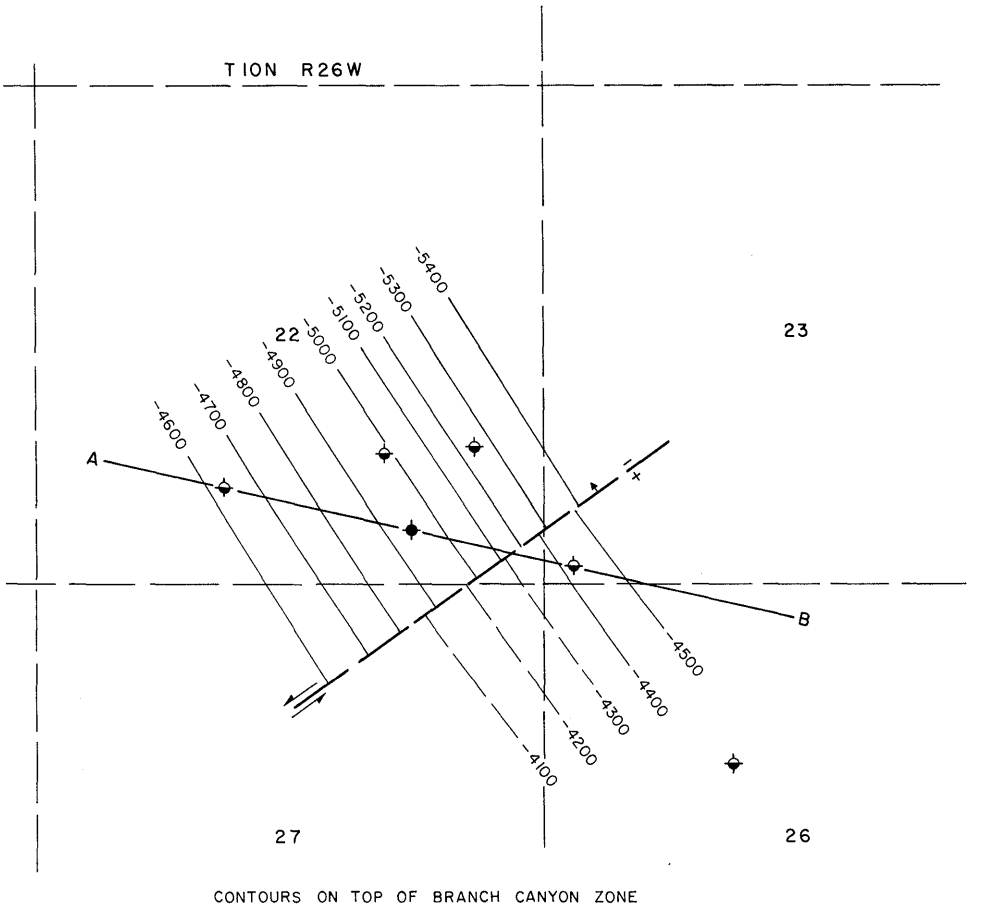
Selected References:

DATE: January 1989

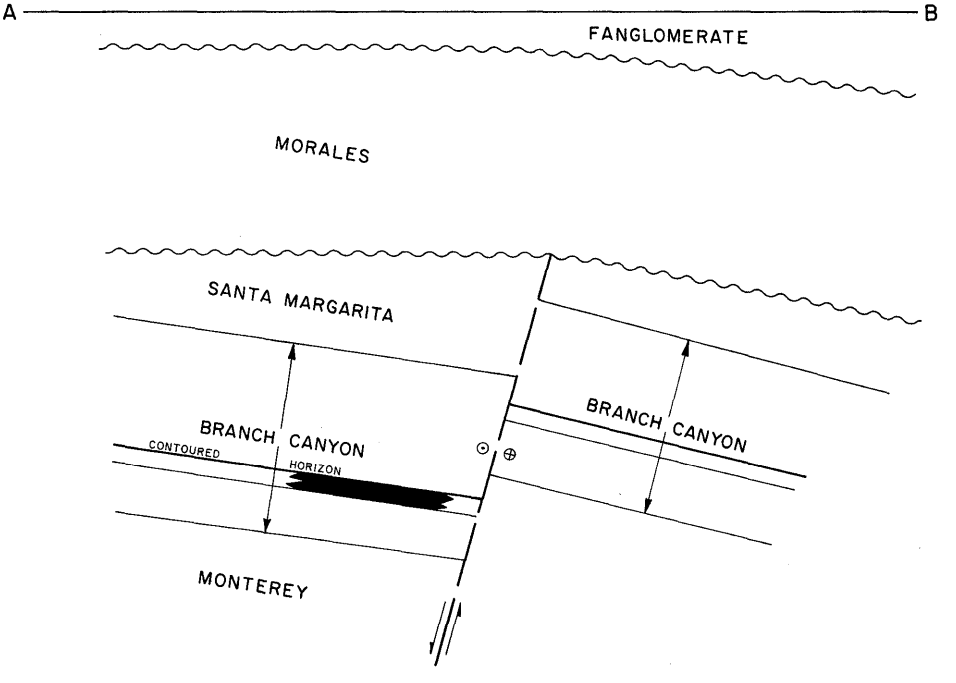
CALIFORNIA DIVISION OF OIL AND GAS

CENTRAL CUYAMA OIL FIELD
(Abandoned)





CONTOURS ON TOP OF BRANCH CANYON ZONE



COUNTY: SANTA BARBARA

CUYAMA, CENTRAL, OIL FIELD (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	ARCO Oil and Gas Co. "Seaboard-Richfield-Kirschenmann" 78-22	Seaboard Oil Co. of Delaware "Seaboard-Richfield-Kirschenmann" 78-22	22 10N 26W	SB	10,097	Branch Canyon	Painted Rock early Miocene
Deepest well	Same as above	"	"	"	"	"	"

POOL DATA

ITEM	BRANCH CANYON					FIELD OR AREA DATA
Discovery date	May 1951					
Initial production rates						
Oil (bbl/day)	131					
Gas (Mcf/day)	trace					
Flow pressure (psi)						
Bean size (in.)						
Initial reservoir pressure (psi)	1,728					
Reservoir temperature (°F)	188					
Initial oil content (STB/ac.-ft.)						
Initial gas content (MSCF/ac.-ft.)						
Formation	Branch Canyon					
Geologic age	middle Miocene					
Average depth (ft.)	7,270					
Average net thickness (ft.)	45					
Maximum productive area (acres)	10					
RESERVOIR ROCK PROPERTIES						
Porosity (%)	19**					
S_{oi} (%)	55**					
S_{wi} (%)	45**					
S_{gi} (%)						
Permeability to air (md)						
RESERVOIR FLUID PROPERTIES						
Oil:						
Oil gravity (°API)	46					
Sulfur content (% by wt.)						
Initial solution GOR (SCF/STB)						
Initial oil FVF (RB/STB)						
Bubble point press. (psia)						
Viscosity (cp) @ °F						
Gas:						
Specific gravity (air = 1.0)						
Heating value (Btu/cu. ft.)						
Water:						
Salinity, NaCl (ppm)	20,970†					
T.D.S. (ppm)						
R_w (ohm/m) (77°F)	0.28					
ENHANCED RECOVERY PROJECTS						
Enhanced recovery projects						
Date started						
Date discontinued						
Peak oil production (bbl)	6,752					
Year	1951					
Peak gas production, net (Mcf)						
Year						

Base of fresh water (ft.): 4,580

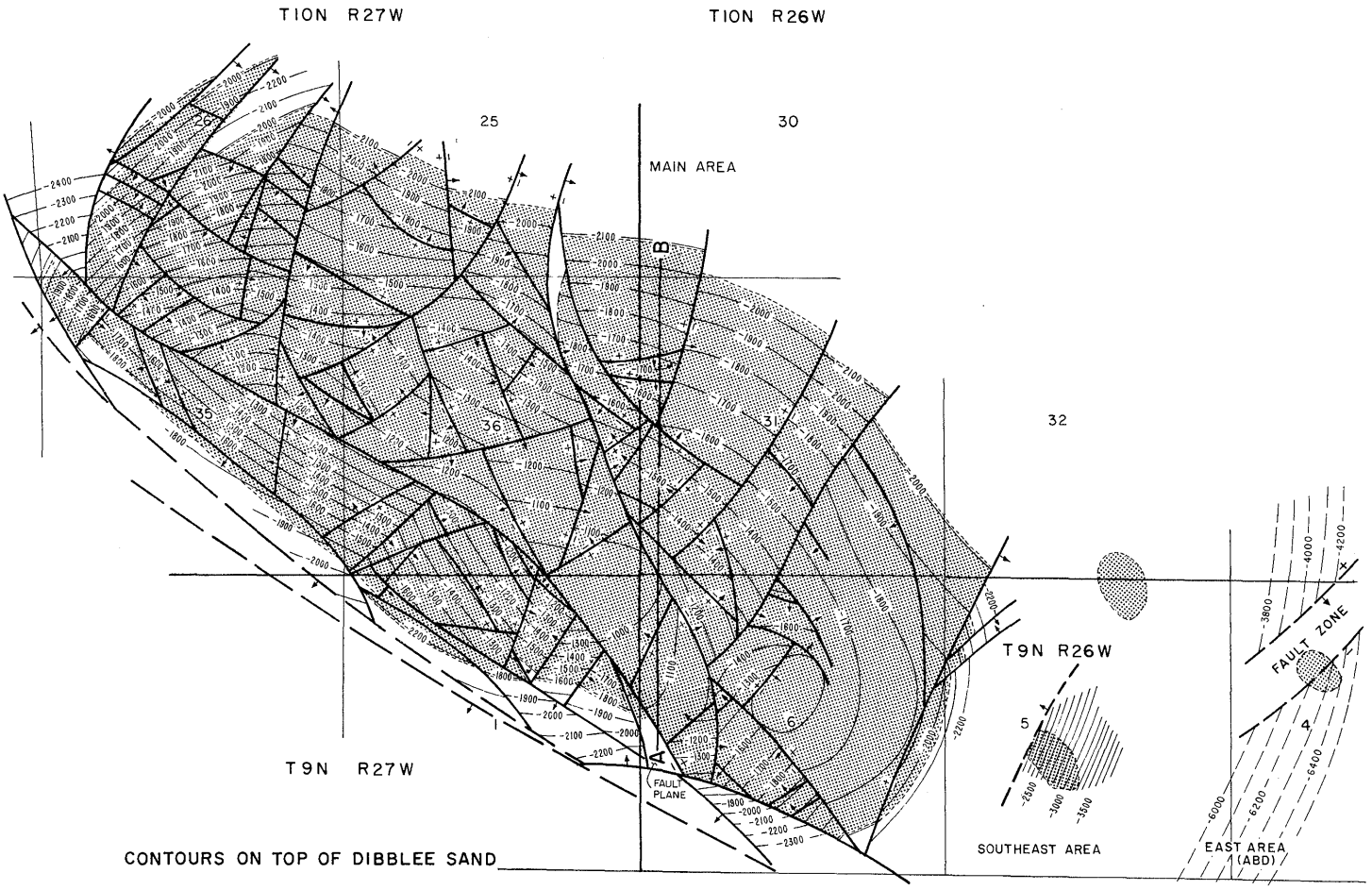
Remarks: The field was abandoned in 1958. Cumulative production is 33,000 bbl of oil and 12,000 Mcf of gas.

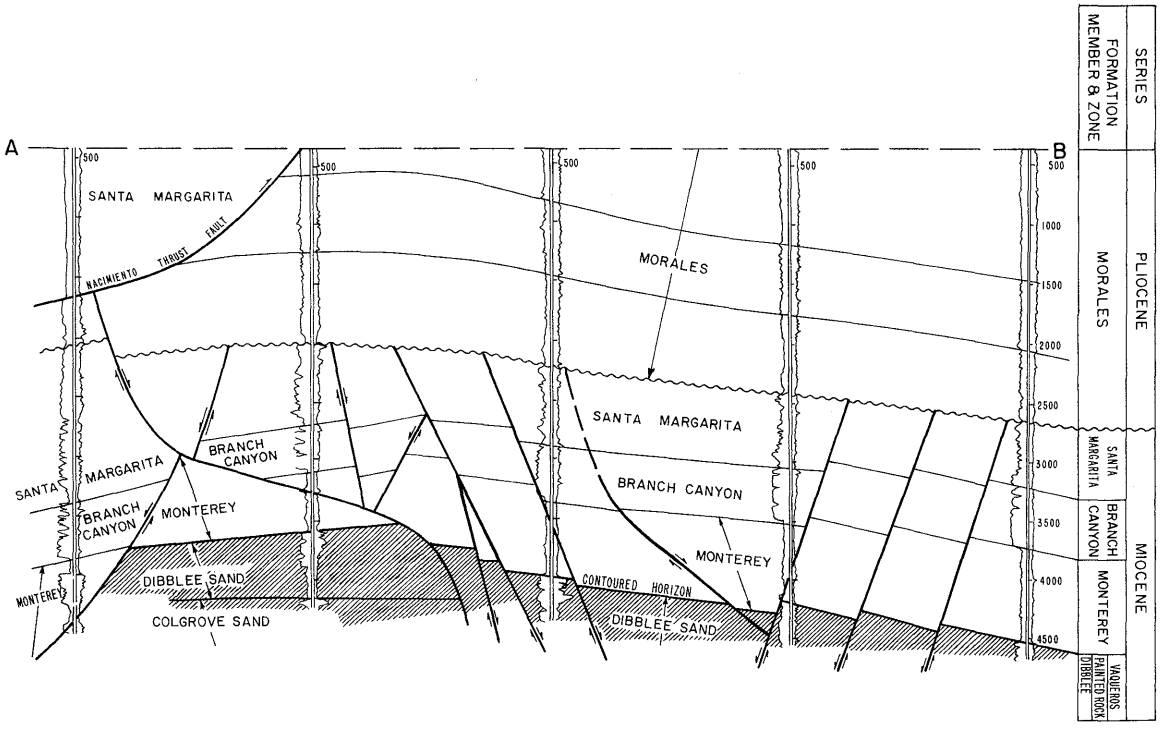
Selected References: Dolman, S.G., 1951, Operations in District No. 3: Calif. Div. of Oil and Gas, Summary of Operations--Calif. Oil Fields, Vol. 37, No. 2.

DATE: January 1989 **Estimated value †Log derived value

CALIFORNIA DIVISION OF OIL AND GAS

SOUTH CUYAMA OIL FIELD





COUNTY: **SANTA BARBARA**

CUYAMA , SOUTH, 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	Steam Energy Inc. "S.C.U." 81-35	Richfield Oil Corp. "Homan A" 81-35	35 10N 27W	SB	4,392	Dibblee	
Deepest well	ARCO Oil and Gas Co. "U.S. Miller" 1	Atlantic Richfield Co. "U.S. Miller" 1	4 9N 26W	SB	8,400		Painted Rock Miocene

POOL DATA

ITEM	DIBBLEE					FIELD OR AREA DATA
Discovery date	May 1949					
Initial production rates						
Oil (bbl/day)	525					
Gas (Mcf/day)	175					
Flow pressure (psi)	250					
Bean size (in.)						
Initial reservoir pressure (psi)	1,660					
Reservoir temperature (°F)	146					
Initial oil content (STB/ac.-ft.)	1,300					
Initial gas content (MSCF/ac.-ft.)	920					
Formation	Vaqueros					
Geologic age	early Miocene					
Average depth (ft.)	4,100					
Average net thickness (ft.)	200-300					
Maximum productive area (acres)						2,650
RESERVOIR ROCK PROPERTIES						
Porosity (%)	26-29					
S_{oi} (%)	0-69					
S_{wi} (%)	0-31					
S_{gi} (%)	0-100					
Permeability to air (md)	177-215					
RESERVOIR FLUID PROPERTIES						
Oil:						
Oil gravity (°API)	28-36					
Sulfur content (% by wt.)						
Initial solution GOR (SCF/STB)	365					
Initial oil FVF (RB/STB)	1.20					
Bubble point press. (psia)	1,650					
Viscosity (cp) @ °F	1.52 @ 146					
Gas:						
Specific gravity (air = 1.0)	0.79					
Heating value (Btu/cu. ft.)	1,290					
Water:						
Salinity, NaCl (ppm)	15,500-20,000					
T.D.S. (ppm)	17,000-21,500					
R_w (ohm/m) (77°F)	0.36					
ENHANCED RECOVERY PROJECTS						
Enhanced recovery projects	gas injection					
Date started	1964					
Date discontinued	active waterflood 1955 active					
Peak oil production (bbl)						14,116,035
Year						1951
Peak gas production, net (Mcf)						
Year						

Base of fresh water (ft.): See areas

Remarks:

Selected References:

Eaton, J.E., 1939, Geology and Oil Possibilities of Caliente Range, Cuyama Valley and Carrizo Plain, California, Calif. Jour. Mines and Geol., Vol. 35, No. 3 (July), p. 255-74.

Eckis, R.E., 1952, Oil Fields in Cuyama Valley, AAPG-SEPM-SEG Guidebook, joint annual meeting, Los Angeles, California (March), p. 88-96.

English, W.A., 1916, Geology and Oil Prospects of Cuyama Valley, California, U.S. Geol. Survey Bull. 621-M, p. 191-214.

Hill, M.L., S.A. Carlson and T.W. Dibblee, Jr., 1958, Stratigraphy of Cuyama Valley-Caliente Range Area, California: Am. Assoc. Petroleum Geologists Bull., Vol. 42, No. 12, p. 2973.

Zulberti, J.L., 1954, South Cuyama Oil Field: Calif. Div. of Oil and Gas, Summary of Operations--Calif. Oil Fields, Vol. 40, No. 1.

DATE: January 1989

CALIFORNIA DIVISION OF OIL AND GAS

COUNTY: SANTA BARBARA

CUYAMA, SOUTH, OIL FIELD EAST 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	ARCO Oil and Gas Co. "U.S. Miller" 1	Atlantic Richfield Co. "U.S. Miller" 1	4 9N 26W	SB	8,400	Dibblee	Painted Rock Miocene
Deepest well	Same as above	"	"	"	"	"	"

POOL DATA

ITEM	DIBBLEE					FIELD OR AREA DATA
Discovery date	February 1975					
Initial production rates						
Oil (bbl/day)	255					
Gas (Mcf/day)	72					
Flow pressure (psi)	153					
Bean size (in.)	23/64					
Initial reservoir pressure (psi)	3,150					
Reservoir temperature (°F)	180					
Initial oil content (STB/ac.-ft.)						
Initial gas content (MSCF/ac.-ft.)						
Formation	Vaqueros					
Geologic age	early Miocene					
Average depth (ft.)	7,500					
Average net thickness (ft.)	84					
Maximum productive area (acres)	10					
RESERVOIR ROCK PROPERTIES						
Porosity (%)	20-23a/					
S_{oi} (%)	70**					
S_{wi} (%)	30**					
S_{gi} (%)						
Permeability to air (md)						
RESERVOIR FLUID PROPERTIES						
Oil:						
Oil gravity (°API)	34-37					
Sulfur content (% by wt.)						
Initial solution GOR (SCF/STB)	239a/					
Initial oil FVF (RB/STB)	1.15a/					
Bubble point press. (psia)						
Viscosity (cp) @ °F	1.25 @ 180					
Gas:						
Specific gravity (air = 1.0)						
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						
Date started						
Date discontinued						
Peak oil production (bbl)	32,614					
Year	1975					
Peak gas production, net (Mcf)	13,842					
Year	1975					

Base of fresh water (ft.): 2,620

Remarks: Only one well completed in this area. The area was abandoned in 1978. Cumulative production is 42,000 bbl of oil and 30,000 Mcf of gas.
a/ Derived from open hole drill stem testing data.

Selected References:

DATE: January 1989 **Estimated value

CALIFORNIA DIVISION OF OIL AND GAS

COUNTY: **SANTA BARBARA**

CUYAMA, SOUTH, 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	Stream Energy Co. "S.C.U." 81-35	Richfield Oil Corp. "Homan A" 81-35	35 10N 27W	SB	4,392	Dibblee	
Deepest well	Stream Energy Co. "S.C.U." 37-25	The Superior Oil Co. "Heath" 37-25	25 10N 27W	SB	5,906		Vaqueros early Miocene

POOL DATA

ITEM	52-1 GAS	DIBBLEE[a/]	COLGROVE[b/]			FIELD OR AREA DATA
Discovery date	August 1953	May 1949	November 1950			
Initial production rates						
Oil (bbl/day)	-	525	313			
Gas (Mcf/day)	4,918	175	58			
Flow pressure (psi)	385	250	80			
Bean size (in.)	48/64	-	-			
Initial reservoir pressure (psi)	1,000**	1,660	1,550			
Reservoir temperature (°F)	100**	146	150			
Initial oil content (STB/ac.-ft.)	-	1,300	1,200			
Initial gas content (MSCF/ac.-ft.)	-	920	-			
Formation	Santa Margarita	Vaqueros	Vaqueros			
Geologic age	late Miocene	early Miocene	early Miocene			
Average depth (ft.)	1,830	4,100	4,300			
Average net thickness (ft.)	35	200-300	60-120			
Maximum productive area (acres)	40	-	-			2,540
RESERVOIR ROCK PROPERTIES						
Porosity (%)	32†	26-29	23			
S_{oi} (%)	-	0-69	75			
S_{wi} (%)	30†	0-31	25			
S_{gi} (%)	70†	0-100	-			
Permeability to air (md)	-	177-215	400			
RESERVOIR FLUID PROPERTIES						
Oil:						
Oil gravity (°API)	-	28-36	33-35			
Sulfur content (% by wt.)						
Initial solution GOR (SCF/STB)	-	365	150			
Initial oil FVF (RB/STB)	-	1.20	1.10			
Bubble point press. (psia)	-	1,650	670			
Viscosity (cp) @ °F	-	1.52 @ 146	1.70 @ 150			
Gas:						
Specific gravity (air = 1.0)	-	0.79	0.78			
Heating value (Btu/cu. ft.)	-	1,290	-			
Water:						
Salinity, NaCl (ppm)	13,500	15,500-20,000	-			
T.D.S. (ppm)	-	17,000-21,500	-			
R_w (ohm/m) (77°F)	-	0.36	-			
ENHANCED RECOVERY PROJECTS						
Enhanced recovery projects		gas injection	waterflood			
Date started		1964	1956			
Date discontinued		active	1973			
		waterflood				
		1955				
		active				
Peak oil production (bbl)						14,078,749
Year						1951
Peak gas production, net (Mcf)	218,114	-	-			11,474,736
Year	1971	-	-			1971

Base of fresh water (ft.): 2,000

Remarks: a/ Also referred to as the Homan pool.
b/ Also referred to as the Hibberd pool.

Selected References: Dolman, S.G., 1949, Operations in District No. 3: Calif. Div. of Oil and Gas, Summary of Operations--Calif. Oil Fields, Vol. 35, No. 2.
Gefert, L.V., 1960, Waterflood Performance of the Hibberd Pool, Cuyama, Calif., API Paper No. 801-360, presented at the spring meeting of the Pacific Coast District, Division of Production, American Petroleum Institute, Los Angeles, Calif., May 12-13.

DATE: January 1989 **Estimated value †Log derived value

CALIFORNIA DIVISION OF OIL AND GAS

COUNTY: SANTA BARBARA

CUYAMA, SOUTH, OIL FIELD
SOUTHEAST 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	ARCO Oil and Gas Co. "Cox" 35-5	Richfield Oil Corp. "Cox" 35-5	5 9N 26W	SB	5,988 a/	Colgrove	
Deepest well	ARCO Oil and Gas Co. "Cox" 84-5	Richfield Oil Corp. "Cox" 84-5	5 9N 26W	SB	8,208		Vaqueros early Miocene

POOL DATA

ITEM	SANTA MARGARITA GAS	COLGROVE b/				FIELD OR AREA DATA
Discovery date	September 1981	April 1951				
Initial production rates						
Oil (bbl/day)	-	190				
Gas (Mcf/day)	270	370				
Flow pressure (psi)	1,040	200				
Bean size (in.)	10/64	-				
Initial reservoir pressure (psi)	-	1,200-2,000				
Reservoir temperature (°F)						
Initial oil content (STB/ac.-ft.)						
Initial gas content (MSCF/ac.-ft.)						
Formation	Santa Margarita	Vaqueros				
Geologic age	late Miocene	early Miocene				
Average depth (ft.)	2,925	5,840				
Average net thickness (ft.)	20	50				
Maximum productive area (acres)	80	20				100
RESERVOIR ROCK PROPERTIES						
Porosity (%)	32†	34†				
Soi (%)						
Swi (%)	26†	70**				
Sgi (%)	74†	30**				
Permeability to air (md)	675	-				
RESERVOIR FLUID PROPERTIES						
Oil:						
Oil gravity (°API)	-	37				
Sulfur content (% by wt.)						
Initial solution GOR (SCF/STB)						
Initial oil FVF (RB/STB)						
Bubble point press. (psia)						
Viscosity (cp) @ °F						
Gas:						
Specific gravity (air = 1.0)						
Heating value (Btu/cu. ft.)	991	-				
Water:						
Salinity, NaCl (ppm)	-	9,160-51,360				
T.D.S. (ppm)						
R_w (ohm/m) (77°F)						
ENHANCED RECOVERY PROJECTS						
Enhanced recovery projects						
Date started						
Date discontinued						
Peak oil production (bbl)		41,536				
Year		1952				
Peak gas production, net (Mcf)	107,614					
Year	1982					

Base of fresh water (ft.): 2,100

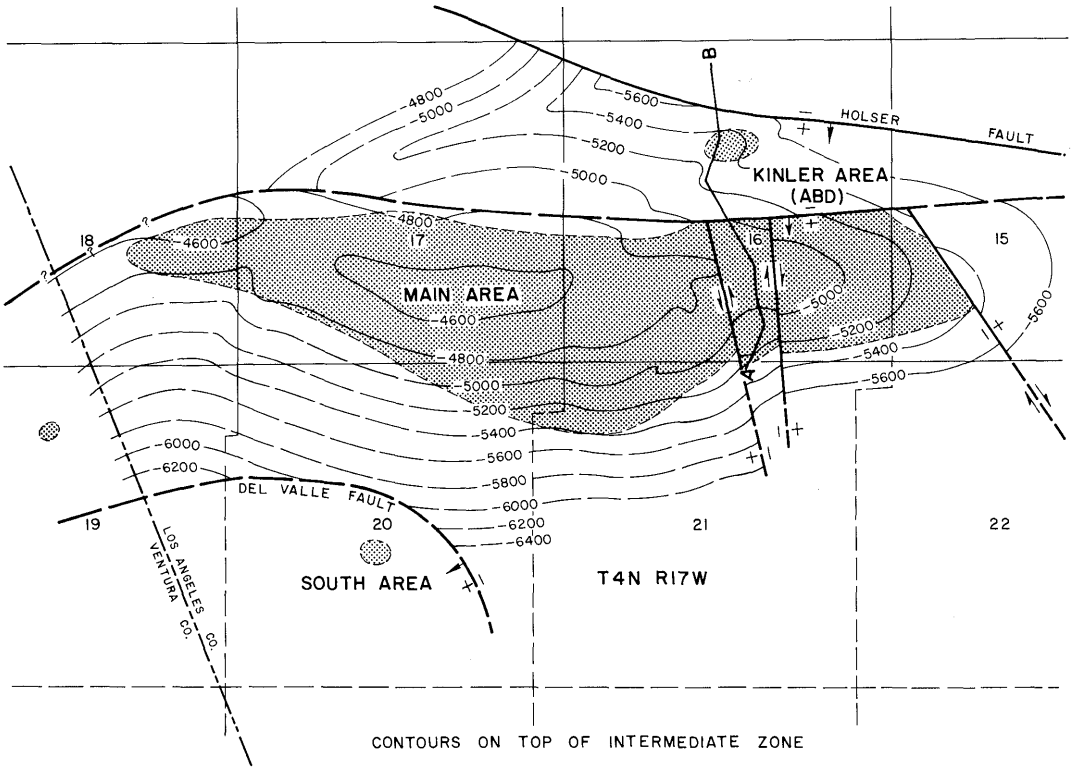
Remarks: a/ Original hole. Redrilled to a total depth of 5,970 feet.
b/ Also referred to as the Cox pool.

Selected References: Dolman, S.G., 1951, Operations in District No. 3: Calif. Div. of Oil and Gas, Summary of Operations--Calif. Oil Fields, Vol. 37, No. 2.

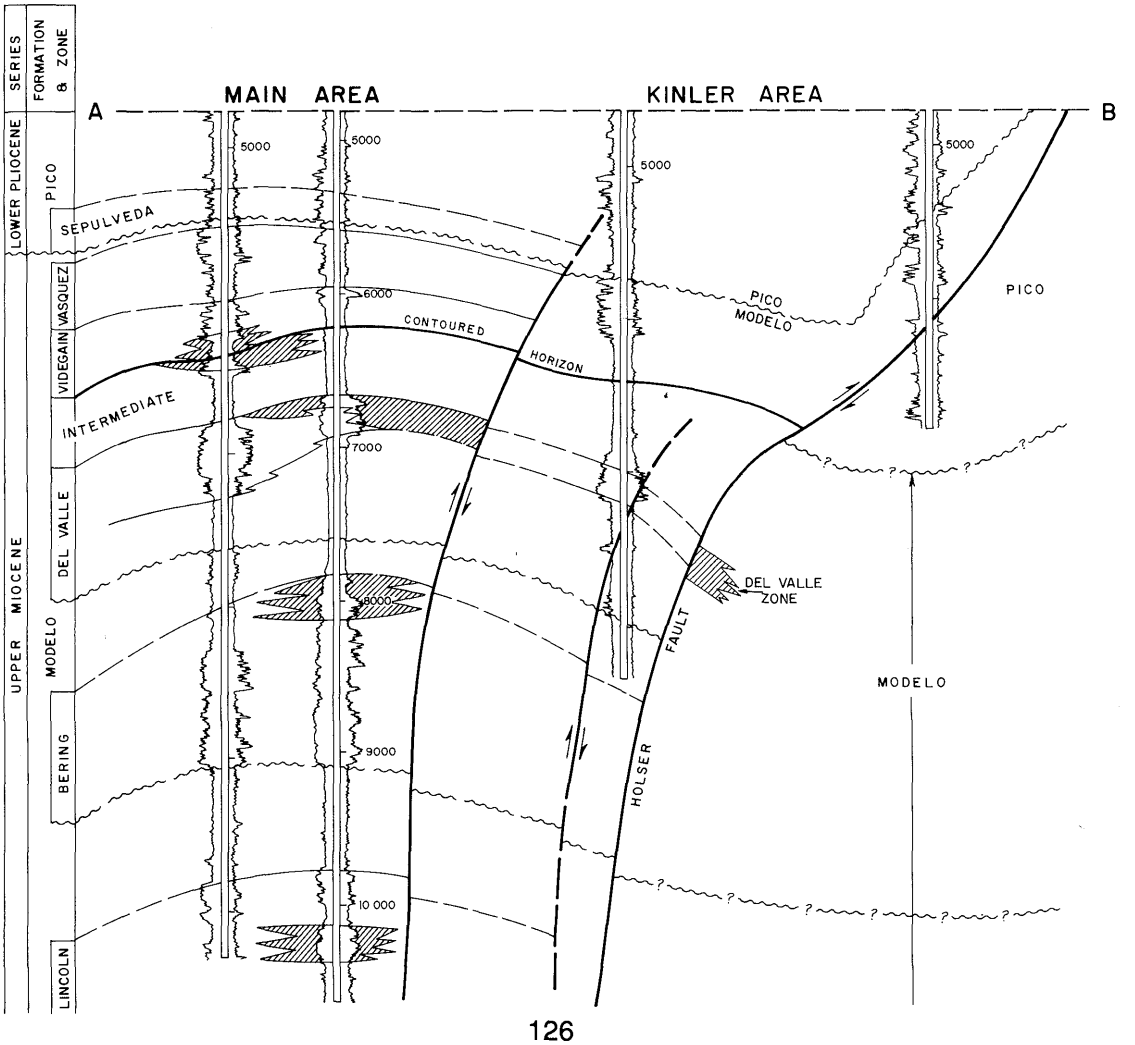
DATE: January 1989 **Estimated value †Log derived value

CALIFORNIA DIVISION OF OIL AND GAS

DEL VALLE OIL FIELD



CONTOURS ON TOP OF INTERMEDIATE ZONE



COUNTY: VENTURA AND LOS ANGELES

DEL VALLE 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	Union Oil Co. of Calif., Opr. "Lincoln" 1	R.E. Havenstrite, Opr. "Lincoln" 1	16 4N 17W	SB	6,954	Del Valle	
Deepest well	Union Oil Co. of Calif., Opr. "Lincoln" 16	Havenstrite Oil Co. "Lincoln" 16	16 4N 17W	SB	13,035		Modelo late Miocene

POOL DATA

ITEM	DEL VALLE					FIELD OR AREA DATA
Discovery date	1940					
Initial production rates						
Oil (bbl/day)	400					
Gas (Mcf/day)	11,000					
Flow pressure (psi)						
Bean size (in.)						
Initial reservoir pressure (psi)						
Reservoir temperature (°F)						
Initial oil content (STB/ac.-ft.)						
Initial gas content (MSCF/ac.-ft.)						
Formation	Modelo					
Geologic age	late Miocene					
Average depth (ft.)	6,500					
Average net thickness (ft.)	350					
Maximum productive area (acres)						720
RESERVOIR ROCK PROPERTIES						
Porosity (%)						
So_i (%)						
Sw_i (%)						
Sg_i (%)						
Permeability to air (md)						
RESERVOIR FLUID PROPERTIES						
Oil:						
Oil gravity (°API)	25-43					
Sulfur content (% by wt.)						
Initial solution GOR (SCF/STB)						
Initial oil FVF (RB/STB)						
Bubble point press. (psia)						
Viscosity (cp) @ °F						
Gas:						
Specific gravity (air = 1.0)						
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						
Date started						
Date discontinued						
Peak oil production (bbl)						1,938,240
Year						1945
Peak gas production, net (Mcf)						7,207,028
Year						1952

Base of fresh water (ft.): See areas

Remarks:

Selected References: Lande, D., 1964, Del Valle Oil Field: Calif. Div. of Oil and Gas, Summary of Operations -- Calif. Oil Fields, Vol. 50, No. 2.
Winterer, E.L., and D.L. Durham, 1962, Geology of the Southeastern Ventura Basin, Los Angeles County, Calif.: U.S. Geol. Survey Prof. Paper 334-H.

DATE: May 1983

CALIFORNIA DIVISION OF OIL AND GAS

COUNTY: VENTURA AND LOS ANGELES

DEL VALLE OIL FIELD
MAIN AREA

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	Union Oil Co. of Calif., Opr. "Lincoln" 1	R.E. Havenstrite, Opr. "Lincoln" 1	16 4N 17W	SB	6,954	Del Valle	
Deepest well	Union Oil Co. of Calif., Opr. "Lincoln" 16	Havenstrite Oil Co. "Lincoln" 16	16 4N 17W	SB	13,035		Modelo late Miocene

POOL DATA

ITEM	GAS ZONE	SEPULVEDA	VASQUEZ	VIDEGAIN	INTERMEDIATE	FIELD OR AREA DATA
Discovery date	October 1950	August 1942	September 1941	December 1940	July 1950	
Initial production rates						
Oil (bbl/day)	0	1,470	1,512	3,000	628	
Gas (Mcf/day)	10,000	840	885	3,000	3,125	
Flow pressure (psi)						
Bean size (in.)						
Initial reservoir pressure (psi)						
Reservoir temperature (°F)						
Initial oil content (STB/ac.-ft.)						
Initial gas content (MSCF/ac.-ft.)						
Formation	Pico	Pico	Modelo	Modelo	Modelo	
Geologic age	early Pliocene	early Pliocene	late Miocene	late Miocene	late Miocene	
Average depth (ft.)	3,800	4,600	5,300	5,600	6,300	
Average net thickness (ft.)	130	80	200	160	200	
Maximum productive area (acres)						
RESERVOIR ROCK PROPERTIES						
Porosity (%)	-	19.1-28.1	20.3-30.1	17.1-28.2	-	
So_i (%)						
Sw_i (%)						
Sg_i (%)						
Permeability to air (md)	-	93-225	95-320	79-561	-	
RESERVOIR FLUID PROPERTIES						
Oil:						
Oil gravity (°API)	-	30-36	30-33	31-36	35	
Sulfur content (% by wt.)						
Initial solution GOR (SCF/STB)						
Initial oil FVF (RB/STB)						
Bubble point press. (psia)						
Viscosity (cp) @ °F						
Gas:						
Specific gravity (air = 1.0)						
Heating value (Btu/cu. ft.)						
Water:						
Salinity, NaCl (ppm)	21,800	13,700	13,700	14,500	14,500	
T.D.S. (ppm)						
R_w (ohm/m) (77°F)						
ENHANCED RECOVERY PROJECTS						
Enhanced recovery projects						
Date started						
Date discontinued						
Peak oil production (bbl)						930,752
Year						1951
Peak gas production, net (Mcf)						
Year						

Base of fresh water (ft.): 300

Remarks:

Selected References:

DATE: May 1983

CALIFORNIA DIVISION OF OIL AND GAS

COUNTY: VENTURA AND LOS ANGELES

DEL VALLE 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							
Deepest well							

POOL DATA

ITEM	DEL VALLE	BERING	LINCOLN			FIELD OR AREA DATA
Discovery date	September 1940	February 1943	August 1947			
Initial production rates						
Oil (bbl/day)	400	972	75			
Gas (Mcf/day)	11,000	580	160			
Flow pressure (psi)						
Bean size (in.)						
Initial reservoir pressure (psi)	2,600	3,545	-			
Reservoir temperature (°F)	165	185	-			
Initial oil content (STB/ac.-ft.)						
Initial gas content (MSCF/ac.-ft.)						
Formation	Modelo	Modelo	Modelo			
Geologic age	late Miocene	late Miocene	late Miocene			
Average depth (ft.)	6,500	7,650	9,700			
Average net thickness (ft.)	350	500	200			
Maximum productive area (acres)						560
RESERVOIR ROCK PROPERTIES						
Porosity (%)	16.1-27.5	13.6-21.1	16.0-28.0			
S_{oi} (%)						
S_{wi} (%)	38	36	-			
S_{gi} (%)						
Permeability to air (md)	40-195	126-637	35-168			
RESERVOIR FLUID PROPERTIES						
Oil:						
Oil gravity (°API)	25-43	30-43	34-43			
Sulfur content (% by wt.)						
Initial solution GOR (SCF/STB)	580	-	-			
Initial oil FVF (RB/STB)						
Bubble point press. (psia)						
Viscosity (cp) @ °F						
Gas:						
Specific gravity (air = 1.0)						
Heating value (Btu/cu. ft.)						
Water:						
Salinity, NaCl (ppm)	15,400	16,200	17,100			
T.D.S. (ppm)						
R_w (ohm/m) (77°F)						
ENHANCED RECOVERY PROJECTS						
Enhanced recovery projects	waterflood					
Date started	1959					
Date discontinued	active					
Peak oil production (bbl)						930,752
Year						1951
Peak gas production, net (Mcf)						
Year						

Base of fresh water (ft.):

Remarks:

Selected References:

DATE: May 1983

CALIFORNIA DIVISION OF OIL AND GAS

COUNTY: LOS ANGELES

DEL VALLE OIL FIELD
KINLER 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	Amax Petroleum Corp. "Kinler" 1	Southern Calif. Petroleum Corp., Opr., "Socalpete-Kinler" 1	16 4N 17W	SB	7,653	Del Valle	
Deepest well	Chevron U.S.A. Inc. "Boobier" 1	Same as present	15 4N 17W	SB	8,855		Modelo late Miocene

POOL DATA

ITEM	DEL VALLE					FIELD OR AREA DATA
Discovery date	March 1950					
Initial production rates						
Oil (bbl/day)	140					
Gas (Mcf/day)	20					
Flow pressure (psi)						
Bean size (in.)						
Initial reservoir pressure (psi)						
Reservoir temperature (°F)						
Initial oil content (STB/ac.-ft.)						
Initial gas content (MSCF/ac.-ft.)						
Formation	Modelo					
Geologic age	late Miocene					
Average depth (ft.)	7,100					
Average net thickness (ft.)	200					
Maximum productive area (acres)	40					
RESERVOIR ROCK PROPERTIES						
Porosity (%)						
So_i (%)						
Sw_i (%)						
Sg_i (%)						
Permeability to air (md)						
RESERVOIR FLUID PROPERTIES						
Oil:						
Oil gravity (°API)	20					
Sulfur content (% by wt.)						
Initial solution GOR (SCF/STB)						
Initial oil FVF (RB/STB)						
Bubble point press. (psia)						
Viscosity (cp) @ °F						
Gas:						
Specific gravity (air = 1.0)						
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						
Date started						
Date discontinued						
Peak oil production (bbl)	43,857					
Year	1951					
Peak gas production, net (Mcf)						
Year						

Base of fresh water (ft.): 1,150

Remarks: a/ The area was abandoned in March 1961. Last production was in January 1961. Cumulative production is 236,761 bbl of oil and 103,498 Mcf of gas.

Selected References:

DATE: May 1983

CALIFORNIA DIVISION OF OIL AND GAS

COUNTY: LOS ANGELES

DEL VALLE OIL FIELD SOUTH 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. "Newhall Land & Farming Co. 3" 1	Same as present	20 4N 17W	SB	7,636	Intermediate	
Deepest well	Mobil Oil Co. "N.L.& F." 3	General Petroleum Corp. "N.L.& F." 3	20 4N 17W	SB	11,497		Modelo late Miocene

POOL DATA

ITEM	INTERMEDIATE	BERING	9700			FIELD OR AREA DATA
Discovery date	May 1944	July 1951	June 1952			
Initial production rates						
Oil (bbl/day)	48	90	101 a/			
Gas (Mcf/day)	50	220	90			
Flow pressure (psi)						
Bean size (in.)						
Initial reservoir pressure (psi)						
Reservoir temperature (°F)						
Initial oil content (STB/ac.-ft.)						
Initial gas content (MSCF/ac.-ft.)						
Formation	Modelo	Modelo	Modelo			
Geologic age	late Miocene	late Miocene	late Miocene			
Average depth (ft.)	5,400	8,850	9,600			
Average net thickness (ft.)	600	100	300			
Maximum productive area (acres)						120
RESERVOIR ROCK PROPERTIES						
Porosity (%)						
So_i (%)						
Sw_i (%)						
Sg_i (%)						
Permeability to air (md)						
RESERVOIR FLUID PROPERTIES						
Oil:						
Oil gravity (°API)	30	28	33			
Sulfur content (% by wt.)						
Initial solution GOR (SCF/STB)						
Initial oil FVF (RB/STB)						
Bubble point press. (psia)						
Viscosity (cp) @ °F						
Gas:						
Specific gravity (air = 1.0)						
Heating value (Btu/cu. ft.)						
Water:						
Salinity, NaCl (ppm)	13,700-17,100	13,700-17,100	13,700-17,100			
T.D.S. (ppm)						
R_w (ohm/m) (77°F)						
ENHANCED RECOVERY PROJECTS						
Enhanced recovery projects						
Date started						
Date discontinued						
Peak oil production (bbl)						11,929
Year						1952
Peak gas production, net (Mcf)						
Year						

Base of fresh water (ft.): 100

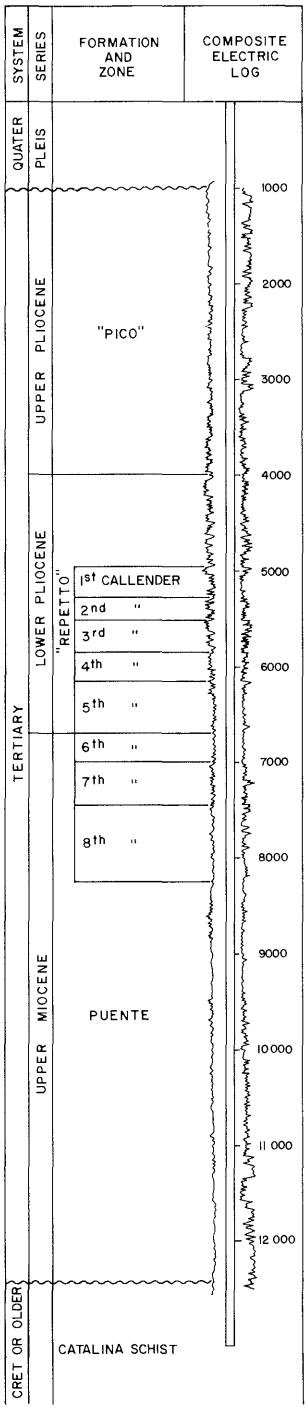
Remarks: a/ Commingled with Bering zone.

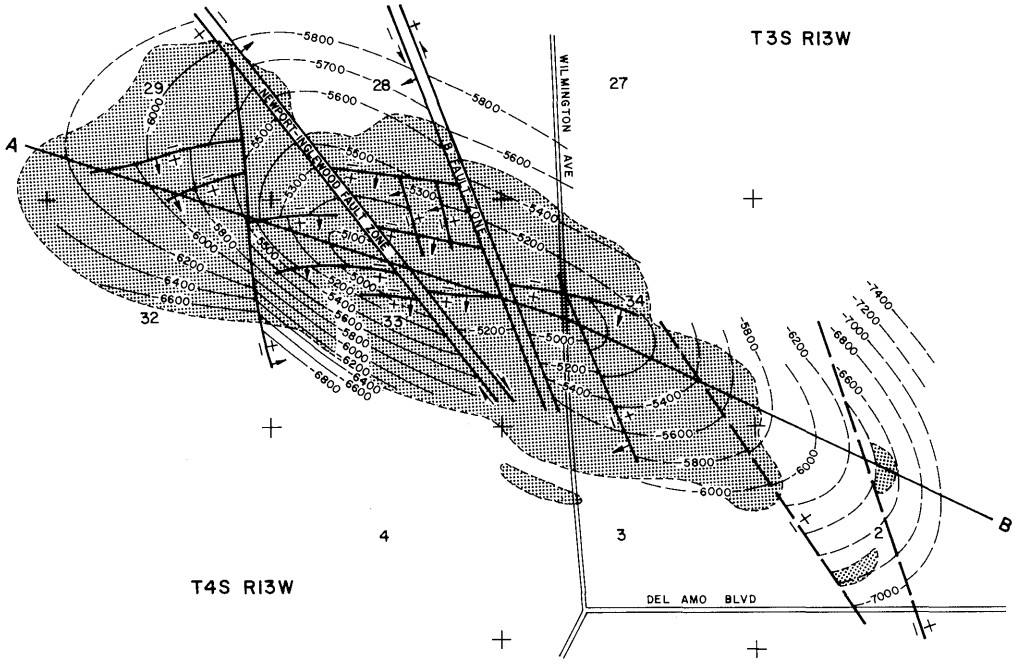
Selected References:

DATE: May 1983

CALIFORNIA DIVISION OF OIL AND GAS

DOMINGUEZ OIL FIELD





CONTOURS ON TOP OF 5th CALLENDER ZONE

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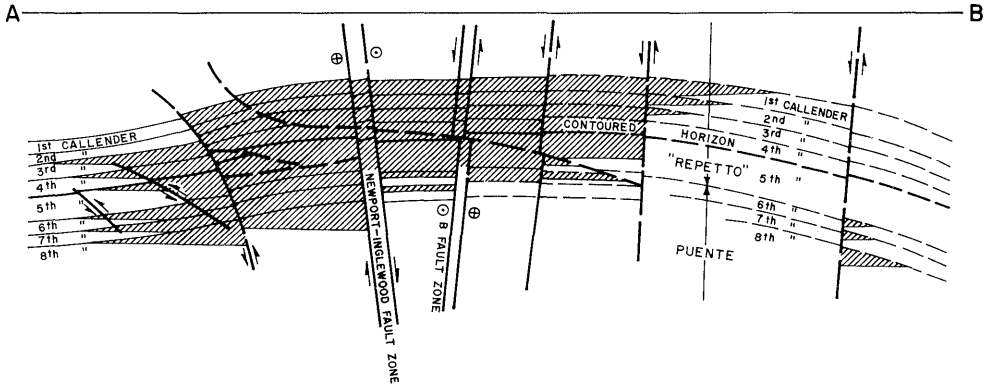


COUNTY: LOS ANGELES

DOMINGUEZ 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	Union Oil Co. of Calif. "Callender" 1	Same as present	33 3S 13W	SB	4,068	1st Callender	
Deepest well	Union Oil Co. of Calif. "Callender" 79	Same as present	32 3S 13W	SB	12,720		Catalina Schist Cret. or older

POOL DATA

ITEM	1ST CALLENDER	2ND CALLENDER	3RD CALLENDER	4TH CALLENDER	5TH CALLENDER	FIELD OR AREA DATA
Discovery date	September 1923	April 1924	July 1925	September 1927	November 1931	
Initial production rates						
Oil (bbl/day)	1,193	941	830	780	274	
Gas (Mcf/day)						
Flow pressure (psi)						
Bean size (in.)						
Initial reservoir pressure (psi)						
Reservoir temperature (°F)						
Initial oil content (STB/ac.-ft.)						
Initial gas content (MSCF/ac.-ft.)						
Formation	"Repetto"	"Repetto"	"Repetto"	"Repetto"	"Repetto"	
Geologic age	early Pliocene	early Pliocene	early Pliocene	early Pliocene	early Pliocene	
Average depth (ft.)	3,950	4,250	4,530	4,830	5,300	
Average net thickness (ft.)	200	110	230	170	340	
Maximum productive area (acres)						
RESERVOIR ROCK PROPERTIES						
Porosity (%)						
So_i (%)						
Sw_i (%)						
Sg_i (%)						
Permeability to air (md)						
RESERVOIR FLUID PROPERTIES						
Oil:						
Oil gravity (°API)	29-33	29-33	29-33	29-33	29-33	
Sulfur content (% by wt.)	0.93	-	0.96	0.96	0.96	
Initial solution GOR (SCF/STB)	400	-	-	-	-	
Initial oil FVF (RB/STB)	1.05	-	-	-	-	
Bubble point press. (psia)	1,800	-	-	-	-	
Viscosity (cp) @ °F	1.7 @ 165	-	-	-	-	
Gas:						
Specific gravity (air = 1.0)						
Heating value (Btu/cu. ft.)						
Water:						
Salinity, NaCl (ppm)	32,000	32,200	31,300	30,500	32,400	
T.D.S. (ppm)						
R_w (ohm/m) (77°F)						
ENHANCED RECOVERY PROJECTS						
Enhanced recovery projects	waterflood	waterflood	waterflood	waterflood	waterflood	
Date started	1948	1957	1946	1959	1958	
Date discontinued	active gas injection 1935 1942	active gas injection 1935 1942	active gas injection 1935 1941	active gas injection 1935 1941	active gas injection 1935 1941	
Peak oil production (bbl)						
Year						
Peak gas production, net (Mcf)						
Year						

Base of fresh water (ft.): 1,500-2,600

Remarks:

Selected References: Dodd, H.V., 1926, Dominguez Oil Field: Calif. Div. of Oil and Gas, Summary of Operations--Calif. Oil Fields, Vol 12, No. 4.
Graves, D.T., 1954, Geology of the Dominguez Oil Field: Div. of Mines Bull. 170, Map Sheet 32.
Seigart, T.E., 1925, Efficiency of flowing wells in Dominguez Oil Field: Div. of Oil and Gas, Summary of Operations--Calif. Oil Fields, Vol. 10, No. 7.

DATE: January 1989

CALIFORNIA DIVISION OF OIL AND GAS

COUNTY: LOS ANGELES

DOMINGUEZ 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 CALLENDER	7TH CALLENDER	8TH CALLENDER			FIELD OR AREA DATA
Discovery date	November 1933	November 1933	November 1936			
Initial production rates						
Oil (bbl/day)	768	97	3,696			
Gas (Mcf/day)	-	-	2,800			
Flow pressure (psi)						
Bean size (in.)						
Initial reservoir pressure (psi)						
Reservoir temperature (°F)						
Initial oil content (STB/ac.-ft.)						
Initial gas content (MSCF/ac.-ft.)						
Formation	Puente	Puente	Puente			
Geologic age	late Miocene	late Miocene	late Miocene			
Average depth (ft.)	5,870	6,360	7,050			
Average net thickness (ft.)	150	300	480			
Maximum productive area (acres)						1,670
RESERVOIR ROCK PROPERTIES						
Porosity (%)						
So_i (%)						
Sw_i (%)						
Sg_i (%)						
Permeability to air (md)						
RESERVOIR FLUID PROPERTIES						
Oil:						
Oil gravity (°API)	29-33	29-33	29-33			
Sulfur content (% by wt.)						
Initial solution GOR (SCF/STB)						
Initial oil FVF (RB/STB)						
Bubble point press. (psia)						
Viscosity (cp) @ °F						
Gas:						
Specific gravity (air = 1.0)						
Heating value (Btu/cu. ft.)						
Water:						
Salinity, NaCl (ppm)	30,000	29,700	24,100			
T.D.S. (ppm)						
R_w (ohm/m) (77°F)						
ENHANCED RECOVERY PROJECTS						
Enhanced recovery projects	waterflood	waterflood	waterflood			
Date started	1960	1960	1961			
Date discontinued	active	active	active			
		gas injection				
		1937				
		1937				
Peak oil production (bbl)						13,465,970
Year						1925
Peak gas production, net (Mcf)						
Year						

Base of fresh water (ft.):

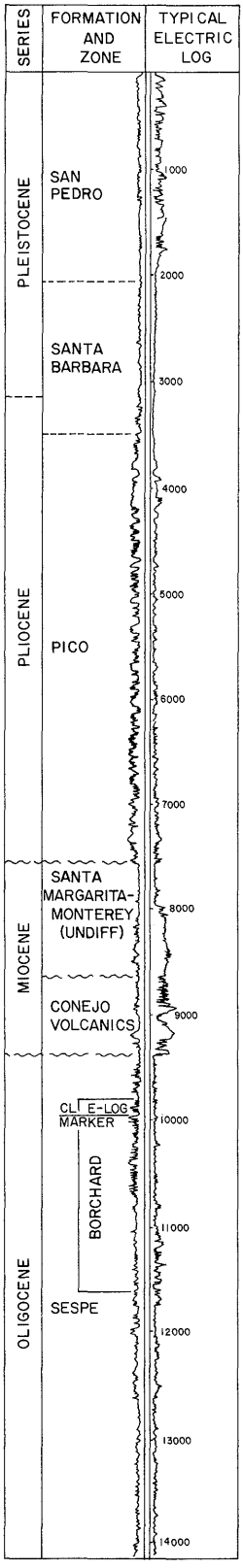
Remarks:

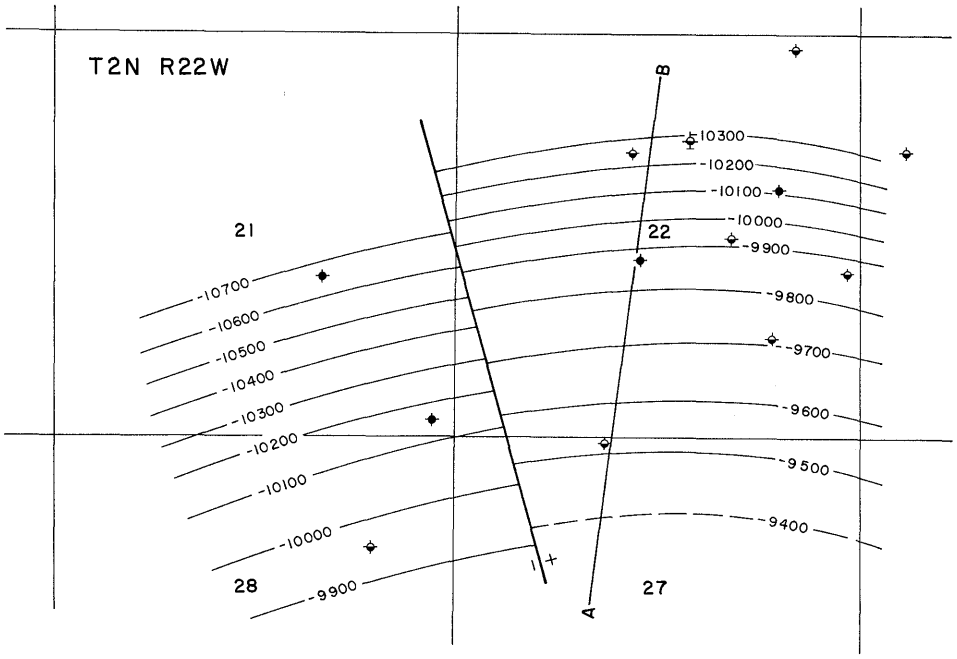
Selected References:

DATE: January 1989

CALIFORNIA DIVISION OF OIL AND GAS

EL RIO OIL FIELD





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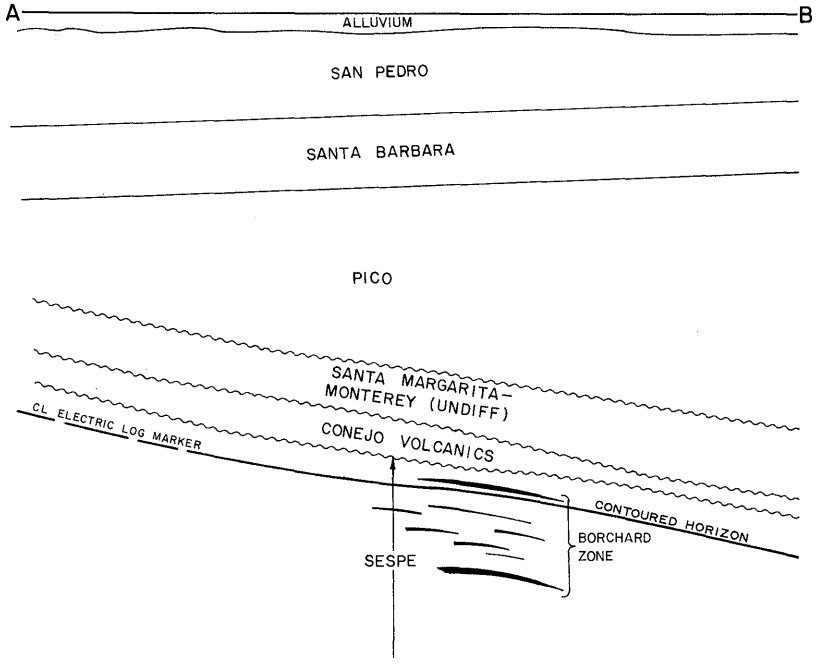


COUNTY: VENTURA

EL RIO 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	Chevron U.S.A. Inc. "H.O. Borchard" 1	Standard Oil Co. of Calif. "H.O. Borchard" 1	21 2N 22W	SB	11,620	Borchard	
Deepest well	Chevron U.S.A. Inc. "N.M. Borchard" 3-1	Standard Oil Co. of Calif. "N.M. Borchard" 3-1	21 2N 22W	SB	15,022		Sespe Oligocene

POOL DATA

ITEM	BORCHARD					FIELD OR AREA DATA
Discovery date	January 1958					
Initial production rates						
Oil (bbl/day)	338					
Gas (Mcf/day)	220					
Flow pressure (psi)						
Bean size (in.)						
Initial reservoir pressure (psi)						
Reservoir temperature (°F)	5,000					
Initial oil content (STB/ac.-ft.)						
Initial gas content (MSCF/ac.-ft.)						
Formation	Sespe					
Geologic age	Oligocene					
Average depth (ft.)	11,238					
Average net thickness (ft.)	300					
Maximum productive area (acres)	50					
RESERVOIR ROCK PROPERTIES						
Porosity (%)						
S_{oi} (%)						
S_{wi} (%)						
S_{gi} (%)						
Permeability to air (md)						
RESERVOIR FLUID PROPERTIES						
Oil:						
Oil gravity (°API)	27					
Sulfur content (% by wt.)						
Initial solution GOR (SCF/STB)						
Initial oil FVF (RB/STB)						
Bubble point press. (psia)						
Viscosity (cp) @ °F						
Gas:						
Specific gravity (air = 1.0)						
Heating value (Btu/cu. ft.)						
Water:						
Salinity, NaCl (ppm)	27,400					
T.D.S. (ppm)						
R_w (ohm/m) (77°F)						
ENHANCED RECOVERY PROJECTS						
Enhanced recovery projects						
Date started						
Date discontinued						
Peak oil production (bbl)	88,289					
Year	1960					
Peak gas production, net (Mcf)						
Year						

Base of fresh water (ft.): 2,200

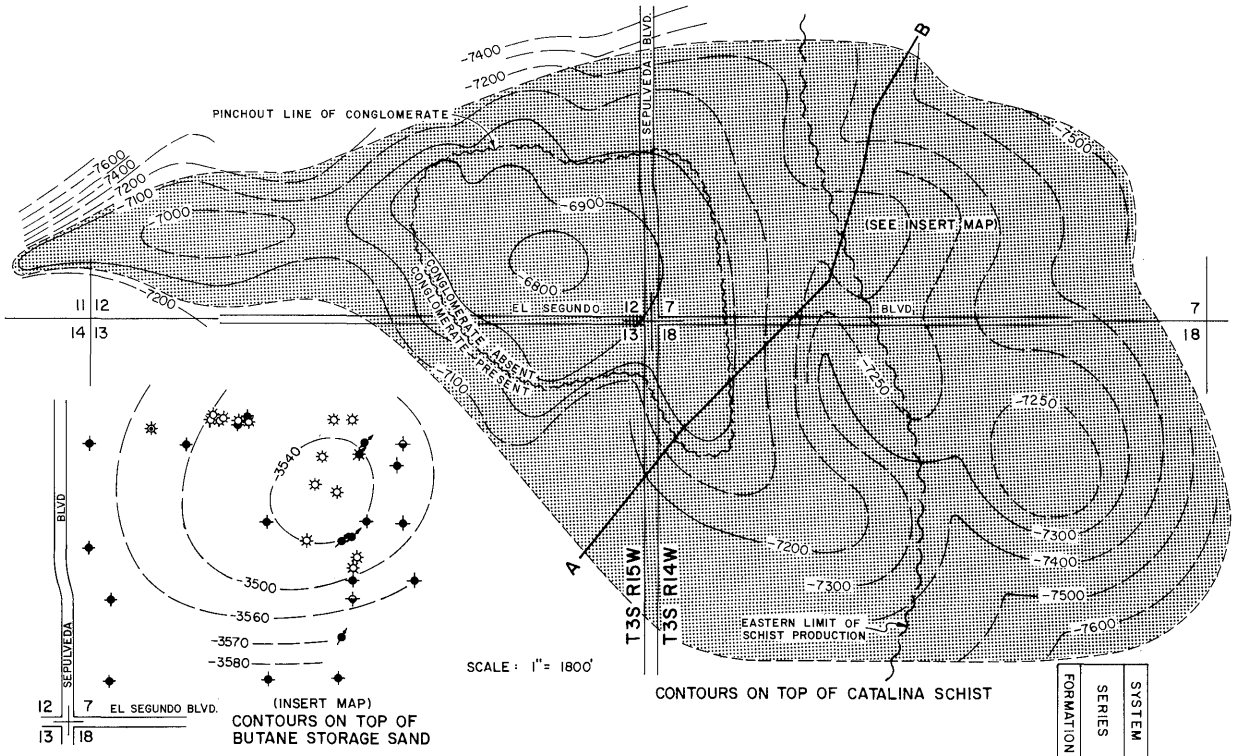
Remarks: The field was abandoned in 1971. The field was reactivated in 1979 when field boundaries changed.

Selected References:

DATE: May 1983

CALIFORNIA DIVISION OF OIL AND GAS

EL SEGUNDO OIL FIELD



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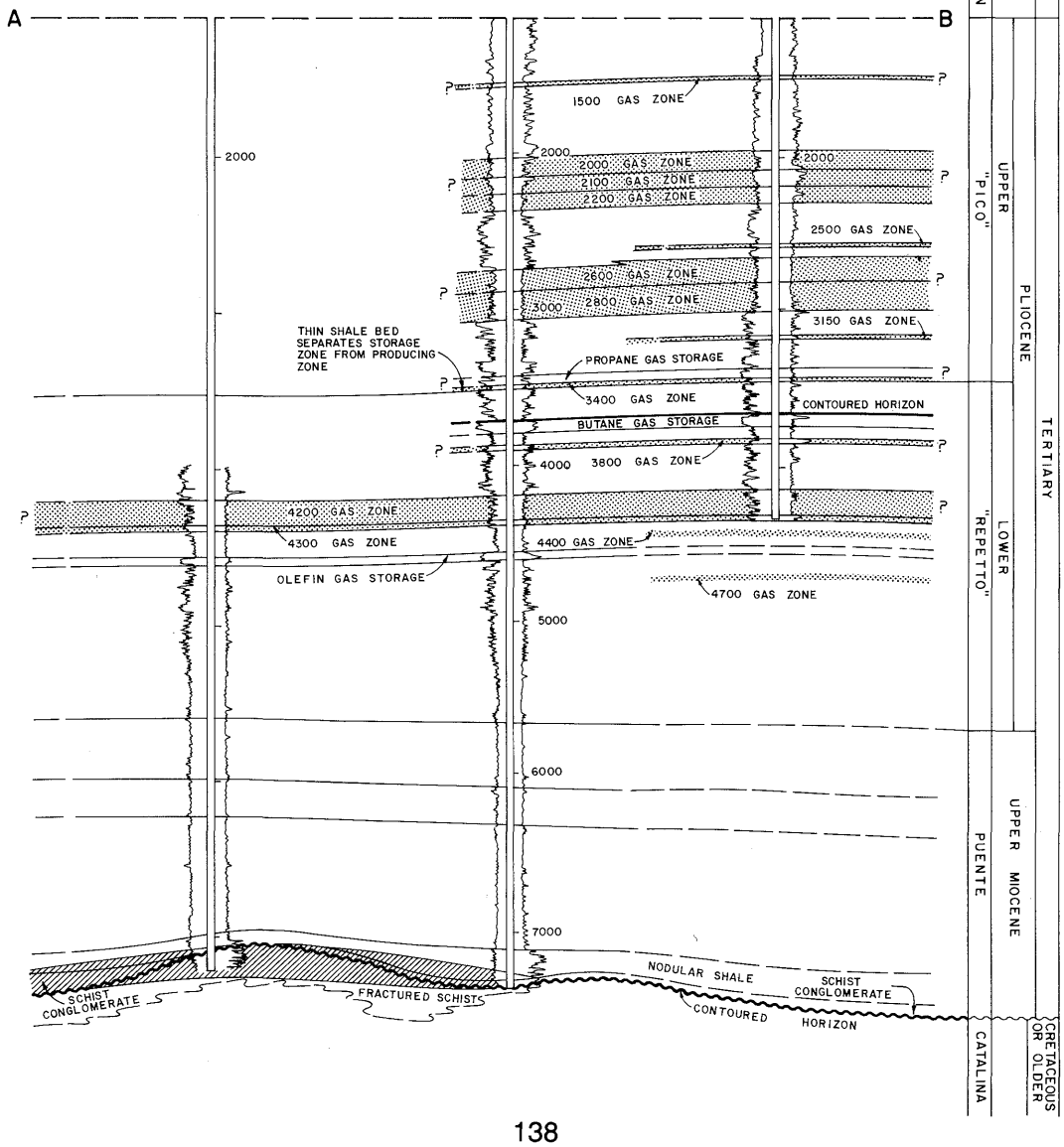


COUNTY: LOS ANGELES

EL SEGUNDO 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	Chevron U.S.A. Inc. "Block" 13	Republic Petroleum Co., Ltd. "Republic El Segundo" 1	18 3S 14W	SB	7,405	Nodular shale	
Deepest well	Cooper and Brain, Inc. "Title Insurance and Trust Co." 3	Occidental Petroleum Corp. "Title Insurance and Trust Co." 3	11 3S 15W	SB	9,008		Catalina Schist Cret. or older

POOL DATA

ITEM	PLIOCENE (GAS)	NODULAR SHALE	SCHIST CONGLOMERATE	FRACTURED SCHIST		FIELD OR AREA DATA
Discovery date	May 1943	August 1935	August 1935	August 1935		
Initial production rates						
Oil (bbl/day)	0	275a/	588a/	588a/		
Gas (Mcf/day)	5,000**	-	1,572	-		
Flow pressure (psi)	-	-	50	-		
Bean size (in.)						
Initial reservoir pressure (psi)						
Reservoir temperature (°F)						
Initial oil content (STB/ac.-ft.)						
Initial gas content (MSCF/ac.-ft.)						
Formation	"Pico"-"Repetto"	Puente	Puente	Catalina Schist		
Geologic age	1 & e Pliocene	late Miocene	late Miocene	Cret. or older		
Average depth (ft.)	1,490-4,180	7,000-7,200	7,250	7,300		
Average net thickness (ft.)	300	125	50	150		
Maximum productive area (acres)						805
RESERVOIR ROCK PROPERTIES						
Porosity (%)						
So_i (%)						
Sw_i (%)						
Sg_i (%)						
Permeability to air (md)						
RESERVOIR FLUID PROPERTIES						
Oil:						
Oil gravity (°API)	-	22-28	14-28	18-28		
Sulfur content (% by wt.)	-	4.33	4.33	4.33		
Initial solution GOR (SCF/STB)						
Initial oil FVF (RB/STB)						
Bubble point press. (psia)						
Viscosity (cp) @ °F						
Gas:						
Specific gravity (air = 1.0)						
Heating value (Btu/cu. ft.)	1,000	-	-	-		
Water:						
Salinity, NaCl (ppm)	1,200-21,400	17,500	17,500	18,000		
T.D.S. (ppm)						
R_w (ohm/m) (77°F)						
ENHANCED RECOVERY PROJECTS						
Enhanced recovery projects						
Date started						
Date discontinued						
Peak oil production (bbl)						3,869,039
Year						1938
Peak gas production, net (Mcf)						94,869
Year						1938

Base of fresh water (ft.): 1,400 - 1,600

Remarks: a/ Production for the Nodular shale, Schist Conglomerate and Fractured Schist zones were commingled.

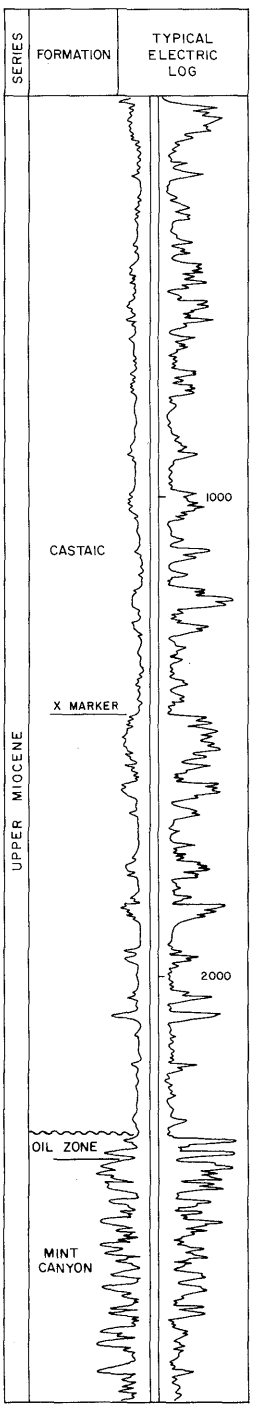
Gas sands were used for L.P.G. Storage. The Pliocene Gas zone was abandoned in 1971. Cumulative dry gas production is 22,956,104 Mcf; 20 wells were drilled and completed; maximum proved acreage was 80 acres.

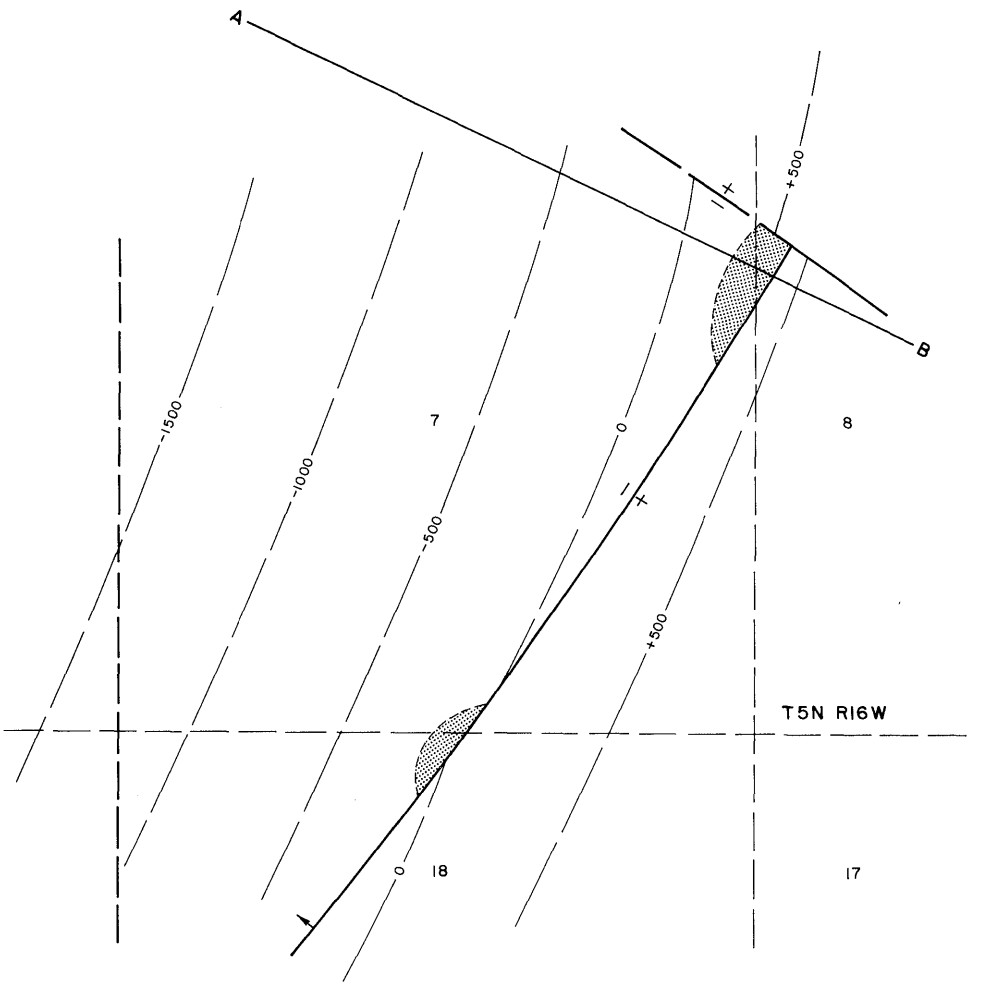
Selected References: Cordova, S., 1963, El Segundo Oil Field: Calif. Div. of Oil and Gas, Summary of Operations -- Calif. Oil Fields, Vol. 49, No. 2.

DATE: January 1989 **Estimated value

CALIFORNIA DIVISION OF OIL AND GAS

ELIZABETH CANYON OIL FIELD
(Abandoned)





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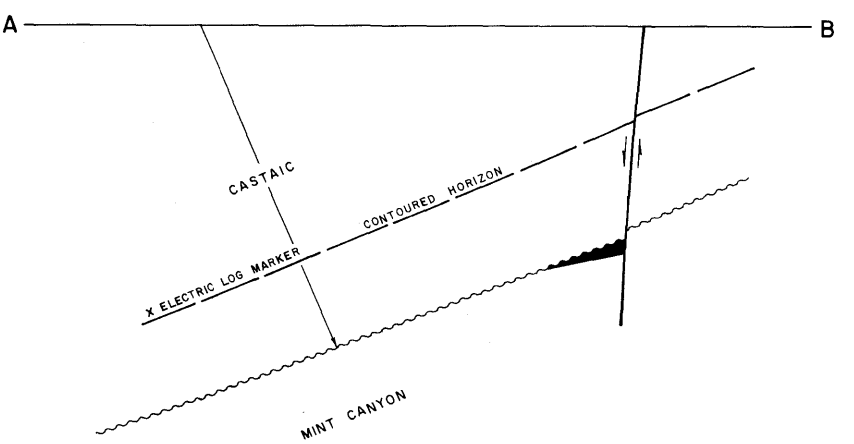


COUNTY: LOS ANGELES

ELIZABETH CANYON OIL FIELD (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	T & M Exploration Co. "Kinler" 1	Same as present	18 5N 16W	SB	2,877	Castaic	
Deepest well	Ember Oil & Gas Co. "Scattle-Toledo-Lyons" 1	North Star Mining & Development Co. "North Star-Lyons" 1	7 5N 16W	SB	4,027		Mint Canyon late Miocene

POOL DATA

ITEM	CASTAIC					FIELD OR AREA DATA
Discovery date	February 1950					
Initial production rates						
Oil (bbl/day)	12					
Gas (Mcf/day)	100					
Flow pressure (psi)						
Bean size (in.)						
Initial reservoir pressure (psi)						
Reservoir temperature (°F)						
Initial oil content (STB/ac.-ft.)						
Initial gas content (MSCF/ac.-ft.)						
Formation	Castaic					
Geologic age	late Miocene					
Average depth (ft.)	3,200					
Average net thickness (ft.)	50					
Maximum productive area (acres)	20					
RESERVOIR ROCK PROPERTIES						
Porosity (%)						
So_i (%)						
Sw_i (%)						
Sg_i (%)						
Permeability to air (md)						
RESERVOIR FLUID PROPERTIES						
Oil:						
Oil gravity (°API)	41					
Sulfur content (% by wt.)						
Initial solution GOR (SCF/STB)						
Initial oil FVF (RB/STB)						
Bubble point press. (psia)						
Viscosity (cp) @ °F						
Gas:						
Specific gravity (air = 1.0)						
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						
Date started						
Date discontinued						
Peak oil production (bbl)	224					
Year	1950					
Peak gas production, net (Mcf)						
Year						

Base of fresh water (ft.): 700

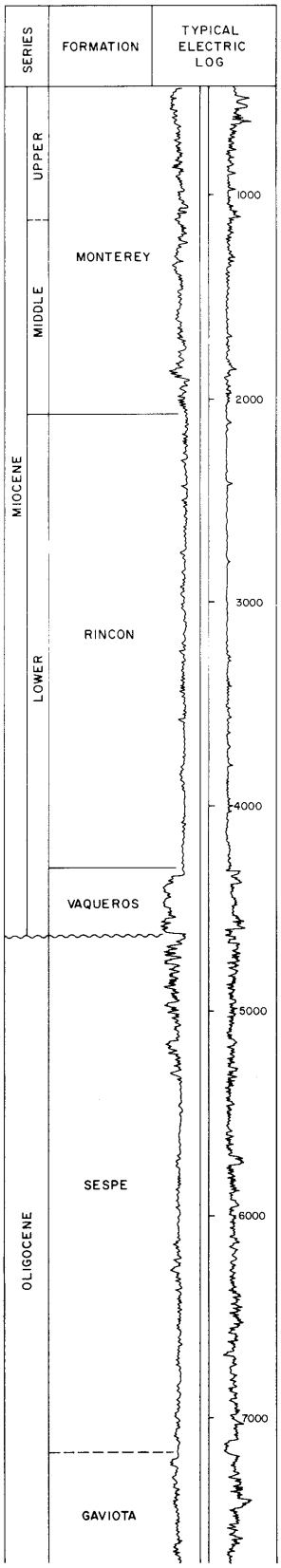
Remarks: Last production was in March 1954. The field was abandoned in 1954. Cumulative production is 601 bbl of oil and 2,368 Mcf of gas.

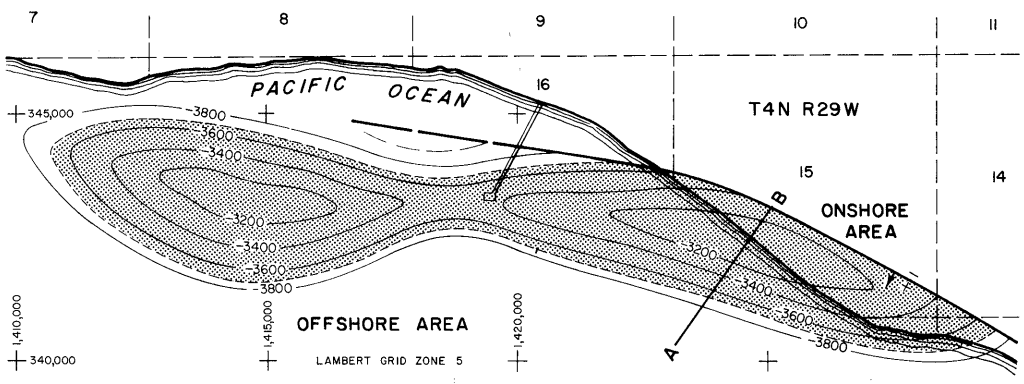
Selected References:

DATE: May 1983

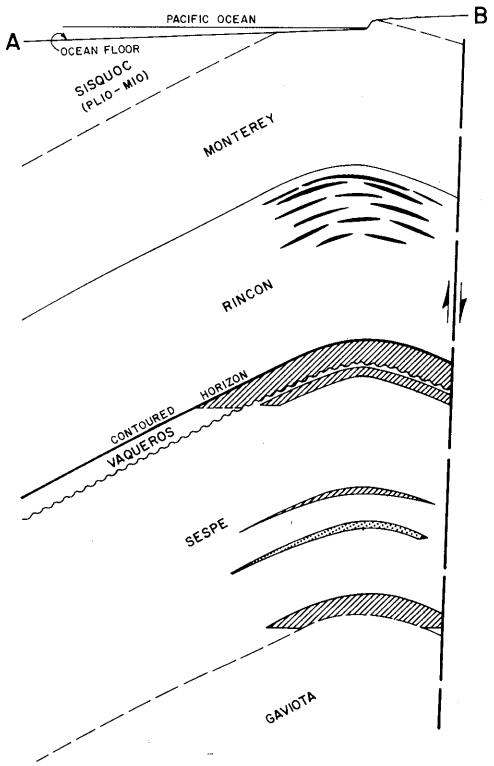
CALIFORNIA DIVISION OF OIL AND GAS

ELWOOD OIL FIELD





CONTOURS ON TOP OF VAQUEROS



COUNTY: SANTA BARBARA

ELWOOD 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	Sun Exploration and Production Co. "Luton-Bell" 1	Barnsdall Oil Co. of Calif. "Luton-Bell" 1	15 4N 29W	SB	3,208	Vaqueros	
Deepest well	ARCO Oil and Gas Co. "State 208" 29X	Signal Oil & Gas Co. "State" 208-29X	17 4N 29W	SB	9,986 a/		Cozy Dell Eocene

POOL DATA

ITEM	VAQUEROS					FIELD OR AREA DATA
Discovery date	July 1928					
Initial production rates						
Oil (bbl/day)	1,316					
Gas (Mcf/day)	750					
Flow pressure (psi)	440					
Bean size (in.)	1					
Initial reservoir pressure (psi)	1,560					
Reservoir temperature (°F)	155					
Initial oil content (STB/ac.-ft.)						
Initial gas content (MSCF/ac.-ft.)						
Formation	Vaqueros					
Geologic age	early Miocene					
Average depth (ft.)	3,400					
Average net thickness (ft.)	300					
Maximum productive area (acres)						810
RESERVOIR ROCK PROPERTIES						
Porosity (%)	24†					
S_{oi} (%)	60-80†					
S_{wi} (%)	20-40†					
S_{gi} (%)						
Permeability to air (md)	900***					
RESERVOIR FLUID PROPERTIES						
Oil:						
Oil gravity (°API)	38					
Sulfur content (% by wt.)						
Initial solution GOR (SCF/STB)						
Initial oil FVF (RB/STB)						
Bubble point press. (psia)						
Viscosity (cp) @ °F						
Gas:						
Specific gravity (air = 1.0)						
Heating value (Btu/cu. ft.)						
Water:						
Salinity, NaCl (ppm)	20,544					
T.D.S. (ppm)						
R_w (ohm/m) (77°F)						
ENHANCED RECOVERY PROJECTS						
Enhanced recovery projects						
Date started						
Date discontinued						
Peak oil production (bbl)						14,617,742
Year						1930
Peak gas production, net (Mcf)						b/
Year						

Base of fresh water (ft.): None

Remarks: a/ Directional well; true vertical depth of original hole is 9,280 feet. b/ Not recorded.

Selected References:

Dibblee, T.W., Jr., 1966, Geology of the Central Santa Ynez Mountains, Santa Barbara Co., California: Calif. Div. of Mines and Geology Bull. 186, p. 85.

Dolman, S.G., 1930, Elwood Oil Field: Calif. Div. of Oil and Gas, Summary of Operations--Calif. Oil Fields, Vol. 16, No. 3.

Dolman, S.G., 1930, Operations in District No. 3: Calif. Div. of Oil and Gas, Summary of Operations--Calif. Oil Fields, Vol. 15, No. 3 (1929) and Vol. 16, No. 3.

Hill, M.L., 1943, Elwood Oil Field: State Div. of Mines Bull. 118, p. 380.

Railroad Commission of the State of California, Elwood Oil Field: Case No. 4591, p. 205 (1942).

Uren, L.C., 1930, 60-Foot Caissons Used for Rig Supports in Drilling Off-Shore Leases: National Petroleum News, June 18, p. 59.

Yerkes, R.F., H.C. Wagner and K.A. Yenne, 1969, Petroleum Development in the Region of the Santa Barbara Channel: U.S. Geol. Survey Prof. Paper 679B, p. 19.

DATE: January 1989 ***Representative values for area, formation, and depth †Log derived value

CALIFORNIA DIVISION OF OIL AND GAS

COUNTY: SANTA BARBARA

ELWOOD OIL FIELD
ONSHORE 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	Oryx Energy Co. "Luton-Bell" 1	Barnsdall Oil Co. of Calif. "Luton-Bell" 1	15 4N 29W	SB	3,208 a/	Vaqueros	
Deepest well	Oryx Energy Co. "Luton-Bell" 12	Barnsdall Oil Co. of Calif. "Luton-Bell" 12	15 4N 29W	SB	8,503		Cozy Dell Eocene

POOL DATA

ITEM	RINCON	VAQUEROS	UPPER SESPE	BELL 14		FIELD OR AREA DATA
Discovery date	August 1931	July 1928	October 1935	October 1931		
Initial production rates						
Oil (bbl/day)	154	1,316	679	2,390		
Gas (Mcf/day)	620	750	567	2,000		
Flow pressure (psi)	-	440	-	-		
Bean size (in.)	-	1	-	-		
Initial reservoir pressure (psi)	-	1,560	-	-		
Reservoir temperature (°F)	-	155	-	-		
Initial oil content (STB/ac.-ft.)						
Initial gas content (MSCF/ac.-ft.)						
Formation	Rincon	Vaqueros	Sespe	Sespe		
Geologic age	early Miocene	early Miocene	Oligocene	Oligocene		
Average depth (ft.)	2,600	3,400	3,700	4,800		
Average net thickness (ft.)	1,500	300	100	60		
Maximum productive area (acres)						200
RESERVOIR ROCK PROPERTIES						
Porosity (%)	20-30***	24	20-30***	20-30***		
So_i (%)	60***	60-80	60-70***	60-70***		
Sw_i (%)	30***	20-40	30-40***	30-40***		
Sg_i (%)	10***	-	-	-		
Permeability to air (md)	400-500***	900***	100-200***	100-200***		
RESERVOIR FLUID PROPERTIES						
Oil:						
Oil gravity (°API)	26	38	36	42		
Sulfur content (% by wt.)						
Initial solution GOR (SCF/STB)						
Initial oil FVF (RB/STB)						
Bubble point press. (psia)						
Viscosity (cp) @ °F						
Gas:						
Specific gravity (air = 1.0)						
Heating value (Btu/cu. ft.)						
Water:						
Salinity, NaCl (ppm)	34,240	20,544	17,120	17,120		
T.D.S. (ppm)						
R_w (ohm/m) (77°F)						
ENHANCED RECOVERY PROJECTS						
Enhanced recovery projects						
Date started						
Date discontinued						
Peak oil production (bbl)						b/
Year						
Peak gas production, net (Mcf)						
Year						

Base of fresh water (ft.): None

Remarks: The area was abandoned in 1972. Early production was not recorded. First recorded production for this area was 3,005 bbl/day of oil in 1928. Cumulative production is 26,874,000 bbl of oil and 30,512,000 Mcf of gas.
a/ Original hole; subsequently deepened to 3,604 feet.
b/ Early production was not broken down by areas.

Selected References: McCabe, R.E., 1928, Operations in District No. 3: Calif. Div. of Oil and Gas, Summary of Operations--Calif. Oil Fields, Vol. 14, No. 8.

DATE: January 1989 ***Representative values for area, formation, and depth

CALIFORNIA DIVISION OF OIL AND GAS

COUNTY: SANTA BARBARA

ELWOOD OIL FIELD
ONSHORE 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							
Deepest well							

POOL DATA

ITEM	SESPE GAS	LOWER SESPE				FIELD OR AREA DATA
Discovery date	June 1936	June 1936				
Initial production rates						
Oil (bbl/day)	-	68				
Gas (Mcf/day)	2,300	600				
Flow pressure (psi)	-	135				
Bean size (in.)	-	44/64				
Initial reservoir pressure (psi)	-	-				
Reservoir temperature (°F)	-	-				
Initial oil content (STB/ac.-ft.)						
Initial gas content (MSCF/ac.-ft.)						
Formation	Sespe	Sespe				
Geologic age	Oligocene	Oligocene				
Average depth (ft.)	5,200	5,620				
Average net thickness (ft.)	100	1,000				
Maximum productive area (acres)						
RESERVOIR ROCK PROPERTIES						
Porosity (%)	20-30***	20-30***				
S_{oi} (%)	-	60-70***				
Swi (%)	30-40***	30-40***				
S_{gi} (%)	60-70***	-				
Permeability to air (md)	100-200***	100-200***				
RESERVOIR FLUID PROPERTIES						
Oil:						
Oil gravity (°API)	-	34				
Sulfur content (% by wt.)						
Initial solution GOR (SCF/STB)						
Initial oil FVF (RB/STB)						
Bubble point press. (psia)						
Viscosity (cp) @ °F						
Gas:						
Specific gravity (air = 1.0)						
Heating value (Btu/cu. ft.)	1,100	-				
Water:						
Salinity, NaCl (ppm)	17,120	17,120				
T.D.S. (ppm)						
R_w (ohm/m) (77°F)						
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.):

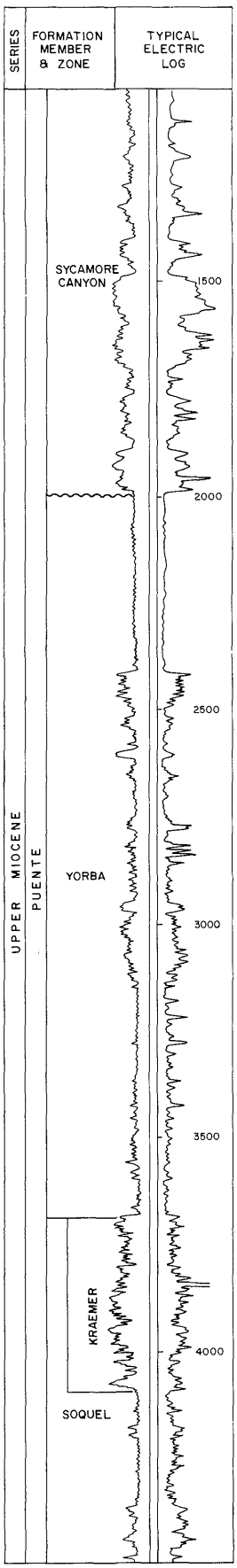
Remarks:

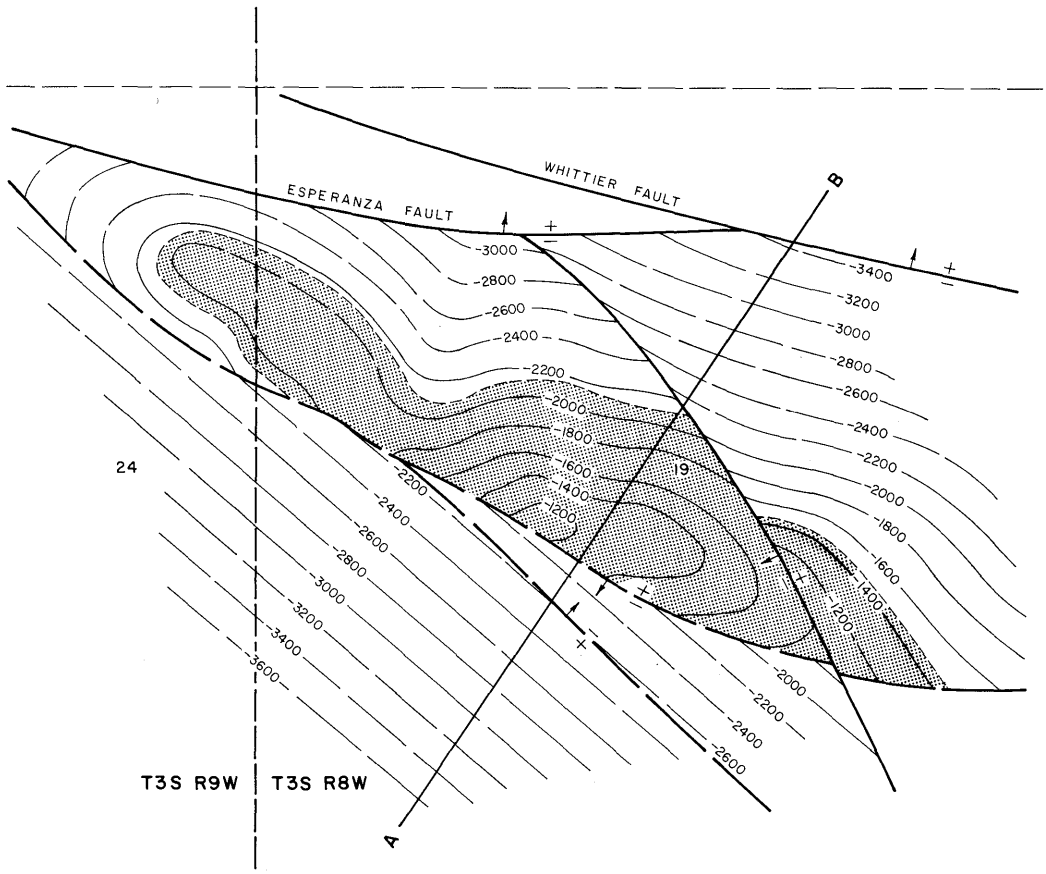
Selected References:

DATE: January 1989 ***Representative values for area, formation, and depth

CALIFORNIA DIVISION OF OIL AND GAS

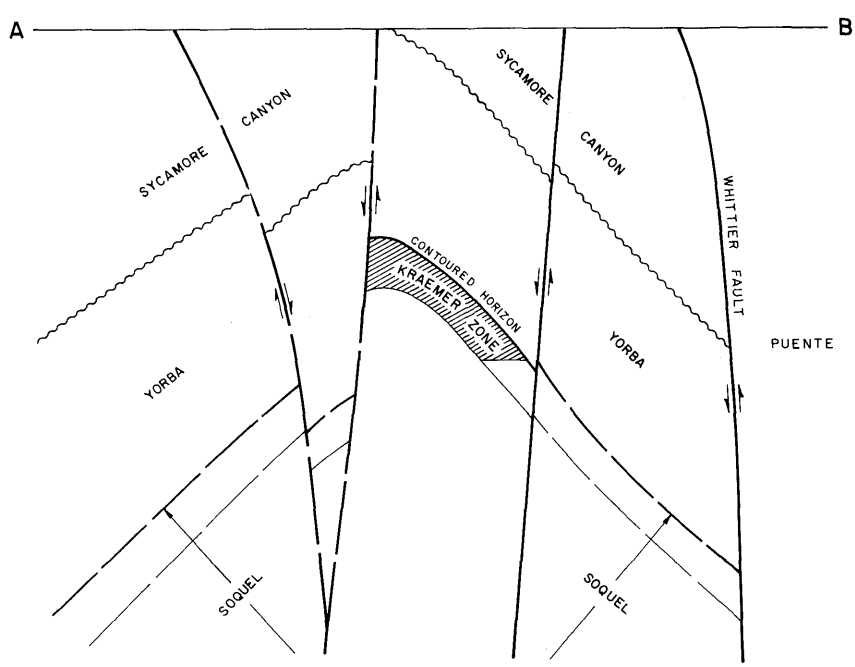
ESPERANZA OIL FIELD





CONTOURS ON TOP OF KRAEMER ZONE

SCALE 1" = 1200'



COUNTY: ORANGE

ESPERANZA 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	Columbine Associates, Sherwin D. Yoelin Operator "Dometal" 1	Shell Oil Co. "Dominguez" 24-19	19 3S 8W	SB	5,000	Kraemer	Puente late Miocene
Deepest well	Same as above	"	"	"	"	"	"

POOL DATA

ITEM	KRAEMER					FIELD OR AREA DATA
Discovery date	October 1956					
Initial production rates						
Oil (bbl/day)	90					
Gas (Mcf/day)	106					
Flow pressure (psi)						
Bean size (in.)						
Initial reservoir pressure (psi)						
Reservoir temperature (°F)						
Initial oil content (STB/ac.-ft.)						
Initial gas content (MSCF/ac.-ft.)						
Formation	Puente					
Geologic age	late Miocene					
Average depth (ft.)	1,600					
Average net thickness (ft.)	375					
Maximum productive area (acres)	85					
RESERVOIR ROCK PROPERTIES						
Porosity (%)	21					
So_i (%)						
Sw_i (%)						
Sg_i (%)	110*					
Permeability to air (md)						
RESERVOIR FLUID PROPERTIES						
Oil:						
Oil gravity (°API)	27					
Sulfur content (% by wt.)						
Initial solution GOR (SCF/STB)	1,145					
Initial oil FVF (RB/STB)						
Bubble point press. (psia)						
Viscosity (cp) @ °F						
Gas:						
Specific gravity (air = 1.0)						
Heating value (Btu/cu. ft.)						
Water:						
Salinity, NaCl (ppm)	1,763					
T.D.S. (ppm)						
R_w (ohm/m) (77°F)						
ENHANCED RECOVERY PROJECTS						
Enhanced recovery projects						
Date started						
Date discontinued						
Peak oil production (bbl)	153,947					
Year	1958					
Peak gas production, net (Mcf)	113,448					
Year	1958					

Base of fresh water (ft.): 1,100 - 2,150

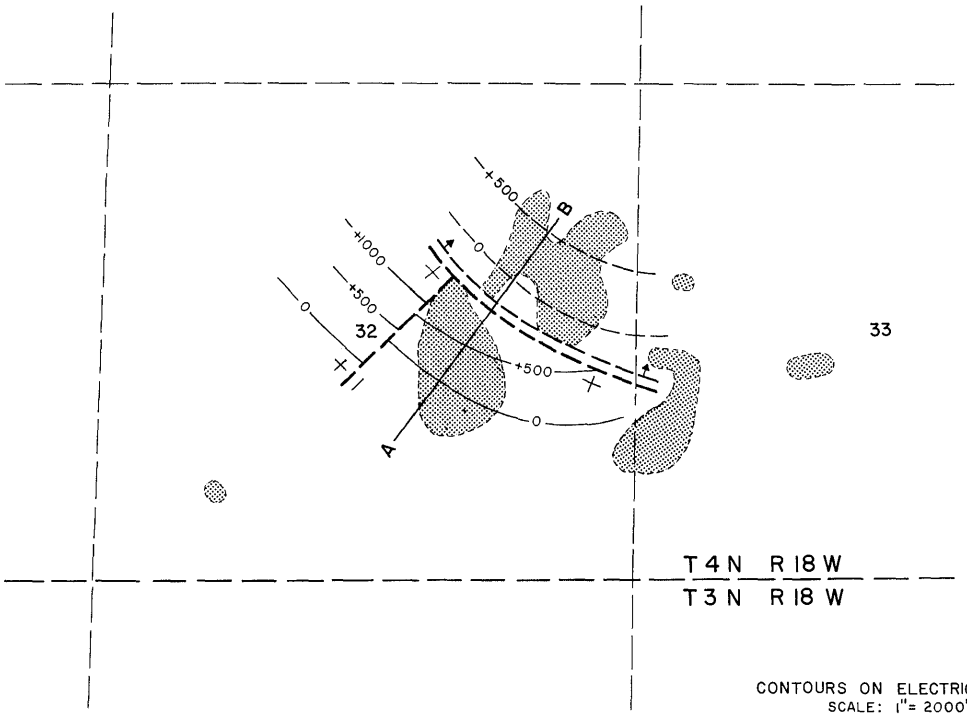
Remarks:

Selected References: Gaede, V.F., 1959, Esperanza Oil Field: Calif. Div. of Oil and Gas, Summary of Operations -- Calif. Oil Fields, Vol. 45, No. 2.

DATE: January 1989 *Average value

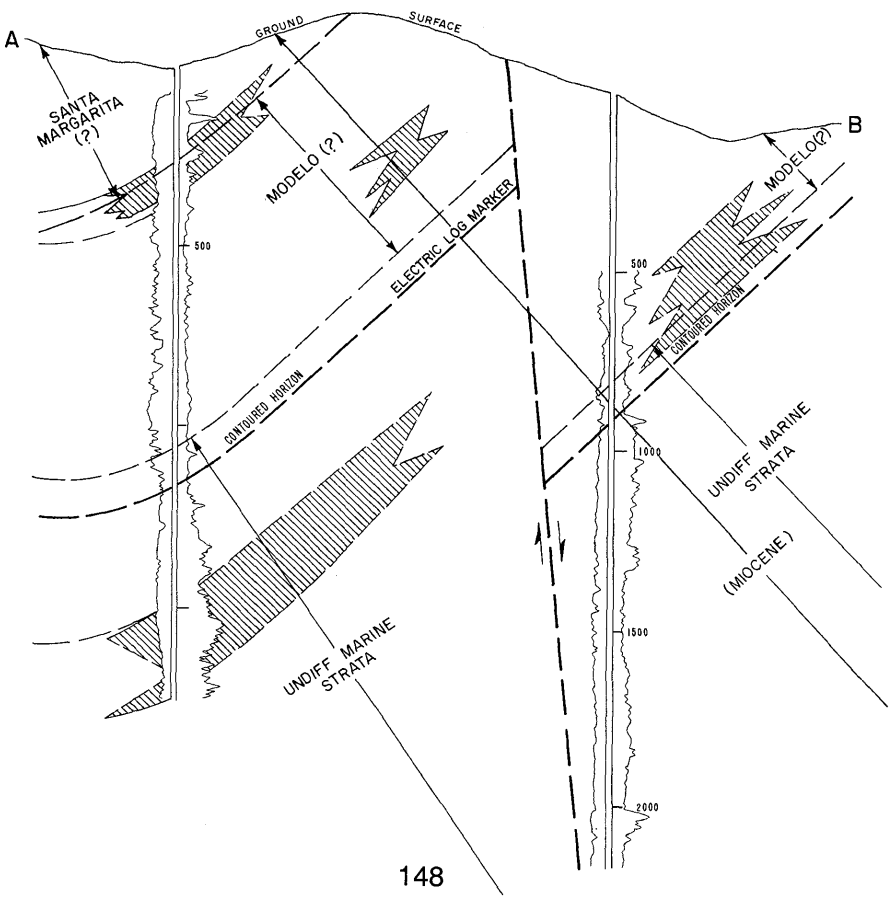
CALIFORNIA DIVISION OF OIL AND GAS

EUREKA CANYON OIL FIELD



CONTOURS ON ELECTRIC LOG MARKER
SCALE: 1"= 2000'

MAP AND CROSS SECTION BASED ON DATA BY MERCURY OIL CO. — MODIFIED BY THE DIVISION OF OIL AND GAS



COUNTY: VENTURA

EUREKA CANYON 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	Mercury Oil Co. No. 1	Eureka Oil Co. No. 1	32 4N 18W	SB	unk.	unnamed	
Deepest well	Petro-Lewis Corp. "Texaco Sloan" 1	The Texas Co. "Sloan" 1	32 4N 18W	SB	10,038		Pico Pliocene

POOL DATA

ITEM	UNNAMED	"102" SAND				FIELD OR AREA DATA
Discovery date	1893	February 1971				
Initial production rates						
Oil (bbl/day)						
Gas (Mcf/day)						
Flow pressure (psi)						
Bean size (in.)						
Initial reservoir pressure (psi)	-	700				
Reservoir temperature (°F)	-	95				
Initial oil content (STB/ac.-ft.)	-	930				
Initial gas content (MSCF/ac.-ft.)						
Formation	Santa Margarita	-				
Geologic age	Miocene	Miocene				
Average depth (ft.)	200-1,500	1,800				
Average net thickness (ft.)	120	250				
Maximum productive area (acres)						220
RESERVOIR ROCK PROPERTIES						
Porosity (%)	-	24				
S_{oi} (%)	-	70**				
S_{wi} (%)	-	30**				
S_{gi} (%)						
Permeability to air (md)	-	120-340				
RESERVOIR FLUID PROPERTIES						
Oil:						
Oil gravity (°API)	23	29				
Sulfur content (% by wt.)						
Initial solution GOR (SCF/STB)						
Initial oil FVF (RB/STB)						
Bubble point press. (psia)	-	1,000**				
Viscosity (cp) @ °F	-	10**				
Gas:						
Specific gravity (air = 1.0)	-	0.7				
Heating value (Btu/cu. ft.)						
Water:						
Salinity, NaCl (ppm)	1,000	2,100				
T.D.S. (ppm)	-	2,200				
R_w (ohm/m) (77°F)						
ENHANCED RECOVERY PROJECTS						
Enhanced recovery projects						
Date started						
Date discontinued						
Peak oil production (bbl)						5,140
Year						1939
Peak gas production, net (Mcf)						3,000
Year						1977

Base of fresh water (ft.): 1,250

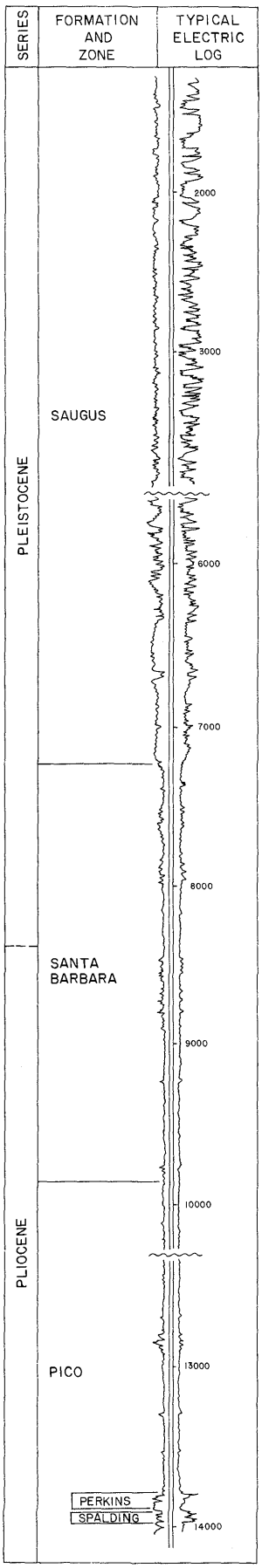
Remarks:

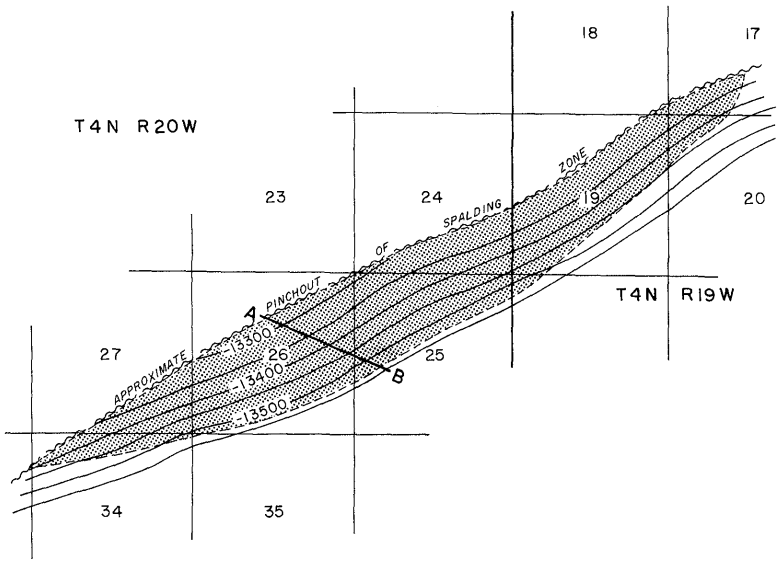
Selected References:

DATE: May 1983 **Estimated value

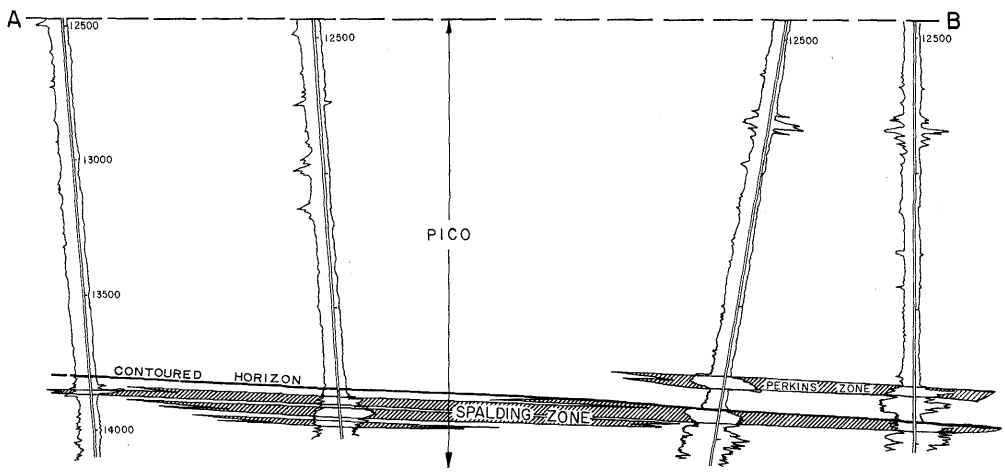
CALIFORNIA DIVISION OF OIL AND GAS

FILLMORE OIL FIELD





CONTOURS ON TOP OF SPALDING ZONE OR EQUIVALENT



COUNTY: VENTURA

FILLMORE 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	Chevron U.S.A. Inc. "S" 1	Standard Oil Co. of Calif. "Sespe Ranch" 1	27 4N 20W	SB	14,503	Spalding	
Deepest well	Chevron U.S.A. Inc. "B" 1	Standard Oil Co. of Calif. "Burson" 1	20 4N 19W	SB	15,454		Pico Pliocene

POOL DATA

ITEM	PERKINS	SPALDING				FIELD OR AREA DATA
Discovery date	January 1957	April 1954				
Initial production rates						
Oil (bbl/day)	493	450				
Gas (Mcf/day)	500	350				
Flow pressure (psi)						
Bean size (in.)						
Initial reservoir pressure (psi)	6,152	6,152				
Reservoir temperature (°F)	230	230				
Initial oil content (STB/ac.-ft.)	590	612				
Initial gas content (MSCF/ac.-ft.)						
Formation	Pico	Pico				
Geologic age	Pliocene	Pliocene				
Average depth (ft.)	13,750	13,900				
Average net thickness (ft.)	35	53				
Maximum productive area (acres)						500
RESERVOIR ROCK PROPERTIES						
Porosity (%)	20	19				
S_{oi} (%)	60	60				
S_{wi} (%)	27.3	30.0				
S_{gi} (%)						
Permeability to air (md)	82*	70*				
RESERVOIR FLUID PROPERTIES						
Oil:						
Oil gravity (°API)	32	32				
Sulfur content (% by wt.)	0	0				
Initial solution GOR (SCF/STB)	980	980				
Initial oil FVF (RB/STB)	1.66	1.66				
Bubble point press. (psia)						
Viscosity (cp) @ °F	0.39 @ 230	0.39 @ 230				
Gas:						
Specific gravity (air = 1.0)						
Heating value (Btu/cu. ft.)						
Water:						
Salinity, NaCl (ppm)	10,300	4,300				
T.D.S. (ppm)						
R_w (ohm/m) (77°F)						
ENHANCED RECOVERY PROJECTS						
Enhanced recovery projects	pressure maintenance	pressure maintenance				
Date started	1967	1967				
Date discontinued	1970	1970				
Peak oil production (bbl)						2,512,186
Year						1958
Peak gas production, net (Mcf)						5,544,566
Year						1958

Base of fresh water (ft.): 5,500

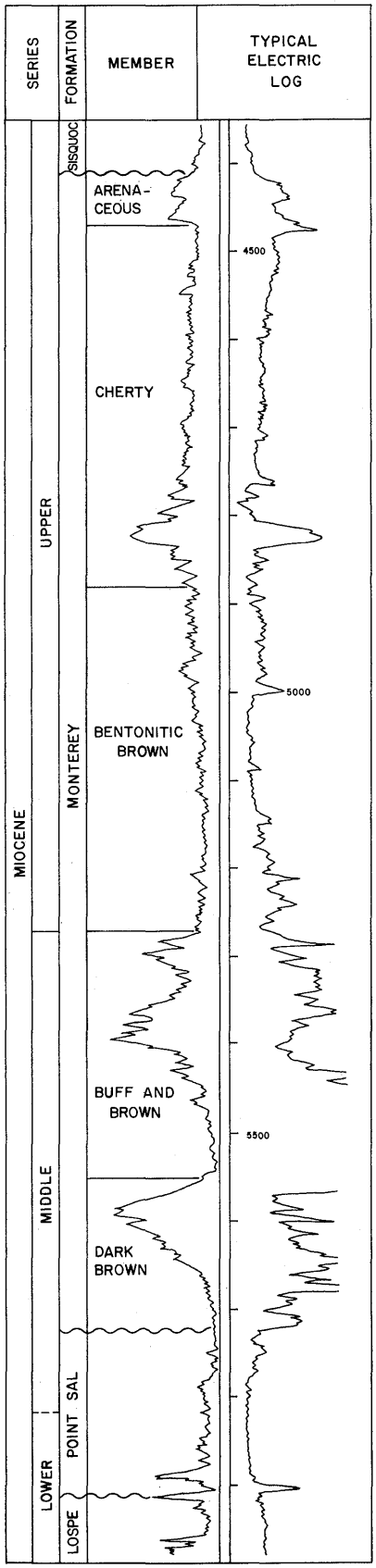
Remarks: The field was abandoned in 1973 and was reactivated in 1982.

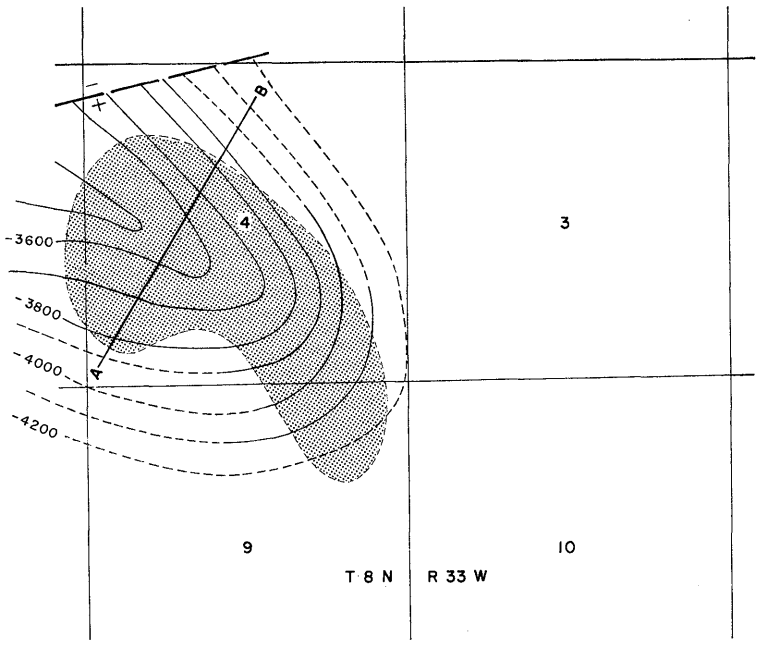
Selected References: Schultz, C.H., 1959, Fillmore Oil Field: Calif. Div. of Oil and Gas, Summary of Operations -- Calif. Oil Fields, Vol. 45, No. 1.

DATE: May 1983 *Average value

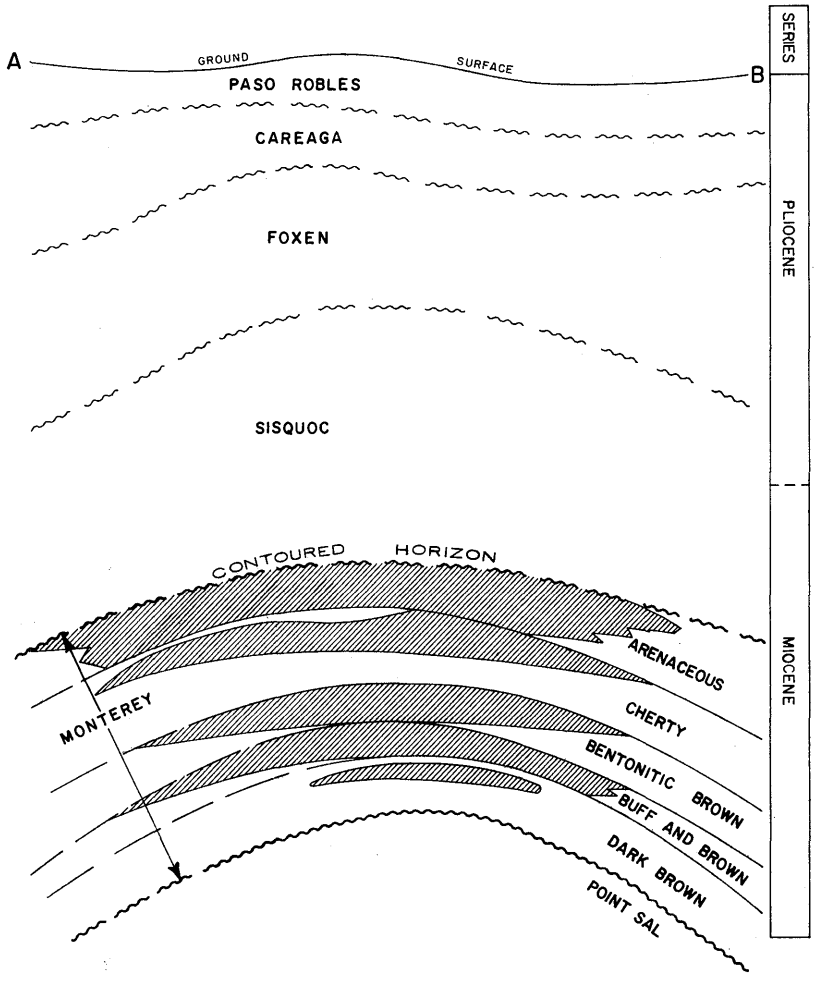
CALIFORNIA DIVISION OF OIL AND GAS

FOUR DEER OIL FIELD





CONTOURS ON TOP OF MONTEREY



COUNTY: SANTA BARBARA

FOUR DEER 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	Chevron U.S.A. Inc. "Los Flores" 1	Sunray Oil Corp. "Sunray Los Flores" 1	4 8N 33W	SB	5,998	Monterey	
Deepest well	Chevron U.S.A. Inc. "Los Flores Ranch" 1	Gulf Oil Corp. "Los Flores Ranch" 1	9 8N 33W	SB	6,698		Knoxville Cretaceous

POOL DATA

ITEM	MONTEREY[a/]					FIELD OR AREA DATA
Discovery date	June 1947					
Initial production rates						
Oil (bbl/day)	319					
Gas (Mcf/day)	170					
Flow pressure (psi)						
Bean size (in.)						
Initial reservoir pressure (psi)	2,000					
Reservoir temperature (°F)	190					
Initial oil content (STB/ac.-ft.)						
Initial gas content (MSCF/ac.-ft.)						
Formation	Monterey					
Geologic age	Miocene					
Average depth (ft.)	4,800-6,200					
Average net thickness (ft.)	600-1,100					
Maximum productive area (acres)	260					
RESERVOIR ROCK PROPERTIES						
Porosity (%)	fractured shale					
S_{oi} (%)						
S_{wi} (%)						
S_{gi} (%)						
Permeability to air (md)						
RESERVOIR FLUID PROPERTIES						
Oil:						
Oil gravity (°API)	22-35					
Sulfur content (% by wt.)	1.62					
Initial solution GOR (SCF/STB)	600-2,000					
Initial oil FVF (RB/STB)						
Bubble point press. (psia)						
Viscosity (cp) @ °F						
Gas:						
Specific gravity (air = 1.0)	0.75					
Heating value (Btu/cu. ft.)	1,200					
Water:						
Salinity, NaCl (ppm)	25,025					
T.D.S. (ppm)	25,377					
R_w (ohm/m) (77°F)	0.28					
ENHANCED RECOVERY PROJECTS						
Enhanced recovery projects	waterflood					
Date started	1965					
Date discontinued	1984					
Peak oil production (bbl)	248,493					
Year	1948					
Peak gas production, net (Mcf)	261,859					
Year	1949					

Base of fresh water (ft.): 1,500

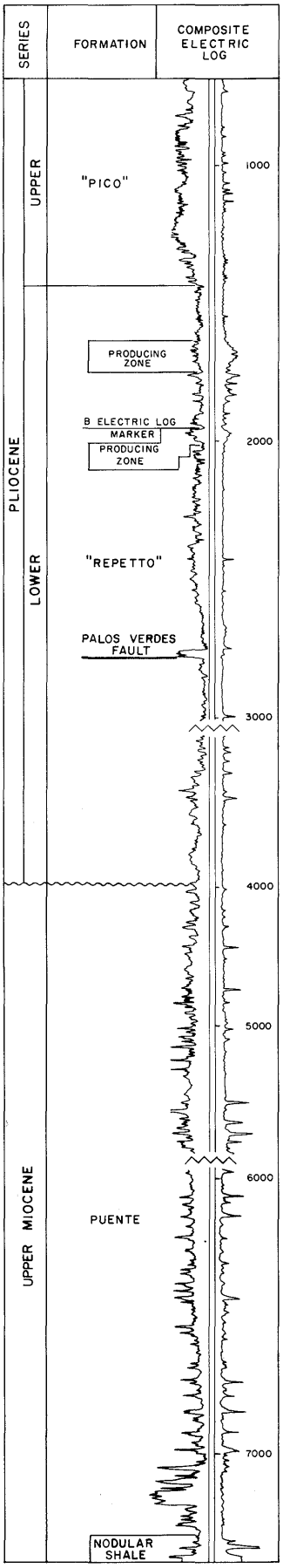
Remarks: Four Deer Oil Field was originally designated as an area of Cat Canyon Oil Field.
a/ The Monterey includes the Arenaceous, Cherty, Bentonitic Brown, Buff and Brown, and Dark Brown zones.

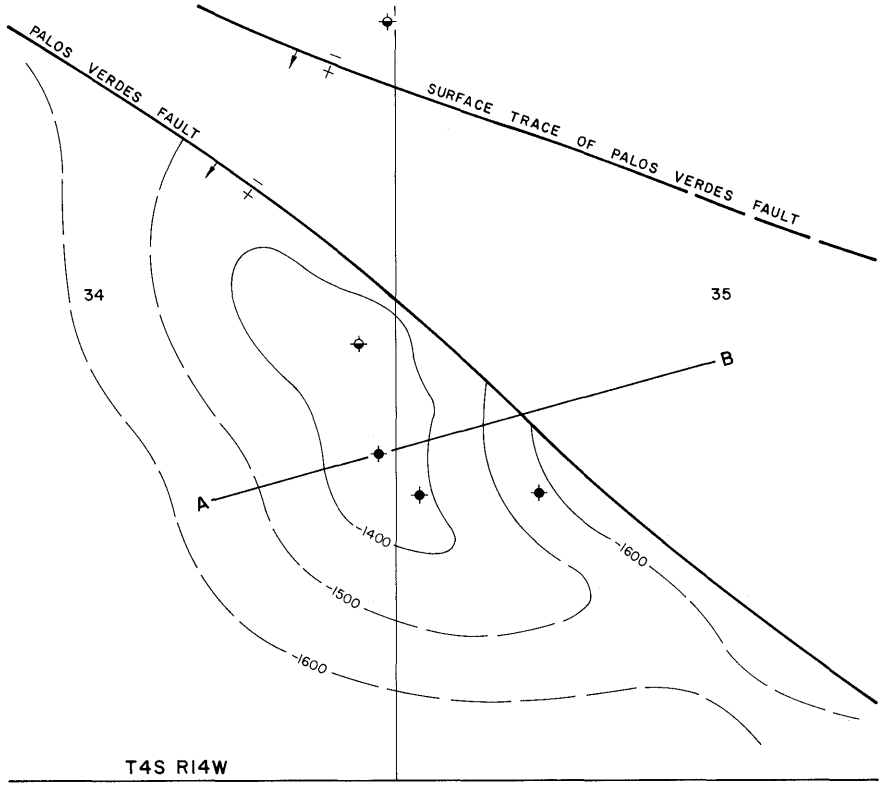
Selected References: Dolman, S.G., 1947, Operations in District No. 3: Calif. Div. of Oil and Gas, Summary of Operations--Calif. Oil Fields, Vol. 33, No. 2.

DATE: January 1989

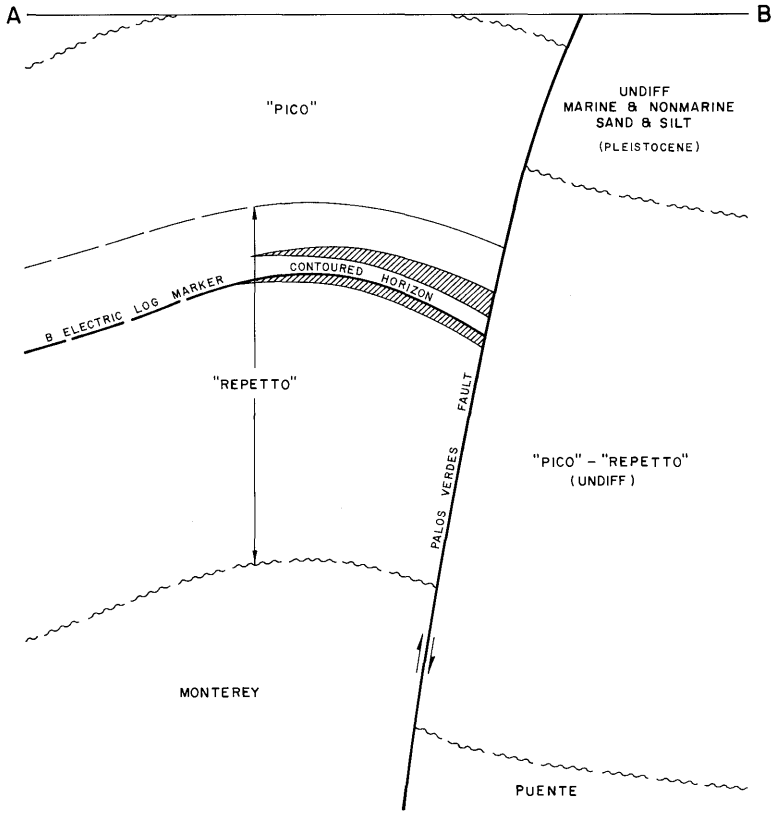
CALIFORNIA DIVISION OF OIL AND GAS

GAFFEY OIL FIELD
(Abandoned)





CONTOURS ON TOP OF B ELECTRIC LOG MARKER
SCALE: 1" = 1200'



COUNTY: LOS ANGELES

GAFFEY OIL FIELD (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	Tideland Exploration Co. "Chandler-McBurney" 1	Same as present	35 4S 14W	SB	7,203	Pliocene	Puente late Miocene
Deepest well	Same as above	"	"	"	"	"	"

POOL DATA

ITEM	PLIOCENE					FIELD OR AREA DATA
Discovery date	November 1955					
Initial production rates						
Oil (bbl/day)	12					
Gas (Mcf/day)						
Flow pressure (psi)						
Bean size (in.)						
Initial reservoir pressure (psi)						
Reservoir temperature (°F)						
Initial oil content (STB/ac.-ft.)						
Initial gas content (MSCF/ac.-ft.)						
Formation	"Repetto"					
Geologic age	early Pliocene					
Average depth (ft.)	1,500					
Average net thickness (ft.)	100					
Maximum productive area (acres)	20					
RESERVOIR ROCK PROPERTIES						
Porosity (%)						
So_i (%)						
Sw_i (%)						
Sg_i (%)						
Permeability to air (md)						
RESERVOIR FLUID PROPERTIES						
Oil:						
Oil gravity (°API)	10					
Sulfur content (% by wt.)						
Initial solution GOR (SCF/STB)						
Initial oil FVF (RB/STB)						
Bubble point press. (psia)						
Viscosity (cp) @ °F						
Gas:						
Specific gravity (air = 1.0)						
Heating value (Btu/cu. ft.)						
Water:						
Salinity, NaCl (ppm)	25,650					
T.D.S. (ppm)						
R_w (ohm/m) (77°F)						
ENHANCED RECOVERY PROJECTS						
Enhanced recovery projects	cyclic steam					
Date started	1966					
Date discontinued	1966					
Peak oil production (bbl)	1,737					
Year	1957					
Peak gas production, net (Mcf)						
Year						

Base of fresh water (ft.): 600

Remarks: Last production was in 1966. The field was abandoned in April 1967. Cumulative production is 10,000 bbl of oil and no gas.

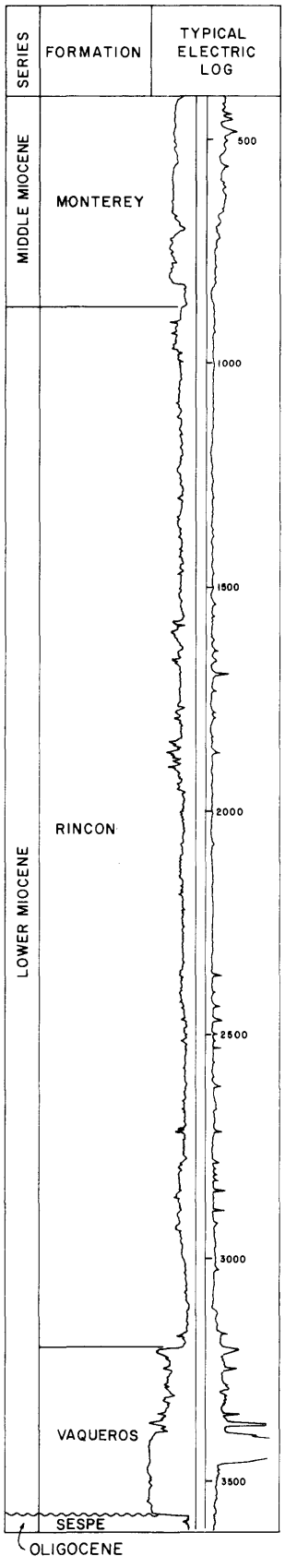
Selected References:

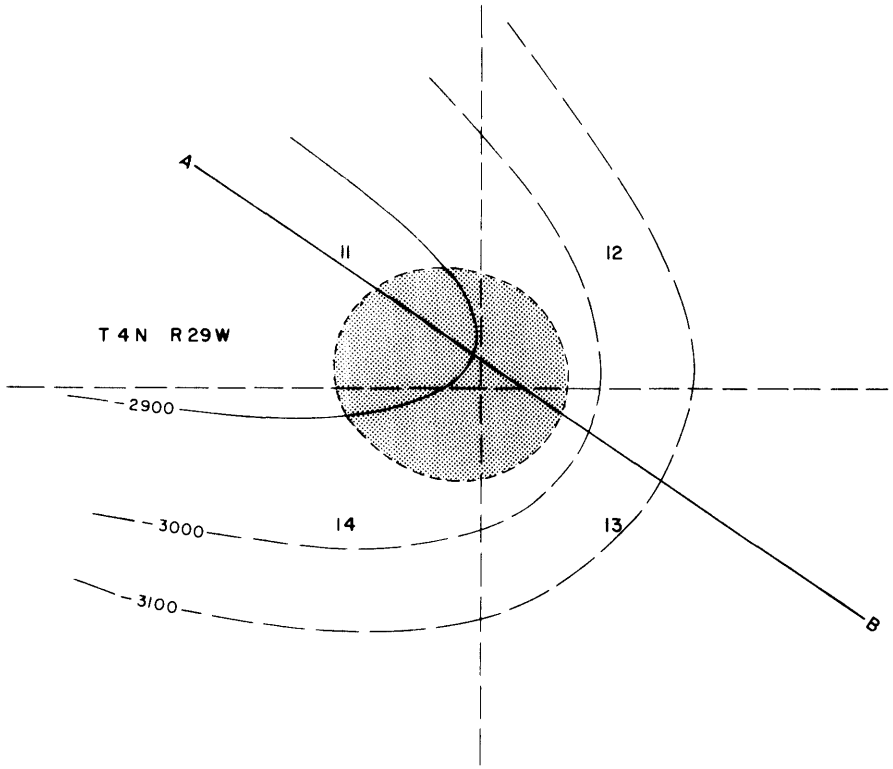
DATE: January 1989

CALIFORNIA DIVISION OF OIL AND GAS

GLEN ANNIE GAS FIELD

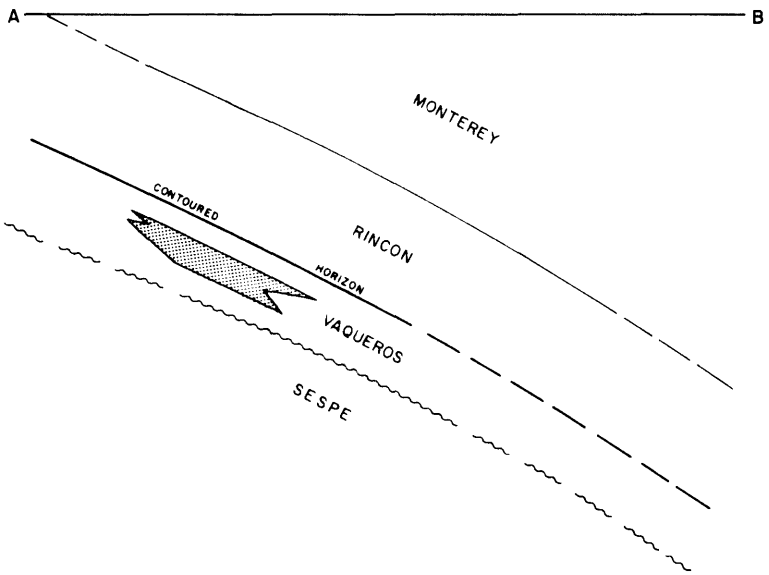
(Abandoned)





CONTOURS ON TOP OF VAQUEROS

SCALE 1" = 500'



COUNTY: **SANTA BARBARA**

GLEN ANNIE GAS FIELD (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	Chevron U.S.A. Inc. "Roy Eaton et al" 1	Standard Oil Co. of Calif. "Roy Eaton et al" 1	11 4N 29W	SB	3,598	Vaqueros	
Deepest well	Fire-Rice Drilling Co. "Harbel" 1	Same as present	13 4N 29W	SB	3,731		Sespe Oligocene

POOL DATA

ITEM	VAQUEROS					FIELD OR AREA DATA
Discovery date	July 1958					
Initial production rates						
Oil (bbl/day)						
Gas (Mcf/day)	2,167					
Flow pressure (psi)	150					
Bean size (in.)	32/64					
Initial reservoir pressure (psi)	400					
Reservoir temperature (°F)	108					
Initial oil content (STB/ac.-ft.)						
Initial gas content (MSCF/ac.-ft.)						
Formation	Vaqueros					
Geologic age	early Miocene					
Average depth (ft.)	3,350					
Average net thickness (ft.)	80					
Maximum productive area (acres)	40					
RESERVOIR ROCK PROPERTIES						
Porosity (%)	25-30***					
S_{oi} (%)						
S_{wi} (%)	24-30***					
S_{gi} (%)	70-76***					
Permeability to air (md)						
RESERVOIR FLUID PROPERTIES						
Oil:						
Oil gravity (°API)						
Sulfur content (% by wt.)						
Initial solution GOR (SCF/STB)						
Initial oil FVF (RB/STB)						
Bubble point press. (psia)						
Viscosity (cp) @ °F						
Gas:						
Specific gravity (air = 1.0)						
Heating value (Btu/cu. ft.)	1,000					
Water:						
Salinity, NaCl (ppm)	2,996					
T.D.S. (ppm)						
R_w (ohm/m) (77°F)						
ENHANCED RECOVERY PROJECTS						
Enhanced recovery projects						
Date started						
Date discontinued						
Peak oil production (bbl)						
Year						
Peak gas production, net (Mcf)	265,490					
Year	1959					

Base of fresh water (ft.): 800

Remarks: This one-well gas field was abandoned in 1962. Cumulative production is 490,983 Mcf of gas.

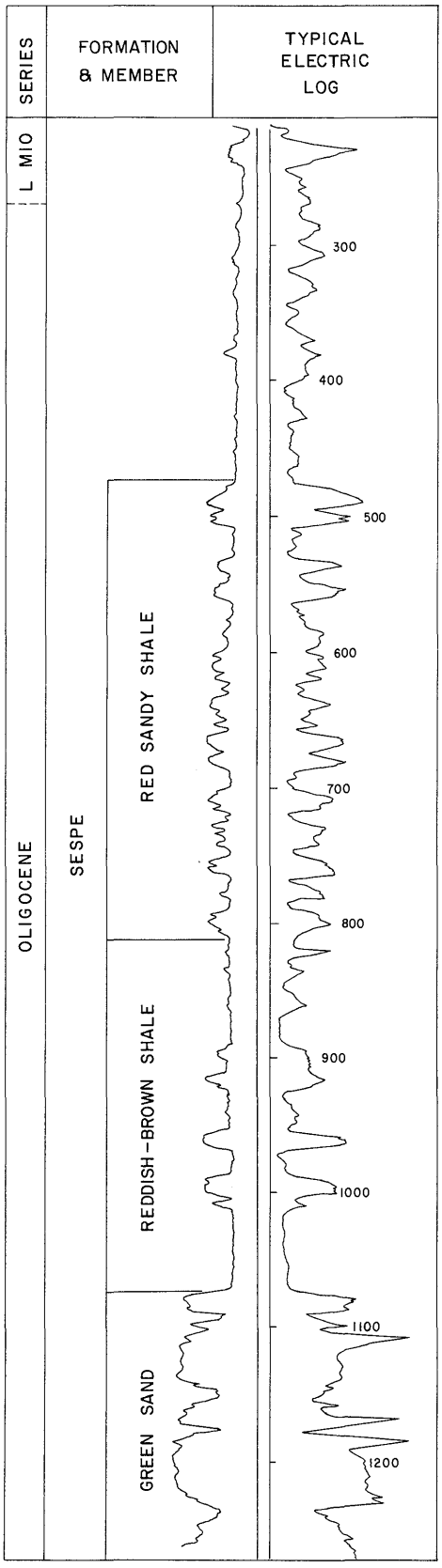
Selected References: Barton, C.L., Operations in District No. 3, 1958: California Div. of Oil and Gas, Summary of Operations--Calif. Oil Fields, Vol. 44, No. 2.
Yerkes, R.F., H.C. Wagner and K.A. Yenne, 1969, Petroleum Development in the Region of the Santa Barbara Channel: U.S. Geol. Survey Prof. Paper 679B, p. 19.

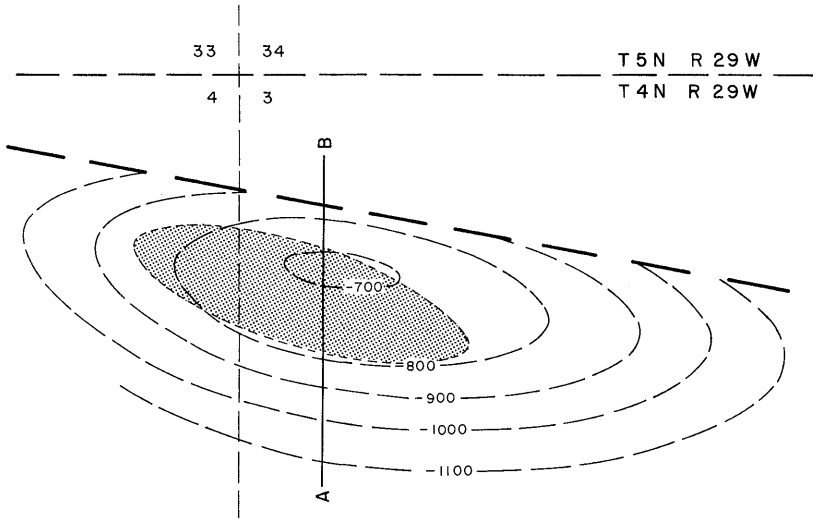
DATE: January 1989 ***Representative values for area, formation, and depth

CALIFORNIA DIVISION OF OIL AND GAS

GOLETA OIL FIELD

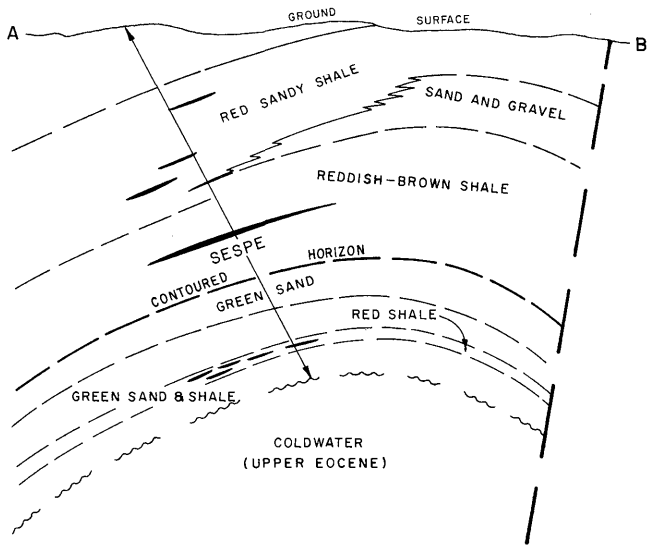
(Abandoned)





CONTOURS ON TOP OF GREEN SAND

SCALE 1" = 1850'



COUNTY: SANTA BARBARA

GOLETA OIL FIELD (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	Miley Petroleum Corp., Ltd. "Goleta" 2	Miley Oil Co. "Goleta" 2	3 4N 29W	SB	1,330	Sespe	
Deepest well	Miley Petroleum Corp., Ltd. "Goleta" 1	Miley Oil Co. No. 1	3 4N 29W	SB	5,664		Coldwater Eocene

POOL DATA

ITEM	SESPE					FIELD OR AREA DATA
Discovery date	February 1927					
Initial production rates						
Oil (bbl/day)	362					
Gas (Mcf/day)						
Flow pressure (psi)						
Bean size (in.)						
Initial reservoir pressure (psi)						
Reservoir temperature (°F)						
Initial oil content (STB/ac.-ft.)						
Initial gas content (MSCF/ac.-ft.)						
Formation	Sespe					
Geologic age	Oligocene					
Average depth (ft.)	400-1,400					
Average net thickness (ft.)	125					
Maximum productive area (acres)	70					
RESERVOIR ROCK PROPERTIES						
Porosity (%)	18-25**					
S_{oi} (%)	40-60**					
S_{wi} (%)	40-60**					
S_{gi} (%)						
Permeability to air (md)	200-1,000**					
RESERVOIR FLUID PROPERTIES						
Oil:						
Oil gravity (°API)	40-43					
Sulfur content (% by wt.)						
Initial solution GOR (SCF/STB)						
Initial oil FVF (RB/STB)						
Bubble point press. (psia)						
Viscosity (cp) @ °F						
Gas:						
Specific gravity (air = 1.0)						
Heating value (Btu/cu. ft.)						
Water:						
Salinity, NaCl (ppm)	514-684					
T.D.S. (ppm)						
R_w (ohm/m) (77°F)						
ENHANCED RECOVERY PROJECTS						
Enhanced recovery projects						
Date started						
Date discontinued						
Peak oil production (bbl)	85,642					
Year	1927					
Peak gas production, net (Mcf)						
Year						

Base of fresh water (ft.): 1,400

Remarks: The field was abandoned in 1953. Cumulative production is 140,281 bbl of oil and about 56,000 Mcf of gas. Produced water has a high boron content.

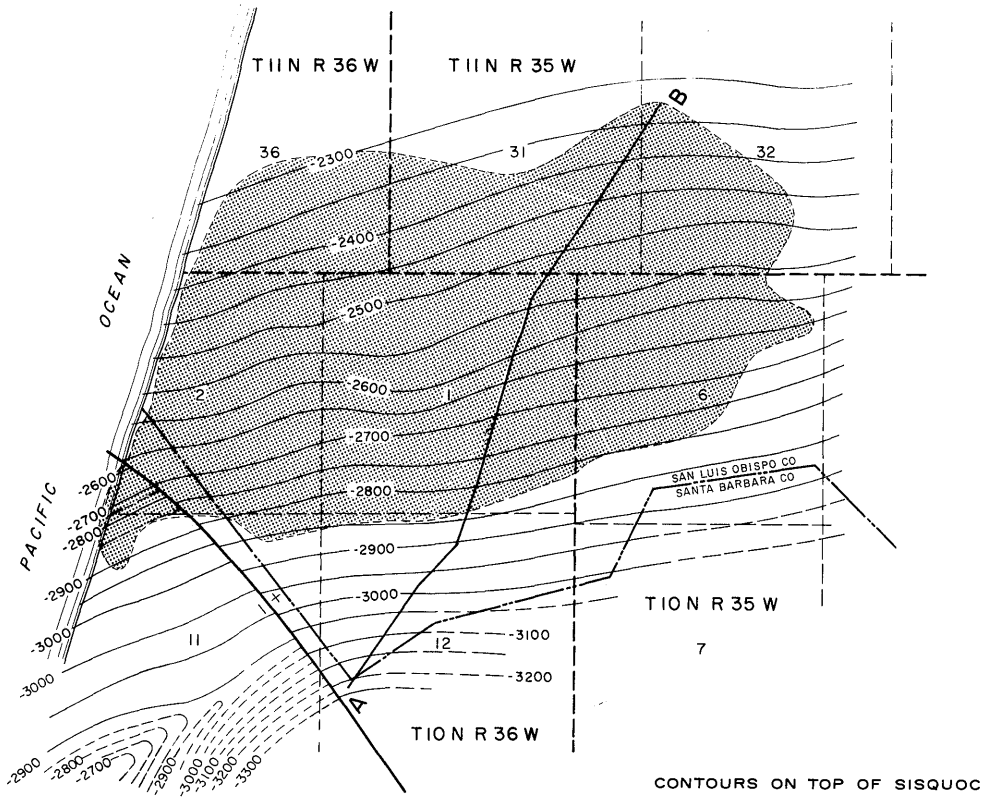
Selected References:

Dolman, S., 1931, Goleta Oil Field: Unpublished report in the files of the Calif. Div. of Oil and Gas, District 3 (Santa Maria).
McCabe, R.E., 1927, Operations in District 3, Calif. Div. of Oil and Gas, Summary of Operations--Calif. Oil Fields, Vol. 13, No. 8.
Vickery, F.P., 1943, Goleta Oil Field: Calif. Div. of Mines Bull. 118, p. 377-379.
Yerkes, R.F., H.C. Wagner and K.A. Yenne, 1969, Petroleum Development in the Region of the Santa Barbara Channel: U.S. Geol. Survey Prof. Paper 679, p. 19.

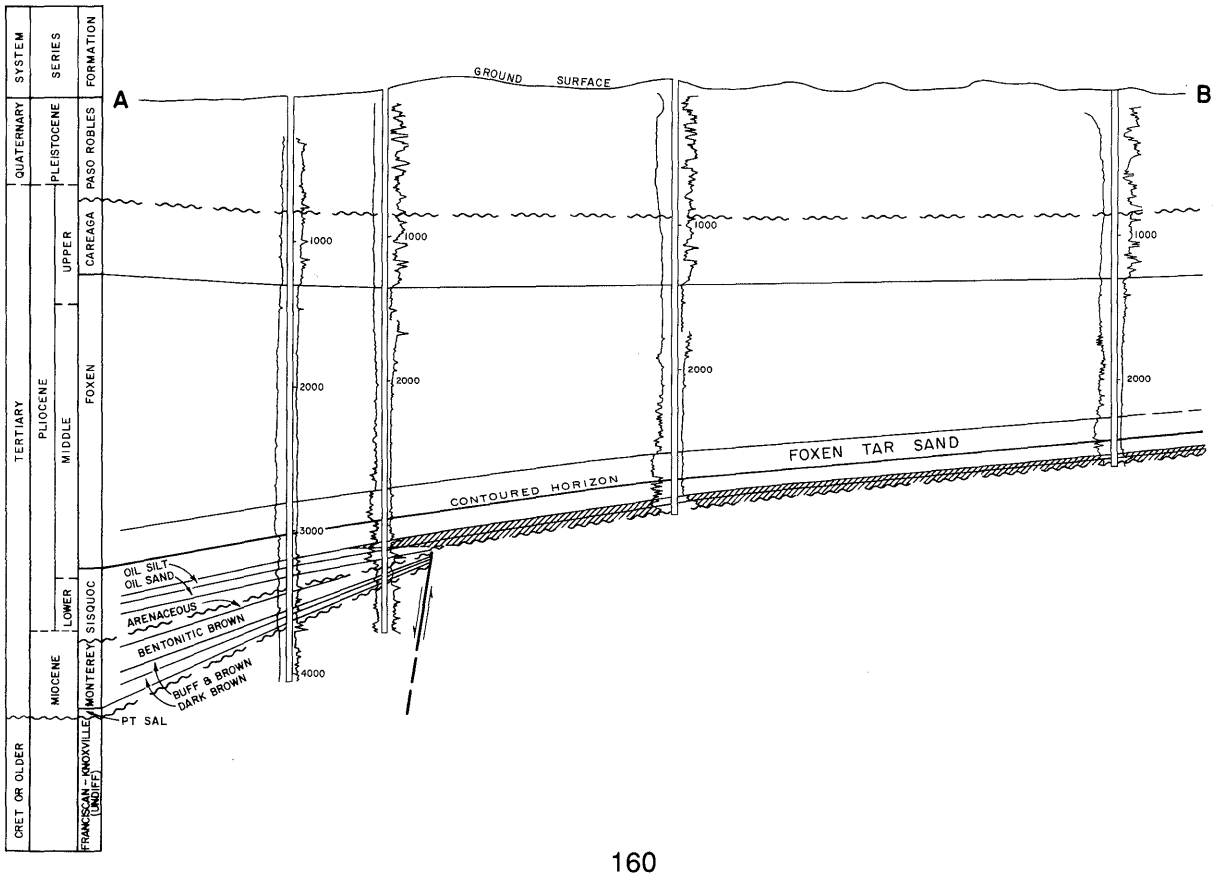
DATE: August 1987 **Estimated value

CALIFORNIA DIVISION OF OIL AND GAS

GUADALUPE OIL FIELD



CONTOURS ON TOP OF SISQUOC



COUNTY: SAN LUIS OBISPO AND SANTA BARBARA

GUADALUPE 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	Union Oil Co. of Calif. "LeRoy" 2	Continental Oil Co. "LeRoy" 2	2 10N 36W	SB	2,759	Sisquoc	
Deepest well	Union Oil Co. of Calif. "LeRoy" F7B	Same as present	31 11N 35W	SB	7,310 a/		Franciscan Cretaceous

POOL DATA

ITEM	SISQUOC b/	MONTEREY-PT. SAL c/				FIELD OR AREA DATA
Discovery date	May 1948	October 1955				
Initial production rates						
Oil (bbl/day)	35	126				
Gas (Mcf/day)	-	74				
Flow pressure (psi)						
Bean size (in.)						
Initial reservoir pressure (psi)	1,200	-				
Reservoir temperature (°F)	155	-				
Initial oil content (STB/ac.-ft.)						
Initial gas content (MSCF/ac.-ft.)						
Formation	Sisquoc	Monterey-Pt.Sal				
Geologic age	early Pliocene	Miocene				
Average depth (ft.)	2,700	3,000				
Average net thickness (ft.)	120	200				
Maximum productive area (acres)						2,090
RESERVOIR ROCK PROPERTIES						
Porosity (%)	35-36	20-30***				
So_i (%)	63	60***				
Sw_i (%)	37	40***				
Sg_i (%)						
Permeability to air (md)	1,000-1,550	-				
RESERVOIR FLUID PROPERTIES						
Oil:						
Oil gravity (°API)	8-14	11-12				
Sulfur content (% by wt.)	5.39	5.39				
Initial solution GOR (SCF/STB)	140	-				
Initial oil FVF (RB/STB)						
Bubble point press. (psia)						
Viscosity (cp) @ °F	300 @ 155	-				
Gas:						
Specific gravity (air = 1.0)						
Heating value (Btu/cu. ft.)						
Water:						
Salinity, NaCl (ppm)	12,700-25,400	24,000				
T.D.S. (ppm)	9,700-27,500	-				
R_w (ohm/m) (77°F)	0.28	-				
ENHANCED RECOVERY PROJECTS						
Enhanced recovery projects	gas injection	cyclic steam				
Date started	1955	1965				
Date discontinued	1959	1965				
	cyclic steam					
	1964					
	active steamflood					
	1979					
	1986					
	waterflood					
	1957					
	1966					
Peak oil production (bbl)						1,703,102
Year						1971
Peak gas production, net (Mcf)						1,232,828
Year						1971

Base of fresh water (ft.): 1,200

Remarks: a/ Directional well; true vertical depth is 6,950 feet.
b/ Includes both "oil silt" and "oil sand" zones.
c/ These zones were tested in 1951 in Union Oil Co. of Calif. well "Union Sugar" 36. However, production was not considered commercial at the time.

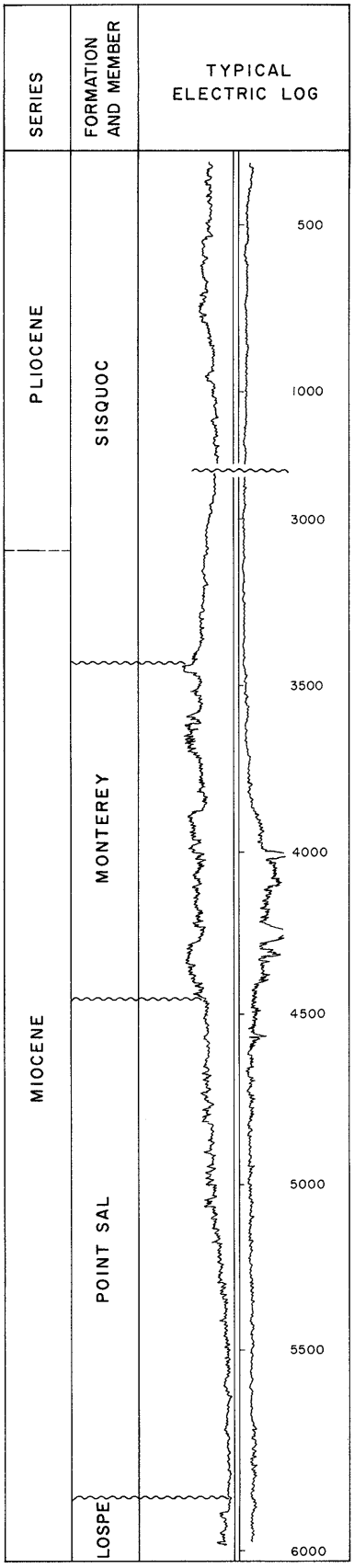
Selected References: Bailey, Wm. C., 1955, Operations in District No. 3: Calif. Div. of Oil and Gas, Resume of Operations--Calif. Oil Fields, Vol. 41, No. 2.
Dept. of Water Resources, 1970, Sea-Water Intrusion, Pismo-Guadalupe Area, Bull. 63-3.
Lawrence, E.D., 1964, Guadalupe Oil Field: Calif. Div. of Oil and Gas, Summary of Operations--Calif. Oil Fields, Vol. 50, No. 2.

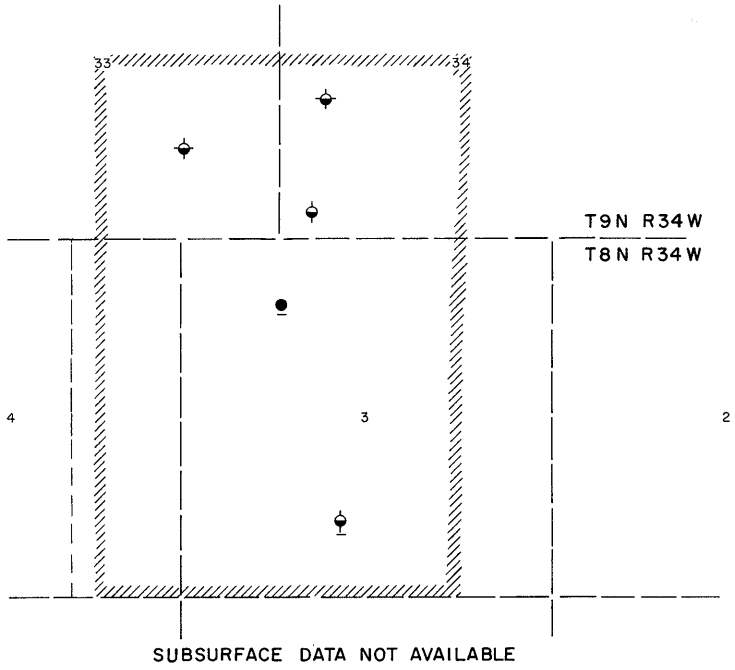
DATE: August 1987 ***Representative values for area, formation, and depth

CALIFORNIA DIVISION OF OIL AND GAS

NORTHWEST HARRIS CANYON OIL FIELD

(Abandoned)





SUBSURFACE DATA NOT AVAILABLE

COUNTY: SANTA BARBARA

HARRIS CANYON, NORTHWEST, OIL FIELD (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	Northern Michigan Exploration Co. "Vandenberg" 1	Same as present	3 8N 34W	SB	5,900 a/	Pt. Sal	
Deepest well	Northern Michigan Exploration Co. "Vandenberg" 2	Same as present	3 8N 34W	SB	8,319 b/		Lospe Miocene

POOL DATA

ITEM	PT. SAL					FIELD OR AREA DATA
Discovery date	February 1983					
Initial production rates						
Oil (bbl/day)	51					
Gas (Mcf/day)						
Flow pressure (psi)						
Bean size (in.)						
Initial reservoir pressure (psi)	2,150					
Reservoir temperature (°F)						
Initial oil content (STB/ac.-ft.)						
Initial gas content (MSCF/ac.-ft.)						
Formation	Pt. Sal					
Geologic age	Miocene					
Average depth (ft.)	5,600					
Average net thickness (ft.)	50					
Maximum productive area (acres)	10					
RESERVOIR ROCK PROPERTIES						
Porosity (%)	20-30					
So_i (%)	20-50					
Sw_i (%)	50-80					
Sg_i (%)	-					
Permeability to air (md)	35-60					
RESERVOIR FLUID PROPERTIES						
Oil:						
Oil gravity (°API)	30.4					
Sulfur content (% by wt.)						
Initial solution GOR (SCF/STB)						
Initial oil FVF (RB/STB)						
Bubble point press. (psia)						
Viscosity (cp) @ °F						
Gas:						
Specific gravity (air = 1.0)						
Heating value (Btu/cu. ft.)						
Water:						
Salinity, NaCl (ppm)	8,013					
T.D.S. (ppm)	9,080					
R_w (ohm/m) (77°F)	0.71					
ENHANCED RECOVERY PROJECTS						
Enhanced recovery projects						
Date started						
Date discontinued						
Peak oil production (bbl)	2,342					
Year	1985					
Peak gas production, net (Mcf)						
Year						

Base of fresh water (ft.): 350

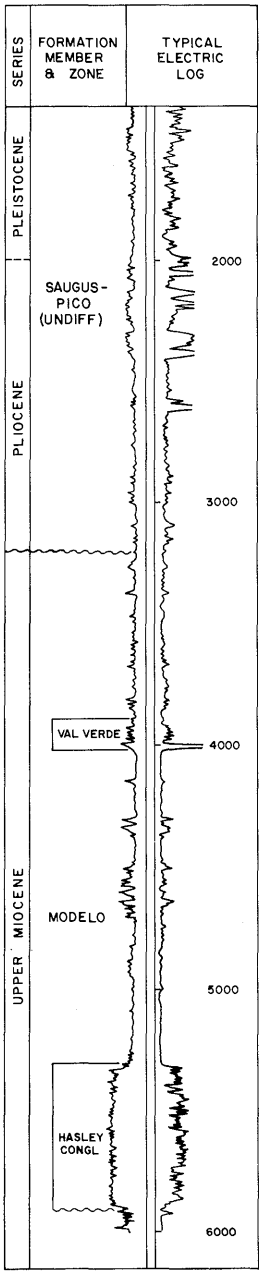
Remarks: The field was abandoned in 1987. Cumulative production is 9,914 bbl of oil, including oil produced during the testing of two uncompleted wells.
a/ Directional well; true vertical depth is 5,878 feet.
b/ Directional well; true vertical depth is 7,934 feet.

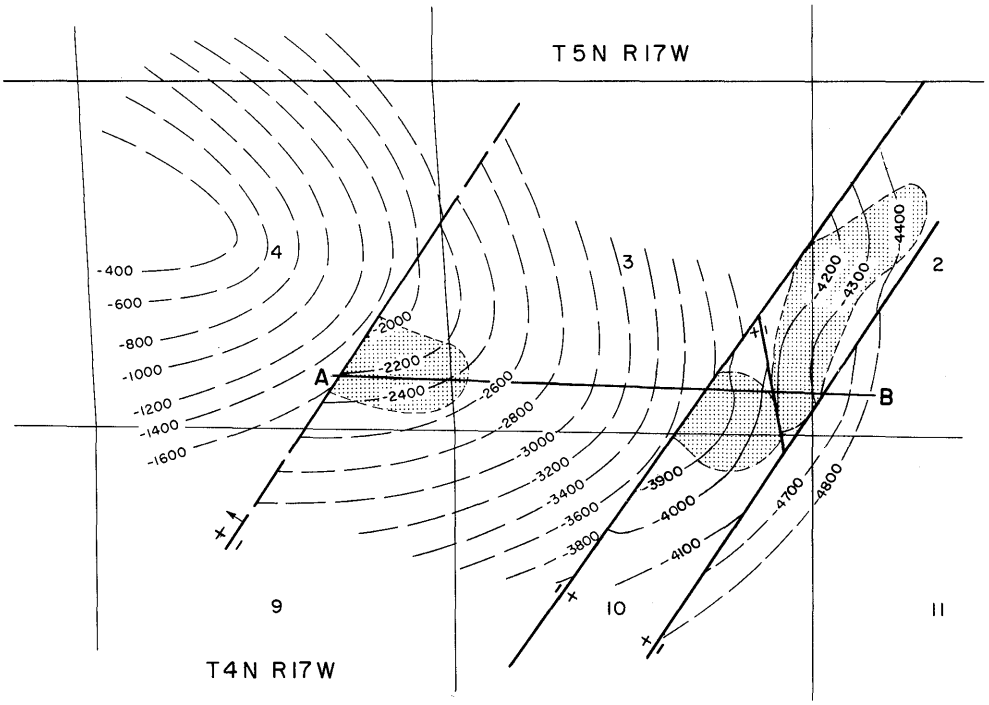
Selected References:

DATE: January 1989

CALIFORNIA DIVISION OF OIL AND GAS

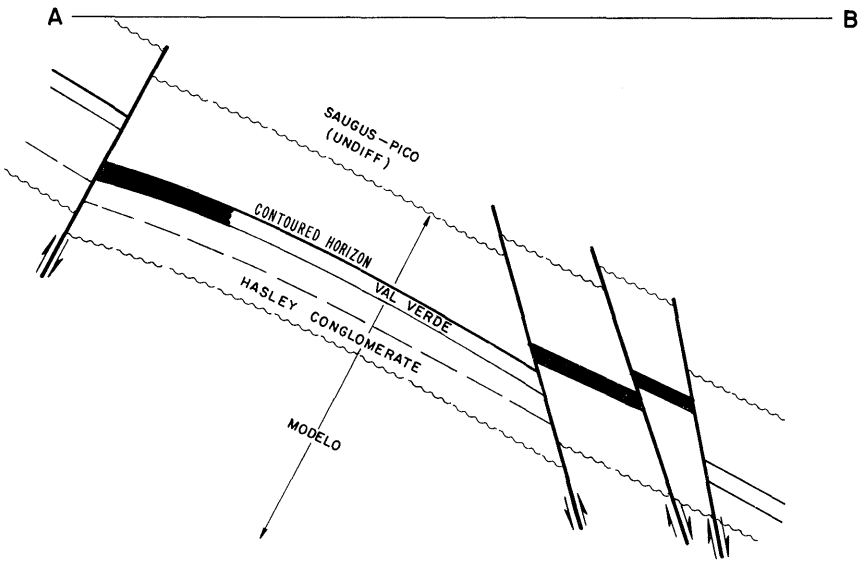
HASLEY CANYON OIL FIELD





CONTOURS ON TOP OF VAL VERDE

SCALE: 1" = 2800'



COUNTY: LOS ANGELES

HASLEY CANYON 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	Porsco Opr. Co. "Claiborne" 88-4	Shell Oil Co. "Claiborne" 88-4	4 4N 17W	SB	4,020	Val Verde	
Deepest well	Petrominerals Corp. "Mabel Strawn" 1	Newhall Land & Farming Co. "Mabel E. Strawn" 1	3 4N 17W	SB	6,722		Modelo Miocene

POOL DATA

ITEM	VAL VERDE					FIELD OR AREA DATA
Discovery date	December 1944					
Initial production rates						
Oil (bbl/day)	36					
Gas (Mcf/day)						
Flow pressure (psi)						
Bean size (in.)						
Initial reservoir pressure (psi)						
Reservoir temperature (°F)						
Initial oil content (STB/ac.-ft.)						
Initial gas content (MSCF/ac.-ft.)						
Formation	Modelo					
Geologic age	Miocene					
Average depth (ft.)	5,063					
Average net thickness (ft.)	200					
Maximum productive area (acres)						190
RESERVOIR ROCK PROPERTIES						
Porosity (%)						
So_i (%)						
Sw_i (%)						
Sg_i (%)						
Permeability to air (md)						
RESERVOIR FLUID PROPERTIES						
Oil:						
Oil gravity (°API)	13-18					
Sulfur content (% by wt.)						
Initial solution GOR (SCF/STB)						
Initial oil FVF (RB/STB)						
Bubble point press. (psia)						
Viscosity (cp) @ °F						
Gas:						
Specific gravity (air = 1.0)						
Heating value (Btu/cu. ft.)						
Water:						
Salinity, NaCl (ppm)	9,600					
T.D.S. (ppm)						
R_w (ohm/m) (77°F)						
ENHANCED RECOVERY PROJECTS						
Enhanced recovery projects						
Date started						
Date discontinued						
Peak oil production (bbl)	8,332					
Year	1966					
Peak gas production, net (Mcf)						
Year						

Base of fresh water (ft.): 1,500

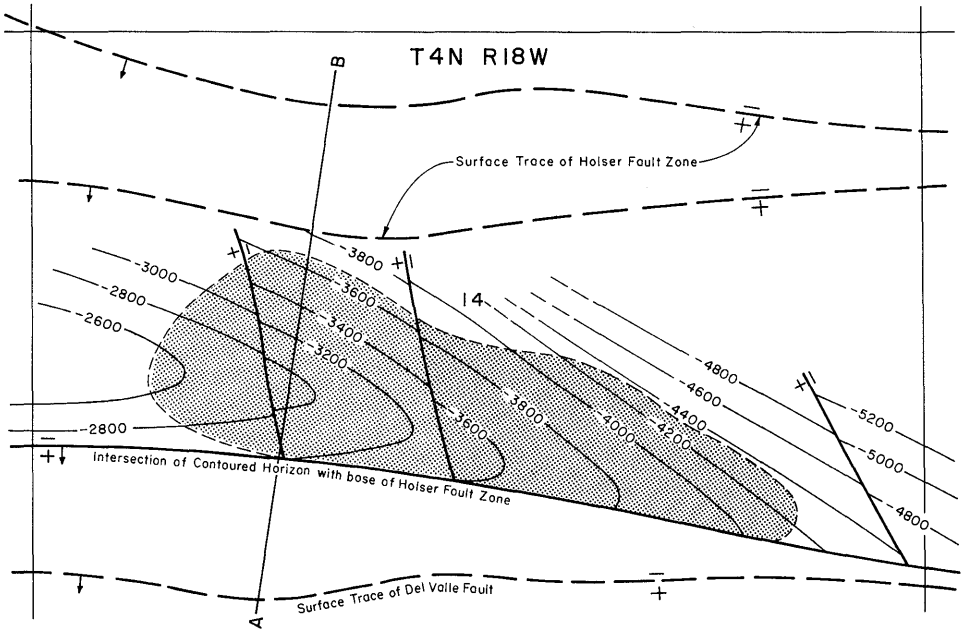
Remarks:

Selected References:

DATE: May 1983

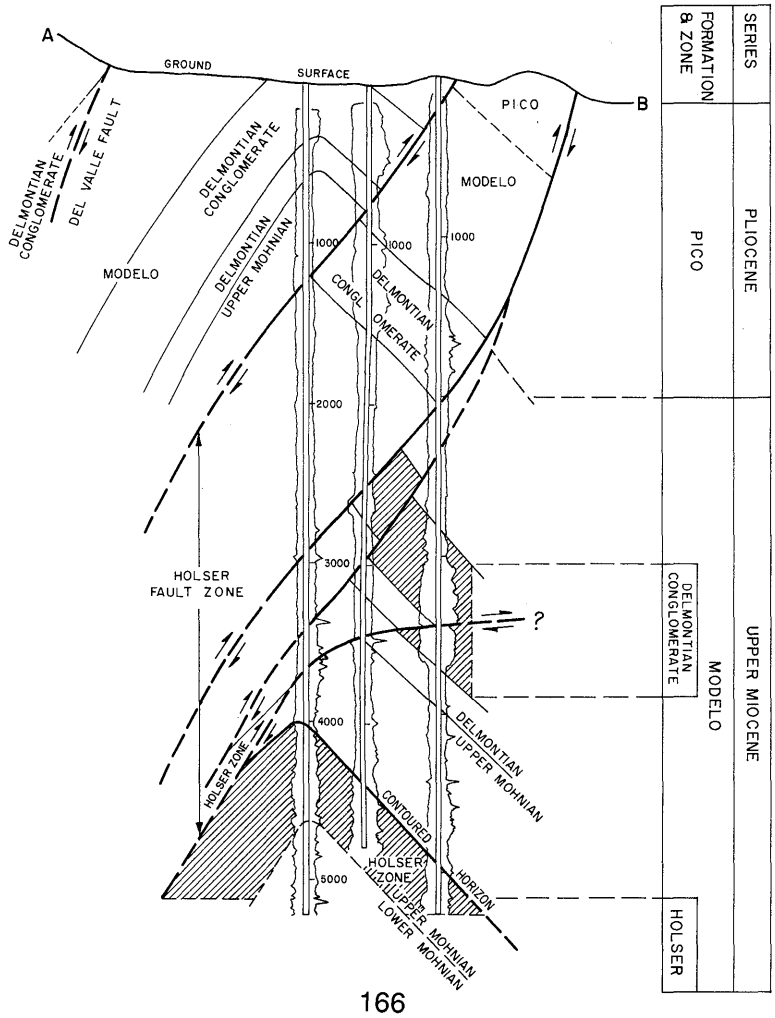
CALIFORNIA DIVISION OF OIL AND GAS

HOLSER OIL FIELD



CONTOURS ON TOP OF HOLSER ZONE

SCALE 1" = 1150'



COUNTY: VENTURA

HOLSER 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	Fortune Petroleum Corp. "Jackson" 1	Continental Oil Co. "Holser" 1	14 4N 18W	SB	5,228	Holser	
Deepest well	Fairfield Volunteer Pet. Co. "Holser" 2	Continental Oil Co. "Holser" 2	14 4N 18W	SB	8,147		Modelo late Miocene

POOL DATA

ITEM	CONGLOMERATE	HOLSER	UNNAMED			FIELD OR AREA DATA
Discovery date	August 1954	August 1942	October 1977			
Initial production rates						
Oil (bbl/day)	4	124	50			
Gas (Mcf/day)	0	-	30			
Flow pressure (psi)						
Bean size (in.)						
Initial reservoir pressure (psi)						
Reservoir temperature (°F)						
Initial oil content (STB/ac.-ft.)						
Initial gas content (MSCF/ac.-ft.)						
Formation	Modelo	Modelo	Modelo			
Geologic age	late Miocene	late Miocene	late Miocene			
Average depth (ft.)	1,000	4,450	6,540			
Average net thickness (ft.)	450	400	64			
Maximum productive area (acres)						130
RESERVOIR ROCK PROPERTIES						
Porosity (%)						
S_{oi} (%)						
S_{wi} (%)						
S_{gi} (%)						
Permeability to air (md)						
RESERVOIR FLUID PROPERTIES						
Oil:						
Oil gravity (°API)	17	27	26			
Sulfur content (% by wt.)						
Initial solution GOR (SCF/STB)						
Initial oil FVF (RB/STB)						
Bubble point press. (psia)						
Viscosity (cp) @ °F						
Gas:						
Specific gravity (air = 1.0)						
Heating value (Btu/cu. ft.)						
Water:						
Salinity, NaCl (ppm)	1,400	2,700	-			
T.D.S. (ppm)						
R_w (ohm/m) (77°F)						
ENHANCED RECOVERY PROJECTS						
Enhanced recovery projects	cyclic steam	cyclic steam				
Date started	1965	1965				
Date discontinued	1965	1965				
Peak oil production (bbl)						35,523
Year						1953
Peak gas production, net (Mcf)						67,176
Year						1978

Base of fresh water (ft.): None

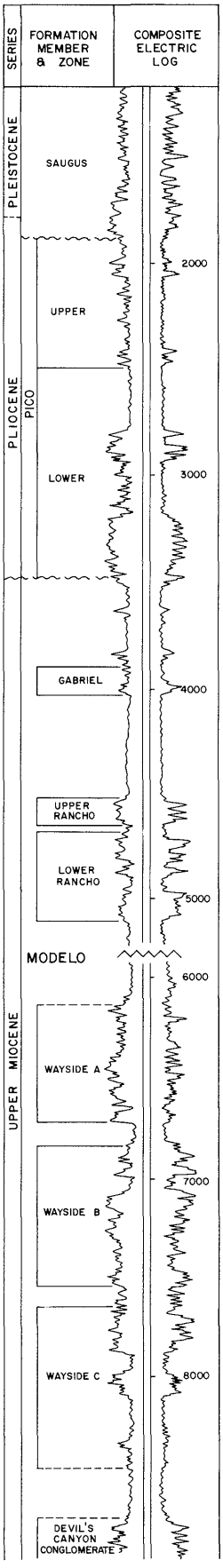
Remarks: The conglomerate zone has produced only 362 bbl of oil. All waters have high concentrations of total solids.

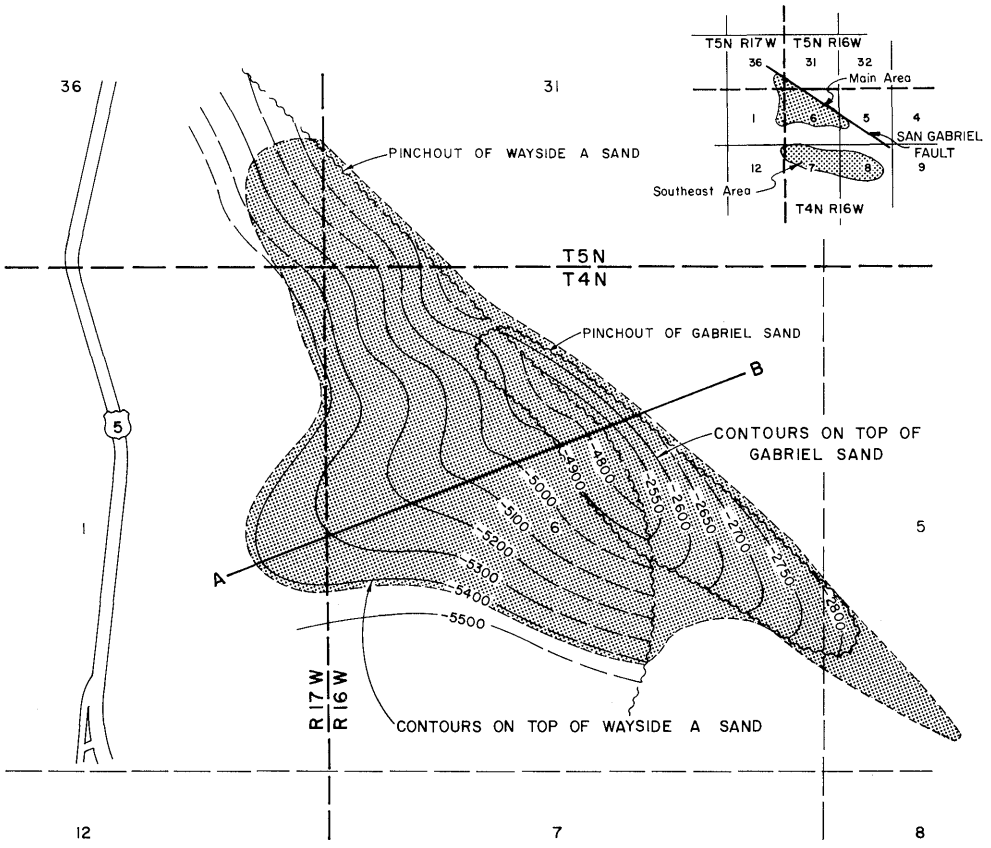
Selected References: Hardoin, J.L., 1960, Holser Oil Field: Calif. Div. of Oil and Gas, Summary of Operations -- Calif. Oil Fields, Vol. 46, No. 2.

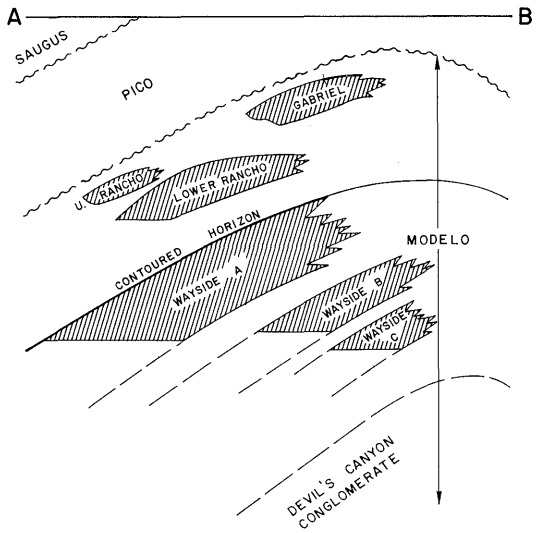
DATE: May 1983

CALIFORNIA DIVISION OF OIL AND GAS

HONOR RANCHO OIL FIELD
Main Area

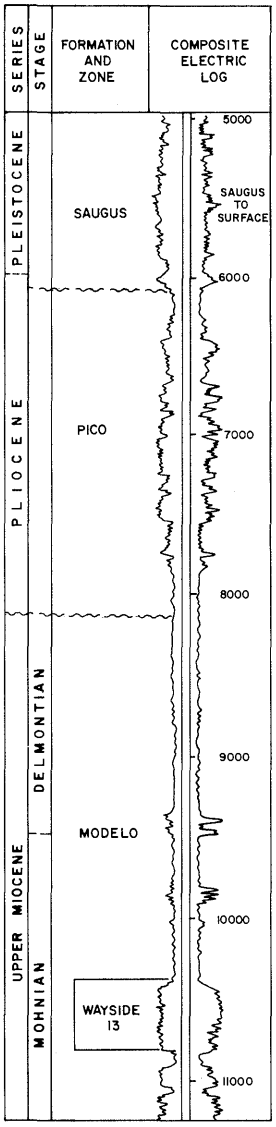


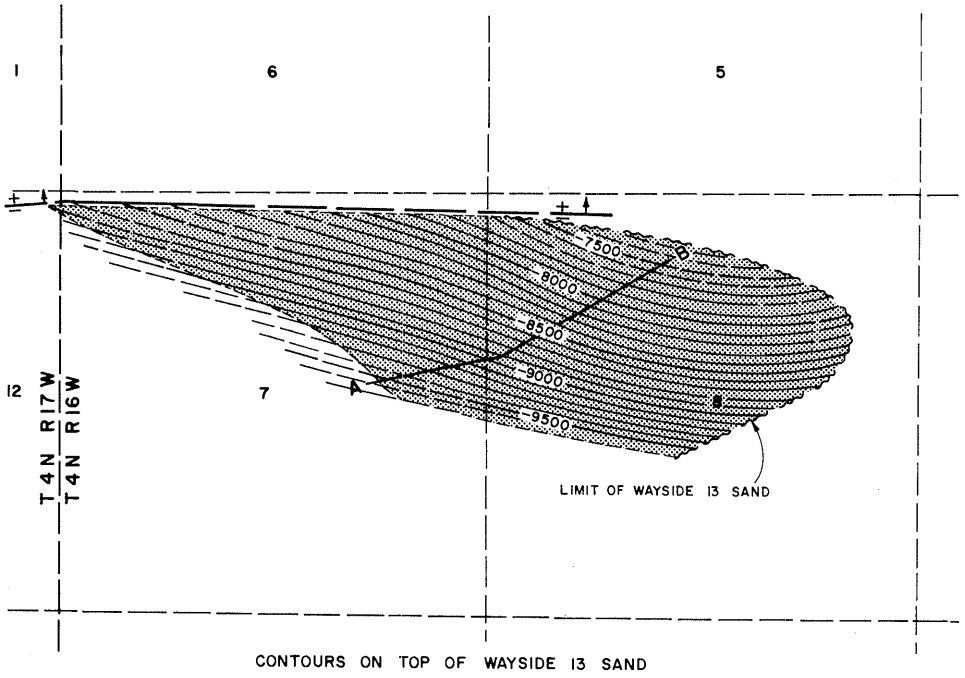




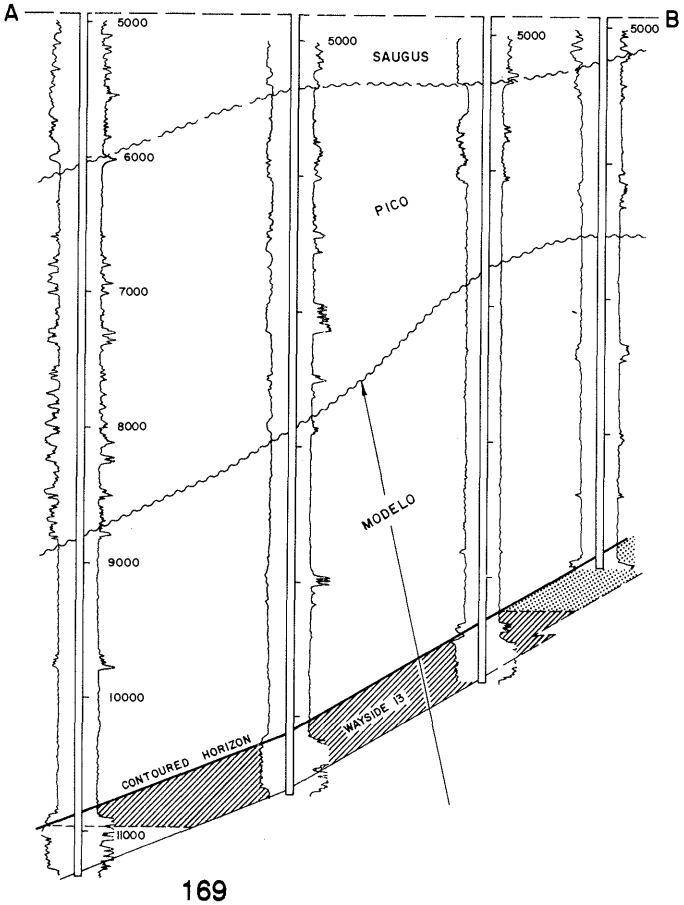
HONOR RANCHO OIL FIELD

Southeast Area





CONTOURS ON TOP OF WAYSIDE 13 SAND



COUNTY: LOS ANGELES

HONOR RANCHO 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. "Honor Rancho 'A'(NCT-1)" 1	The Texas Co. "Honor Rancho 'A'(NCT-1)" 1	6 4N 16W	SB	6,038	Rancho	
Deepest well	Southern California Gas Co. "Wayside Unit" 28	Texaco Inc. "Honor Rancho 'A'(NCT-1)" 28	7 4N 16W	SB	11,747		Modelo Miocene

POOL DATA

ITEM	RANCHO					FIELD OR AREA DATA
Discovery date	August 1950					
Initial production rates						
Oil (bbl/day)	673					
Gas (Mcf/day)	428					
Flow pressure (psi)						
Bean size (in.)						
Initial reservoir pressure (psi)	1,900					
Reservoir temperature (°F)						
Initial oil content (STB/ac.-ft.)	795					
Initial gas content (MSCF/ac.-ft.)						
Formation	Modelo					
Geologic age	late Miocene					
Average depth (ft.)	5,300					
Average net thickness (ft.)	50					
Maximum productive area (acres)						450
RESERVOIR ROCK PROPERTIES						
Porosity (%)	23					
So_i (%)	65					
Sw_i (%)						
Sg_i (%)						
Permeability to air (md)	320					
RESERVOIR FLUID PROPERTIES						
Oil:						
Oil gravity (°API)	34-36					
Sulfur content (% by wt.)						
Initial solution GOR (SCF/STB)						
Initial oil FVF (RB/STB)						
Bubble point press. (psia)						
Viscosity (cp) @ °F						
Gas:						
Specific gravity (air = 1.0)						
Heating value (Btu/cu. ft.)						
Water:						
Salinity, NaCl (ppm)	10,300					
T.D.S. (ppm)						
R_w (ohm/m) (77°F)						
ENHANCED RECOVERY PROJECTS						
Enhanced recovery projects	waterflood					
Date started	1959					
Date discontinued	1966					
Peak oil production (bbl)						2,637,460
Year						1957
Peak gas production, net (Mcf)						4,540,770
Year						1965

Base of fresh water (ft.): See areas

Remarks:

Selected References: Herring, D.G., Jr., 1954, Geology of Honor Rancho Oil Field, Los Angeles County, Geology of Southern California: Calif. Div. of Mines Bull. 170 Map Sheet 30.

DATE: May 1983

CALIFORNIA DIVISION OF OIL AND GAS

COUNTY: LOS ANGELES

HONOR RANCHO 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	Texaco Inc. "Honor Rancho 'A'(NCT-1)" 1	The Texas Co. "Honor Rancho 'A'(NCT-1)" 1	6 4N 16W	SB	6,038	Rancho	
Deepest well	Exxon Corp. "Newhall Land & Farming Co." C-1	Humble Oil & Refining Co. "Newhall Land & Farming Co." C-1	1 4N 17W	SB	11,440		Modelo late Miocene

POOL DATA

ITEM	GABRIEL	RANCHO	WAYSIDE			FIELD OR AREA DATA
Discovery date	June 1952	August 1950	December 1950			
Initial production rates						
Oil (bbl/day)	53	673	258			
Gas (Mcf/day)	14	428	133			
Flow pressure (psi)						
Bean size (in.)						
Initial reservoir pressure (psi)	-	1,900	2,962			
Reservoir temperature (°F)						
Initial oil content (STB/ac.-ft.)	-	795	940			
Initial gas content (MSCF/ac.-ft.)						
Formation	Modelo	Modelo	Modelo			
Geologic age	late Miocene	late Miocene	late Miocene			
Average depth (ft.)	3,800	5,300	6,481			
Average net thickness (ft.)	50	50	94			
Maximum productive area (acres)						20
RESERVOIR ROCK PROPERTIES						
Porosity (%)	-	23	24			
S_{oi} (%)	-	65	75			
S_{wi} (%)	-	-	25			
S_{gi} (%)						
Permeability to air (md)	-	320	179			
RESERVOIR FLUID PROPERTIES						
Oil:						
Oil gravity (°API)	37	34-36	35			
Sulfur content (% by wt.)	-	-	0.40			
Initial solution GOR (SCF/STB)	-	-	550			
Initial oil FVF (RB/STB)						
Bubble point press. (psia)						
Viscosity (cp) @ °F						
Gas:						
Specific gravity (air = 1.0)	-	-	0.47			
Heating value (Btu/cu. ft.)						
Water:						
Salinity, NaCl (ppm)	21,400	10,300	24,800			
T.D.S. (ppm)						
R_w (ohm/m) (77°F)						
ENHANCED RECOVERY PROJECTS						
Enhanced recovery projects		waterflood	waterflood			
Date started		1959	1957			
Date discontinued		1966	1967			
			gas injection			
			1954			
			1961			
Peak oil production (bbl)						1,483,301
Year						1953
Peak gas production, net (Mcf)						
Year						

Base of fresh water (ft.): 1,150

Remarks: For reservoir performance evaluation, the Rancho zone is divided into two units, Upper & Lower, and the Wayside zone into three units; A, B & C.

Selected References: Matthews, John F., Jr., 1953, Honor Rancho Oil Field: Calif. Div. of Oil and Gas, Summary of Operations -- Calif. Oil Fields, Vol. 39, No. 1.

DATE: May 1983

CALIFORNIA DIVISION OF OIL AND GAS

COUNTY: LOS ANGELES

HONOR RANCHO OIL FIELD
SOUTHEAST 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	Southern Calif. Gas Co. "Wayside Unit" 13	The Texas Co. "Honor Rancho 'A'(NCT-2)" 13	8 4N 16W	SB	9,254	Wayside 13	
Deepest well	Southern Calif. Gas Co. "Wayside Unit" 28	Texaco Inc. "Honor Rancho 'A'(NCT-1)" 28	7 4N 16W	SB	11,747		Modelo late Miocene

POOL DATA

ITEM	WAYSIDE 13					FIELD OR AREA DATA
Discovery date	May 1956					
Initial production rates						
Oil (bbl/day)	1,101					
Gas (Mcf/day)	1,260					
Flow pressure (psi)						
Bean size (in.)						
Initial reservoir pressure (psi)	4,500					
Reservoir temperature (°F)	190					
Initial oil content (STB/ac.-ft.)	760**					
Initial gas content (MSCF/ac.-ft.)	272**					
Formation	Modelo					
Geologic age	late Miocene					
Average depth (ft.)	10,000					
Average net thickness (ft.)	310					
Maximum productive area (acres)						430
RESERVOIR ROCK PROPERTIES						
Porosity (%)	7-26					
S_{oi} (%)	7.5					
S_{wi} (%)	23*					
S_{gi} (%)	69.5					
Permeability to air (md)	20*					
RESERVOIR FLUID PROPERTIES						
Oil:						
Oil gravity (°API)	39					
Sulfur content (% by wt.)						
Initial solution GOR (SCF/STB)	1,250					
Initial oil FVF (RB/STB)	1.74					
Bubble point press. (psia)	3,725					
Viscosity (cp) @ °F	0.38					
Gas:						
Specific gravity (air = 1.0)	0.620-0.675					
Heating value (Btu/cu. ft.)	1,066					
Water:						
Salinity, NaCl (ppm)	11,200					
T.D.S. (ppm)	20,200*					
R_w (ohm/m) (77°F)	0.4 @ 75					
ENHANCED RECOVERY PROJECTS						
Enhanced recovery projects	gas injection					
Date started	1960					
Date discontinued	1966 waterflood 1972 1975					
Peak oil production (bbl)						2,086,330
Year						1957
Peak gas production, net (Mcf)						
Year						

Base of fresh water (ft.): 600

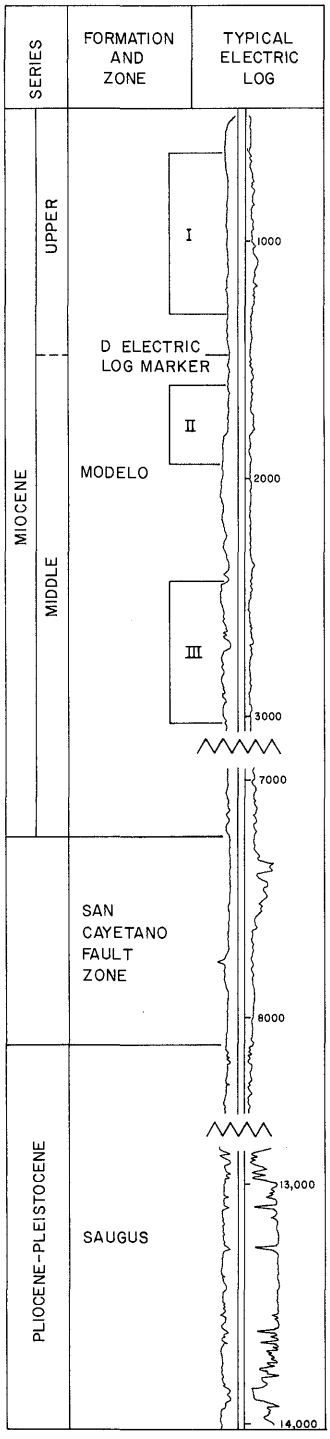
Remarks: Storage of gas in the "Wayside 13" zone began in 1975.

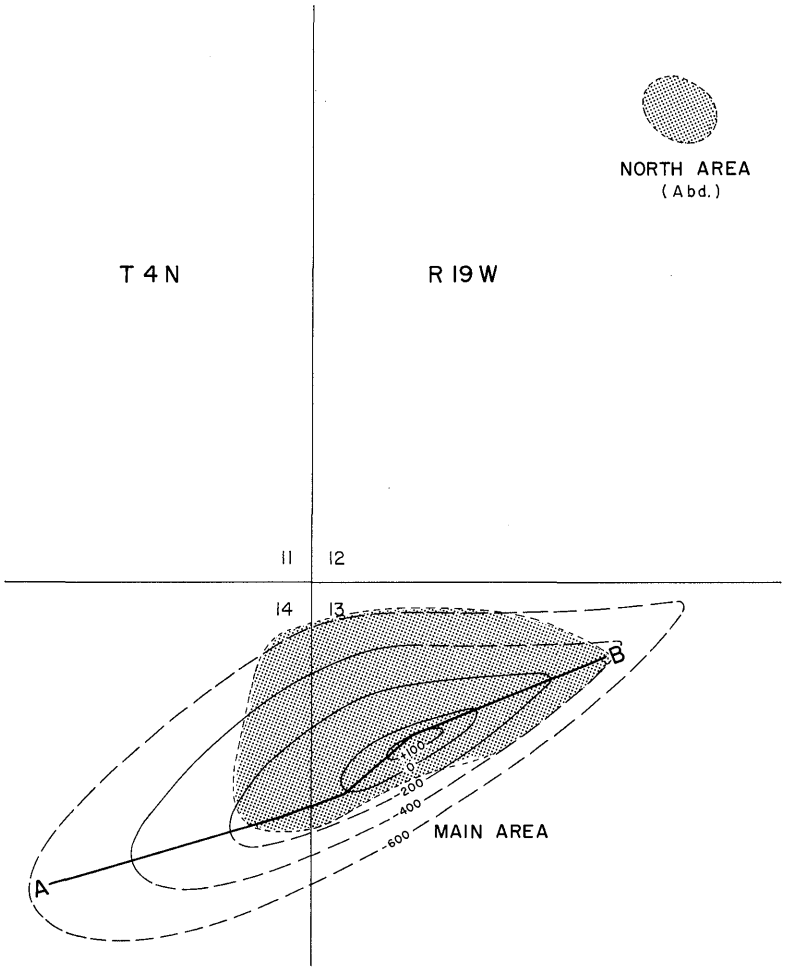
Selected References: Ritzius, D.E., 1959, Southeast Area of Honor Rancho Oil Field: Calif. Div. of Oil and Gas, Summary of Operations -- Calif. Oil Fields, Vol. 45, No. 2.

DATE: May 1983 *Average value **Estimated value

CALIFORNIA DIVISION OF OIL AND GAS

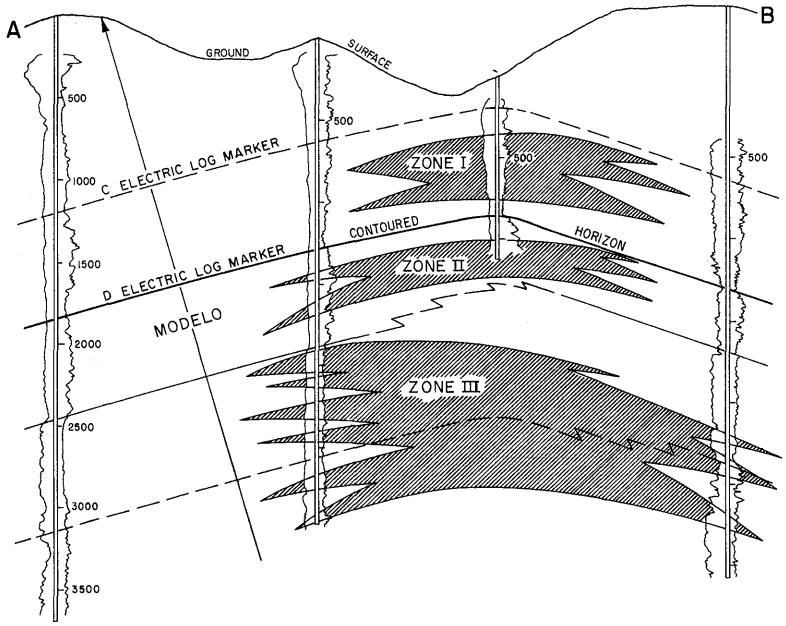
HOPPER CANYON OIL FIELD





CONTOURS ON D MARKER

SCALE 1" = 1300'



COUNTY: VENTURA

HOPPER CANYON 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	Argo Petroleum Corp. No. 1	Buckhorn Oil & Transportation Co. No. 1	13 4N 19W	SB	unk.	I	
Deepest well	Fortune Petroleum Corp. "Hopper Canyon" 14	McCulloch Oil Co. of Calif. "McCulloch Hopper Canyon Deep Unit" 1A	13 4N 19W	SB	14,016		Saugus Pleis-Plio a/

POOL DATA

ITEM	I					FIELD OR AREA DATA
Discovery date	1884					
Initial production rates						
Oil (bbl/day)						
Gas (Mcf/day)						
Flow pressure (psi)						
Bean size (in.)						
Initial reservoir pressure (psi)						
Reservoir temperature (°F)						
Initial oil content (STB/ac.-ft.)						
Initial gas content (MSCF/ac.-ft.)						
Formation	Modelo					
Geologic age	Miocene					
Average depth (ft.)	1,000					
Average net thickness (ft.)	1,500					
Maximum productive area (acres)						120
RESERVOIR ROCK PROPERTIES						
Porosity (%)						
So_i (%)						
Sw_i (%)						
Sg_i (%)						
Permeability to air (md)						
RESERVOIR FLUID PROPERTIES						
Oil:						
Oil gravity (°API)	13-18					
Sulfur content (% by wt.)						
Initial solution GOR (SCF/STB)						
Initial oil FVF (RB/STB)						
Bubble point press. (psia)						
Viscosity (cp) @ °F						
Gas:						
Specific gravity (air = 1.0)						
Heating value (Btu/cu. ft.)						
Water:						
Salinity, NaCl (ppm)	700					
T.D.S. (ppm)						
R_w (ohm/m) (77°F)						
ENHANCED RECOVERY PROJECTS						
Enhanced recovery projects						
Date started						
Date discontinued						
Peak oil production (bbl)						68,040
Year						1946
Peak gas production, net (Mcf)						
Year						

Base of fresh water (ft.): See areas

Remarks: Formerly an area of Piru field, designated a separate field January 1, 1955.
a/ Well penetrated about 8,000 feet of the Modelo Formation (Miocene) before passing through the San Cayetano fault and into the Saugus Formation.

Selected References:

Dosch, M.W., 1968, Hopper Canyon Oil Field: Calif. Div. of Oil and Gas, Summary of Operations -- Calif. Oil Fields, Vol. 54, No. 1.
Eldridge, G.H., and R. Arnold, 1907, The Santa Clara Valley, Puente Hills and Los Angeles Oil Districts, Southern California: U.S. Geol. Survey Bull. 309, pp. 68-72.
Jennings, C.W., and B.W. Troxel, 1954, Geology of Southern Calif., Ventura Basin: Calif. Div. of Mines Bull. 170, p. 33.
Kew, W.S.W., 1924, Geology and Oil Resources of a Part of Los Angeles and Ventura Counties: U.S. Geol. Survey Bull. 753, pp. 55-60, 128-129.
Prutzman, P.W., 1913, Petroleum in Southern Calif.: Calif. State Mining Bureau Bull. 63, pp. 117-122.
Watts, W.L., 1897, Oil and Gas Yielding Formations of Los Angeles, Ventura and Santa Barbara Counties: Calif. State Mining Bureau Bull. 11, Figure G.

DATE: May 1983

CALIFORNIA DIVISION OF OIL AND GAS

COUNTY: VENTURA

HOPPER CANYON 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	Argo Petroleum Corp. "Hopper" 1	Commander Oil Co., Inc. No. 1-B	13 4N 19W	SB	2,534	II & III	
Deepest well	Fortune Petroleum Corp. "Hopper Canyon" 14	McCulloch Oil Co. of Calif. "McCulloch Hopper Canyon Deep Unit" 1A	13 4N 19W	SB	14,016		Saugus Pleis-Plio a/

POOL DATA

ITEM	I	II	III			FIELD OR AREA DATA
Discovery date	1984	December 1931	December 1931			
Initial production rates						
Oil (bbl/day)	800	160 b/	-			
Gas (Mcf/day)						
Flow pressure (psi)						
Bean size (in.)						
Initial reservoir pressure (psi)						
Reservoir temperature (°F)	-	90	-			
Initial oil content (STB/ac.-ft.)						
Initial gas content (MSCF/ac.-ft.)						
Formation	Modelo	Modelo	Modelo			
Geologic age	Miocene	Miocene	Miocene			
Average depth (ft.)	1,000	1,700	2,700			
Average net thickness (ft.)	1,500	600**	650**			
Maximum productive area (acres)						100
RESERVOIR ROCK PROPERTIES						
Porosity (%)	-	11	-			
So_i (%)						
Sw_i (%)	-	66	-			
Sg_i (%)						
Permeability to air (md)						
RESERVOIR FLUID PROPERTIES						
Oil:						
Oil gravity (°API)	13-18	30	26-34			
Sulfur content (% by wt.)						
Initial solution GOR (SCF/STB)						
Initial oil FVF (RB/STB)						
Bubble point press. (psia)						
Viscosity (cp) @ °F						
Gas:						
Specific gravity (air = 1.0)						
Heating value (Btu/cu. ft.)						
Water:						
Salinity, NaCl (ppm)	700	1,700	6,000			
T.D.S. (ppm)						
R_w (ohm/m) (77°F)						
ENHANCED RECOVERY PROJECTS						
Enhanced recovery projects						
Date started						
Date discontinued						
Peak oil production (bbl)						68,040
Year						1946
Peak gas production, net (Mcf)						
Year						

Base of fresh water (ft.): 0 - 100

Remarks: a/ Well penetrated about 8,000 feet of the Modelo Formation (Miocene) before passing through the San Cayetano fault and into the Saugus Formation.
b/ Initial production from zones II & III was commingled.

Selected References:

DATE: May 1983 **Estimated value

CALIFORNIA DIVISION OF OIL AND GAS

COUNTY: VENTURA

HOPPER CANYON 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 Producing Inc. No. 2	Clark and Sherman Co. No. 2	12 4N 19W	SB	unk.	unnamed	
Deepest well	Texaco Producing Inc. No. 4	Clark and Sherman Co. No. 4	12 4N 19W	SB	1,000		Modelo Miocene

POOL DATA

ITEM	UNNAMED					FIELD OR AREA DATA
Discovery date	1889-90					
Initial production rates						
Oil (bbl/day)						
Gas (Mcf/day)						
Flow pressure (psi)						
Bean size (in.)						
Initial reservoir pressure (psi)						
Reservoir temperature (°F)						
Initial oil content (STB/ac.-ft.)						
Initial gas content (MSCF/ac.-ft.)						
Formation	Modelo					
Geologic age	Miocene					
Average depth (ft.)	660					
Average net thickness (ft.)						
Maximum productive area (acres)						20
RESERVOIR ROCK PROPERTIES						
Porosity (%)						
So_i (%)						
Sw_i (%)						
Sg_i (%)						
Permeability to air (md)						
RESERVOIR FLUID PROPERTIES						
Oil:						
Oil gravity (°API)	14					
Sulfur content (% by wt.)						
Initial solution GOR (SCF/STB)						
Initial oil FVF (RB/STB)						
Bubble point press. (psia)						
Viscosity (cp) @ °F						
Gas:						
Specific gravity (air = 1.0)						
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						
Date started						
Date discontinued						
Peak oil production (bbl)	unknown					
Year						
Peak gas production, net (Mcf)						
Year						

Base of fresh water (ft.): 0 - 100

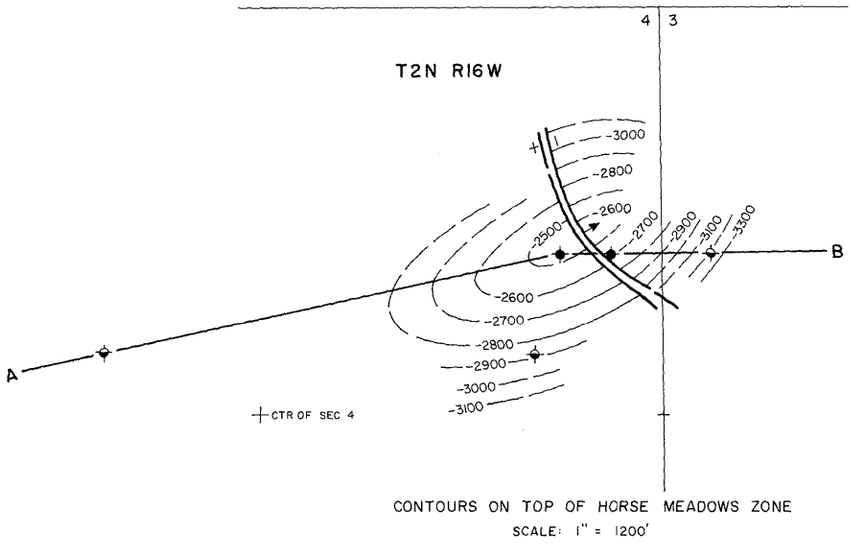
Remarks: Wells drilled prior to 1911, and production ceased on October 1922. Cumulative production is 100,000 bbl of oil.

Selected References:

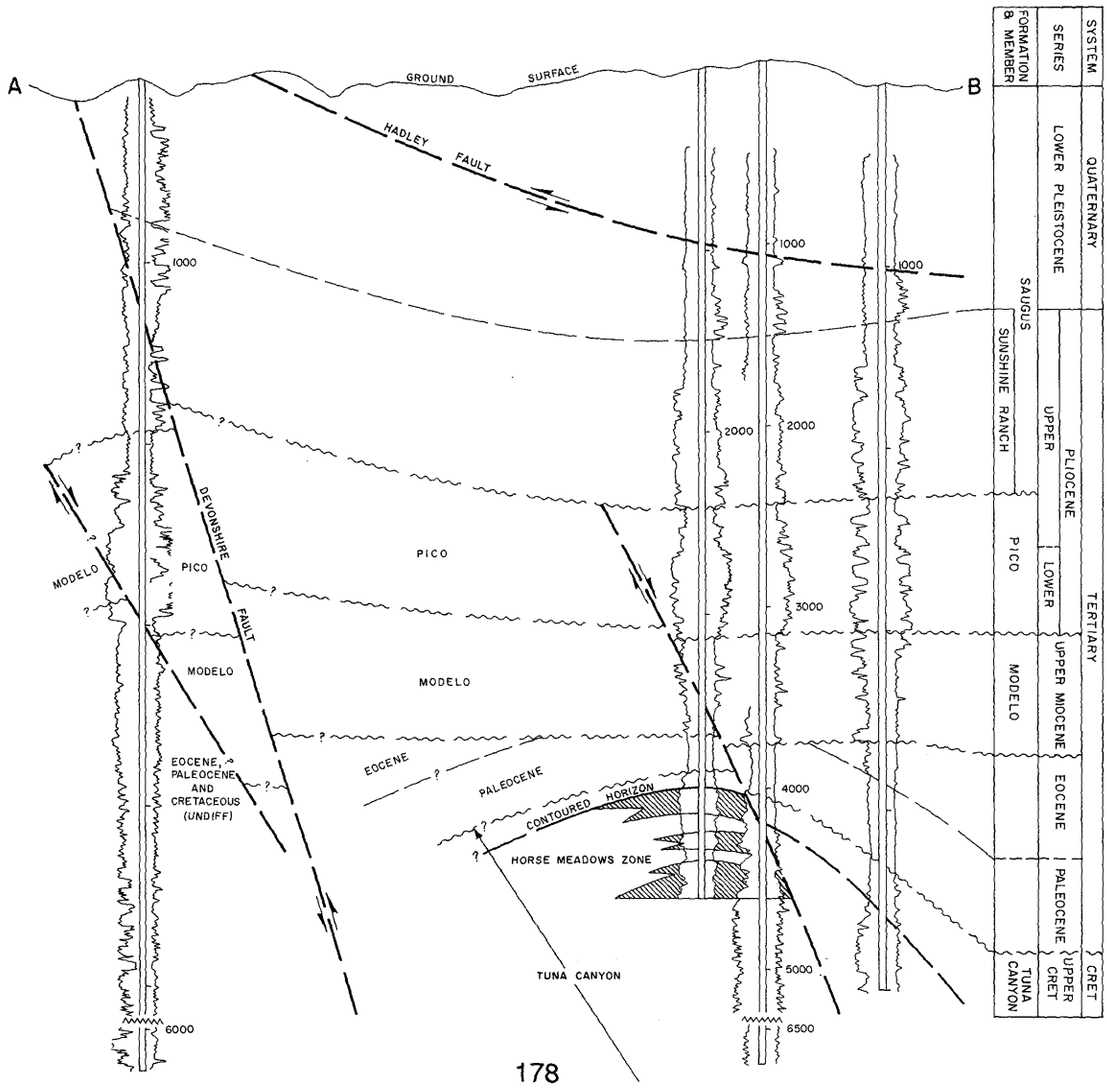
DATE: May 1983

CALIFORNIA DIVISION OF OIL AND GAS

HORSE MEADOWS OIL FIELD
(Abandoned)



CONTOURS ON TOP OF HORSE MEADOWS ZONE
SCALE: 1" = 1200'



COUNTY: LOS ANGELES

HORSE MEADOWS OIL FIELD (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	Porter Sesnon et al "Horse Meadows" 2-47	Union Oil Co. of Calif. "Porter Sesnon" 1	4 2N 16W	SB	6,696	Horse Meadows	"Chico" Late Cretaceous
Deepest well	Same as above	"	"	"	"	"	"

POOL DATA

ITEM	HORSE MEADOWS					FIELD OR AREA DATA
Discovery date	July 1952					
Initial production rates						
Oil (bbl/day)	86					
Gas (Mcf/day)	30					
Flow pressure (psi)						
Bean size (in.)						
Initial reservoir pressure (psi)						
Reservoir temperature (°F)						
Initial oil content (STB/ac.-ft.)						
Initial gas content (MSCF/ac.-ft.)						
Formation	"Chico"					
Geologic age	Late Cretaceous					
Average depth (ft.)	4,150					
Average net thickness (ft.)	500					
Maximum productive area (acres)	20					
RESERVOIR ROCK PROPERTIES						
Porosity (%)						
So_i (%)						
Sw_i (%)						
Sg_i (%)						
Permeability to air (md)						
RESERVOIR FLUID PROPERTIES						
Oil:						
Oil gravity (°API)	24					
Sulfur content (% by wt.)						
Initial solution GOR (SCF/STB)						
Initial oil FVF (RB/STB)						
Bubble point press. (psia)						
Viscosity (cp) @ °F						
Gas:						
Specific gravity (air = 1.0)						
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						
Date started						
Date discontinued						
Peak oil production (bbl)	13,250					
Year	1955					
Peak gas production, net (Mcf)						
Year						

Base of fresh water (ft.): 300

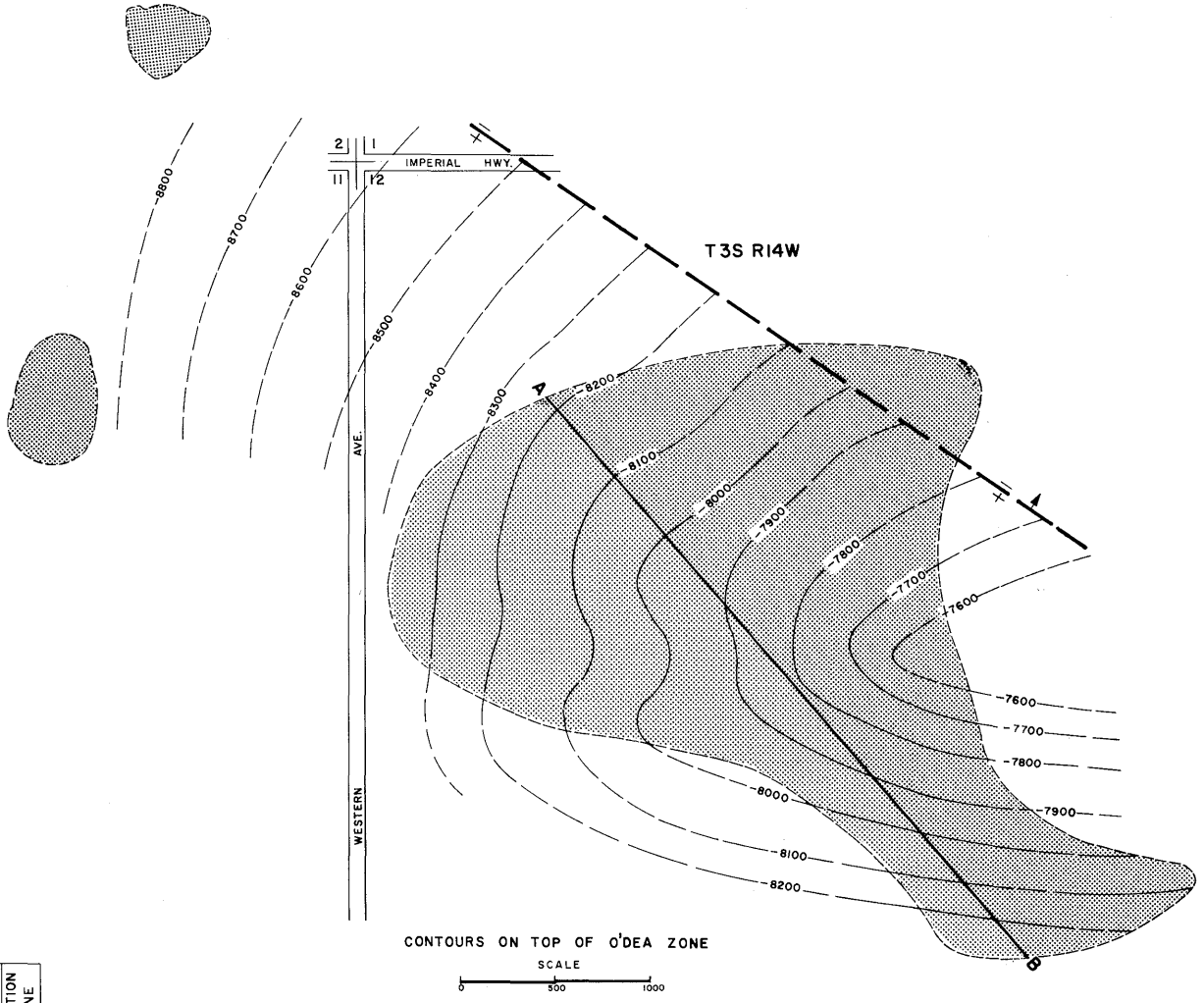
Remarks: The field last produced in 1966. The field was abandoned in 1966. Cumulative production is 136,556 bbl of oil and 86,746 Mcf of gas.

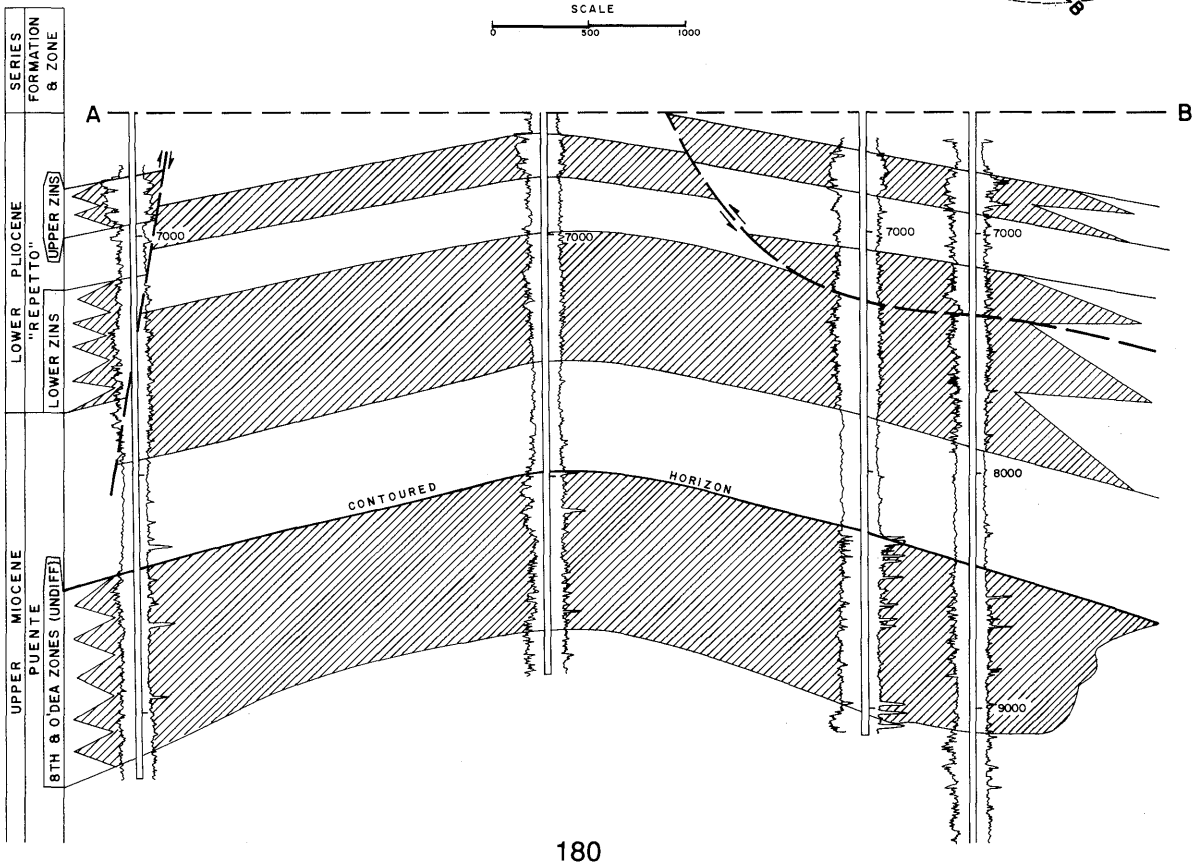
Selected References: Cordova, S., 1965, Horse Meadows Oil Fields: Calif. Div. of Oil and Gas, Summary of Operations -- Calif. Oil Fields, Vol. 51, No. 1.

DATE: May 1983

CALIFORNIA DIVISION OF OIL AND GAS

HOWARD TOWNSITE OIL FIELD





COUNTY: LOS ANGELES

HOWARD TOWNSITE 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	Santa Fe Energy Operating Partners LP "Union-Poindexter" 1	Shell Oil Co. "Union-Poindexter" 1	12 3S 14W	SB	9,274	O'Dea & 8th	
Deepest well	Texaco Inc. "Century Park Unit One" 1	Texaco Inc. "C.P. Unit One" 1	11 3S 14W	SB	11,646		Puente late Miocene

POOL DATA

ITEM	ZINS	O'DEA	8TH			FIELD OR AREA DATA
Discovery date	June 1952	September 1947	September 1947			
Initial production rates						
Oil (bbl/day)	24	138a/	a/			
Gas (Mcf/day)	842	75a/	a/			
Flow pressure (psi)						
Bean size (in.)						
Initial reservoir pressure (psi)						
Reservoir temperature (°F)						
Initial oil content (STB/ac.-ft.)						
Initial gas content (MSCF/ac.-ft.)						
Formation	"Repetto"	Puente	Puente			
Geologic age	early Pliocene	late Miocene	late Miocene			
Average depth (ft.)	5,650	8,100	8,600			
Average net thickness (ft.)	50	300	200			
Maximum productive area (acres)						195
RESERVOIR ROCK PROPERTIES						
Porosity (%)	-	20	-			
Soi (%)						
Swi (%)						
Sgi (%)	-	20-30	-			
Permeability to air (md)						
RESERVOIR FLUID PROPERTIES						
Oil:						
Oil gravity (°API)	48-60	27-35	27-35			
Sulfur content (% by wt.)	0.17	0.39	-			
Initial solution GOR (SCF/STB)						
Initial oil FVF (RB/STB)						
Bubble point press. (psia)						
Viscosity (cp) @ °F	1.5 @ 122	4.4 @ 122				
Gas:						
Specific gravity (air = 1.0)	0.729	0.721	-			
Heating value (Btu/cu. ft.)	1,262	1,228	-			
Water:						
Salinity, NaCl (ppm)						
T.D.S. (ppm)						
R_w (ohm/m) (77°F)						
ENHANCED RECOVERY PROJECTS						
Enhanced recovery projects						
Date started						
Date discontinued						
Peak oil production (bbl)						343,777
Year						1951
Peak gas production, net (Mcf)						2,616,714
Year						1951

Base of fresh water (ft.): 2,000 - 2,400

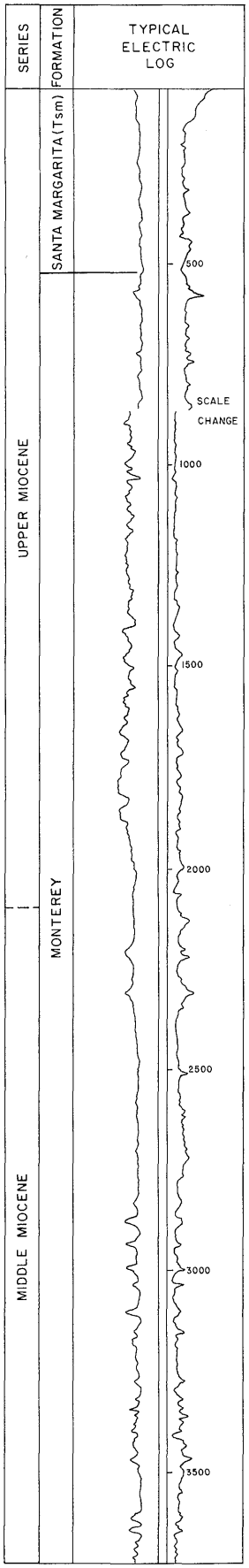
Remarks: a/ Production from O'Dea & 8th are commingled.

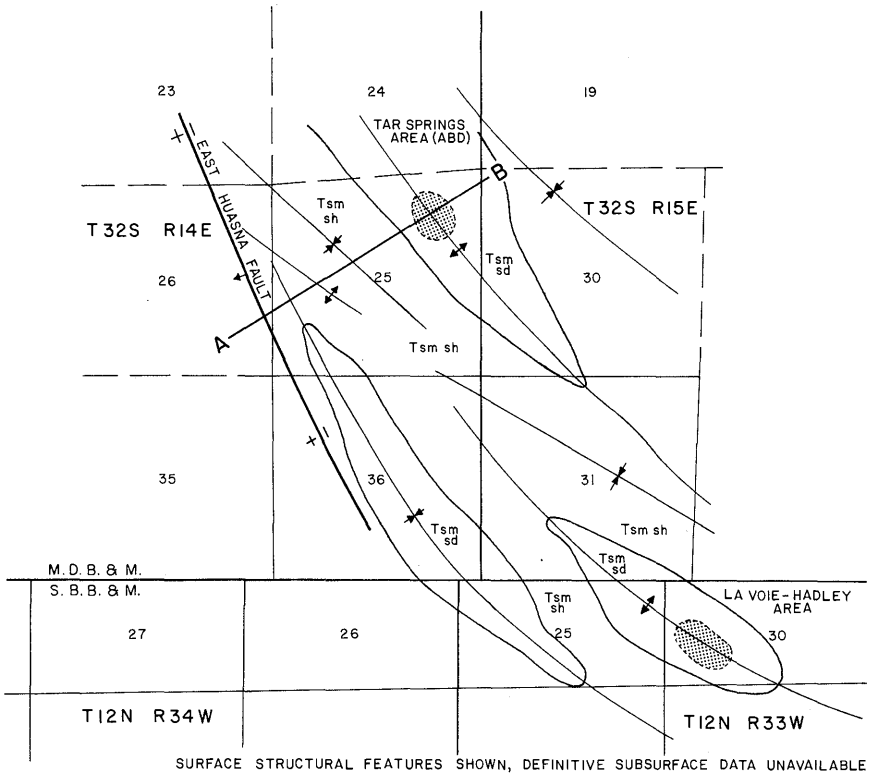
Selected References: Matthews, J.F., Jr., 1954, Howard Townsite Oil Field: Calif. Div. of Oil and Gas, Summary of Operations -- Calif. Oil Fields, Vol. 40, No. 2.

DATE: July 1983

CALIFORNIA DIVISION OF OIL AND GAS

HUASNA OIL FIELD





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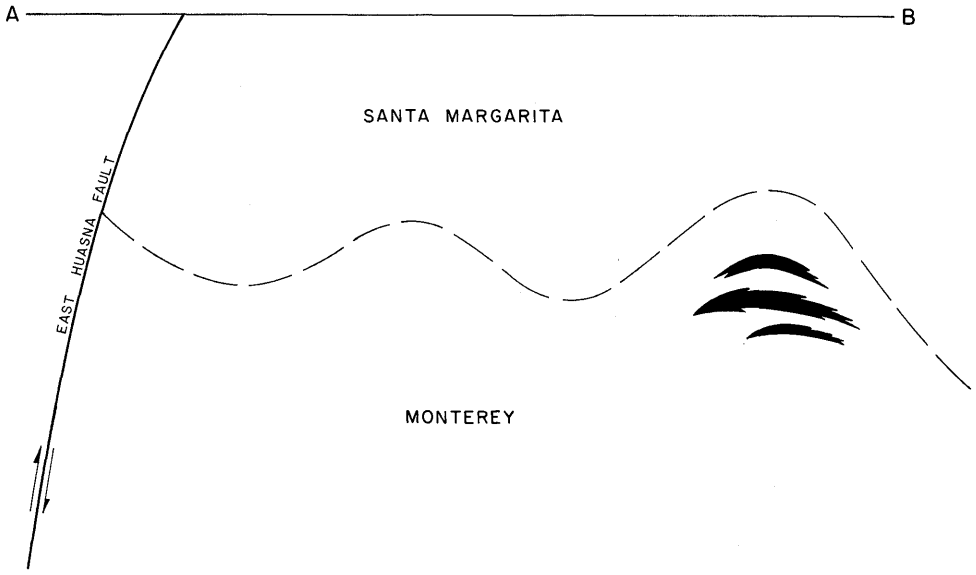


COUNTY: SAN LUIS OBISPO

HUASNA 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	Texas-Pacific Coal and Oil Co. "Trustee" 1	Trustees No. 1	25 32S 14E	MD	3,945	Monterey	
Deepest well	N.B. Hunt "Tar Springs" 1	Same as present	25 32S 14E	MD	10,010		Vaqueros early Miocene

POOL DATA

ITEM	MONTEREY					FIELD OR AREA DATA
Discovery date	November 1928					
Initial production rates						
Oil (bbl/day)	33					
Gas (Mcf/day)						
Flow pressure (psi)						
Bean size (in.)						
Initial reservoir pressure (psi)						
Reservoir temperature (°F)						
Initial oil content (STB/ac.-ft.)						
Initial gas content (MSCF/ac.-ft.)						
Formation	Monterey					
Geologic age	Miocene					
Average depth (ft.)	2,085-3,015					
Average net thickness (ft.)	100-110					
Maximum productive area (acres)	10					50
RESERVOIR ROCK PROPERTIES						
Porosity (%)	fractured shale					
S_{oi} (%)						
S_{wi} (%)						
S_{gi} (%)						
Permeability to air (md)						
RESERVOIR FLUID PROPERTIES						
Oil:						
Oil gravity (°API)	16-18					
Sulfur content (% by wt.)						
Initial solution GOR (SCF/STB)						
Initial oil FVF (RB/STB)						
Bubble point press. (psia)						
Viscosity (cp) @ °F						
Gas:						
Specific gravity (air = 1.0)						
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						
Date started						
Date discontinued						
Peak oil production (bbl)						17,757
Year						1966
Peak gas production, net (Mcf)						
Year						

Base of fresh water (ft.): See areas

Remarks:

Selected References:

A.A.P.G.-SEPM, 1956, Spring Field Trip, Huasna Basin, San Luis Obispo County, Guidebook GB2-B.

Arnold, R. and R. Anderson, 1907, Geology and Oil Resources of the Santa Maria Oil District, Santa Barbara Co., Calif.: U.S. Geol. Survey Bull. 322, p. 109.

Hall, C.A., Jr., 1967, Stratigraphy and Structure of Mesozoic and Cenozoic Rocks, Nipomo Quadrangle, Southern Coast Ranges, California: Geol. Soc. of America Bull., Vol. 78, Plates 1 and 2.

Kablanow, R.I. II, and R.C. Surdam, 1983, Diagenesis and Hydrocarbon Generation in the Monterey Formation, Huasna Basin, California: Soc. Econ. Paleontologists & Mineralogists Pacific Section, p. 53-68.

King, V.L. 1943, Huasna Area Development: Calif. Div. of Mines, Bull. 118, p. 448-449.

Taliaferro, N.L., 1943, Geology of Huasna Area: Calif. Div. of Mines Bull. 118, p. 443-447.

Vander Leck, L., 1921, Petroleum Resources of California: Calif. State Mining Bureau Bull. 89, p. 96-98.

DATE: January 1989

CALIFORNIA DIVISION OF OIL AND GAS

COUNTY: SAN LUIS OBISPO

HUASNA OIL FIELD
LAVOIE - HADLEY 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	Deuel Petroleum Co., Inc. "LaVoie-Hadley" O-1	Home-Stake Production Co. "LaVoie-Hadley" O-1	30 12N 33W	SB	2,986	Santa Margarita	
Deepest well	Verde Enterprises, Operator for Huasna Co. "Union-Dickes" 1	Same as present	30 12N 33W	SB	7,753		Vaqueros-Sespe Mio-Oligocene

POOL DATA

ITEM	SANTA MARGARITA					FIELD OR AREA DATA
Discovery date	July 1965					
Initial production rates						
Oil (bbl/day)	56					
Gas (Mcf/day)						
Flow pressure (psi)						
Bean size (in.)						
Initial reservoir pressure (psi)						
Reservoir temperature (°F)						
Initial oil content (STB/ac.-ft.)						
Initial gas content (MSCF/ac.-ft.)						
Formation	Santa Margarita					
Geologic age	late Miocene					
Average depth (ft.)	750-1,560					
Average net thickness (ft.)	500-1,300					
Maximum productive area (acres)	40					
RESERVOIR ROCK PROPERTIES						
Porosity (%)						
So_i (%)						
Sw_i (%)						
Sg_i (%)						
Permeability to air (md)						
RESERVOIR FLUID PROPERTIES						
Oil:						
Oil gravity (°API)	9-11					
Sulfur content (% by wt.)						
Initial solution GOR (SCF/STB)						
Initial oil FVF (RB/STB)						
Bubble point press. (psia)						
Viscosity (cp) @ °F						
Gas:						
Specific gravity (air = 1.0)						
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	cyclic steam					
Date started	1965					
Date discontinued	1966					
Peak oil production (bbl)	17,757					
Year	1966					
Peak gas production, net (Mcf)						
Year						

Base of fresh water (ft.): 500

Remarks:

Selected References:

DATE: January 1989

CALIFORNIA DIVISION OF OIL AND GAS

COUNTY: SAN LUIS OBISPO

HUASNA OIL FIELD
TAR SPRINGS 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	Texas-Pacific Coal and Oil Company "Trustee" 1	Trustees No. 1	25 32S 14E	MD	3,945	Monterey	
Deepest well	N.B. Hunt "Tar Springs" 1	Same as present	25 32S 14E	MD	10,010		Vaqueros early Miocene

POOL DATA

ITEM	MONTEREY					FIELD OR AREA DATA
Discovery date	November 1928					
Initial production rates						
Oil (bbl/day)	33					
Gas (Mcf/day)						
Flow pressure (psi)						
Bean size (in.)						
Initial reservoir pressure (psi)						
Reservoir temperature (°F)						
Initial oil content (STB/ac.-ft.)						
Initial gas content (MSCF/ac.-ft.)						
Formation	Monterey					
Geologic age	Miocene					
Average depth (ft.)	2,085-3,015					
Average net thickness (ft.)	100-110					
Maximum productive area (acres)	10					
RESERVOIR ROCK PROPERTIES						
Porosity (%)	fractured shale					
So_i (%)						
Sw_i (%)						
Sg_i (%)						
Permeability to air (md)						
RESERVOIR FLUID PROPERTIES						
Oil:						
Oil gravity (°API)	16-18					
Sulfur content (% by wt.)						
Initial solution GOR (SCF/STB)						
Initial oil FVF (RB/STB)						
Bubble point press. (psia)						
Viscosity (cp) @ °F						
Gas:						
Specific gravity (air = 1.0)						
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						
Date started						
Date discontinued						
Peak oil production (bbl)	4,416					
Year	1929					
Peak gas production, net (Mcf)						
Year						

Base of fresh water (ft.): 500

Remarks: This one-well area was abandoned in 1938. Cumulative production is 11,475 bbl of oil.

Selected References:

Arnold, R., and R. Anderson, 1907, Geology and Oil Resources of the Santa Maria Oil District, Santa Barbara Co., Calif: U.S. Geol. Survey Bull. 322, p. 109.

King, V.L., 1943, Huasna Area Development: Calif. Div. of Mines Bull. 118.

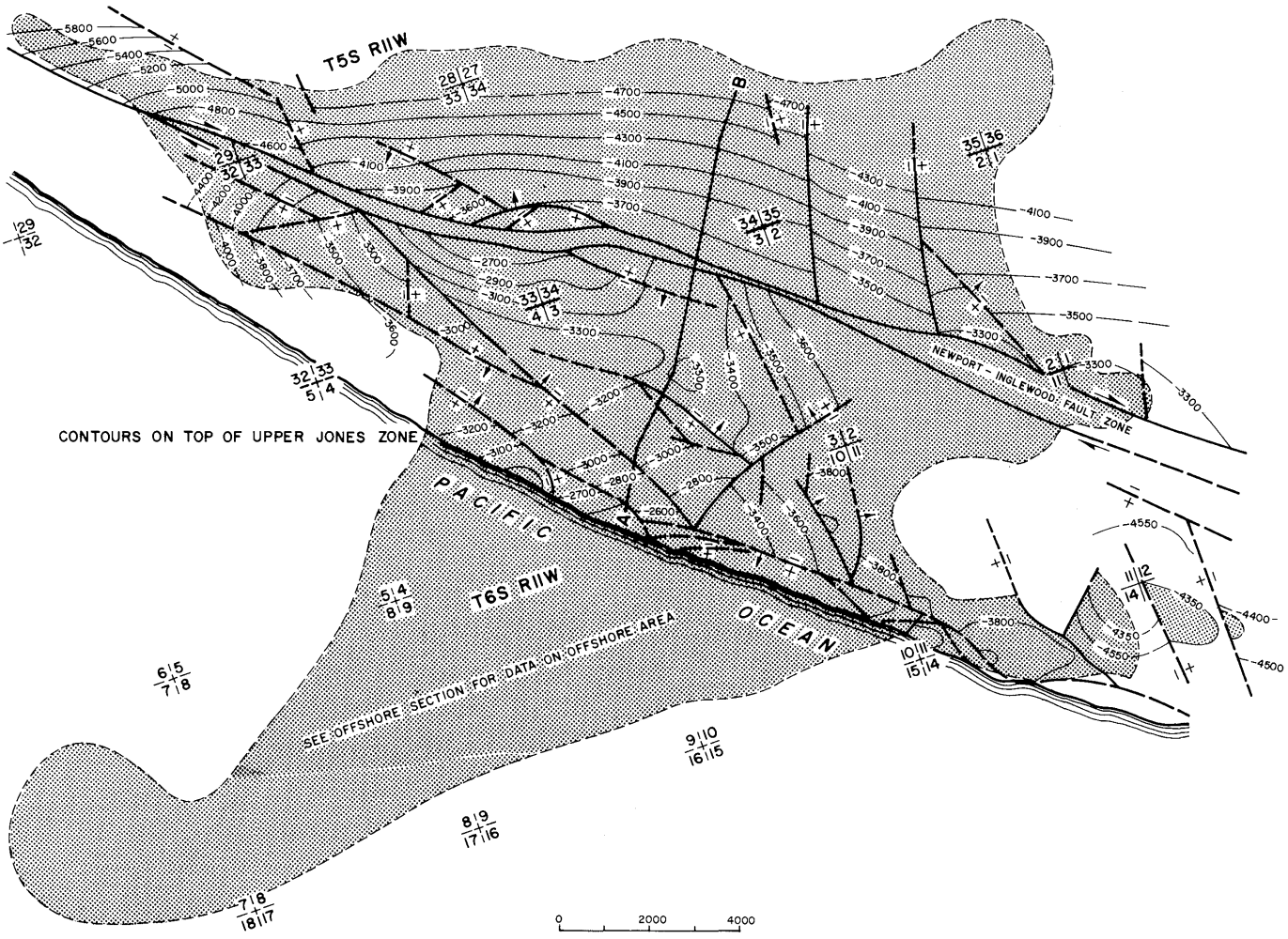
McCabe, R.E., 1928, Operations in District No. 3: Calif. Div. of Oil and Gas, Summary of Operations--Calif. Oil Fields, Vol. 14, No. 8.

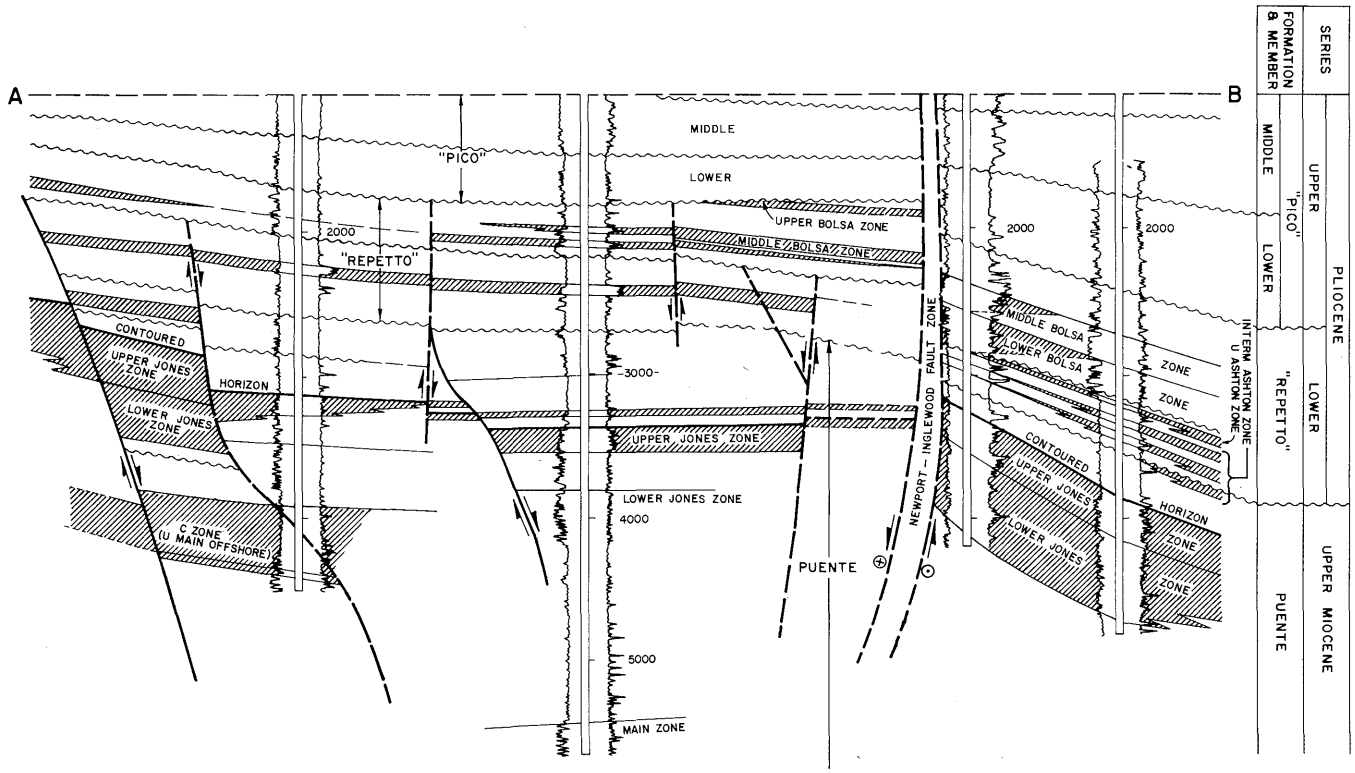
Taliaferro, N.L., 1943, Geology of Huasna Area: Calif. Div. of Mines Bull. 118.

DATE: January 1989

CALIFORNIA DIVISION OF OIL AND GAS

HUNTINGTON BEACH OIL FIELD





COUNTY: ORANGE

HUNTINGTON BEACH 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	Chevron U.S.A. Inc. "Huntington A" 1	Standard Oil Co. of Calif. "Huntington A" 1	3 6S 11W	SB	2,381	Middle Bolsa (Upper Tar)	
Deepest well	Shell Western Expl. & Prod. Inc. "State PRC 426" 4143	Signal Oil and Gas Co. "State 426" 143	33 5S 11W	SB	12,236		Puente late Miocene

POOL DATA

ITEM	MIDDLE BOLSA (Upper Tar)					FIELD OR AREA DATA
Discovery date	May 1920					
Initial production rates						
Oil (bbl/day)	45					
Gas (Mcf/day)						
Flow pressure (psi)						
Bean size (in.)						
Initial reservoir pressure (psi)	975					
Reservoir temperature (°F)	122					
Initial oil content (STB/ac.-ft.)	1,800					
Initial gas content (MSCF/ac.-ft.)						
Formation	"Repetto"					
Geologic age	early Pliocene					
Average depth (ft.)	2,200					
Average net thickness (ft.)	150					
Maximum productive area (acres)						6,295
RESERVOIR ROCK PROPERTIES						
Porosity (%)	28-34					
S_{oi} (%)	65					
S_{wi} (%)	35					
S_{gi} (%)						
Permeability to air (md)	2,300					
RESERVOIR FLUID PROPERTIES						
Oil:						
Oil gravity (°API)	11-24					
Sulfur content (% by wt.)						
Initial solution GOR (SCF/STB)	1,000					
Initial oil FVF (RB/STB)	3.01					
Bubble point press. (psia)						
Viscosity (cp) @ °F	940 @ 120					
Gas:						
Specific gravity (air = 1.0)						
Heating value (Btu/cu. ft.)						
Water:						
Salinity, NaCl (ppm)	20,450					
T.D.S. (ppm)						
R_w (ohm/m) (77°F)						
ENHANCED RECOVERY PROJECTS						
Enhanced recovery projects	steamflood					
Date started	1964					
Date discontinued	active waterflood 1976 active					
Peak oil production (bbl)						33,813,185
Year						1923
Peak gas production, net (Mcf)						
Year						

Base of fresh water (ft.):

Remarks: See Onshore Area sheet for references.

Selected References:

DATE: January 1989

CALIFORNIA DIVISION OF OIL AND GAS

COUNTY: ORANGE

HUNTINGTON BEACH OIL FIELD
ONSHORE 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. "Huntington A" 1	Standard Oil Co. of California "Huntington A" 1	10 6S 11W	SB	2,381	Middle Bolsa (upper tar)	
Deepest well	Aminoil U.S.A. Inc. "South Bolsa" S-1-D	Signal Oil and Gas Co. "Signal-Bolsa" S-1-D	33 5S 11W	SB	11,669		Puente late Miocene

POOL DATA

ITEM	UPPER BOLSA (Garfield)	MIDDLE BOLSA (Upper Tar)	LOWER BOLSA (Lower Tar)	UPPER ASHTON	INTERMEDIATE ASHTON	FIELD OR AREA DATA
Discovery date	November 1926	May 1920	May 1920	July 1920	July 1926	
Initial production rates						
Oil (bbl/day)	68	45a/	a/	70	472	
Gas (Mcf/day)						
Flow pressure (psi)						
Bean size (in.)						
Initial reservoir pressure (psi)	975	975	975	1,550	-	
Reservoir temperature (°F)	126	122	125	130	-	
Initial oil content (STB/ac.-ft.)	-	1,800	1,800	-	-	
Initial gas content (MSCF/ac.-ft.)	469	-	-	-	-	
Formation	"Repetto"	"Repetto"	"Repetto"	"Repetto"	"Repetto" & Puente	
Geologic age	early Pliocene	early Pliocene	early Pliocene	early Pliocene	e Plio-l Mio	
Average depth (ft.)	1,800	2,200	2,300	3,900	4,100	
Average net thickness (ft.)	100	150	100	100	200	
Maximum productive area (acres)	-	350	350	580	-	
RESERVOIR ROCK PROPERTIES						
Porosity (%)	28.0-34.0	28.0-38.0	28.0-38.0	26.5	-	
So_i (%)	75	65	65	65	-	
Sw_i (%)	25	35	35	35	-	
Sg_i (%)						
Permeability to air (md)	330-3,220	2,300	2,300	-	-	
RESERVOIR FLUID PROPERTIES						
Oil:						
Oil gravity (°API)	11-24	11-24	11-24	14-31	14-31	
Sulfur content (% by wt.)						
Initial solution GOR (SCF/STB)	1,000	1,000	1,000	400	-	
Initial oil FVF (RB/STB)	3.01	3.01	3.01	1.27	-	
Bubble point press. (psia)						
Viscosity (cp) @ °F	60 @ 120	940 @ 120	3,700 @ 120	-	-	
Gas:						
Specific gravity (air = 1.0)						
Heating value (Btu/cu. ft.)						
Water:						
Salinity, NaCl (ppm)	20,450	20,450	20,450	23,300	23,300	
T.D.S. (ppm)						
R_w (ohm/m) (77°F)						
ENHANCED RECOVERY PROJECTS						
Enhanced recovery projects	waterflood	steamflood	steamflood	waterflood		
Date started	1962	1964	1964	1971		
Date discontinued	active	active	active	active		
	waterflood	waterflood	waterflood			
	1964	1976	1976			
	active	active	active			
Peak oil production (bbl)						
Year						
Peak gas production, net (Mcf)						
Year						

Base of fresh water (ft.): 1,000-2,400

Remarks:

A few geographically restricted, minor productive sands are not described.
a/ Initial production from Middle and Lower Bolsa zones commingled.

Selected References:

Carls, J.M., 1944, Recent developments in the tar sands of Townlot Area, Huntington Beach Oil Field: Calif. Div. of Oil and Gas Summary of Operations--Calif. Oil Fields, Vol. 35, No. 1.

Carriel, J.T., 1942, Huntington Beach Oil Field - Old Field Portion: Calif Div. of Oil and Gas, Summary of Operations--Calif. Oil Fields, Vol. 28, No. 1.

Case, J.B., 1921, Report on Huntington Beach Oil Field, Orange County, Calif., with special reference to lack of definite subsurface information after eighteen months of drilling activity: Calif. Div. of Oil and Gas, Summary of Operations -- Calif. Oil Fields, Vol. 7 No. 5.

DATE: August 1983

CALIFORNIA DIVISION OF OIL AND GAS

COUNTY: ORANGE

HUNTINGTON BEACH OIL FIELD
ONSHORE 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	UPPER JONES a/	LOWER JONES a/	"C" (Hamilton)	MAIN		FIELD OR AREA DATA
Discovery date	December 1926	unknown	August 1953	September 1926		
Initial production rates						
Oil (bbl/day)	2,024	-	500	688		
Gas (Mcf/day)	-	-	2,000	-		
Flow pressure (psi)						
Bean size (in.)						
Initial reservoir pressure (psi)	1,190	1,190	-	-		
Reservoir temperature (°F)	150	150	-	170		
Initial oil content (STB/ac.-ft.)						
Initial gas content (MSCF/ac.-ft.)						
Formation	Puente	Puente	Puente	Puente		
Geologic age	late Miocene	late Miocene	late Miocene	late Miocene		
Average depth (ft.)	4,300	4,600	3,800	4,300		
Average net thickness (ft.)	275	150	100	277		
Maximum productive area (acres)	35	-	-	-		3,930
RESERVOIR ROCK PROPERTIES						
Porosity (%)	25.0	25.0	-	30.4		
So_i (%)	60	60	-	70		
Sw_i (%)	40	40	-	30		
Sg_i (%)						
Permeability to air (md)	-	-	-	630		
RESERVOIR FLUID PROPERTIES						
Oil:						
Oil gravity (°API)	13-23	13-23	18-26	11-26		
Sulfur content (% by wt.)						
Initial solution GOR (SCF/STB)						
Initial oil FVF (RB/STB)	1.55	1.55	-	-		
Bubble point press. (psia)						
Viscosity (cp) @ °F						
Gas:						
Specific gravity (air = 1.0)						
Heating value (Btu/cu. ft.)						
Water:						
Salinity, NaCl (ppm)	30,280	22,200	24,400	23,970		
T.D.S. (ppm)	30,976	-	-	26,670		
R_w (ohm/m) (77°F)	0.25	-	-	0.27		
ENHANCED RECOVERY PROJECTS						
Enhanced recovery projects	waterflood	waterflood		waterflood		
Date started	1966	1963		1964		
Date discontinued	active	active		active		
Peak oil production (bbl)						33,813,185
Year						1923
Peak gas production, net (Mcf)						
Year						

Base of fresh water (ft.): 1,000 - 2,400

Remarks: a/ These pools are also a part of the A-37 zone.

Selected References:

Case, J.B., and V.H. Wilhelm, 1923, Report on Huntington Beach Oil Field, including Geochemical Relationship of Waters Encountered in the Huntington Beach Field by M.A. Grizzle: Calif. Div. of Oil and Gas, Summary of Operations -- Calif. Oil Fields, Vol. 9, No. 6.

Dolman, S.G., 1928, Tar Sands in the Townlot Area of Huntington Beach Oil Field: Calif. Div. of Oil and Gas, Summary of Operations -- Calif. Oil Fields, Vol. 13, No. 12.

Graser, F.A., 1927, Recent Developments in Huntington Beach Oil Field: Calif. Div. of Oil and Gas, Summary of Operations -- Calif. Oil Fields, Vol. 12, No. 12.

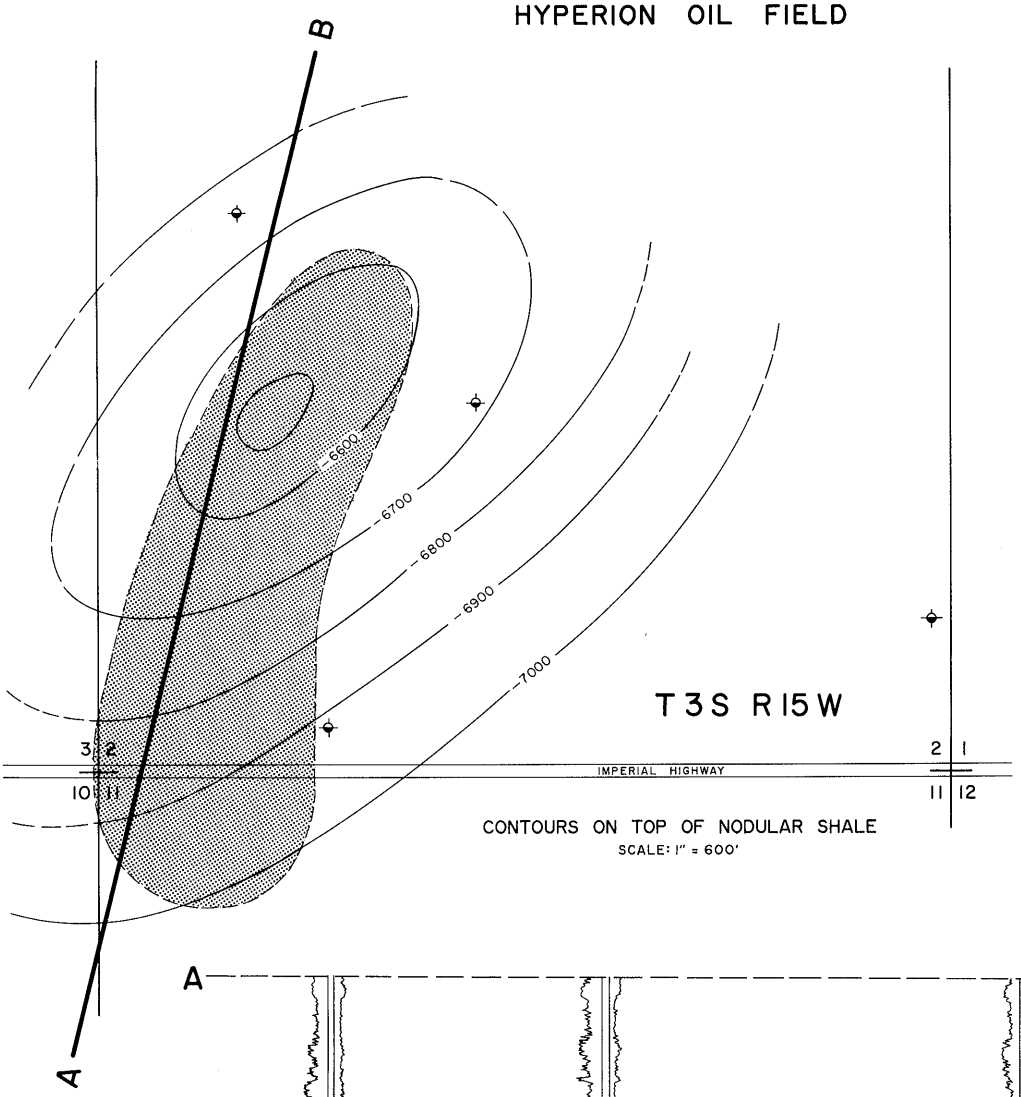
Hezenbush, G.C., and D.R. Allen, 1958, Huntington Beach Oil Field: Calif. Div. of Oil and Gas, Summary of Operations -- Calif. Oil Fields, Vol. 44, No. 1.

Hunter, A.L., W.C. Bradford, and D.R. Allen, 1955, Huntington Beach Oil Field - Southeast extension of Townlot Area: Calif. Div. of Oil and Gas, Summary of Operations -- Calif. Oil Fields, Vol. 41, No. 1.

DATE: August 1983

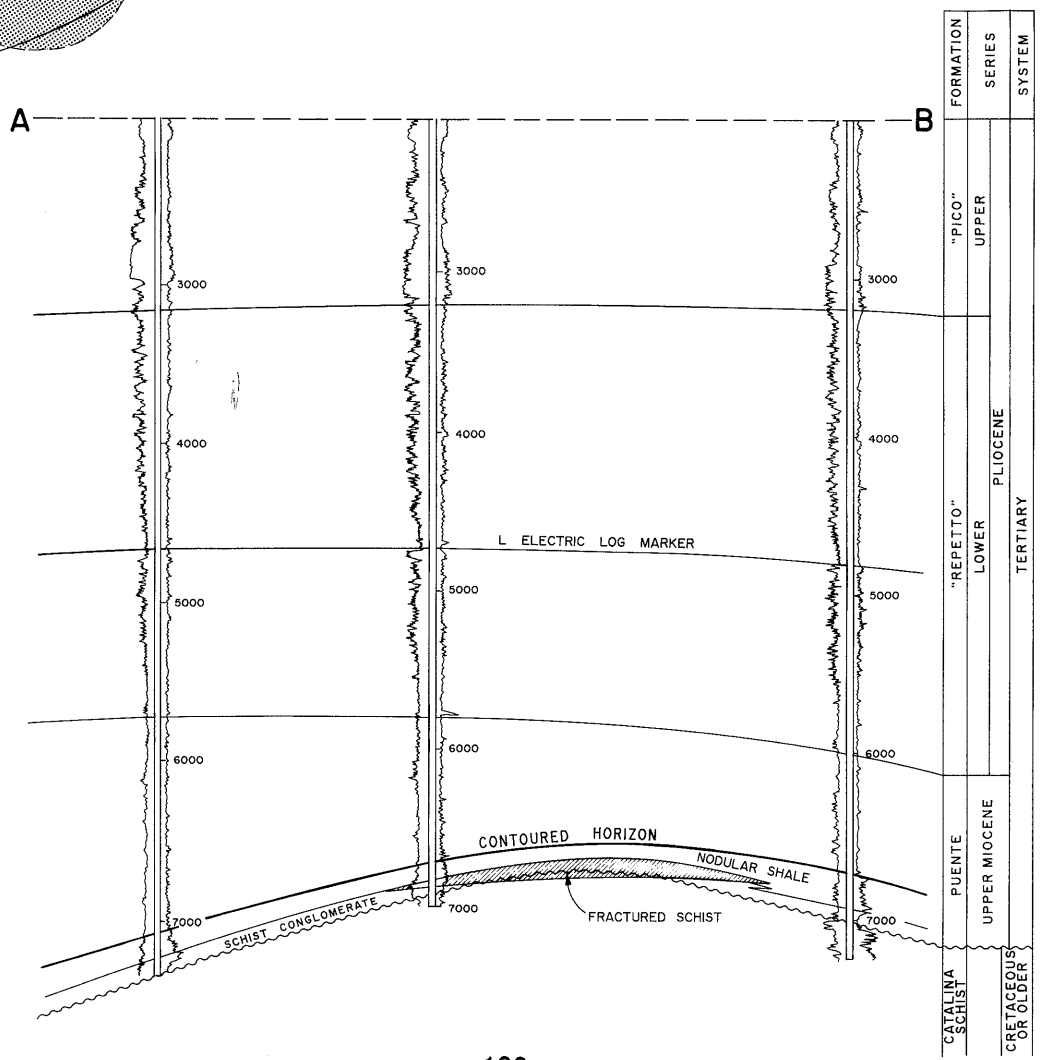
CALIFORNIA DIVISION OF OIL AND GAS

HYPERION OIL FIELD



CONTOURS ON TOP OF NODULAR SHALE

SCALE: 1" = 600'



COUNTY: LOS ANGELES

HYPERION 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	Pauley Petroleum, Inc. "Loftus" 1	Edwin W. Pauley and Harold R. Pauley "Loftus" 1	11 3S 15W	SB	7,356	Nodular shale	Puente late Miocene
Deepest well	Same as above	"	"	"	"	"	"

POOL DATA

ITEM	NODULAR SHALE	SCHIST CONGLOMERATE	SCHIST			FIELD OR AREA DATA
Discovery date	April 1944	April 1944	August 1946			
Initial production rates						
Oil (bbl/day)	72a/	a/	165			
Gas (Mcf/day)	-	-	50			
Flow pressure (psi)						
Bean size (in.)						
Initial reservoir pressure (psi)	-	2,890	-			
Reservoir temperature (°F)						
Initial oil content (STB/ac.-ft.)						
Initial gas content (MSCF/ac.-ft.)						
Formation	Puente	Puente	Catalina Schist			
Geologic age	late Miocene	late Miocene	Cret. or older			
Average depth (ft.)						
Average net thickness (ft.)						
Maximum productive area (acres)						40
RESERVOIR ROCK PROPERTIES						
Porosity (%)						
So_i (%)						
Sw_i (%)						
Sg_i (%)						
Permeability to air (md)						
RESERVOIR FLUID PROPERTIES						
Oil:						
Oil gravity (°API)	15-18	15-18	15-18			
Sulfur content (% by wt.)						
Initial solution GOR (SCF/STB)						
Initial oil FVF (RB/STB)						
Bubble point press. (psia)						
Viscosity (cp) @ °F						
Gas:						
Specific gravity (air = 1.0)	-	0.693	-			
Heating value (Btu/cu. ft.)	-	1,200	-			
Water:						
Salinity, NaCl (ppm)	13,694	13,694	13,694			
T.D.S. (ppm)						
R_w (ohm/m) (77°F)						
ENHANCED RECOVERY PROJECTS						
Enhanced recovery projects						
Date started						
Date discontinued						
Peak oil production (bbl)						47,963
Year						1948
Peak gas production, net (Mcf)						
Year						

Base of fresh water (ft.): 840

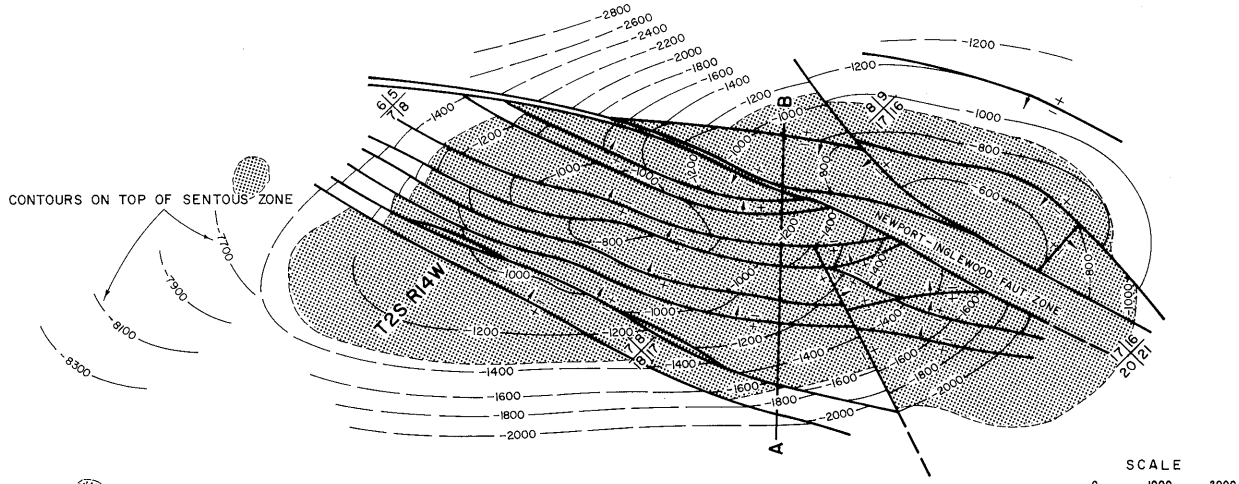
Remarks: a/Production commingled.

Selected References: Crowder, R.E., 1960, Hyperion Oil Field: Calif. Div. of Oil and Gas, Summary of Operations -- Calif. Oil Fields, Vol. 46, No. 1.

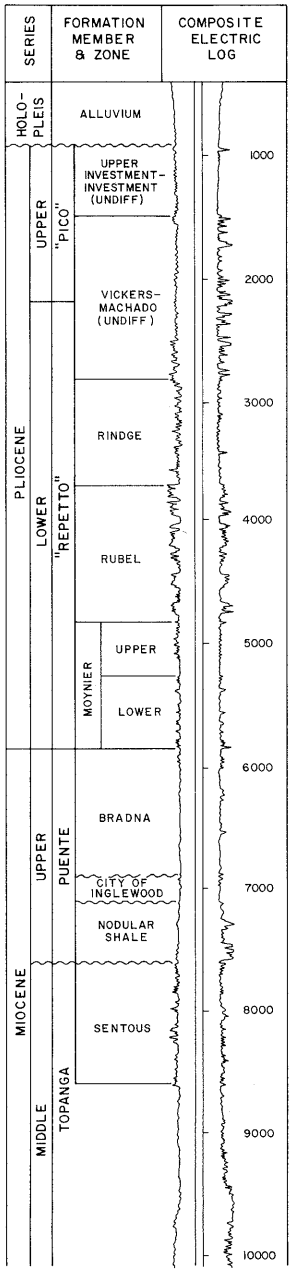
DATE: July 1983

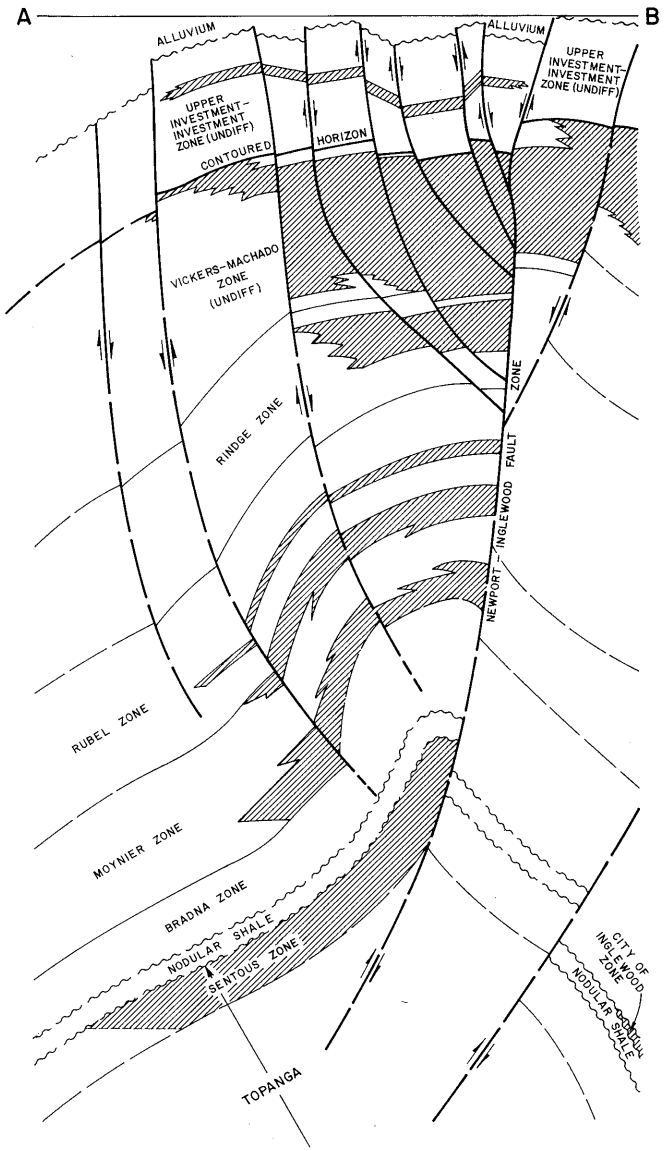
CALIFORNIA DIVISION OF OIL AND GAS

INGLEWOOD OIL FIELD



CONTOURS ON TOP OF VICKERS ZONE





COUNTY: LOS ANGELES

INGLEWOOD 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	Chevron U.S.A. Inc. "L.A. Investment" 1-1	Standard Oil Co. of Calif. "L.A. Investment" 1-1	17 2S 14W	SB	2,134	Investment	
Deepest well	Chevron U.S.A. Inc. "Buckler" 1A	Humble Oil and Refining Co. "Buckler Community" 1	16 2S 14W	SB	13,516		Topanga middle Miocene

POOL DATA

ITEM	UPPER INVESTMENT	INVESTMENT	VICKERS	RINDGE	RUBEL	FIELD OR AREA DATA
Discovery date	August 1948	September 1924	September 1924	July 1925	August 1934	
Initial production rates						
Oil (bbl/day)	89	120	145	1,057	1,903	
Gas (Mcf/day)	10	-	-	-	850	
Flow pressure (psi)						
Bean size (in.)						
Initial reservoir pressure (psi)	450	-	750	1,150	1,795	
Reservoir temperature (°F)	100	-	118	140	175	
Initial oil content (STB/ac.-ft.)	-	-	2,067	1,738	1,052	
Initial gas content (MSCF/ac.-ft.)	40	-	-	-	-	
Formation	"Pico"	"Pico"	"Pico"-"Repetto"	"Repetto"	"Repetto"	
Geologic age	late Pliocene	late Pliocene	l & e Pliocene	early Pliocene	early Pliocene	
Average depth (ft.)	950	1,050	1,500	2,400	3,400	
Average net thickness (ft.)	100	100	750	400	325	
Maximum productive area (acres)						
RESERVOIR ROCK PROPERTIES						
Porosity (%)	39	-	35	32	26	
S_{oi} (%)	-	-	80	77	60	
S_{wi} (%)	-	-	20	23	31	
S_{gi} (%)	-	-	-	-	9	
Permeability to air (md)	5,900	-	534	534	250	
RESERVOIR FLUID PROPERTIES						
Oil:						
Oil gravity (°API)	14	15	13-29	20-38	20-35	
Sulfur content (% by wt.)	-	-	2.50	1.67	-	
Initial solution GOR (SCF/STB)						
Initial oil FVF (RB/STB)	1.02	-	1.05	1.10	1.15	
Bubble point press. (psia)						
Viscosity (cp) @ °F	1,200 @ 100	-	28 @ 100	4 @ 100	16 @ 100	
Gas:						
Specific gravity (air = 1.0)						
Heating value (Btu/cu. ft.)						
Water:						
Salinity, NaCl (ppm)	3,424	25,700	29,100	30,800	30,800	
T.D.S. (ppm)	-	-	30,100	42,600	41,000	
R_w (ohm/m) (77°F)						
ENHANCED RECOVERY PROJECTS						
Enhanced recovery projects			waterflood	waterflood	waterflood	
Date started			1953	1968	1959	
Date discontinued			active	active	active	
			cyclic steam			
			1964			
			1970			
Peak oil production (bbl)						
Year						
Peak gas production, net (Mcf)						
Year						

Base of fresh water (ft.): 200-350

Remarks:

Selected References:

Driver, H.L., 1943, Inglewood Oil Field: Calif. State Div. of Mines, Bull 118, P. 306-309.
Huguenin, E., 1926, Inglewood Oil Field: Calif. Div. of Oil and Gas, Summary of Operations -- Calif. Oil Fields, Vol. 11, No. 12.

DATE: January 1989

CALIFORNIA DIVISION OF OIL AND GAS

COUNTY: LOS ANGELES

INGLEWOOD 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	MOYNIER	BRADNA	CITY OF INGLEWOOD (Marlow Burns)	SENTOUS		FIELD OR AREA DATA
Discovery date	April 1932	August 1957	May 1960	September 1940		
Initial production rates						
Oil (bbl/day)	50	110	396	75		
Gas (Mcf/day)	-	138	422	125		
Flow pressure (psi)						
Bean size (in.)						
Initial reservoir pressure (psi)	2,140	-	4,275	3,700		
Reservoir temperature (°F)	188	-	255	215		
Initial oil content (STB/ac.-ft.)	931	-	11,700	560		
Initial gas content (MSCF/ac.-ft.)	-	-	8,750	-		
Formation	"Repetto"	Puente	Puente	Topanga		
Geologic age	early Pliocene	late Miocene	late Miocene	middle Miocene		
Average depth (ft.)	4,200	8,000	9,000	8,200		
Average net thickness (ft.)	300	80	125	350		
Maximum productive area (acres)						1,215
RESERVOIR ROCK PROPERTIES						
Porosity (%)	23.0	-	15.8	18.0		
So_i (%)	60	-	64	56		
Sw_i (%)	31	-	36	44		
Sg_i (%)	9	-	-	-		
Permeability to air (md)	60	-	10	34		
RESERVOIR FLUID PROPERTIES						
Oil:						
Oil gravity (°API)	22	27	27-32	32		
Sulfur content (% by wt.)	-	-	-	1.00		
Initial solution GOR (SCF/STB)	-	-	965	1,600		
Initial oil FVF (RB/STB)	1.150	-	1.633	1.400		
Bubble point press. (psia)						
Viscosity (cp) @ °F	14.00 @ 188	-	0.28 @ 255	-		
Gas:						
Specific gravity (air = 1.0)						
Heating value (Btu/cu. ft.)						
Water:						
Salinity, NaCl (ppm)	34,200	34,200	34,200	34,200		
T.D.S. (ppm)						
R_w (ohm/m) (77°F)						
ENHANCED RECOVERY PROJECTS						
Enhanced recovery projects	waterflood					
Date started	1966					
Date discontinued	active					
Peak oil production (bbl)						18,371,536
Year						1925
Peak gas production, net (Mcf)						
Year						

Base of fresh water (ft.):

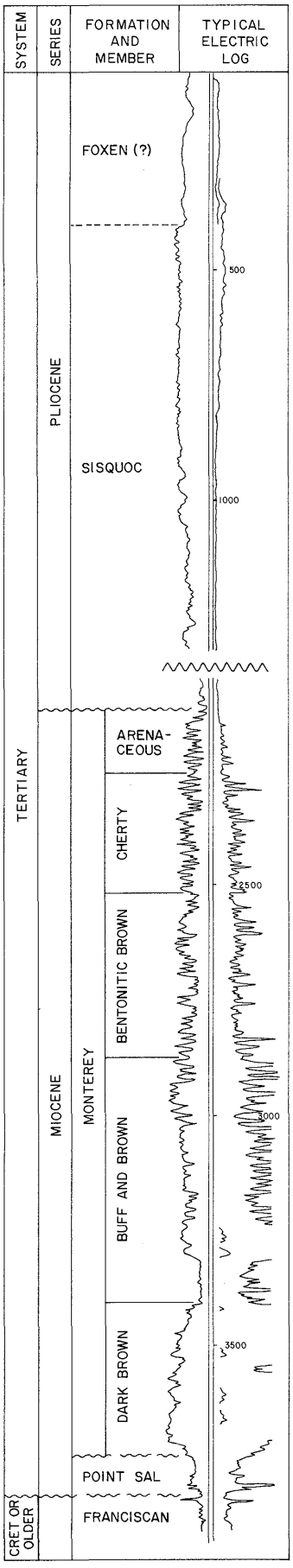
Remarks:

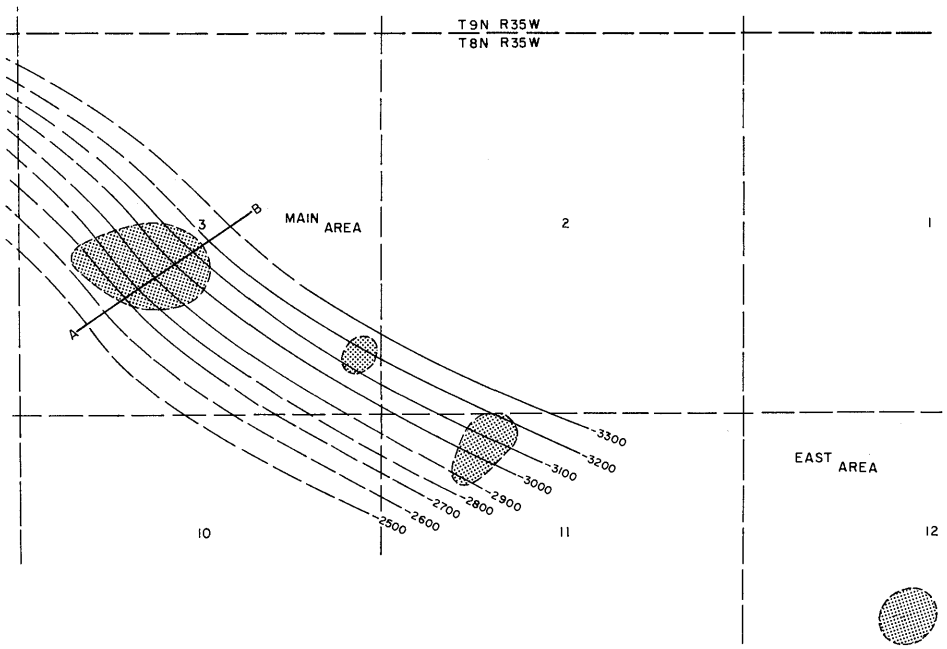
Selected References:

DATE: January 1989

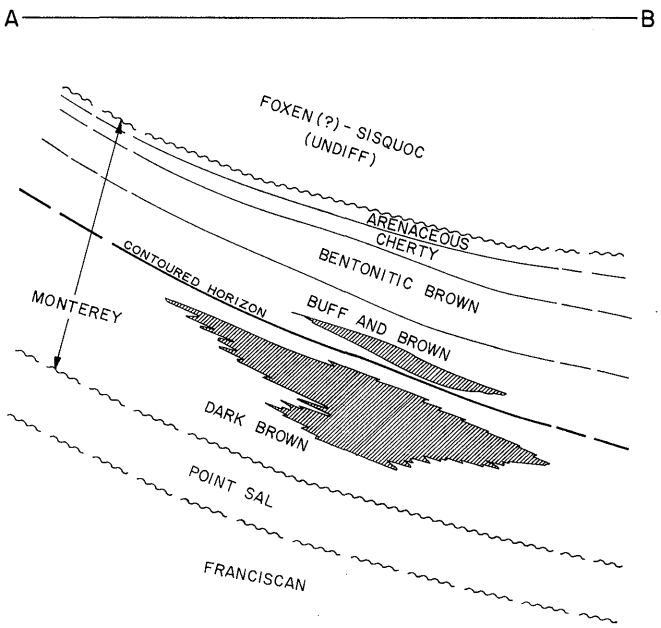
CALIFORNIA DIVISION OF OIL AND GAS

JESUS MARIA OIL FIELD





CONTOURS ON TOP OF DARK BROWN



COUNTY: SANTA BARBARA

JESUS MARIA 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	Union Oil Co. of Calif. "Jesus Maria" 1	Same as present	34 9N 35W	SB	2,274	Monterey	
Deepest well	Union Oil Co. of Calif. "Jesus Maria" 22-11	Same as present	11 8N 35W	SB	4,596 a/		Pt. Sal Miocene

POOL DATA

ITEM	MONTEREY b/					FIELD OR AREA DATA
Discovery date	October 1948					
Initial production rates						
Oil (bbl/day)	36					
Gas (Mcf/day)						
Flow pressure (psi)						
Bean size (in.)						
Initial reservoir pressure (psi)	700-1,000					
Reservoir temperature (°F)	110					
Initial oil content (STB/ac.-ft.)						
Initial gas content (MSCF/ac.-ft.)						
Formation	Monterey					
Geologic age	Miocene					
Average depth (ft.)	2,600-2,900					
Average net thickness (ft.)	290-500					
Maximum productive area (acres)						100
RESERVOIR ROCK PROPERTIES						
Porosity (%)	fractured shale					
So_i (%)						
Sw_i (%)						
Sg_i (%)						
Permeability to air (md)						
RESERVOIR FLUID PROPERTIES						
Oil:						
Oil gravity (°API)	8-12					
Sulfur content (% by wt.)						
Initial solution GOR (SCF/STB)						
Initial oil FVF (RB/STB)						
Bubble point press. (psia)						
Viscosity (cp) @ °F	2,200 @ 160					
Gas:						
Specific gravity (air = 1.0)	0.55-0.78					
Heating value (Btu/cu. ft.)						
Water:						
Salinity, NaCl (ppm)	3,000					
T.D.S. (ppm)	6,600					
R_w (ohm/m) (77°F)	1.3					
ENHANCED RECOVERY PROJECTS						
Enhanced recovery projects						
Date started						
Date discontinued						
Peak oil production (bbl)						64,440
Year						1956
Peak gas production, net (Mcf)						21,869
Year						1985

Base of fresh water (ft.): See areas

Remarks: Field shut in from 1958 to April 1981.
a/ Directional well; true vertical depth is 4,400 feet.
b/ The Monterey includes the Arenaceous, Buff and Brown, and Dark Brown zones.

Selected References: Bailey, W.C., 1952, Operations in District No. 3: Calif. Div. of Oil and Gas, Summary of Operations--Calif. Oil Fields, Vol. 38, No. 2.

DATE: January 1989

CALIFORNIA DIVISION OF OIL AND GAS

COUNTY: SANTA BARBARA

JESUS MARIA OIL FIELD
EAST 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	Union Oil Co. of Calif. "Jesus Maria" S23-12	Same as present	12 8N 35W	SB	2,776	Monterey	Monterey Miocene
Deepest well	Same as above	"	"	"	"	"	"

POOL DATA

ITEM	MONTEREY					FIELD OR AREA DATA
Discovery date	July 1985					
Initial production rates						
Oil (bbl/day)	65					
Gas (Mcf/day)	80					
Flow pressure (psi)						
Bean size (in.)						
Initial reservoir pressure (psi)						
Reservoir temperature (°F)						
Initial oil content (STB/ac.-ft.)						
Initial gas content (MSCF/ac.-ft.)						
Formation	Monterey					
Geologic age	Miocene					
Average depth (ft.)	1,950					
Average net thickness (ft.)	220					
Maximum productive area (acres)	10					
RESERVOIR ROCK PROPERTIES						
Porosity (%)	fractured shale					
S_{oi} (%)						
S_{wi} (%)						
S_{gi} (%)						
Permeability to air (md)						
RESERVOIR FLUID PROPERTIES						
Oil:						
Oil gravity (°API)	11.5					
Sulfur content (% by wt.)						
Initial solution GOR (SCF/STB)						
Initial oil FVF (RB/STB)						
Bubble point press. (psia)						
Viscosity (cp) @ °F						
Gas:						
Specific gravity (air = 1.0)						
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	cyclic steam					
Date started	1985					
Date discontinued	1987					
Peak oil production (bbl)	7,708					
Year	1985					
Peak gas production, net (Mcf)	13,981					
Year	1985					

Base of fresh water (ft.): None

Remarks:

Selected References:

DATE: January 1989

CALIFORNIA DIVISION OF OIL AND GAS

COUNTY: SANTA BARBARA

JESUS MARIA 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	Union Oil Co. of Calif. "Jesus Maria" 1	Same as present	34 9N 35W	SB	2,274	Monterey	
Deepest well	Union Oil Co. of Calif. "Jesus Maria" 22-11	Same as present	11 8N 35W	SB	4,596 a/		Pt. Sal Miocene

POOL DATA

ITEM	MONTEREY b/					FIELD OR AREA DATA
Discovery date	October 1948					
Initial production rates						
Oil (bbl/day)	36					
Gas (Mcf/day)						
Flow pressure (psi)						
Bean size (in.)						
Initial reservoir pressure (psi)	700-1,000					
Reservoir temperature (°F)	110					
Initial oil content (STB/ac.-ft.)						
Initial gas content (MSCF/ac.-ft.)						
Formation	Monterey					
Geologic age	Miocene					
Average depth (ft.)	2,600-2,900					
Average net thickness (ft.)	290-500					
Maximum productive area (acres)	90					
RESERVOIR ROCK PROPERTIES						
Porosity (%)	fractured shale					
S_{oi} (%)						
S_{wi} (%)						
S_{gi} (%)						
Permeability to air (md)						
RESERVOIR FLUID PROPERTIES						
Oil:						
Oil gravity (°API)	8-12					
Sulfur content (% by wt.)						
Initial solution GOR (SCF/STB)						
Initial oil FVF (RB/STB)						
Bubble point press. (psia)						
Viscosity (cp) @ °F	2,200 @ 160					
Gas:						
Specific gravity (air = 1.0)	0.55-0.78					
Heating value (Btu/cu. ft.)						
Water:						
Salinity, NaCl (ppm)	3,000					
T.D.S. (ppm)	6,600					
R_w (ohm/m) (77°F)	1.3					
ENHANCED RECOVERY PROJECTS						
Enhanced recovery projects	cyclic steam					
Date started	1982					
Date discontinued	1986					
Peak oil production (bbl)	64,440					
Year	1956					
Peak gas production, net (Mcf)						
Year						

Base of fresh water (ft.): None

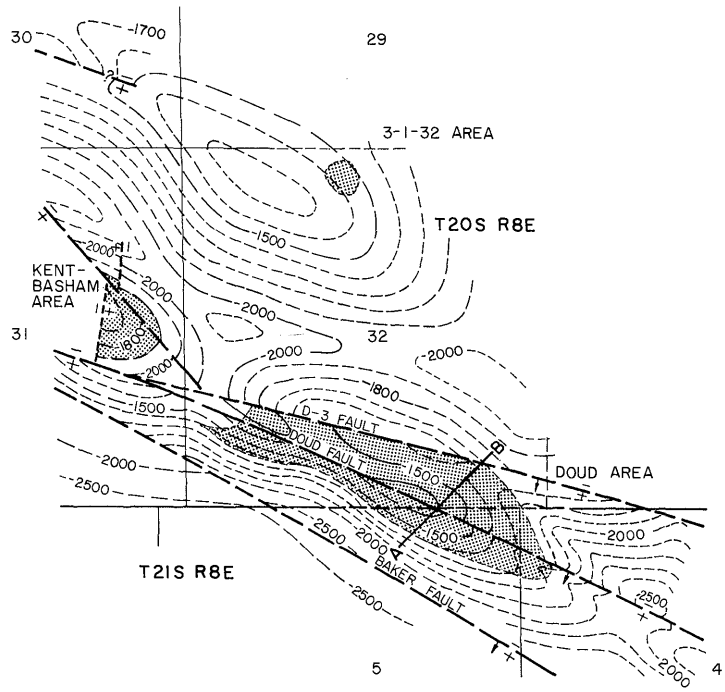
Remarks: a/ Directional well; true vertical depth is 4,400 feet.
b/ The Monterey includes the Arenaceous, Buff and Brown, and Dark Brown zones.

Selected References:

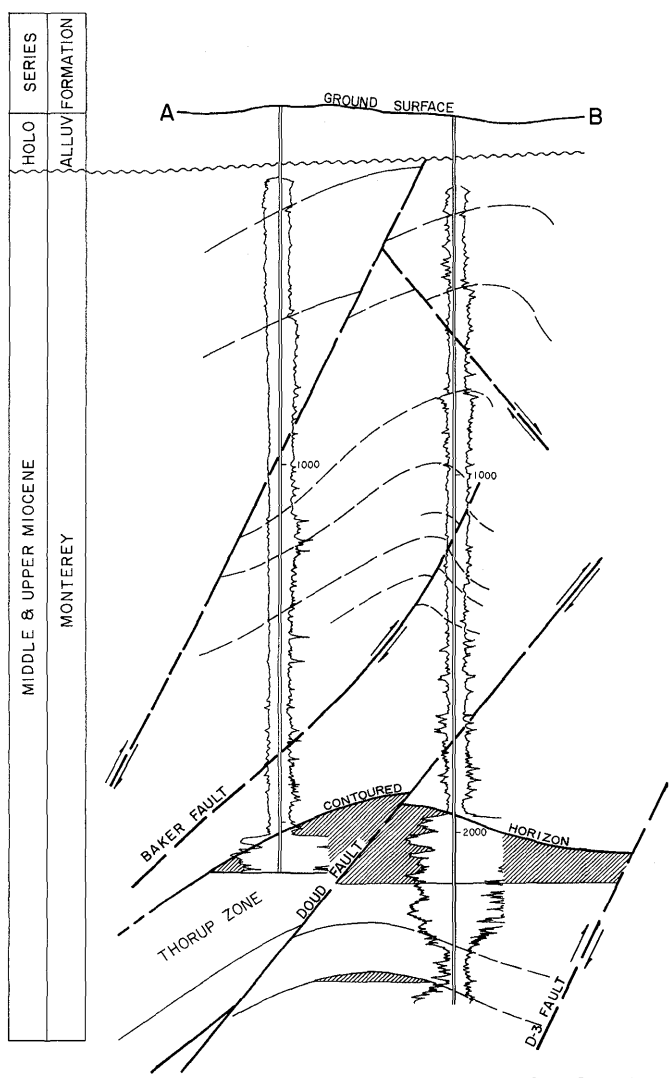
DATE: January 1989

CALIFORNIA DIVISION OF OIL AND GAS

KING CITY OIL FIELD



CONTOURS ON TOP OF THORUP ZONE



DATA COURTESY OF VISTA PETROLEUM CO. AND MODIFIED BY THE DIVISION OF OIL AND GAS

COUNTY: MONTEREY

KING CITY 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	El Dorado Exploration Co. "Thomas Doud Estate" 2	Richard R. Thorup "Thomas Doud Estate" 2	32 20S 8E	MD	2,483	Thorup	
Deepest well	Texaco Inc. "Currell" 1	The Texas Co. "Currell" 1	4 21S 8E	MD	3,280		Monterey Miocene

POOL DATA

ITEM	THORUP					FIELD OR AREA DATA
Discovery date	December 1959					
Initial production rates						
Oil (bbl/day)	85					
Gas (Mcf/day)	5					
Flow pressure (psi)						
Bean size (in.)	22/64					
Initial reservoir pressure (psi)	600					
Reservoir temperature (°F)	110-116					
Initial oil content (STB/ac.-ft.)	1,702					
Initial gas content (MSCF/ac.-ft.)						
Formation	Monterey					
Geologic age	Miocene					
Average depth (ft.)	2,000					
Average net thickness (ft.)	100					
Maximum productive area (acres)						160
RESERVOIR ROCK PROPERTIES						
Porosity (%)	32					
So_i (%)	72					
Sw_i (%)	28					
Sg_i (%)						
Permeability to air (md)						
RESERVOIR FLUID PROPERTIES						
Oil:						
Oil gravity (°API)	13-16					
Sulfur content (% by wt.)						
Initial solution GOR (SCF/STB)						
Initial oil FVF (RB/STB)	1.05					
Bubble point press. (psia)						
Viscosity (cp) @ °F						
Gas:						
Specific gravity (air = 1.0)						
Heating value (Btu/cu. ft.)						
Water:						
Salinity, NaCl (ppm)	8,594					
T.D.S. (ppm)	9,626					
R_w (ohm/m) (77°F)						
ENHANCED RECOVERY PROJECTS						
Enhanced recovery projects						
Date started						
Date discontinued						
Peak oil production (bbl)						174,680
Year						1963
Peak gas production, net (Mcf)						33,611
Year						1963

Base of fresh water (ft.): See areas

Remarks:

Selected References:

Church, V.H., 1963, King City Oil Field: AAPG-SEPM Guidebook to the Geology of the Salinas Valley and the San Andreas Fault.
Hart, E.W., 1963, Mines and Mineral Resources of Monterey County, Calif. Div. of Mines and Geology Report, No. 5.

DATE: January 1989

CALIFORNIA DIVISION OF OIL AND GAS

COUNTY: MONTEREY

KING CITY OIL FIELD
3 - 1 - 32 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	El Dorado Exploration Co. "Doud Estate" 3-1-32	John H. Beach "Doud" 3-1-32	32 20S 8E	MD	1,899	Thorup	
Deepest well	John H. Beach "Doud" 4-2-32	Same as present	32 20S 8E	MD	2,142		Monterey Miocene

POOL DATA

ITEM	THORUP					FIELD OR AREA DATA
Discovery date	February 1963					
Initial production rates						
Oil (bbl/day)	10					
Gas (Mcf/day)						
Flow pressure (psi)						
Bean size (in.)						
Initial reservoir pressure (psi)	600					
Reservoir temperature (°F)	110					
Initial oil content (STB/ac.-ft.)						
Initial gas content (MSCF/ac.-ft.)						
Formation	Monterey					
Geologic age	Miocene					
Average depth (ft.)	1,860					
Average net thickness (ft.)	30					
Maximum productive area (acres)	10					
RESERVOIR ROCK PROPERTIES						
Porosity (%)	17-28					
So_i (%)	50					
Sw_i (%)	50					
Sg_i (%)						
Permeability to air (md)	1,000					
RESERVOIR FLUID PROPERTIES						
Oil:						
Oil gravity (°API)	13					
Sulfur content (% by wt.)						
Initial solution GOR (SCF/STB)						
Initial oil FVF (RB/STB)						
Bubble point press. (psia)						
Viscosity (cp) @ °F						
Gas:						
Specific gravity (air = 1.0)						
Heating value (Btu/cu. ft.)						
Water:						
Salinity, NaCl (ppm)	8,570					
T.D.S. (ppm)						
R_w (ohm/m) (77°F)						
ENHANCED RECOVERY PROJECTS						
Enhanced recovery projects						
Date started						
Date discontinued						
Peak oil production (bbl)	409					
Year	1963					
Peak gas production, net (Mcf)						
Year						

Base of fresh water (ft.): 240

Remarks:

Selected References:

DATE: January 1989

CALIFORNIA DIVISION OF OIL AND GAS

COUNTY: MONTEREY

KING CITY OIL FIELD
DOUD 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	El Dorado Exploration Co. "Thomas Doud Estate" 2	Richard R. Thorup "Thomas Doud Estate" 2	32 20S 8E	MD	2,483	Thorup	
Deepest well	Texaco Inc. "Currell" 1	The Texas Co. "Currell" 1	4 21S 8E	MD	3,280		Monterey Miocene

POOL DATA

ITEM	THORUP					FIELD OR AREA DATA
Discovery date	December 1959					
Initial production rates						
Oil (bbl/day)	85					
Gas (Mcf/day)	5					
Flow pressure (psi)						
Bean size (in.)	22/64					
Initial reservoir pressure (psi)	600					
Reservoir temperature (°F)	100-116					
Initial oil content (STB/ac.-ft.)	1,702					
Initial gas content (MSCF/ac.-ft.)						
Formation	Monterey					
Geologic age	Miocene					
Average depth (ft.)	2,000					
Average net thickness (ft.)	100					
Maximum productive area (acres)	110					
RESERVOIR ROCK PROPERTIES						
Porosity (%)	32					
S_{oi} (%)	72					
S_{wi} (%)	28					
S_{gi} (%)						
Permeability to air (md)						
RESERVOIR FLUID PROPERTIES						
Oil:						
Oil gravity (°API)	13-16					
Sulfur content (% by wt.)						
Initial solution GOR (SCF/STB)						
Initial oil FVF (RB/STB)	1.05					
Bubble point press. (psia)						
Viscosity (cp) @ °F						
Gas:						
Specific gravity (air = 1.0)						
Heating value (Btu/cu. ft.)						
Water:						
Salinity, NaCl (ppm)	8,594					
T.D.S. (ppm)	9,626					
R_w (ohm/m) (77°F)						
ENHANCED RECOVERY PROJECTS						
Enhanced recovery projects						
Date started						
Date discontinued						
Peak oil production (bbl)	157,340					
Year	1963					
Peak gas production, net (Mcf)						
Year						

Base of fresh water (ft.): 225

Remarks:

Selected References: Barton, C.L., 1959, Operations in District No. 3: Calif. Div. of Oil and Gas, Summary of Operations--Calif. Oil Fields, Vol. 45, No. 2.

DATE: January 1989

CALIFORNIA DIVISION OF OIL AND GAS

COUNTY: MONTEREY

KING CITY OIL FIELD
KENT - BASHAM 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	Domestic Oil Corp. "B.C.B.-Kent-Basham" 1-31	Pennant Operating Co. "B.C.B.-Kent-Basham" 1-31	31 20S 8E	MD	2,455	Thorup	
Deepest well	Tri-Valley Oil and Gas Co. "Mozzini" 1-31	Same as present	31 20S 8E	MD	3,046		Monterey Miocene

POOL DATA

ITEM	THORUP					FIELD OR AREA DATA
Discovery date	October 1961					
Initial production rates						
Oil (bbl/day)	143					
Gas (Mcf/day)						
Flow pressure (psi)						
Bean size (in.)						
Initial reservoir pressure (psi)	900					
Reservoir temperature (°F)						
Initial oil content (STB/ac.-ft.)						
Initial gas content (MSCF/ac.-ft.)						
Formation	Monterey					
Geologic age	Miocene					
Average depth (ft.)	2,450					
Average net thickness (ft.)	65					
Maximum productive area (acres)	40					
RESERVOIR ROCK PROPERTIES						
Porosity (%)	17-28					
So_i (%)	50-72					
Sw_i (%)	28-50					
Sg_i (%)						
Permeability to air (md)	1,000					
RESERVOIR FLUID PROPERTIES						
Oil:						
Oil gravity (°API)	16-17					
Sulfur content (% by wt.)						
Initial solution GOR (SCF/STB)						
Initial oil FVF (RB/STB)						
Bubble point press. (psia)						
Viscosity (cp) @ °F						
Gas:						
Specific gravity (air = 1.0)						
Heating value (Btu/cu. ft.)						
Water:						
Salinity, NaCl (ppm)	8,560					
T.D.S. (ppm)						
R_w (ohm/m) (77°F)						
ENHANCED RECOVERY PROJECTS						
Enhanced recovery projects						
Date started						
Date discontinued						
Peak oil production (bbl)	18,975					
Year	1962					
Peak gas production, net (Mcf)						
Year						

Base of fresh water (ft.): 200

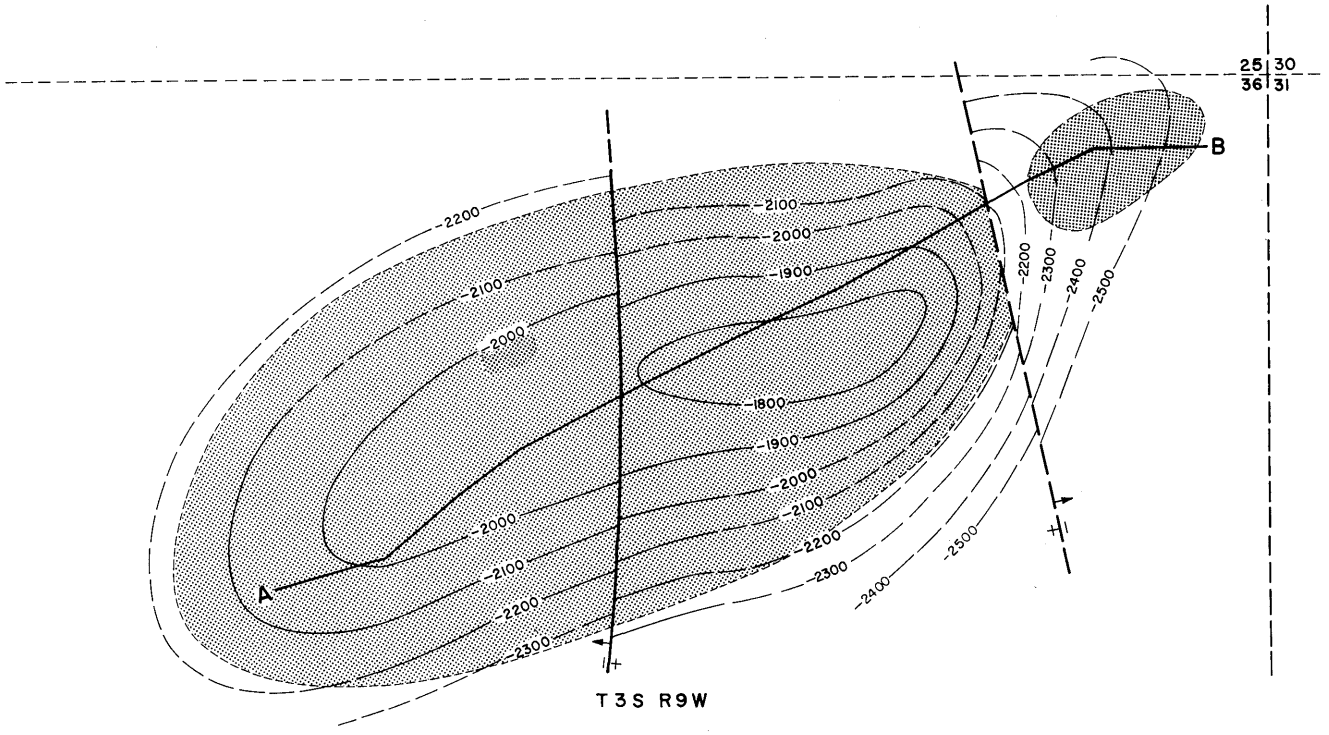
Remarks: Since October 1973, the area has been used exclusively for water disposal.

Selected References: Barton, C.L., 1961, Operations in District 3: Calif. Div. of Oil and Gas, Summary of Operations--Calif. Oil Fields, Vol. 47, No. 2.

DATE: August 1987

CALIFORNIA DIVISION OF OIL AND GAS

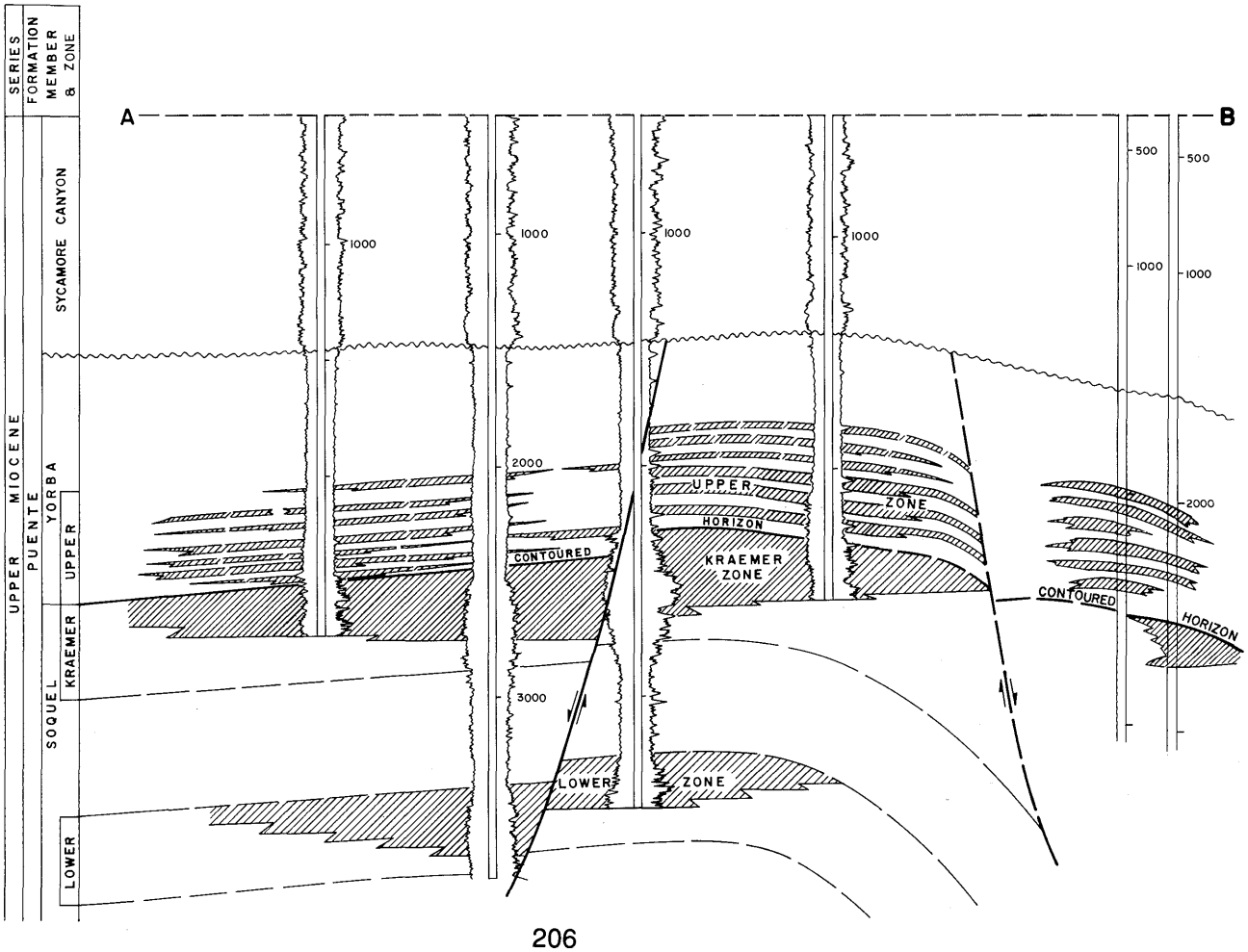
KRAEMER OIL FIELD



CONTOURS ON TOP OF KRAEMER ZONE

SCALE

0 200 400



COUNTY: ORANGE

KRAEMER 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	Chevron U.S.A. Inc. "Kraemer 1" 1	Standard Oil Co. of Calif. "Kraemer 1" 1	36 3S 9W	SB	3,160	Kraemer	
Deepest well	Shell California Production Inc. "Shell Travis" 1	Shell Oil Co. "Shell Travis" 1	36 3S 9W	SB	6,185		Topanga middle Miocene

POOL DATA

ITEM	UPPER	KRAEMER	LOWER			FIELD OR AREA DATA
Discovery date	June 1919	September 1918	November 1954			
Initial production rates						
Oil (bbl/day)	318	144	20			
Gas (Mcf/day)						
Flow pressure (psi)						
Bean size (in.)						
Initial reservoir pressure (psi)	-	118	-			
Reservoir temperature (°F)	-	1,108	-			
Initial oil content (STB/ac.-ft.)						
Initial gas content (MSCF/ac.-ft.)						
Formation	Puente	Puente	Puente			
Geologic age	late Miocene	late Miocene	late Miocene			
Average depth (ft.)	1,900	2,400	3,300			
Average net thickness (ft.)	200	300	250			
Maximum productive area (acres)						60
RESERVOIR ROCK PROPERTIES						
Porosity (%)	-	20	-			
S_{oi} (%)	-	75	-			
S_{wi} (%)	-	25	-			
S_{gi} (%)						
Permeability to air (md)						
RESERVOIR FLUID PROPERTIES						
Oil:						
Oil gravity (°API)	17-20	18-20	22			
Sulfur content (% by wt.)						
Initial solution GOR (SCF/STB)	-	251	-			
Initial oil FVF (RB/STB)	-	1.050	-			
Bubble point press. (psia)						
Viscosity (cp) @ °F						
Gas:						
Specific gravity (air = 1.0)						
Heating value (Btu/cu. ft.)						
Water:						
Salinity, NaCl (ppm)	-	7,200	3,420			
T.D.S. (ppm)						
R_w (ohm/m) (77°F)						
ENHANCED RECOVERY PROJECTS						
Enhanced recovery projects		waterflood				
Date started		1969				
Date discontinued		active				
Peak oil production (bbl)						189,089
Year						1920
Peak gas production, net (Mcf)						112,043
Year						1956

Base of fresh water (ft.): 50-1,500

Remarks: The Lower zone was of little economic importance. The two wells completed in that zone were subsequently recompleted in the Kraemer zone.

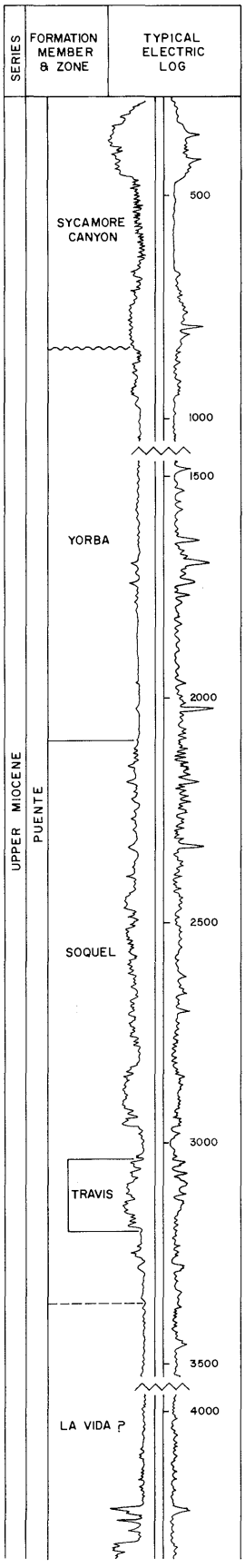
Selected References: Ingram, W.L., 1960, Kraemer Oil Field: Calif. Div. of Oil and Gas, Summary of Operations -- Calif. Oil Fields, Vol. 46, No. 1.

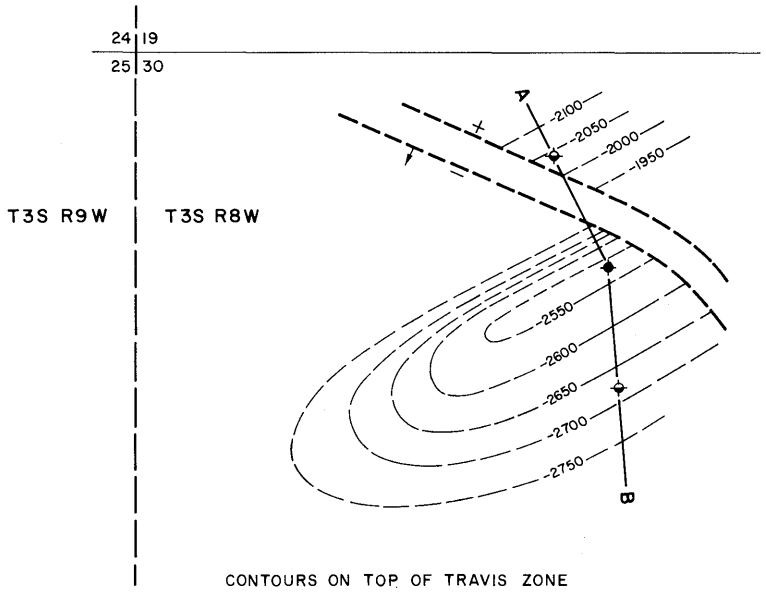
DATE: July 1983

CALIFORNIA DIVISION OF OIL AND GAS

NORTHEAST KRAEMER OIL FIELD

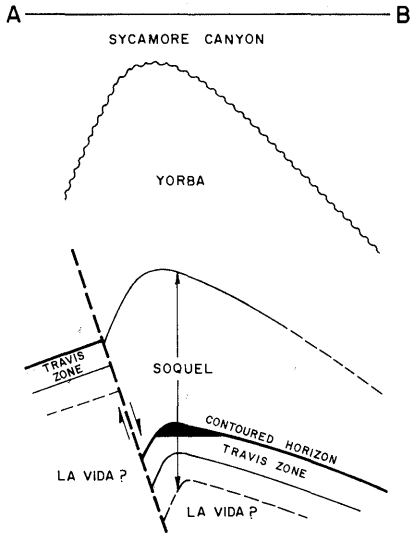
(Abandoned)





CONTOURS ON TOP OF TRAVIS ZONE

SCALE: 1" = 800'



COUNTY: ORANGE

KRAEMER, NORTHEAST, OIL FIELD (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. "Travis" 1	The Texas Company "Travis" 1	30 3S 8W	SB	4,827	Travis	Topanga middle Miocene
Deepest well	Same as above	"	"	"	"	"	"

POOL DATA

ITEM	TRAVIS					FIELD OR AREA DATA
Discovery date	March 1953					
Initial production rates						
Oil (bbl/day)	3					
Gas (Mcf/day)						
Flow pressure (psi)						
Bean size (in.)						
Initial reservoir pressure (psi)						
Reservoir temperature (°F)						
Initial oil content (STB/ac.-ft.)						
Initial gas content (MSCF/ac.-ft.)						
Formation	Puente					
Geologic age	late Miocene					
Average depth (ft.)	3,035					
Average net thickness (ft.)	85					
Maximum productive area (acres)	10					
RESERVOIR ROCK PROPERTIES						
Porosity (%)						
S_{oi} (%)						
S_{wi} (%)						
S_{gi} (%)						
Permeability to air (md)						
RESERVOIR FLUID PROPERTIES						
Oil:						
Oil gravity (°API)	23					
Sulfur content (% by wt.)						
Initial solution GOR (SCF/STB)						
Initial oil FVF (RB/STB)						
Bubble point press. (psia)						
Viscosity (cp) @ °F						
Gas:						
Specific gravity (air = 1.0)						
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						
Date started						
Date discontinued						
Peak oil production (bbl)	389					
Year	1953					
Peak gas production, net (Mcf)						
Year						

Base of fresh water (ft.): 400

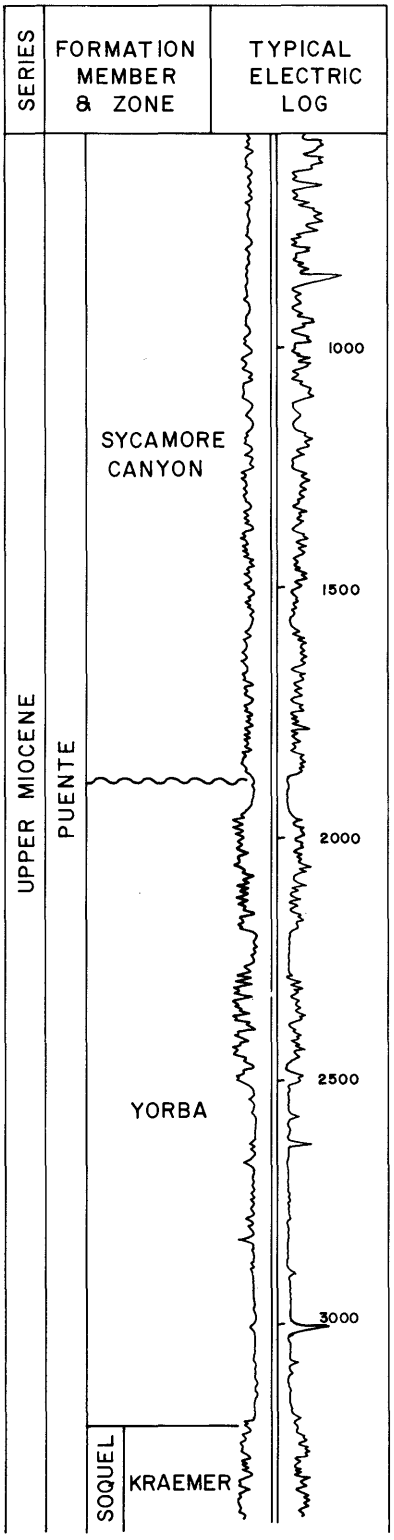
Remarks: Last production was in December 1953. The field was abandoned in 1954. Cumulative production is 389 bbl of oil and no gas.

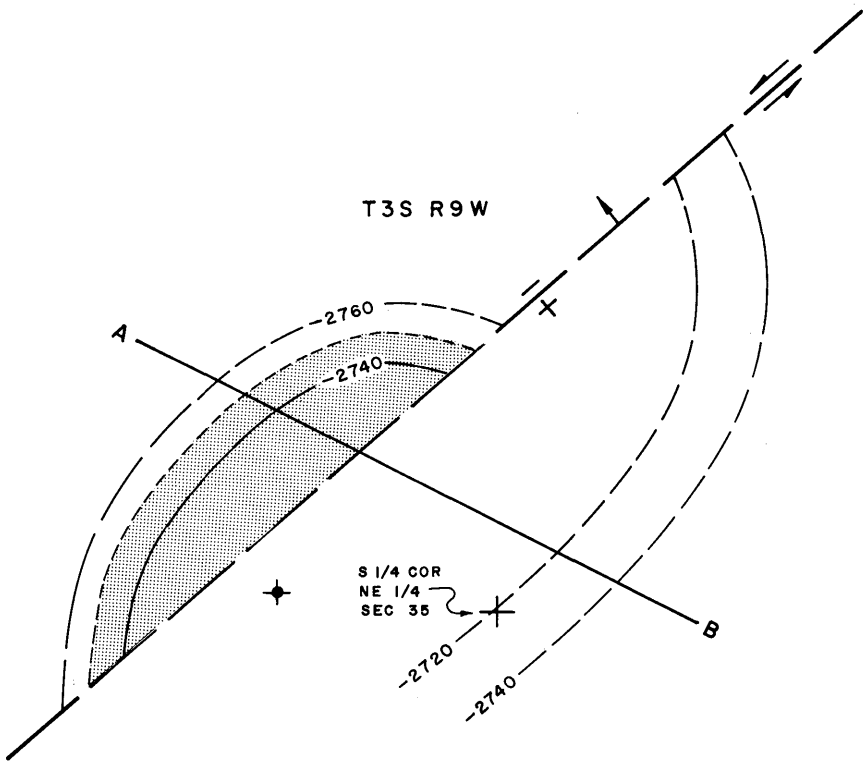
Selected References:

DATE: July 1983

CALIFORNIA DIVISION OF OIL AND GAS

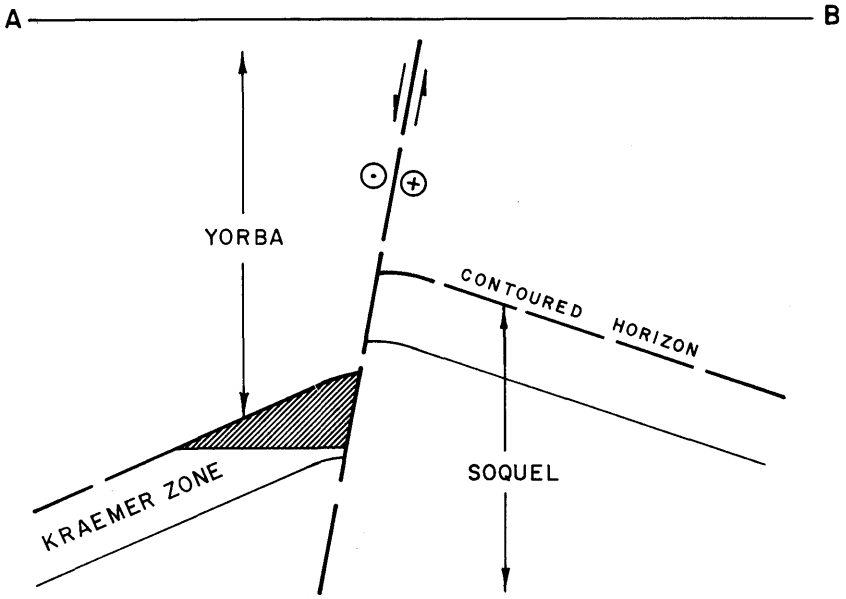
WEST KRAEMER OIL FIELD
(Abandoned)





CONTOURS ON TOP OF KRAEMER ZONE

SCALE
0 100 200 300



COUNTY: ORANGE

KRAEMER, WEST, OIL FIELD (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	Patrick A. Doheny "Stern" 1	Same as present	35 3S 9W	SB	3,300	Kraemer	
Deepest well	Patrick A. Doheny "Stern" 3	Same as present	35 3S 9W	SB	3,418		Soquel late Miocene

POOL DATA

ITEM	KRAEMER					FIELD OR AREA DATA
Discovery date	May 1956					
Initial production rates						
Oil (bbl/day)	14					
Gas (Mcf/day)						
Flow pressure (psi)						
Bean size (in.)						
Initial reservoir pressure (psi)						
Reservoir temperature (°F)						
Initial oil content (STB/ac.-ft.)						
Initial gas content (MSCF/ac.-ft.)						
Formation	Puente					
Geologic age	late Miocene					
Average depth (ft.)	3,100					
Average net thickness (ft.)	100					
Maximum productive area (acres)	10					
RESERVOIR ROCK PROPERTIES						
Porosity (%)						
So_i (%)						
Sw_i (%)						
Sg_i (%)						
Permeability to air (md)						
RESERVOIR FLUID PROPERTIES						
Oil:						
Oil gravity (°API)	19					
Sulfur content (% by wt.)						
Initial solution GOR (SCF/STB)						
Initial oil FVF (RB/STB)						
Bubble point press. (psia)						
Viscosity (cp) @ °F						
Gas:						
Specific gravity (air = 1.0)						
Heating value (Btu/cu. ft.)						
Water:						
Salinity, NaCl (ppm)	3,700					
T.D.S. (ppm)						
R_w (ohm/m) (77°F)						
ENHANCED RECOVERY PROJECTS						
Enhanced recovery projects						
Date started						
Date discontinued						
Peak oil production (bbl)	3,779					
Year	1957					
Peak gas production, net (Mcf)						
Year						

Base of fresh water (ft.): 1,250

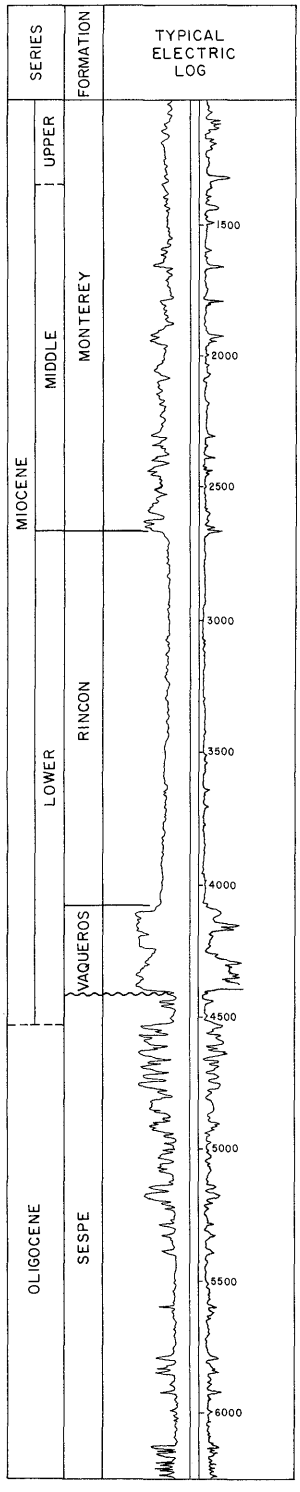
Remarks: Last production was in February 1959. The field was abandoned in March 1959. Cumulative production is 9,583 bbl of oil and no gas.

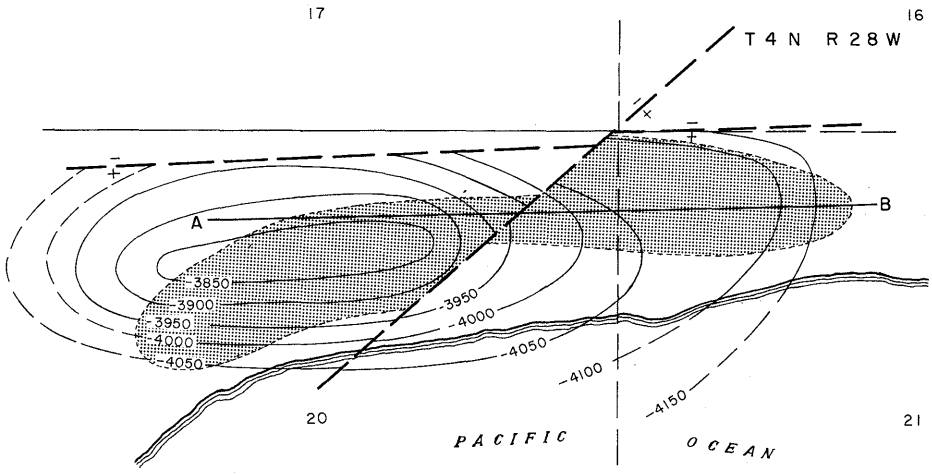
Selected References:

DATE: July 1983

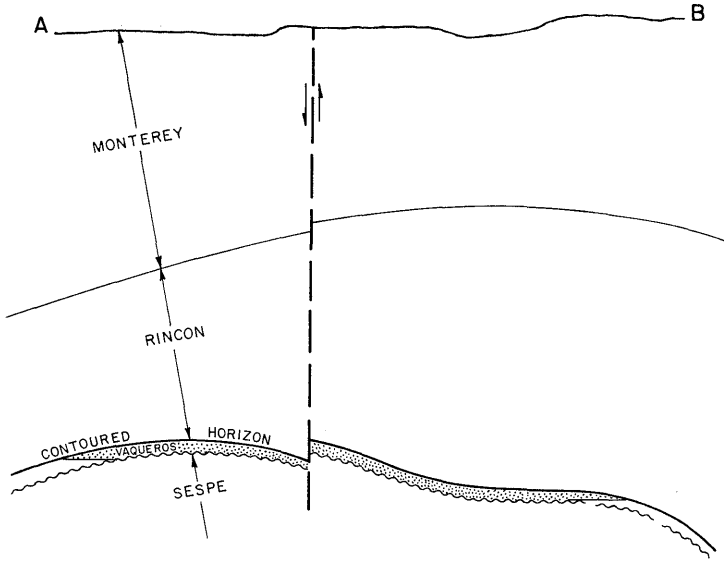
CALIFORNIA DIVISION OF OIL AND GAS

LA GOLETA GAS FIELD





CONTOURS ON TOP OF VAQUEROS
SCALE: 1"=1700'



COUNTY: SANTA BARBARA

LA GOLETA GAS 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	Southern Calif. Gas Co. "More" 1	General Petroleum Corp. of Calif. "More" 1	21 4N 28W	SB	4,533	Vaqueros	
Deepest well	Southern Calif. Gas Co. "More" 3	General Petroleum Corp. of Calif. "More" 3	21 4N 28W	SB	6,912		Sespe Oligocene

POOL DATA

ITEM	VAQUEROS					FIELD OR AREA DATA
Discovery date	July 1932					
Initial production rates						
Oil (bbl/day)						
Gas (Mcf/day)	58,000					
Flow pressure (psi)	525					
Bean size (in.)	1 1/2					
Initial reservoir pressure (psi)	1,840-2,000					
Reservoir temperature (°F)	140-155					
Initial oil content (STB/ac.-ft.)						
Initial gas content (MSCF/ac.-ft.)	999					
Formation	Vaqueros					
Geologic age	early Miocene					
Average depth (ft.)	3,950					
Average net thickness (ft.)	350					
Maximum productive area (acres)	280					
RESERVOIR ROCK PROPERTIES						
Porosity (%)	22-27					
S_{oi} (%)						
S_{wi} (%)	30					
S_{gi} (%)	70					
Permeability to air (md)	100-500					
RESERVOIR FLUID PROPERTIES						
Oil:						
Oil gravity (°API)						
Sulfur content (% by wt.)						
Initial solution GOR (SCF/STB)						
Initial oil FVF (RB/STB)						
Bubble point press. (psia)						
Viscosity (cp) @ °F						
Gas:						
Specific gravity (air = 1.0)	0.59-0.63					
Heating value (Btu/cu. ft.)	1,000					
Water:						
Salinity, NaCl (ppm)	5,136					
T.D.S. (ppm)						
R_w (ohm/m) (77°F)						
ENHANCED RECOVERY PROJECTS						
Enhanced recovery projects						
Date started						
Date discontinued						
Peak oil production (bbl)						
Year						
Peak gas production, net (Mcf)	3,949,487[a/]					
Year	1934					

Base of fresh water (ft.): None

Remarks: The discovery well blew out in 1929 at a depth of 4,533 feet and flowed at an estimated rate of 60,000 Mcf per day. The well was brought under control shortly thereafter. It was later redrilled and completed in 1932. The field has also been known as More Ranch and has been used for gas storage since 1941. During 1972 and 1973, all gas withdrawn was charged to the reserve existing before gas storage commenced in 1941.

a/ The peak gas production figure applies to production prior to gas storage.

Selected References:

Dibblee, T.W., Jr., 1966, Geology of the Central Santa Ynez mountains, Santa Barbara Co., Calif.: Calif. Div. Mines and Geol. Bull. 186, p. 85.

Dolman, S.G., 1929, Operations in District No. 3: Calif. Div. of Oil and Gas, Summary of Operations--Calif. Oil Fields, Vol. 15, No. 3.

Railroad Commission of the State of Calif., 1941, La Goleta Gas Field: Case No. 4591.

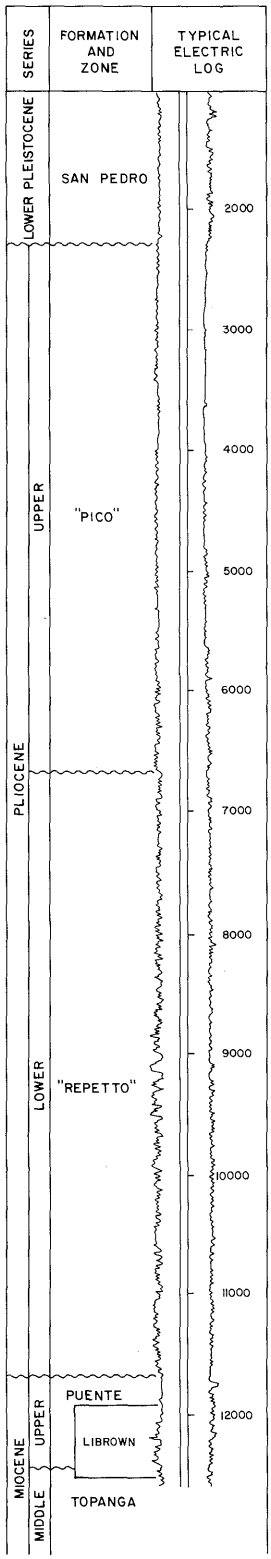
Swayze, R.O., 1943, La Goleta Gas Field: Calif. State Div. of Mines Bull. 118.

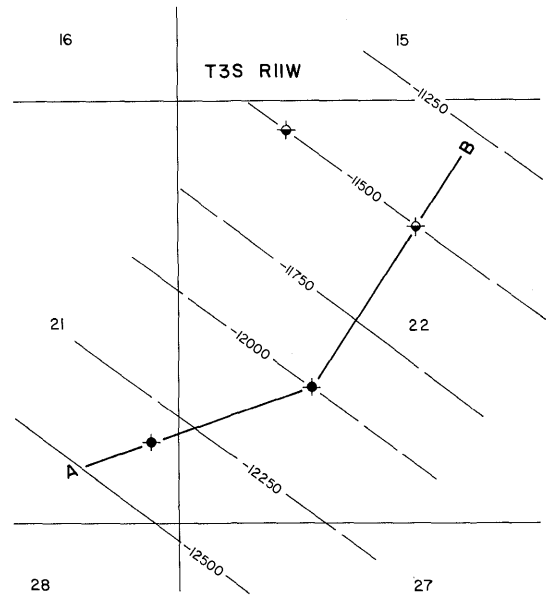
Yerkes, R.F., H.C. Wagner, and K.A. Yenne, 1969, Petroleum Development in the Region of the Santa Barbara Channel: U.S. Geol. Survey Prof. Paper 679B, p. 19.

DATE: January 1989

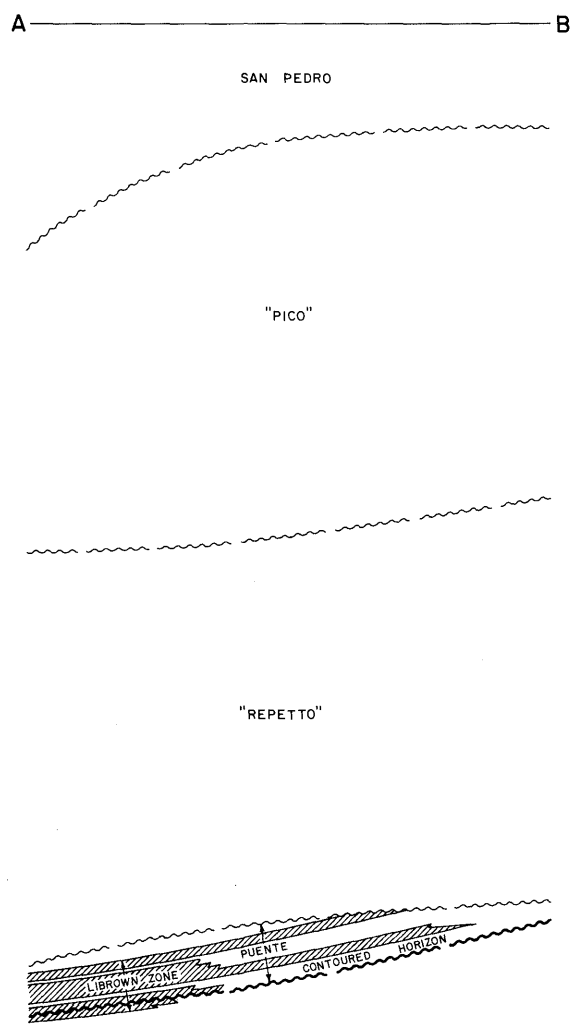
CALIFORNIA DIVISION OF OIL AND GAS

LA MIRADA OIL FIELD
(Abandoned)





CONTOURS ON TOP OF TOPANGA
SCALE: 1" = 2400'



COUNTY: LOS ANGELES

LA MIRADA OIL FIELD (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	Mobil Oil Corp. "Librown" 1	General Petroleum Corp. "Librown" 1	21 3S 11W	SB	12,600	Librown	Puente-Topanga Miocene
Deepest well	Same as above	"	"	"	"	"	"

POOL DATA

ITEM	LIBROWN					FIELD OR AREA DATA
Discovery date	February 1946					
Initial production rates						
Oil (bbl/day)	268					
Gas (Mcf/day)						
Flow pressure (psi)						
Bean size (in.)						
Initial reservoir pressure (psi)						
Reservoir temperature (°F)						
Initial oil content (STB/ac.-ft.)						
Initial gas content (MSCF/ac.-ft.)						
Formation	Puente-Topanga					
Geologic age	Miocene					
Average depth (ft.)	11,900					
Average net thickness (ft.)	500					
Maximum productive area (acres)	20					
RESERVOIR ROCK PROPERTIES						
Porosity (%)						
So_i (%)						
Sw_i (%)						
Sg_i (%)						
Permeability to air (md)						
RESERVOIR FLUID PROPERTIES						
Oil:						
Oil gravity (°API)	30					
Sulfur content (% by wt.)						
Initial solution GOR (SCF/STB)						
Initial oil FVF (RB/STB)						
Bubble point press. (psia)						
Viscosity (cp) @ °F						
Gas:						
Specific gravity (air = 1.0)						
Heating value (Btu/cu. ft.)						
Water:						
Salinity, NaCl (ppm)	4,104					
T.D.S. (ppm)						
R_w (ohm/m) (77°F)						
ENHANCED RECOVERY PROJECTS						
Enhanced recovery projects						
Date started						
Date discontinued						
Peak oil production (bbl)	19,498					
Year	1946					
Peak gas production, net (Mcf)						
Year						

Base of fresh water (ft.): 2,200

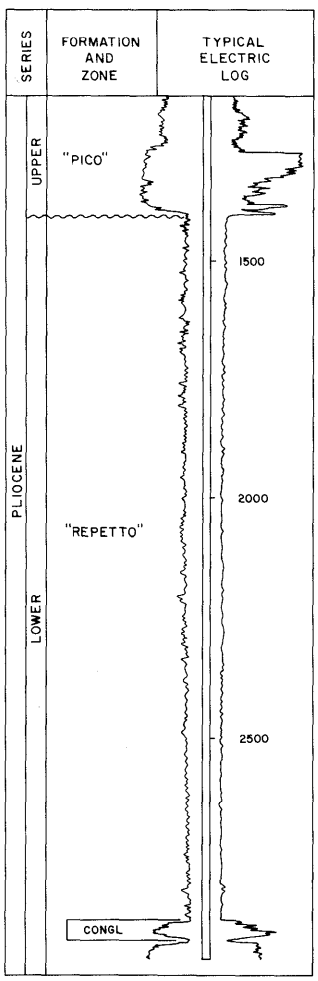
Remarks: Last production was in July 1954. The field was abandoned in 1954. Cumulative production is 25,250 bbl of oil and 10,425 Mcf of gas.

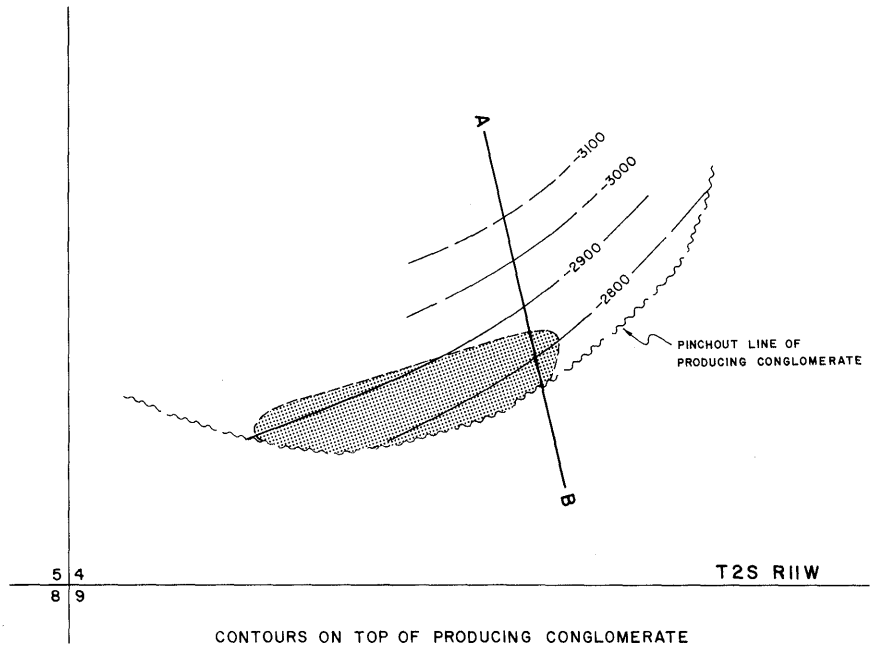
Selected References:

DATE: August 1983

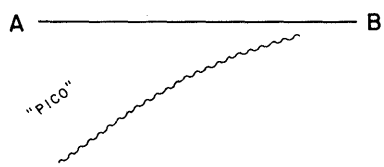
CALIFORNIA DIVISION OF OIL AND GAS

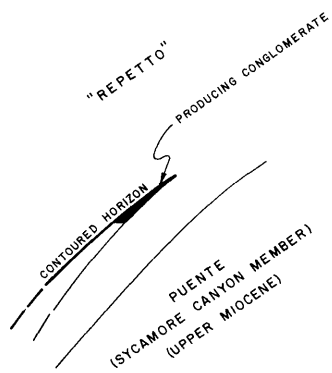
LAPWORTH OIL FIELD
(Abandoned)





CONTOURS ON TOP OF PRODUCING CONGLOMERATE
SCALE : 1" = 600'





COUNTY: LOS ANGELES

LAPWORTH OIL FIELD (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	Flanders and Brown "Lapworth" 1	Woodward Oil Co. "Lapworth" 1	4 2S 11W	SB	3,224	Conglomerate	
Deepest well	Shell Oil Co. "Pellissier" 1	Same as present	4 2S 11W	SB	8,374		"Repetto" early Pliocene

POOL DATA

ITEM	CONGLOMERATE					FIELD OR AREA DATA
Discovery date	July 1935					
Initial production rates						
Oil (bbl/day)	220					
Gas (Mcf/day)						
Flow pressure (psi)						
Bean size (in.)						
Initial reservoir pressure (psi)						
Reservoir temperature (°F)						
Initial oil content (STB/ac.-ft.)						
Initial gas content (MSCF/ac.-ft.)						
Formation	"Repetto"					
Geologic age	early Pliocene					
Average depth (ft.)	3,100					
Average net thickness (ft.)	20					
Maximum productive area (acres)	10					
RESERVOIR ROCK PROPERTIES						
Porosity (%)						
So_i (%)						
Sw_i (%)						
Sg_i (%)						
Permeability to air (md)						
RESERVOIR FLUID PROPERTIES						
Oil:						
Oil gravity (°API)	28-31					
Sulfur content (% by wt.)						
Initial solution GOR (SCF/STB)						
Initial oil FVF (RB/STB)						
Bubble point press. (psia)						
Viscosity (cp) @ °F						
Gas:						
Specific gravity (air = 1.0)						
Heating value (Btu/cu. ft.)						
Water:						
Salinity, NaCl (ppm)	513					
T.D.S. (ppm)						
R_w (ohm/m) (77°F)						
ENHANCED RECOVERY PROJECTS						
Enhanced recovery projects						
Date started						
Date discontinued						
Peak oil production (bbl)	9,504					
Year	1935					
Peak gas production, net (Mcf)						
Year						

Base of fresh water (ft.): 2,800

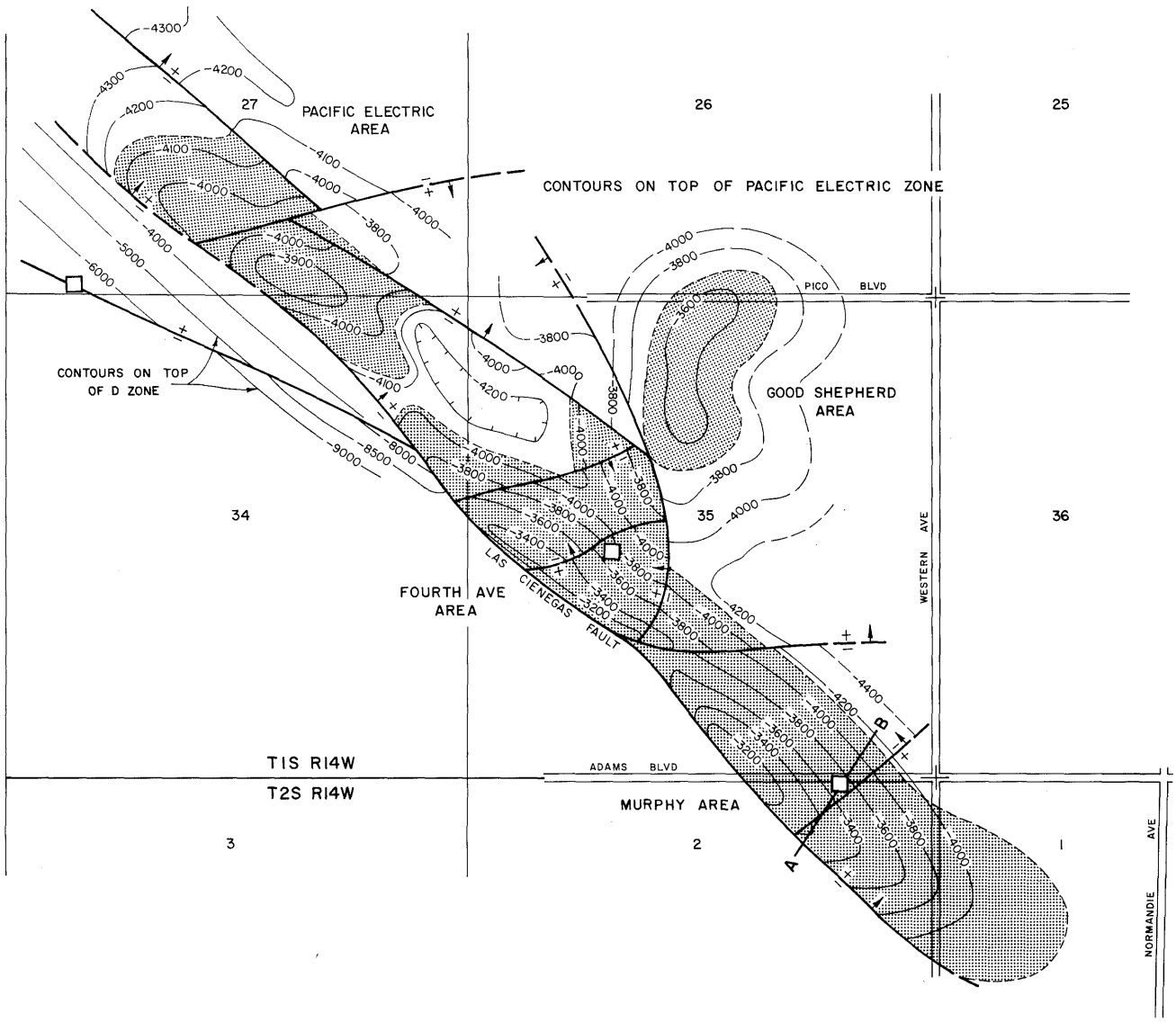
Remarks: Last production was in July 1943. The field was abandoned in 1957. Cumulative production is 55,000 bbl of oil and 429 Mcf of gas.

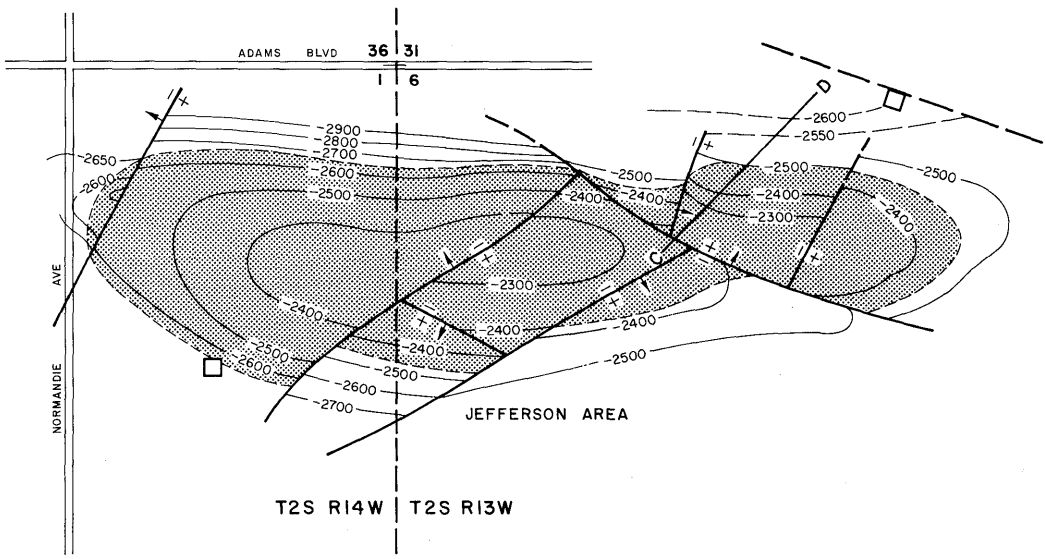
Selected References:

DATE: January 1989

CALIFORNIA DIVISION OF OIL AND GAS

LAS CIENEGAS OIL FIELD

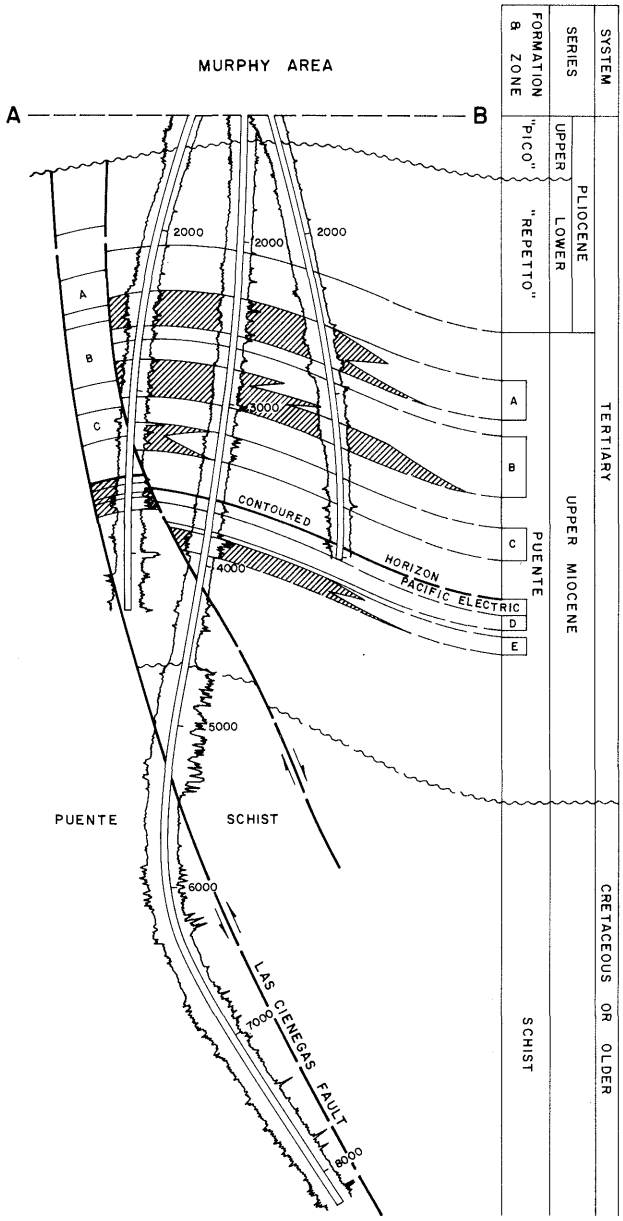


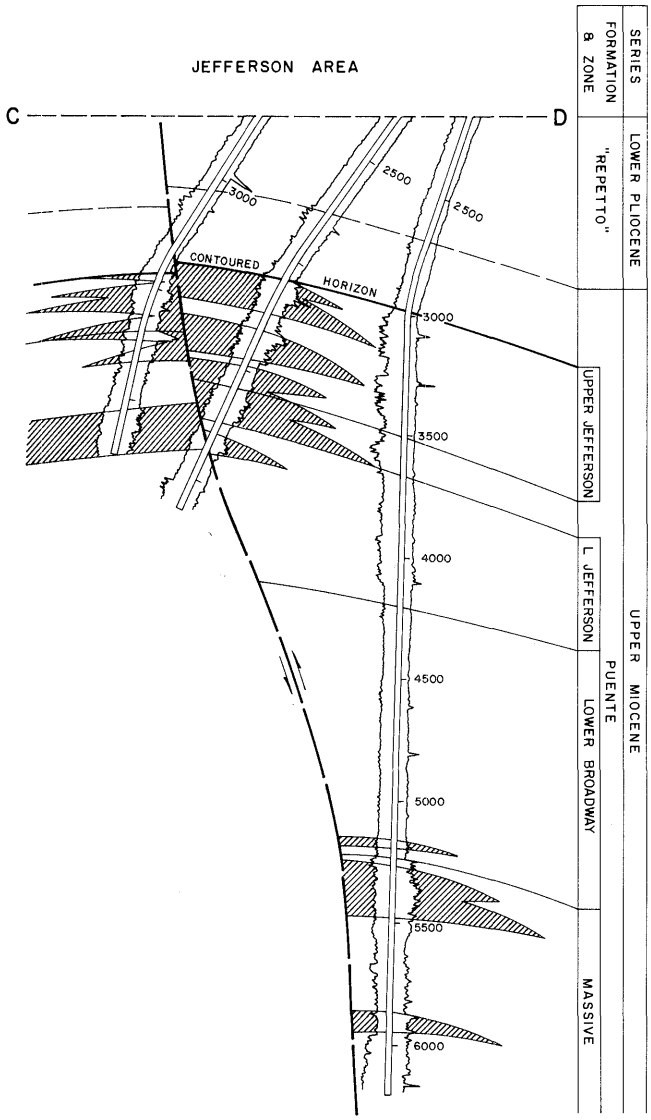


CONTOURS ON TOP OF UPPER JEFFERSON ZONE

SCALE: 1" = 1600'

LAS CIENEGAS OIL FIELD





COUNTY: LOS ANGELES

LAS CIENEGAS 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	Union Oil Co. of Calif. "Pacific Electric" 1	Union Oil Co. of Calif. "Union-Signal Pacific Electric" 1	27 1S 14W	SB	6,186	Pacific Electric	
Deepest well	Union Oil Co. of Calif. "Fourth Avenue" 16	Union Oil Co. of Calif. "Union-Signal Fourth Avenue" 16	35 1S 14W	SB	9,514		Puente late Miocene

POOL DATA

ITEM	PACIFIC ELECTRIC					FIELD OR AREA DATA
Discovery date	September 1961					
Initial production rates						
Oil (bbl/day)	309					
Gas (Mcf/day)	115					
Flow pressure (psi)						
Bean size (in.)						
Initial reservoir pressure (psi)						
Reservoir temperature (°F)						
Initial oil content (STB/ac.-ft.)						
Initial gas content (MSCF/ac.-ft.)						
Formation	Puente					
Geologic age	late Miocene					
Average depth (ft.)	4,100					
Average net thickness (ft.)	55					
Maximum productive area (acres)						970
RESERVOIR ROCK PROPERTIES						
Porosity (%)						
So_i (%)						
Sw_i (%)						
Sg_i (%)						
Permeability to air (md)						
RESERVOIR FLUID PROPERTIES						
Oil:						
Oil gravity (°API)	32-36					
Sulfur content (% by wt.)						
Initial solution GOR (SCF/STB)	600					
Initial oil FVF (RB/STB)						
Bubble point press. (psia)						
Viscosity (cp) @ °F						
Gas:						
Specific gravity (air = 1.0)						
Heating value (Btu/cu. ft.)						
Water:						
Salinity, NaCl (ppm)	22,300					
T.D.S. (ppm)						
R_w (ohm/m) (77°F)						
ENHANCED RECOVERY PROJECTS						
Enhanced recovery projects	waterflood					
Date started	1965					
Date discontinued	active					
Peak oil production (bbl)						4,998,562
Year						1968
Peak gas production, net (Mcf)						
Year						

Base of fresh water (ft.): See areas

Remarks: See areas

Selected References: See areas

DATE: January 1989

CALIFORNIA DIVISION OF OIL AND GAS

COUNTY: LOS ANGELES

LAS CIENEGAS OIL FIELD
FOURTH AVENUE 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	Union Oil Co. of Calif. "Fourth Avenue" 2	Union Oil Co. of Calif. "Union-Signal Fourth Avenue" 2	35 1S 14W	SB	5,216	B	
Deepest well	Union Oil Co. of Calif. "Fourth Avenue" 16	Same as present	35 1S 14W	SB	9,514		Puente late Miocene

POOL DATA

ITEM	A	B	C	PACIFIC ELECTRIC		FIELD OR AREA DATA
Discovery date	May 1964	April 1964	April 1964	April 1964		
Initial production rates						
Oil (bbl/day)	162	416a/	a/	726		
Gas (Mcf/day)	225	171a/	a/	191		
Flow pressure (psi)						
Bean size (in.)						
Initial reservoir pressure (psi)	-	-	3,160	-		
Reservoir temperature (°F)	-	-	190	-		
Initial oil content (STB/ac.-ft.)						
Initial gas content (MSCF/ac.-ft.)						
Formation	Puente	Puente	Puente	Puente		
Geologic age	late Miocene	late Miocene	late Miocene	late Miocene		
Average depth (ft.)	2,500	2,750	3,500	4,000		
Average net thickness (ft.)	65	45	80	150		
Maximum productive area (acres)						160
RESERVOIR ROCK PROPERTIES						
Porosity (%)	-	-	26.7	-		
S_{oi} (%)						
S_{wi} (%)						
S_{gi} (%)						
Permeability to air (md)	-	-	57	-		
RESERVOIR FLUID PROPERTIES						
Oil:						
Oil gravity (°API)	27-36	27-36	27-36	27-36		
Sulfur content (% by wt.)						
Initial solution GOR (SCF/STB)						
Initial oil FVF (RB/STB)						
Bubble point press. (psia)						
Viscosity (cp) @ °F						
Gas:						
Specific gravity (air = 1.0)						
Heating value (Btu/cu. ft.)						
Water:						
Salinity, NaCl (ppm)	17,100	18,800	18,800	22,300		
T.D.S. (ppm)						
R_w (ohm/m) (77°F)						
ENHANCED RECOVERY PROJECTS						
Enhanced recovery projects				waterflood		
Date started				1965		
Date discontinued				active		
Peak oil production (bbl)						1,536,182
Year						1965
Peak gas production, net (Mcf)						
Year						

Base of fresh water (ft.): 400

Remarks: a/ B and C zones initial production was commingled.

Selected References:

DATE: June 1983

CALIFORNIA DIVISION OF OIL AND GAS

COUNTY: LOS ANGELES

LAS CIENEGAS OIL FIELD
GOOD SHEPHERD 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	Union Oil Co. of Calif. "Fourth Avenue" 5-A	Union Oil Co. of Calif. "Union-Signal Fourth Avenue" 5-A	35 1S 14W	SB	7,047	Pacific Electric	Puente late Miocene
Deepest well	Same as above	"	"	"	"	"	"

POOL DATA

ITEM	PACIFIC ELECTRIC	D				FIELD OR AREA DATA
Discovery date	November 1964	December 1964				
Initial production rates						
Oil (bbl/day)	592	618				
Gas (Mcf/day)	557	527				
Flow pressure (psi)						
Bean size (in.)						
Initial reservoir pressure (psi)	1,760	-				
Reservoir temperature (°F)	150	157**				
Initial oil content (STB/ac.-ft.)						
Initial gas content (MSCF/ac.-ft.)						
Formation	Puente	Puente				
Geologic age	late Miocene	late Miocene				
Average depth (ft.)	3,900	4,250				
Average net thickness (ft.)	40	30				
Maximum productive area (acres)						20
RESERVOIR ROCK PROPERTIES						
Porosity (%)	30.6	-				
S_{oi} (%)						
S_{wi} (%)						
S_{gi} (%)						
Permeability to air (md)	359	-				
RESERVOIR FLUID PROPERTIES						
Oil:						
Oil gravity (°API)	29-33	29-33				
Sulfur content (% by wt.)						
Initial solution GOR (SCF/STB)	600	-				
Initial oil FVF (RB/STB)	1.3025	-				
Bubble point press. (psia)						
Viscosity (cp) @ °F	0.727 @ 70	-				
Gas:						
Specific gravity (air = 1.0)						
Heating value (Btu/cu. ft.)						
Water:						
Salinity, NaCl (ppm)	22,300	22,300				
T.D.S. (ppm)	22,440	-				
R_w (ohm/m) (77°F)						
ENHANCED RECOVERY PROJECTS						
Enhanced recovery projects						
Date started						
Date discontinued						
Peak oil production (bbl)						307,562
Year						1966
Peak gas production, net (Mcf)						
Year						

Base of fresh water (ft.): 400

Remarks: Both completed wells were drilled from the Fourth Avenue drillsite.

Selected References:

DATE: June 1983 **Estimated value

CALIFORNIA DIVISION OF OIL AND GAS

COUNTY: LOS ANGELES

LAS CIENEGAS OIL FIELD
JEFFERSON 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	Union Oil Co. of Calif. "Jefferson" 8	Union Oil Co. of Calif. "Union-Signal-Jefferson" 8-1	1 2S 14W	SB	6,899	Upper Jefferson	
Deepest well	Union Oil Co. of Calif. "Jefferson" 35	Union Oil Co. of Calif. "Signal-Jefferson E.H." 1	1 2S 14W	SB	8,500		Puente late Miocene

POOL DATA

ITEM	UPPER JEFFERSON	LOWER JEFFERSON	C	PACIFIC ELECTRIC	LOWER BROADWAY	FIELD OR AREA DATA
Discovery date	October 1965	October 1965	December 1965	December 1965	December 1967	
Initial production rates						
Oil (bbl/day)	1,082	679	832a/	a/	360	
Gas (Mcf/day)	207	218	275a/	a/	270	
Flow pressure (psi)						
Bean size (in.)						
Initial reservoir pressure (psi)						
Reservoir temperature (°F)						
Initial oil content (STB/ac.-ft.)						
Initial gas content (MSCF/ac.-ft.)						
Formation	Puente	Puente	Puente	Puente	Puente	
Geologic age	late Miocene	late Miocene	late Miocene	late Miocene	late Miocene	
Average depth (ft.)	2,900	3,500	4,600	6,420	5,100	
Average net thickness (ft.)	240	150	160	40	75	
Maximum productive area (acres)						
RESERVOIR ROCK PROPERTIES						
Porosity (%)						
So_i (%)						
Sw_i (%)						
Sg_i (%)						
Permeability to air (md)						
RESERVOIR FLUID PROPERTIES						
Oil:						
Oil gravity (°API)	18-26	24-36	28-42	28-42	38-42	
Sulfur content (% by wt.)	0.58	0.58	0.58	0.58	0.58	
Initial solution GOR (SCF/STB)						
Initial oil FVF (RB/STB)						
Bubble point press. (psia)						
Viscosity (cp) @ °F						
Gas:						
Specific gravity (air = 1.0)						
Heating value (Btu/cu. ft.)						
Water:						
Salinity, NaCl (ppm)	26,500	26,500	26,500	26,500	20,500	
T.D.S. (ppm)						
R_w (ohm/m) (77°F)						
ENHANCED RECOVERY PROJECTS						
Enhanced recovery projects	waterflood	waterflood				
Date started	1967	1967				
Date discontinued	active	active				
Peak oil production (bbl)						
Year						
Peak gas production, net (Mcf)						
Year						

Base of fresh water (ft.): 650

Remarks: a/ Initial production from C and Pacific Electric zone was commingled.

Selected References:

DATE: January 1989

CALIFORNIA DIVISION OF OIL AND GAS

COUNTY: LOS ANGELES

LAS CIENEGAS OIL FIELD
JEFFERSON 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	MASSIVE					FIELD OR AREA DATA
Discovery date	July 1968					
Initial production rates						
Oil (bbl/day)	652					
Gas (Mcf/day)	318					
Flow pressure (psi)						
Bean size (in.)						
Initial reservoir pressure (psi)						
Reservoir temperature (°F)						
Initial oil content (STB/ac.-ft.)						
Initial gas content (MSCF/ac.-ft.)						
Formation	Puente					
Geologic age	late Miocene					
Average depth (ft.)	5,500					
Average net thickness (ft.)	200					
Maximum productive area (acres)						350
RESERVOIR ROCK PROPERTIES						
Porosity (%)	26					
S_{oi} (%)						
S_{wi} (%)						
S_{gi} (%)						
Permeability to air (md)	300					
RESERVOIR FLUID PROPERTIES						
Oil:						
Oil gravity (°API)	42					
Sulfur content (% by wt.)	0.58					
Initial solution GOR (SCF/STB)						
Initial oil FVF (RB/STB)						
Bubble point press. (psia)						
Viscosity (cp) @ °F						
Gas:						
Specific gravity (air = 1.0)						
Heating value (Btu/cu. ft.)						
Water:						
Salinity, NaCl (ppm)	20,300					
T.D.S. (ppm)	21,700					
R_w (ohm/m) (77°F)						
ENHANCED RECOVERY PROJECTS						
Enhanced recovery projects	waterflood					
Date started	1969					
Date discontinued	active					
Peak oil production (bbl)						2,751,197
Year						1968
Peak gas production, net (Mcf)						
Year						

Base of fresh water (ft.): 650

Remarks:

Selected References:

DATE: January 1989

CALIFORNIA DIVISION OF OIL AND GAS

COUNTY: LOS ANGELES

LAS CIENEGAS OIL FIELD
MURPHY 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	Union Oil Co. of Calif. "Murphy" 4	Union Oil Co. of Calif. "Union-Signal-Murphy" 4	2 2S 14W	SB	5,232	A	
Deepest well	Union Oil Co. of Calif. "Murphy" 6	Union Oil Co. of Calif. "Union-Signal-Murphy" 6	2 2S 14W	SB	8,802		Puente late Miocene

POOL DATA

ITEM	A	B	C	PACIFIC ELECTRIC	D	FIELD OR AREA DATA
Discovery date	March 1962	March 1962	March 1962	March 1962	March 1962	
Initial production rates						
Oil (bbl/day)	277a/	a/	a/	313	a/	
Gas (Mcf/day)	226a/	a/	a/	128	a/	
Flow pressure (psi)						
Bean size (in.)						
Initial reservoir pressure (psi)	1,170	1,320	1,630	1,720	-	
Reservoir temperature (°F)	128	136	150	155	-	
Initial oil content (STB/ac.-ft.)						
Initial gas content (MSCF/ac.-ft.)						
Formation	Puente	Puente	Puente	Puente	Puente	
Geologic age	late Miocene	late Miocene	late Miocene	late Miocene	late Miocene	
Average depth (ft.)	2,500	2,750	3,500	3,900	4,100	
Average net thickness (ft.)	150	100	100	110	60	
Maximum productive area (acres)						
RESERVOIR ROCK PROPERTIES						
Porosity (%)	34.5	31.6	29.4	27.4	-	
Soi (%)						
Swi (%)						
Sgi (%)						
Permeability to air (md)	663	316	181	160-244	-	
RESERVOIR FLUID PROPERTIES						
Oil:						
Oil gravity (°API)	22	32	30	36	36	
Sulfur content (% by wt.)	0.58	0.58	0.58	0.58	0.58	
Initial solution GOR (SCF/STB)	195	265	440	385	-	
Initial oil FVF (RB/STB)	1.106	1.144	1.231	1.255	-	
Bubble point press. (psia)						
Viscosity (cp) @ °F	6.60 @ 136	2.60 @ 136	0.85 @ 150	0.75 @ 155	-	
Gas:						
Specific gravity (air = 1.0)						
Heating value (Btu/cu. ft.)						
Water:						
Salinity, NaCl (ppm)	17,100	18,800	18,800	22,300	22,300	
T.D.S. (ppm)						
R_w (ohm/m) (77°F)	-	-	-	0.3503	-	
ENHANCED RECOVERY PROJECTS						
Enhanced recovery projects	waterflood	waterflood	waterflood	waterflood	waterflood	
Date started	1979	1979	1979	1979	1979	
Date discontinued	active	active	active	active	active	
	gas injection	gas injection	gas injection			
	1975	1975	1975			
	active	active	active			
Peak oil production (bbl)						
Year						
Peak gas production, net (Mcf)						
Year						

Base of fresh water (ft.): 800

Remarks: a/ Initial production of A, B, C, D and E zones was commingled.

Selected References: Mefferd, M.G., 1970, Murphy Area of the Las Cienegas Oil Field: Div. of Oil and Gas, Summary of Operations -- Calif. Oil Fields, Vol. 56, No. 1.

DATE: January 1989

CALIFORNIA DIVISION OF OIL AND GAS

COUNTY: LOS ANGELES

LAS CIENEGAS OIL FIELD
MURPHY 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	E					FIELD OR AREA DATA
Discovery date	March 1962					
Initial production rates						
Oil (bbl/day)	a/					
Gas (Mcf/day)						
Flow pressure (psi)						
Bean size (in.)						
Initial reservoir pressure (psi)						
Reservoir temperature (°F)						
Initial oil content (STB/ac.-ft.)						
Initial gas content (MSCF/ac.-ft.)						
Formation	Puente					
Geologic age	late Miocene					
Average depth (ft.)	4,200					
Average net thickness (ft.)	80					
Maximum productive area (acres)						290
RESERVOIR ROCK PROPERTIES						
Porosity (%)						
S_{oi} (%)						
S_{wi} (%)						
S_{gi} (%)						
Permeability to air (md)						
RESERVOIR FLUID PROPERTIES						
Oil:						
Oil gravity (°API)	36					
Sulfur content (% by wt.)	0.58					
Initial solution GOR (SCF/STB)						
Initial oil FVF (RB/STB)						
Bubble point press. (psia)						
Viscosity (cp) @ °F						
Gas:						
Specific gravity (air = 1.0)						
Heating value (Btu/cu. ft.)						
Water:						
Salinity, NaCl (ppm)	22,300					
T.D.S. (ppm)						
R_w (ohm/m) (77°F)						
ENHANCED RECOVERY PROJECTS						
Enhanced recovery projects						
Date started						
Date discontinued						
Peak oil production (bbl)						1,986,504
Year						1965
Peak gas production, net (Mcf)						
Year						

Base of fresh water (ft.):

Remarks: a/ Production commingled.

Selected References:

DATE: January 1989

CALIFORNIA DIVISION OF OIL AND GAS

COUNTY: LOS ANGELES

LAS CIENEGAS OIL FIELD
PACIFIC ELECTRIC 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	Union Oil Co. of Calif. "Pacific Electric" 1	Union Oil Co. of Calif. "Union-Signal-Pacific Electric" 1	27 1S 14W	SB	9,512	Pacific Electric	Puente late Miocene
Deepest well	Same as above	"	"	"	"	"	"

POOL DATA

ITEM	PACIFIC ELECTRIC	D				FIELD OR AREA DATA
Discovery date	September 1961	September 1961				
Initial production rates						
Oil (bbl/day)	309a/	a/				
Gas (Mcf/day)	115a/	a/				
Flow pressure (psi)						
Bean size (in.)						
Initial reservoir pressure (psi)						
Reservoir temperature (°F)						
Initial oil content (STB/ac.-ft.)						
Initial gas content (MSCF/ac.-ft.)						
Formation	Puente	Puente				
Geologic age	late Miocene	late Miocene				
Average depth (ft.)	4,100	4,300				
Average net thickness (ft.)	55	45				
Maximum productive area (acres)						150
RESERVOIR ROCK PROPERTIES						
Porosity (%)						
So_i (%)						
Sw_i (%)						
Sg_i (%)						
Permeability to air (md)						
RESERVOIR FLUID PROPERTIES						
Oil:						
Oil gravity (°API)	32-36	32-36				
Sulfur content (% by wt.)						
Initial solution GOR (SCF/STB)	600	-				
Initial oil FVF (RB/STB)						
Bubble point press. (psia)						
Viscosity (cp) @ °F						
Gas:						
Specific gravity (air = 1.0)						
Heating value (Btu/cu. ft.)						
Water:						
Salinity, NaCl (ppm)	22,300	23,300				
T.D.S. (ppm)						
R_w (ohm/m) (77°F)						
ENHANCED RECOVERY PROJECTS						
Enhanced recovery projects	waterflood					
Date started	1965					
Date discontinued	active					
Peak oil production (bbl)						466,464
Year						1962
Peak gas production, net (Mcf)						
Year						

Base of fresh water (ft.): 400

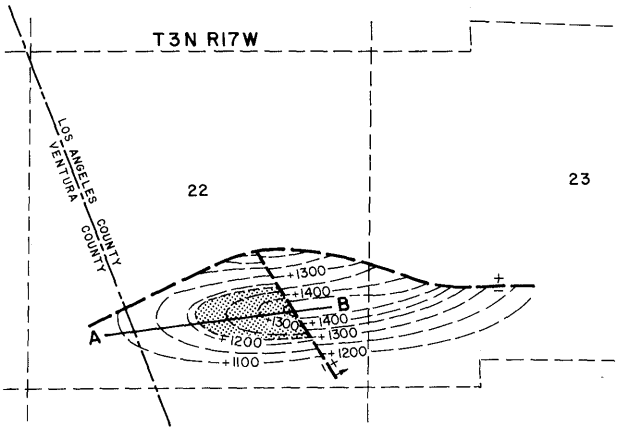
Remarks: a/ Pacific Electric and D zone initial production was commingled.

Selected References:

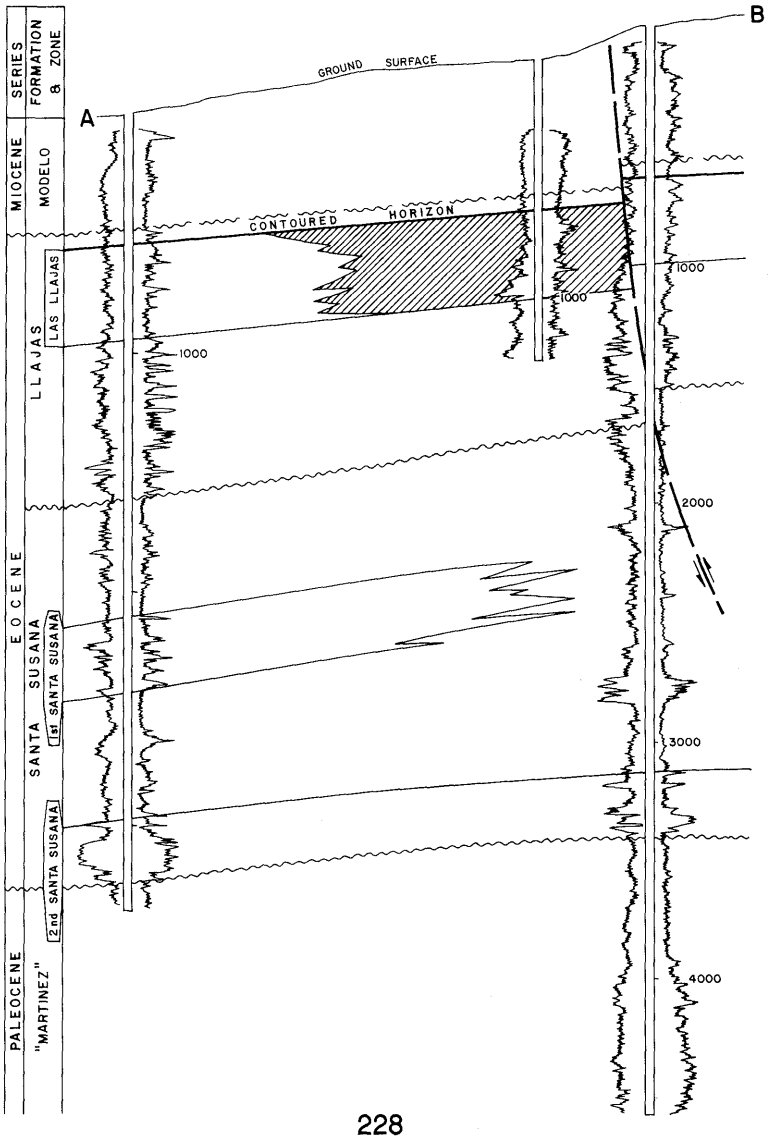
DATE: January 1989

CALIFORNIA DIVISION OF OIL AND GAS

LAS LLAJAS OIL FIELD



CONTOURS ON TOP OF LAS LLAJAS ZONE



COUNTY: LOS ANGELES

LAS LLAJAS 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	Union Oil Co. of Calif. "Las Llajas" 5	Union Oil Co. of Calif. "Simi" 5	22 3N 17W	SB	1,040	Las Llajas	
Deepest well	Union Oil Co. of Calif. "Las Llajas" 9	Same as present	22 3N 17W	SB	4,572		Martinez Paleocene

POOL DATA

ITEM	LAS LLAJAS					FIELD OR AREA DATA
Discovery date	September 1945					
Initial production rates						
Oil (bbl/day)	11					
Gas (Mcf/day)						
Flow pressure (psi)						
Bean size (in.)						
Initial reservoir pressure (psi)						
Reservoir temperature (°F)						
Initial oil content (STB/ac.-ft.)						
Initial gas content (MSCF/ac.-ft.)						
Formation	Llajas					
Geologic age	Eocene					
Average depth (ft.)	977					
Average net thickness (ft.)	200					
Maximum productive area (acres)	20					
RESERVOIR ROCK PROPERTIES						
Porosity (%)						
So_i (%)						
Sw_i (%)						
Sg_i (%)						
Permeability to air (md)						
RESERVOIR FLUID PROPERTIES						
Oil:						
Oil gravity (°API)	25-28					
Sulfur content (% by wt.)						
Initial solution GOR (SCF/STB)						
Initial oil FVF (RB/STB)						
Bubble point press. (psia)						
Viscosity (cp) @ °F						
Gas:						
Specific gravity (air = 1.0)						
Heating value (Btu/cu. ft.)						
Water:						
Salinity, NaCl (ppm)	19,800					
T.D.S. (ppm)						
R_w (ohm/m) (77°F)						
ENHANCED RECOVERY PROJECTS						
Enhanced recovery projects						
Date started						
Date discontinued						
Peak oil production (bbl)	4,746					
Year	1951					
Peak gas production, net (Mcf)	2,091					
Year	1976					

Base of fresh water (ft.): 700

Remarks:

Selected References:

Levorsen, R., 1947, Geology of the Las Llajas Canyon Area, California. Thesis on file at Univ. of Calif., Los Angeles.

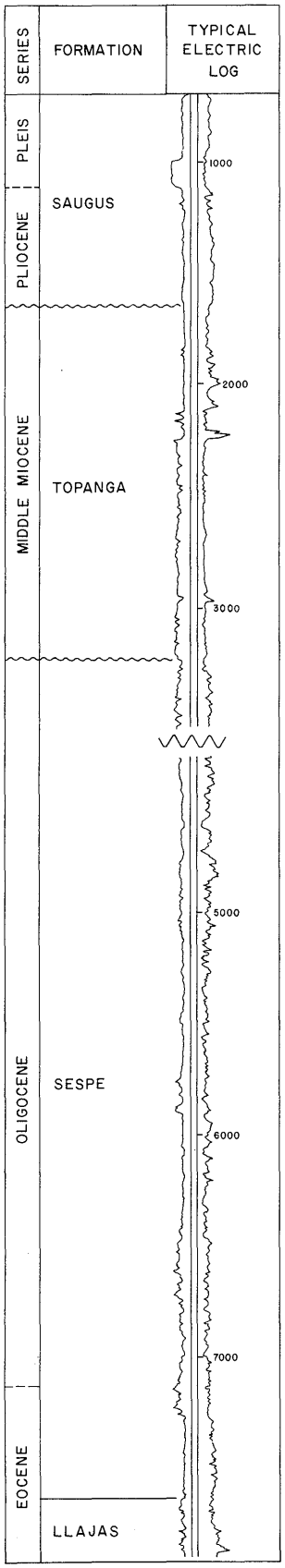
Oakeshott, G.B., 1958, Geology and Mineral Deposits of San Fernando Quadrangle, Los Angeles County, California: Calif. Div. of Mines Bull. 172, p. 58.

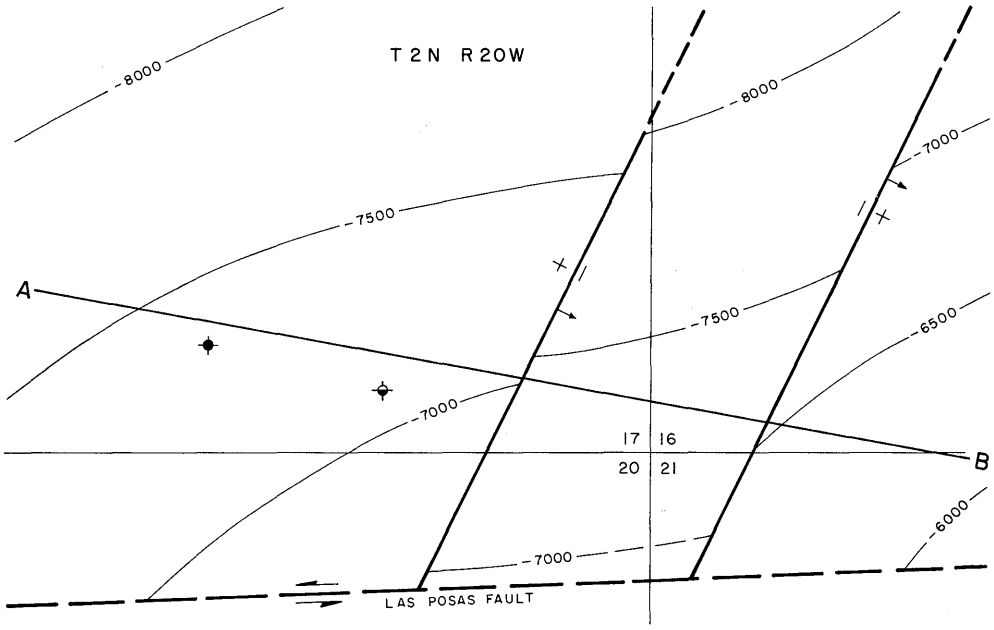
Tudor, R.B., 1963, Las Llajas Oil Field: Calif. Div. of Oil and Gas, Summary of Operations -- Calif. Oil Fields, Vol. 49, No. 2.

DATE: May 1983

CALIFORNIA DIVISION OF OIL AND GAS

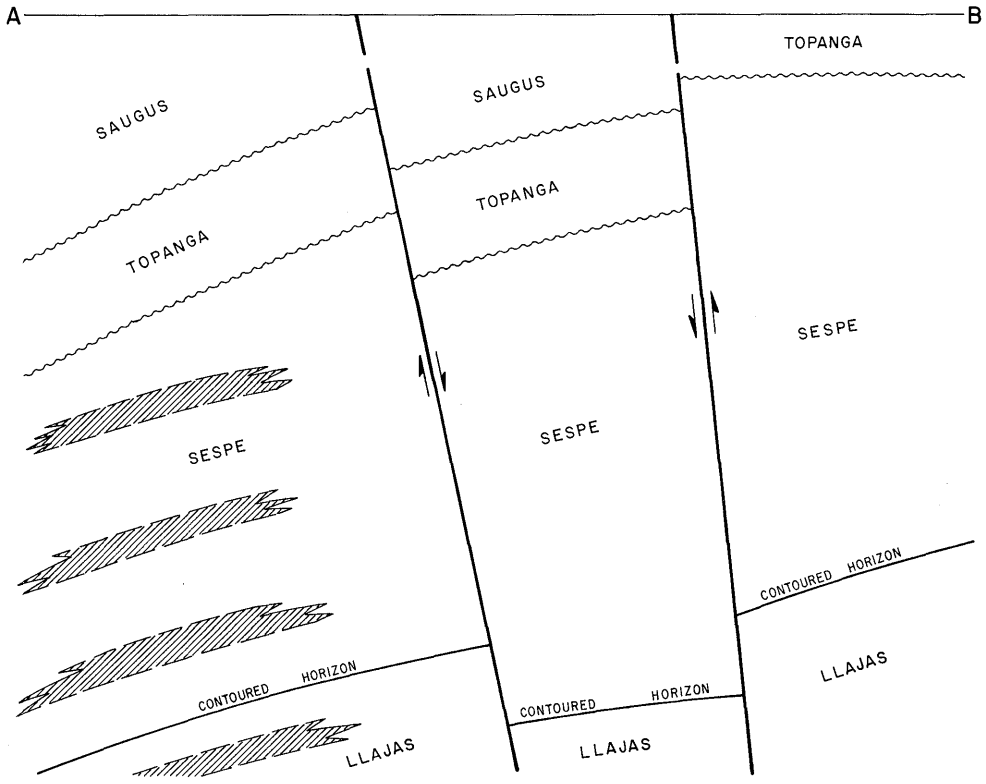
LAS POSAS OIL FIELD





CONTOURS ON TOP OF LLAJAS

SCALE 1" = 1200'



COUNTY: VENTURA

LAS POSAS 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	Hollis Cunningham "Berylwood" 1	Buttes Gas and Oil Co. "Buttes-Berylwood" 1	17 2N 20W	SB	7,894	Sespe	Sespe Eocene
Deepest well	Same as above	"	"	"	"	"	"

POOL DATA

ITEM	SESPE EOCENE	UNNAMED				FIELD OR AREA DATA
Discovery date	December 1966	April 1977				
Initial production rates						
Oil (bbl/day)	306	60				
Gas (Mcf/day)						
Flow pressure (psi)						
Bean size (in.)						
Initial reservoir pressure (psi)						
Reservoir temperature (°F)						
Initial oil content (STB/ac.-ft.)						
Initial gas content (MSCF/ac.-ft.)						
Formation	Sespe-Llajas	-				
Geologic age	Oligocene-Eocene	Miocene				
Average depth (ft.)	4,600	4,770				
Average net thickness (ft.)	2,000	283				
Maximum productive area (acres)						20
RESERVOIR ROCK PROPERTIES						
Porosity (%)						
So_i (%)						
Sw_i (%)						
Sg_i (%)						
Permeability to air (md)						
RESERVOIR FLUID PROPERTIES						
Oil:						
Oil gravity (°API)	15	20				
Sulfur content (% by wt.)						
Initial solution GOR (SCF/STB)						
Initial oil FVF (RB/STB)						
Bubble point press. (psia)						
Viscosity (cp) @ °F						
Gas:						
Specific gravity (air = 1.0)						
Heating value (Btu/cu. ft.)						
Water:						
Salinity, NaCl (ppm)	23,900	-				
T.D.S. (ppm)						
R_w (ohm/m) (77°F)						
ENHANCED RECOVERY PROJECTS						
Enhanced recovery projects						
Date started						
Date discontinued						
Peak oil production (bbl)						5,420
Year						1967
Peak gas production, net (Mcf)						
Year						

Base of fresh water (ft.): 450

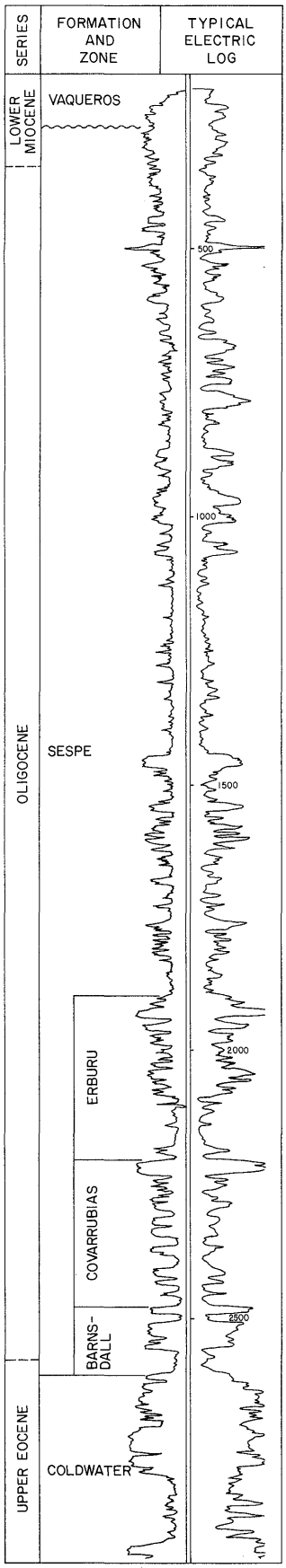
Remarks: The field was abandoned in November 1971 and was reactivated in April 1977. Production in Section 30 is from the Miocene.

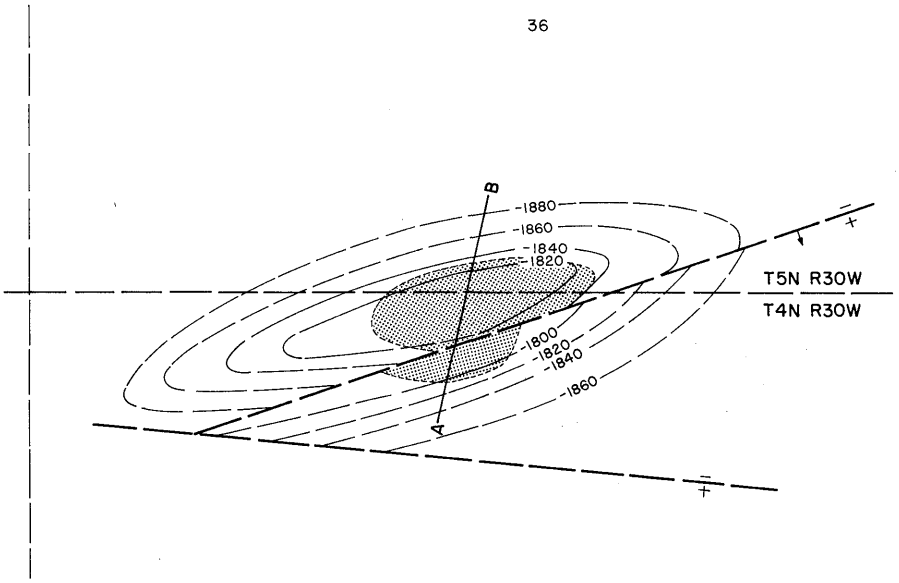
Selected References:

DATE: May 1983

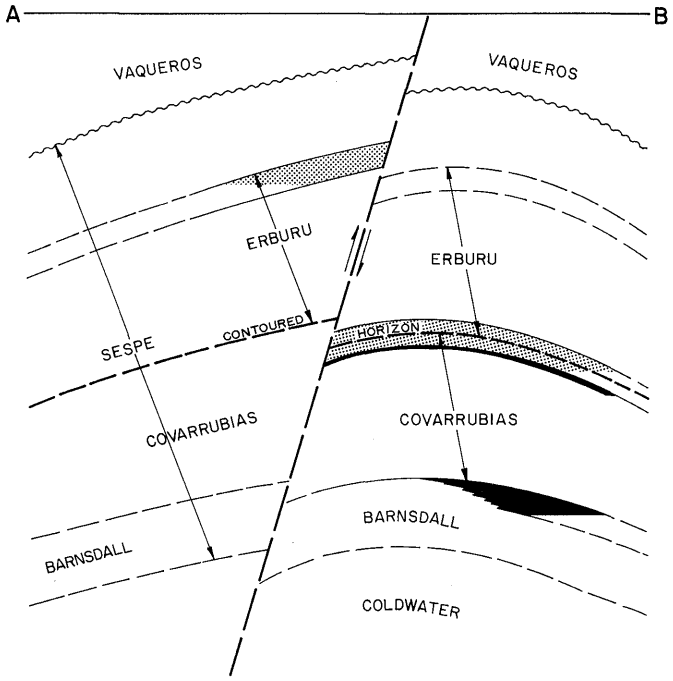
CALIFORNIA DIVISION OF OIL AND GAS

LAS VARAS CANYON OIL FIELD
(Abandoned)





CONTOURS ON TOP OF COVARRUBIAS
SCALE: 1"=1150'



COUNTY: SANTA BARBARA

LAS VARAS CANYON OIL FIELD (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	Harry S. Rothschild "Barnsdall" 1	Barnsdall Oil Co. of Calif. "Edwards" 1	36 5N 30W	SB	2,720	Barnsdall	
Deepest well	Harry S. Rothschild "Edwards" 1	Same as present	36 5N 30W	SB	2,949		Coldwater Eocene

POOL DATA

ITEM	ERBURU GAS	ERBURU	COVARRUBIAS	BARNSDALL		FIELD OR AREA DATA
Discovery date	February 1928	March 1958	March 1958	October 1927		
Initial production rates						
Oil (bbl/day)	-	2	7	500		
Gas (Mcf/day)	200	2,960	675	-		
Flow pressure (psi)	210	380	450	360		
Bean size (in.)	1/2	3/4	12/64	38/64		
Initial reservoir pressure (psi)						
Reservoir temperature (°F)						
Initial oil content (STB/ac.-ft.)						
Initial gas content (MSCF/ac.-ft.)						
Formation	Sespe	Sespe	Sespe	Sespe		
Geologic age	Oligocene	Oligocene	Oligocene	Oligocene		
Average depth (ft.)	1,800	1,885	2,180	2,450		
Average net thickness (ft.)	100	50	40	50		
Maximum productive area (acres)						40
RESERVOIR ROCK PROPERTIES						
Porosity (%)	18-24***	18-24***	18-24***	18-24***		
Soi (%)	-	44-64***	44-64***	44-64***		
Swi (%)	40-60**	36-56***	36-56***	36-56***		
Sgi (%)	40-60**	-	-	-		
Permeability to air (md)						
RESERVOIR FLUID PROPERTIES						
Oil:						
Oil gravity (°API)	-	38	38	41		
Sulfur content (% by wt.)						
Initial solution GOR (SCF/STB)						
Initial oil FVF (RB/STB)						
Bubble point press. (psia)						
Viscosity (cp) @ °F						
Gas:						
Specific gravity (air = 1.0)						
Heating value (Btu/cu. ft.)						
Water:						
Salinity, NaCl (ppm)	1,150-1,180	1,250***	1,250***	1,250***		
T.D.S. (ppm)						
R_w (ohm/m) (77°F)	3.4-3.5	-	-	3.2		
ENHANCED RECOVERY PROJECTS						
Enhanced recovery projects						
Date started						
Date discontinued						
Peak oil production (bbl)						2,243
Year						1928
Peak gas production, net (Mcf)						
Year						

Base of fresh water (ft.): 250

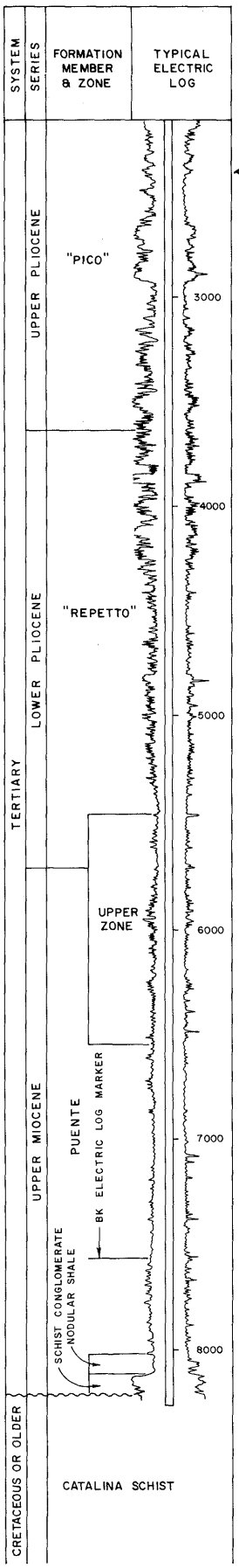
Remarks: The field was abandoned in 1960. Cumulative production is 4,990 bbl of oil and 287,025 Mcf of gas. Early production was formerly included in Goleta oil field.

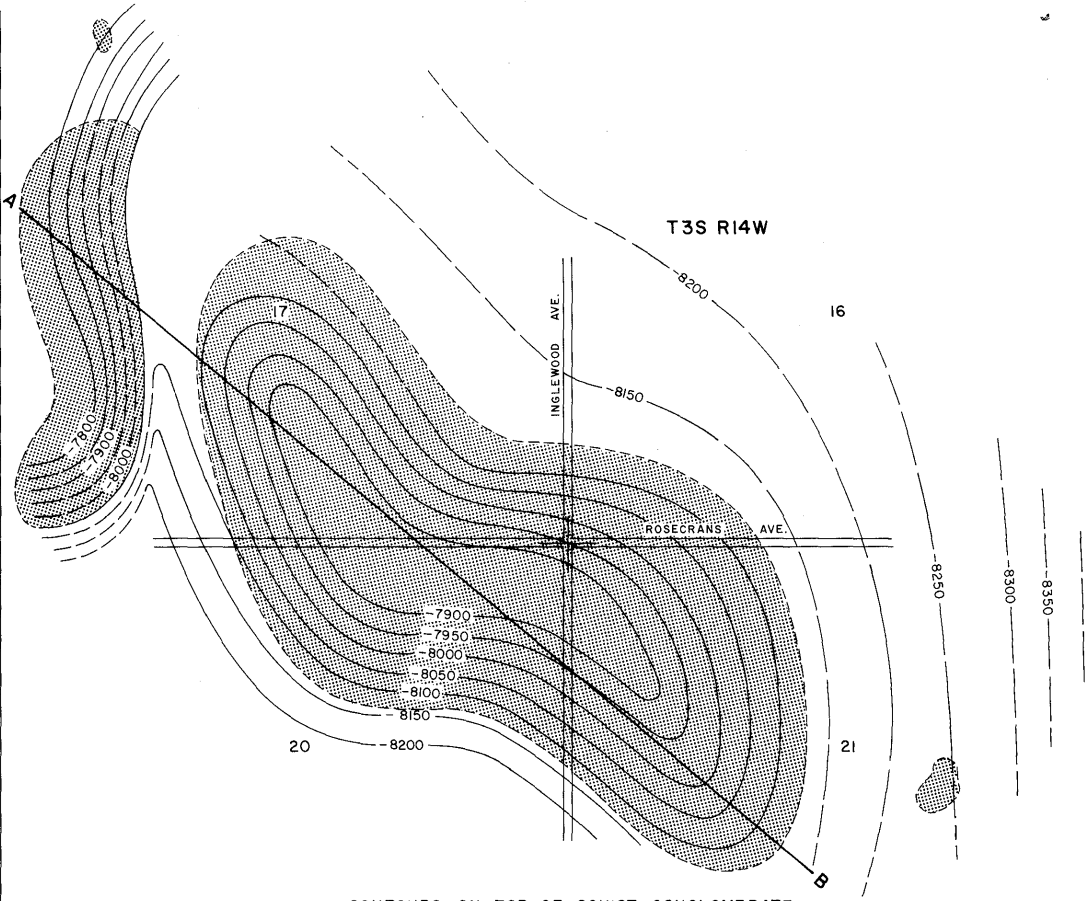
Selected References: Yerkes, R.F., H.C. Wagner and K.A. Yenne, 1969, Petroleum Development in the Region of the Santa Barbara Channel: U.S. Geol. Survey Prof. Paper 679B, p. 19.

DATE: January 1989 **Estimated value ***Representative values for area, formation, and depth

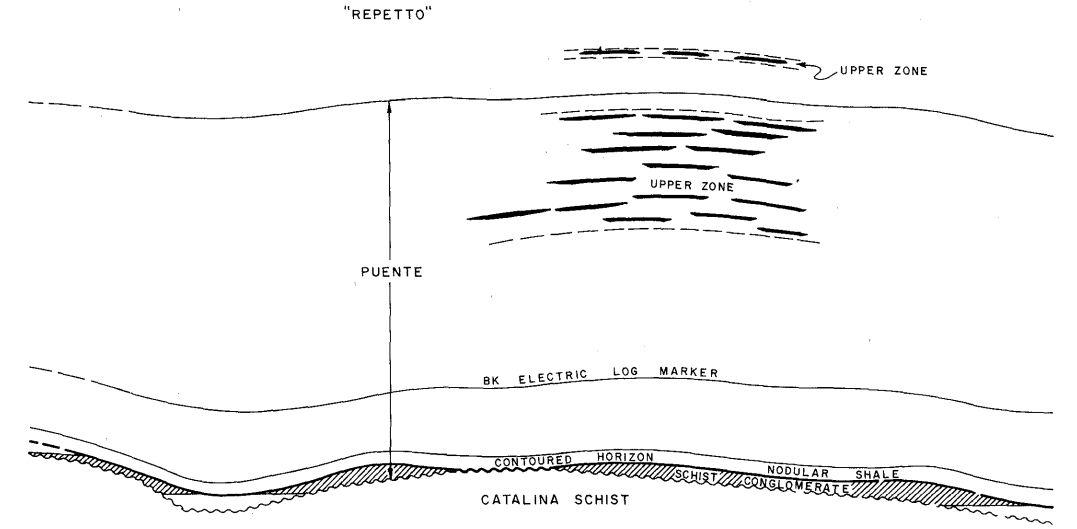
CALIFORNIA DIVISION OF OIL AND GAS

LAWNDALE OIL FIELD





CONTOURS ON TOP OF SCHIST CONGLOMERATE
SCALE: 1" = 1200'



COUNTY: LOS ANGELES

LAWNDALE 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	Texaco Inc. "Pauley-Seaboard Peck" 1	San Clemente Oil Co. No. 1	20 3S 14W	SB	5,897	Upper	
Deepest well	Pauley Petroleum, Inc. "S.F.L.I." 83-20	Same as present	20 3S 14W	SB	8,213		Catalina Schist Cret. or older

POOL DATA

ITEM	UPPER	SCHIST CONGLOMERATE				FIELD OR AREA DATA
Discovery date	July 1928	September 1947				
Initial production rates						
Oil (bbl/day)	140	225				
Gas (Mcf/day)	-	2,250				
Flow pressure (psi)						
Bean size (in.)						
Initial reservoir pressure (psi)						
Reservoir temperature (°F)						
Initial oil content (STB/ac.-ft.)						
Initial gas content (MSCF/ac.-ft.)						
Formation	"Repetto"-Puente	Puente				
Geologic age	e Plio./l Miocene	late Miocene				
Average depth (ft.)	6,000	7,900				
Average net thickness (ft.)	200	60				
Maximum productive area (acres)						15
RESERVOIR ROCK PROPERTIES						
Porosity (%)	-	15-31				
So_i (%)						
Sw_i (%)						
Sg_i (%)						
Permeability to air (md)						
RESERVOIR FLUID PROPERTIES						
Oil:						
Oil gravity (°API)	27-32	28				
Sulfur content (% by wt.)	1.4	1.4				
Initial solution GOR (SCF/STB)						
Initial oil FVF (RB/STB)						
Bubble point press. (psia)						
Viscosity (cp) @ °F						
Gas:						
Specific gravity (air = 1.0)						
Heating value (Btu/cu. ft.)						
Water:	-	20,500				
Salinity, NaCl (ppm)						
T.D.S. (ppm)						
R_w (ohm/m) (77°F)						
ENHANCED RECOVERY PROJECTS						
Enhanced recovery projects						
Date started						
Date discontinued						
Peak oil production (bbl)						389,937
Year						1929
Peak gas production, net (Mcf)						
Year						

Base of fresh water (ft.): 1,400

Remarks: Most of the production was obtained from the Schist Conglomerate.

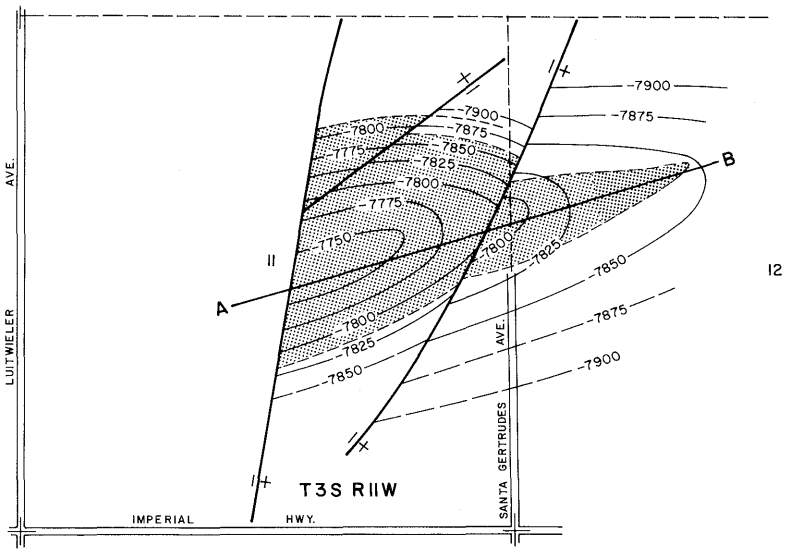
Selected References: White, J.L., 1950, Lawndale Oil Field and Alondra Area: Calif. Div. of Oil and Gas, Summary of Operations -- Calif. Oil Fields, Vol. 36, No. 2.

DATE: January 1989

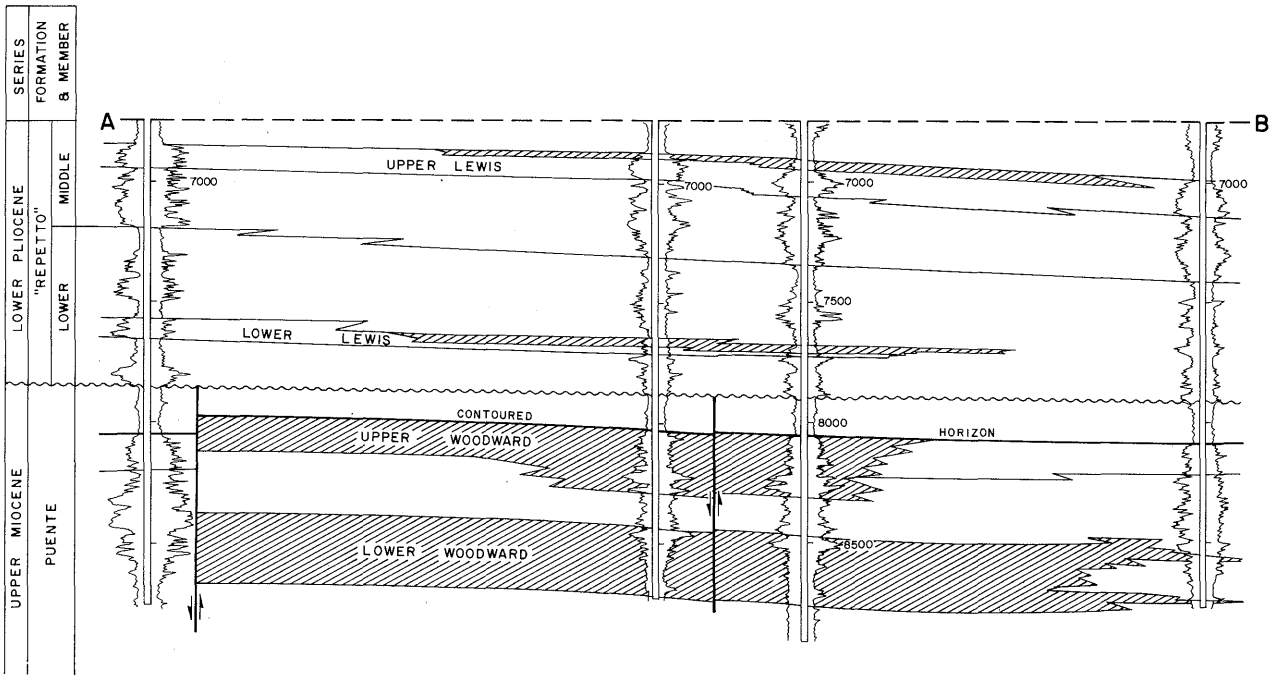
CALIFORNIA DIVISION OF OIL AND GAS

LEFFINGWELL OIL FIELD

(Abandoned)



CONTOURS ON
TOP OF UPPER WOODWARD ZONE



COUNTY: LOS ANGELES

LEFFINGWELL OIL FIELD (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	Pyramid Oil Co. "K" 1	Standard Oil Co. of Calif. "Lewis Community" 1	11 3S 11W	SB	12,184	Upper Lewis	Sespe Oligocene
Deepest well	Same as above	"	"	"	"	"	"

POOL DATA

ITEM	UPPER LEWIS	LOWER LEWIS	UPPER WOODWARD	LOWER WOODWARD		FIELD OR AREA DATA
Discovery date	January 1946	September 1946	July 1953	March 1953		
Initial production rates						
Oil (bbl/day)	162	145	104	196		
Gas (Mcf/day)	33	150	47	800		
Flow pressure (psi)						
Bean size (in.)						
Initial reservoir pressure (psi)						
Reservoir temperature (°F)						
Initial oil content (STB/ac.-ft.)						
Initial gas content (MSCF/ac.-ft.)						
Formation	"Repetto"	"Repetto"	Puente	Puente		
Geologic age	early Pliocene	early Pliocene	late Miocene	late Miocene		
Average depth (ft.)	6,875	7,600	8,000	8,400		
Average net thickness (ft.)	30	30	100	200		
Maximum productive area (acres)						125
RESERVOIR ROCK PROPERTIES						
Porosity (%)	19.0	21.0	17.6	17.6		
S_{oi} (%)						
S_{wi} (%)						
S_{gi} (%)						
Permeability to air (md)	70	100	30	30		
RESERVOIR FLUID PROPERTIES						
Oil:						
Oil gravity (°API)	34	32	31-42	28-30		
Sulfur content (% by wt.)						
Initial solution GOR (SCF/STB)						
Initial oil FVF (RB/STB)						
Bubble point press. (psia)						
Viscosity (cp) @ °F						
Gas:						
Specific gravity (air = 1.0)						
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						
Date started						
Date discontinued						
Peak oil production (bbl)						109,347
Year						1954
Peak gas production, net (Mcf)						667,280
Year						1954

Base of fresh water (ft.): 850

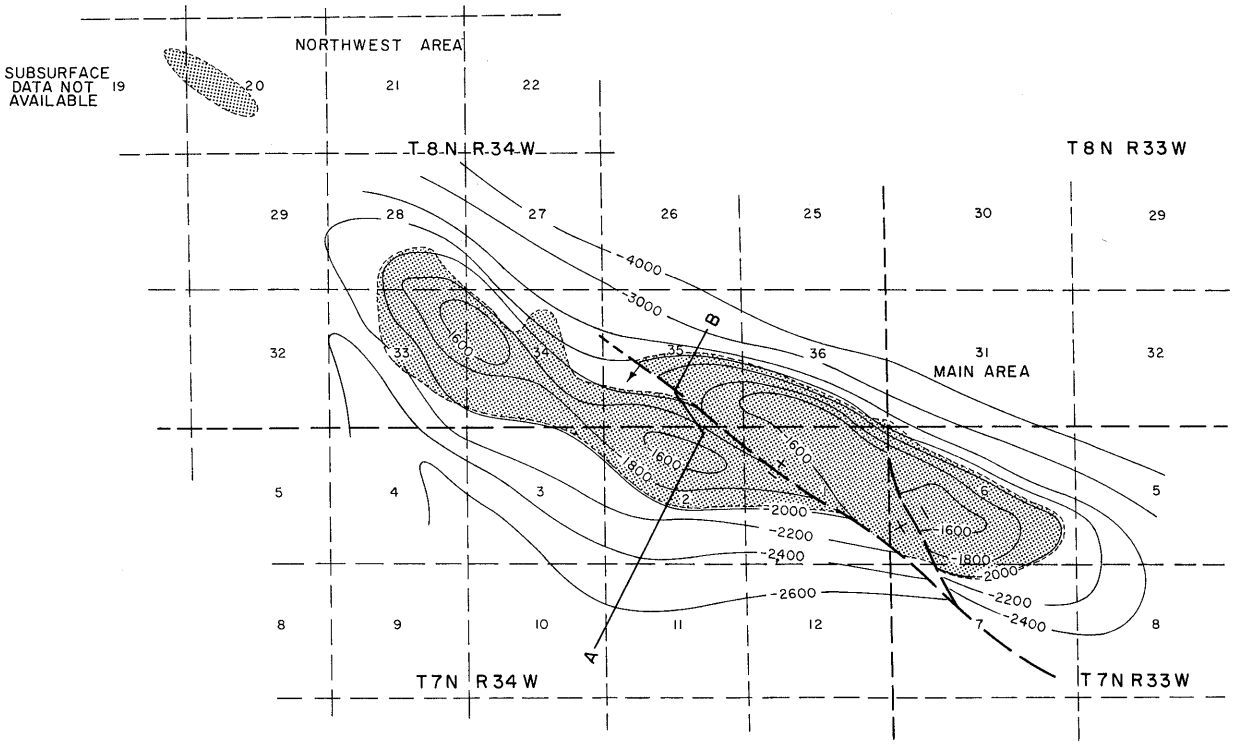
Remarks: Only one well, the discovery well, produced from the Lewis zones. Last production was in October 1971. The field was abandoned in December 1973. Cumulative production is 763,000 bbl oil and 2,460,000 Mcf gas.

Selected References: Gaede, V.F., 1957, Leffingwell Oil Field: Calif. Div. of Oil and Gas, Summary of Operations -- Calif. Oil Fields, Vol. 43, No. 2.

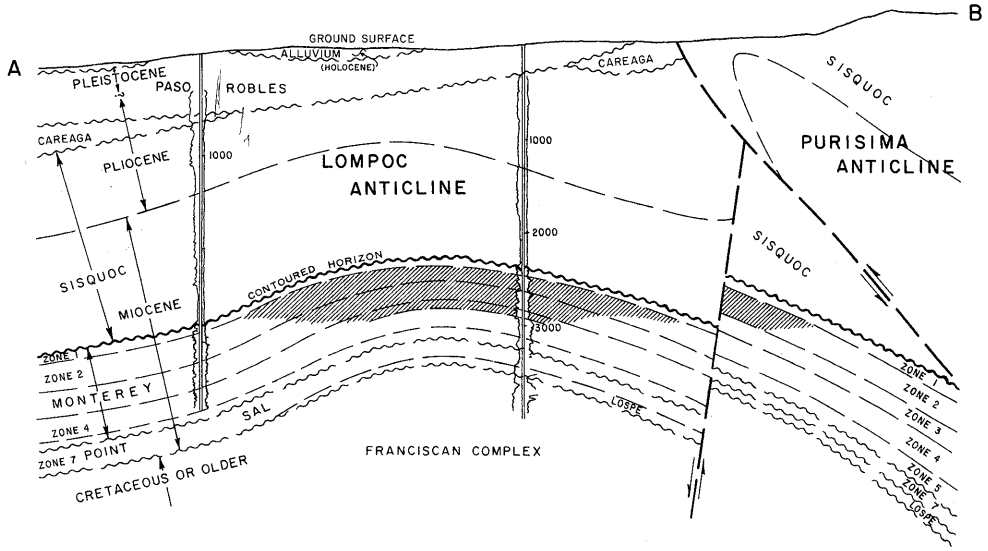
DATE: June 1983

CALIFORNIA DIVISION OF OIL AND GAS

LOMPOC OIL FIELD



CONTOURS ON TOP OF MONTEREY



DATA ACCORDING TO AAPG CORRELATION SECTION ACROSS SANTA MARIA BASIN

COUNTY: **SANTA BARBARA**

LOMPOC 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	Union Oil Co. of Calif. "Hill" 1	Same as present	1 7N 34W	SB	2,546	Monterey	
Deepest well	Conoco Inc. "N.L.& F." 18-1	Same as present	18 8N 34W	SB	8,310		Monterey Miocene

POOL DATA

ITEM	MONTEREY					FIELD OR AREA DATA
Discovery date	March 1903					
Initial production rates						
Oil (bbl/day)	225					
Gas (Mcf/day)						
Flow pressure (psi)						
Bean size (in.)						
Initial reservoir pressure (psi)	1,100					
Reservoir temperature (°F)	160-180					
Initial oil content (STB/ac.-ft.)						
Initial gas content (MSCF/ac.-ft.)						
Formation	Monterey					
Geologic age	Miocene					
Average depth (ft.)	2,250-2,750					
Average net thickness (ft.)	450-500					
Maximum productive area (acres)						2,350
RESERVOIR ROCK PROPERTIES						
Porosity (%)	fractured shale					
S_{oi} (%)						
S_{wi} (%)						
S_{gi} (%)						
Permeability to air (md)						
RESERVOIR FLUID PROPERTIES						
Oil:						
Oil gravity (°API)	15-26					
Sulfur content (% by wt.)						
Initial solution GOR (SCF/STB)						
Initial oil FVF (RB/STB)						
Bubble point press. (psia)						
Viscosity (cp) @ °F						
Gas:						
Specific gravity (air = 1.0)	0.73					
Heating value (Btu/cu. ft.)	1,129					
Water:						
Salinity, NaCl (ppm)	4,700-7,019					
T.D.S. (ppm)	4,860-8,090					
R_w (ohm/m) (77°F)	1.46					
ENHANCED RECOVERY PROJECTS						
Enhanced recovery projects	gas injection					
Date started	1929					
Date discontinued	1960					
Peak oil production (bbl)						2,481,652
Year						1951
Peak gas production, net (Mcf)						2,446,333
Year						1969

Base of fresh water (ft.): See areas

Remarks:

Selected References: Am. Assoc. Petroleum Geologists, 1970, Petroleum Potential of the Santa Maria Province, California: Memoir 15, Vol. 1, p. 325.

DATE: January 1989

CALIFORNIA DIVISION OF OIL AND GAS

COUNTY: SANTA BARBARA

LOMPOC 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	Union Oil Co. of Calif. "Hill" 1	Same as present	1 7N 34W	SB	2,546	Monterey	
Deepest well	Mobil Oil Corp. "Los Alamos" 3	General Petroleum Corp. of Calif. "Los Alamos" 3	31 8N 33W	SB	6,287		Franciscan Cretaceous

POOL DATA

ITEM	MONTEREY					FIELD OR AREA DATA
Discovery date	March 1903					
Initial production rates						
Oil (bbl/day)	225					
Gas (Mcf/day)						
Flow pressure (psi)						
Bean size (in.)						
Initial reservoir pressure (psi)	1,100					
Reservoir temperature (°F)	160-180					
Initial oil content (STB/ac.-ft.)						
Initial gas content (MSCF/ac.-ft.)						
Formation	Monterey					
Geologic age	Miocene					
Average depth (ft.)	2,250-2,750					
Average net thickness (ft.)	450-500					
Maximum productive area (acres)	2,290					
RESERVOIR ROCK PROPERTIES						
Porosity (%)	fractured shale					
So_i (%)						
Sw_i (%)						
Sg_i (%)						
Permeability to air (md)						
RESERVOIR FLUID PROPERTIES						
Oil:						
Oil gravity (°API)	15-26					
Sulfur content (% by wt.)						
Initial solution GOR (SCF/STB)						
Initial oil FVF (RB/STB)						
Bubble point press. (psia)						
Viscosity (cp) @ °F						
Gas:						
Specific gravity (air = 1.0)	0.73					
Heating value (Btu/cu. ft.)	1,129					
Water:						
Salinity, NaCl (ppm)	4,700-7,019					
T.D.S. (ppm)	4,860-8,090					
R_w (ohm/m) (77°F)	1.46					
ENHANCED RECOVERY PROJECTS						
Enhanced recovery projects	gas injection					
Date started	1929					
Date discontinued	1960					
Peak oil production (bbl)	2,481,652					
Year	1951					
Peak gas production, net (Mcf)	2,446,333					
Year	1969					

Base of fresh water (ft.): 400

Remarks:

Selected References:

Arnold, R., and R. Anderson, 1907, Geology and Oil Resources of the Santa Maria Oil District, Santa Barbara County, California: U.S. Geol. Survey Bull. 322, p. 104.

Dibblee, T.W., Jr., 1941, Lompoc Oil Field: Calif. Div. of Mines Bull. 118, p. 427.

Dolman, S.G., 1932, Lompoc Oil Field, Santa Barbara County: Calif. Div. of Oil and Gas, Summary of Operations--Calif. Oil Fields, Vol. 17, No. 4.

Hodges, F.C., and A.M. Johnson, 1932, Subsurface Storage of Oil and Gas in the Brea-Olinda and Lompoc fields: Calif. Div. of Oil and Gas, Summary of Operations--Calif. Oil Fields, Vol. 17, No. 4.

Prutzman, P.W., 1913, Petroleum in Southern California: Calif. State Mining Bureau Bull. 63, p. 345.

Regan, L.J., Jr., and A.W. Hughes, 1949, Fractured Reservoirs of Santa Maria District, Calif.: Am. Assoc. Petroleum Geologists Bull., Vol. 33, No. 1, p. 35.

Woodring, W.P., and M.N. Bramlette, 1950, Geology and Paleontology of the Santa Maria Dist., Calif.:U.S.G.S. Prof. Paper 222, p. 119.

DATE: January 1989

CALIFORNIA DIVISION OF OIL AND GAS

COUNTY: SANTA BARBARA

LOMPOC OIL FIELD
NORTHWEST 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	Union Oil Co. of Calif. "Jesus Maria" A83-19	Union Oil Co. of Calif. "Jesus Maria" 83-19	19 8N 34W	SB	5,944 a/	Monterey	
Deepest well	Conoco Inc. "N.L.& F." 18-1	Same as present	18 8N 34W	SB	8,310		Monterey Miocene

POOL DATA

ITEM	MONTEREY					FIELD OR AREA DATA
Discovery date	December 1983					
Initial production rates						
Oil (bbl/day)	342					
Gas (Mcf/day)	52					
Flow pressure (psi)	20					
Bean size (in.)						
Initial reservoir pressure (psi)	750-850					
Reservoir temperature (°F)	150					
Initial oil content (STB/ac.-ft.)	50					
Initial gas content (MSCF/ac.-ft.)						
Formation	Monterey					
Geologic age	Miocene					
Average depth (ft.)	2,700					
Average net thickness (ft.)	280					
Maximum productive area (acres)	100					
RESERVOIR ROCK PROPERTIES						
Porosity (%)	fractured shale					
So_i (%)						
Sw_i (%)						
Sg_i (%)						
Permeability to air (md)						
RESERVOIR FLUID PROPERTIES						
Oil:						
Oil gravity (°API)	17.0-19.5					
Sulfur content (% by wt.)	1.84					
Initial solution GOR (SCF/STB)	120					
Initial oil FVF (RB/STB)	1.076					
Bubble point press. (psia)	750					
Viscosity (cp) @ °F	70 @ 67					
Gas:						
Specific gravity (air = 1.0)	0.79					
Heating value (Btu/cu. ft.)	902					
Water:						
Salinity, NaCl (ppm)	3,811					
T.D.S. (ppm)	6,621					
R_w (ohm/m) (77°F)	1.41					
ENHANCED RECOVERY PROJECTS						
Enhanced recovery projects						
Date started						
Date discontinued						
Peak oil production (bbl)	210,125					
Year	1989					
Peak gas production, net (Mcf)	145,442					
Year	1987					

Base of fresh water (ft.): None

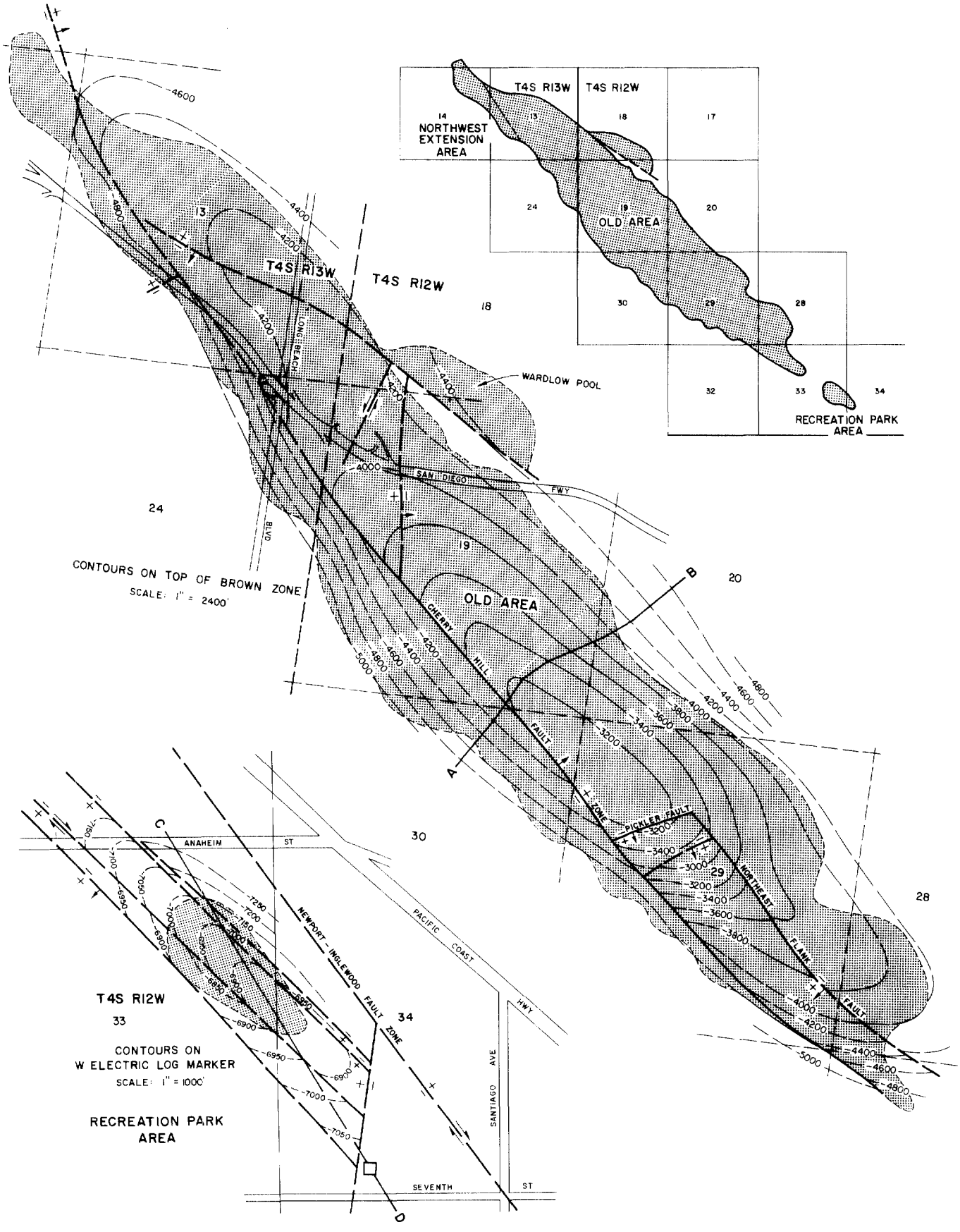
Remarks: a/ Directional well; true vertical depth is 5,870 feet.

Selected References:

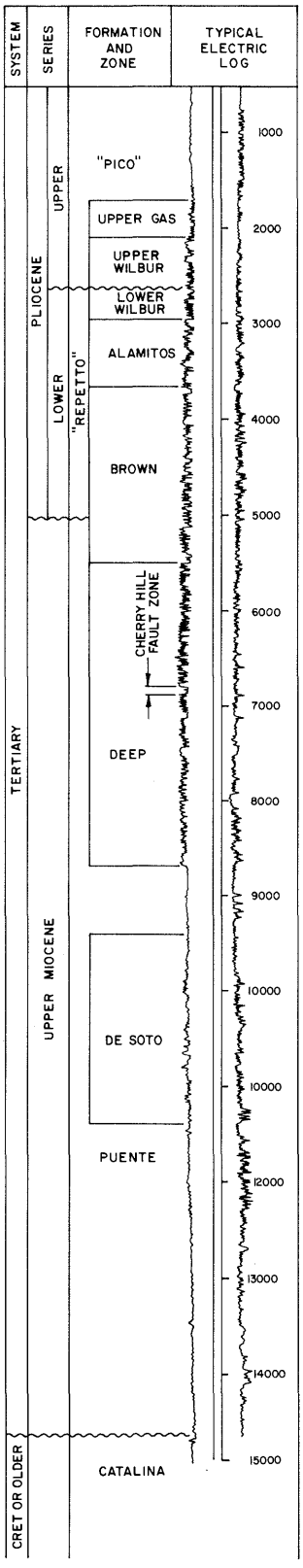
DATE: January 1990

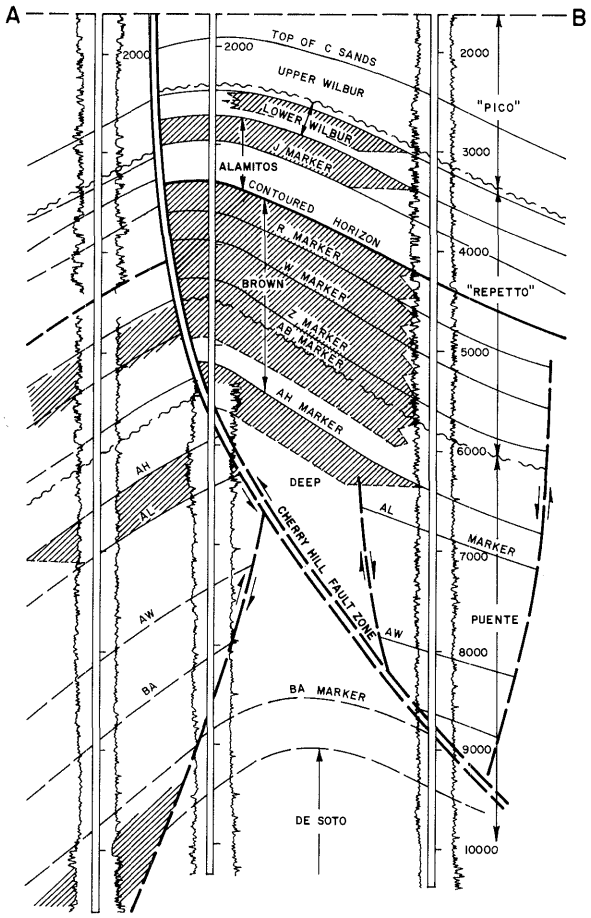
CALIFORNIA DIVISION OF OIL AND GAS

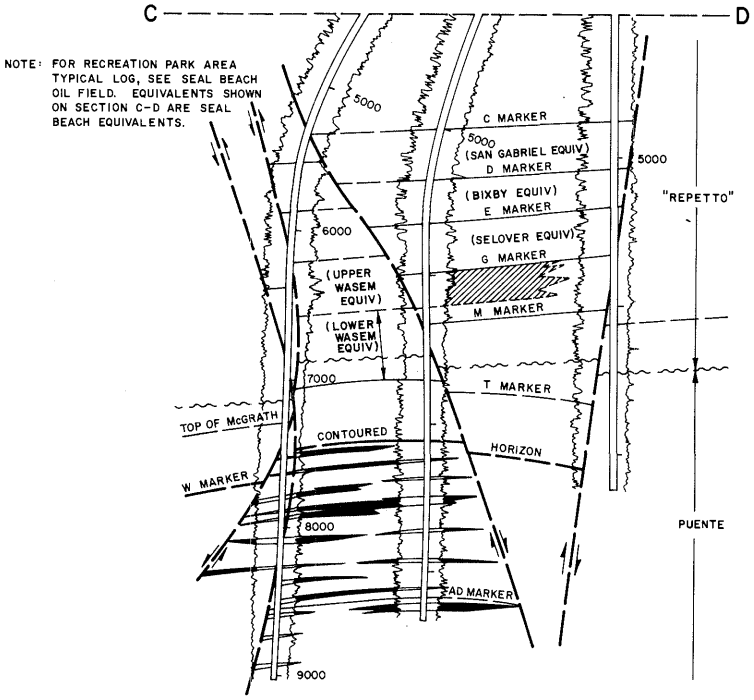
LONG BEACH OIL FIELD



LONG BEACH OIL FIELD







COUNTY: LOS ANGELES

LONG BEACH 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	Barto/Signal Petroleum, Inc. No. 149	Shell Oil Co. "Alamitos" 1	29 4S 12W	SB	3,114	Alamitos	
Deepest well	Shell Oil Co. "Alamitos" 48-A	Same as present	29 4S 12W	SB	14,950		Catalina Schist Cret. or older

POOL DATA

ITEM	ALAMITOS					FIELD OR AREA DATA
Discovery date	June 1921					
Initial production rates						
Oil (bbl/day)	483					
Gas (Mcf/day)						
Flow pressure (psi)						
Bean size (in.)						
Initial reservoir pressure (psi)	1,300					
Reservoir temperature (°F)	130					
Initial oil content (STB/ac.-ft.)	1,770					
Initial gas content (MSCF/ac.-ft.)	230					
Formation	"Repetto"					
Geologic age	early Pliocene					
Average depth (ft.)	2,800					
Average net thickness (ft.)	430					
Maximum productive area (acres)						1,725
RESERVOIR ROCK PROPERTIES						
Porosity (%)	31					
S_{oi} (%)	76					
S_{wi} (%)	24					
S_{gi} (%)						
Permeability to air (md)	700					
RESERVOIR FLUID PROPERTIES						
Oil:						
Oil gravity (°API)	21-28					
Sulfur content (% by wt.)	3					
Initial solution GOR (SCF/STB)	700					
Initial oil FVF (RB/STB)	1.11					
Bubble point press. (psia)	1,400					
Viscosity (cp) @ °F	23 @ 60					
Gas:						
Specific gravity (air = 1.0)	1.2					
Heating value (Btu/cu. ft.)	999					
Water:						
Salinity, NaCl (ppm)	27,700					
T.D.S. (ppm)	28,760					
R_w (ohm/m) (77°F)	0.136					
ENHANCED RECOVERY PROJECTS						
Enhanced recovery projects	waterflood					
Date started	1973					
Date discontinued	active					
Peak oil production (bbl)						68,323,589
Year						1923
Peak gas production, net (Mcf)						
Year						

Base of fresh water (ft.): See areas

Remarks: See areas

Selected References: Ingram, W.L., 1968, Long Beach Oil Field: Calif. Div. of Oil and Gas, Summary of Operations -- Calif. Oil Fields, Vol. 54, No. 1.

DATE: July 1983

CALIFORNIA DIVISION OF OIL AND GAS

COUNTY: LOS ANGELES

LONG BEACH OIL FIELD
NORTHWEST EXTENSION 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	ARCO Oil & Gas Co. "Bixby" 3	The United Oil Co. "Bixby" 3	13 4S 13W	SB	4,402	Alamitos	
Deepest well	Berry-Loukonen, Ltd. "Jones" 1	General Petroleum Corp. "Los Cerritos" 1	13 4S 13W	SB	11,493		Puente late Miocene

POOL DATA

ITEM	ALAMITOS	BROWN				FIELD OR AREA DATA
Discovery date	January 1926	December 1940				
Initial production rates						
Oil (bbl/day)	156	329				
Gas (Mcf/day)	-	88				
Flow pressure (psi)						
Bean size (in.)						
Initial reservoir pressure (psi)						
Reservoir temperature (°F)						
Initial oil content (STB/ac.-ft.)						
Initial gas content (MSCF/ac.-ft.)						
Formation	"Repetto"	"Repetto"-Puente				
Geologic age	early Pliocene	e Plio./l Miocene				
Average depth (ft.)	4,040	5,230				
Average net thickness (ft.)	85	700				
Maximum productive area (acres)						85
RESERVOIR ROCK PROPERTIES						
Porosity (%)						
S_{oi} (%)						
S_{wi} (%)						
S_{gi} (%)						
Permeability to air (md)						
RESERVOIR FLUID PROPERTIES						
Oil:						
Oil gravity (°API)	21-25	25				
Sulfur content (% by wt.)						
Initial solution GOR (SCF/STB)						
Initial oil FVF (RB/STB)						
Bubble point press. (psia)						
Viscosity (cp) @ °F						
Gas:						
Specific gravity (air = 1.0)						
Heating value (Btu/cu. ft.)						
Water:						
Salinity, NaCl (ppm)	27,388	30,812				
T.D.S. (ppm)						
R_w (ohm/m) (77°F)						
ENHANCED RECOVERY PROJECTS						
Enhanced recovery projects						
Date started						
Date discontinued						
Peak oil production (bbl)						1,146,207
Year						1938
Peak gas production, net (Mcf)						
Year						

Base of fresh water (ft.): 2,500

Remarks:

Selected References:

DATE: January 1991

CALIFORNIA DIVISION OF OIL AND GAS

COUNTY: LOS ANGELES

LONG BEACH OIL FIELD
OLD 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	Barto/Signal Petroleum, Inc. No. 149	Shell Oil Co. "Alamitos" 1	9 4S 12W	SB	3,114	Alamitos	
Deepest well	Shell Oil Co. "Alamitos" 48-A	Same as present	29 4S 12W	SB	14,950		Catalina Schist Cret. or older

POOL DATA

ITEM	UPPER WILBUR	LOWER WILBUR	ALAMITOS	BROWN	DEEP	FIELD OR AREA DATA
Discovery date	April 1938	December 1921	June 1921	November 1922	November 1926	
Initial production rates						
Oil (bbl/day)	80	36	483	3,650	2,500	
Gas (Mcf/day)	40	7,000	-	-	-	
Flow pressure (psi)						
Bean size (in.)						
Initial reservoir pressure (psi)	1,160	1,160	1,300	2,000	2,800	
Reservoir temperature (°F)	112	112	130	150	200	
Initial oil content (STB/ac.-ft.)	1,665	1,665	1,770	1,400	900	
Initial gas content (MSCF/ac.-ft.)	243	243	230	1,288	427	
Formation	"Pico"	"Repetto"	"Repetto"	"Repetto"-Puente	Puente	
Geologic age	late Pliocene	early Pliocene	early Pliocene	e Plio./l Miocene	late Miocene	
Average depth (ft.)	2,000	2,400	2,800	3,600	5,300	
Average net thickness (ft.)	110	165	430	840	500	
Maximum productive area (acres)						
RESERVOIR ROCK PROPERTIES						
Porosity (%)	30	30	31	30	22	
S_{oi} (%)	65.0	65.0	76.0	46.5	63.0	
S_{wi} (%)	35	35	24	28	37	
S_{gi} (%)	-	-	-	25.5	-	
Permeability to air (md)	200	200	700	400	50	
RESERVOIR FLUID PROPERTIES						
Oil:						
Oil gravity (°API)	14-23	21-24	21-28	18-30	-	
Sulfur content (% by wt.)	2	2	3	2	2	
Initial solution GOR (SCF/STB)	175	175	700	310	500	
Initial oil FVF (RB/STB)	1.01	1.01	1.11	1.18	1.27	
Bubble point press. (psia)	1,160	1,160	1,400	2,000	2,800	
Viscosity (cp) @ °F	40.0 @ 60	40.0 @ 60	23.0 @ 60	3.3 @ 60	5.5 @ 60	
Gas:						
Specific gravity (air = 1.0)	0.7	0.7	1.2	0.7	1.2	
Heating value (Btu/cu. ft.)	1,000	1,000	999	1,000	999	
Water:						
Salinity, NaCl (ppm)	27,700	27,700	27,700	27,700	27,700	
T.D.S. (ppm)	28,750	28,750	28,760	28,760	28,760	
R_w (ohm/m) (77°F)	0.215	0.215	0.136	0.280	0.280	
ENHANCED RECOVERY PROJECTS						
Enhanced recovery projects			waterflood	waterflood	waterflood	
Date started			1973	1964	1973	
Date discontinued			active	active	active	
Peak oil production (bbl)						
Year						
Peak gas production, net (Mcf)						
Year						

Base of fresh water (ft.): 1,800

Remarks:

Selected References:

DATE: August 1983

CALIFORNIA DIVISION OF OIL AND GAS

COUNTY: LOS ANGELES

LONG BEACH OIL FIELD
OLD AREA

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	DEEP (WARDLOW)	DE SOTO				FIELD OR AREA DATA
Discovery date	April 1951	December 1938				
Initial production rates						
Oil (bbl/day)	750	300				
Gas (Mcf/day)	1,700	350				
Flow pressure (psi)						
Bean size (in.)						
Initial reservoir pressure (psi)	2,800	-				
Reservoir temperature (°F)	200	-				
Initial oil content (STB/ac.-ft.)	900	-				
Initial gas content (MSCF/ac.-ft.)	427	-				
Formation	Puente	Puente				
Geologic age	late Miocene	late Miocene				
Average depth (ft.)	6,700	7,500				
Average net thickness (ft.)	600	300				
Maximum productive area (acres)						1,605
RESERVOIR ROCK PROPERTIES						
Porosity (%)	22	24-27				
So_i (%)	63	-				
Sw_i (%)	37	-				
Sg_i (%)						
Permeability to air (md)	50	-				
RESERVOIR FLUID PROPERTIES						
Oil:						
Oil gravity (°API)	32	-				
Sulfur content (% by wt.)	2	-				
Initial solution GOR (SCF/STB)	500	-				
Initial oil FVF (RB/STB)	1.27	-				
Bubble point press. (psia)	2,800	-				
Viscosity (cp) @ °F	5.5					
Gas:						
Specific gravity (air = 1.0)	1.2	-				
Heating value (Btu/cu. ft.)	999	-				
Water:						
Salinity, NaCl (ppm)	27,700	-				
T.D.S. (ppm)	28,760	-				
R_w (ohm/m) (77°F)	0.280	-				
ENHANCED RECOVERY PROJECTS						
Enhanced recovery projects	waterflood					
Date started	1975					
Date discontinued	active					
Peak oil production (bbl)						68,323,589
Year						1923
Peak gas production, net (Mcf)						
Year						

Base of fresh water (ft.):

Remarks:

Selected References:

DATE: August 1983

CALIFORNIA DIVISION OF OIL AND GAS

COUNTY: LOS ANGELES

LONG BEACH OIL FIELD
RECREATION PARK 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	Transpac Petroleum, Inc. "Recreation Park E" 1	Richfield Oil Corp. "Recreation Park E" 1	33 4S 12W	SB	9,781	McGrath	Puente late Miocene
Deepest well	Same as above	"	"	"	"	"	"

POOL DATA

ITEM	UPPER WASEM	MCGRATH				FIELD OR AREA DATA
Discovery date	June 1962	October 1952				
Initial production rates						
Oil (bbl/day)	66	141				
Gas (Mcf/day)	50	48				
Flow pressure (psi)						
Bean size (in.)						
Initial reservoir pressure (psi)						
Reservoir temperature (°F)	120**	120**				
Initial oil content (STB/ac.-ft.)						
Initial gas content (MSCF/ac.-ft.)						
Formation	"Repetto"	Puente				
Geologic age	early Pliocene	late Miocene				
Average depth (ft.)	6,000	6,900				
Average net thickness (ft.)	250	650				
Maximum productive area (acres)						35
RESERVOIR ROCK PROPERTIES						
Porosity (%)	28**	25**				
S_{oi} (%)						
S_{wi} (%)						
S_{gi} (%)						
Permeability to air (md)	200**	125**				
RESERVOIR FLUID PROPERTIES						
Oil:						
Oil gravity (°API)	21-27	28-32				
Sulfur content (% by wt.)						
Initial solution GOR (SCF/STB)	758††	340††				
Initial oil FVF (RB/STB)						
Bubble point press. (psia)						
Viscosity (cp) @ °F						
Gas:						
Specific gravity (air = 1.0)						
Heating value (Btu/cu. ft.)						
Water:						
Salinity, NaCl (ppm)	25,677	25,677				
T.D.S. (ppm)						
R_w (ohm/m) (77°F)	0.16**	0.16**				
ENHANCED RECOVERY PROJECTS						
Enhanced recovery projects						
Date started						
Date discontinued						
Peak oil production (bbl)						138,885
Year						1963
Peak gas production, net (Mcf)						176,997
Year						1963

Base of fresh water (ft.): 2,400

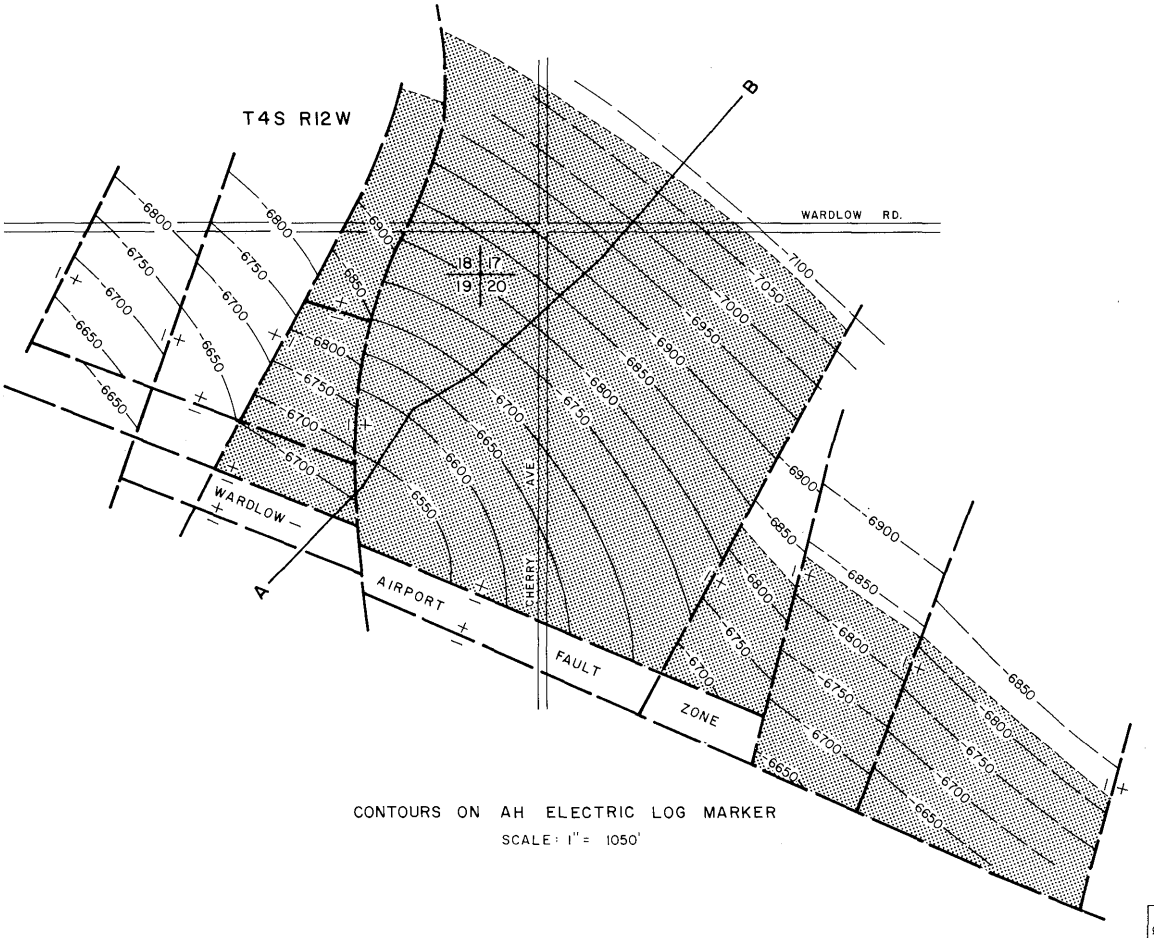
Remarks:

Selected References: Ingram, W.L., 1966, Recreation Park Area of Long Beach Oil Field: Calif. Div. of Oil and Gas, Summary of Operations -- Calif. Oil Fields, Vol. 52, No. 2.

DATE: August 1983 **Estimated value ††Calculated value

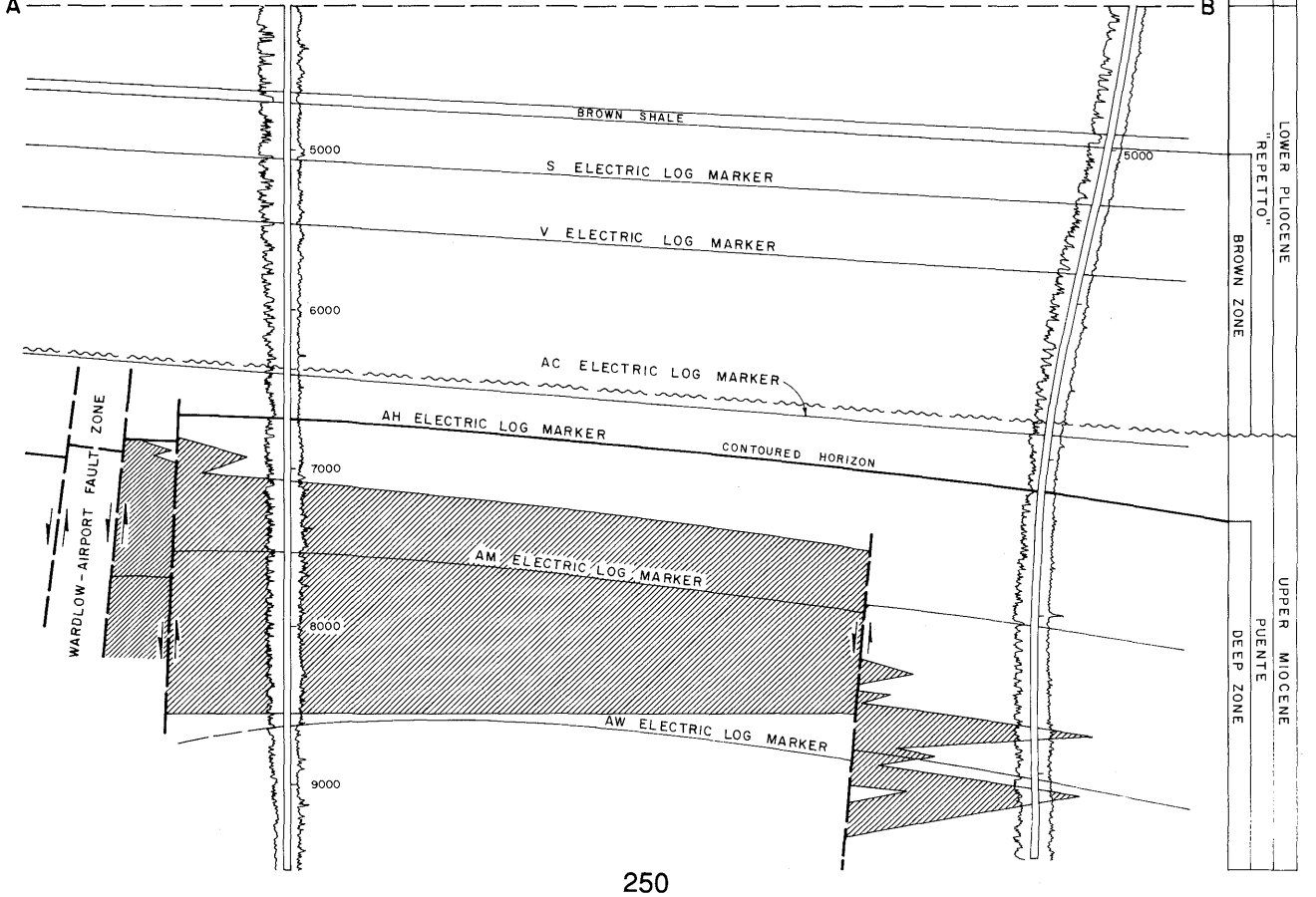
CALIFORNIA DIVISION OF OIL AND GAS

LONG BEACH AIRPORT OIL FIELD



CONTOURS ON AH ELECTRIC LOG MARKER

SCALE: 1" = 1050'



COUNTY: LOS ANGELES

LONG BEACH AIRPORT 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	Texaco Inc. "Long Beach Airport (NCT-1)" 1	The Texas Co. "Long Beach Airport (NCT-1)" 1	20 4S 12W	SB	13,016	Deep	Puente late Miocene
Deepest well	Same as above	"	"	"	"	"	"

POOL DATA

ITEM	DEEP					FIELD OR AREA DATA
Discovery date	February 1954					
Initial production rates						
Oil (bbl/day)	148					
Gas (Mcf/day)	122					
Flow pressure (psi)						
Bean size (in.)						
Initial reservoir pressure (psi)						
Reservoir temperature (°F)						
Initial oil content (STB/ac.-ft.)						
Initial gas content (MSCF/ac.-ft.)						
Formation	Puente					
Geologic age	late Miocene					
Average depth (ft.)	8,200					
Average net thickness (ft.)	1,200					
Maximum productive area (acres)	115					
RESERVOIR ROCK PROPERTIES						
Porosity (%)	24-27					
S_{oi} (%)						
S_{wi} (%)						
S_{gi} (%)						
Permeability to air (md)	50-100					
RESERVOIR FLUID PROPERTIES						
Oil:						
Oil gravity (°API)	32-36					
Sulfur content (% by wt.)						
Initial solution GOR (SCF/STB)						
Initial oil FVF (RB/STB)						
Bubble point press. (psia)						
Viscosity (cp) @ °F						
Gas:						
Specific gravity (air = 1.0)	0.8					
Heating value (Btu/cu. ft.)						
Water:						
Salinity, NaCl (ppm)	22,253					
T.D.S. (ppm)						
R_w (ohm/m) (77°F)						
ENHANCED RECOVERY PROJECTS						
Enhanced recovery projects	waterflood					
Date started	1961					
Date discontinued	1964					
Peak oil production (bbl)	3,243,681					
Year	1955					
Peak gas production, net (Mcf)						
Year						

Base of fresh water (ft.): 2,100

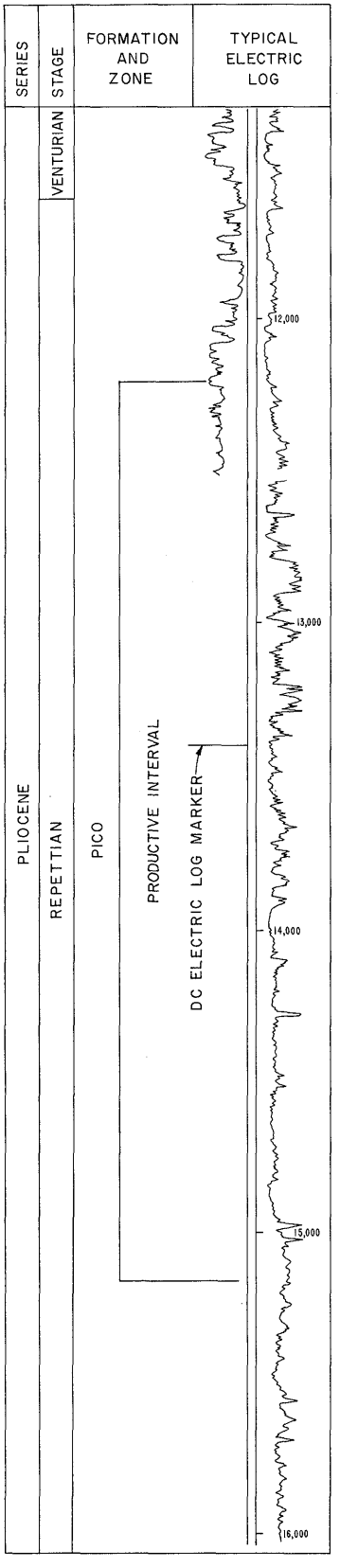
Remarks:

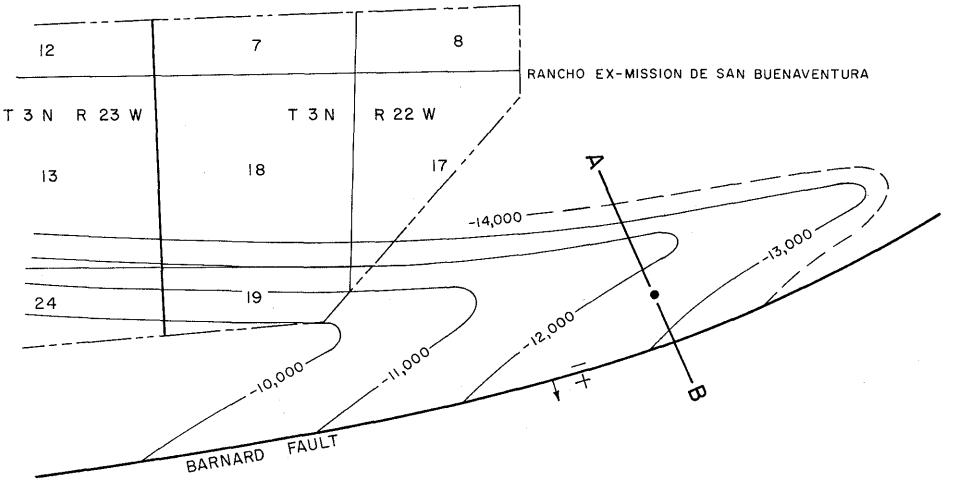
Selected References: Loken, K.P., 1964, Long Beach Airport Oil Field: Calif. Div. of Oil and Gas, Summary of Operations -- Calif. Oil Fields, Vol. 50, No. 1.

DATE: August 1983

CALIFORNIA DIVISION OF OIL AND GAS

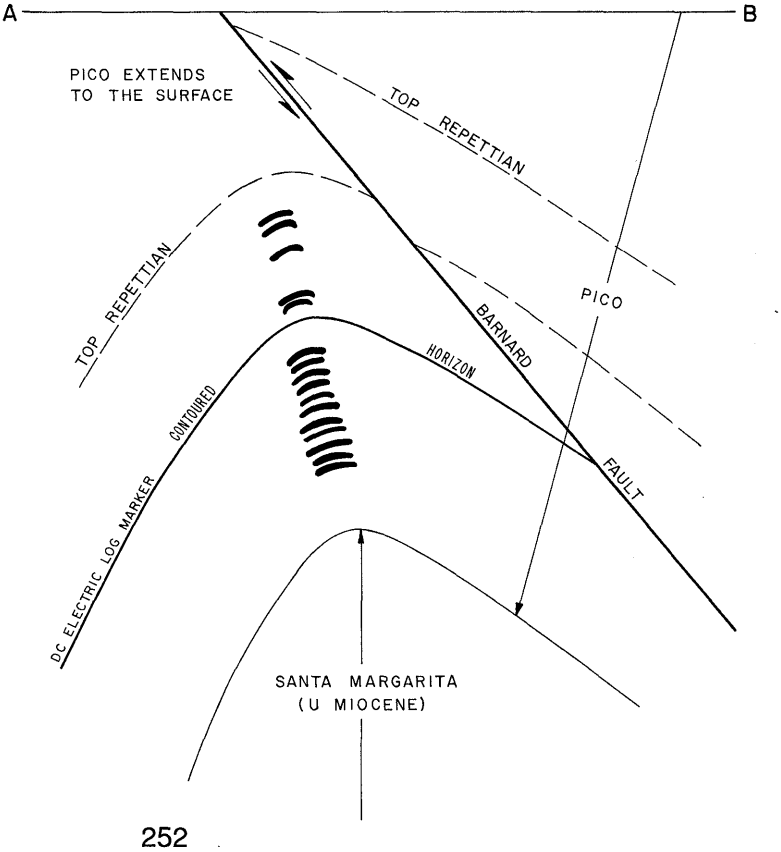
LONG CANYON OIL FIELD





CONTOURS ON DC ELECTRIC LOG MARKER

SCALE 1" = 5500'



COUNTY: VENTURA

LONG CANYON 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	Royal American Petroleum Corp. "Lloyd Corp." W.S. 4	Lloyd Corp., Ltd. "Lloyd Corp." W.S. 4	21 3N 22W	SB	16,343	Pico	Santa Margarita late Miocene
Deepest well	Same as above	"	"	"	"	"	"

POOL DATA

ITEM	PICO					FIELD OR AREA DATA
Discovery date	June 1956					
Initial production rates						
Oil (bbl/day)	40					
Gas (Mcf/day)	75					
Flow pressure (psi)						
Bean size (in.)						
Initial reservoir pressure (psi)						
Reservoir temperature (°F)						
Initial oil content (STB/ac.-ft.)						
Initial gas content (MSCF/ac.-ft.)						
Formation	Pico					
Geologic age	Pliocene					
Average depth (ft.)	12,200-15,150					
Average net thickness (ft.)	thin sand stringers					
Maximum productive area (acres)	10					
RESERVOIR ROCK PROPERTIES						
Porosity (%)						
S_{oi} (%)						
S_{wi} (%)						
S_{gi} (%)						
Permeability to air (md)						
RESERVOIR FLUID PROPERTIES						
Oil:						
Oil gravity (°API)	32					
Sulfur content (% by wt.)						
Initial solution GOR (SCF/STB)						
Initial oil FVF (RB/STB)						
Bubble point press. (psia)						
Viscosity (cp) @ °F						
Gas:						
Specific gravity (air = 1.0)						
Heating value (Btu/cu. ft.)						
Water:						
Salinity, NaCl (ppm)	15,400-18,800					
T.D.S. (ppm)						
R_w (ohm/m) (77°F)						
ENHANCED RECOVERY PROJECTS						
Enhanced recovery projects						
Date started						
Date discontinued						
Peak oil production (bbl)	6,047					
Year	1957					
Peak gas production, net (Mcf)						
Year						

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

Remarks: A one well field; last produced in June 1960.

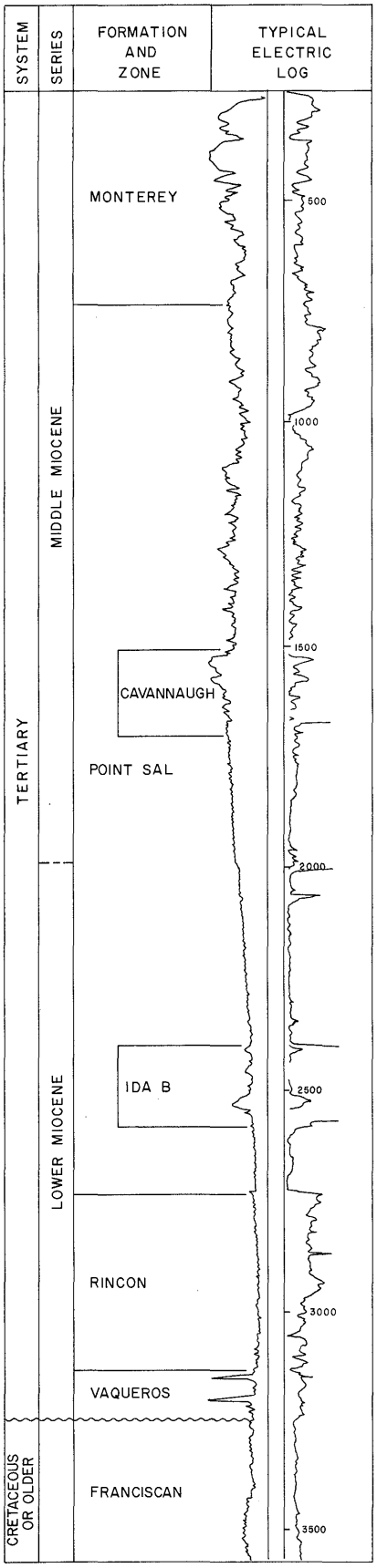
Selected References: Jennings, C.W., and B.W. Troxel, 1954, Geologic Guide through the Ventura Basin and Adjacent Areas, Southern California: Calif. Div. of Mines Bull. 170, Geologic Guide No. 2, Map 18, pp. 49-50.

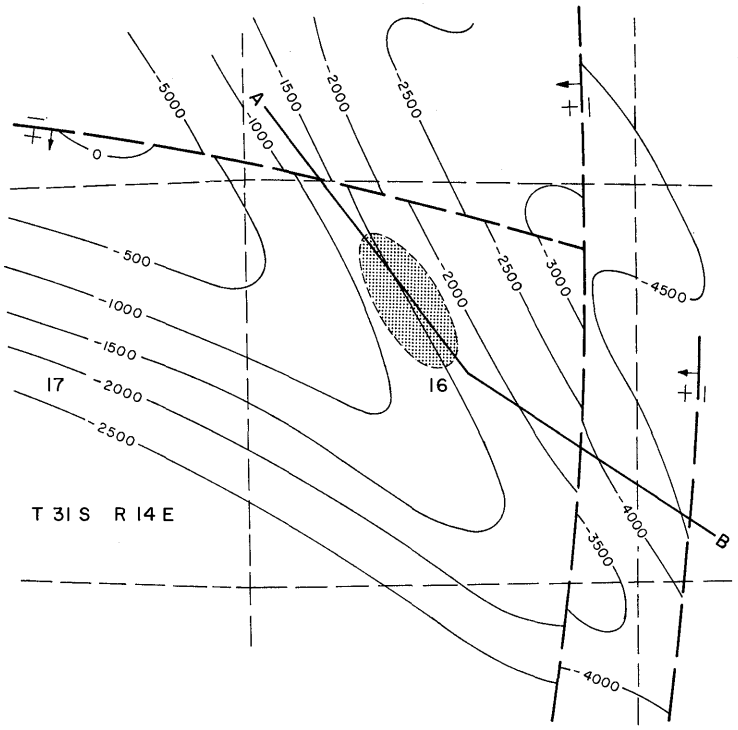
DATE: May 1983

CALIFORNIA DIVISION OF OIL AND GAS

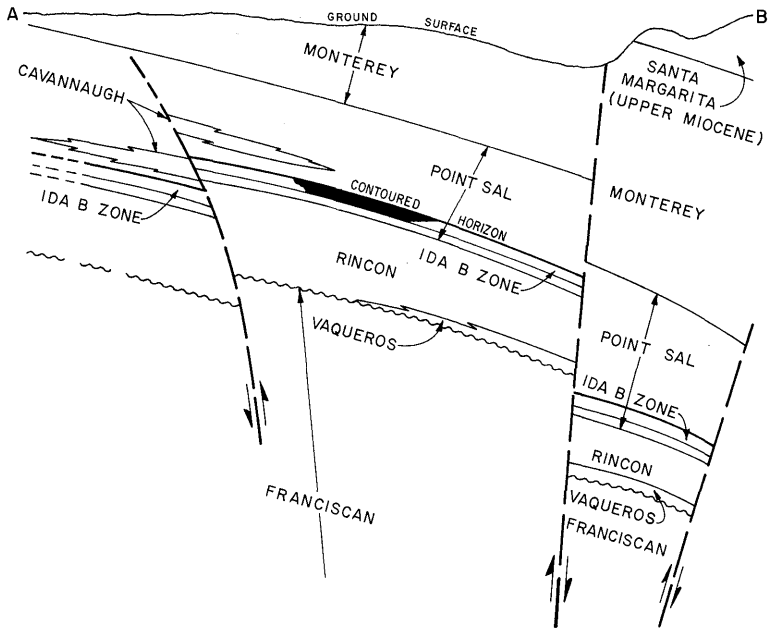
LOPEZ CANYON OIL FIELD

(Abandoned)





CONTOURS ON TOP OF IDA B ZONE



COUNTY: SAN LUIS OBISPO

LOPEZ CANYON OIL FIELD (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 Producing Inc. "Ida B" One	Joseph M. Gross "Ida B" One	16 31S 14E	MD	3,550	Ida B	
Deepest well	Texaco Producing Inc. "U.S.L." 18-15	Tidewater Oil Co. "U.S.L." 18-15	15 31S 14E	MD	7,437		Vaqueros early Miocene

POOL DATA

ITEM	IDA B					FIELD OR AREA DATA
Discovery date	August 1963					
Initial production rates						
Oil (bbl/day)	175					
Gas (Mcf/day)	100					
Flow pressure (psi)	325					
Bean size (in.)						
Initial reservoir pressure (psi)						
Reservoir temperature (°F)	107					
Initial oil content (STB/ac.-ft.)						
Initial gas content (MSCF/ac.-ft.)						
Formation	Pt. Sal					
Geologic age	early Miocene					
Average depth (ft.)	2,375					
Average net thickness (ft.)	200					
Maximum productive area (acres)	10					
RESERVOIR ROCK PROPERTIES						
Porosity (%)	fractured shale					
So_i (%)						
Sw_i (%)						
Sg_i (%)						
Permeability to air (md)						
RESERVOIR FLUID PROPERTIES						
Oil:						
Oil gravity (°API)	15					
Sulfur content (% by wt.)						
Initial solution GOR (SCF/STB)	575					
Initial oil FVF (RB/STB)						
Bubble point press. (psia)						
Viscosity (cp) @ °F						
Gas:						
Specific gravity (air = 1.0)						
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						
Date started						
Date discontinued						
Peak oil production (bbl)	1,706					
Year	1963					
Peak gas production, net (Mcf)	3,867					
Year	1964					

Base of fresh water (ft.): 500

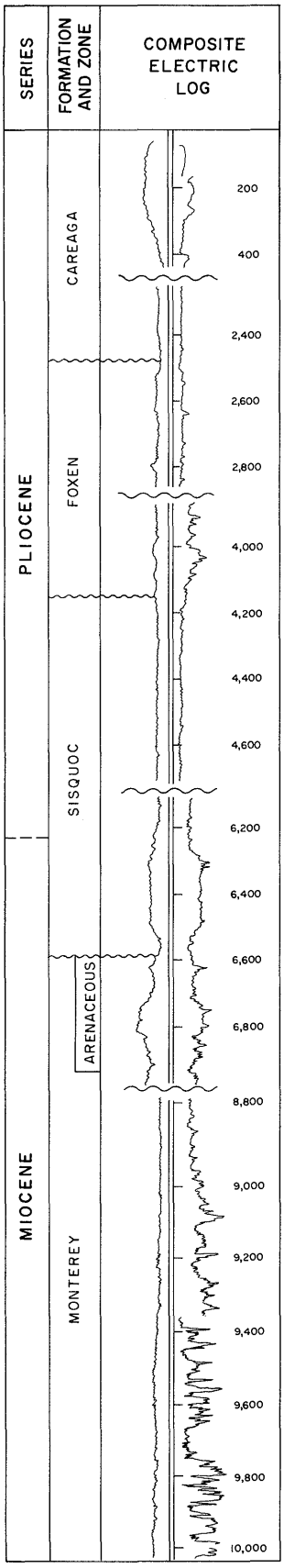
Remarks: The only producing well was abandoned in October 1965. Cumulative production is 1,898 bbl of oil and 6,076 Mcf of gas. The field is located in the Lopez Dam recreational area.

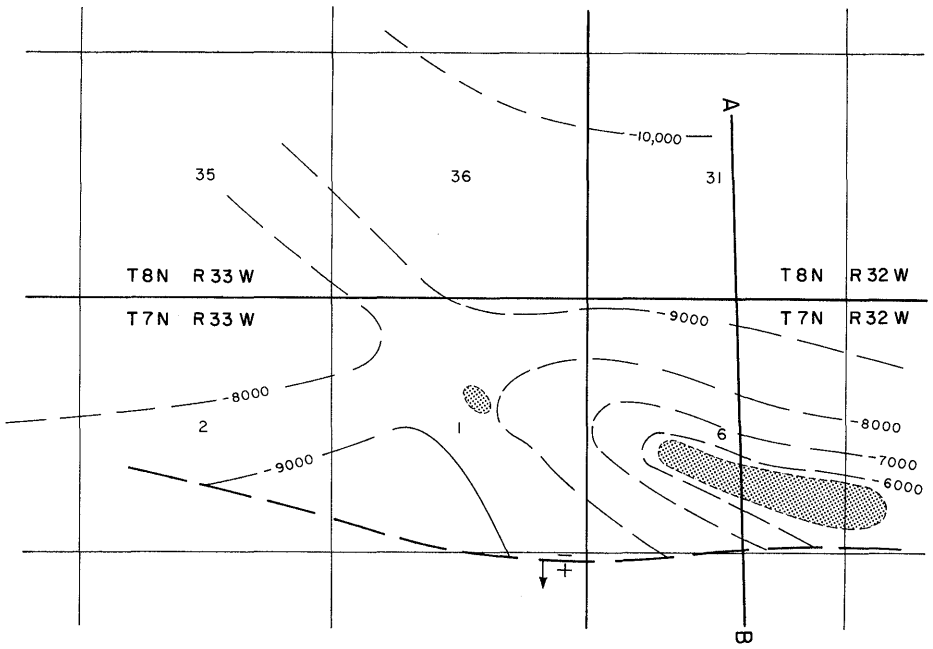
Selected References:

DATE: January 1989

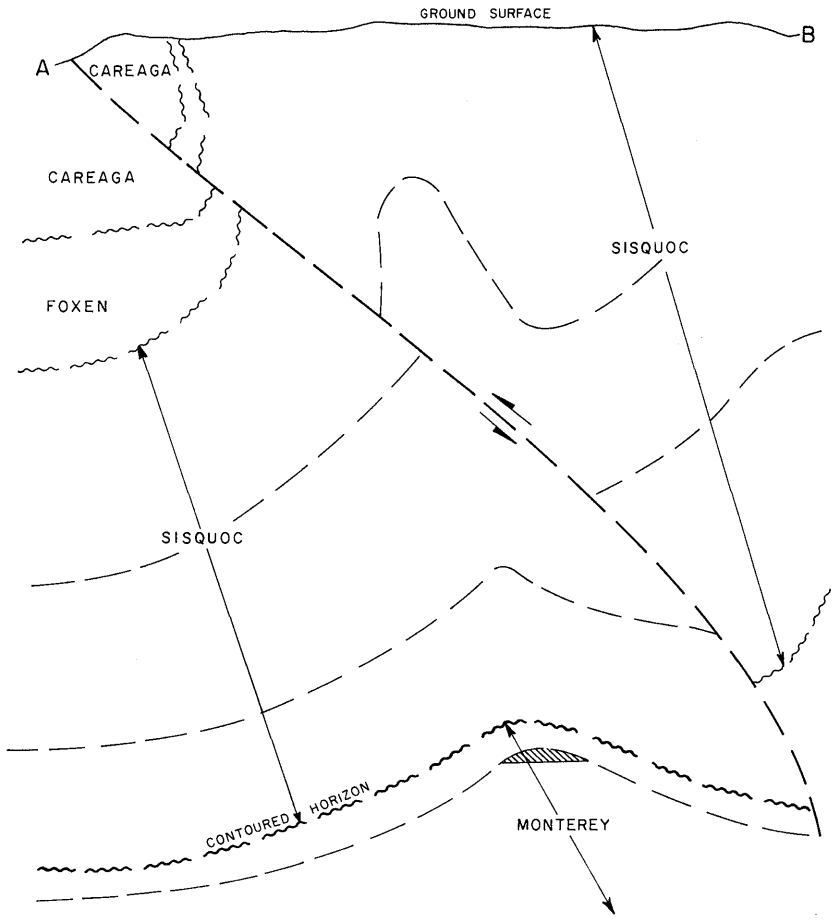
CALIFORNIA DIVISION OF OIL AND GAS

LOS ALAMOS OIL FIELD





CONTOURS ON TOP OF MONTEREY



COUNTY: SANTA BARBARA

LOS ALAMOS 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	Nord-Montara Petroleum Co. "Ferrero et al" 1-1	McCulloch Oil Corp. "Ferrero et al" 1-1	1 7N 33W	SB	10,231 a/	Monterey	Monterey Miocene
Deepest well	Same as above	"	"	"	"	"	"

POOL DATA

ITEM	MONTEREY					FIELD OR AREA DATA
Discovery date	April 1972					
Initial production rates						
Oil (bbl/day)	25					
Gas (Mcf/day)						
Flow pressure (psi)						
Bean size (in.)						
Initial reservoir pressure (psi)	3,200**					
Reservoir temperature (°F)	206**					
Initial oil content (STB/ac.-ft.)						
Initial gas content (MSCF/ac.-ft.)						
Formation	Monterey					
Geologic age	Miocene					
Average depth (ft.)	9,300					
Average net thickness (ft.)	550					
Maximum productive area (acres)	50					
RESERVOIR ROCK PROPERTIES						
Porosity (%)	fractured shale					
S_{oj} (%)						
S_{wj} (%)						
S_{gj} (%)						
Permeability to air (md)						
RESERVOIR FLUID PROPERTIES						
Oil:						
Oil gravity (°API)	34-38					
Sulfur content (% by wt.)						
Initial solution GOR (SCF/STB)						
Initial oil FVF (RB/STB)						
Bubble point press. (psia)						
Viscosity (cp) @ °F						
Gas:						
Specific gravity (air = 1.0)						
Heating value (Btu/cu. ft.)						
Water:						
Salinity, NaCl (ppm)	5,992					
T.D.S. (ppm)						
R_w (ohm/m) (77°F)						
ENHANCED RECOVERY PROJECTS						
Enhanced recovery projects						
Date started						
Date discontinued						
Peak oil production (bbl)	111,098					
Year	1984					
Peak gas production, net (Mcf)	61,424					
Year	1984					

Base of fresh water (ft.): None

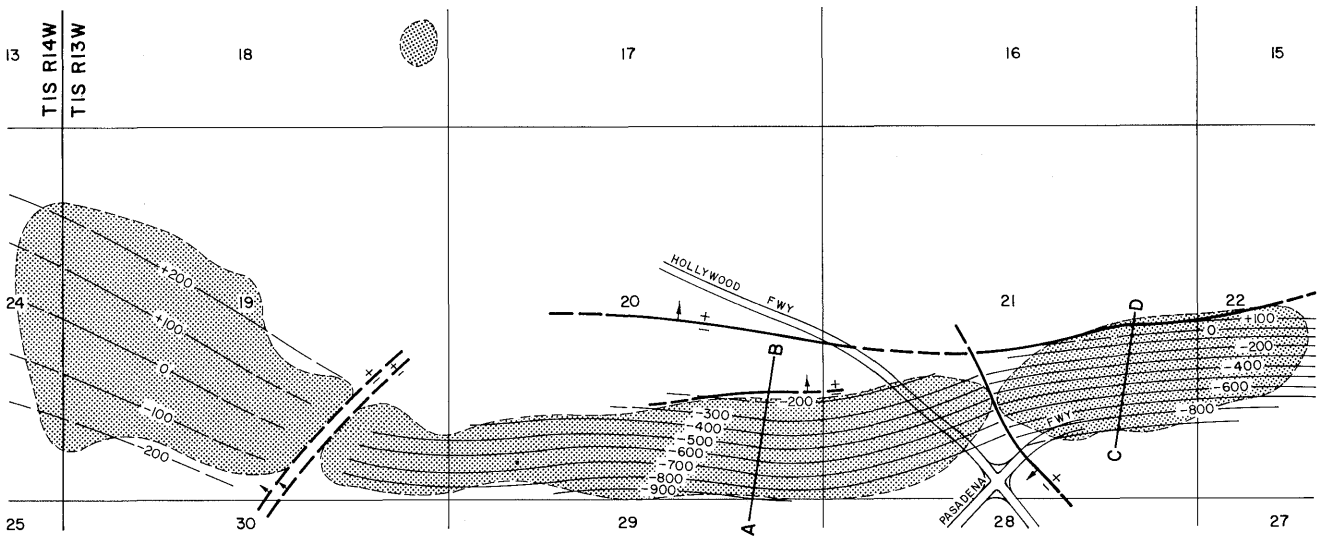
Remarks: The field was abandoned in 1977 and reactivated in 1982.
a/ Directional well; true vertical depth is 10,019 feet.

Selected References: Woodring, W.P., and M.N. Bramlette, 1950, Geology and Paleontology of the Santa Maria District: U.S. Geol. Survey Prof. Paper 222, p. 125.
Zulberti, J.L., 1972, Operations in District No. 3: Calif. Div. of Oil and Gas, Summary of Operations--Calif. Oil Fields, Vol. 58, No. 2.

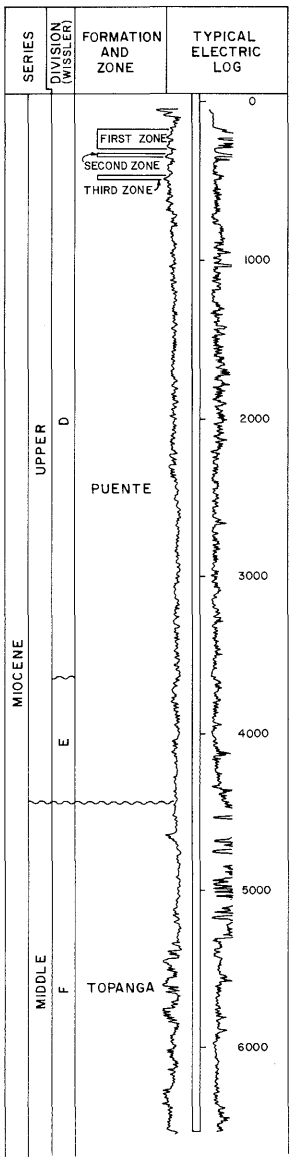
DATE: January 1989 **Estimated value

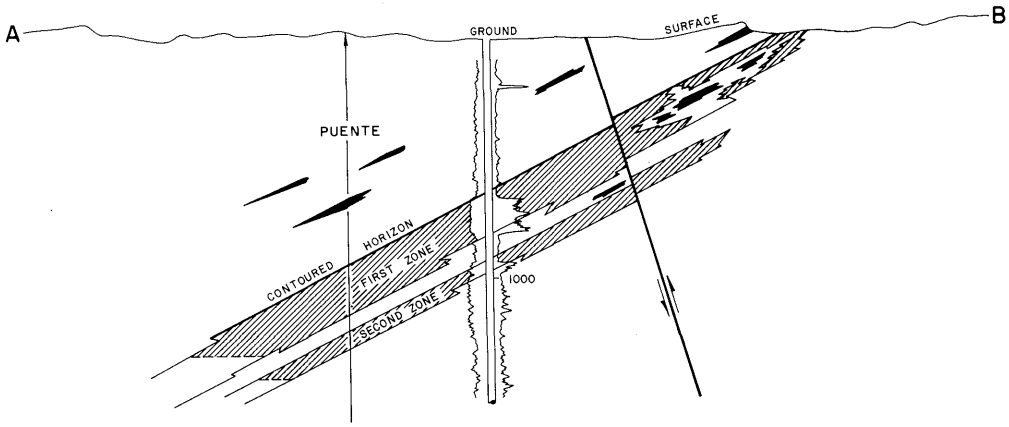
CALIFORNIA DIVISION OF OIL AND GAS

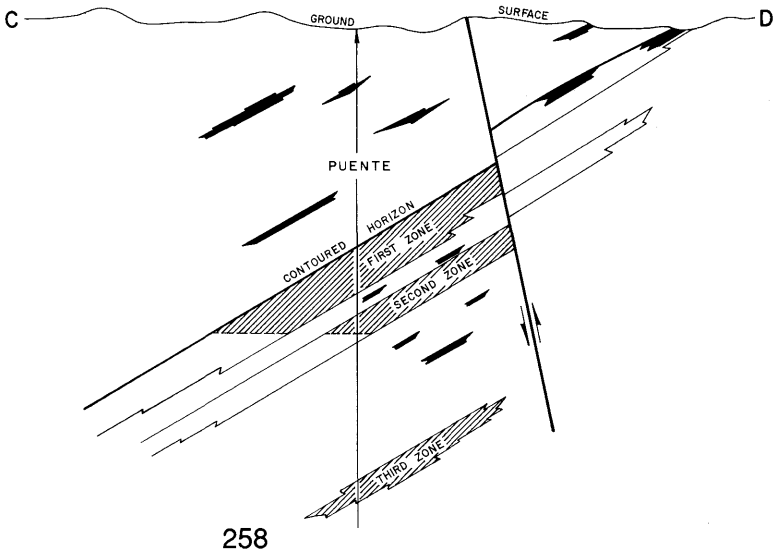
LOS ANGELES CITY OIL FIELD



CONTOURS ON TOP OF FIRST ZONE







COUNTY: LOS ANGELES

LOS ANGELES CITY 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	Maltman Oil Co. "Maltman" 1	Same as present	19 1S 13W	SB	unknown	First	
Deepest well	Ventura Oil Co. "L.A. Brick" 1	Seaboard Oil Co. of Delaware "L.A. Brick" 1	21 1S 13W	SB	7,505		Topanga middle Miocene

POOL DATA

ITEM	FIRST	SECOND	THIRD			FIELD OR AREA DATA
Discovery date	About 1890	unknown	unknown			
Initial production rates						
Oil (bbl/day)	2	-	-			
Gas (Mcf/day)	0	-	-			
Flow pressure (psi)						
Bean size (in.)						
Initial reservoir pressure (psi)						
Reservoir temperature (°F)						
Initial oil content (STB/ac.-ft.)						
Initial gas content (MSCF/ac.-ft.)						
Formation	Puente	Puente	Puente			
Geologic age	late Miocene	late Miocene	late Miocene			
Average depth (ft.)	900	1,100	1,500			
Average net thickness (ft.)	125	30	30			
Maximum productive area (acres)						780
RESERVOIR ROCK PROPERTIES						
Porosity (%)	34*	34*	-			
So_i (%)						
Sw_i (%)						
Sg_i (%)						
Permeability to air (md)						
RESERVOIR FLUID PROPERTIES						
Oil:						
Oil gravity (°API)	18-20	12-16	14			
Sulfur content (% by wt.)						
Initial solution GOR (SCF/STB)						
Initial oil FVF (RB/STB)						
Bubble point press. (psia)						
Viscosity (cp) @ °F						
Gas:						
Specific gravity (air = 1.0)						
Heating value (Btu/cu. ft.)						
Water:						
Salinity, NaCl (ppm)	1,000	3,300	3,400			
T.D.S. (ppm)						
R_w (ohm/m) (77°F)						
ENHANCED RECOVERY PROJECTS						
Enhanced recovery projects						
Date started						
Date discontinued						
Peak oil production (bbl)						1,830,000
Year						1901
Peak gas production, net (Mcf)						
Year						

Base of fresh water (ft.): 150

Remarks: The first known well was dug by hand and was known locally as the Dryden well. It produced heavy oil for several years. Predating the arrival of the pioneers, Native Americans commonly made use of asphaltum to tar canoe bottoms and waterproof containers.

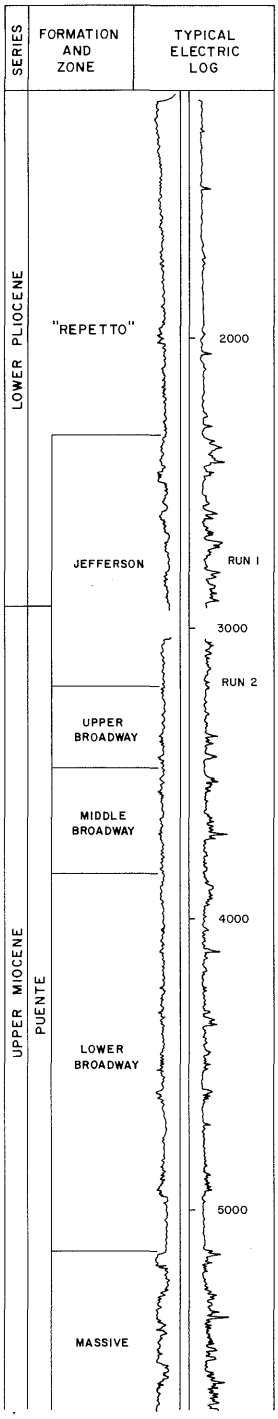
Selected References:

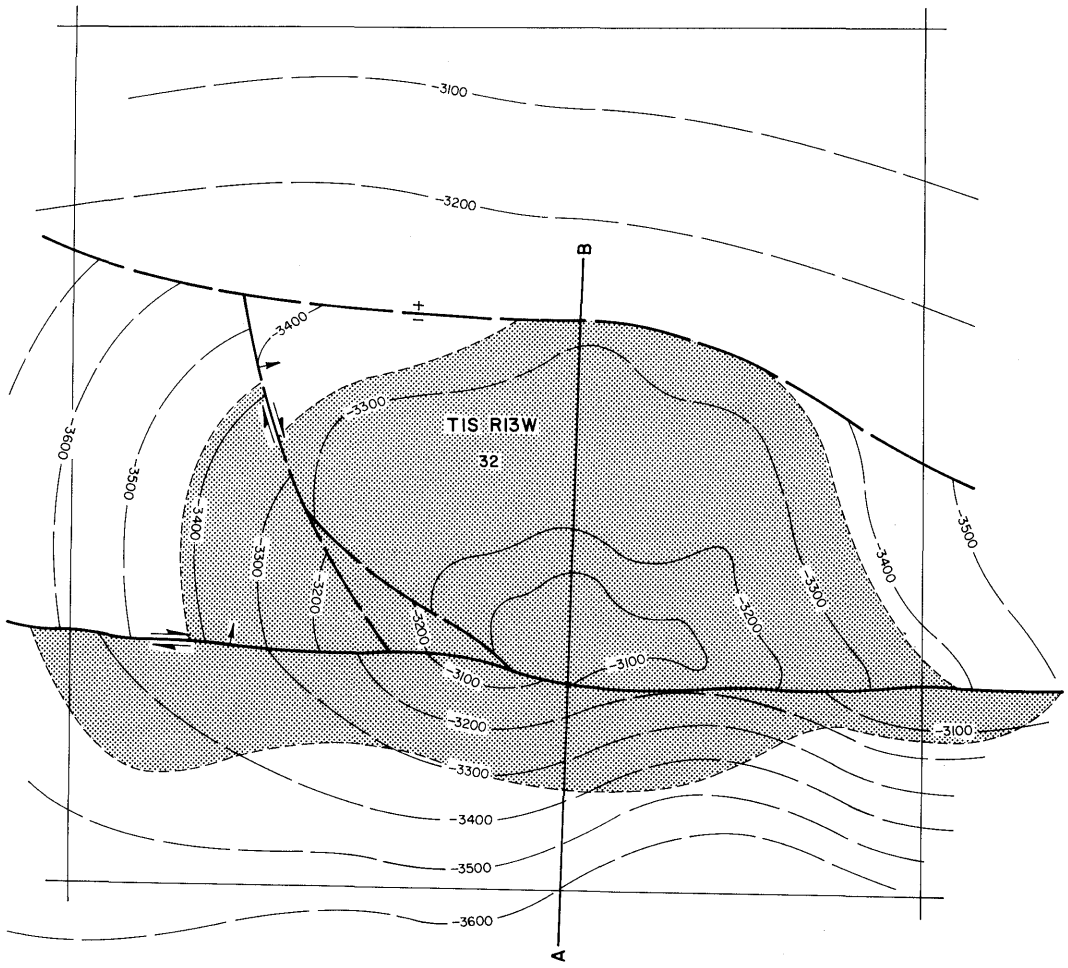
Crowder, R.E., 1961, Los Angeles City Oil Field: Calif. Div. of Oil and Gas, Summary of Operations--Calif. Oil Fields., Vol. 47, No. 1
Eldridge, G.H. and R. Arnold, 1907, U.S. Geological Survey Bull. 309.
McLaughlin, R.P., 1914, Petroleum Industry of California: Calif. State Mining Bureau Bull. 69.
Soper, E.K., 1943, Los Angeles City Oil Field: Geologic Formations and Economic Development of California: State Div. of Mines Bull. 118.
Watts, W.L., 1896, Calif. State Mining Bureau Bull. 11.
Watts, E.L., 1900, Oil and Gas Yielding Formations of California: Calif. State Mining Bureau Bull. 19.

DATE: July 1983 *Average value

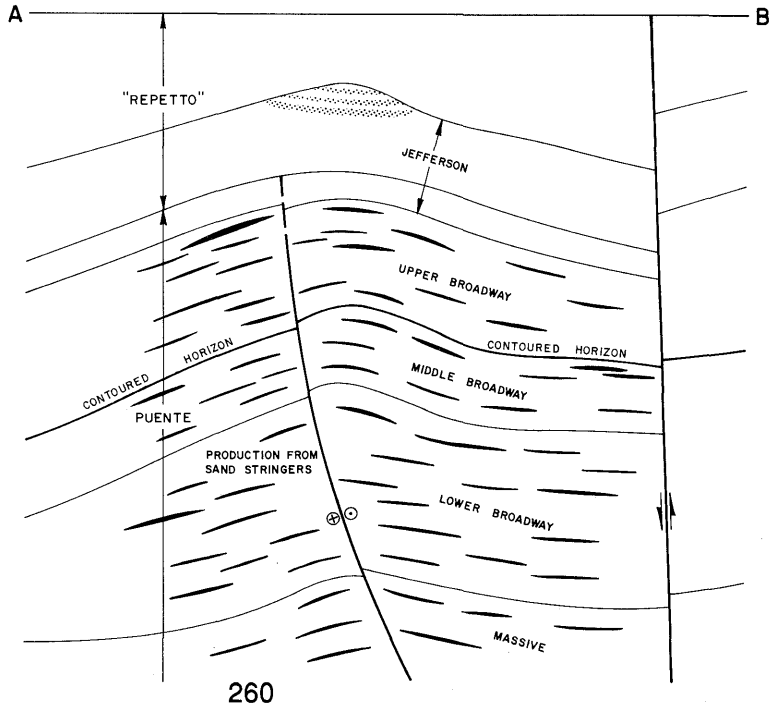
CALIFORNIA DIVISION OF OIL AND GAS

LOS ANGELES DOWNTOWN OIL FIELD





CONTOURS ON TOP OF MIDDLE BROADWAY



COUNTY: LOS ANGELES

LOS ANGELES DOWNTOWN 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	Chevron U.S.A. Inc. "LA Unit Venice Community" 1	Standard Oil Co. of Calif. "Venice Community" 1	32 1S 13W	SB	5,295	Lower Broadway	
Deepest well	Chevron U.S.A. Inc. "Spring" 2	Standard Oil Co. of Calif. "Spring" 2	32 1S 13W	SB	8,510		Puente late Miocene

POOL DATA

ITEM	JEFFERSON (GAS) a/	UPPER BROADWAY	MIDDLE BROADWAY	LOWER BROADWAY	MASSIVE	FIELD OR AREA DATA
Discovery date	March 1969	March 1965	March 1965	March 1965	May 1965	
Initial production rates						
Oil (bbl/day)	0	106	-	320	135	
Gas (Mcf/day)	1,169	248	-	264	490	
Flow pressure (psi)						
Bean size (in.)						
Initial reservoir pressure (psi)	-	1,590b/	b/	b/	2,078	
Reservoir temperature (°F)	-	139	141	145	168	
Initial oil content (STB/ac.-ft.)						
Initial gas content (MSCF/ac.-ft.)	-	1,150c/	c/	c/	c/	
Formation	"Repetto"	Puente	Puente	Puente	Puente	
Geologic age	early Pliocene	late Miocene	late Miocene	late Miocene	late Miocene	
Average depth (ft.)	2,000	2,900	3,100	3,500	4,800	
Average net thickness (ft.)	40	200	400	1,300	1,100	
Maximum productive area (acres)						210
RESERVOIR ROCK PROPERTIES						
Porosity (%)	-	30.00b/	b/	b/	0.23	
Soi (%)						
Swi (%)	-	40.00b/	b/	b/	0.53	
Sgi (%)						
Permeability to air (md)	-	179c/	c/	c/	c/	
RESERVOIR FLUID PROPERTIES						
Oil:						
Oil gravity (°API)	-	29	34	37	35	
Sulfur content (% by wt.)	-	-	1,578	-	1,578	
Initial solution GOR (SCF/STB)	-	689c/	c/	c/	c/	
Initial oil FVF (RB/STB)	-	1.394c/	c/	c/	c/	
Bubble point press. (psia)						
Viscosity (cp) @ °F	-	0.447 @ 128c/	c/	c/	c/	
Gas:						
Specific gravity (air = 1.0)	-	0.7571c/	c/	c/	c/	
Heating value (Btu/cu. ft.)	-	1,340c/	c/	c/	c/	
Water:						
Salinity, NaCl (ppm)	14,721	23,452	23,452	23,452	23,452	
T.D.S. (ppm)	-	-	-	24,876	-	
R_w (ohm/m) (77°F)	-	-	-	26.9	-	
ENHANCED RECOVERY PROJECTS						
Enhanced recovery projects		waterflood	waterflood	waterflood	waterflood	
Date started		1966	1966	1966	1966	
Date discontinued		1973	1973	1973	1973	
Peak oil production (bbl)						1,687,957
Year						1967
Peak gas production, net (Mcf)						2,447,481
Year						1967

Base of fresh water (ft.): 300

Remarks: a/ Ceased production in 1981; cumulative dry gas production is 1,469,000 Mcf; proved acreage (1973) 10 acres.

b/ Upper Broadway information includes the Middle & Lower Broadway pools.

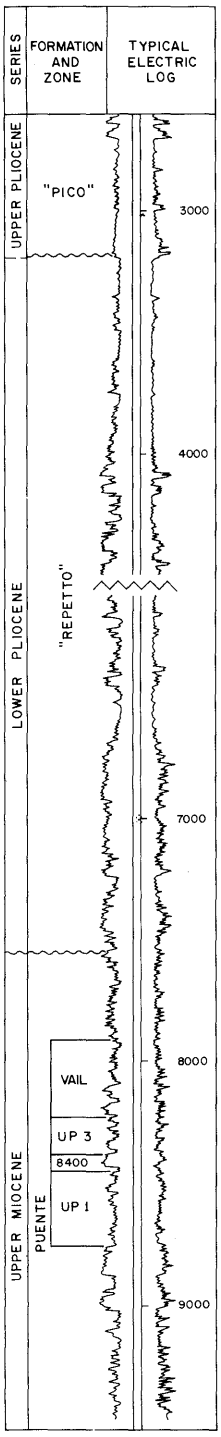
c/ Upper Broadway information includes the Middle & Lower Broadway & Massive pools.

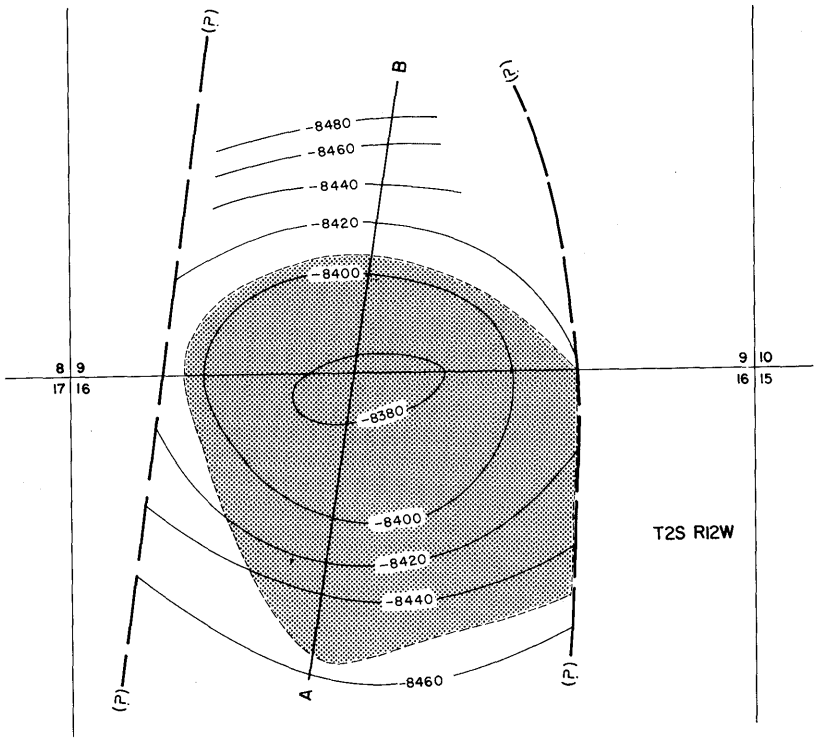
Selected References:

DATE: January 1989

CALIFORNIA DIVISION OF OIL AND GAS

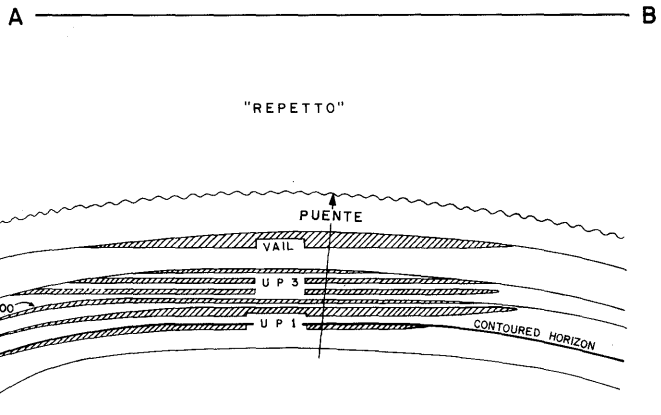
EAST LOS ANGELES OIL FIELD





CONTOURS ON TOP OF UP 1 ZONE

SCALE: 1" = 1500'



COUNTY: LOS ANGELES

LOS ANGELES, EAST, 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	Western Avenue Properties "U.P. Unit" 1	Richfield Oil Corp. "U.P. Unit" 1	9 2S 12W	SB	9,629	U.P. 1	Puente late Miocene
Deepest well	Same as above	"	"	"	"	"	"

POOL DATA

ITEM	VAIL	U.P. 3	8400	U.P. 1		FIELD OR AREA DATA
Discovery date	February 1946	January 1947	January 1947	February 1946		
Initial production rates						
Oil (bbl/day)	405	235a/	235a/	239		
Gas (Mcf/day)	4,320	81	81	1,050		
Flow pressure (psi)	350	1,075	1,075	500		
Bean size (in.)	24/64	13/64 x 2	13/64 x 2	1 1/2		
Initial reservoir pressure (psi)	-	165	165	-		
Reservoir temperature (°F)						
Initial oil content (STB/ac.-ft.)						
Initial gas content (MSCF/ac.-ft.)						
Formation	Puente	Puente	Puente	Puente		
Geologic age	late Miocene	late Miocene	late Miocene	late Miocene		
Average depth (ft.)	8,100	8,400	8,500	8,560		
Average net thickness (ft.)	18	28	12	23		
Maximum productive area (acres)						125
RESERVOIR ROCK PROPERTIES						
Porosity (%)	18-22b/	18-22b/	18-22b/	18-22b/		
Soi (%)						
Swi (%)						
Sgi (%)						
Permeability to air (md)	40-1,500b/	b/	b/	b/		
RESERVOIR FLUID PROPERTIES						
Oil:						
Oil gravity (°API)	33-36b/	33-36b/	33-36b/	33-36b/		
Sulfur content (% by wt.)						
Initial solution GOR (SCF/STB)						
Initial oil FVF (RB/STB)						
Bubble point press. (psia)						
Viscosity (cp) @ °F						
Gas:						
Specific gravity (air = 1.0)						
Heating value (Btu/cu. ft.)						
Water:						
Salinity, NaCl (ppm)	23,109	23,109	23,965	23,965		
T.D.S. (ppm)						
R_w (ohm/m) (77°F)						
ENHANCED RECOVERY PROJECTS						
Enhanced recovery projects						
Date started						
Date discontinued						
Peak oil production (bbl)						562,038
Year						1950
Peak gas production, net (Mcf)						442,680
Year						1950

Base of fresh water (ft.): 2,000

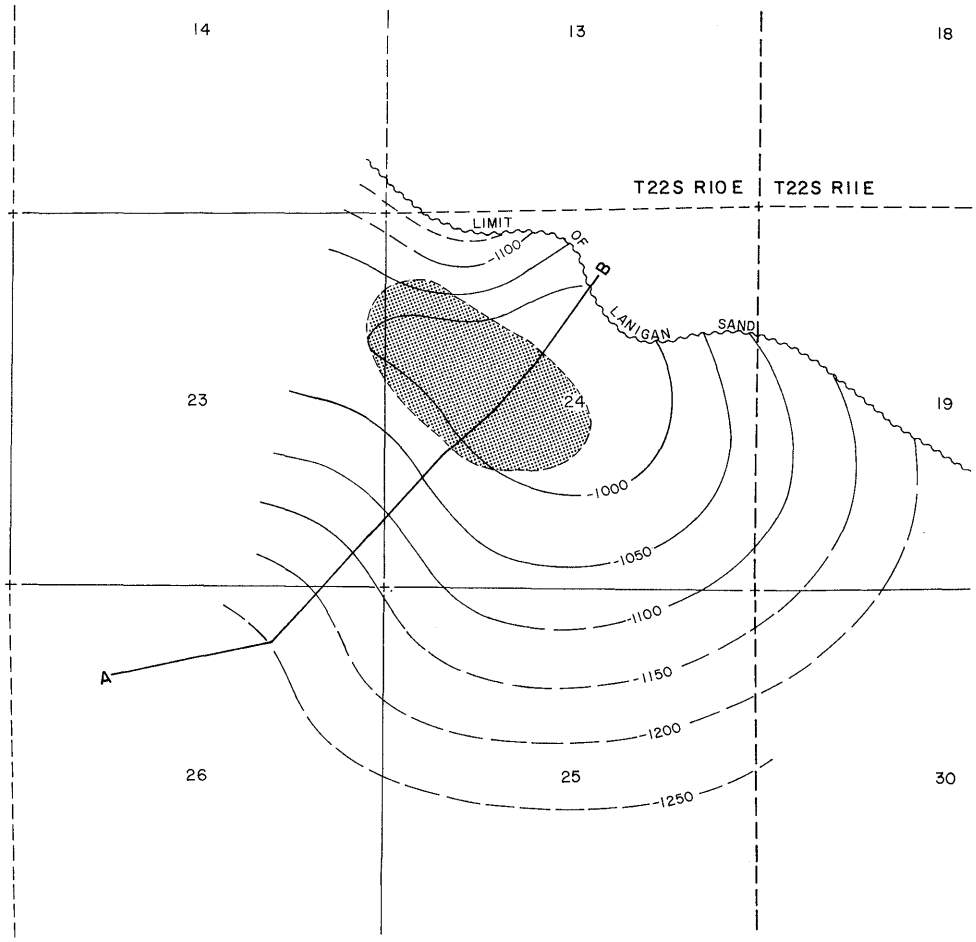
Remarks: a/ U.P. 3 and 8400 production commingled.
b/ Data include U.P. 3, 8400, & U.P. 1 pools.

Selected References: Winterburn, R., 1952, East Los Angeles Field: Calif. Div. of Oil and Gas, Summary of Operations -- Calif. Oil Fields, Vol. 38, No. 1.

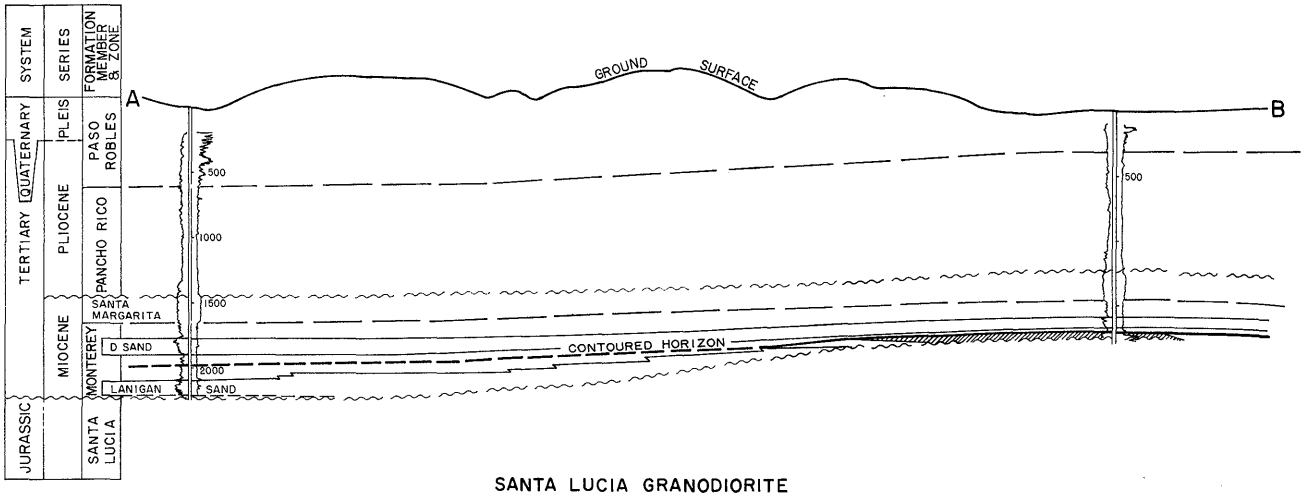
DATE: June 1983

CALIFORNIA DIVISION OF OIL AND GAS

LYNCH CANYON OIL FIELD



CONTOURS ON TOP OF LANIGAN "OIL" SAND AND EQUIVALENT HORIZON



SANTA LUCIA GRANODIORITE

COUNTY: MONTEREY

LYNCH CANYON 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	Mobil Oil Corp. "Lanigan" 172	Moriqui Exploration Co. "Lanigan" 172	24 22S 10E	MD	1,745	Lanigan	-
Deepest well	Texaco Inc. "Lanigan Core Hole" 1	Same as present	24 22S 10E	MD	2,385		Santa Lucia granodiorite Cretaceous

POOL DATA

ITEM	LANIGAN					FIELD OR AREA DATA
Discovery date	September 1962					
Initial production rates						
Oil (bbl/day)	41					
Gas (Mcf/day)						
Flow pressure (psi)						
Bean size (in.)						
Initial reservoir pressure (psi)	675					
Reservoir temperature (°F)	104					
Initial oil content (STB/ac.-ft.)	1,800					
Initial gas content (MSCF/ac.-ft.)						
Formation	Monterey					
Geologic age	Miocene					
Average depth (ft.)	1,800					
Average net thickness (ft.)	55					
Maximum productive area (acres)	140					
RESERVOIR ROCK PROPERTIES						
Porosity (%)	26-42					
S_{oi} (%)	70					
S_{wi} (%)	30					
S_{gi} (%)						
Permeability to air (md)	1,700-6,000					
RESERVOIR FLUID PROPERTIES						
Oil:						
Oil gravity (°API)	10-12					
Sulfur content (% by wt.)						
Initial solution GOR (SCF/STB)						
Initial oil FVF (RB/STB)	1.03					
Bubble point press. (psia)						
Viscosity (cp) @ °F	9,000 @ 104					
Gas:						
Specific gravity (air = 1.0)						
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	air injection					
Date started	1967					
Date discontinued	1967					
	cyclic steam					
	1964					
	1967					
Peak oil production (bbl)	45,779					
Year	1964					
Peak gas production, net (Mcf)						
Year						

Base of fresh water (ft.): 400

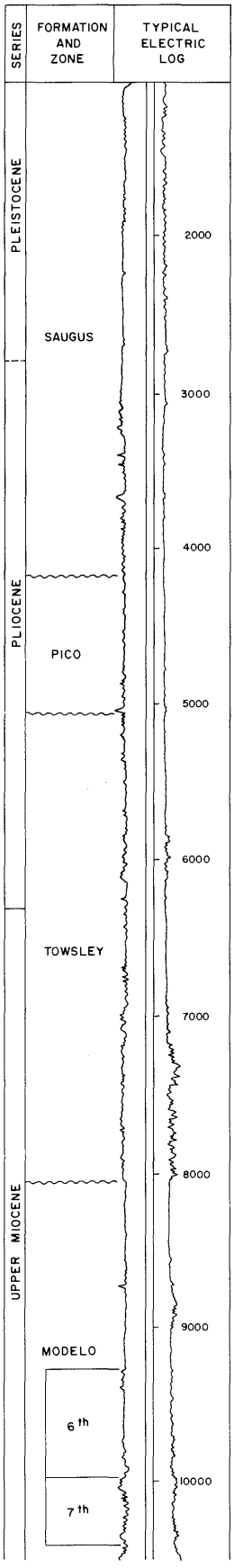
Remarks: The field was abandoned in 1968 and reactivated in 1979. Last production was in 1979.

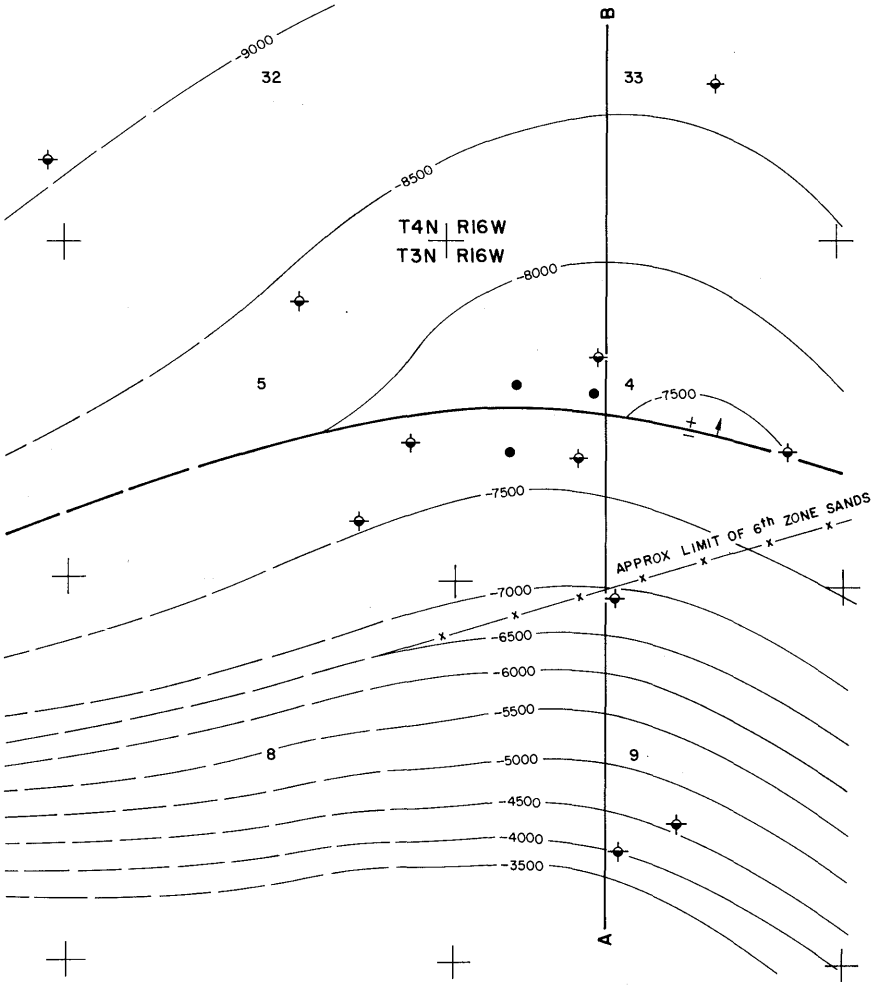
Selected References: Gribi, E.A., Jr., 1963, Lynch Canyon Oil Field, Monterey County, Calif.: A.A.P.G. - S.E.P.M. Guidebook to the Geology of the Salinas Valley and the San Andreas Fault, p. 73.
Hart, E.W., 1963, Mines and Mineral Resources of Monterey County, Calif.: Calif. Div. of Mines and Geology, County Report No. 5, p. 76.
Wilkinson, E.R., 1964, Lynch Canyon Oil Field: Calif. Div. of Oil and Gas, Summary of Operations--Calif. Oil Fields, Vol. 50, No. 2.

DATE: January 1989

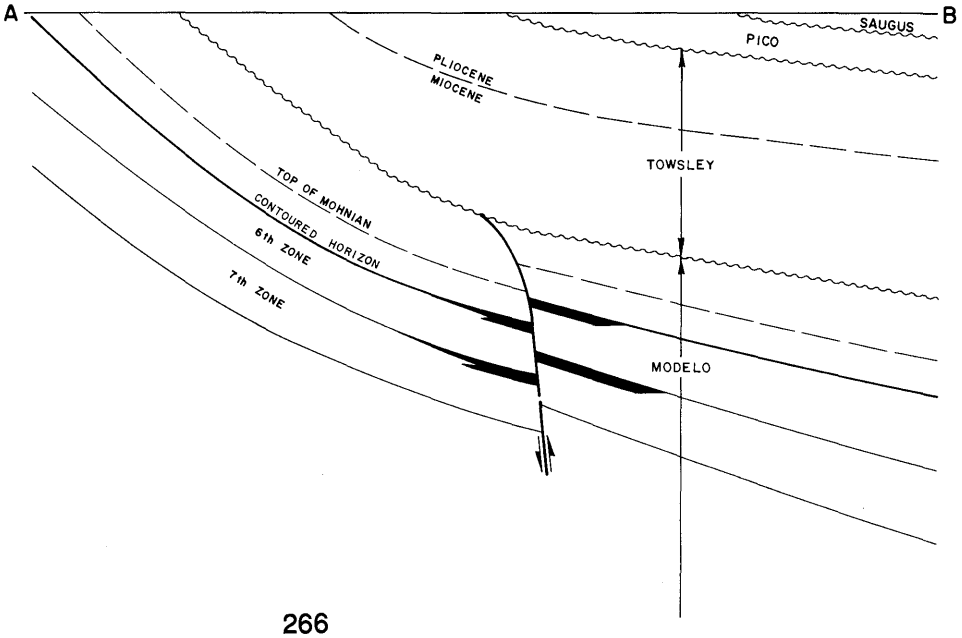
CALIFORNIA DIVISION OF OIL AND GAS

LYON CANYON OIL FIELD
(Abandoned)





CONTOURS ON TOP OF 6th ZONE



COUNTY: LOS ANGELES

LYON CANYON OIL FIELD (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	Lyon Canyon Oil Corporation 35X-4	Arrowhead Exploration Co. 35X-4	4 3N 16W	SB	10,930	Seventh	Modelo Miocene
Deepest well	Same as above	"	"	"	"	"	"

POOL DATA

ITEM	SIXTH	SEVENTH				FIELD OR AREA DATA
Discovery date	January 1970	March 1969				
Initial production rates						
Oil (bbl/day)	100	475				
Gas (Mcf/day)	160	2,100				
Flow pressure (psi)						
Bean size (in.)						
Initial reservoir pressure (psi)						
Reservoir temperature (°F)						
Initial oil content (STB/ac.-ft.)						
Initial gas content (MSCF/ac.-ft.)						
Formation	Modelo	Modelo				
Geologic age	Miocene	Miocene				
Average depth (ft.)	9,130	9,775				
Average net thickness (ft.)	570	750				
Maximum productive area (acres)						30
RESERVOIR ROCK PROPERTIES						
Porosity (%)						
S_{oi} (%)						
S_{wi} (%)						
S_{gi} (%)						
Permeability to air (md)						
RESERVOIR FLUID PROPERTIES						
Oil:						
Oil gravity (°API)	35	33				
Sulfur content (% by wt.)						
Initial solution GOR (SCF/STB)						
Initial oil FVF (RB/STB)						
Bubble point press. (psia)						
Viscosity (cp) @ °F						
Gas:						
Specific gravity (air = 1.0)						
Heating value (Btu/cu. ft.)						
Water:						
Salinity, NaCl (ppm)	21,400	21,900				
T.D.S. (ppm)						
R_w (ohm/m) (77°F)						
ENHANCED RECOVERY PROJECTS						
Enhanced recovery projects						
Date started						
Date discontinued						
Peak oil production (bbl)						109,014
Year						1969
Peak gas production, net (Mcf)						168,834
Year						1969

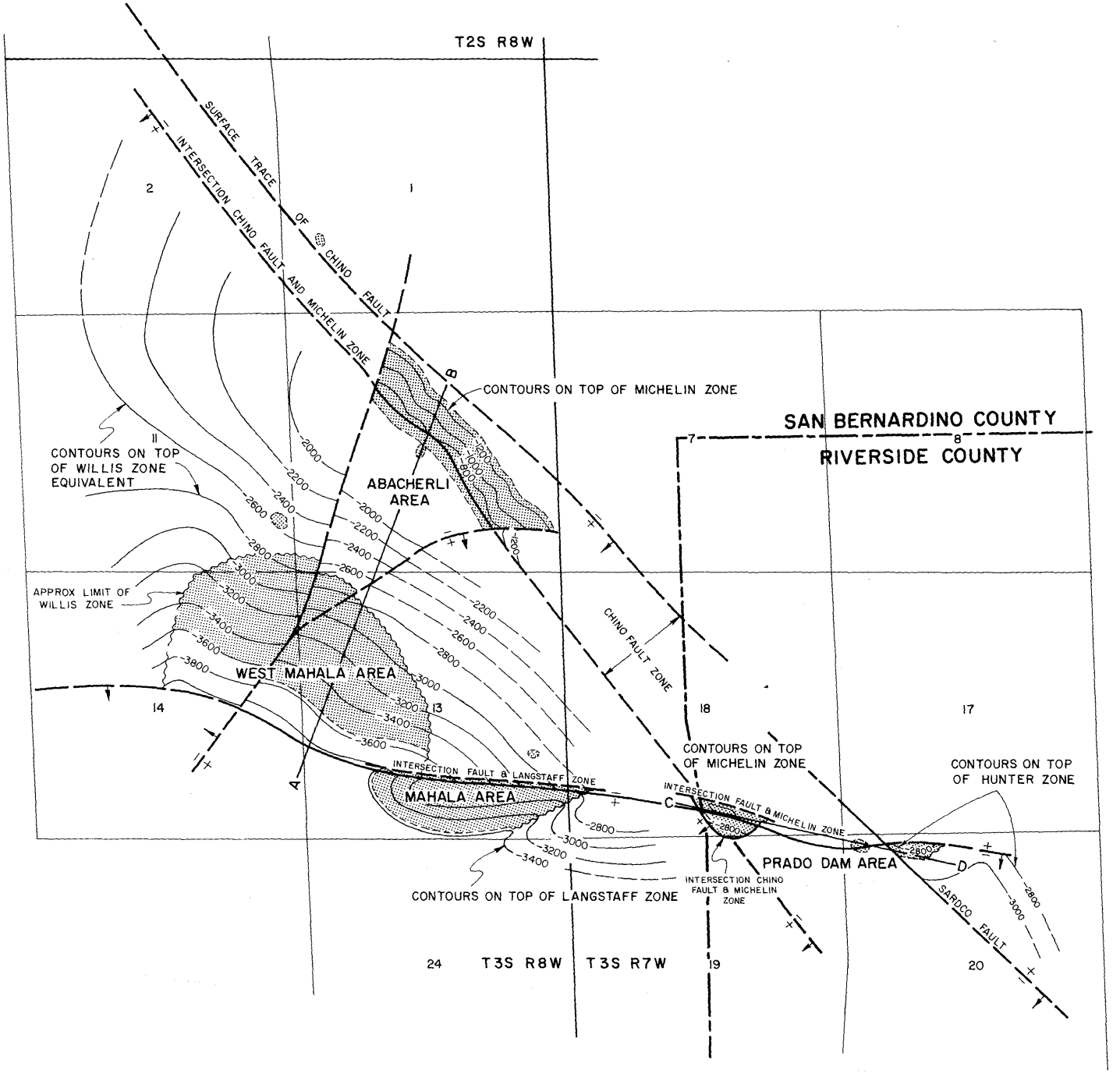
Base of fresh water (ft.): 2,500

Remarks: The field last produced in November 1985 and was abandoned in March 1986. Cumulative production is 314,719 bbl of oil and 334,121 Mcf of gas.

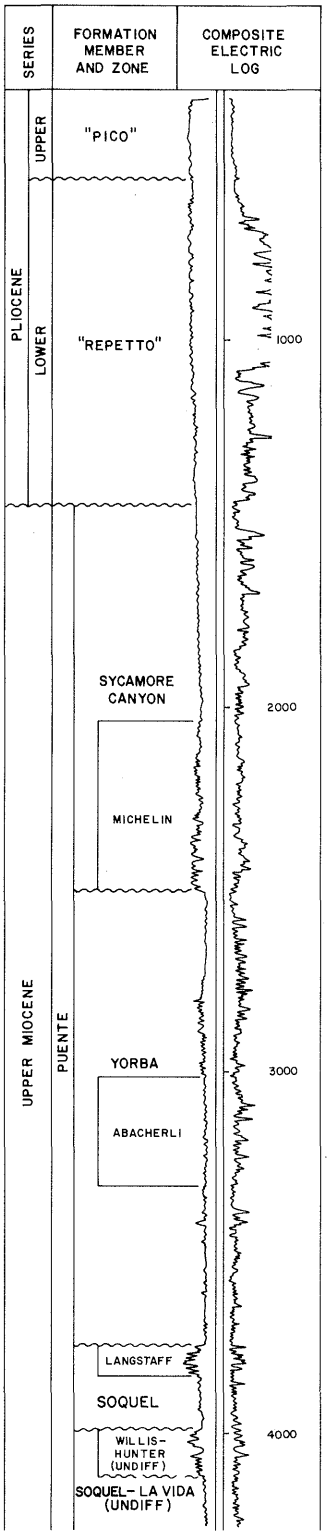
Selected References: Stockton, A.D., 1974, Lyon Canyon Oil Field: Calif. Div. of Oil and Gas, Summary of Operations -- Calif. Oil Fields, Vol. 59, No. 1.

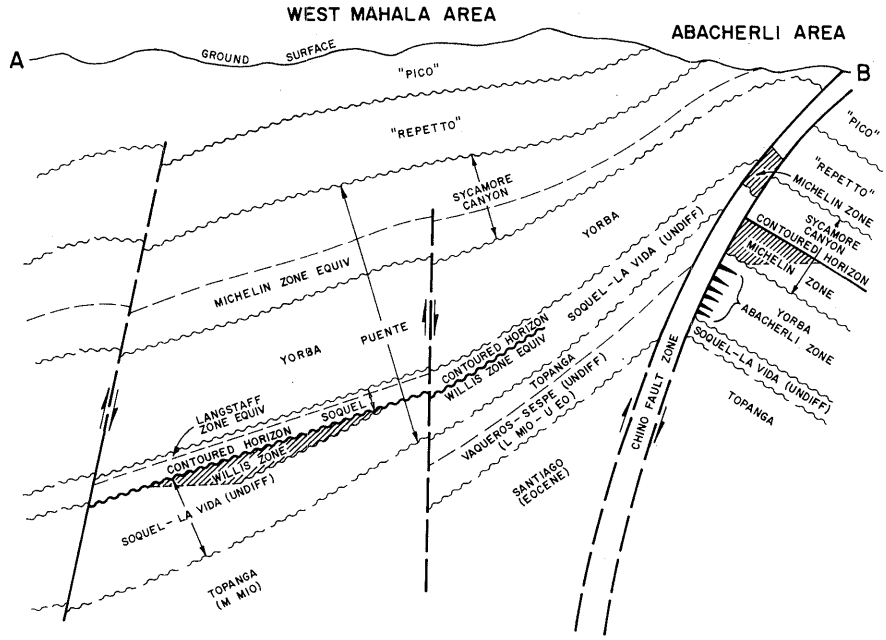
DATE: March 1986

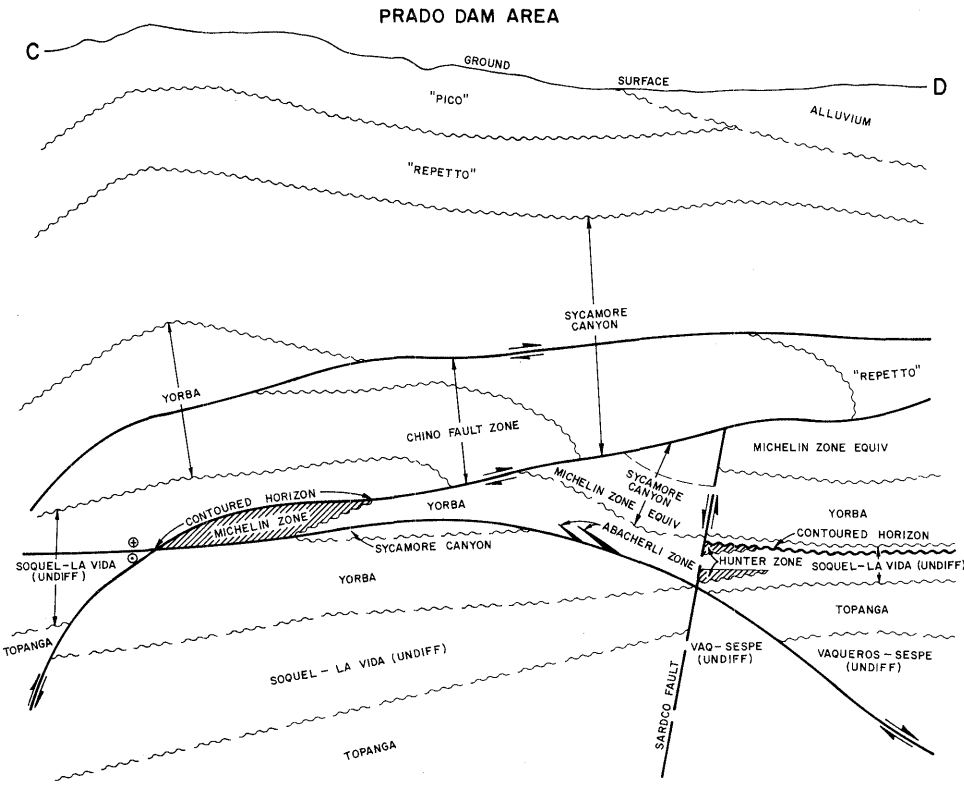
CALIFORNIA DIVISION OF OIL AND GAS


T2S R8W
SURFACE TRACE OF CHINO FAULT
INTERSECTION CHINO FAULT AND MICHELIN ZONE
CONTOURS ON TOP OF MICHELIN ZONE
SAN BERNARDINO COUNTY
RIVERSIDE COUNTY
CONTOURS ON TOP OF WILLIS ZONE EQUIVALENT
ABACHERLI AREA
APPROX LIMIT OF WILLIS ZONE
WEST MAHALA AREA
CHINO FAULT ZONE
MAHALA AREA
INTERSECTION FAULT & LANGSTAFF ZONE
CONTOURS ON TOP OF MICHELIN ZONE
CONTOURS ON TOP OF HUNTER ZONE
INTERSECTION FAULT & MICHELIN ZONE
PRADO DAM AREA
SARDCO FAULT
INTERSECTION CHINO FAULT & MICHELIN ZONE
CONTOURS ON TOP OF LANGSTAFF ZONE
T3S R8W
T3S R7W

MAHALA OIL FIELD







COUNTY: SAN BERNARDINO AND RIVERSIDE

MAHALA 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	California-Time Petroleum Inc. "Mahala" 1	Mahala Oil and Gas Co. No. 1	12 3S 8W	SB	4,217	Abacherli	
Deepest well	Jade Oil & Gas Co. "Scott" 7	L.H. Scott Co., Inc. "Scott" 7	18 3S 7W	SB	5,416		Topanga middle Miocene

POOL DATA

ITEM	ABACHERLI					FIELD OR AREA DATA
Discovery date	October 1921					
Initial production rates						
Oil (bbl/day)	11					
Gas (Mcf/day)						
Flow pressure (psi)						
Bean size (in.)						
Initial reservoir pressure (psi)						
Reservoir temperature (°F)	135					
Initial oil content (STB/ac.-ft.)						
Initial gas content (MSCF/ac.-ft.)						
Formation	Puente					
Geologic age	late Miocene					
Average depth (ft.)	3,700-3,900					
Average net thickness (ft.)	400					
Maximum productive area (acres)						350
RESERVOIR ROCK PROPERTIES						
Porosity (%)	30					
S_{oi} (%)						
S_{wi} (%)						
S_{gi} (%)						
Permeability to air (md)						
RESERVOIR FLUID PROPERTIES						
Oil:						
Oil gravity (°API)	23-25					
Sulfur content (% by wt.)						
Initial solution GOR (SCF/STB)						
Initial oil FVF (RB/STB)						
Bubble point press. (psia)						
Viscosity (cp) @ °F						
Gas:						
Specific gravity (air = 1.0)						
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						
Date started						
Date discontinued						
Peak oil production (bbl)						547,099
Year						1970
Peak gas production, net (Mcf)						258,775
Year						1971

Base of fresh water (ft.): See areas

Remarks: See areas

Selected References: Durham, D.L., and R.F. Yerkes, 1964, Geology and Oil Resources of the Eastern Puente Hills Area, Southern California, in Geology of the Eastern Los Angeles Basin, Southern California: U.S. Geol. Survey Prof. Paper 420-B.

Gray, C.H. Jr., 1961, Geology of the Corona South Quadrangle and the Santa Ana Narrows Area, Riverside, Orange and San Bernardino Counties, California: Calif. Div. of Mines Bull. 178.

DATE: July 1983

CALIFORNIA DIVISION OF OIL AND GAS

COUNTY: SAN BERNARDINO

MAHALA OIL FIELD
ABACHERLI 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	Hathaway Co. "Abacherli" 1	Western Gulf Oil Co. "Abacherli" 1	12 3S 8W	SB	3,267	Abacherli	
Deepest well	Mahala Oil & Gas Co. No. 2	same as present	13 3S 8W	SB	5,080		Topanga middle Miocene

POOL DATA

ITEM	MICHELIN	ABACHERLI				FIELD OR AREA DATA
Discovery date	June 1955	May 1931				
Initial production rates						
Oil (bbl/day)	194	65				
Gas (Mcf/day)	30	-				
Flow pressure (psi)	50	-				
Bean size (in.)						
Initial reservoir pressure (psi)						
Reservoir temperature (°F)						
Initial oil content (STB/ac.-ft.)						
Initial gas content (MSCF/ac.-ft.)						
Formation	Puente	Puente				
Geologic age	late Miocene	late Miocene				
Average depth (ft.)	1,000-1,700***	2,500				
Average net thickness (ft.)	250-400***	600				
Maximum productive area (acres)						95
RESERVOIR ROCK PROPERTIES						
Porosity (%)	28-32***	30***				
So_i (%)						
Sw_i (%)						
Sg_i (%)						
Permeability to air (md)	300-1,000***	-				
RESERVOIR FLUID PROPERTIES						
Oil:						
Oil gravity (°API)	25-26***	14-23				
Sulfur content (% by wt.)						
Initial solution GOR (SCF/STB)						
Initial oil FVF (RB/STB)						
Bubble point press. (psia)						
Viscosity (cp) @ °F						
Gas:						
Specific gravity (air = 1.0)						
Heating value (Btu/cu. ft.)						
Water:						
Salinity, NaCl (ppm)	5,000					
T.D.S. (ppm)						
R_w (ohm/m) (77°F)						
ENHANCED RECOVERY PROJECTS						
Enhanced recovery projects						cyclic steam
Date started						1964
Date discontinued						1965
Peak oil production (bbl)						33,003
Year						1957
Peak gas production, net (Mcf)						
Year						

Base of fresh water (ft.): 1,000-1,500

Remarks: A cyclic-steam project was initiated in 1964 and terminated in 1965 after injecting 10,279 bbl of water-converted-to-steam into three wells.

Selected References: Gaede, V.F., and M. Dosch, 1955, Oil and Gas Development in San Bernardino County: Calif. Div. of Oil and Gas, Summary of Operations -- Calif. Oil Fields, Vol. 41, No. 2.

DATE: July 1983 *** Representative values for area, formation and depth

CALIFORNIA DIVISION OF OIL AND GAS

COUNTY: SAN BERNARDINO

MAHALA OIL FIELD
MAHALA 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	California-Time Petroleum, Inc. "Mahala" 1	Mahala Oil & Gas Co. No. 1	13 3S 8W	SB	4,217	Abacherli	
Deepest well	KMT Oil Co. Inc. "Franco-Langstaff" 57	Franco Western Oil Co. "Langstaff-Willis" 57A-13	13 3S 8W	SB	4,900		Puente late Miocene

POOL DATA

ITEM	ABACHERLI	LANGSTAFF	WILLIS			FIELD OR AREA DATA
Discovery date	October 1921	January 1962	March 1965			
Initial production rates						
Oil (bbl/day)	11	101	120			
Gas (Mcf/day)	-	100	-			
Flow pressure (psi)	-	50	-			
Bean size (in.)						
Initial reservoir pressure (psi)						
Reservoir temperature (°F)	135	140	145			
Initial oil content (STB/ac.-ft.)						
Initial gas content (MSCF/ac.-ft.)						
Formation	Puente	Puente	Puente			
Geologic age	late Miocene	late Miocene	late Miocene			
Average depth (ft.)	3,700-3,900	4,100	4,300-4,400			
Average net thickness (ft.)	400	50	25			
Maximum productive area (acres)						75
RESERVOIR ROCK PROPERTIES						
Porosity (%)	30	25	17-20			
So_i (%)						
Sw_i (%)						
Sg_i (%)	-	-	200			
Permeability to air (md)						
RESERVOIR FLUID PROPERTIES						
Oil:						
Oil gravity (°API)	25-25	24-26	24-26			
Sulfur content (% by wt.)						
Initial solution GOR (SCF/STB)						
Initial oil FVF (RB/STB)						
Bubble point press. (psia)						
Viscosity (cp) @ °F						
Gas:						
Specific gravity (air = 1.0)						
Heating value (Btu/cu. ft.)						
Water:						
Salinity, NaCl (ppm)	-	17,000	20,000			
T.D.S. (ppm)						
R_w (ohm/m) (77°F)						
ENHANCED RECOVERY PROJECTS						
Enhanced recovery projects						
Date started						
Date discontinued						
Peak oil production (bbl)						17,245
Year						1962
Peak gas production, net (Mcf)						
Year						

Base of fresh water (ft.): 2,300

Remarks:

Selected References: Olson, L.J., 1977, Mahala Oil Field and Vicinity, California Division of Oil and Gas publication No. TR18.

DATE: July 1983

CALIFORNIA DIVISION OF OIL AND GAS

COUNTY: SAN BERNARDINO

MAHALA OIL FIELD
MAHALA, WEST 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	Casex Co. "Abacherli" 1	M.J. Castro "Abacherli" 1	13 3S 8S	SB	4,603	Willis	
Deepest well	Casex Co. "Abacherli" 5	Fleet Exploration, Ltd. "Abacherli" 5	13 3S 8S	SB	5,112		Topanga middle Miocene

POOL DATA

ITEM	WILLIS					FIELD OR AREA DATA
Discovery date	April 1969					
Initial production rates						
Oil (bbl/day)	400					
Gas (Mcf/day)	100					
Flow pressure (psi)	150					
Bean size (in.)	18/64					
Initial reservoir pressure (psi)	1,800**					
Reservoir temperature (°F)	145					
Initial oil content (STB/ac.-ft.)						
Initial gas content (MSCF/ac.-ft.)						
Formation	Puente					
Geologic age	late Miocene					
Average depth (ft.)	4,000					
Average net thickness (ft.)	100					
Maximum productive area (acres)	135					
RESERVOIR ROCK PROPERTIES						
Porosity (%)	20-23					
So_i (%)						
Sw_i (%)						
Sg_i (%)						
Permeability to air (md)	200					
RESERVOIR FLUID PROPERTIES						
Oil:						
Oil gravity (°API)	31					
Sulfur content (% by wt.)						
Initial solution GOR (SCF/STB)	375					
Initial oil FVF (RB/STB)	1.21					
Bubble point press. (psia)						
Viscosity (cp) @ °F						
Gas:						
Specific gravity (air = 1.0)						
Heating value (Btu/cu. ft.)						
Water:						
Salinity, NaCl (ppm)	24,000					
T.D.S. (ppm)	24,000					
R_w (ohm/m) (77°F)	0.296					
ENHANCED RECOVERY PROJECTS						
Enhanced recovery projects	waterflood					
Date started	1973					
Date discontinued	active					
Peak oil production (bbl)	509,732					
Year	1970					
Peak gas production, net (Mcf)	250,499					
Year	1971					

Base of fresh water (ft.): 2,000

Remarks:

Selected References:

DATE: July 1983 **Estimated value

CALIFORNIA DIVISION OF OIL AND GAS

COUNTY: RIVERSIDE

MAHALA OIL FIELD
PRADO DAM 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	Macrate Oil Co. G-G 1	Lyle A. Garner "Gout. G-G" 1	20 3S 7W	SB	3,613	Abacherli	
Deepest well	Jade Oil & Gas Co. "Scott" 7	L.H. Scott Co., Inc. "Scott" 7	18 3S 7W	SB	5,416		Topanga middle Miocene

POOL DATA

ITEM	MICHELIN	ABACHERLI	HUNTER			FIELD OR AREA DATA
Discovery date	May 1957	March 1957	December 1960			
Initial production rates						
Oil (bbl/day)	125	12	190			
Gas (Mcf/day)	40	0	100			
Flow pressure (psi)	20	20	250			
Bean size (in.)						
Initial reservoir pressure (psi)						
Reservoir temperature (°F)						
Initial oil content (STB/ac.-ft.)						
Initial gas content (MSCF/ac.-ft.)						
Formation	Puente	Puente	Puente			
Geologic age	late Miocene	late Miocene	late Miocene			
Average depth (ft.)	3,500	3,500	3,400			
Average net thickness (ft.)	250	100	50			
Maximum productive area (acres)						45
RESERVOIR ROCK PROPERTIES						
Porosity (%)						
S_{oi} (%)						
S_{wi} (%)						
S_{gi} (%)						
Permeability to air (md)						
RESERVOIR FLUID PROPERTIES						
Oil:						
Oil gravity (°API)	20	22	27			
Sulfur content (% by wt.)						
Initial solution GOR (SCF/STB)						
Initial oil FVF (RB/STB)						
Bubble point press. (psia)						
Viscosity (cp) @ °F						
Gas:						
Specific gravity (air = 1.0)						
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						
Date started						
Date discontinued						
Peak oil production (bbl)						4,786
Year						1961
Peak gas production, net (Mcf)						
Year						

Base of fresh water (ft.): 800-2,000

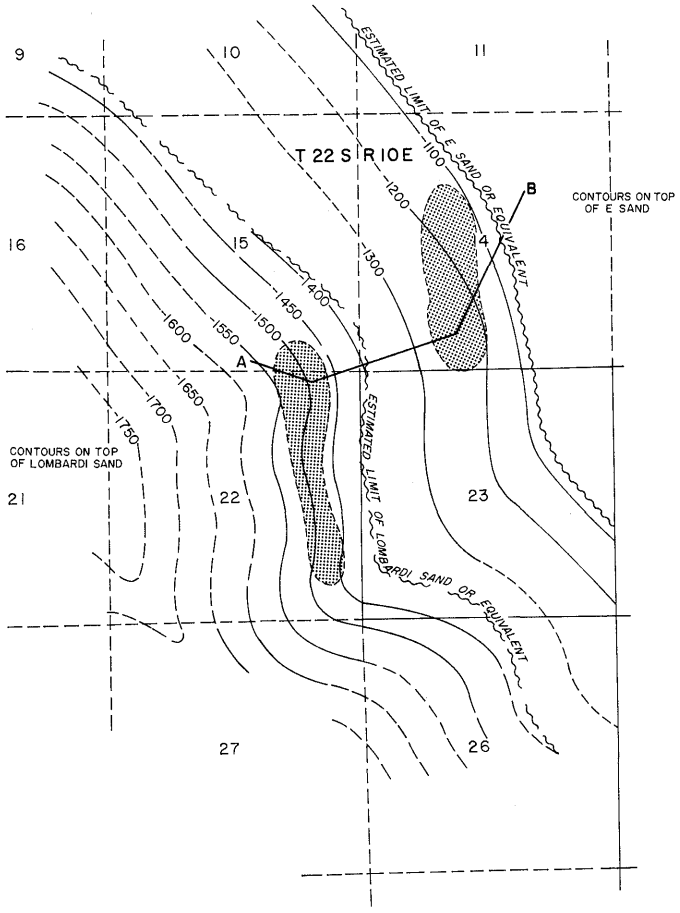
Remarks:

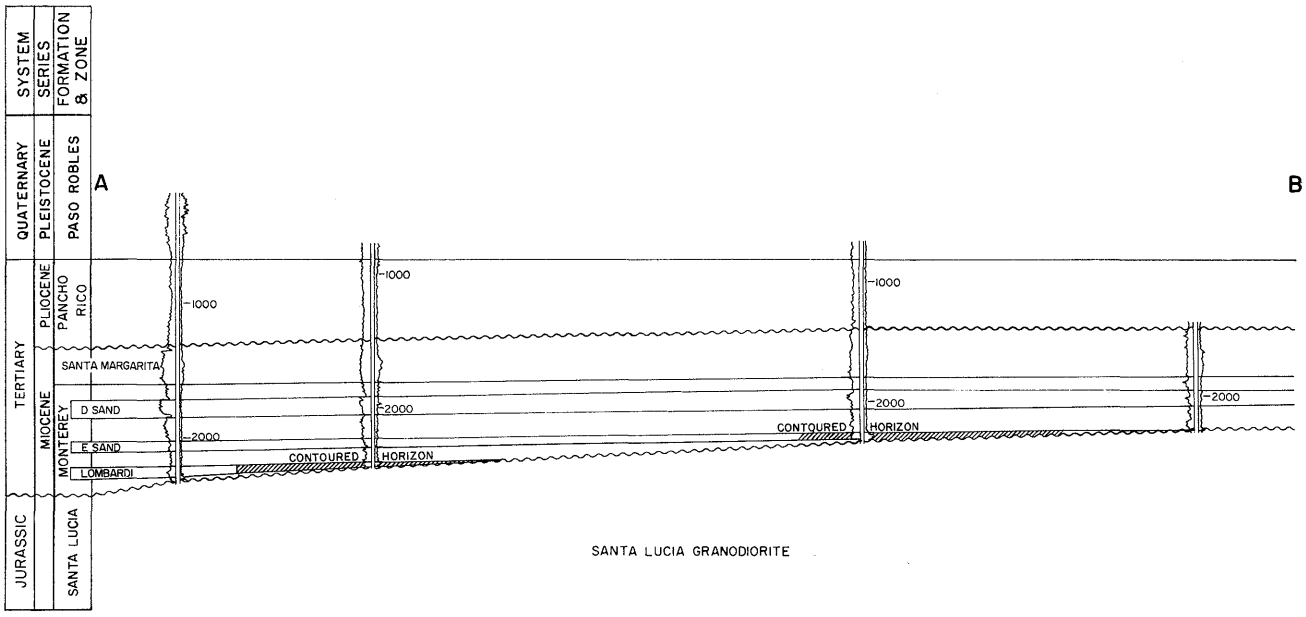
Selected References:

DATE: July 1983

CALIFORNIA DIVISION OF OIL AND GAS

McCOOL RANCH OIL FIELD





COUNTY: MONTEREY

MC COOL RANCH 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	Lombardi Oil Co., Inc. "Sinclair" 5	C.A. Luckey "Sinclair" 5	22 22S 10E	MD	2,193	Lombardi	
Deepest well	Texaco Inc. "Brinan" 2	Same as present	15 22S 10E	MD	2,332		Santa Lucia granodiorite Cretaceous

POOL DATA

ITEM	E	LOMBARDI				FIELD OR AREA DATA
Discovery date	October 1981	April 1964				
Initial production rates						
Oil (bbl/day)	9	62				
Gas (Mcf/day)						
Flow pressure (psi)						
Bean size (in.)						
Initial reservoir pressure (psi)	850	810**				
Reservoir temperature (°F)	111	102				
Initial oil content (STB/ac.-ft.)						
Initial gas content (MSCF/ac.-ft.)						
Formation	Monterey	Monterey				
Geologic age	Miocene	Miocene				
Average depth (ft.)	2,250	2,150				
Average net thickness (ft.)	30-40	30-40				
Maximum productive area (acres)	50	80				
RESERVOIR ROCK PROPERTIES						
Porosity (%)	22-38	21-38				
S_{oi} (%)	21-38	14-52				
S_{wi} (%)	62-79	48-86				
S_{gi} (%)						
Permeability to air (md)	580-1,050	605-2,530				
RESERVOIR FLUID PROPERTIES						
Oil:						
Oil gravity (°API)	11.7	11.7				
Sulfur content (% by wt.)	1.2	-				
Initial solution GOR (SCF/STB)						
Initial oil FVF (RB/STB)	1.05	-				
Bubble point press. (psia)						
Viscosity (cp) @ °F	16,400 @ 100	-				
Gas:						
Specific gravity (air = 1.0)						
Heating value (Btu/cu. ft.)						
Water:						
Salinity, NaCl (ppm)	-	5,992-7,300				
T.D.S. (ppm)						
R_w (ohm/m) (77°F)						
ENHANCED RECOVERY PROJECTS						
Enhanced recovery projects	cyclic steam	waterflood				
Date started	1981	1967				
Date discontinued	1983	1968				
Peak oil production (bbl)	12,518	34,144				
Year	1983	1966				
Peak gas production, net (Mcf)						
Year						

Base of fresh water (ft.): 800

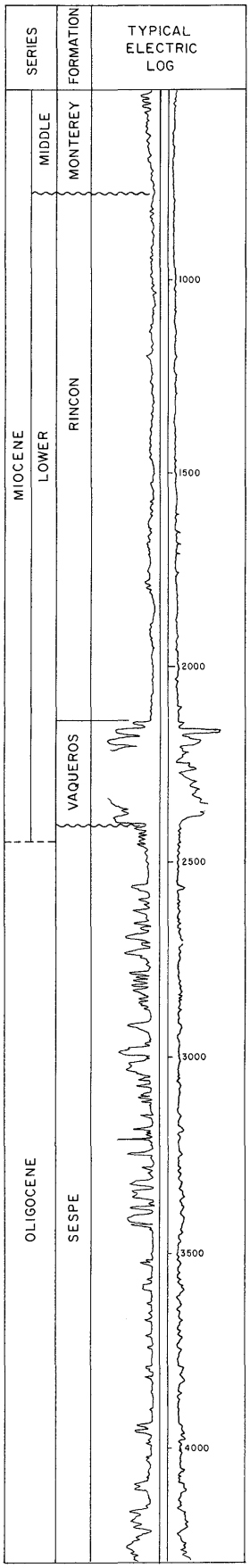
Remarks:

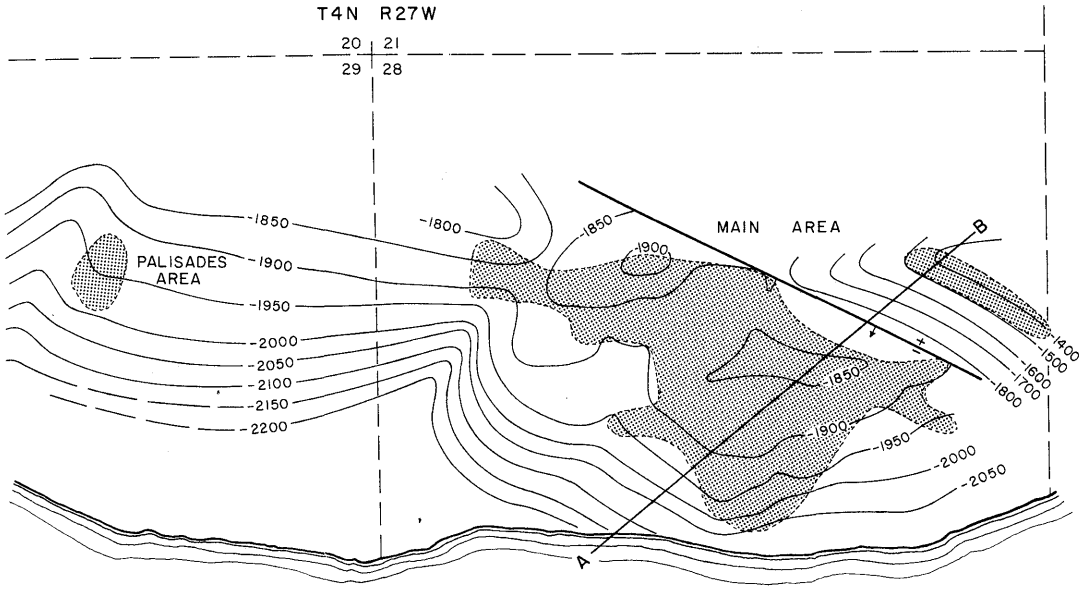
Selected References: Wilkinson, E.R., 1965, McCool Ranch Oil Field: Calif. Div. of Oil and Gas, Summary of Operations--Calif. Oil Fields, Vol. 51, No. 2.

DATE: January 1989 **Estimated value

CALIFORNIA DIVISION OF OIL AND GAS

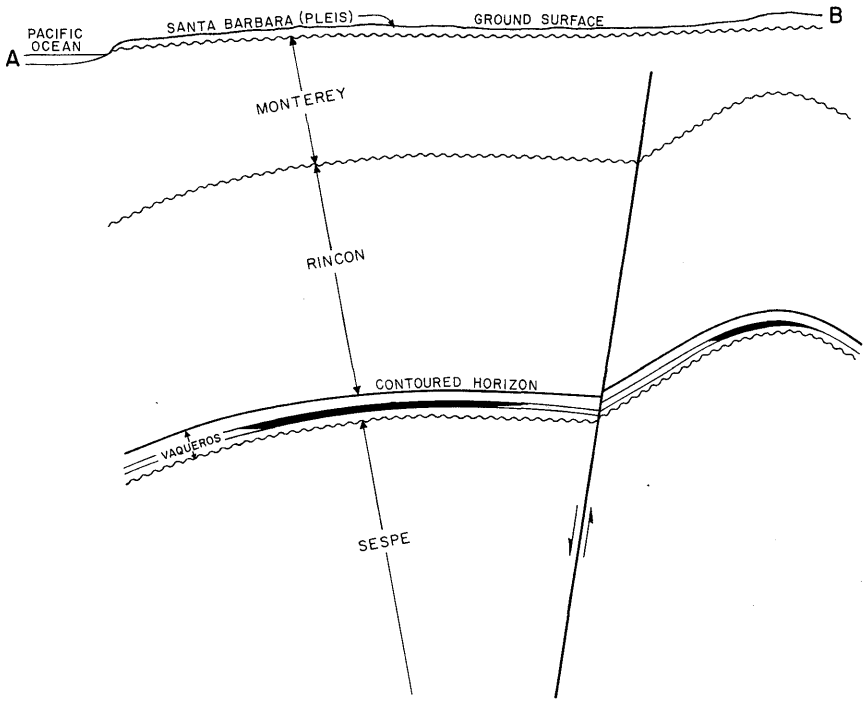
MESA OIL FIELD
(Abandoned)





CONTOURS ON TOP VAQUEROS
SCALE: 1"=1500'

P A C I F I C O C E A N



COUNTY: **SANTA BARBARA**

MESA OIL FIELD (ABD)

(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	C.C. Loftin "Lomas" 1	Olympic Refining Co. "Lomas" 1	29 4N 27W	SB	2,427	Vaqueros	
Deepest well	Trans-Oceanic Oil Corp. "Trans-Oceanic M'Divani" 8	Same as present	28 4N 27W	SB	10,047		Sespe Oligocene

POOL DATA

ITEM	VAQUEROS					FIELD OR AREA DATA
Discovery date	May 1929					
Initial production rates						
Oil (bbl/day)	500					
Gas (Mcf/day)						
Flow pressure (psi)						
Bean size (in.)						
Initial reservoir pressure (psi)						
Reservoir temperature (°F)						
Initial oil content (STB/ac.-ft.)						
Initial gas content (MSCF/ac.-ft.)						
Formation	Vaqueros					
Geologic age	early Miocene					
Average depth (ft.)	2,150					
Average net thickness (ft.)	60					
Maximum productive area (acres)						210
RESERVOIR ROCK PROPERTIES						
Porosity (%)	22-27**					
S_{oi} (%)	25**					
S_{wi} (%)	75**					
S_{gi} (%)						
Permeability to air (md)	100-500**					
RESERVOIR FLUID PROPERTIES						
Oil:						
Oil gravity (°API)	20-24					
Sulfur content (% by wt.)	0.45					
Initial solution GOR (SCF/STB)						
Initial oil FVF (RB/STB)						
Bubble point press. (psia)						
Viscosity (cp) @ °F						
Gas:						
Specific gravity (air = 1.0)						
Heating value (Btu/cu. ft.)						
Water:						
Salinity, NaCl (ppm)	18,198-19,910					
T.D.S. (ppm)						
R_w (ohm/m) (77°F)						
ENHANCED RECOVERY PROJECTS						
Enhanced recovery projects						
Date started						
Date discontinued						
Peak oil production (bbl)						1,112,333
Year						1935
Peak gas production, net (Mcf)						
Year						

Base of fresh water (ft.): None

Remarks: The field was abandoned in 1976. Cumulative production is 3,725,116 bbl of oil and 7,547 Mcf of gas.

Selected References:

Dibblee, T.W., Jr., 1966, Geology of the Central Santa Ynez Mountains, Santa Barbara Co. Calif., Calif. Div. of Mines and Geology Bull. 186, p. 85.

Dolman, S.G., 1938, Mesa Oil Field: Calif. Div. of Oil and Gas Summary of Operations--Calif. Oil Fields, Vol. 24, No. 2.

Yerkes, R.F., H.C. Wagner and K.A. Yenne, 1969, Petroleum Development in the Santa Barbara Channel Region: U.S. Geol. Survey Prof. Paper 679B, p. 18.

DATE: January 1989 **Estimated value

CALIFORNIA DIVISION OF OIL AND GAS

COUNTY: SANTA BARBARA

MESA OIL FIELD
MAIN 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	Kenneth L. Switzer "Rogers" 1	Valemont Oil Co., Ltd. "Birdie Cline" 1	28 4N 27W	SB	2,119	Vaqueros	
Deepest well	Trans-Oceanic Oil Corp. "Trans-Oceanic M'Divani" 8	Same as present	28 4N 27W	SB	10,047		Sespe Oligocene

POOL DATA

ITEM	VAQUEROS					FIELD OR AREA DATA
Discovery date	September 1930					
Initial production rates						
Oil (bbl/day)	198					
Gas (Mcf/day)						
Flow pressure (psi)						
Bean size (in.)						
Initial reservoir pressure (psi)						
Reservoir temperature (°F)						
Initial oil content (STB/ac.-ft.)						
Initial gas content (MSCF/ac.-ft.)						
Formation	Vaqueros					
Geologic age	early Miocene					
Average depth (ft.)	2,200					
Average net thickness (ft.)	50					
Maximum productive area (acres)	190					
RESERVOIR ROCK PROPERTIES						
Porosity (%)	22-27**					
S_{oi} (%)	25**					
S_{wi} (%)	75**					
S_{gi} (%)						
Permeability to air (md)	100-500**					
RESERVOIR FLUID PROPERTIES						
Oil:						
Oil gravity (°API)	18					
Sulfur content (% by wt.)	0.45-0.55					
Initial solution GOR (SCF/STB)						
Initial oil FVF (RB/STB)						
Bubble point press. (psia)						
Viscosity (cp) @ °F						
Gas:						
Specific gravity (air = 1.0)						
Heating value (Btu/cu. ft.)						
Water:						
Salinity, NaCl (ppm)	18,198-19,910					
T.D.S. (ppm)						
R_w (ohm/m) (77°F)						
ENHANCED RECOVERY PROJECTS						
Enhanced recovery projects						
Date started						
Date discontinued						
Peak oil production (bbl)	1,112,333					
Year	1935					
Peak gas production, net (Mcf)						
Year						

Base of fresh water (ft.): None

Remarks: The area was abandoned in 1976. Cumulative production is 3,704,207 bbl of oil and 7,547 Mcf of gas.

Selected References: Dolman, S.G., 1930, Operations in Dist. No. 3: Calif. Div. of Oil and Gas, Summary of Operations--Calif. Oil Fields, Vol. 16, No. 3, p. 47.

DATE: January 1989 **Estimated value

CALIFORNIA DIVISION OF OIL AND GAS

COUNTY: SANTA BARBARA

MESA OIL FIELD
PALISADES 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	C.C. Loftin "Lomas" 1	Olympic Refining Co. "Lomas" 1	29 4N 27W	SB	2,424	Vaqueros	
Deepest well	Palisades Petroleum Corp. No. 1	Altadena Oil Co. No. 1	29 4N 27W	SB	4,270		Vaqueros early Miocene

POOL DATA

ITEM	VAQUEROS					FIELD OR AREA DATA
Discovery date	May 1929					
Initial production rates						
Oil (bbl/day)	500					
Gas (Mcf/day)						
Flow pressure (psi)						
Bean size (in.)						
Initial reservoir pressure (psi)						
Reservoir temperature (°F)						
Initial oil content (STB/ac.-ft.)						
Initial gas content (MSCF/ac.-ft.)						
Formation	Vaqueros					
Geologic age	early Miocene					
Average depth (ft.)	2,150					
Average net thickness (ft.)	60					
Maximum productive area (acres)	20					
RESERVOIR ROCK PROPERTIES						
Porosity (%)	22-27**					
So_i (%)	25**					
Sw_i (%)	75**					
Sg_i (%)						
Permeability to air (md)	100-500**					
RESERVOIR FLUID PROPERTIES						
Oil:						
Oil gravity (°API)	20-24					
Sulfur content (% by wt.)	0.45					
Initial solution GOR (SCF/STB)						
Initial oil FVF (RB/STB)						
Bubble point press. (psia)						
Viscosity (cp) @ °F						
Gas:						
Specific gravity (air = 1.0)						
Heating value (Btu/cu. ft.)						
Water:						
Salinity, NaCl (ppm)	18,198-19,910					
T.D.S. (ppm)						
R_w (ohm/m) (77°F)						
ENHANCED RECOVERY PROJECTS						
Enhanced recovery projects						
Date started						
Date discontinued						
Peak oil production (bbl)	19,183					
Year	1929					
Peak gas production, net (Mcf)						
Year						

Base of fresh water (ft.): None

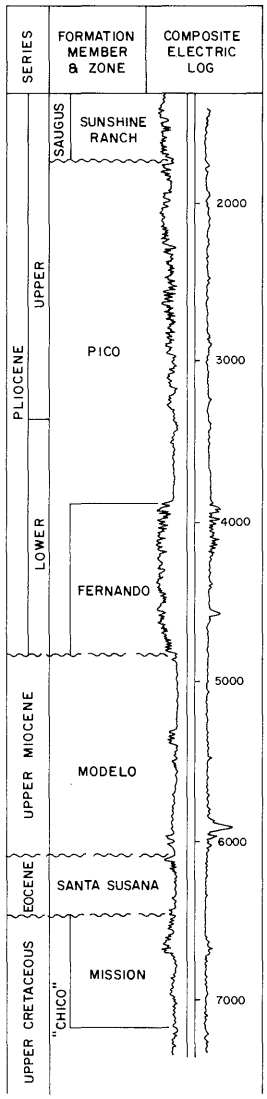
Remarks: The area was abandoned in 1931. Cumulative production is 20,909 bbl of oil.

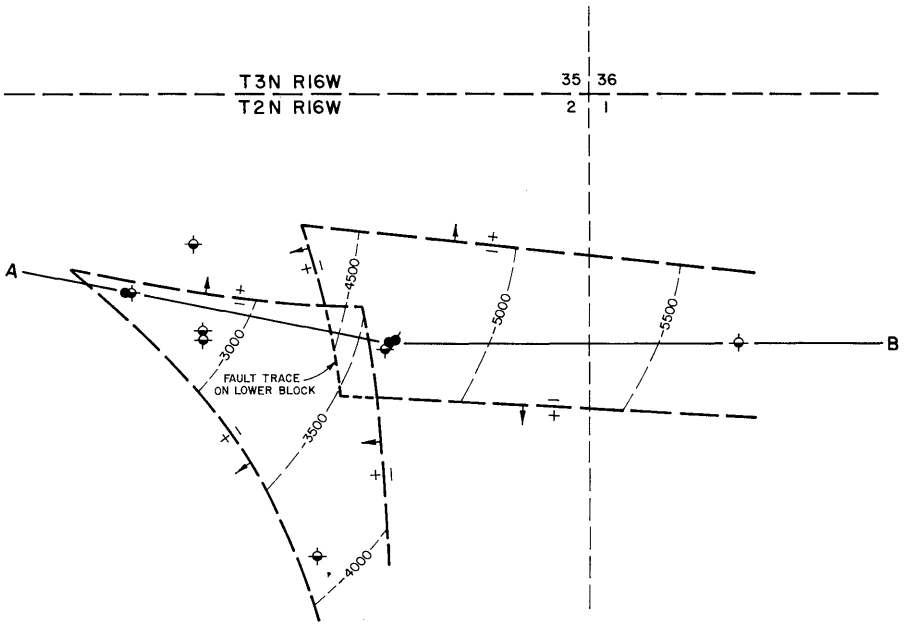
Selected References: Dibblee, T.W., Jr., 1966, Geology of the Central Santa Ynez Mountains, Santa Barbara Co., California: Calif. Div. of Mines and Geology Bull. 186, p. 88.
Dolman, S.G., 1929, Operations in District No. 3: Calif. Div. of Oil and Gas, Summary of Operations--Calif. Oil Fields, Vol. 15, No. 3, p. 53.

DATE: January 1989 **Estimated value

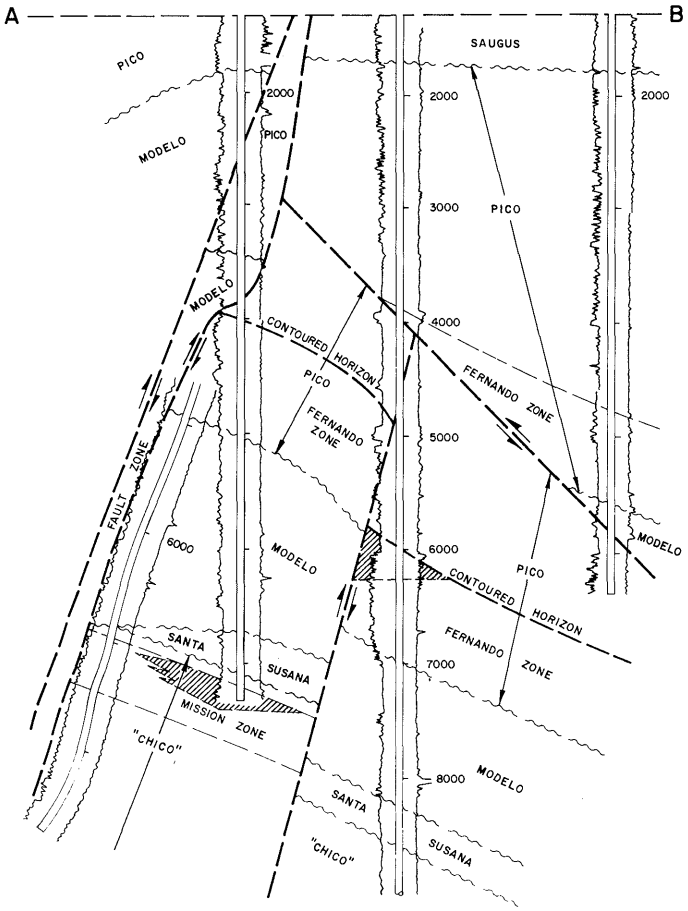
CALIFORNIA DIVISION OF OIL AND GAS

MISSION OIL FIELD
(Abandoned)





CONTOURS ON TOP OF FERNANDO ZONE
SCALE: 1" = 1000'



COUNTY: LOS ANGELES

MISSION OIL FIELD (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	Chevron U.S.A. Inc. "Mission 6" 1	Standard Oil Co. of Calif. "Mission 6" 1	2 2N 16W	SB	7,341	Mission	
Deepest well	Chevron U.S.A. Inc. "Mission 5" 1	Standard Oil Co. of Calif. "Mission 5" 1	2 2N 16W	SB	9,510		"Chico" Late Cretaceous

POOL DATA

ITEM	FERNANDO	MISSION				FIELD OR AREA DATA
Discovery date	December 1953	May 1953				
Initial production rates						
Oil (bbl/day)	855	229				
Gas (Mcf/day)	260	-				
Flow pressure (psi)						
Bean size (in.)						
Initial reservoir pressure (psi)						
Reservoir temperature (°F)						
Initial oil content (STB/ac.-ft.)						
Initial gas content (MSCF/ac.-ft.)						
Formation	Pico	"Chico"				
Geologic age	early Pliocene	Late Cretaceous				
Average depth (ft.)	6,000	7,200				
Average net thickness (ft.)	100	200				
Maximum productive area (acres)						30
RESERVOIR ROCK PROPERTIES						
Porosity (%)						
So_i (%)						
Sw_i (%)						
Sg_i (%)						
Permeability to air (md)						
RESERVOIR FLUID PROPERTIES						
Oil:						
Oil gravity (°API)	28	26				
Sulfur content (% by wt.)						
Initial solution GOR (SCF/STB)						
Initial oil FVF (RB/STB)						
Bubble point press. (psia)						
Viscosity (cp) @ °F						
Gas:						
Specific gravity (air = 1.0)						
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						
Date started						
Date discontinued						
Peak oil production (bbl)						82,304
Year						1954
Peak gas production, net (Mcf)						5,831
Year						1969

Base of fresh water (ft.): 1,500

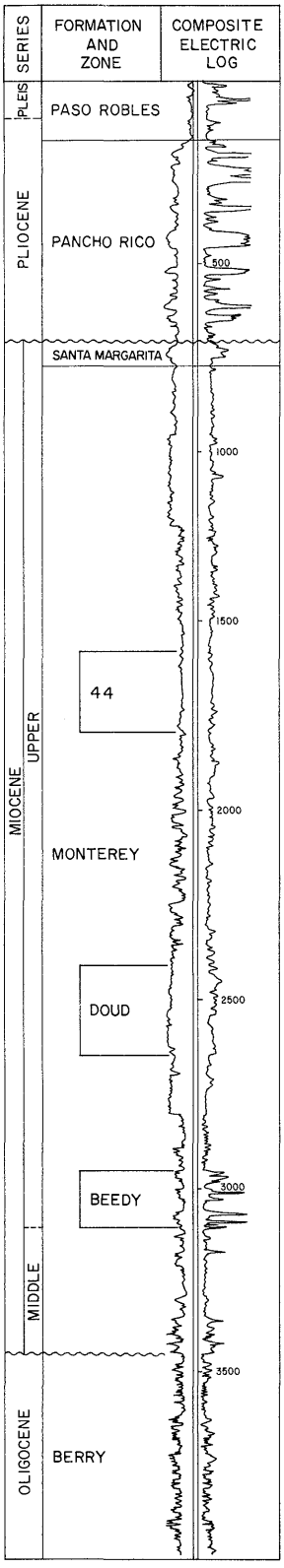
Remarks: Field abandoned in 1977. Cumulative production is 536,621 bbl of oil and 301,411 Mcf of gas.

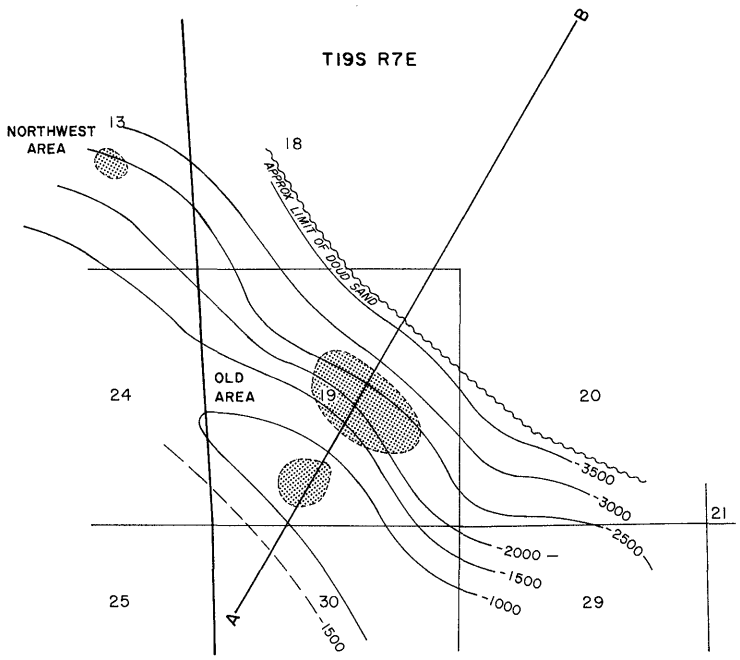
Selected References: Mefferd, M.G., and S. Cordova, 1961, Mission Oil Field: Calif. Div. of Oil and Gas, Summary of Operations -- Calif. Oil Fields, Vol. 47, No. 1.

DATE: May 1983

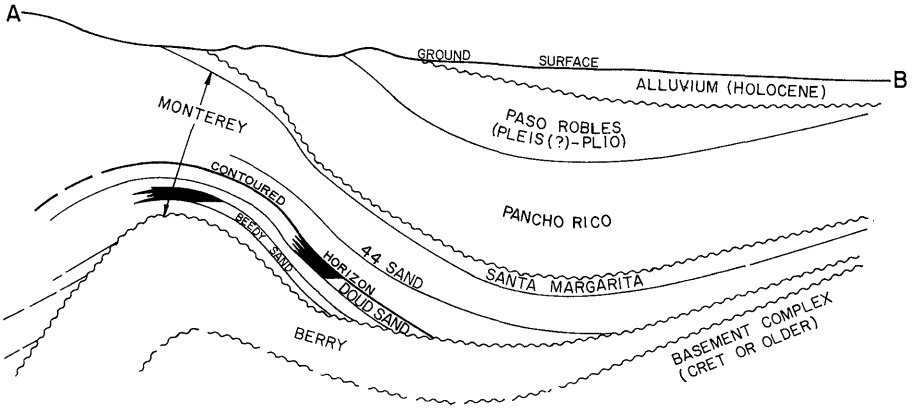
CALIFORNIA DIVISION OF OIL AND GAS

MONROE SWELL OIL FIELD





CONTOURS ON TOP OF DOUD SAND



COUNTY: **MONTEREY**

MONROE SWELL 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. "Beedy (NCT-2)" 1	The Texas Co. "Beedy (NCT-2)" 1	19 19S 7E	MD	3,300	Beedy	
Deepest well	Texaco Inc. "Dunphy" 1	The Texas Co. "Dunphy" 1	30 19S 7E	MD	4,759		Berry Oligocene

POOL DATA

ITEM	44	DOUD	BEEDY			FIELD OR AREA DATA
Discovery date	November 1960	February 1959	June 1949			
Initial production rates						
Oil (bbl/day)	58	72	30			
Gas (Mcf/day)						
Flow pressure (psi)						
Bean size (in.)						
Initial reservoir pressure (psi)	400	442	450			
Reservoir temperature (°F)	110	109	104			
Initial oil content (STB/ac.-ft.)						
Initial gas content (MSCF/ac.-ft.)						
Formation	Monterey	Monterey	Monterey			
Geologic age	late Miocene	late Miocene	late Miocene			
Average depth (ft.)	2,000	2,900	3,200			
Average net thickness (ft.)	200	200	150			
Maximum productive area (acres)						90
RESERVOIR ROCK PROPERTIES						
Porosity (%)	15-35***	15-35***	15-35***			
So_i (%)	30-40***	30-40***	30-40***			
Sw_i (%)	60-70***	60-70***	60-70***			
Sg_i (%)						
Permeability to air (md)	500-1,500***	500-1,500***	500-1,500***			
RESERVOIR FLUID PROPERTIES						
Oil:						
Oil gravity (°API)	19	19	17			
Sulfur content (% by wt.)						
Initial solution GOR (SCF/STB)						
Initial oil FVF (RB/STB)						
Bubble point press. (psia)						
Viscosity (cp) @ °F						
Gas:						
Specific gravity (air = 1.0)						
Heating value (Btu/cu. ft.)						
Water:						
Salinity, NaCl (ppm)	-	3,500	-			
T.D.S. (ppm)	-	4,800	-			
R_w (ohm/m) (77°F)						
ENHANCED RECOVERY PROJECTS						
Enhanced recovery projects						cyclic steam
Date started						1965
Date discontinued						1965
Peak oil production (bbl)						26,580
Year						1972
Peak gas production, net (Mcf)						2,664
Year						1980

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

Remarks: The field was abandoned in 1951 and reactivated in 1959.

Selected References:

Barton, C.L., 1959, Operations in District No. 3: Calif. Div. of Oil and Gas, Summary of Operations--Calif. Oil Fields, Vol. 45, No. 2.

Gribi, E.A., Jr., 1963, Monroe Swell Oil Field, Monterey Co., Calif: A.A.P.G.-S.E.P.M. Guidebook to the Geology of Salinas Valley and the San Andreas Fault.

Hart, E.W., 1963, Mines and Mineral Resources of Monterey Co., Calif.: Calif. Div. of Mines and Geology County Report No. 5, p. 76.

DATE: August 1987 ***Representative values for area, formation, and depth

CALIFORNIA DIVISION OF OIL AND GAS

COUNTY: MONTEREY

MONROE SWELL OIL FIELD
NORTHWEST 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	Phillips Petroleum Co. "Doud A" 1	Same as present	13 19S 6E	MD	3,761	Luard	
Deepest well	W.W. Holmes, Operator "Doud" 1-13	Same as present	13 19S 6E	MD	3,809		Monterey Miocene

POOL DATA

ITEM	LUARD					FIELD OR AREA DATA
Discovery date	January 1987					
Initial production rates						
Oil (bbl/day)	33					
Gas (Mcf/day)	10					
Flow pressure (psi)						
Bean size (in.)						
Initial reservoir pressure (psi)						
Reservoir temperature (°F)						
Initial oil content (STB/ac.-ft.)						
Initial gas content (MSCF/ac.-ft.)						
Formation	Monterey					
Geologic age	Miocene					
Average depth (ft.)	2,720					
Average net thickness (ft.)	300					
Maximum productive area (acres)	10					
RESERVOIR ROCK PROPERTIES						
Porosity (%)	10-37					
So_i (%)						
Sw_i (%)						
Sg_i (%)						
Permeability to air (md)	1-150					
RESERVOIR FLUID PROPERTIES						
Oil:						
Oil gravity (°API)	23					
Sulfur content (% by wt.)						
Initial solution GOR (SCF/STB)						
Initial oil FVF (RB/STB)						
Bubble point press. (psia)						
Viscosity (cp) @ °F						
Gas:						
Specific gravity (air = 1.0)						
Heating value (Btu/cu. ft.)						
Water:						
Salinity, NaCl (ppm)						
T.D.S. (ppm)	5,300†					
R_w (ohm/m) (77°F)	1.04-1.09†					
ENHANCED RECOVERY PROJECTS						
Enhanced recovery projects						
Date started						
Date discontinued						
Peak oil production (bbl)	13,645					
Year	1988					
Peak gas production, net (Mcf)	3,482					
Year	1988					

Base of fresh water (ft.): 2,000

Remarks: Only one well has been completed in the area to date.

Selected References:

DATE: March 1988

†Log derived value

CALIFORNIA DIVISION OF OIL AND GAS

COUNTY: MONTEREY

MONROE SWELL OIL FIELD
OLD 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	Texaco Inc. "Beedy (NCT-2)" 1	The Texas Co. "Beedy (NCT-2)" 1	19 19S 7E	MD	3,300	Beedy	
Deepest well	Texaco Inc. "Doud (NCT-1)" 1	The Texas Co. "Doud (NCT-1)" 1	24 19S 6E	MD	4,120		Berry Oligocene

POOL DATA

ITEM	44	DOUD	BEEDY			FIELD OR AREA DATA
Discovery date	November 1960	February 1959	June 1949			
Initial production rates						
Oil (bbl/day)	58	72	30			
Gas (Mcf/day)						
Flow pressure (psi)						
Bean size (in.)						
Initial reservoir pressure (psi)	400	442	450			
Reservoir temperature (°F)	110	109	104			
Initial oil content (STB/ac.-ft.)						
Initial gas content (MSCF/ac.-ft.)						
Formation	Monterey	Monterey	Monterey			
Geologic age	late Miocene	late Miocene	late Miocene			
Average depth (ft.)	2,000	2,900	3,200			
Average net thickness (ft.)	200	200	150			
Maximum productive area (acres)						90
RESERVOIR ROCK PROPERTIES						
Porosity (%)	15-35***	15-35***	15-35***			
So_i (%)	30-40***	30-40***	30-40***			
Sw_i (%)	60-70***	60-70***	60-70***			
Sg_i (%)						
Permeability to air (md)	500-1,500***	500-1,500***	500-1,500***			
RESERVOIR FLUID PROPERTIES						
Oil:						
Oil gravity (°API)	19	19	17			
Sulfur content (% by wt.)						
Initial solution GOR (SCF/STB)						
Initial oil FVF (RB/STB)						
Bubble point press. (psia)						
Viscosity (cp) @ °F						
Gas:						
Specific gravity (air = 1.0)						
Heating value (Btu/cu. ft.)						
Water:						
Salinity, NaCl (ppm)	-	3,500	-			
T.D.S. (ppm)	-	4,800	-			
R_w (ohm/m) (77°F)						
ENHANCED RECOVERY PROJECTS						
Enhanced recovery projects						cyclic steam
Date started						1965
Date discontinued						1965
Peak oil production (bbl)						26,580
Year						1972
Peak gas production, net (Mcf)						2,664
Year						1980

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

Remarks:

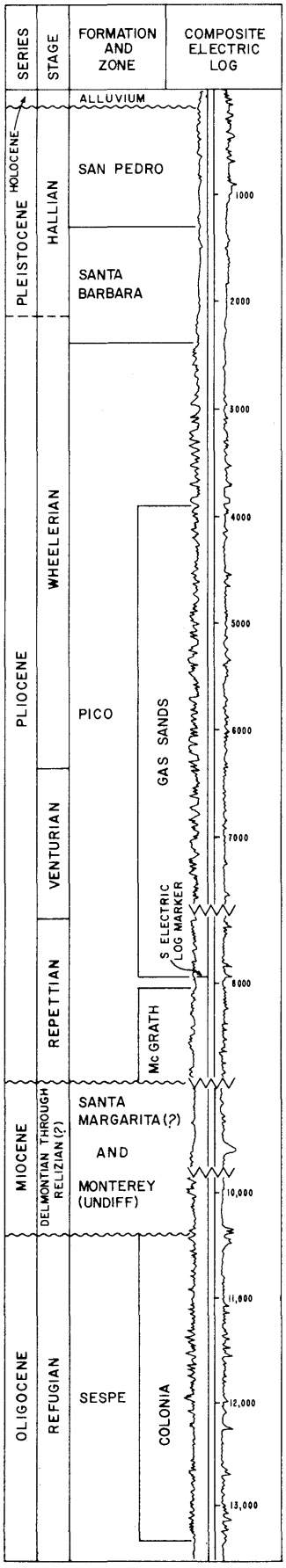
Selected References:

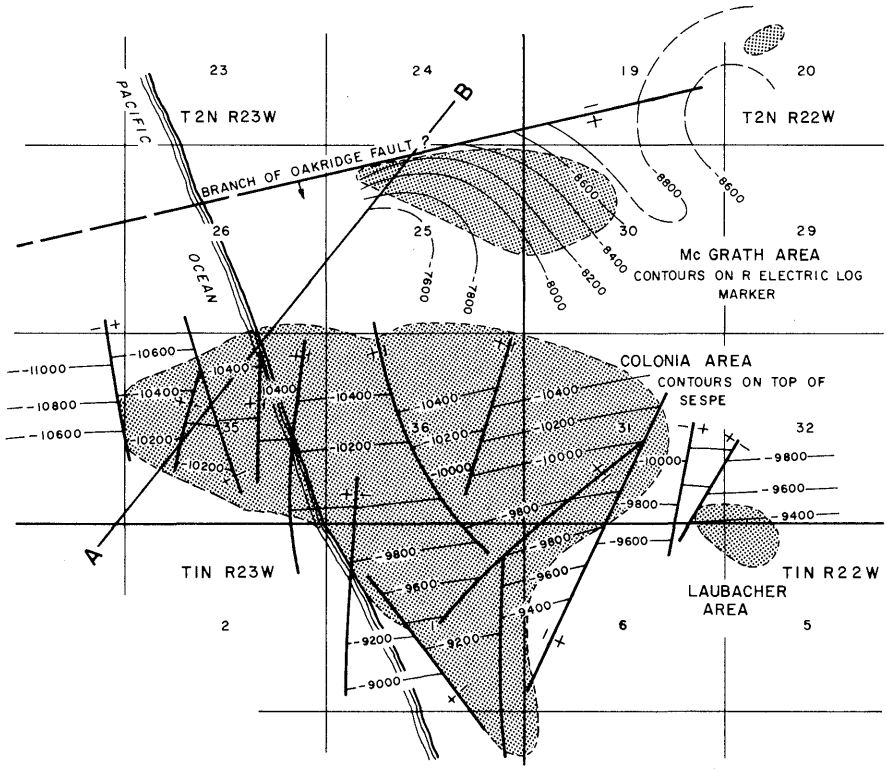
DATE: Jaunuary 1989

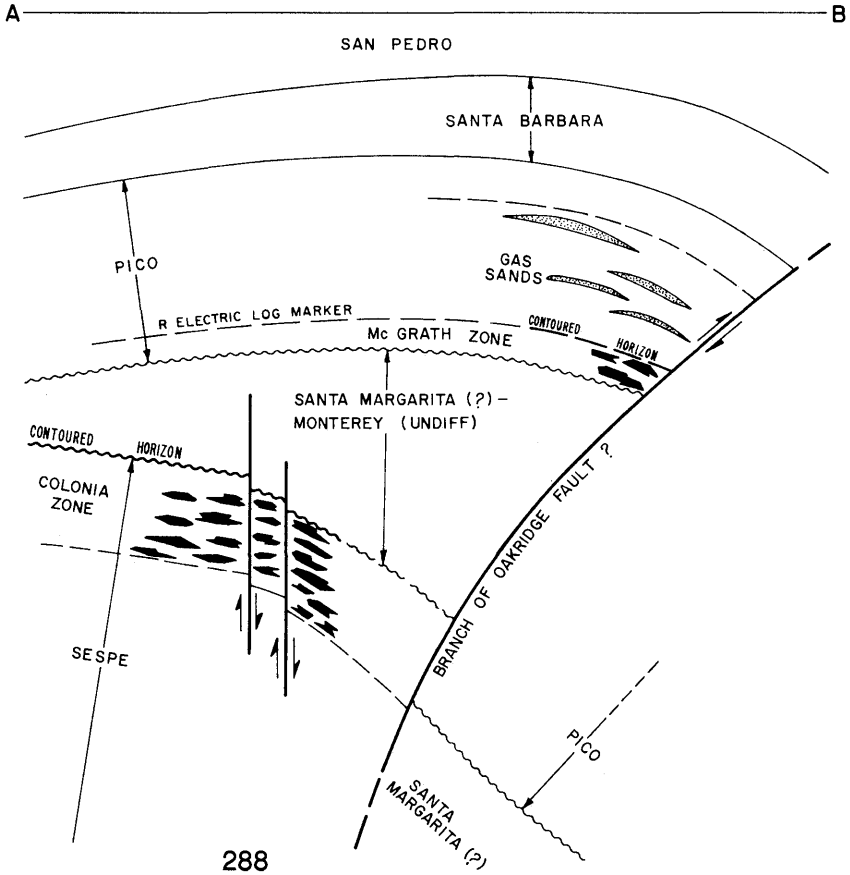
*** Representative values for area, formation, and depth

CALIFORNIA DIVISION OF OIL AND GAS

WEST MONTALVO OIL FIELD







COUNTY: VENTURA

MONTALVO, WEST, OIL FIELD

(SEE AREA 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	Chevron U.S.A. Inc. "McGrath 4" 2	Standard Oil Co. of Calif. "McGrath 4" 2	25 2N 23W	SB	11,505	McGrath	
Deepest well	Chevron U.S.A. Inc. "McGrath 4" 1212	Standard Oil Co. of Calif. "McGrath 4" 1212	35 2N 23W	SB	17,422		Sespe Oligocene

POOL DATA

ITEM	MCGRATH					FIELD OR AREA DATA
Discovery date	April 1947					
Initial production rates						
Oil (bbl/day)	154					
Gas (Mcf/day)	1,420					
Flow pressure (psi)						
Bean size (in.)						
Initial reservoir pressure (psi)	4,500					
Reservoir temperature (°F)	190					
Initial oil content (STB/ac.-ft.)	600					
Initial gas content (MSCF/ac.-ft.)						
Formation	Pico					
Geologic age	Pliocene					
Average depth (ft.)	9,200					
Average net thickness (ft.)	250					
Maximum productive area (acres)						780
RESERVOIR ROCK PROPERTIES						
Porosity (%)						
So_i (%)						
Sw_i (%)						
Sg_i (%)						
Permeability to air (md)						
RESERVOIR FLUID PROPERTIES						
Oil:						
Oil gravity (°API)	28					
Sulfur content (% by wt.)						
Initial solution GOR (SCF/STB)	830					
Initial oil FVF (RB/STB)	1.43					
Bubble point press. (psia)						
Viscosity (cp) @ °F	1.7 @ 190					
Gas:						
Specific gravity (air = 1.0)						
Heating value (Btu/cu. ft.)						
Water:						
Salinity, NaCl (ppm)	18,800					
T.D.S. (ppm)						
R_w (ohm/m) (77°F)						
ENHANCED RECOVERY PROJECTS						
Enhanced recovery projects						
Date started						
Date discontinued						
Peak oil production (bbl)						2,869,327
Year						1962
Peak gas production, net (Mcf)						2,847,968
Year						1971

Base of fresh water (ft.): See areas

Remarks: The first commercial dry gas reservoir in Ventura County was discovered in the McGrath Area of the West Montalvo field in 1953.

Selected References:

DATE: May 1983

CALIFORNIA DIVISION OF OIL AND GAS

COUNTY: VENTURA

MONTALVO, WEST, OIL FIELD
ONSHORE 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. "McGrath 4" 2	Standard Oil Co. of Calif. "McGrath 4" 2	25 2N 23W	SB	11,505	McGrath	
Deepest well	Chevron U.S.A. Inc. "McGrath 4" 1212	Standard Oil Co. of Calif. "McGrath 4" 1212	35 2N 23W	SB	17,422		Sespe Oligocene

POOL DATA

ITEM	PICO GAS SANDS	MCGRATH	COLONIA			FIELD OR AREA DATA
Discovery date	January 1953	April 1947	February 1951			
Initial production rates						
Oil (bbl/day)	0	154	191			
Gas (Mcf/day)	2,860	1,420	30			
Flow pressure (psi)						
Bean size (in.)						
Initial reservoir pressure (psi)	-	4,500	5,500			
Reservoir temperature (°F)	-	190	230			
Initial oil content (STB/ac.-ft.)	-	600	1,050			
Initial gas content (MSCF/ac.-ft.)						
Formation	Pico	Pico	Sespe			
Geologic age	Pliocene	Pliocene	Oligocene			
Average depth (ft.)	6,000	9,200	11,000			
Average net thickness (ft.)	4,000	250	2,500			
Maximum productive area (acres)						580
RESERVOIR ROCK PROPERTIES						
Porosity (%)	-	19.8	21.0			
S_{oi} (%)	-	-	70			
S_{wi} (%)	-	40	25			
S_{gi} (%)	-	-	5			
Permeability to air (md)	-	58	243			
RESERVOIR FLUID PROPERTIES						
Oil:						
Oil gravity (°API)	-	28	16			
Sulfur content (% by wt.)		-	4.1			
Initial solution GOR (SCF/STB)	-	830	371			
Initial oil FVF (RB/STB)	-	1.43	1.24			
Bubble point press. (psia)						
Viscosity (cp) @ °F	-	1.7 @ 190	10.8 @ 236			
Gas:						
Specific gravity (air = 1.0)						
Heating value (Btu/cu. ft.)	1,010	-	-			
Water:						
Salinity, NaCl (ppm)	6,840-17,100	18,800	21,400			
T.D.S. (ppm)						
R_w (ohm/m) (77°F)						
ENHANCED RECOVERY PROJECTS						
Enhanced recovery projects		gas injection	gas injection			
Date started		1956	1964			
Date discontinued		1968	1971			
		waterflood	waterflood			
		1963	1960			
		active	active			
Peak oil production (bbl)						2,869,491
Year						1962
Peak gas production, net (Mcf)						2,847,968
Year						1971

Base of fresh water (ft.): 2,000

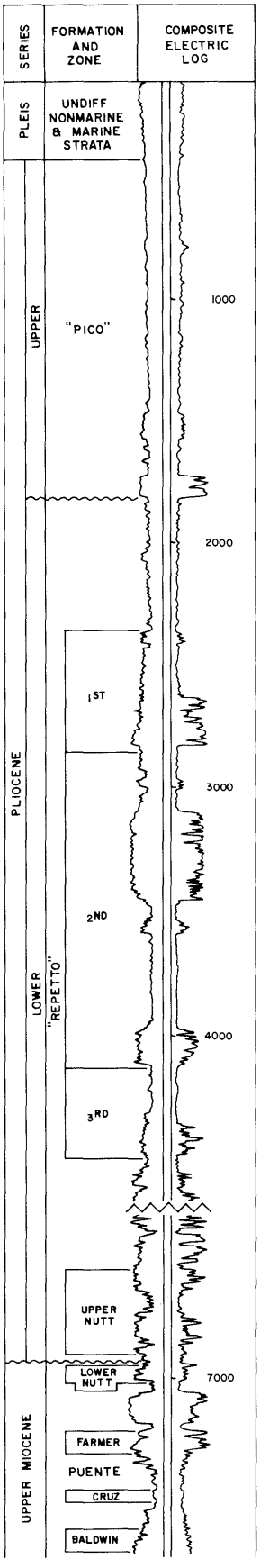
Remarks:

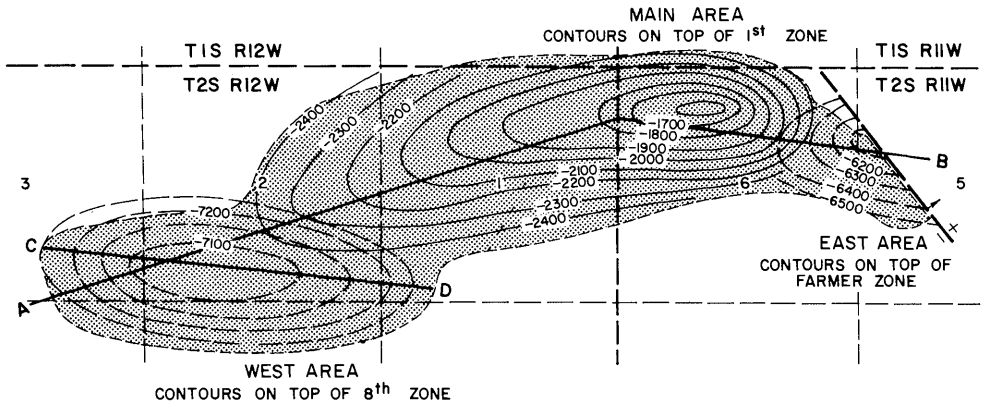
Selected References: Hardoin, J.L., 1961, McGrath Area of West Montalvo Oil Field: Calif. Div. of Oil and Gas, Summary of Operations -- Calif. Oil Fields, Vol. 47, No. 2.

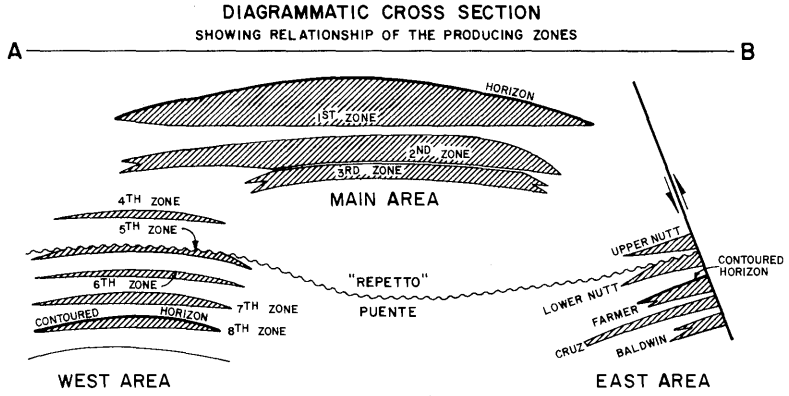
DATE: May 1983

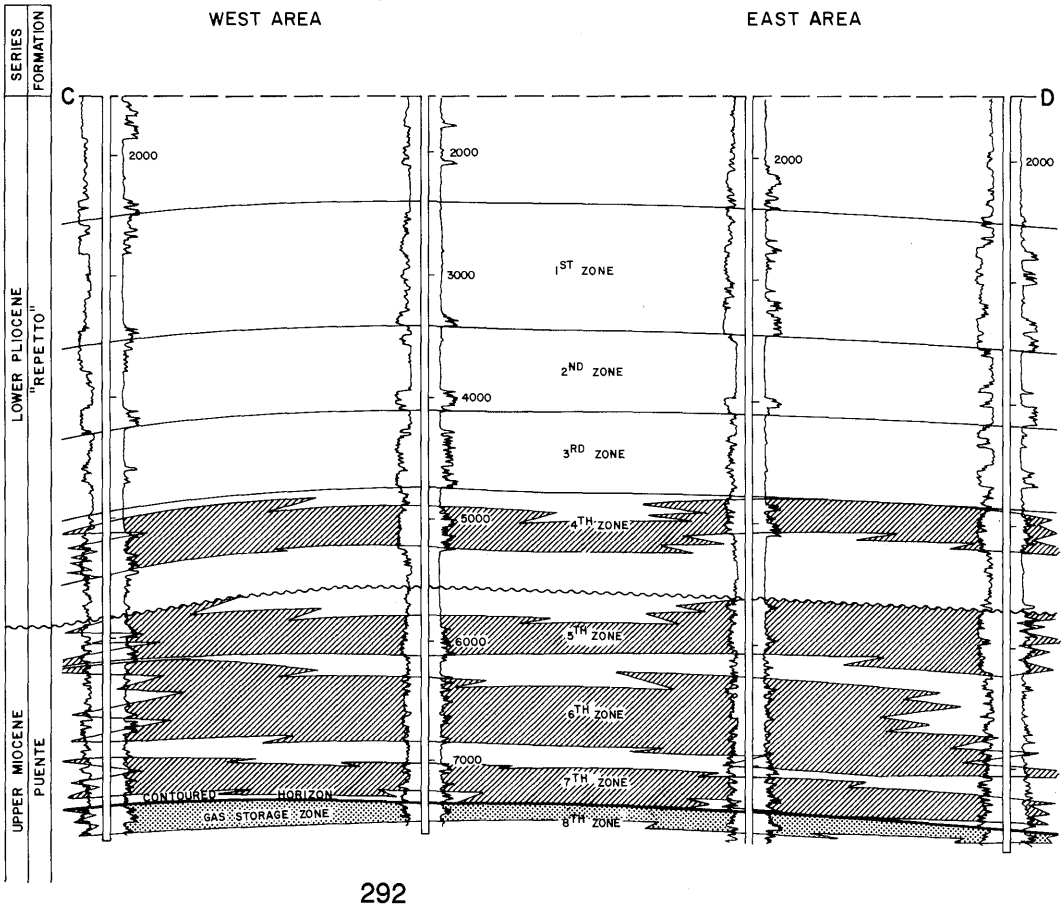
CALIFORNIA DIVISION OF OIL AND GAS

MONTEBELLO OIL FIELD









COUNTY: LOS ANGELES

MONTEBELLO 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	Chevron U.S.A. Inc. "Baldwin" 1	Standard Oil Company "Baldwin" 1	1 2S 12W	SB	2,395	1st	
Deepest well	Southern Calif. Gas Co. "Howard and Smith" 3	Union Oil Co. of Calif. "Howard and Smith" 3	2 2S 12W	SB	10,772		Puente late Miocene

POOL DATA

ITEM	1ST	2ND	3RD	4TH	5TH	FIELD OR AREA DATA
Discovery date	February 1917	February 1917	February 1917	June 1927	April 1938	
Initial production rates						
Oil (bbl/day)	345	-	-	180	2,845	
Gas (Mcf/day)	-	-	-	-	3,177	
Flow pressure (psi)	-	-	-	-	375	
Bean size (in.)	-	-	-	-	1 1/2	
Initial reservoir pressure (psi)	1,100	1,550	-	-	-	
Reservoir temperature (°F)	110	130	-	-	-	
Initial oil content (STB/ac.-ft.)						
Initial gas content (MSCF/ac.-ft.)						
Formation	"Repetto"	"Repetto"	"Repetto"	"Repetto"	Puente-"Repetto"	
Geologic age	early Pliocene	early Pliocene	early Pliocene	early Pliocene	e Plio./l Miocene	
Average depth (ft.)	2,200	3,500	4,500	4,800	5,700	
Average net thickness (ft.)	350	200	70	20	300	
Maximum productive area (acres)	770	760	150	-	-	
RESERVOIR ROCK PROPERTIES						
Porosity (%)	29	27	27	-	27	
S_{oi} (%)	70	70	70	-	-	
S_{wi} (%)	30	30	30	-	-	
S_{gi} (%)						
Permeability to air (md)	700	50	260	-	400	
RESERVOIR FLUID PROPERTIES						
Oil:						
Oil gravity (°API)	20	25	30	20	36	
Sulfur content (% by wt.)						
Initial solution GOR (SCF/STB)	140	300	410	-	-	
Initial oil FVF (RB/STB)	1.07	1.15	1.22	-	-	
Bubble point press. (psia)	1,100	1,550	1,800	-	-	
Viscosity (cp) @ °F	50	50	-	-	-	
Gas:						
Specific gravity (air = 1.0)						
Heating value (Btu/cu. ft.)						
Water:						
Salinity, NaCl (ppm)	14,037	14,037	14,037	14,550	14,550	
T.D.S. (ppm)						
R_w (ohm/m) (77°F)						
ENHANCED RECOVERY PROJECTS						
Enhanced recovery projects	waterflood	waterflood				
Date started	1960	1962				
Date discontinued	active	active				
Peak oil production (bbl)						
Year						
Peak gas production, net (Mcf)						
Year						

Base of fresh water (ft.): 1,600

Remarks: The 8th zone is being used for gas storage.

Selected References: McLaughlin, R.P., 1920, Montebello Oil Field: Calif. Div. of Oil and Gas, Summary of Operations -- Calif. Oil Fields, Vol. 5, No. 1l.
Stolz, H.P., 1939, West Montebello Oil Field and Application of the State Gas Law: Calif. Div. of Oil and Gas, Summary of Operations -- Calif. Oil Fields, Vol. 25.

COUNTY: LOS ANGELES

MONTEBELLO 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	Chevron U.S.A. Inc. "Baldwin" 1	Standard Oil Company "Baldwin" 1	1 2S 12W	SB	2,395	1st	"Repetto" early Pliocene
Deepest well	Same as above	"	"	"	"	"	"

POOL DATA

ITEM	UPPER NUTT	LOWER NUTT	FARMER	6TH	CRUZ	FIELD OR AREA DATA
Discovery date	-	-	-	December 1937	August 1933	
Initial production rates						
Oil (bbl/day)	-	-	-	970	900	
Gas (Mcf/day)	-	-	-	9,000	-	
Flow pressure (psi)	-	-	-	1,075	-	
Bean size (in.)	-	-	-	7/8	-	
Initial reservoir pressure (psi)						
Reservoir temperature (°F)						
Initial oil content (STB/ac.-ft.)						
Initial gas content (MSCF/ac.-ft.)						
Formation	"Repetto"	Puente	Puente	Puente	Puente	
Geologic age	early Pliocene	late Miocene	late Miocene	late Miocene	late Miocene	
Average depth (ft.)	5,300	5,500	6,500	6,100	6,900	
Average net thickness (ft.)	30	150	100	300	50	
Maximum productive area (acres)						
RESERVOIR ROCK PROPERTIES						
Porosity (%)	-	-	-	27	-	
So_i (%)						
Sw_i (%)						
Sg_i (%)						
Permeability to air (md)	-	-	-	250	-	
RESERVOIR FLUID PROPERTIES						
Oil:						
Oil gravity (°API)	38	38	40	40	37	
Sulfur content (% by wt.)						
Initial solution GOR (SCF/STB)						
Initial oil FVF (RB/STB)						
Bubble point press. (psia)						
Viscosity (cp) @ °F						
Gas:						
Specific gravity (air = 1.0)						
Heating value (Btu/cu. ft.)						
Water:						
Salinity, NaCl (ppm)						
T.D.S. (ppm)	-	-	-	15,406	17,118	
R_w (ohm/m) (77°F)						
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.): 1,600

Remarks:

Selected References: McLaughlin, R.P., 1929, Montebello Oil Field, Calif. Div. of Oil and Gas, Summary of Operations -- Calif. Oil Fields, Vol. 15, No. 11.
Stolz, H.P., 1939, West Montebello Oil Field, and Application of the State Gas Law: Calif. Div. of Oil and Gas, Summary of Operations -- Calif. Oil Fields, Vol. 25.

DATE: January 1989

CALIFORNIA DIVISION OF OIL AND GAS

COUNTY: LOS ANGELES

MONTEBELLO OIL FIELD

Sheet 3 of 3

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. "Baldwin" 1	Standard Oil Company "Baldwin" 1	1 2S 12W	SB	2,395	1st	"Repetto" early Pliocene
Deepest well	Same as above	"	"	"	"	"	"

POOL DATA

ITEM	BALDWIN	7TH	8TH			FIELD OR AREA DATA
Discovery date	unknown	November 1938	April 1939			
Initial production rates						
Oil (bbl/day)	-	720	710			
Gas (Mcf/day)	-	384	430			
Flow pressure (psi)	-	280	55			
Bean size (in.)	-	-	1			
Initial reservoir pressure (psi)						
Reservoir temperature (°F)						
Initial oil content (STB/ac.-ft.)						
Initial gas content (MSCF/ac.-ft.)						
Formation	Puente	Puente	Puente			
Geologic age	late Miocene	late Miocene	late Miocene			
Average depth (ft.)	7,000	7,200	7,650			
Average net thickness (ft.)	100	400	250			
Maximum productive area (acres)						
RESERVOIR ROCK PROPERTIES						
Porosity (%)	-	23	20-22			
Soi (%)						
Swi (%)						
Sgi (%)						
Permeability to air (md)	-	125	80-100			
RESERVOIR FLUID PROPERTIES						
Oil:						
Oil gravity (°API)	38	35	35			
Sulfur content (% by wt.)						
Initial solution GOR (SCF/STB)						
Initial oil FVF (RB/STB)						
Bubble point press. (psia)						
Viscosity (cp) @ °F						
Gas:						
Specific gravity (air = 1.0)						
Heating value (Btu/cu. ft.)						
Water:						
Salinity, NaCl (ppm)						
T.D.S. (ppm)	20,542	23,965	25,677			
R_w (ohm/m) (77°F)						
ENHANCED RECOVERY PROJECTS						
Enhanced recovery projects						
Date started						
Date discontinued						
Peak oil production (bbl)						7,428,016
Year						1939
Peak gas production, net (Mcf)						
Year						

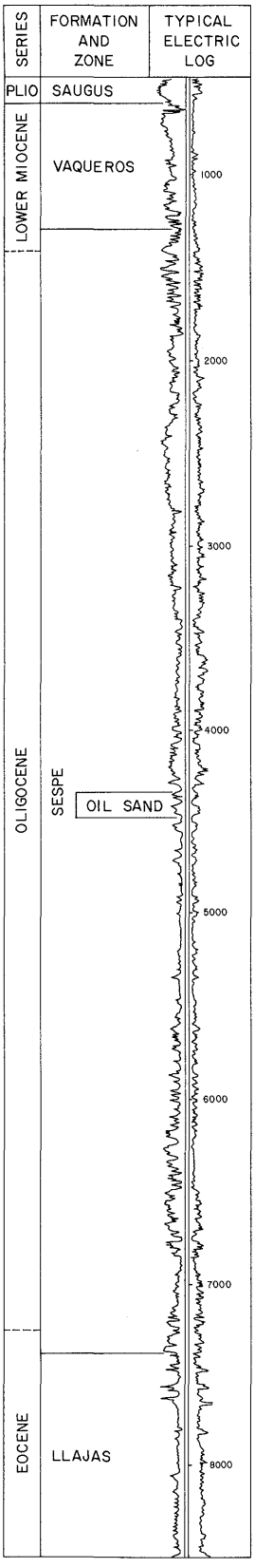
Base of fresh water (ft.): 1,600

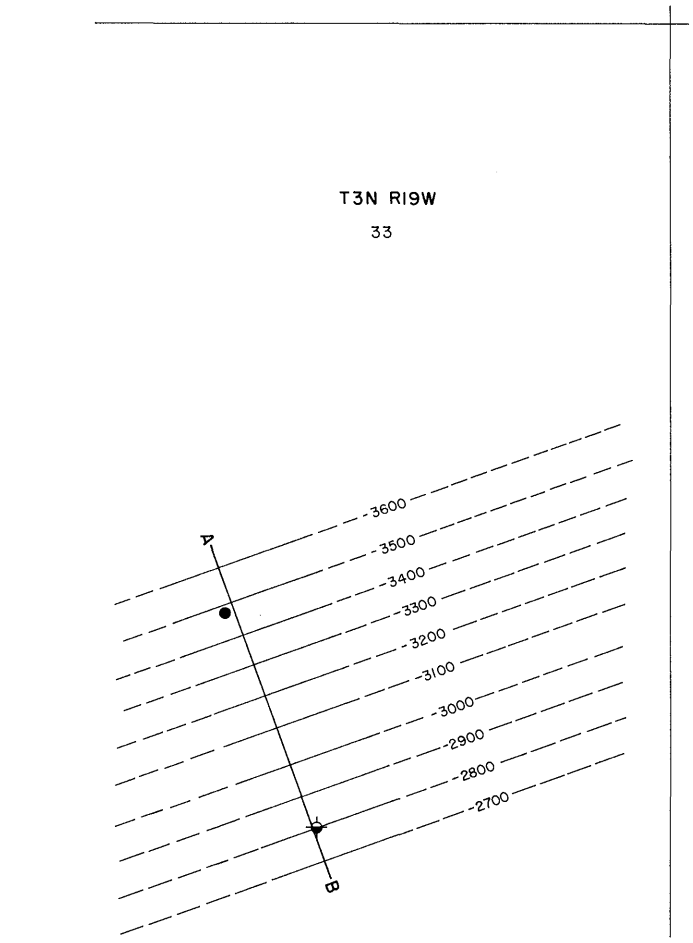
Remarks:

Selected References: McLaughlin, R.P., 1929, Montebello Oil Field, Calif. Div. of Oil and Gas, Summary of Operations -- Calif. Oil Fields, Vol. 15. No. 11.
Stolz, H.P., 1939, West Montebello Oil Field and Application of the State Gas Law: Calif. Div. of Oil and Gas, Summary of Operations -- Calif. Oil Fields, Vol. 25.

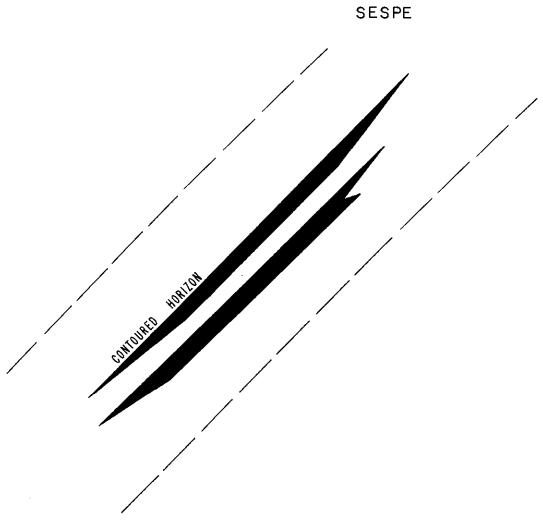
MOORPARK OIL FIELD

(Abandoned)





CONTOURS ON TOP OF OIL SAND
SCALE: 1"=400'



COUNTY: VENTURA

MOORPARK OIL FIELD (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	E.H. Williams "Williams" 1-A	Robert S. Lytle "Williams" 1	33 3N 19W	SB	8,500	unnamed	Llajas Eocene
Deepest well	Same as above	"	"	"	"	"	"

POOL DATA

ITEM	UNNAMED					FIELD OR AREA DATA
Discovery date	April 1955					
Initial production rates						
Oil (bbl/day)	60					
Gas (Mcf/day)	50					
Flow pressure (psi)						
Bean size (in.)						
Initial reservoir pressure (psi)						
Reservoir temperature (°F)						
Initial oil content (STB/ac.-ft.)						
Initial gas content (MSCF/ac.-ft.)						
Formation	Sespe					
Geologic age	Oligocene					
Average depth (ft.)	4,250					
Average net thickness (ft.)	80					
Maximum productive area (acres)	10					
RESERVOIR ROCK PROPERTIES						
Porosity (%)						
S_{oi} (%)						
S_{wi} (%)						
S_{gi} (%)						
Permeability to air (md)						
RESERVOIR FLUID PROPERTIES						
Oil:						
Oil gravity (°API)	25					
Sulfur content (% by wt.)						
Initial solution GOR (SCF/STB)						
Initial oil FVF (RB/STB)						
Bubble point press. (psia)						
Viscosity (cp) @ °F						
Gas:						
Specific gravity (air = 1.0)						
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						
Date started						
Date discontinued						
Peak oil production (bbl)	2,552					
Year	1955					
Peak gas production, net (Mcf)						
Year						

Base of fresh water (ft.): 600

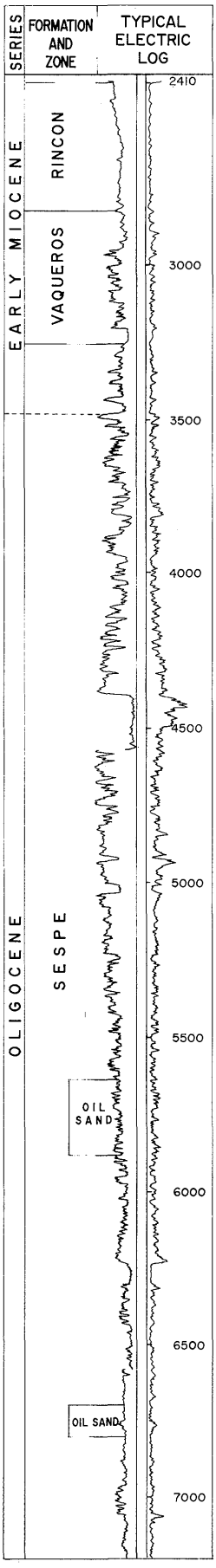
Remarks: The field was abandoned in 1989. Cumulative production is 29,118 bbl of oil and no gas.

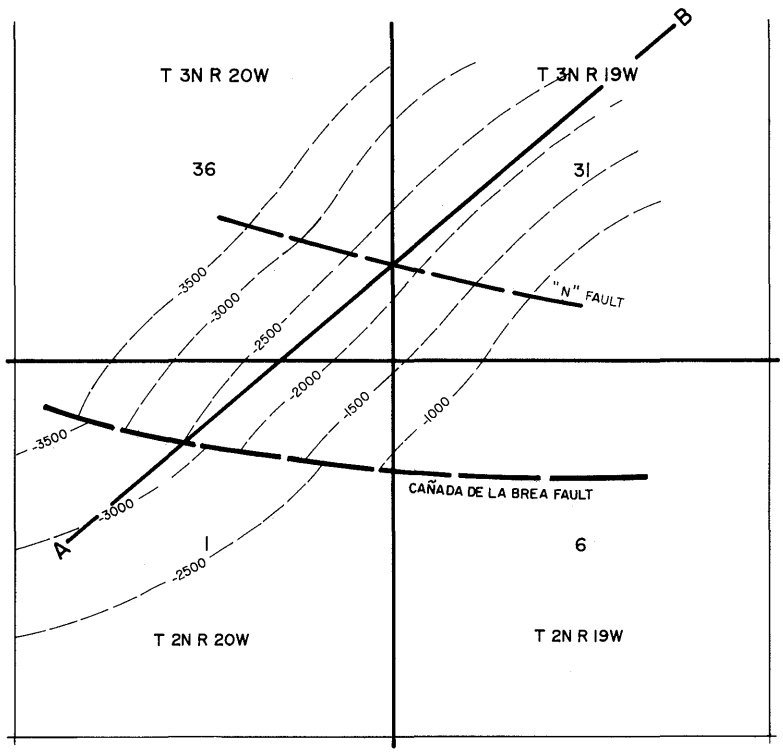
Selected References:

DATE: January 1990

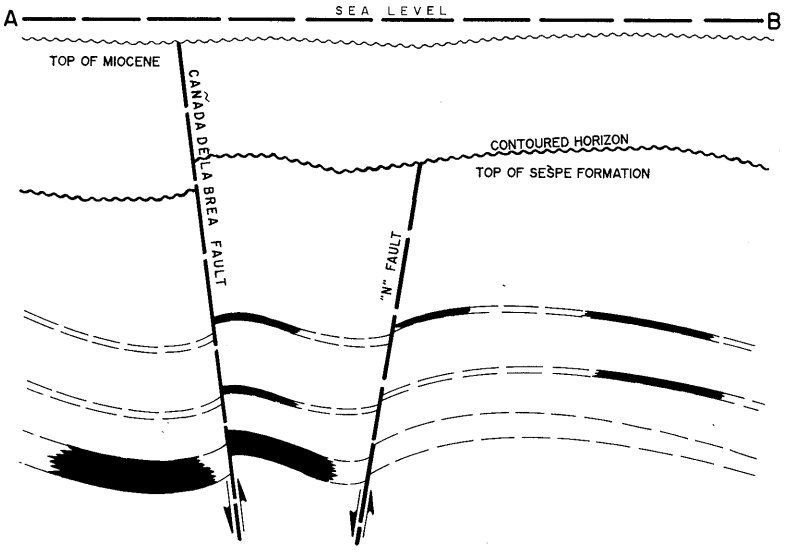
CALIFORNIA DIVISION OF OIL AND GAS

MOORPARK WEST OIL FIELD





CONTOURS ON TOP OF SESPE FORMATION



COUNTY: VENTURA

MOORPARK, WEST, 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	Neaves Petroleum Developments "Neaves-Kaiser-Aetna" 1	Same as present	36 3N 20W	SB	7,200	unnamed	
Deepest well	Texas Pacific Oil Co., Inc. "Kaiser" 1	Same as present	1 2N 20W	SB	8,286		Sespe Oligocene

POOL DATA

ITEM	UNNAMED	UNNAMED				FIELD OR AREA DATA
Discovery date	September 1976	June 1977				
Initial production rates						
Oil (bbl/day)	75	63				
Gas (Mcf/day)						
Flow pressure (psi)						
Bean size (in.)						
Initial reservoir pressure (psi)						
Reservoir temperature (°F)	145	-				
Initial oil content (STB/ac.-ft.)						
Initial gas content (MSCF/ac.-ft.)						
Formation	Sespe	Sespe				
Geologic age	Oligocene	Oligocene				
Average depth (ft.)	5,700	6,410				
Average net thickness (ft.)	380	125				
Maximum productive area (acres)						30
RESERVOIR ROCK PROPERTIES						
Porosity (%)	23.3	-				
S_{oi} (%)	16.9	-				
S_{wi} (%)	60	-				
S_{gi} (%)						
Permeability to air (md)						
RESERVOIR FLUID PROPERTIES						
Oil:						
Oil gravity (°API)	15	13				
Sulfur content (% by wt.)						
Initial solution GOR (SCF/STB)						
Initial oil FVF (RB/STB)						
Bubble point press. (psia)						
Viscosity (cp) @ °F						
Gas:						
Specific gravity (air = 1.0)						
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						
Date started						
Date discontinued						
Peak oil production (bbl)						21,842
Year						1977
Peak gas production, net (Mcf)						2,730
Year						1981

Base of fresh water (ft.): 600

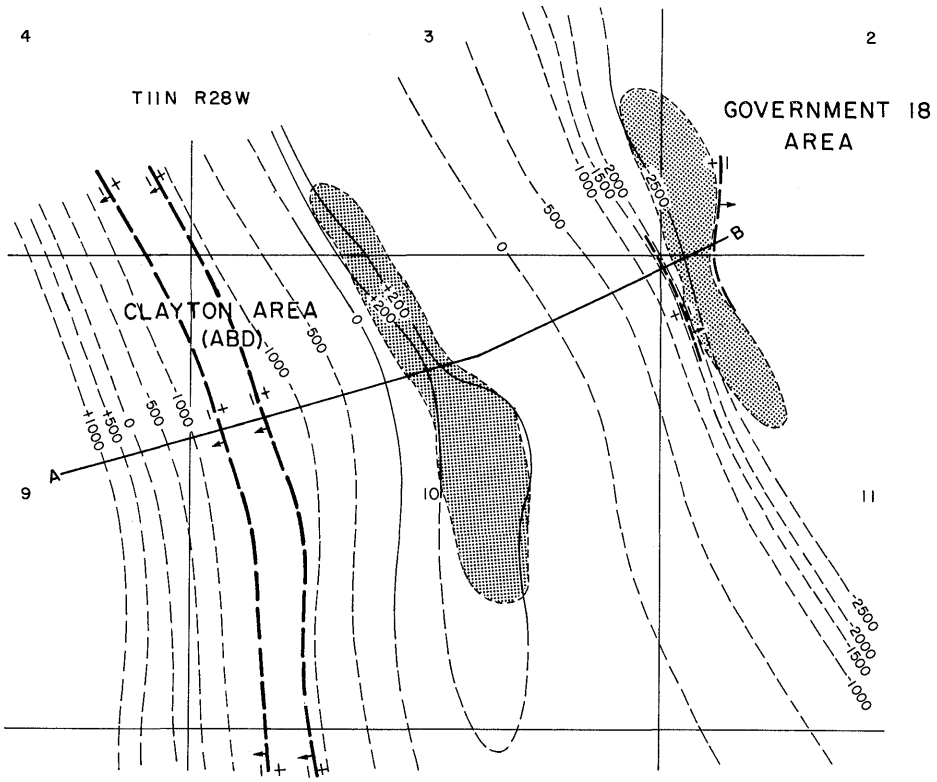
Remarks:

Selected References:

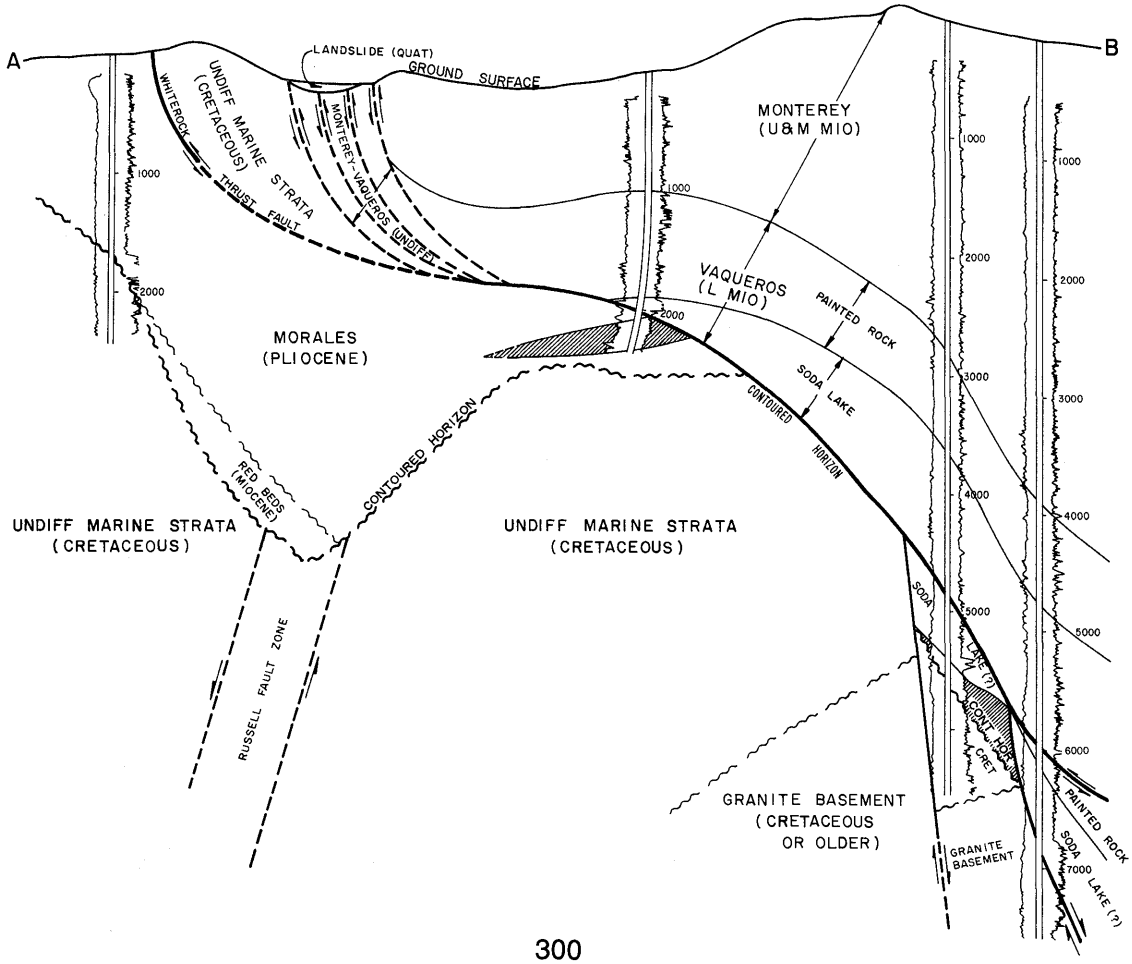
DATE: May 1983

CALIFORNIA DIVISION OF OIL AND GAS

MORALES CANYON OIL FIELD



CONTOURS ON TOP OF CRETACEOUS



COUNTY: **SAN LUIS OBISPO**

MORALES CANYON 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	Mobil Expl. and Prod. N.A., Inc. "Government" 18-2	The Superior Oil Co. "Government" 18-2	2 11N 28W	SB	6,128	Government 18	
Deepest well	Mobil Expl. and Prod. N.A., Inc. "Government" 28-2	The Superior Oil Co. "Government" 28-2	2 11N 28W	SB	7,576		granitic basement Jurassic (?)

POOL DATA

ITEM	GOVERNMENT 18					FIELD OR AREA DATA
Discovery date	March 1950					
Initial production rates						
Oil (bbl/day)	399					
Gas (Mcf/day)	180					
Flow pressure (psi)	480					
Bean size (in.)	7/64					
Initial reservoir pressure (psi)	675					
Reservoir temperature (°F)	139					
Initial oil content (STB/ac.-ft.)						
Initial gas content (MSCF/ac.-ft.)						
Formation	Vaqueros					
Geologic age	early Miocene					
Average depth (ft.)	5,800					
Average net thickness (ft.)	400					
Maximum productive area (acres)						220
RESERVOIR ROCK PROPERTIES						
Porosity (%)	40-70**					
Soi (%)	20-60**					
Swi (%)	0-10**					
Sgi (%)						
Permeability to air (md)						
RESERVOIR FLUID PROPERTIES						
Oil:						
Oil gravity (°API)	38					
Sulfur content (% by wt.)						
Initial solution GOR (SCF/STB)	600					
Initial oil FVF (RB/STB)						
Bubble point press. (psia)						
Viscosity (cp) @ °F						
Gas:						
Specific gravity (air = 1.0)						
Heating value (Btu/cu. ft.)						
Water:						
Salinity, NaCl (ppm)	7,757					
T.D.S. (ppm)	9,020					
R_w (ohm/m) (77°F)						
ENHANCED RECOVERY PROJECTS						
Enhanced recovery projects						
Date started						
Date discontinued						
Peak oil production (bbl)						410,332
Year						1951
Peak gas production, net (Mcf)						258,514
Year						1951

Base of fresh water (ft.): See areas

Remarks: The field was originally called Morales Oil Field.

Selected References: Dolman, S.G., 1950, Operations in District 3: Calif. Div. of Oil and Gas, Summary of Operations--Calif. Oil Fields, Vol. 36, No. 2.
Hill, M.L., S.A. Carlson and T.W. Dibblee, Jr., 1958, Stratigraphy of Cuyama Valley - Caliente Range Area, California: Am. Assoc. Petroleum Geologists Bull., Vol. 42, No. 12, p. 2973.
Lawrence, E.D., 1960, Morales Oil Field: Calif. Div. of Oil and Gas, Summary of Operations--Calif. Oil Fields, Vol. 46, No. 2.

DATE: January 1989 **Estimated value

CALIFORNIA DIVISION OF OIL AND GAS

COUNTY: SAN LUIS OBISPO

MORALES CANYON OIL FIELD
CLAYTON 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	Alfred M. Hammerslough "Hancock-Oceanic" 65-10	The Hancock Oil Co. of Calif. "Hancock-Oceanic" 65-10	10 11N 28W	SB	2,492	Clayton	
Deepest well	Chevron U.S.A. Inc. "Shlaudeman" 1-10	Southern California Petroleum Co. "Shlaudeman" 1-10	10 11N 28W	SB	2,577		Morales early Pliocene

POOL DATA

ITEM	CLAYTON					FIELD OR AREA DATA
Discovery date	May 1950					
Initial production rates						
Oil (bbl/day)	68					
Gas (Mcf/day)	12					
Flow pressure (psi)						
Bean size (in.)						
Initial reservoir pressure (psi)	250-350					
Reservoir temperature (°F)	112					
Initial oil content (STB/ac.-ft.)						
Initial gas content (MSCF/ac.-ft.)						
Formation	Morales					
Geologic age	early Pliocene					
Average depth (ft.)	1,900					
Average net thickness (ft.)	100					
Maximum productive area (acres)	150					
RESERVOIR ROCK PROPERTIES						
Porosity (%)	30-70**					
S_{oi} (%)	30-60**					
S_{wi} (%)	0-10**					
S_{gi} (%)						
Permeability to air (md)						
RESERVOIR FLUID PROPERTIES						
Oil:						
Oil gravity (°API)	32					
Sulfur content (% by wt.)						
Initial solution GOR (SCF/STB)	176					
Initial oil FVF (RB/STB)						
Bubble point press. (psia)						
Viscosity (cp) @ °F						
Gas:						
Specific gravity (air = 1.0)						
Heating value (Btu/cu. ft.)						
Water:						
Salinity, NaCl (ppm)	2,673					
T.D.S. (ppm)	5,750					
R_w (ohm/m) (77°F)						
ENHANCED RECOVERY PROJECTS						
Enhanced recovery projects	waterflood					
Date started	1968					
Date discontinued	1969					
Peak oil production (bbl)	237,353					
Year	1951					
Peak gas production, net (Mcf)	112,720					
Year	1951					

Base of fresh water (ft.): 0-200

Remarks: The area was abandoned in 1977 and reactivated in 1990.

Selected References:

DATE: June 1991 **Estimated value

CALIFORNIA DIVISION OF OIL AND GAS

COUNTY: SAN LUIS OBISPO

MORALES CANYON OIL FIELD
GOVERNMENT 18 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 Expl. and Prod. N.A., Inc. "Government" 18-2	The Superior Oil Co. "Government" 18-2	2 11N 28W	SB	6,128	Government 18	
Deepest well	Mobil Expl. and Prod. N.A., Inc. "Government" 28-2	The Superior Oil Co. "Government" 28-2	2 11N 28W	SB	7,576		granitic basement Jurassic (?)

POOL DATA

ITEM	GOVERNMENT 18					FIELD OR AREA DATA
Discovery date	March 1950					
Initial production rates						
Oil (bbl/day)	399					
Gas (Mcf/day)	180					
Flow pressure (psi)	480					
Bean size (in.)	7/64					
Initial reservoir pressure (psi)	675					
Reservoir temperature (°F)	139					
Initial oil content (STB/ac.-ft.)						
Initial gas content (MSCF/ac.-ft.)						
Formation	Vaqueros					
Geologic age	early Miocene					
Average depth (ft.)	5,800					
Average net thickness (ft.)	400					
Maximum productive area (acres)	70					
RESERVOIR ROCK PROPERTIES						
Porosity (%)	40-70**					
S_{oi} (%)	20-60**					
S_{wi} (%)	0-10**					
S_{gi} (%)						
Permeability to air (md)						
RESERVOIR FLUID PROPERTIES						
Oil:						
Oil gravity (°API)	38					
Sulfur content (% by wt.)						
Initial solution GOR (SCF/STB)	600					
Initial oil FVF (RB/STB)						
Bubble point press. (psia)						
Viscosity (cp) @ °F						
Gas:						
Specific gravity (air = 1.0)						
Heating value (Btu/cu. ft.)						
Water:						
Salinity, NaCl (ppm)	7,757					
T.D.S. (ppm)	9,020					
R_w (ohm/m) (77°F)						
ENHANCED RECOVERY PROJECTS						
Enhanced recovery projects						
Date started						
Date discontinued						
Peak oil production (bbl)	172,979					
Year	1951					
Peak gas production, net (Mcf)	177,618					
Year	1952					

Base of fresh water (ft.): 0-200

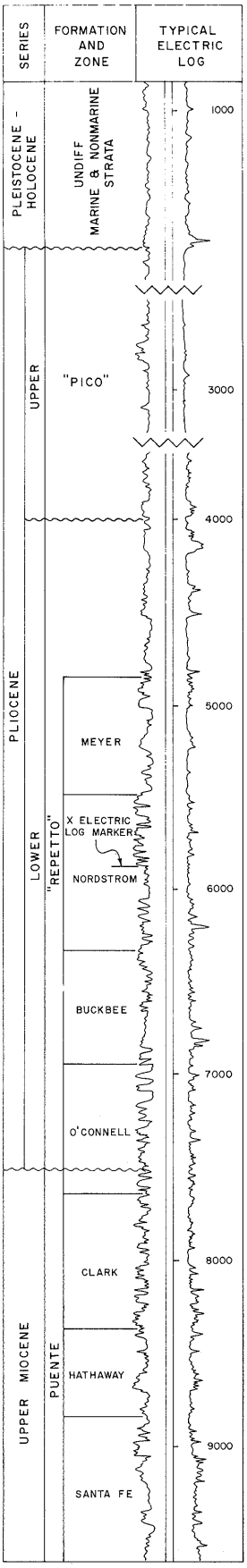
Remarks: The Government 18 zone was originally referred to as the Superior zone.

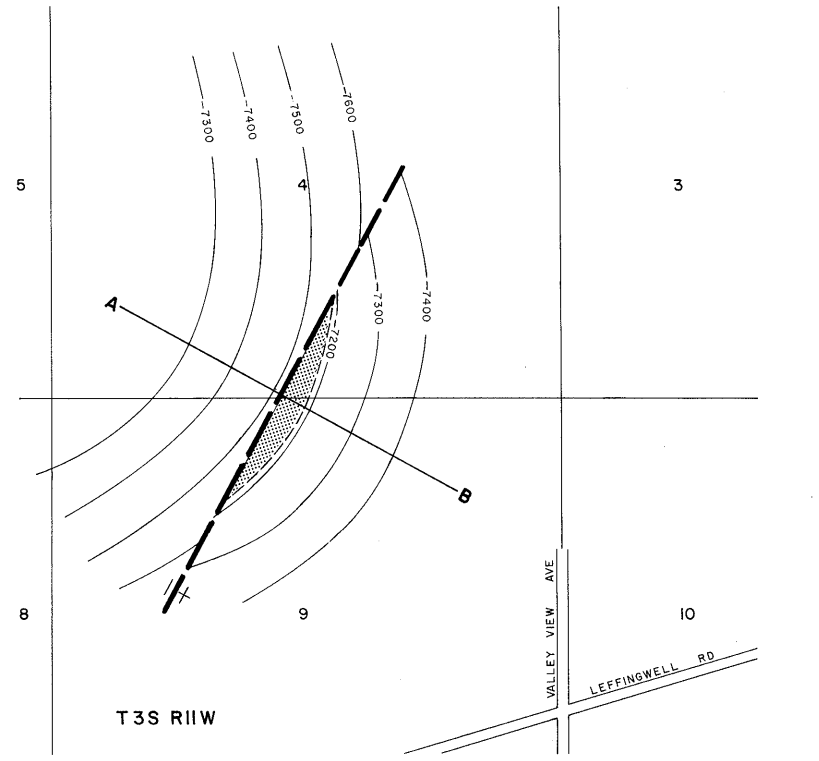
Selected References:

DATE: January 1989 **Estimated value

CALIFORNIA DIVISION OF OIL AND GAS

NEWGATE OIL FIELD

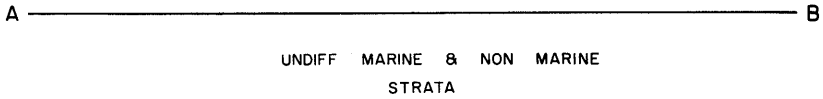




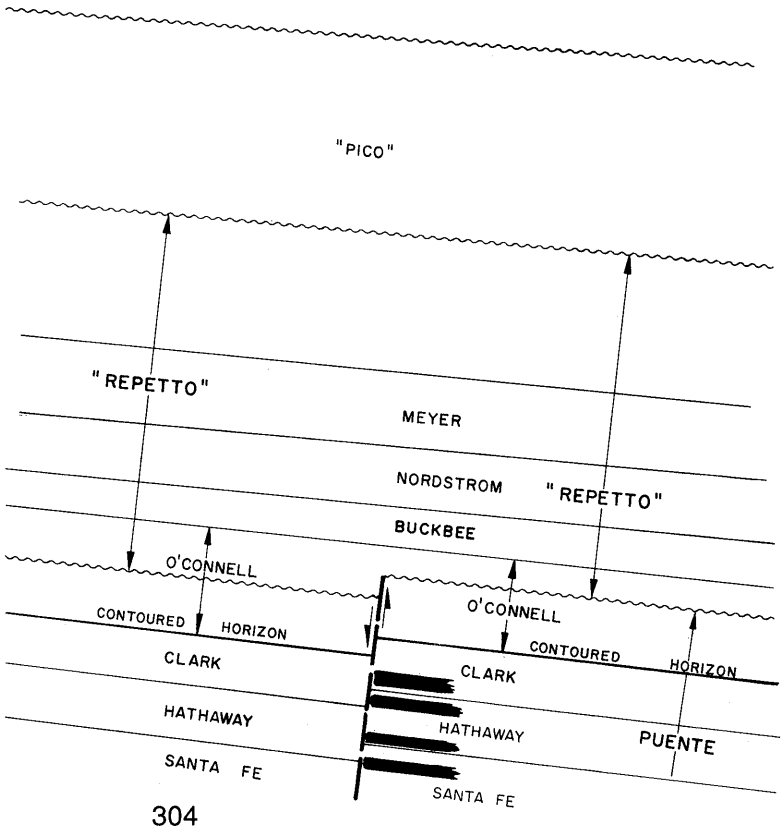
CONTOURS ON TOP OF CLARK

SCALE

0 1000 2000



UNDIFF MARINE & NON MARINE STRATA



COUNTY: LOS ANGELES

NEWGATE 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	Deuel Petroleum Inc. "Newgate Unit A" 1	Western Gulf Oil Co. "Newgate Unit A" 1	9 3S 11W	SB	9,556	Santa Fe	Puente late Miocene
Deepest well	Same as above	"	"	"	"	"	"

POOL DATA

ITEM	CLARK	HATHAWAY	SANTA FE			FIELD OR AREA DATA
Discovery date	January 1957	January 1957	July 1956			
Initial production rates						
Oil (bbl/day)	124	a/	54			
Gas (Mcf/day)	154	-	480			
Flow pressure (psi)						
Bean size (in.)	-	-	30/64			
Initial reservoir pressure (psi)						
Reservoir temperature (°F)						
Initial oil content (STB/ac.-ft.)						
Initial gas content (MSCF/ac.-ft.)						
Formation	Puente	Puente	Puente			
Geologic age	late Miocene	late Miocene	late Miocene			
Average depth (ft.)	7,700	8,400	8,900			
Average net thickness (ft.)	120	90	120			
Maximum productive area (acres)						10
RESERVOIR ROCK PROPERTIES						
Porosity (%)						
So_i (%)						
Sw_i (%)						
Sg_i (%)						
Permeability to air (md)						
RESERVOIR FLUID PROPERTIES						
Oil:						
Oil gravity (°API)	32	32	33			
Sulfur content (% by wt.)						
Initial solution GOR (SCF/STB)						
Initial oil FVF (RB/STB)						
Bubble point press. (psia)						
Viscosity (cp) @ °F						
Gas:						
Specific gravity (air = 1.0)						
Heating value (Btu/cu. ft.)						
Water:						
Salinity, NaCl (ppm)	24,795	24,795	15,390			
T.D.S. (ppm)						
R_w (ohm/m) (77°F)						
ENHANCED RECOVERY PROJECTS						
Enhanced recovery projects						
Date started						
Date discontinued						
Peak oil production (bbl)						17,409
Year						1960
Peak gas production, net (Mcf)						
Year						

Base of fresh water (ft.): 1,700

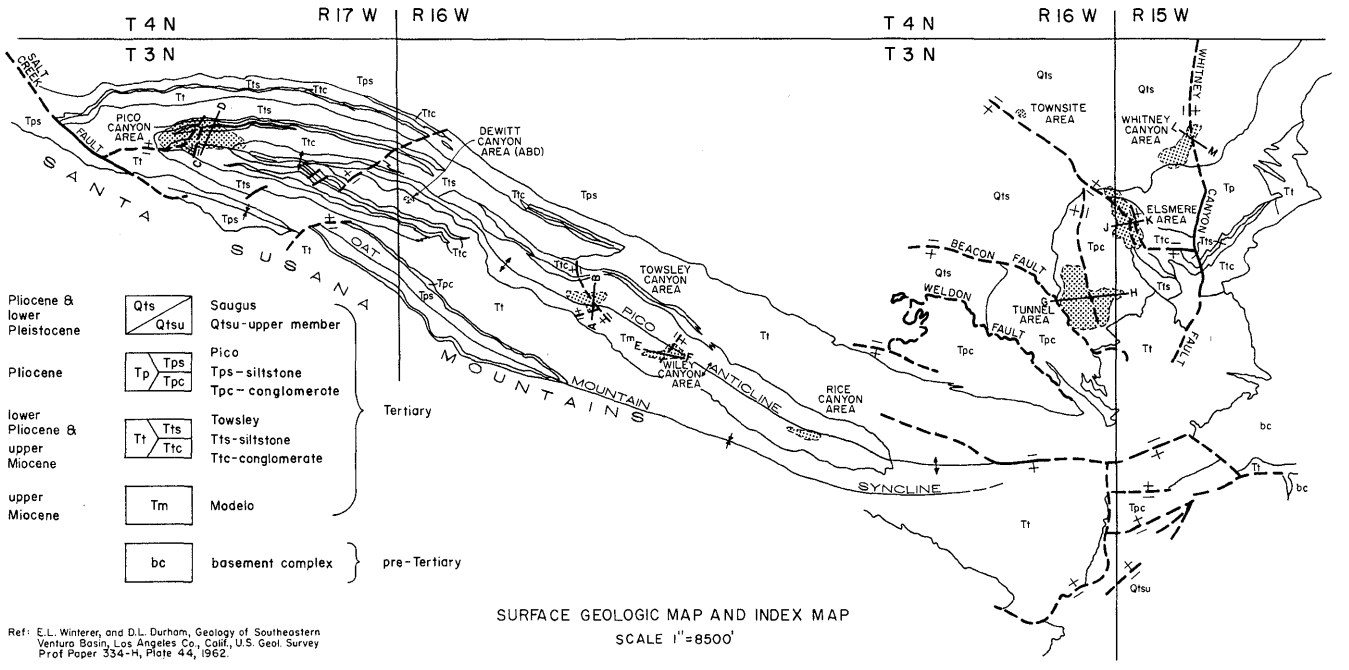
Remarks: a/ Initial production from Clark and Hathaway zones was commingled.

Selected References:

DATE: May 1991

CALIFORNIA DIVISION OF OIL AND GAS

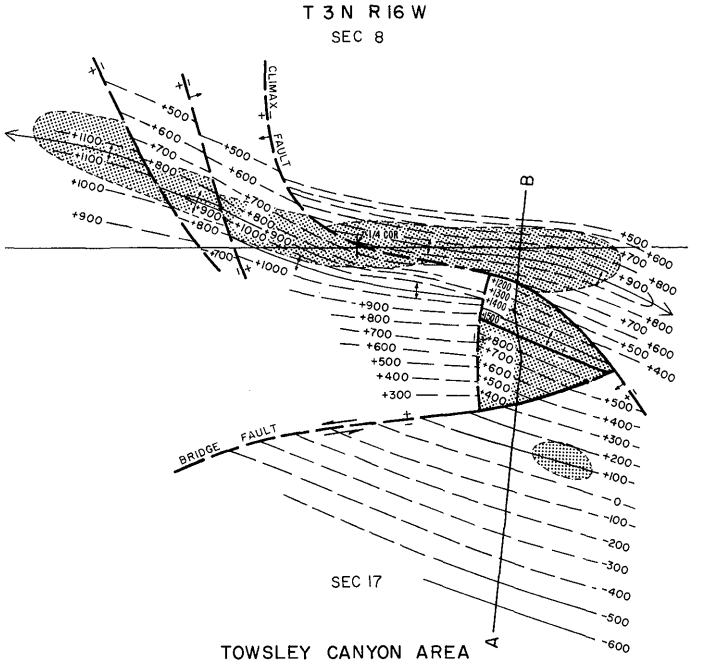
NEWHALL OIL FIELD



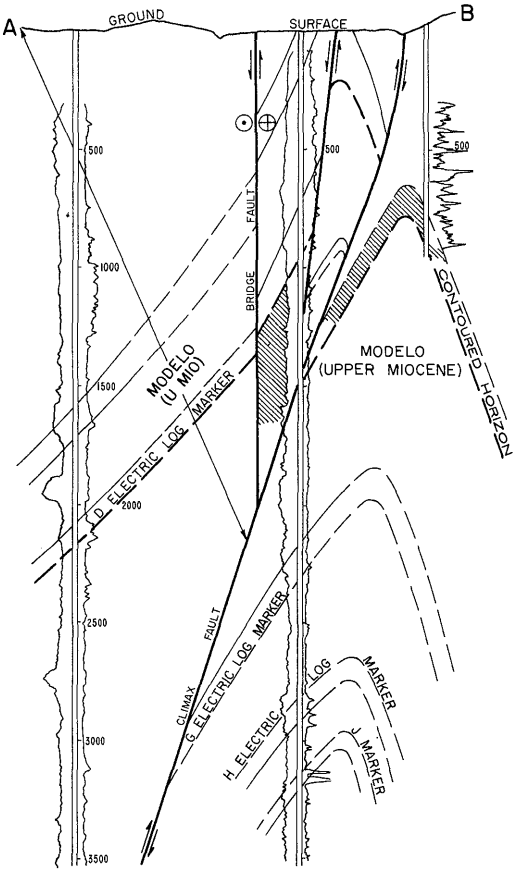
SURFACE GEOLOGIC MAP AND INDEX MAP
SCALE 1"=8500'

Ref: E.L. Winterer, and D.L. Durham, Geology of Southeastern Ventura Basin, Los Angeles Co., Calif., U.S. Geol. Survey Prof Paper 334-H, Plate 44, 1962.

DEFINITIVE SUBSURFACE DATA AVAILABLE ONLY FOR THE TOWSLEY CANYON AREA.



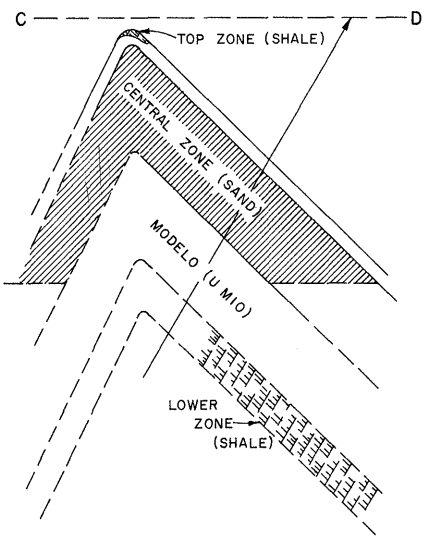
TOWSLEY CANYON AREA
CONTOURS ON D ELECTRIC LOG MARKER
SCALE : 1"= 800'



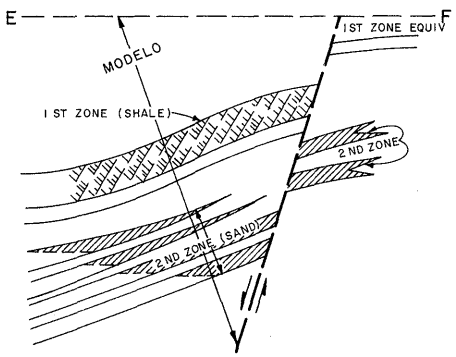
NEWHALL OIL FIELD

GENERALIZED CROSS SECTIONS OF SOME AREAS
OTHER THAN TOWSLEY CANYON AREA
(TOWSLEY CANYON AREA IS SHOWN ON PRECEDING PAGE)

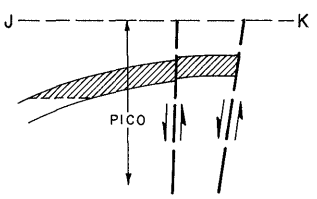
PICO CANYON AREA (ABANDONED)



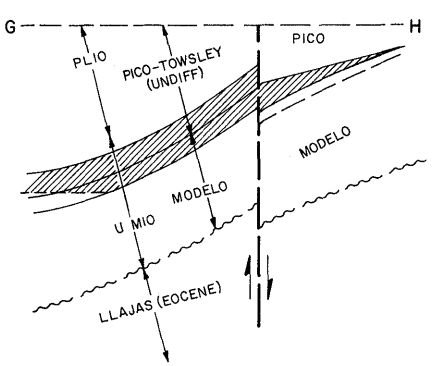
WILEY CANYON AREA (ABANDONED)



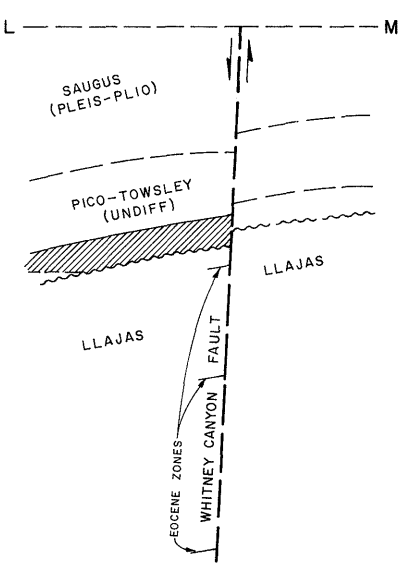
ELSMERE AREA



TUNNEL AREA



WHITNEY CANYON AREA



COUNTY: LOS ANGELES

NEWHALL 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	Chevron U.S.A. Inc. "C.S.O." 4	California Star Oil Works Co. "Pico" 4	2 3N 17W	SB	1,400	Top	
Deepest well	Sun Expl. & Prod. Co. "Limbocker" 1	Barnsdall Oil Co. "Limbocker" 1	17 3N 16W	SB	7,056		Modelo late Miocene

POOL DATA

ITEM	TOP					FIELD OR AREA DATA
Discovery date	Sept. 1876					
Initial production rates						
Oil (bbl/day)	25					
Gas (Mcf/day)						
Flow pressure (psi)						
Bean size (in.)						
Initial reservoir pressure (psi)	900					
Reservoir temperature (°F)						
Initial oil content (STB/ac.-ft.)	866					
Initial gas content (MSCF/ac.-ft.)						
Formation	Modelo					
Geologic age	late Miocene					
Average depth (ft.)	145					
Average net thickness (ft.)	50					
Maximum productive area (acres)						690
RESERVOIR ROCK PROPERTIES						
Porosity (%)	17.6					
S_{oi} (%)						
S_{wi} (%)						
S_{gi} (%)						
Permeability to air (md)	27.7					
RESERVOIR FLUID PROPERTIES						
Oil:						
Oil gravity (°API)	32					
Sulfur content (% by wt.)						
Initial solution GOR (SCF/STB)	250					
Initial oil FVF (RB/STB)	1.12					
Bubble point press. (psia)						
Viscosity (cp) @ °F	1.1 @ 95					
Gas:						
Specific gravity (air = 1.0)						
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						
Date started						
Date discontinued						
Peak oil production (bbl)						434,114
Year						1939
Peak gas production, net (Mcf)						344,434
Year						1939

Base of fresh water (ft.): See areas

Remarks:

Selected References:

Eldridge, G.H., and R. Arnold, 1907, The Santa Clara Valley, Puente Hills, and Los Angeles Oil Districts, Southern California: U.S. Geol. Survey Bulletin 309, pp. 90-101.

Kew, W.S.W., 1924, Geology and Oil Resources of a Part of Los Angeles and Ventura Counties, California: U.S. Geol. Survey Bulletin 753, pp. 144-160.

Welling, R.W., 1934, Report on Newhall Oil Field: Calif. Div. of Oil and Gas, Summary of Operations -- Calif. Oil Fields, Vol. 20, No. 2.

Winterer, E.L., and D.L. Durham, 1962, Geology of Southeastern Ventura Basin, Los Angeles County, California: U.S. Geol. Survey Prof. Paper 334-H.

DATE: May 1983

CALIFORNIA DIVISION OF OIL AND GAS

COUNTY: LOS ANGELES

NEWHALL OIL FIELD
DE WITT CANYON 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	Pacific Coast Oil Co. No. 1	Hardison and Stewart No. 1	7 3N 16W	SB	1,320	unnamed sands & fractured shales	
Deepest well	Pacific Coast Oil Co. No. 3	Hardison and Stewart No. 3	7 3N 16W	SB	1,600		Modelo late Miocene

POOL DATA

ITEM	UNNAMED SANDS & FRACTURED SHALES					FIELD OR AREA DATA
Discovery date	1882					
Initial production rates						
Oil (bbl/day)						
Gas (Mcf/day)						
Flow pressure (psi)						
Bean size (in.)						
Initial reservoir pressure (psi)						
Reservoir temperature (°F)						
Initial oil content (STB/ac.-ft.)						
Initial gas content (MSCF/ac.-ft.)						
Formation	Modelo					
Geologic age	late Miocene					
Average depth (ft.)	90-200					
Average net thickness (ft.)	30					
Maximum productive area (acres)	10					
RESERVOIR ROCK PROPERTIES						
Porosity (%)						
S_{oi} (%)						
S_{wi} (%)						
S_{gi} (%)						
Permeability to air (md)						
RESERVOIR FLUID PROPERTIES						
Oil:						
Oil gravity (°API)	21					
Sulfur content (% by wt.)						
Initial solution GOR (SCF/STB)						
Initial oil FVF (RB/STB)						
Bubble point press. (psia)						
Viscosity (cp) @ °F						
Gas:						
Specific gravity (air = 1.0)						
Heating value (Btu/cu. ft.)						
Water:						
Salinity, NaCl (ppm)	4,300					
T.D.S. (ppm)						
R_w (ohm/m) (77°F)						
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.): 0 - 100

Remarks: The area was abandoned prior to 1900. Oil was mined from two placer mining claims in 1890. Cumulative production is unknown.

Selected References: Walling, R.W., 1934, Report on Newhall Oil Field: Calif. Div. of Oil and Gas, Summary of Operations -- Calif. Oil Fields, Vol. 20, No. 2.

DATE: May 1983

CALIFORNIA DIVISION OF OIL AND GAS

COUNTY: LOS ANGELES

NEWHALL OIL FIELD
ELSMERE 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. "Elsmere" 2	Pacific Coast Oil Co. "Elsmere" 2	7 3N 15W	SB	1,226	unnamed	
Deepest well	Chevron U.S.A. Inc. "Elsmere" 23	Standard Oil Co. of Calif. "Elsmere" 23	7 3N 15W	SB	2,821		Llajas Eocene

POOL DATA

ITEM	UNNAMED					FIELD OR AREA DATA
Discovery date	March 1891					
Initial production rates						
Oil (bbl/day)	57					
Gas (Mcf/day)						
Flow pressure (psi)						
Bean size (in.)						
Initial reservoir pressure (psi)						
Reservoir temperature (°F)						
Initial oil content (STB/ac.-ft.)						
Initial gas content (MSCF/ac.-ft.)						
Formation	Pico					
Geologic age	Pliocene					
Average depth (ft.)	780					
Average net thickness (ft.)	100					
Maximum productive area (acres)	100					
RESERVOIR ROCK PROPERTIES						
Porosity (%)						
So_i (%)						
Sw_i (%)						
Sg_i (%)						
Permeability to air (md)						
RESERVOIR FLUID PROPERTIES						
Oil:						
Oil gravity (°API)	15					
Sulfur content (% by wt.)						
Initial solution GOR (SCF/STB)						
Initial oil FVF (RB/STB)						
Bubble point press. (psia)						
Viscosity (cp) @ °F						
Gas:						
Specific gravity (air = 1.0)						
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						
Date started						
Date discontinued						
Peak oil production (bbl)	992					
Year	1954					
Peak gas production, net (Mcf)						
Year						

Base of fresh water (ft.): 100 - 500

Remarks: There has been no production from the Elsmere Canyon Area since 1955. The area was abandoned in 1987. Cumulative production is 1,064,589 bbl of oil and 785 Mcf of gas.

Selected References: Walling, R.W., 1934, Report on Newhall Oil Field: Calif. Div. of Oil and Gas, Summary of Operations -- Calif. Oil Fields, Vol. 20, No. 2.

DATE: May 1983

CALIFORNIA DIVISION OF OIL AND GAS

COUNTY: LOS ANGELES

NEWHALL OIL FIELD
PICO CANYON 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	Chevron U.S.A. Inc. "C.S.O." 4	California Star Oil Works Co. "Pico" 4	2 3N 17W	SB	1,400	Top	
Deepest well	Chevron U.S.A. Inc. "C.S.O." 32	Pacific Coast Oil Co. "C.S.O.W." 32	2 3N 17W	SB	3,445		Modelo late Miocene

POOL DATA

ITEM	TOP	CENTRAL	LOWER			FIELD OR AREA DATA
Discovery date	September 1876	September 1880	March 1905			
Initial production rates						
Oil (bbl/day)	25	-	-			
Gas (Mcf/day)						
Flow pressure (psi)						
Bean size (in.)						
Initial reservoir pressure (psi)	900	900	900			
Reservoir temperature (°F)						
Initial oil content (STB/ac.-ft.)	866	866	866			
Initial gas content (MSCF/ac.-ft.)						
Formation	Modelo	Modelo	Modelo			
Geologic age	late Miocene	late Miocene	late Miocene			
Average depth (ft.)	145	1,250	3,000			
Average net thickness (ft.)	50	400	175			
Maximum productive area (acres)						160
RESERVOIR ROCK PROPERTIES						
Porosity (%)	17.6	17.6	17.6			
So_i (%)						
Sw_i (%)						
Sg_i (%)						
Permeability to air (md)	27.7	27.7	27.7			
RESERVOIR FLUID PROPERTIES						
Oil:						
Oil gravity (°API)	32	38	34			
Sulfur content (% by wt.)						
Initial solution GOR (SCF/STB)	250	250	250			
Initial oil FVF (RB/STB)	1.12	1.12	1.12			
Bubble point press. (psia)						
Viscosity (cp) @ °F	1.1 @ 95	1.1 @ 95	1.1 @ 95			
Gas:						
Specific gravity (air = 1.0)						
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	waterflood[a/]					
Date started	1963					
Date discontinued	1967					
Peak oil production (bbl)						23,600
Year						1933
Peak gas production, net (Mcf)						
Year						

Base of fresh water (ft.): None

Remarks: Seepage oil was collected in Pico Canyon in 1850 by Andreas Pico and used by the San Fernando Mission for illumination. Oil was mined at five placer claims from 1865-1890.

a/ Water was injected into all three zones: Top, Central, and Lower.

Selected References: Walling, R.W., 1934, Report on Newhall Oil Field: Calif. Div. of Oil and Gas, Summary of Operations -- Calif. Oil Fields, Vol. 20, No. 2.

DATE: January 1990

CALIFORNIA DIVISION OF OIL AND GAS

COUNTY: LOS ANGELES

NEWHALL OIL FIELD
RICE CANYON 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	Chevron U.S.A. Inc. "Rice" 1	Pacific Coast Oil Co. "Rice" 1	22 3N 16W	SB	550	1st	
Deepest well	Ricano Oil Co. No. 1	Inspiration Oil Co. No. 1	22 3N 16W	SB	1,580		Modelo late Miocene

POOL DATA

ITEM	1ST	2ND				FIELD OR AREA DATA
Discovery date	November 1899	-				
Initial production rates						
Oil (bbl/day)						
Gas (Mcf/day)						
Flow pressure (psi)						
Bean size (in.)						
Initial reservoir pressure (psi)						
Reservoir temperature (°F)						
Initial oil content (STB/ac.-ft.)						
Initial gas content (MSCF/ac.-ft.)						
Formation	Modelo	Modelo				
Geologic age	late Miocene	late Miocene				
Average depth (ft.)	700	1,275				
Average net thickness (ft.)	150	200				
Maximum productive area (acres)						30
RESERVOIR ROCK PROPERTIES						
Porosity (%)						
So_i (%)						
Sw_i (%)						
Sg_i (%)						
Permeability to air (md)						
RESERVOIR FLUID PROPERTIES						
Oil:						
Oil gravity (°API)	25	31				
Sulfur content (% by wt.)						
Initial solution GOR (SCF/STB)						
Initial oil FVF (RB/STB)						
Bubble point press. (psia)						
Viscosity (cp) @ °F						
Gas:						
Specific gravity (air = 1.0)						
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						
Date started						
Date discontinued						
Peak oil production (bbl)						622
Year						1935
Peak gas production, net (Mcf)						
Year						

Base of fresh water (ft.): 0 - 100

Remarks: There has been no production from the Rice Canyon Area since 1935. The area was abandoned in 1972. Cumulative production is 111,175 bbl of oil and 120,000 Mcf of gas.

Selected References: Walling, R.W., 1934, Report on Newhall Oil Field: Calif. Div. of Oil and Gas, Summary of Operations -- Calif. Oil Fields, Vol. 20, No. 2.

DATE: May 1983

CALIFORNIA DIVISION OF OIL AND GAS

COUNTY: LOS ANGELES

NEWHALL OIL FIELD
TOWNSITE 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	Southwest Oil Co. "Braille" 1	Talisman Oil Co. "Braille" 1	1 3N 16W	SB	3,196	Braille	
Deepest well	Conoco Inc. "Braille" 3	Continental Oil Co. "Braille" 3	1 3N 16W	SB	3,835		Modelo Miocene

POOL DATA

ITEM	BRAILLE					FIELD OR AREA DATA
Discovery date	March 1951					
Initial production rates						
Oil (bbl/day)	30					
Gas (Mcf/day)	50					
Flow pressure (psi)						
Bean size (in.)						
Initial reservoir pressure (psi)						
Reservoir temperature (°F)						
Initial oil content (STB/ac.-ft.)						
Initial gas content (MSCF/ac.-ft.)						
Formation	Modelo					
Geologic age	Miocene					
Average depth (ft.)	2,735					
Average net thickness (ft.)	82					
Maximum productive area (acres)	40					
RESERVOIR ROCK PROPERTIES						
Porosity (%)						
S_{oi} (%)						
S_{wi} (%)						
S_{gi} (%)						
Permeability to air (md)						
RESERVOIR FLUID PROPERTIES						
Oil:						
Oil gravity (°API)	20					
Sulfur content (% by wt.)						
Initial solution GOR (SCF/STB)						
Initial oil FVF (RB/STB)						
Bubble point press. (psia)						
Viscosity (cp) @ °F						
Gas:						
Specific gravity (air = 1.0)						
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						
Date started						
Date discontinued						
Peak oil production (bbl)	14,648					
Year	1952					
Peak gas production, net (Mcf)						
Year						

Base of fresh water (ft.): 1,400

Remarks:

Selected References:

DATE: May 1983

CALIFORNIA DIVISION OF OIL AND GAS

COUNTY: LOS ANGELES

NEWHALL OIL FIELD
TOWSLEY CANYON 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	Estate of Welburn Mayock "Climax" 1	Temple Oil Co.	8 3N 16W	SB	970	unnamed	
Deepest well	Sun Expl. & Prod. Co. "Limbocker" 1	Barnsdall Oil Company "Limbocker" 1	17 3N 16W	SB	7,056		Modelo Miocene

POOL DATA

ITEM	UNNAMED					FIELD OR AREA DATA
Discovery date	Prior to 1893					
Initial production rates						
Oil (bbl/day)						
Gas (Mcf/day)						
Flow pressure (psi)						
Bean size (in.)						
Initial reservoir pressure (psi)						
Reservoir temperature (°F)						
Initial oil content (STB/ac.-ft.)						
Initial gas content (MSCF/ac.-ft.)						
Formation	Modelo					
Geologic age	Miocene					
Average depth (ft.)	1,482					
Average net thickness (ft.)	30-200					
Maximum productive area (acres)	80					
RESERVOIR ROCK PROPERTIES						
Porosity (%)						
So_i (%)						
Sw_i (%)						
Sg_i (%)						
Permeability to air (md)						
RESERVOIR FLUID PROPERTIES						
Oil:						
Oil gravity (°API)	16-24					
Sulfur content (% by wt.)						
Initial solution GOR (SCF/STB)						
Initial oil FVF (RB/STB)						
Bubble point press. (psia)						
Viscosity (cp) @ °F						
Gas:						
Specific gravity (air = 1.0)						
Heating value (Btu/cu. ft.)						
Water:						
Salinity, NaCl (ppm)	4,300					
T.D.S. (ppm)						
R_w (ohm/m) (77°F)						
ENHANCED RECOVERY PROJECTS						
Enhanced recovery projects						
Date started						
Date discontinued						
Peak oil production (bbl)	3,349					
Year	1955					
Peak gas production, net (Mcf)						
Year						

Base of fresh water (ft.): 0 - 100

Remarks: Native Americans first gathered petroleum here by soaking blankets in the oil from the seeps located in this canyon. Oil was mined from oil seeps prior to 1876.

Selected References:

Bailey, Thomas L., 1957, Geology of Towsley Canyon Oil Field: Manuscript prepared for the Waterflood Oil Company, on file in the office of Lewis A. Bond in San Marino, California.

Prutzman, Paul W., 1913, Petroleum in Southern California: California State Mining Bureau Bulletin 63, p. 167.

Stanley and Stolz, 1951, Towsley Canyon Properties: Manuscript on file in the office of Welburn Mayock.

Walling, R.W., 1934, Report on Newhall Oil Field: Calif. Div. of Oil and Gas, Summary of Operations -- Calif. Oil Fields, Vol. 20, No. 2 (Reprint No. 2).

Wents, John H. Jr., 1948, The Oil Possibilities of Towsley Canyon Area on the Pico Anticline Newhall Dist. Los Angeles County, Calif: Manuscript on file in the office of Welburn Mayock.

Zulberti, J.L., 1966, Towsley Canyon Area of Newhall Oil Field: Calif. Div. of Oil and Gas, Summary of Operations -- Calif. Oil Fields, Vol. 52, No. 1.

DATE: May 1983

CALIFORNIA DIVISION OF OIL AND GAS

COUNTY: LOS ANGELES

NEWHALL OIL FIELD
TUNNEL 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	Eureka Crude Oil Co. No. 1	Same as present	13 3N 16W	SB	800	unnamed	
Deepest well	Morton and Dolley "Needham" 5	Union Oil Co. of Calif., Opr. "Needham" 3	12 3N 16W	SB	4,037		Llajas Eocene

POOL DATA

ITEM	UNNAMED					FIELD OR AREA DATA
Discovery date	1900					
Initial production rates						
Oil (bbl/day)	7					
Gas (Mcf/day)						
Flow pressure (psi)						
Bean size (in.)						
Initial reservoir pressure (psi)						
Reservoir temperature (°F)	103					
Initial oil content (STB/ac.-ft.)						
Initial gas content (MSCF/ac.-ft.)						
Formation	Towsley-Modelo					
Geologic age	late Miocene					
Average depth (ft.)	1,581					
Average net thickness (ft.)	70-300					
Maximum productive area (acres)	140					
RESERVOIR ROCK PROPERTIES						
Porosity (%)	20-25**					
S_{oi} (%)	59					
S_{wi} (%)	41					
S_{gi} (%)						
Permeability to air (md)	100**					
RESERVOIR FLUID PROPERTIES						
Oil:						
Oil gravity (°API)	13-21					
Sulfur content (% by wt.)						
Initial solution GOR (SCF/STB)						
Initial oil FVF (RB/STB)	1.05					
Bubble point press. (psia)						
Viscosity (cp) @ °F						
Gas:						
Specific gravity (air = 1.0)						
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	waterflood					
Date started	1971					
Date discontinued	1982					
Peak oil production (bbl)	113,190					
Year	1953					
Peak gas production, net (Mcf)						
Year						

Base of fresh water (ft.): 100 - 500

Remarks:

Selected References: Walling, W.R., 1934, Report on Newhall Oil Field: Calif. Div. of Oil and Gas, Summary of Operations -- Calif. Oil Fields, Vol. 20, No. 2.

DATE: May 1983 **Estimated value

CALIFORNIA DIVISION OF OIL AND GAS

COUNTY: LOS ANGELES

NEWHALL OIL FIELD
WHITNEY CANYON 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	Tosco Enhanced Oil Recovery Corp. "Banner" 1	Banner Oil Co. "Banner" 1	6 3N 15W	SB	2,117	unnamed	
Deepest well	Occidental Petroleum Corp. "Price" 4	Southern Production Co., Ltd. No. 1	6 3N 15W	SB	2,842		Llajas Eocene

POOL DATA

ITEM	UNNAMED	EOCENE				FIELD OR AREA DATA
Discovery date	1893	June 1933				
Initial production rates						
Oil (bbl/day)	100	2				
Gas (Mcf/day)						
Flow pressure (psi)						
Bean size (in.)						
Initial reservoir pressure (psi)						
Reservoir temperature (°F)						
Initial oil content (STB/ac.-ft.)						
Initial gas content (MSCF/ac.-ft.)						
Formation	Towsley	Llajas				
Geologic age	late Miocene	Eocene				
Average depth (ft.)	1,075	2,000				
Average net thickness (ft.)	150	150				
Maximum productive area (acres)						80
RESERVOIR ROCK PROPERTIES						
Porosity (%)						
S_{oi} (%)						
S_{wi} (%)						
S_{gi} (%)						
Permeability to air (md)						
RESERVOIR FLUID PROPERTIES						
Oil:						
Oil gravity (°API)	18	27				
Sulfur content (% by wt.)						
Initial solution GOR (SCF/STB)						
Initial oil FVF (RB/STB)						
Bubble point press. (psia)						
Viscosity (cp) @ °F						
Gas:						
Specific gravity (air = 1.0)						
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						
Date started						
Date discontinued						
Peak oil production (bbl)						4,347
Year						1933
Peak gas production, net (Mcf)						
Year						

Base of fresh water (ft.): 100 - 500

Remarks:

Selected References: Walling, R.W., 1934, Report on Newhall Oil Field: Calif. Div. of Oil and Gas, Summary of Operations -- Calif. Oil Fields, Vol. 20, No. 2.

DATE: May 1983

CALIFORNIA DIVISION OF OIL AND GAS

COUNTY: LOS ANGELES

NEWHALL OIL FIELD
WILEY CANYON 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	Chevron U.S.A. Inc. "Wiley" 4	Pacific Coast Oil Co. "Wiley" 4 a/	16 3N 16W	SB	1,275	1st	
Deepest well	Chevron U.S.A. Inc. "Wiley" 25	Pacific Coast Oil Co. "Wiley" 25	16 3N 16W	SB	3,835		Modelo late Miocene

POOL DATA

ITEM	1ST	2ND				FIELD OR AREA DATA
Discovery date	May 1884	May 1884				
Initial production rates						
Oil (bbl/day)	2	2				
Gas (Mcf/day)						
Flow pressure (psi)						
Bean size (in.)						
Initial reservoir pressure (psi)						
Reservoir temperature (°F)						
Initial oil content (STB/ac.-ft.)						
Initial gas content (MSCF/ac.-ft.)						
Formation	Modelo	Modelo				
Geologic age	late Miocene	late Miocene				
Average depth (ft.)	1,000	1,275				
Average net thickness (ft.)	150	250				
Maximum productive area (acres)						70
RESERVOIR ROCK PROPERTIES						
Porosity (%)						
So_i (%)						
Sw_i (%)						
Sg_i (%)						
Permeability to air (md)						
RESERVOIR FLUID PROPERTIES						
Oil:						
Oil gravity (°API)	25	31				
Sulfur content (% by wt.)						
Initial solution GOR (SCF/STB)						
Initial oil FVF (RB/STB)						
Bubble point press. (psia)						
Viscosity (cp) @ °F						
Gas:						
Specific gravity (air = 1.0)						
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						
Date started						
Date discontinued						
Peak oil production (bbl)						5,822
Year						1933
Peak gas production, net (Mcf)						
Year						

Base of fresh water (ft.): 0 - 100

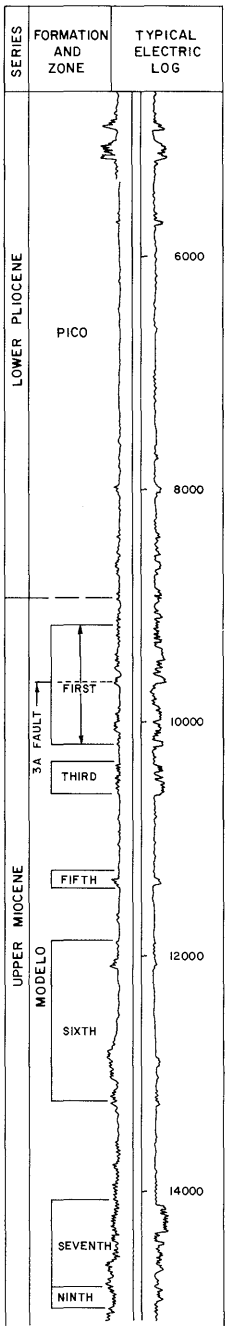
Remarks: The Wiley Canyon area has not produced since 1940. The area was abandoned in 1978. Cumulative production is 510,249 bbl of oil and 1,020,498 Mcf of gas.
Seepage oil was collected and sold to the Metropolitan Gas Works in San Francisco as early as 1868. Two tunnels were dug 300 to 400 feet into the canyon's side in unsuccessful attempts to increase seepage. In 1869, a dry hole was drilled using the spring pole method.
a/ Generally credited with the first commercial production from this area.

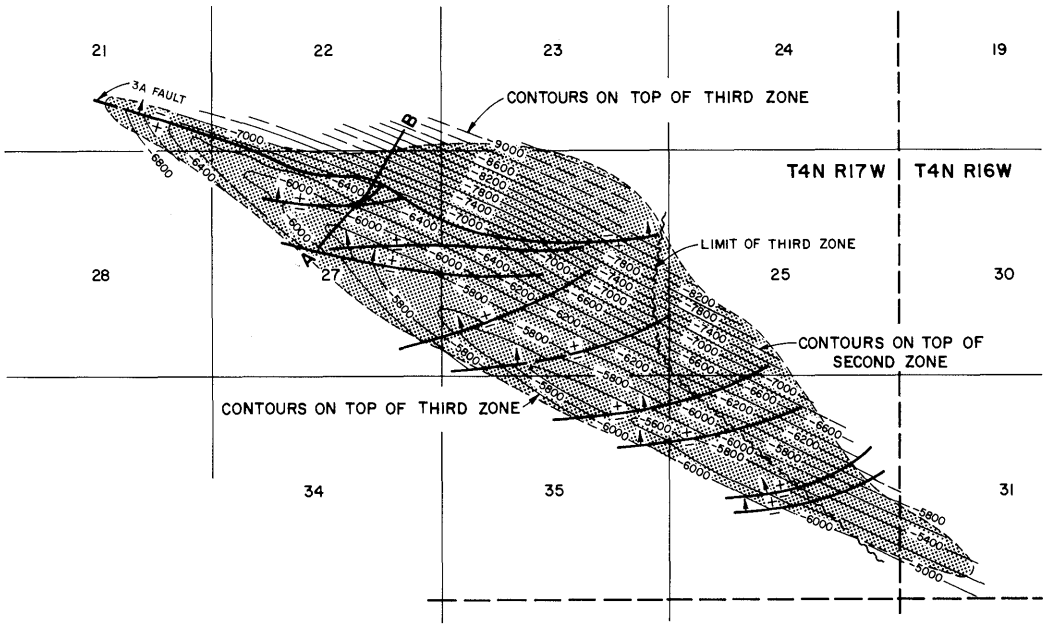
Selected References: Walling, R.W., 1934, Report on Newhall Oil Field: Calif. Div. of Oil and Gas, Summary of Operations -- Calif. Oil Fields, Vol. 20, No. 2.

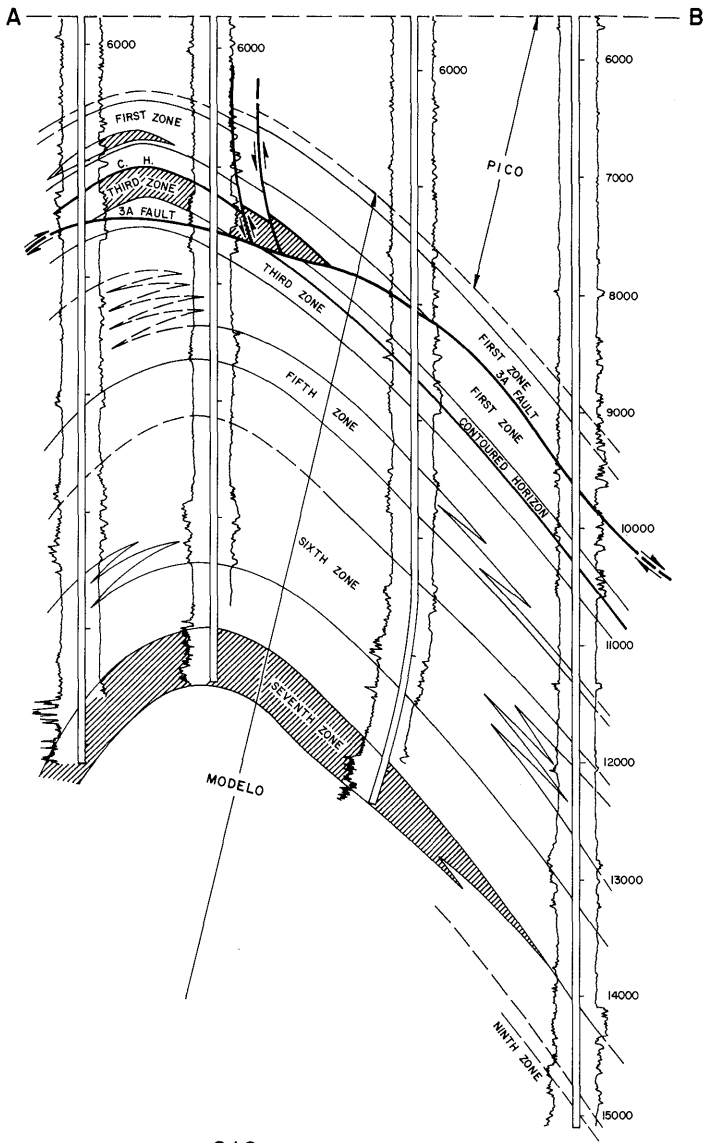
DATE: May 1983

CALIFORNIA DIVISION OF OIL AND GAS

NEWHALL - POTRERO OIL FIELD







COUNTY: LOS ANGELES

NEWHALL- POTRERO 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	Sun Expl. & Prod. Co. "Rancho San Francisco" 1	Barnsdall Oil Co. "Rancho San Francisco" 1	26 4N 17W	SB	7,012	First	
Deepest well	Sun Oil Co. "Rancho San Francisco" 154	Sunray Mid-Continent Oil Co. "Rancho San Francisco" 154	27 4N 17W	SB	15,490		Modelo Miocene

POOL DATA

ITEM	FIRST	SECOND	THIRD	FIFTH	SIXTH	FIELD OR AREA DATA
Discovery date	March 1937	February 1938	September 1938	June 1946	March 1945	
Initial production rates						
Oil (bbl/day)	118	631	790	336	557	
Gas (Mcf/day)	200	555	455	370	505	
Flow pressure (psi)						
Bean size (in.)						
Initial reservoir pressure (psi)	3,100	3,100	3,100	3,925	4,959	
Reservoir temperature (°F)	170	170	170	200	205	
Initial oil content (STB/ac.-ft.)						
Initial gas content (MSCF/ac.-ft.)						
Formation	Modelo	Modelo	Modelo	Modelo	Modelo	
Geologic age	Miocene	Miocene	Miocene	Miocene	Miocene	
Average depth (ft.)	6,500	6,900	7,400	9,300	9,700	
Average net thickness (ft.)	300	200	250	300	275	
Maximum productive area (acres)						
RESERVOIR ROCK PROPERTIES						
Porosity (%)	17.7	17.7	17.7	11.0	11.0	
S_{oi} (%)	70	70	70	60	65	
S_{wi} (%)	30	30	30	40	35	
S_{gi} (%)						
Permeability to air (md)	75	75	75	15	50	
RESERVOIR FLUID PROPERTIES						
Oil:						
Oil gravity (°API)	34	35	34	26-42	31-41	
Sulfur content (% by wt.)	0.52	0.52	0.52	0.56	0.56	
Initial solution GOR (SCF/STB)	707	707	707	906	1,274	
Initial oil FVF (RB/STB)	1.358	1.358	1.358	1.548	1.681	
Bubble point press. (psia)	2,723	2,723	2,723	3,138	4,085	
Viscosity (cp) @ °F	0.72 @ 170	0.72 @ 170	0.72 @ 170	0.51 @ 200	0.25 @ 205	
Gas:						
Specific gravity (air = 1.0)						
Heating value (Btu/cu. ft.)						
Water:						
Salinity, NaCl (ppm)	6,000	6,000	6,000	6,800	6,000	
T.D.S. (ppm)						
R_w (ohm/m) (77°F)						
ENHANCED RECOVERY PROJECTS						
Enhanced recovery projects	pressure maintenance[a/]	waterflood	waterflood	pressure maintenance	pressure maintenance	
Date started	1944	1969	1958	1952	1954	
Date discontinued	active waterflood 1963 active	1981	active	active waterflood 1981 active	active	
Peak oil production (bbl)						
Year						
Peak gas production, net (Mcf)						
Year						

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

Remarks: a/ Pressure maintenance injection into First, Second, and Third Zones.

Selected References:

Hodges, F.C., and E.R. Murray-Aaron, 1943, Newhall-Potrero, Aliso Canyon, Del Valle and Oak Canyon Oil Fields: Calif. Div. of Oil and Gas, Summary of Operations -- Calif. Oil Fields, Vol. 29, No. 1 (Reprint No. 2).

Loofbourow, J.S., Jr., 1952, Newhall-Potrero Oil Field: A.A.P.G.-S.E.P.M.-S.E.G. Guidebook, Joint Annual Meeting, Los Angeles.

Mefferd, M.G., 1965, Newhall-Potrero Oil Field: Calif. Div of Oil and Gas, Summary of Operations -- Calif. Oil Fields, Vol. 51, No. 2.

Winterer, E.L., and D.L. Durham, 1962, Geology of Southeastern Ventura Basin, Los Angeles County, California: U.S. Geological Survey Prof. Paper 334-H.

DATE: May 1983

CALIFORNIA DIVISION OF OIL AND GAS

COUNTY: LOS ANGELES

NEWHALL-POTRERO 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	SEVENTH	NINTH				FIELD OR AREA DATA
Discovery date	April 1948	December 1947				
Initial production rates						
Oil (bbl/day)	430	55				
Gas (Mcf/day)	230	20				
Flow pressure (psi)						
Bean size (in.)						
Initial reservoir pressure (psi)	5,650	-				
Reservoir temperature (°F)	323	-				
Initial oil content (STB/ac.-ft.)						
Initial gas content (MSCF/ac.-ft.)						
Formation	Modelo	Modelo				
Geologic age	Miocene	Miocene				
Average depth (ft.)	11,806	14,200				
Average net thickness (ft.)	200	300				
Maximum productive area (acres)						1,080
RESERVOIR ROCK PROPERTIES						
Porosity (%)	12.5	-				
So_i (%)	60	-				
Sw_i (%)	40	-				
Sg_i (%)						
Permeability to air (md)	24	-				
RESERVOIR FLUID PROPERTIES						
Oil:						
Oil gravity (°API)	30-33	-				
Sulfur content (% by wt.)	0.81	-				
Initial solution GOR (SCF/STB)	390	-				
Initial oil FVF (RB/STB)	1.351	-				
Bubble point press. (psia)	2,627	-				
Viscosity (cp) @ °F	86 @ 323	-				
Gas:						
Specific gravity (air = 1.0)						
Heating value (Btu/cu. ft.)						
Water:						
Salinity, NaCl (ppm)	6,800	6,000				
T.D.S. (ppm)						
R_w (ohm/m) (77°F)						
ENHANCED RECOVERY PROJECTS						
Enhanced recovery projects	pressure maintenance					
Date started	1954					
Date discontinued	active waterflood					
	1978					
	active					
Peak oil production (bbl)						3,611,892
Year						1955
Peak gas production, net (Mcf)						24,780,791
Year						1963

Base of fresh water (ft.):

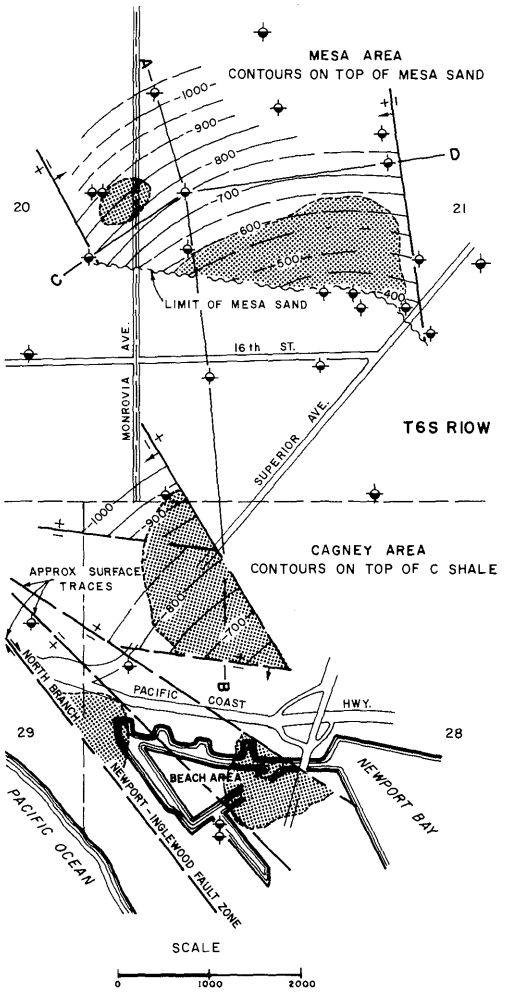
Remarks:

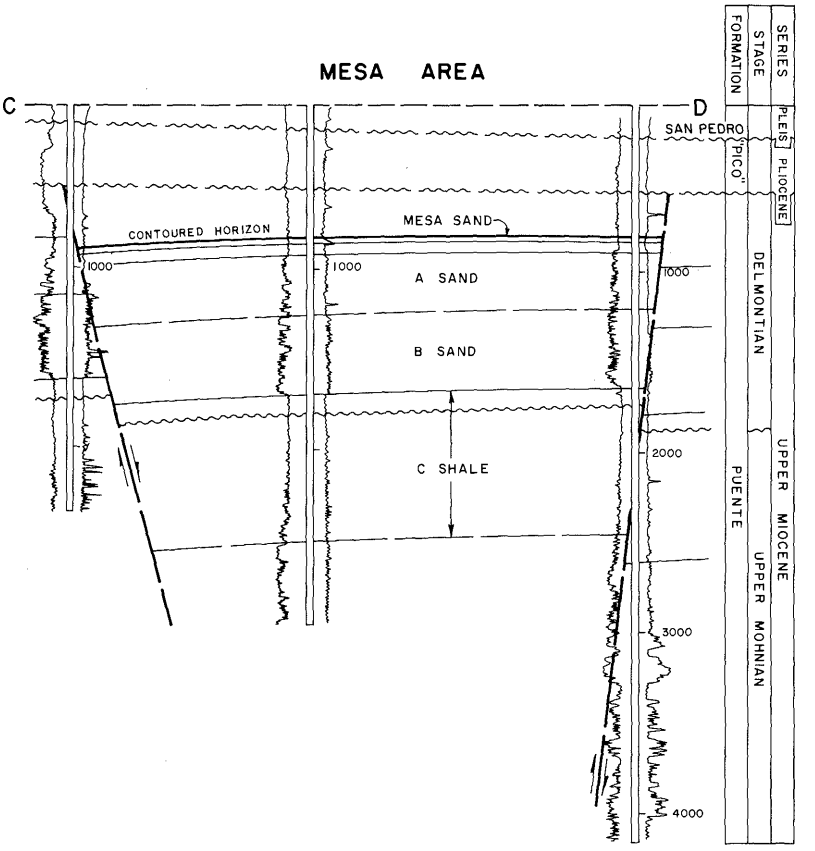
Selected References:

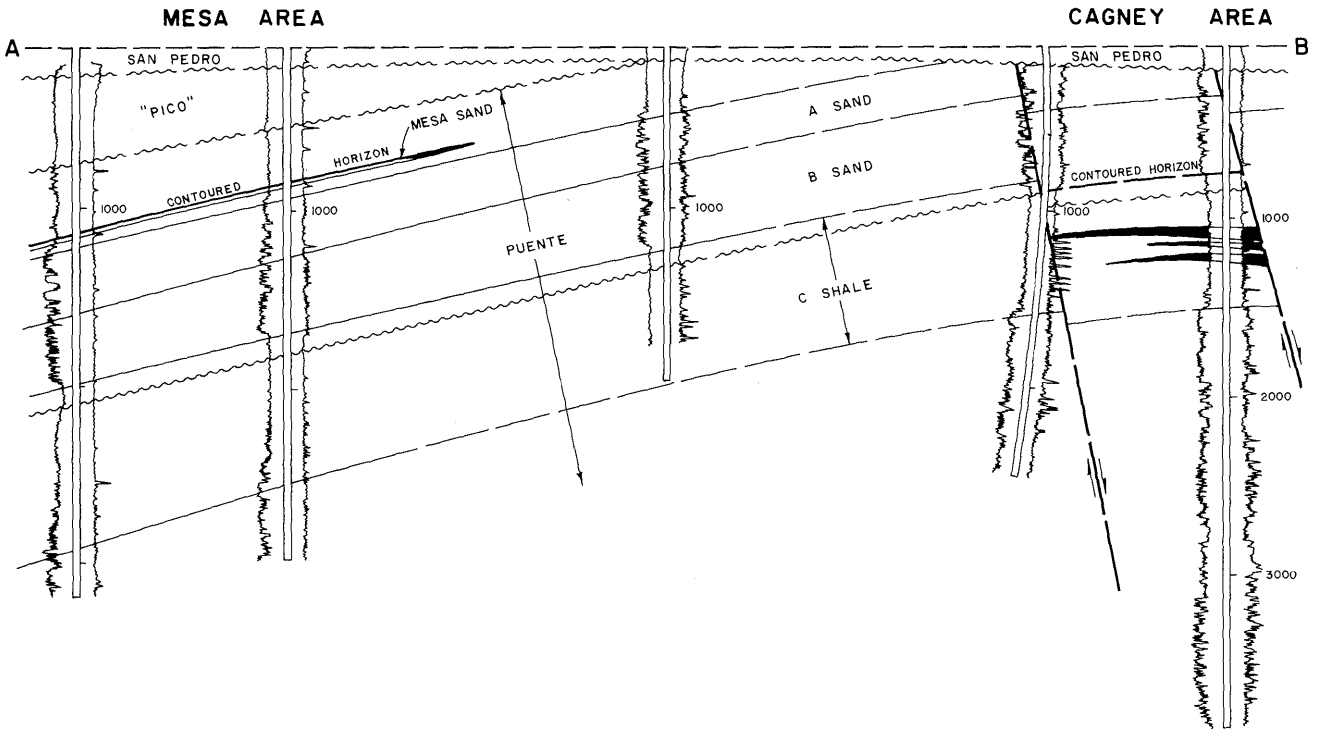
DATE: May 1987

CALIFORNIA DIVISION OF OIL AND GAS

NEWPORT OIL FIELD







COUNTY: ORANGE

NEWPORT 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	Gilbert H. Beesemyer "Steel Rig" 1	Bulkerson et al No. 1	28 6S 10W	SB	1,750	C Shale	
Deepest well	Ajax Petroleum Co., Ltd. "Mesa" 1	Same as present	21 6S 10W	SB	7,253		Topanga middle Miocene

POOL DATA

ITEM	C SHALE					FIELD OR AREA DATA
Discovery date	1922					
Initial production rates						
Oil (bbl/day)	15					
Gas (Mcf/day)						
Flow pressure (psi)						
Bean size (in.)						
Initial reservoir pressure (psi)						
Reservoir temperature (°F)						
Initial oil content (STB/ac.-ft.)						
Initial gas content (MSCF/ac.-ft.)						
Formation	Puente					
Geologic age	late Miocene					
Average depth (ft.)	1,225					
Average net thickness (ft.)	300					
Maximum productive area (acres)						90
RESERVOIR ROCK PROPERTIES						
Porosity (%)						
So_i (%)						
Sw_i (%)						
Sg_i (%)						
Permeability to air (md)						
RESERVOIR FLUID PROPERTIES						
Oil:						
Oil gravity (°API)	12					
Sulfur content (% by wt.)						
Initial solution GOR (SCF/STB)						
Initial oil FVF (RB/STB)						
Bubble point press. (psia)						
Viscosity (cp) @ °F						
Gas:						
Specific gravity (air = 1.0)						
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						
Date started						
Date discontinued						
Peak oil production (bbl)						37,223
Year						1925
Peak gas production, net (Mcf)						
Year						

Base of fresh water (ft.): See areas

Remarks: Freshwater zones have been invaded by sea water.

Selected References: Ingram, W.L., 1968, Newport Oil Field: Calif. Div. of Oil and Gas, Summary of Operations - Calif. Oil Fields, Vol. 54, No. 2 - Part 2.

DATE: July 1983

CALIFORNIA DIVISION OF OIL AND GAS

COUNTY: ORANGE

NEWPORT OIL FIELD
BEACH 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	Gilbert H. Bessemyer "Steel Rig" 1	Mitchell, Bouer, & Fulkerson No. 1	28 6S 10W	SB	1,750	C Shale	Puente late Miocene
Deepest well	Same as above	"	"	"	"	"	"

POOL DATA

ITEM	C SHALE					FIELD OR AREA DATA
Discovery date	1922					
Initial production rates						
Oil (bbl/day)	15					
Gas (Mcf/day)						
Flow pressure (psi)						
Bean size (in.)						
Initial reservoir pressure (psi)						
Reservoir temperature (°F)						
Initial oil content (STB/ac.-ft.)						
Initial gas content (MSCF/ac.-ft.)						
Formation	Puente					
Geologic age	late Miocene					
Average depth (ft.)	1,225					
Average net thickness (ft.)	300					
Maximum productive area (acres)	40					
RESERVOIR ROCK PROPERTIES						
Porosity (%)						
So_i (%)						
Sw_i (%)						
Sg_i (%)						
Permeability to air (md)						
RESERVOIR FLUID PROPERTIES						
Oil:						
Oil gravity (°API)	12					
Sulfur content (% by wt.)						
Initial solution GOR (SCF/STB)						
Initial oil FVF (RB/STB)						
Bubble point press. (psia)						
Viscosity (cp) @ °F						
Gas:						
Specific gravity (air = 1.0)						
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						
Date started						
Date discontinued						
Peak oil production (bbl)	28,946					
Year	1925					
Peak gas production, net (Mcf)						
Year						

Base of fresh water (ft.): None

Remarks: Area was abandoned in 1921. Cumulative production is unknown.

Selected References:

DATE: July 1983

CALIFORNIA DIVISION OF OIL AND GAS

COUNTY: ORANGE

NEWPORT OIL FIELD
CAGNEY 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	James Cagney-William Cagney "Cagney" 1	California Exploration Co. "Cagney" 1	28 6S 10	SB	1,906	C Shale	
Deepest well	James Cagney-William Cagney "Cagney" 5	Jergins Oil Co. "Cagney" 5	28 6S 10	SB	3,878		Puente late Miocene

POOL DATA

ITEM	C SHALE					FIELD OR AREA DATA
Discovery date	June 1947					
Initial production rates						
Oil (bbl/day)	120					
Gas (Mcf/day)						
Flow pressure (psi)						
Bean size (in.)						
Initial reservoir pressure (psi)						
Reservoir temperature (°F)						
Initial oil content (STB/ac.-ft.)						
Initial gas content (MSCF/ac.-ft.)						
Formation	Puente					
Geologic age	late Miocene					
Average depth (ft.)	1,500					
Average net thickness (ft.)	300					
Maximum productive area (acres)	25					
RESERVOIR ROCK PROPERTIES						
Porosity (%)						
S_{oi} (%)						
S_{wi} (%)						
S_{gi} (%)						
Permeability to air (md)						
RESERVOIR FLUID PROPERTIES						
Oil:						
Oil gravity (°API)	9					
Sulfur content (% by wt.)						
Initial solution GOR (SCF/STB)						
Initial oil FVF (RB/STB)						
Bubble point press. (psia)						
Viscosity (cp) @ °F						
Gas:						
Specific gravity (air = 1.0)						
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						
Date started						
Date discontinued						
Peak oil production (bbl)	4,270					
Year	1948					
Peak gas production, net (Mcf)						
Year						

Base of fresh water (ft.): None

Remarks: A bottomhole heater was installed in one well, but production was noncommercial and the well was abandoned in 1964. Cumulative production is unknown. Freshwater zones have been invaded by sea water.

Selected References:

DATE: July 1983

CALIFORNIA DIVISION OF OIL AND GAS

COUNTY: ORANGE

NEWPORT OIL FIELD
MESA 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	Costa Mesa Oil Co. "Tedesco" 1	Barnett Rosenberg "Mesa" 1	21 6S 10W	SB	643	Mesa	
Deepest well	Ajax Petroleum Co., Ltd. "Mesa" 1	Same as present	21 6S 10W	SB	7,253		Topanga middle Miocene

POOL DATA

ITEM	MESA					FIELD OR AREA DATA
Discovery date	May 1925					
Initial production rates						
Oil (bbl/day)	210					
Gas (Mcf/day)						
Flow pressure (psi)						
Bean size (in.)						
Initial reservoir pressure (psi)						
Reservoir temperature (°F)						
Initial oil content (STB/ac.-ft.)						
Initial gas content (MSCF/ac.-ft.)						
Formation	Puente					
Geologic age	late Miocene					
Average depth (ft.)	500					
Average net thickness (ft.)	15					
Maximum productive area (acres)	25					
RESERVOIR ROCK PROPERTIES						
Porosity (%)						
S_{oi} (%)						
S_{wi} (%)						
S_{gi} (%)						
Permeability to air (md)						
RESERVOIR FLUID PROPERTIES						
Oil:						
Oil gravity (°API)	12					
Sulfur content (% by wt.)						
Initial solution GOR (SCF/STB)						
Initial oil FVF (RB/STB)						
Bubble point press. (psia)						
Viscosity (cp) @ °F						
Gas:						
Specific gravity (air = 1.0)						
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						
Date started						
Date discontinued						
Peak oil production (bbl)	14,035					
Year	1926					
Peak gas production, net (Mcf)						
Year						

Base of fresh water (ft.): None

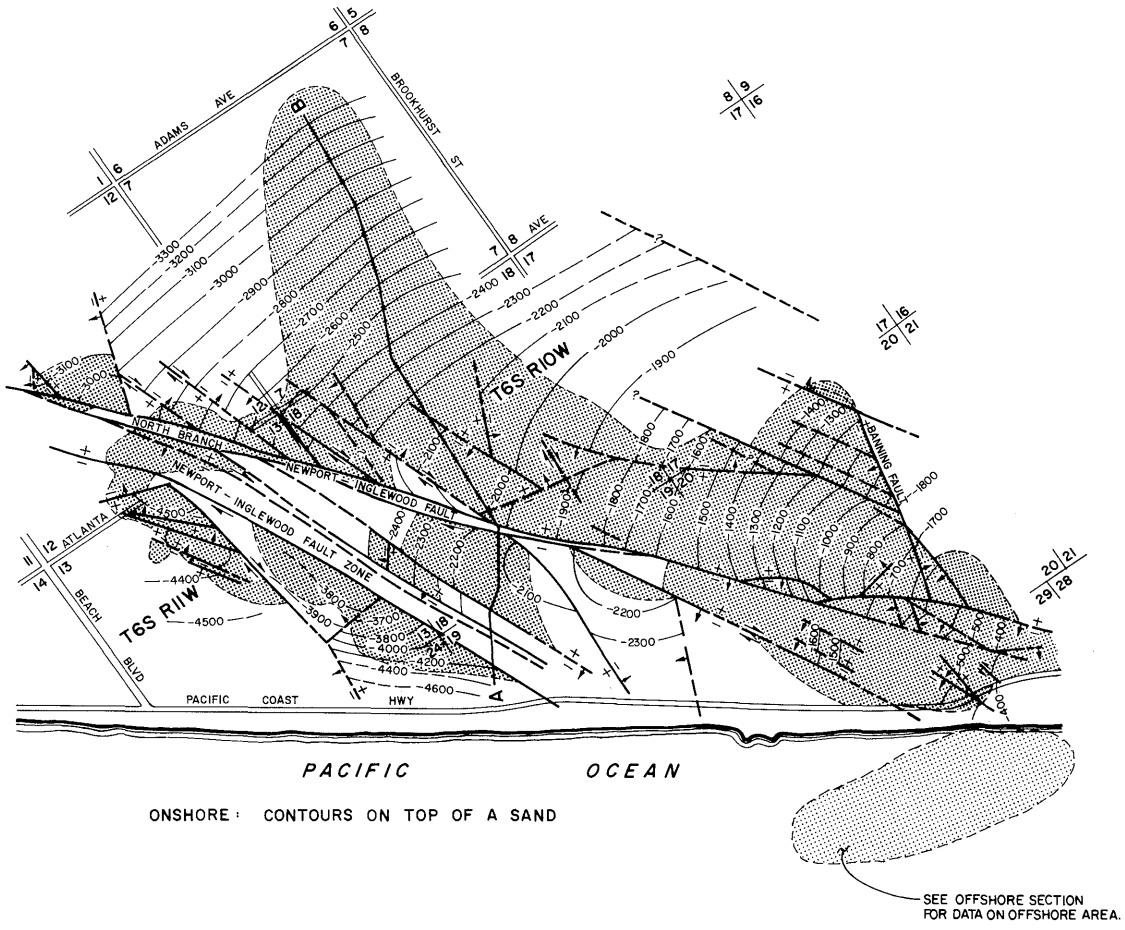
Remarks: Area was abandoned in 1945. Cumulative production is unknown.

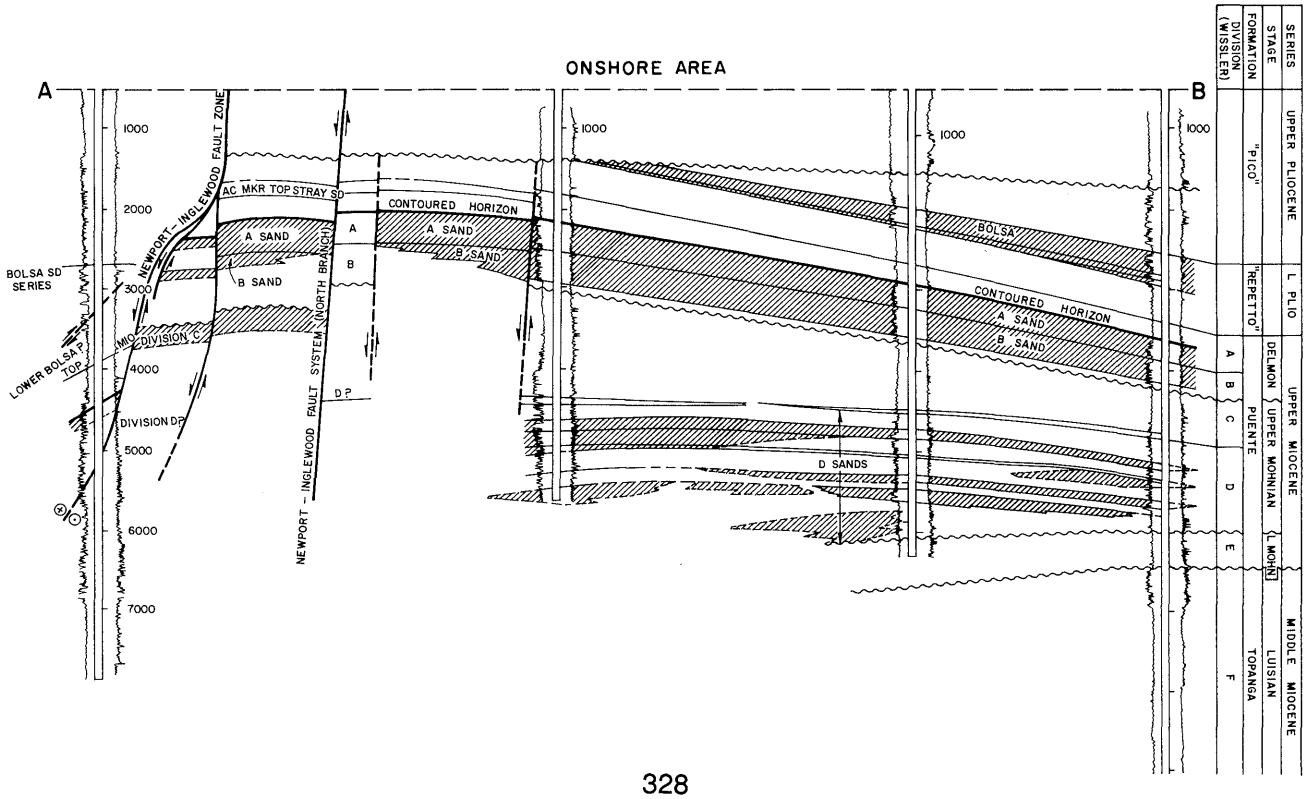
Selected References:

DATE: July 1983

CALIFORNIA DIVISION OF OIL AND GAS

WEST NEWPORT OIL FIELD





COUNTY: ORANGE

NEWPORT, WEST, 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	Mobil Oil Corp. "Banning" 1	D.W. Elliott "Townsend Land Co." 1	20 6S 10W	SB	2,424	B	
Deepest well	Exxon Corp. "State 1549" 2	Monterey Oil Co. "State 1549" 2	19 6S 10W	SB	10,896		Topanga middle Miocene

POOL DATA

ITEM	B SANDS					FIELD OR AREA DATA
Discovery date	April 1943					
Initial production rates						
Oil (bbl/day)	26					
Gas (Mcf/day)						
Flow pressure (psi)						
Bean size (in.)						
Initial reservoir pressure (psi)	585					
Reservoir temperature (°F)	110					
Initial oil content (STB/ac.-ft.)	1,900					
Initial gas content (MSCF/ac.-ft.)	0.5					
Formation	Puente					
Geologic age	late Miocene					
Average depth (ft.)	2,850					
Average net thickness (ft.)	200					
Maximum productive area (acres)						1,328
RESERVOIR ROCK PROPERTIES						
Porosity (%)	36					
So_i (%)	68					
Sw_i (%)	29					
Sg_i (%)	3					
Permeability to air (md)	1,500					
RESERVOIR FLUID PROPERTIES						
Oil:						
Oil gravity (°API)	18					
Sulfur content (% by wt.)	1.98					
Initial solution GOR (SCF/STB)	40					
Initial oil FVF (RB/STB)	1.03					
Bubble point press. (psia)	360					
Viscosity (cp) @ °F	750 @ 100					
Gas:						
Specific gravity (air = 1.0)	0.8					
Heating value (Btu/cu. ft.)						
Water:						
Salinity, NaCl (ppm)	28,000					
T.D.S. (ppm)						
R_w (ohm/m) (77°F)	0.22					
ENHANCED RECOVERY PROJECTS						
Enhanced recovery projects						
Date started						
Date discontinued						
Peak oil production (bbl)						2,593,403
Year						1947
Peak gas production, net (Mcf)						
Year						

Base of fresh water (ft.): See Areas

Remarks: See Areas

Selected References: Corwin, C.H., 1946, West Newport Field: Calif. Div. of Oil and Gas, Summary of Operations -- Calif. Oil Fields, Vol. 32. No. 2.
Hunter, A.L., and D.R. Allen, 1956, Recent Developments in West Newport Oil Field: Calif. Div. of Oil and Gas, Summary of Operations -- Calif. Oil Fields, Vol. 42, No. 2.

DATE: June 1983

CALIFORNIA DIVISION OF OIL AND GAS

COUNTY: ORANGE

NEWPORT, WEST, OIL FIELD ONSHORE 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. "Banning" 1	D.W. Elliott "Townsend Land Co." 1	20 6S 10W	SB	2,424	B	
Deepest well	Exxon Corp. "Thorpe" 2	Monterey Oil Co. "Thorpe" 2	19 6S 10W	SB	7,889		Topanga middle Miocene

POOL DATA

ITEM	BOLSA a/ (Gas)	BOLSA	A SANDS	B SANDS	C SANDS	FIELD OR AREA DATA
Discovery date	July 1954	October 1947	February 1945	April 1943	November 1943	
Initial production rates						
Oil (bbl/day)	0	150	150	26	12	
Gas (Mcf/day)	967	-	-	-	-	
Flow pressure (psi)						
Bean size (in.)						
Initial reservoir pressure (psi)	-	-	450	585	876	
Reservoir temperature (°F)	-	-	105	110	110	
Initial oil content (STB/ac.-ft.)	-	-	1,850	1,900	1,071	
Initial gas content (MSCF/ac.-ft.)	-	-	0.50	0.50	0.41	
Formation	"Repetto"	"Repetto"	Puente	Puente	Puente	
Geologic age	early Pliocene	early Pliocene	late Miocene	late Miocene	late Miocene	
Average depth (ft.)	1,400	2,400	2,500	2,850	3,500	
Average net thickness (ft.)	100	100	100	200	100	
Maximum productive area (acres)						
RESERVOIR ROCK PROPERTIES						
Porosity (%)	-	-	36	36	29	
S_{oi} (%)	-	-	66	68	47	
S_{wi} (%)	-	-	31	29	50	
S_{gi} (%)	-	-	3	3	3	
Permeability to air (md)	-	-	1,500	1,500	229	
RESERVOIR FLUID PROPERTIES						
Oil:						
Oil gravity (°API)	-	18	23	18	23	
Sulfur content (% by wt.)	-	-	-	1.98	-	
Initial solution GOR (SCF/STB)	-	-	40	40	80	
Initial oil FVF (RB/STB)	-	-	1.03	1.03	1.05	
Bubble point press. (psia)	-	-	390	360	650	
Viscosity (cp) @ °F	-	-	3,500 @ 100	570 @ 100	500 @ 100	
Gas:						
Specific gravity (air = 1.0)	-	-	0.8	0.8	0.8	
Heating value (Btu/cu. ft.)	1,005	-	-	-	-	
Water:						
Salinity, NaCl (ppm)	-	25,650	28,000	28,000	25,000	
T.D.S. (ppm)						
R_w (ohm/m) (77°F)	-	-	0.22	0.22	0.24	
ENHANCED RECOVERY PROJECTS						
Enhanced recovery projects			fireflood	fireflood		
Date started			1970	1959		
Date discontinued			active	active		
			steamflood			
			1979			
			1982			
Peak oil production (bbl)						
Year						
Peak gas production, net (Mcf)						
Year						

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

Remarks: a/ This zone was produced from the discovery well only and was abandoned in May 1964. Cumulative dry gas production from the Bolsa gas sands is 190,545 Mcf.

Selected References: Corwin, C. H., 1946, West Newport Oil Field: Calif. Div. of Oil and Gas, Summary of Operations -- Calif. Oil Fields, Vol. 32, No. 2.
Hunter, A., and D. R. Allen, 1956, Recent Developments in the West Newport Oil Field: Calif. Div. of Oil and Gas, Summary of Operations -- Calif. Oil Fields, Vol. 42, No. 2.

DATE: June 1983

CALIFORNIA DIVISION OF OIL AND GAS

COUNTY: ORANGE

NEWPORT, WEST, OIL FIELD
ONSHORE 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	D SANDS					FIELD OR AREA DATA
Discovery date	July 1946					
Initial production rates						
Oil (bbl/day)	1,000					
Gas (Mcf/day)						
Flow pressure (psi)						
Bean size (in.)						
Initial reservoir pressure (psi)	2,300					
Reservoir temperature (°F)	165					
Initial oil content (STB/ac.-ft.)	1,090					
Initial gas content (MSCF/ac.-ft.)	650					
Formation	Puente					
Geologic age	late Miocene					
Average depth (ft.)	5,300					
Average net thickness (ft.)	250					
Maximum productive area (acres)						1,248
RESERVOIR ROCK PROPERTIES						
Porosity (%)	25.5					
S_{oi} (%)	65					
S_{wi} (%)	35					
S_{gi} (%)	0					
Permeability to air (md)	450					
RESERVOIR FLUID PROPERTIES						
Oil:						
Oil gravity (°API)	23					
Sulfur content (% by wt.)						
Initial solution GOR (SCF/STB)	250					
Initial oil FVF (RB/STB)	1.18					
Bubble point press. (psia)	2,300					
Viscosity (cp) @ °F	3.5 @ 150					
Gas:						
Specific gravity (air = 1.0)	0.8					
Heating value (Btu/cu. ft.)						
Water:						
Salinity, NaCl (ppm)	5,130					
T.D.S. (ppm)						
R_w (ohm/m) (77°F)						
ENHANCED RECOVERY PROJECTS						
Enhanced recovery projects						
Date started						
Date discontinued						
Peak oil production (bbl)						2,593,403
Year						1947
Peak gas production, net (Mcf)						
Year						

Base of fresh water (ft.):

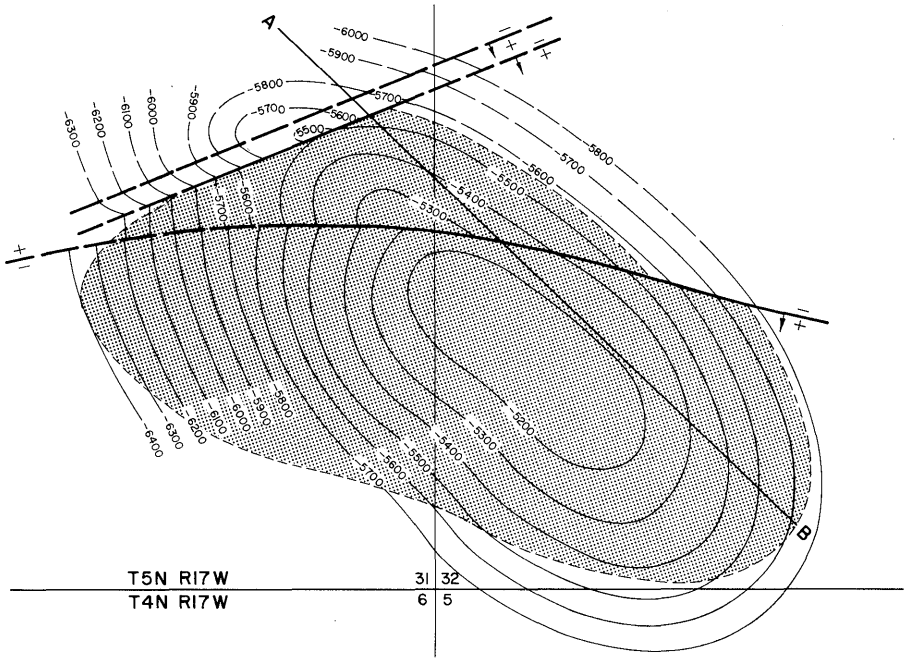
Remarks:

Selected References:

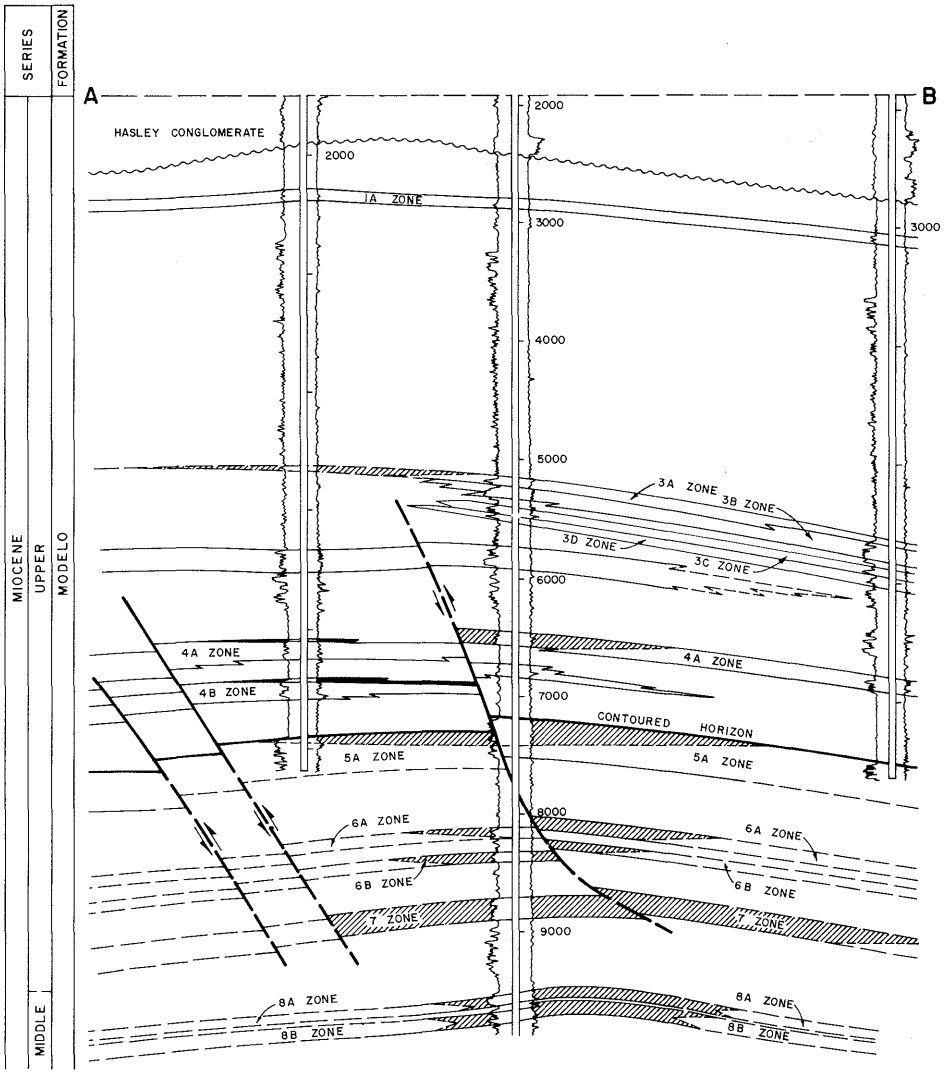
DATE: June 1983

CALIFORNIA DIVISION OF OIL AND GAS

OAK CANYON OIL FIELD



CONTOURS ON TOP OF 5A ZONE
SCALE: 1" = 1600'



COUNTY: LOS ANGELES

OAK CANYON OIL FIELD

Sheet 1 of 3

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	George M. Lechler "Geo. M. Lechler" 1	Western Gulf Oil Co. "Lechler" 1	31 5N 17W	SB	2,442	1A	
Deepest well	Chevron U.S.A. Inc. "USL-G" 6	Western Gulf Oil Co. "L.W. Gilmour, U.S." 3	32 5N 17W	SB	10,816		Modelo Miocene

POOL DATA

ITEM	1A	3A	3B	3C	3D	FIELD OR AREA DATA
Discovery date	February 1941	January 1944	January 1944	1980	1980	
Initial production rates						
Oil (bbl/day)	56	194	194	-	-	
Gas (Mcf/day)	2	44	44	-	-	
Flow pressure (psi)						
Bean size (in.)						
Initial reservoir pressure (psi)	1,043**	1,830**	1,830**	1,830**	1,830**	
Reservoir temperature (°F)	132	148	148	148	-	
Initial oil content (STB/ac.-ft.)						
Initial gas content (MSCF/ac.-ft.)						
Formation	Modelo	Modelo	Modelo	Modelo	Modelo	
Geologic age	Miocene	Miocene	Miocene	Miocene	Miocene	
Average depth (ft.)	2,750	5,160	5,225	5,395	5,445	
Average net thickness (ft.)	85	50	60	-	-	
Maximum productive area (acres)						
RESERVOIR ROCK PROPERTIES						
Porosity (%)	28.8	22.9	22.9	22.9	22.9	
S_{oi} (%)	64.5	55.0	55.0	55.0	55.0	
S_{wi} (%)	35.5	35.0	35.0	35.0	35.0	
S_{gi} (%)	0	0	10	10	10	
Permeability to air (md)	177	262	262	262	262	
RESERVOIR FLUID PROPERTIES						
Oil:						
Oil gravity (°API)	24	30	30	24	24	
Sulfur content (% by wt.)	-	1.03	1.03	1.03	1.03	
Initial solution GOR (SCF/STB)	142	260	260	260	-	
Initial oil FVF (RB/STB)	1.081	1.136	1.136	1.136	1.136	
Bubble point press. (psia)						
Viscosity (cp) @ °F	8 @ 132	4 @ 148	4 @ 148	4 @ 148	4 @ 148	
Gas:						
Specific gravity (air = 1.0)	0.605	0.605	0.605	0.605	0.605	
Heating value (Btu/cu. ft.)	1,050	1,050	1,050	1,050	1,050	
Water:						
Salinity, NaCl (ppm)	8,242	8,465	8,465	8,465	8,465	
T.D.S. (ppm)	9,510	10,010	10,010	10,010	10,010	
R_w (ohm/m) (77°F)	0.54	0.51	0.51	0.51	0.51	
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.): 2,500

Remarks:

Selected References: Ybarra, R.A., and A.D. Stockton, 1958, Oak Canyon Oil Field: Calif. Div. of Oil and Gas, Summary of Operations -- Calif. Oil Fields, Vol. 44, No. 2.

DATE: May 1983 **Estimated value

CALIFORNIA DIVISION OF OIL AND GAS

COUNTY: LOS ANGELES

OAK CANYON 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	4A	4B	5A	6A	6B	FIELD OR AREA DATA
Discovery date	January 1945	January 1945	July 1941	April 1945	April 1945	
Initial production rates						
Oil (bbl/day)	172	55	398	83	83	
Gas (Mcf/day)	0	10	212	0	0	
Flow pressure (psi)						
Bean size (in.)						
Initial reservoir pressure (psi)	2,565	2,565	1,825	3,600	3,600	
Reservoir temperature (°F)	168	168	178	189	191	
Initial oil content (STB/ac.-ft.)						
Initial gas content (MSCF/ac.-ft.)						
Formation	Modelo	Modelo	Modelo	Modelo	Modelo	
Geologic age	Miocene	Miocene	Miocene	Miocene	Miocene	
Average depth (ft.)	6,310	6,600	7,000	7,900	8,050	
Average net thickness (ft.)	80	60	80	60	60	
Maximum productive area (acres)						
RESERVOIR ROCK PROPERTIES						
Porosity (%)	22.5	22.2-23.2	23.0	15.0-18.0	15.0-18.0	
So_i (%)	61.0	61.0	73.0	44.4	44.4	
Sw_i (%)	39.0	39.0	27.0	55.6	56.6	
Sg_i (%)	0	0	0	0	0	
Permeability to air (md)	20	25	70	8	8	
RESERVOIR FLUID PROPERTIES						
Oil:						
Oil gravity (°API)	30	30	32	31	31	
Sulfur content (% by wt.)	460	-	-	-	-	
Initial solution GOR (SCF/STB)	-	460	718	1,057	1,057	
Initial oil FVF (RB/STB)	1.242	1.242	1.376	1.719	1.719	
Bubble point press. (psia)	-	-	2,835	-	-	
Viscosity (cp) @ °F	2 @ 168	2 @ 168	-	-	-	
Gas:						
Specific gravity (air = 1.0)	0.883	0.883	0.883	0.772	0.772	
Heating value (Btu/cu. ft.)	1,490	1,490	1,490	1,318	1,318	
Water:						
Salinity, NaCl (ppm)	8,885	8,885	8,060	6,898	6,898	
T.D.S. (ppm)	9,840	9,840	11,850	9,205	9,205	
R_w (ohm/m) (77°F)	0.451	0.451	0.700	0.451	0.451	
ENHANCED RECOVERY PROJECTS						
Enhanced recovery projects	waterflood	waterflood	waterflood			
Date started	1978	1978	1972			
Date discontinued	active	active	active			
Peak oil production (bbl)						
Year						
Peak gas production, net (Mcf)						
Year						

Base of fresh water (ft.):

Remarks:

Selected References:

DATE: May 1983

CALIFORNIA DIVISION OF OIL AND GAS

COUNTY: LOS ANGELES

OAK CANYON OIL FIELD

Sheet 3 of 3

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	7	8A	8B			FIELD OR AREA DATA
Discovery date	December 1947	June 1945	June 1945			
Initial production rates						
Oil (bbl/day)	194	114	114			
Gas (Mcf/day)	194	94	94			
Flow pressure (psi)						
Bean size (in.)						
Initial reservoir pressure (psi)	3,600**	3,600**	3,600**			
Reservoir temperature (°F)	198	211	213			
Initial oil content (STB/ac.-ft.)						
Initial gas content (MSCF/ac.-ft.)						
Formation	Modelo	Modelo	Modelo			
Geologic age	Miocene	Miocene	Miocene			
Average depth (ft.)	8,560	9,675	9,800			
Average net thickness (ft.)	100	60	60			
Maximum productive area (acres)						210
RESERVOIR ROCK PROPERTIES						
Porosity (%)	15.0-18.0	15.8	15.8			
So_i (%)	44.4	44.4	44.4			
Sw_i (%)	55.6	55.6	55.6			
Sg_i (%)	0	0	0			
Permeability to air (md)	8	21	21			
RESERVOIR FLUID PROPERTIES						
Oil:						
Oil gravity (°API)	31	31	31			
Sulfur content (% by wt.)						
Initial solution GOR (SCF/STB)	1,057	1,057	1,057			
Initial oil FVF (RB/STB)	1.719	1.719	1.719			
Bubble point press. (psia)						
Viscosity (cp) @ °F						
Gas:						
Specific gravity (air = 1.0)	0.772	0.772	0.772			
Heating value (Btu/cu. ft.)	1,318	1,318	1,318			
Water:						
Salinity, NaCl (ppm)	6,898	6,898	6,898			
T.D.S. (ppm)	9,205	9,205	9,205			
R_w (ohm/m) (77°F)	0.451	0.451	0.451			
ENHANCED RECOVERY PROJECTS						
Enhanced recovery projects						
Date started						
Date discontinued						
Peak oil production (bbl)						736,690
Year						1945
Peak gas production, net (Mcf)						5,005,553
Year						1962

Base of fresh water (ft.):

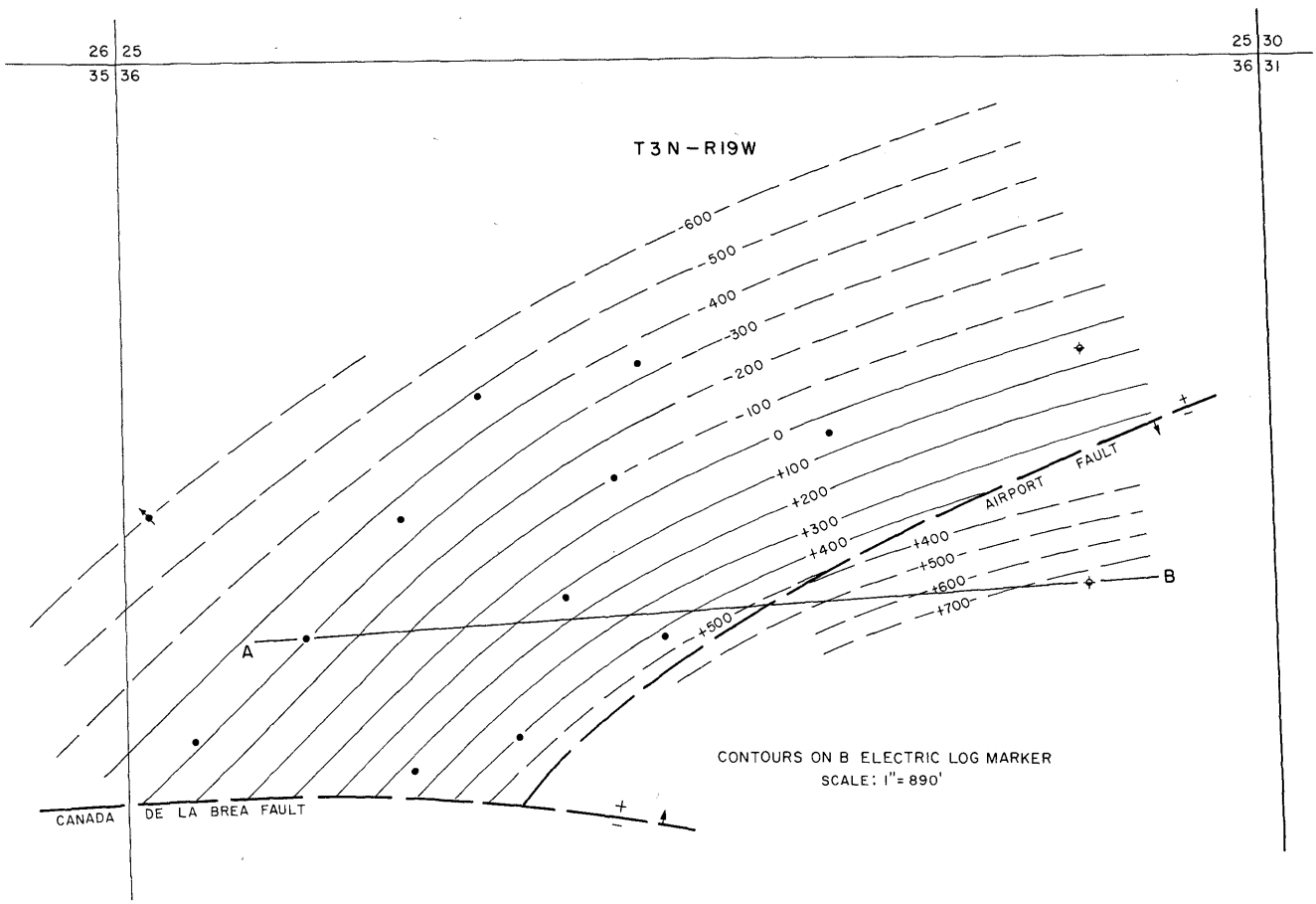
Remarks:

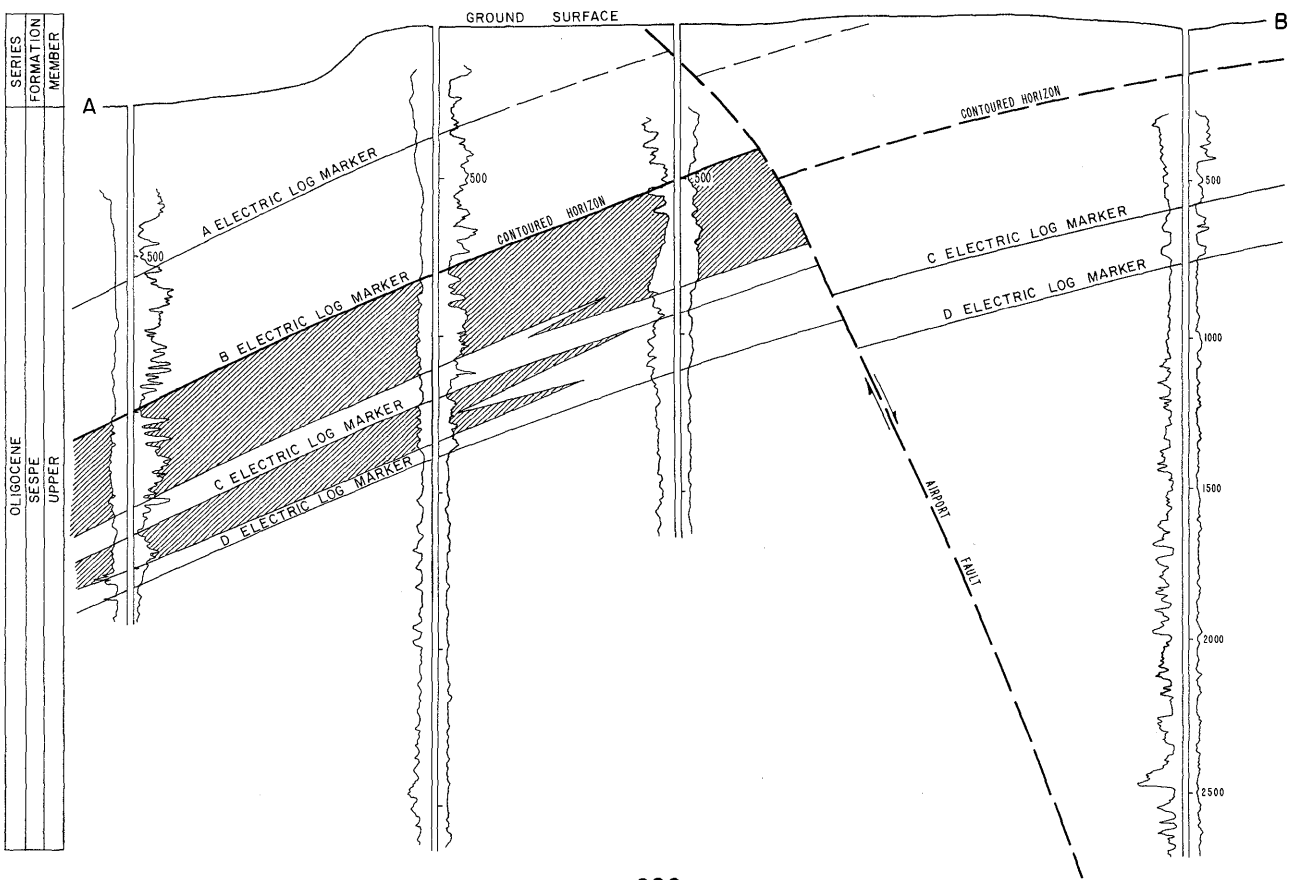
Selected References:

DATE: May 1983 **Estimated value

CALIFORNIA DIVISION OF OIL AND GAS

OAK PARK OIL FIELD





COUNTY: VENTURA

OAK PARK 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	Union Oil Co. of Calif. "Oak Park" 1	Union Oil Co. of Calif. "Union-Kay-Investments" 24-1	36 3N 19W	SB	4,100	Sespe	
Deepest well	Union Oil Co. of Calif. "Simi" 14	Same as present	36 3N 19W	SB	5,240		Sespe Oligocene

POOL DATA

ITEM	SESPE					FIELD OR AREA DATA
Discovery date	October 1969					
Initial production rates						
Oil (bbl/day)	81					
Gas (Mcf/day)	15					
Flow pressure (psi)						
Bean size (in.)						
Initial reservoir pressure (psi)	600					
Reservoir temperature (°F)	105					
Initial oil content (STB/ac.-ft.)						
Initial gas content (MSCF/ac.-ft.)						
Formation	Sespe					
Geologic age	Oligocene					
Average depth (ft.)	800-1,500					
Average net thickness (ft.)	400					
Maximum productive area (acres)	190					
RESERVOIR ROCK PROPERTIES						
Porosity (%)	20					
S_{oi} (%)	45					
S_{wi} (%)	55					
S_{gi} (%)	0					
Permeability to air (md)	235					
RESERVOIR FLUID PROPERTIES						
Oil:						
Oil gravity (°API)	22					
Sulfur content (% by wt.)						
Initial solution GOR (SCF/STB)						
Initial oil FVF (RB/STB)	1.05					
Bubble point press. (psia)						
Viscosity (cp) @ °F	50 @ 105					
Gas:						
Specific gravity (air = 1.0)	0.62					
Heating value (Btu/cu. ft.)						
Water:						
Salinity, NaCl (ppm)	7,200					
T.D.S. (ppm)						
R_w (ohm/m) (77°F)						
ENHANCED RECOVERY PROJECTS						
Enhanced recovery projects	waterflood					
Date started	1971					
Date discontinued	1978					
	cyclic steam					
	1976					
	1982					
Peak oil production (bbl)	101,211					
Year	1971					
Peak gas production, net (Mcf)	22,374					
Year	1971					

Base of fresh water (ft.): 400

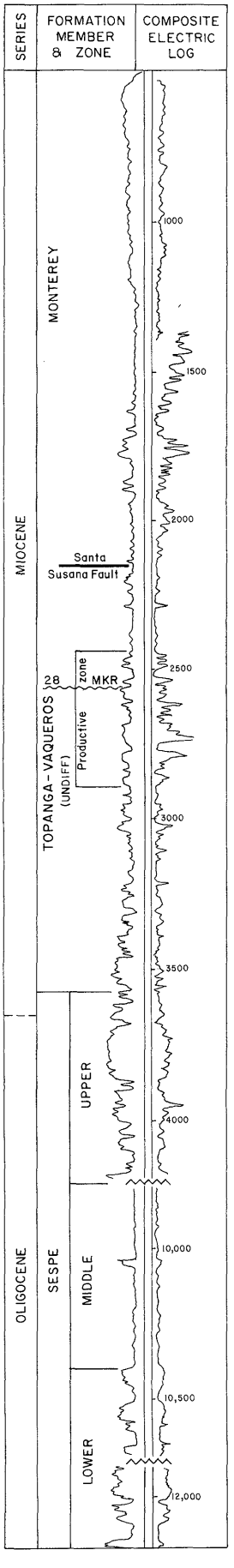
Remarks:

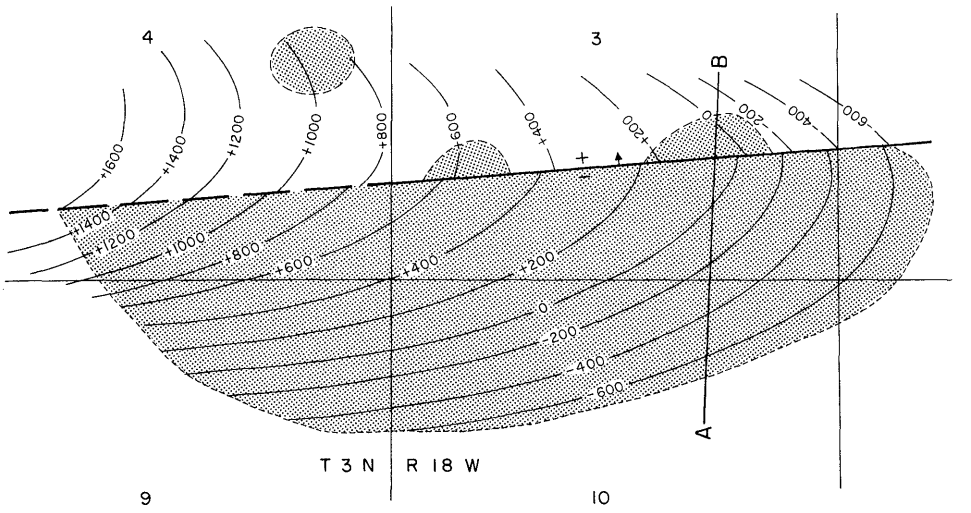
Selected References: Bright, L.S., 1973, Oak Park Oil Field: Calif. Div. of Oil and Gas, Summary of Operations -- Calif. Oil Fields, Vol. 59, No. 1.

DATE: May 1983

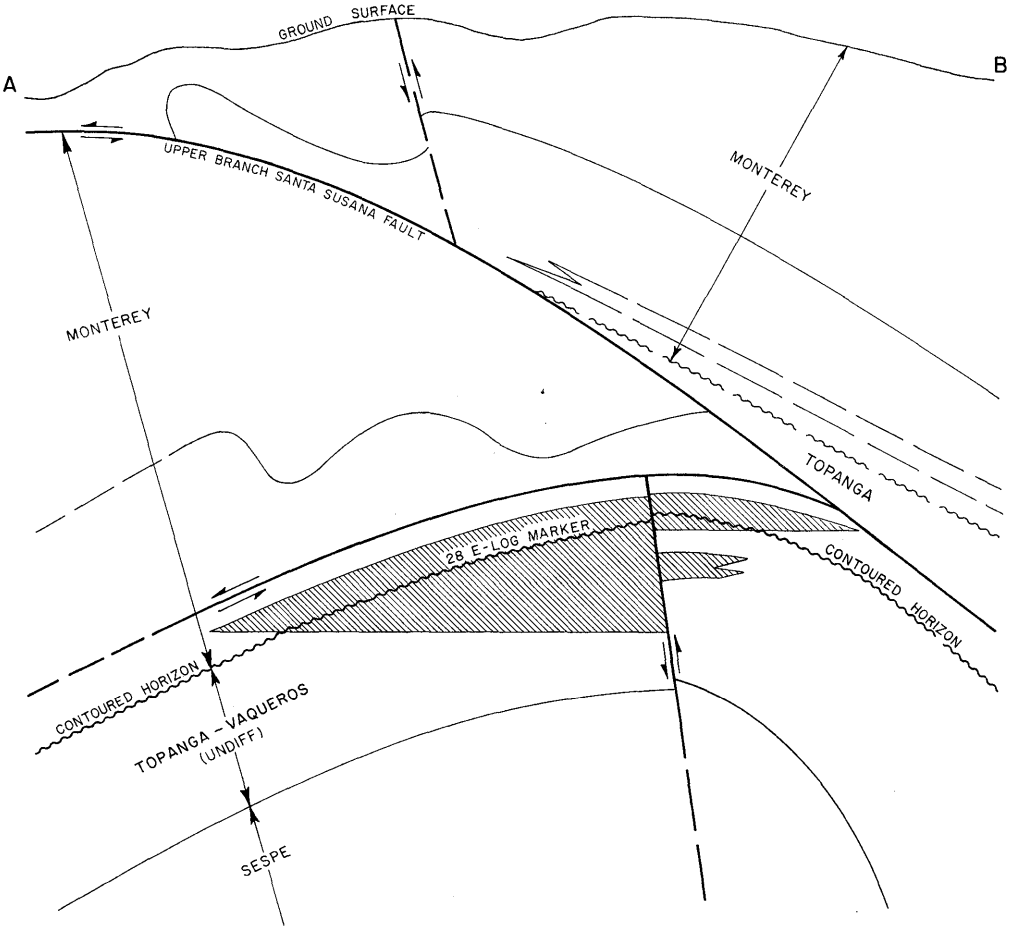
CALIFORNIA DIVISION OF OIL AND GAS

OAKRIDGE OIL FIELD





CONTOURS ON 28 ELECTRIC LOG MARKER
SCALE 1"= 2250'



COUNTY: VENTURA

OAKRIDGE 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	Union Oil Co. of Calif. "Oakridge" 2-10	Same as present	10 3N 18W	SB	3,300	unnamed	
Deepest well	Union Oil Co. of Calif. "Oakridge" 1-3	Same as present	3 3N 18W	SB	12,180		Sespe Oligocene

POOL DATA

ITEM	UNNAMED	UNNAMED				FIELD OR AREA DATA
Discovery date	July 1955	August 1952				
Initial production rates						
Oil (bbl/day)	9	304				
Gas (Mcf/day)	0	97				
Flow pressure (psi)						
Bean size (in.)						
Initial reservoir pressure (psi)						
Reservoir temperature (°F)	110	-				
Initial oil content (STB/ac.-ft.)						
Initial gas content (MSCF/ac.-ft.)						
Formation	Monterey	Topanga-Vaqueros				
Geologic age	Miocene	Miocene				
Average depth (ft.)	2,400	2,600				
Average net thickness (ft.)	125	375				
Maximum productive area (acres)						475
RESERVOIR ROCK PROPERTIES						
Porosity (%)	30	30				
So_i (%)	41	-				
Sw_i (%)	51	45				
Sg_i (%)	8	-				
Permeability to air (md)	430	-				
RESERVOIR FLUID PROPERTIES						
Oil:						
Oil gravity (°API)	21	21				
Sulfur content (% by wt.)	-	0.98				
Initial solution GOR (SCF/STB)	0.136	0.136				
Initial oil FVF (RB/STB)	1.075	-				
Bubble point press. (psia)						
Viscosity (cp) @ °F	20	-				
Gas:						
Specific gravity (air = 1.0)						
Heating value (Btu/cu. ft.)						
Water:						
Salinity, NaCl (ppm)	700	700				
T.D.S. (ppm)						
R_w (ohm/m) (77°F)						
ENHANCED RECOVERY PROJECTS						
Enhanced recovery projects	waterflood	waterflood				
Date started	1956	1956				
Date discontinued	active	active				
	cyclic steam					
	1964					
	1965					
Peak oil production (bbl)						1,225,303
Year						1953
Peak gas production, net (Mcf)						1,002,908
Year						1953

Base of fresh water (ft.): None

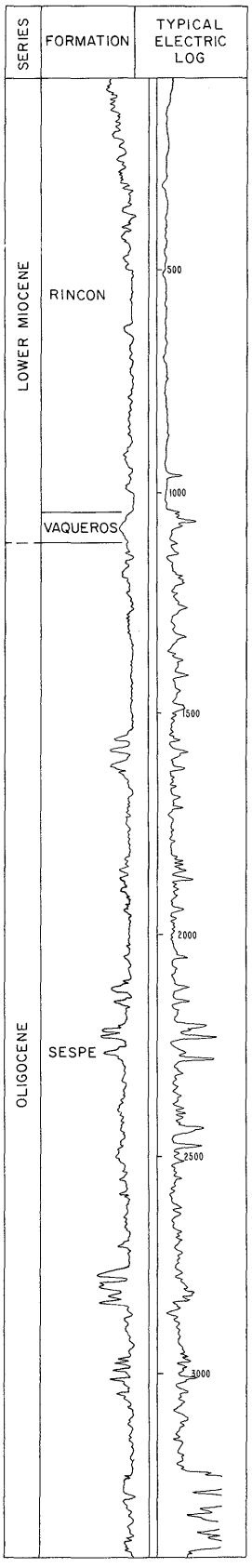
Remarks: Zone water contains a high concentration of bicarbonates.

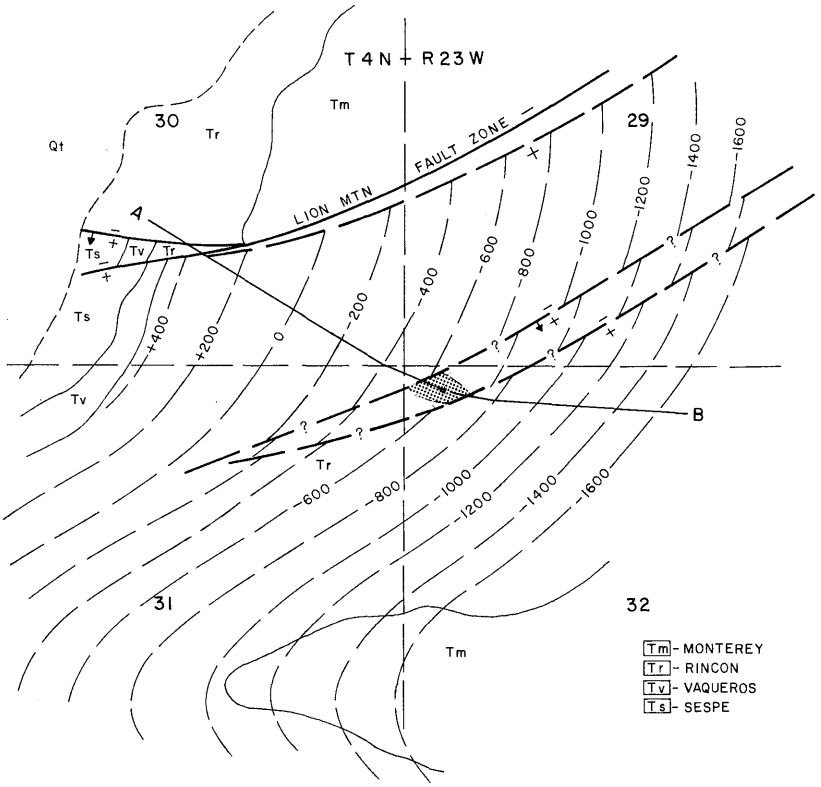
Selected References: Schultz, C.H., 1955, Oakridge Oil Field: Calif. Div. of Oil and Gas, Summary of Operations -- Calif. Oil Fields, Vol. 41, No. 1.

DATE: May 1983

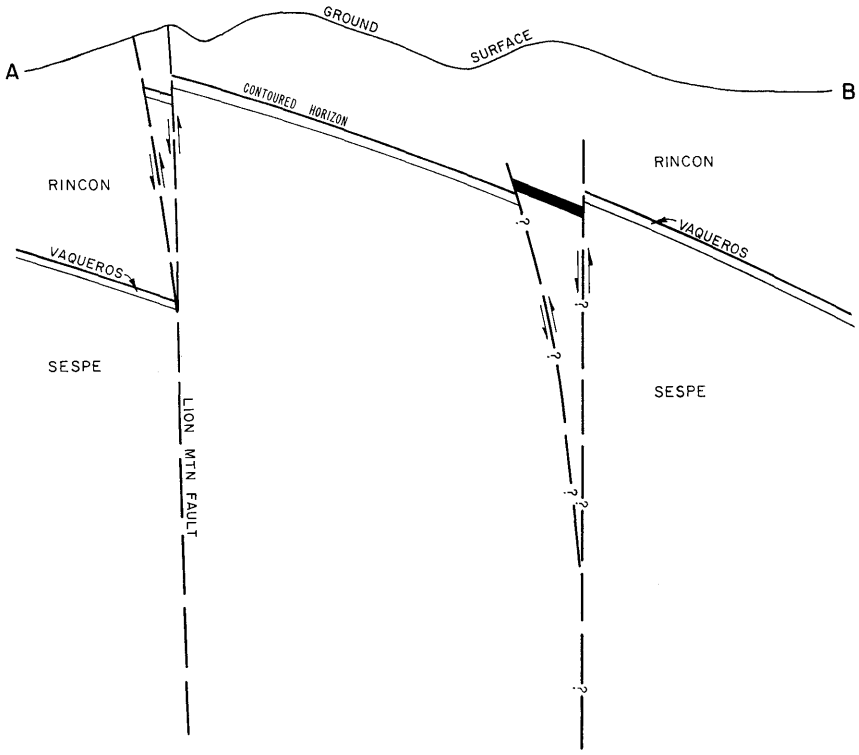
CALIFORNIA DIVISION OF OIL AND GAS

OAKVIEW OIL FIELD
(Abandoned)





SURFACE GEOLOGIC MAP AND
CONTOURS ON TOP OF VAQUEROS
SCALE: 1" = 2000'



COUNTY: VENTURA

OAKVIEW OIL FIELD (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	A.D. Rushing, Inc. "Newman" 1	Same as present	32 4N 23W	SB	1,576	Vaqueros	
Deepest well	A.D. Rushing, Inc. "Newman" 2	Same as present	32 4N 23W	SB	4,709		Sespe Oligocene

POOL DATA

ITEM	VAQUEROS					FIELD OR AREA DATA
Discovery date	April 1955					
Initial production rates						
Oil (bbl/day)	15					
Gas (Mcf/day)	0					
Flow pressure (psi)						
Bean size (in.)						
Initial reservoir pressure (psi)						
Reservoir temperature (°F)						
Initial oil content (STB/ac.-ft.)						
Initial gas content (MSCF/ac.-ft.)						
Formation	Vaqueros					
Geologic age	early Miocene					
Average depth (ft.)	1,545					
Average net thickness (ft.)	60					
Maximum productive area (acres)	10					
RESERVOIR ROCK PROPERTIES						
Porosity (%)						
S_{oi} (%)						
S_{wi} (%)						
S_{gi} (%)						
Permeability to air (md)						
RESERVOIR FLUID PROPERTIES						
Oil:						
Oil gravity (°API)	34					
Sulfur content (% by wt.)						
Initial solution GOR (SCF/STB)						
Initial oil FVF (RB/STB)						
Bubble point press. (psia)						
Viscosity (cp) @ °F						
Gas:						
Specific gravity (air = 1.0)						
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						
Date started						
Date discontinued						
Peak oil production (bbl)	726					
Year	1955					
Peak gas production, net (Mcf)						
Year						

Base of fresh water (ft.): 200

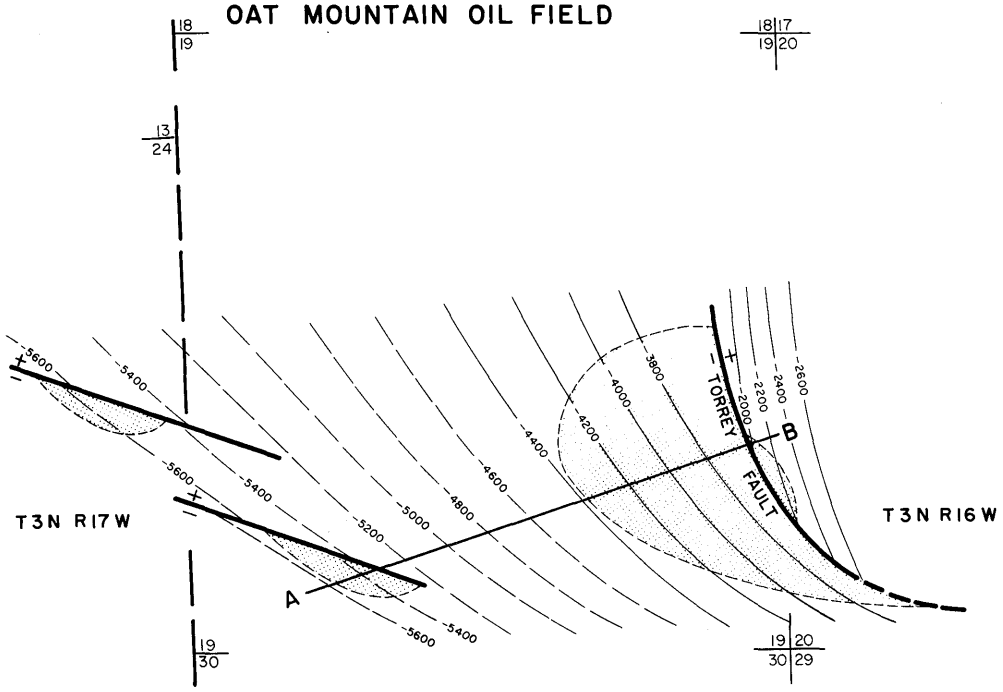
Remarks: One-well field, which was abandoned in September 1955. Cumulative production is 726 bbl of oil and no gas.

Selected References:

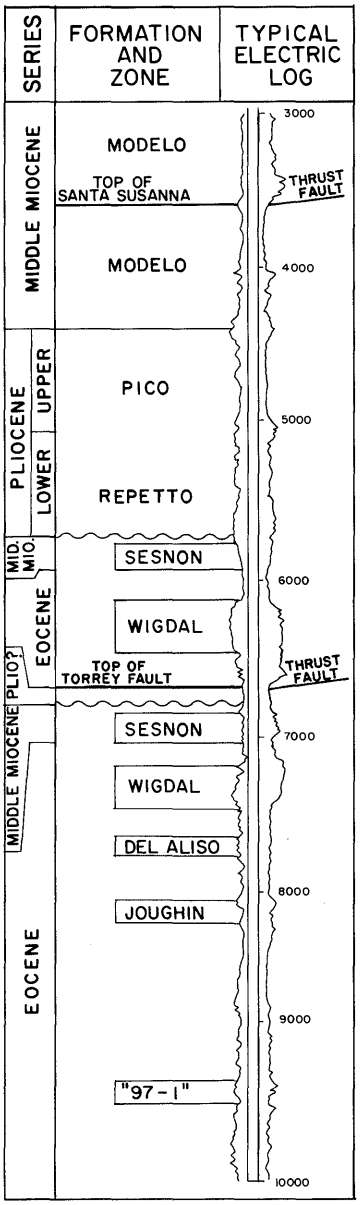
DATE: May 1983

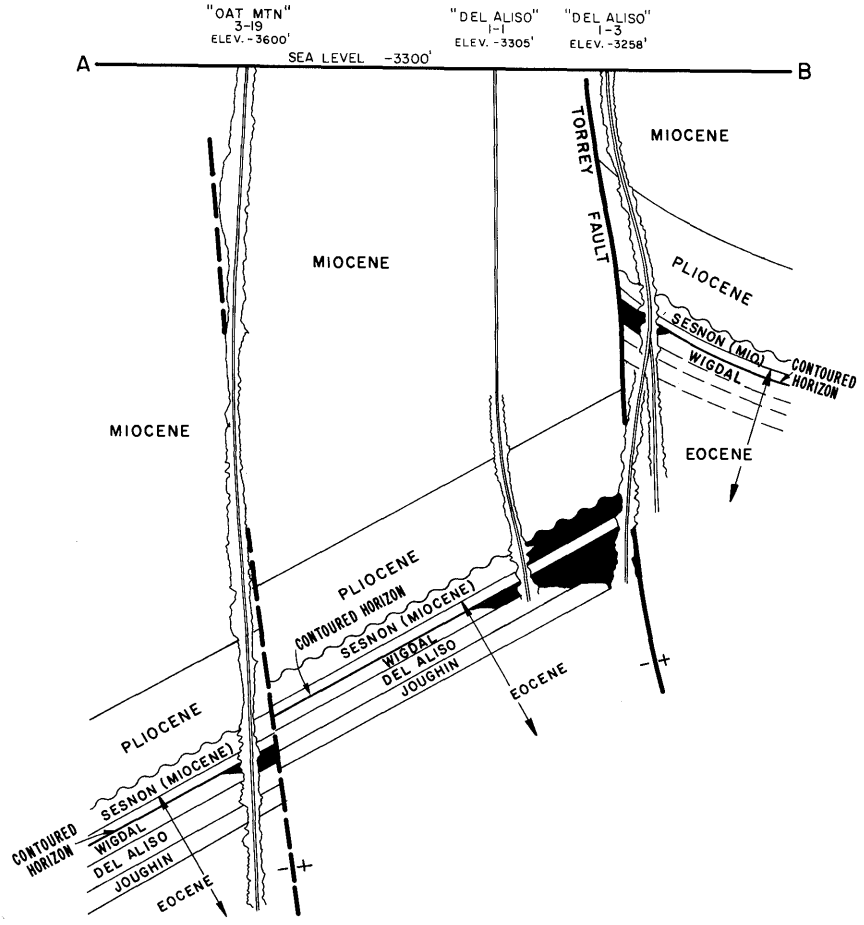
CALIFORNIA DIVISION OF OIL AND GAS

OAT MOUNTAIN OIL FIELD



CONTOUR ON TOP OF WIGDAL ZONE





COUNTY: LOS ANGELES

OAT MOUNTAIN 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	Edwin W. Pauley "Blow" 36	Standard Oil Co. of Calif. "Wigdal" 1	19 3N 16W	SB	9,368	Joughin	
Deepest well	Union Oil Co. of Calif. "Oat Mountain" 5-19	Same as present	19 3N 16W	SB	11,777		undiff. marine Eocene

POOL DATA

ITEM	SESNON	WIGDAL	DEL ALISO	JOUGHIN	97-1	FIELD OR AREA DATA
Discovery date	September 1955	September 1955	May 1990	April 1946	August 1981	
Initial production rates						
Oil (bbl/day)	205	205	205	100	39	
Gas (Mcf/day)	55	55	55	0	25	
Flow pressure (psi)						
Bean size (in.)						
Initial reservoir pressure (psi)	2,800	-	-	-	-	
Reservoir temperature (°F)	135	-	-	-	-	
Initial oil content (STB/ac.-ft.)						
Initial gas content (MSCF/ac.-ft.)	-	-	-	-	-	
Formation	-	-	-	-	-	
Geologic age	Miocene	Eocene	Eocene	Eocene	Eocene	
Average depth (ft.)	6,650-7,400	7,025-8,950a/	7,240-7,370	7,400-9,300	9,430-9,690	
Average net thickness (ft.)	60-400	40-350	130	40-230	50-140	
Maximum productive area (acres)						100
RESERVOIR ROCK PROPERTIES						
Porosity (%)						
So_i (%)						
Sw_i (%)						
Sg_i (%)						
Permeability to air (md)						
RESERVOIR FLUID PROPERTIES						
Oil:						
Oil gravity (°API)	15-20	16-20	16	19	19	
Sulfur content (% by wt.)						
Initial solution GOR (SCF/STB)						
Initial oil FVF (RB/STB)						
Bubble point press. (psia)						
Viscosity (cp) @ °F						
Gas:						
Specific gravity (air = 1.0)						
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						
Date started						
Date discontinued						
Peak oil production (bbl)						112,772
Year						1982
Peak gas production, net (Mcf)						73,265
Year						1982

Base of fresh water (ft.): 1,500

Remarks: Previously, this field was an area of Aliso Canyon Field. It was designated as a field in 1980.

a/ Above the Torrey fault, the zone lies at a depth ranging from 5,350 to 5,870 feet.

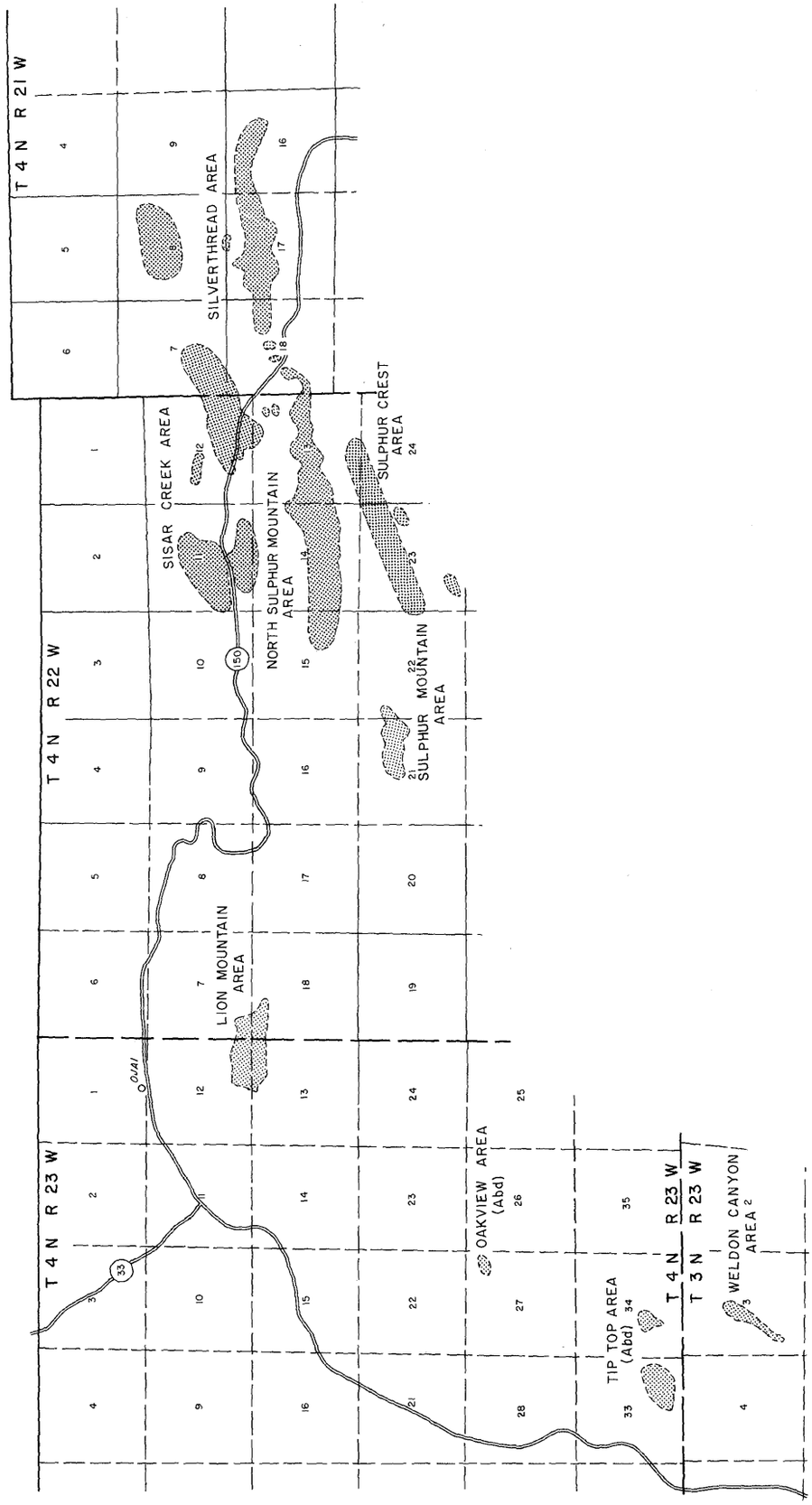
Selected References:

DATE: May 1991

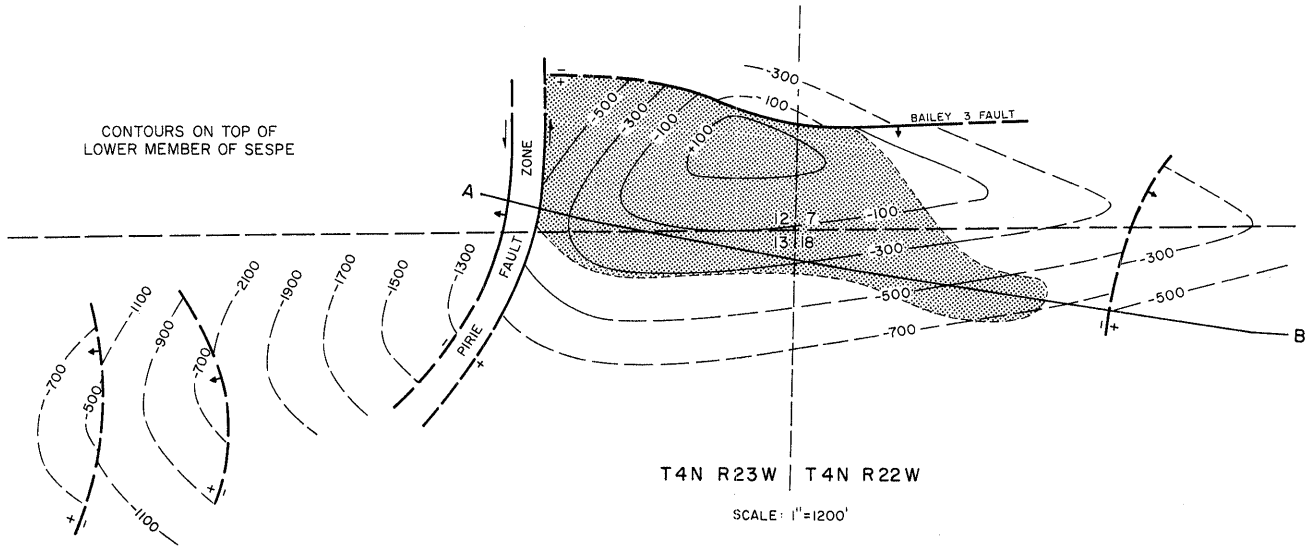
CALIFORNIA DIVISION OF OIL AND GAS

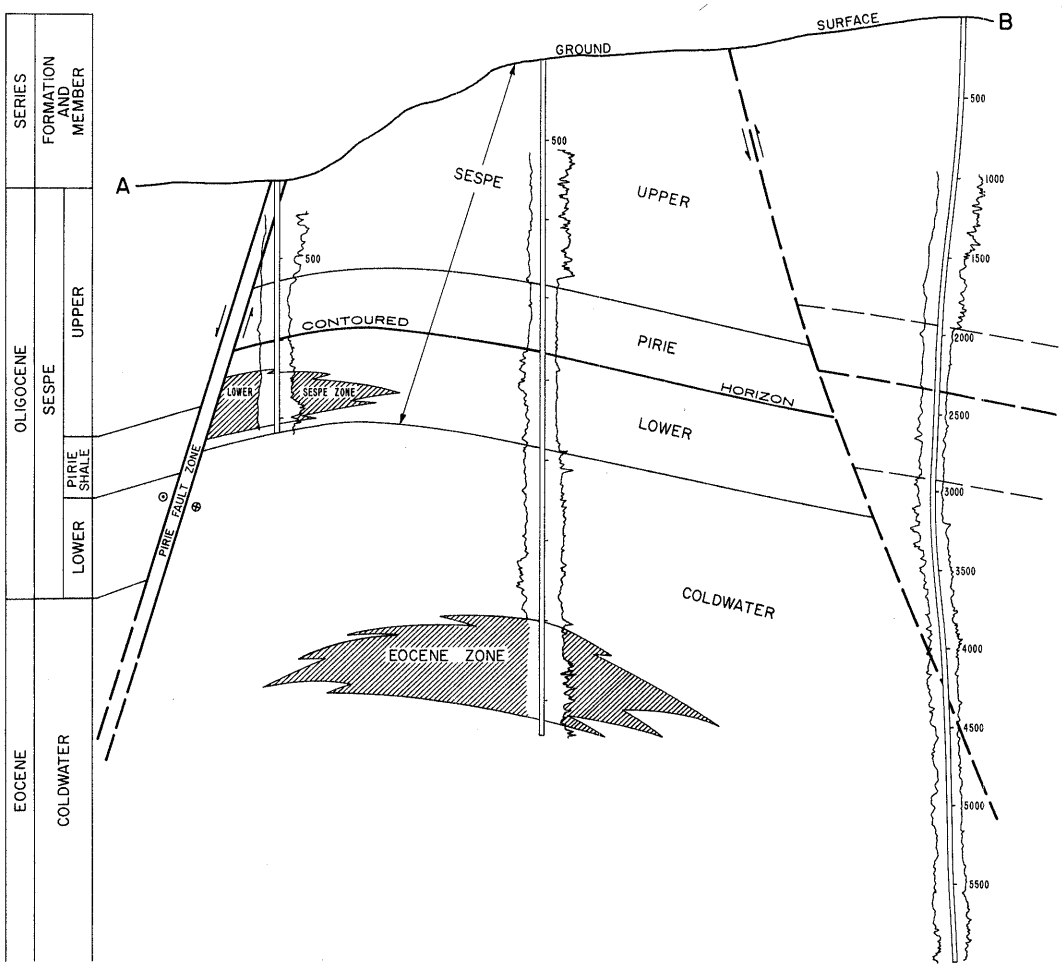
OJAI OIL FIELD

Index Map



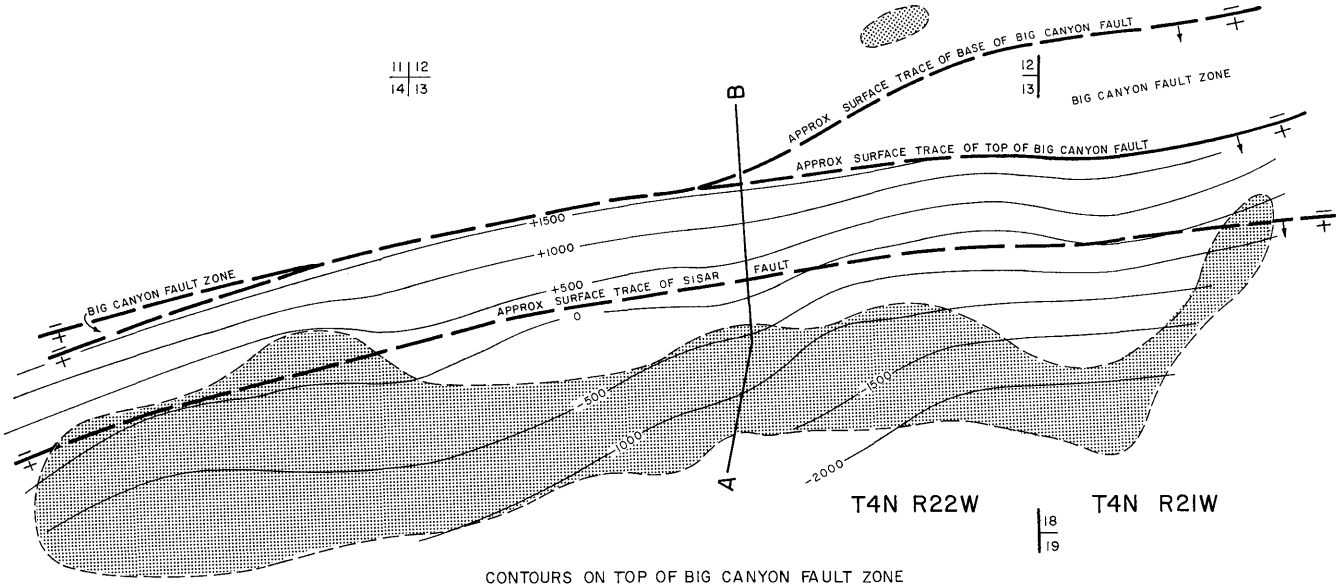
OJAI OIL FIELD
Lion Mountain Area





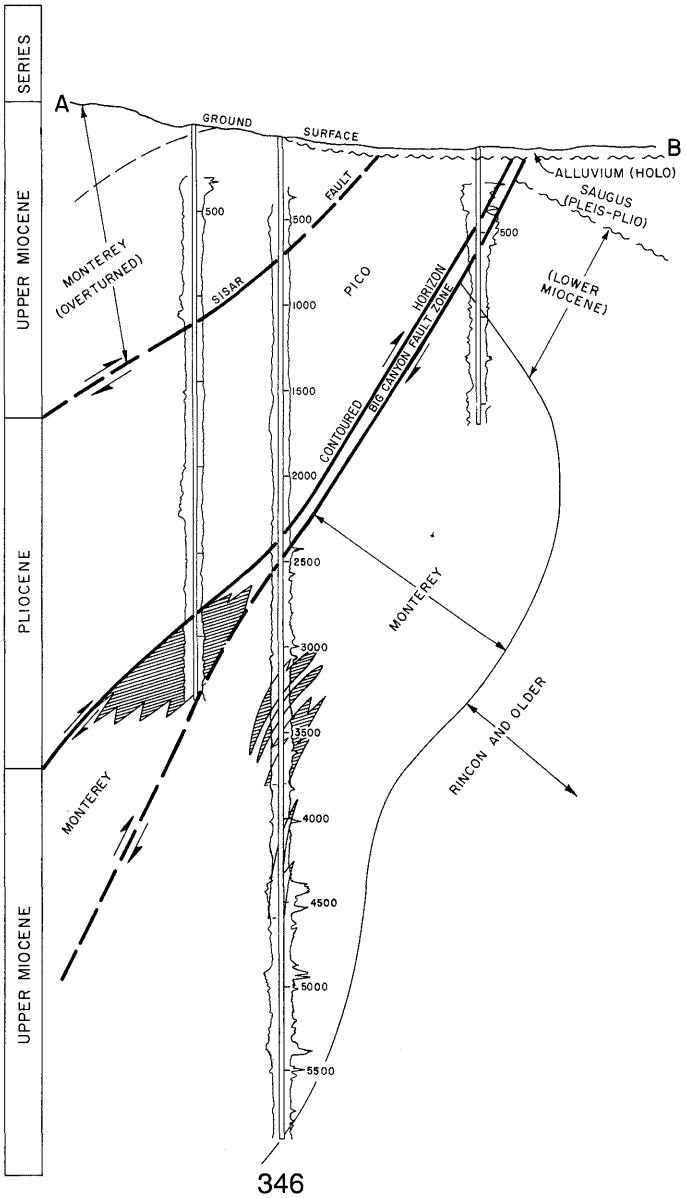
OJAI OIL FIELD

North Sulphur Mountain Area



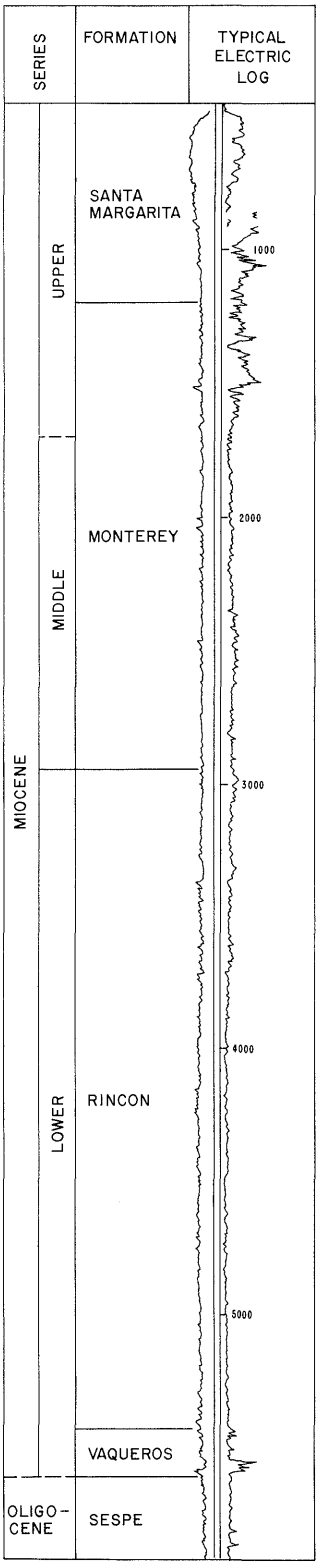
CONTOURS ON TOP OF BIG CANYON FAULT ZONE

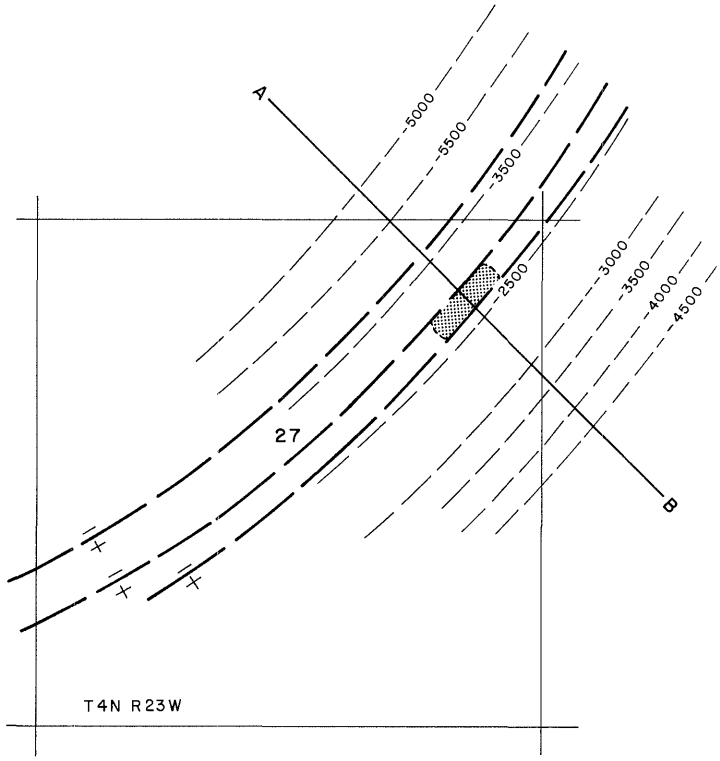
SCALE 1" = 1600'



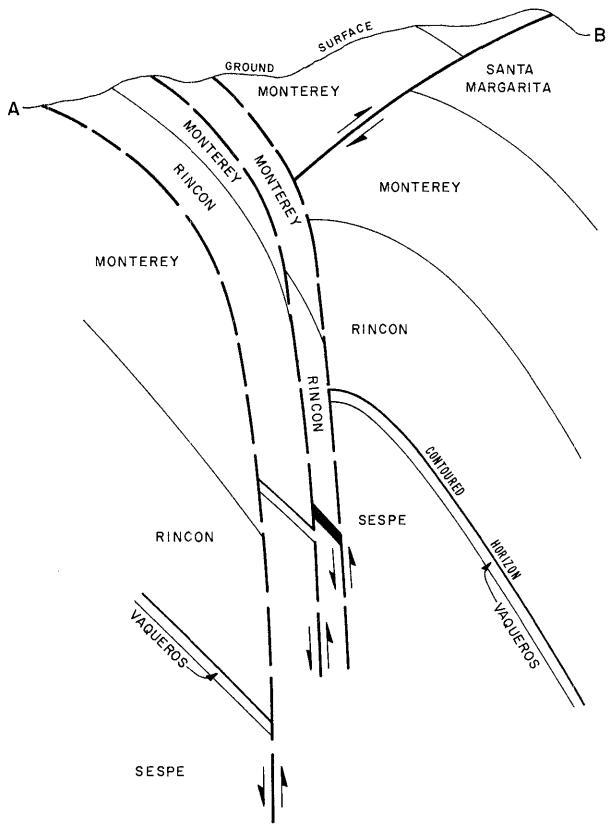
OJAI OIL FIELD

Oakview Area (Abandoned)





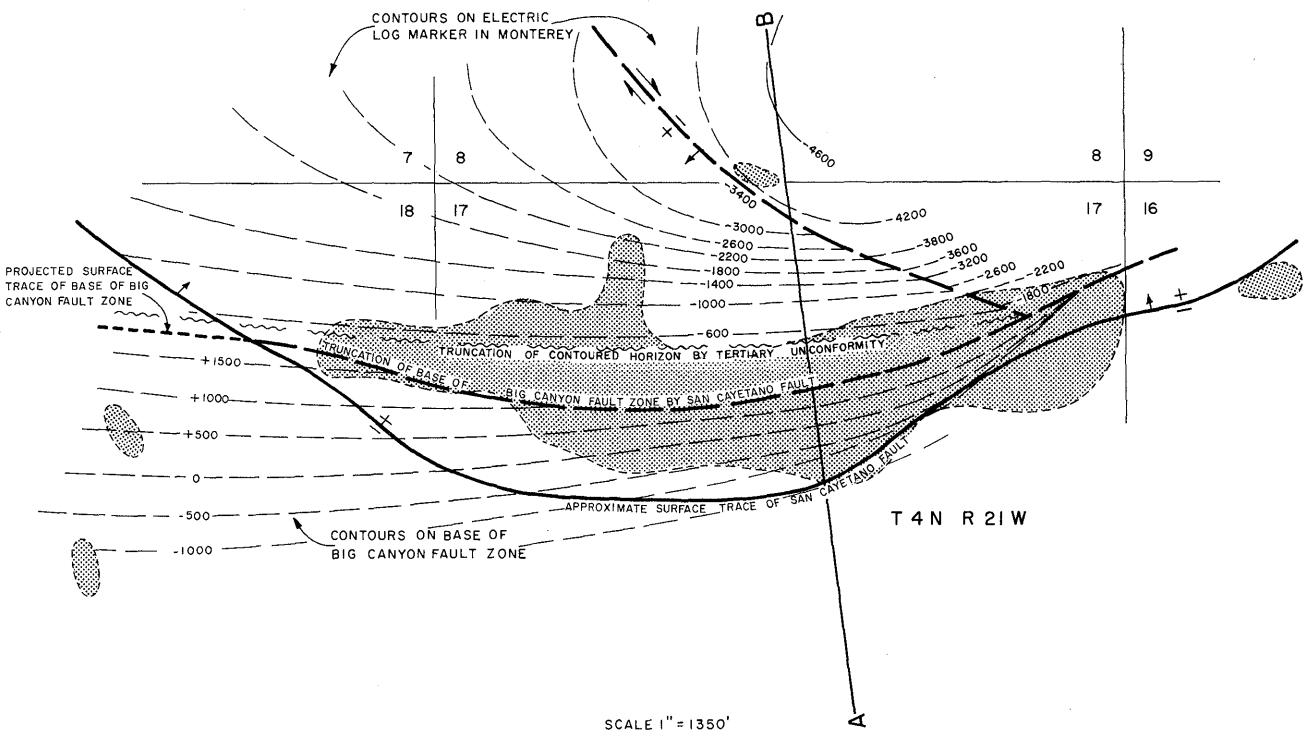
CONTOURS ON TOP OF VAQUEROS

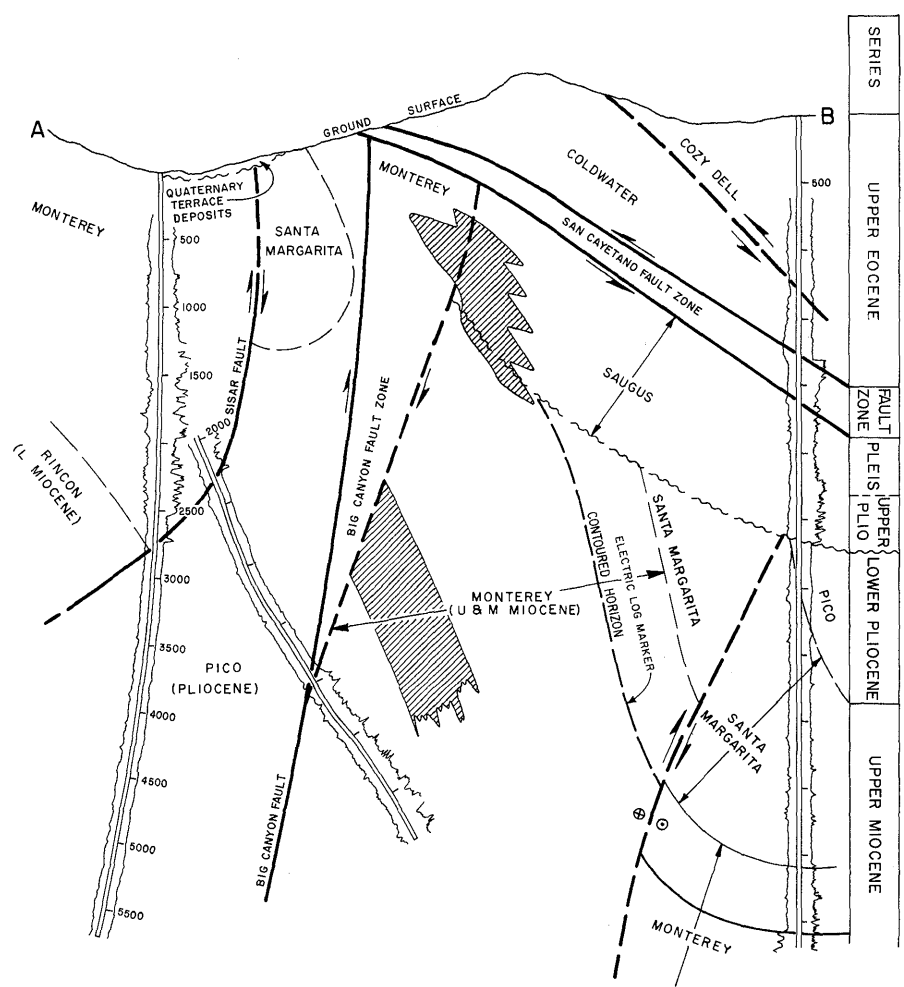


AFTER T L BAILEY

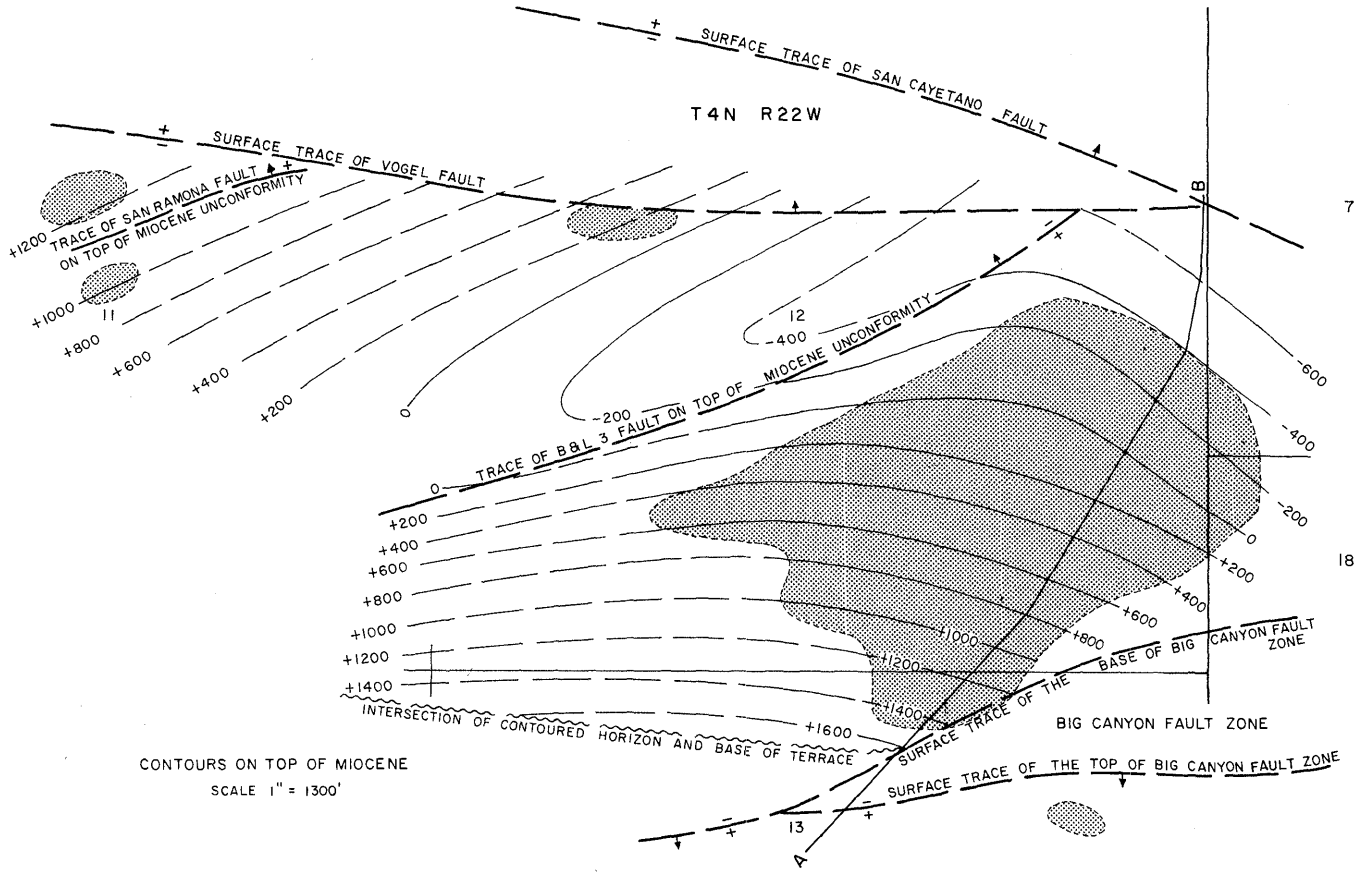
OJAI OIL FIELD

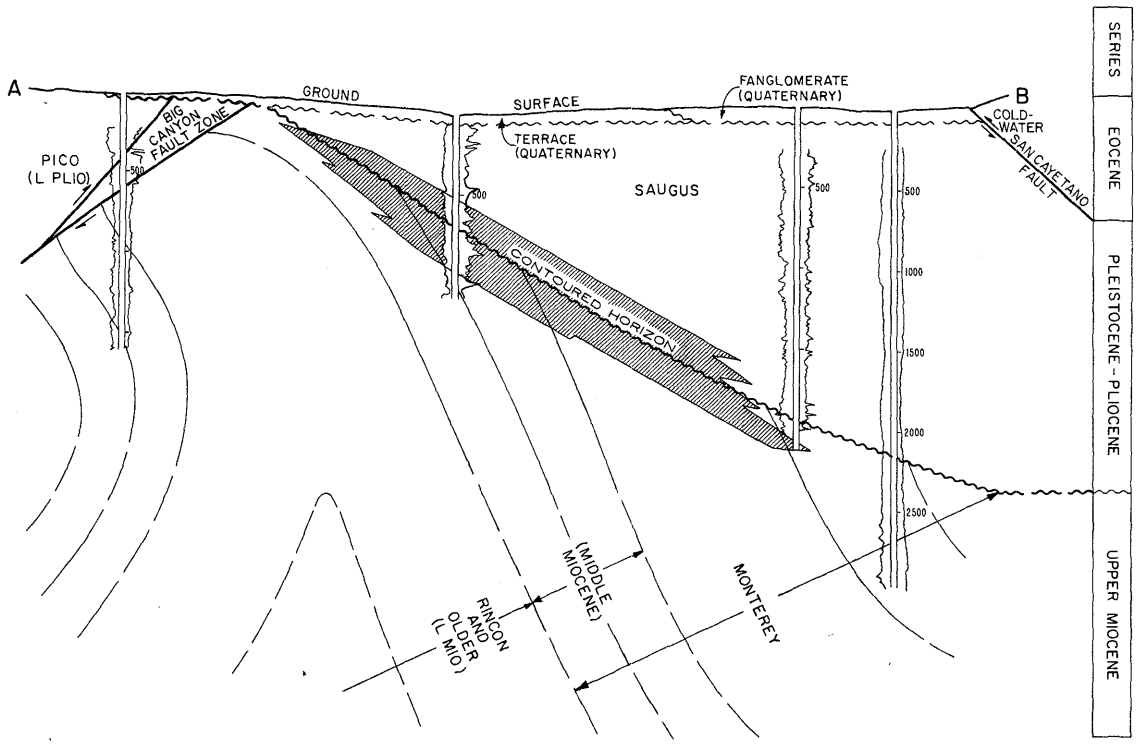
Silverthread Area





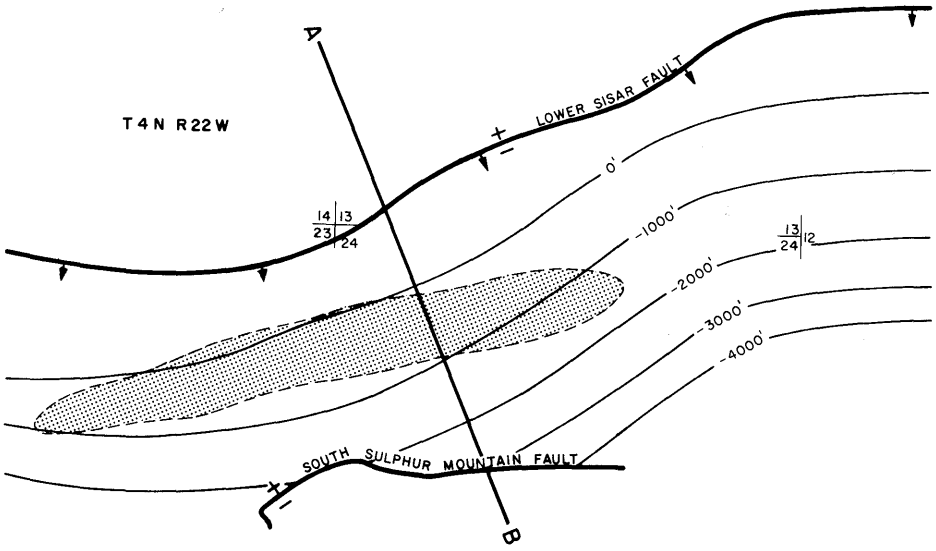
OJAI OIL FIELD
Sisar Creek Area



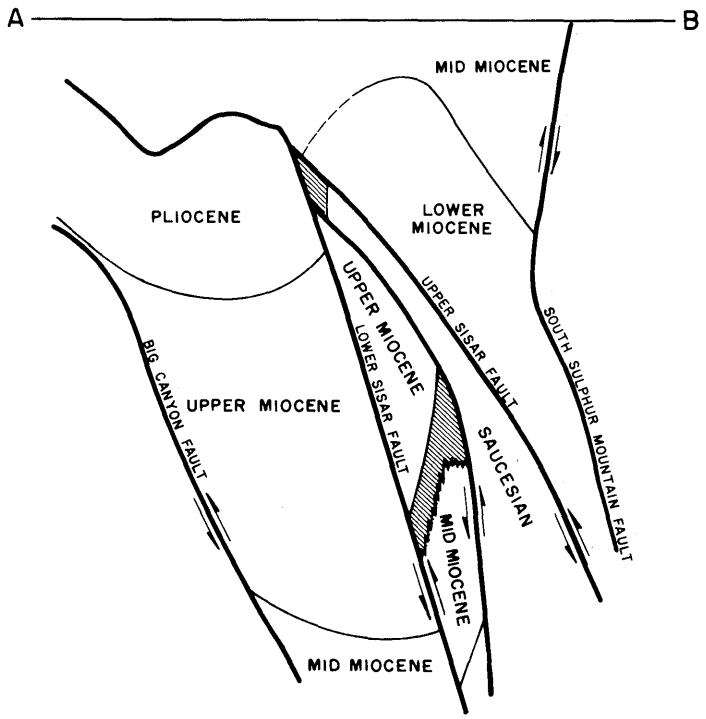


OJAI OIL FIELD

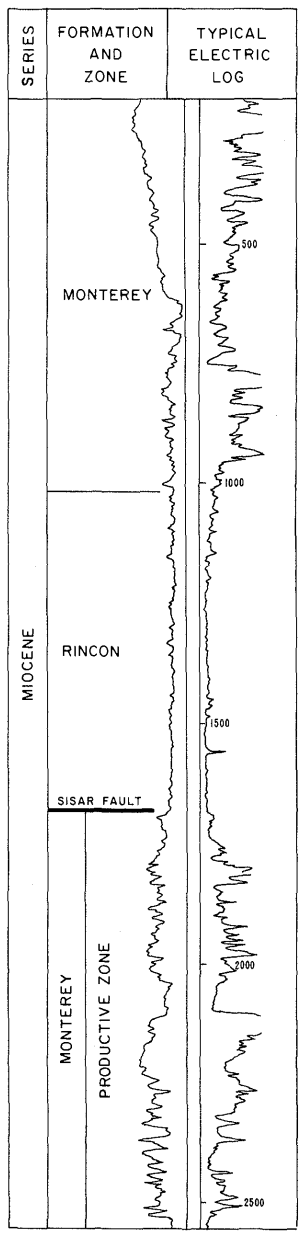
Sulphur Crest Area

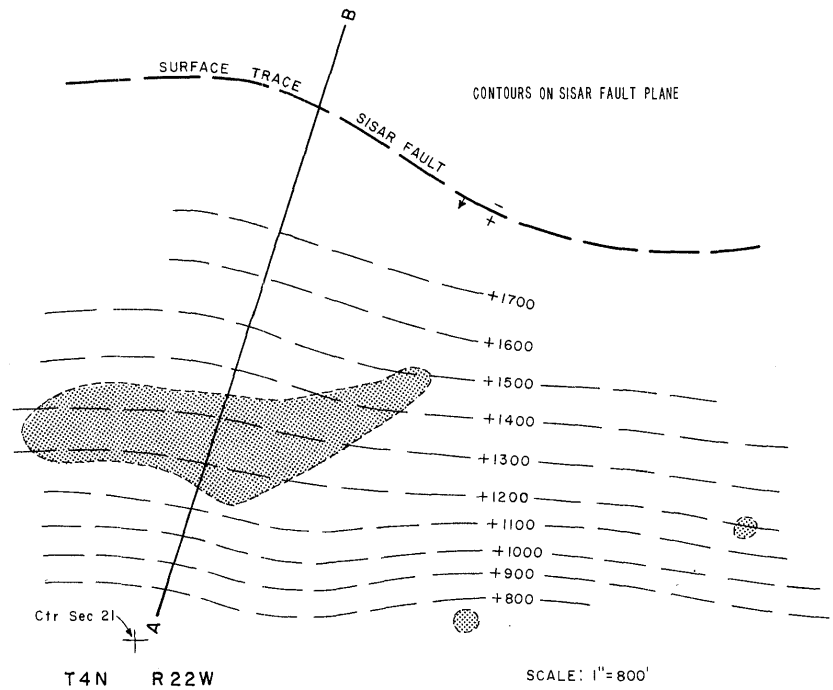


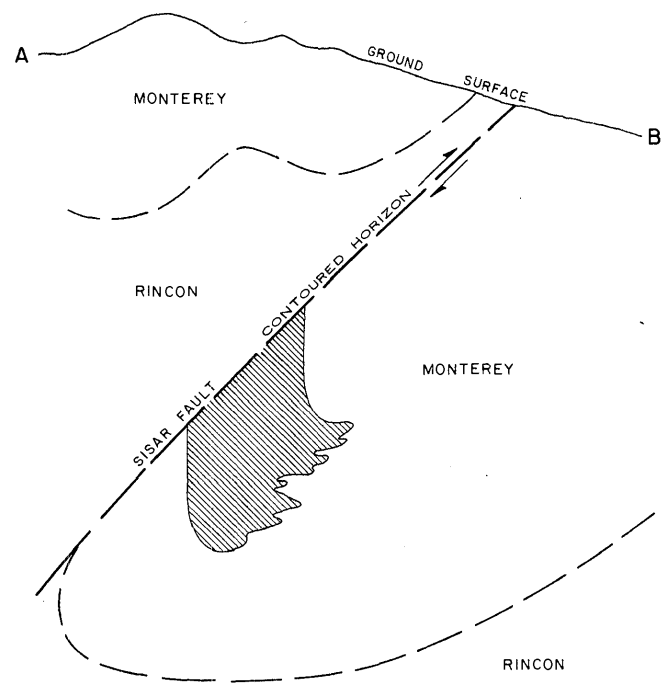
STRUCTURE CONTOURS ON UPPER SISAR FAULT



OJAI OIL FIELD
Sulphur Mountain Area

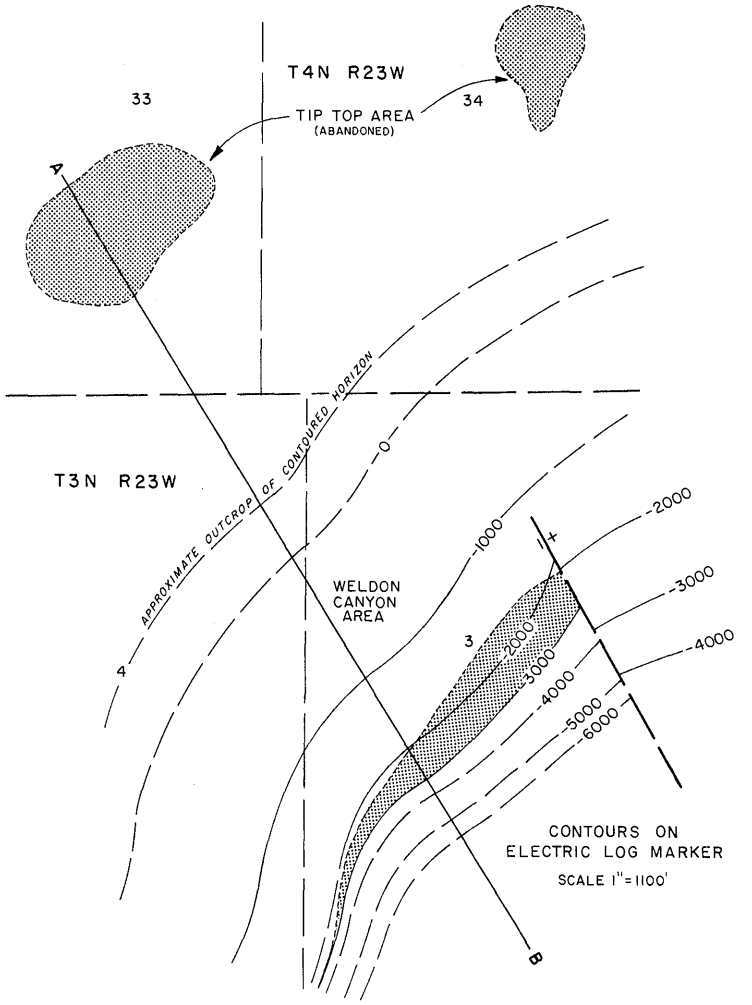


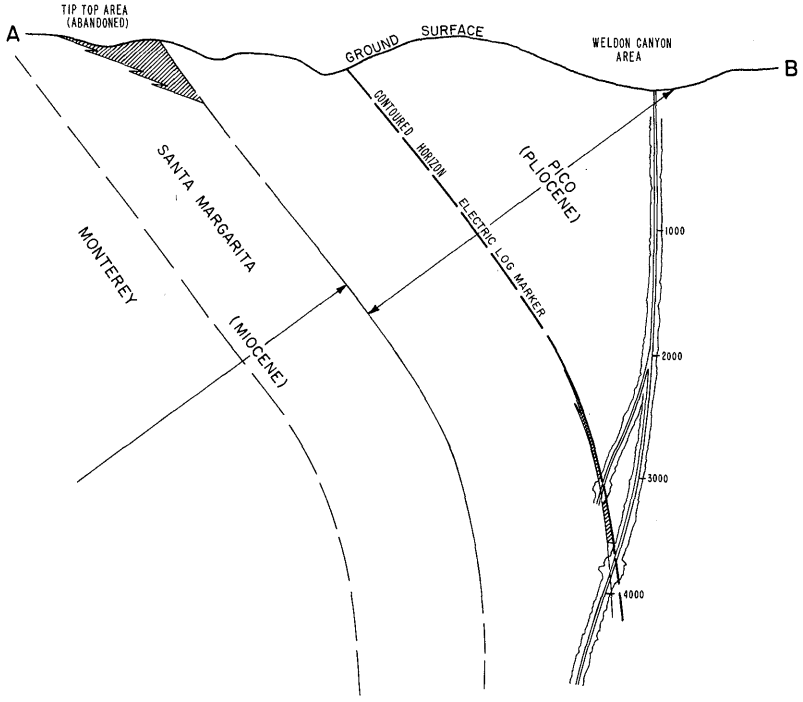




OJAI OIL FIELD

Tip Top Area (Abandoned) & Weldon Canyon Area





COUNTY: VENTURA

OJAI 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	Philadelphia Calif. Petroleum Co. "Ojai" 6	Same as present	18 4N 21W	SB	unk.	unnamed	
Deepest well	Argo Petroleum Corp. "Hillside" 3	Richfield Oil Corp. "Hillside" 1	8 4N 21W	SB	9,221		Rincon Miocene

POOL DATA

ITEM	UNNAMED					FIELD OR AREA DATA
Discovery date	1866					
Initial production rates						
Oil (bbl/day)	15					
Gas (Mcf/day)						
Flow pressure (psi)						
Bean size (in.)						
Initial reservoir pressure (psi)						
Reservoir temperature (°F)						
Initial oil content (STB/ac.-ft.)						
Initial gas content (MSCF/ac.-ft.)						
Formation	Saugus-Monterey					
Geologic age	Plio-Miocene					
Average depth (ft.)	420					
Average net thickness (ft.)	295					
Maximum productive area (acres)						1,930
RESERVOIR ROCK PROPERTIES						
Porosity (%)						
So_i (%)						
Sw_i (%)						
Sg_i (%)						
Permeability to air (md)						
RESERVOIR FLUID PROPERTIES						
Oil:						
Oil gravity (°API)	22					
Sulfur content (% by wt.)						
Initial solution GOR (SCF/STB)						
Initial oil FVF (RB/STB)						
Bubble point press. (psia)						
Viscosity (cp) @ °F						
Gas:						
Specific gravity (air = 1.0)						
Heating value (Btu/cu. ft.)						
Water:						
Salinity, NaCl (ppm)	1,700					
T.D.S. (ppm)						
R_w (ohm/m) (77°F)						
ENHANCED RECOVERY PROJECTS						
Enhanced recovery projects						
Date started						
Date discontinued						
Peak oil production (bbl)						1,380,551
Year						1980
Peak gas production, net (Mcf)						3,506,885
Year						1980

Base of fresh water (ft.): See areas

Remarks:

Selected References:

Bramlett, M.N., 1946, The Monterey Formation of California and the Origin of its Siliceous Rocks: U.S. Geol. Survey, Prof. Paper 212.
Cenozoic Correlation Section, 1952, Western Ventura Basin: in A.A.P.G.-S.E.P.M.-S.E.G. Guidebook, Joint Ann. Mtg., Los Angeles, CA.
Carey, W.H., 1954, Tertiary Basin of Southern California: Geology of Southern California, Calif. Div. of Mines Bull. 170, Chap. III.
Fine, S.F., 1954, Geology and Occurrences of Oil in the Ojai-Santa Paula Area, Ventura County; Geology of Southern California: Calif. Div. of Mines Bull. 170, Map Sheet 28.
Kleinpell, R.W., 1943, Miocene Stratigraphy of California, Geologic Formations and Economic Development of Oil and Gas Fields of California: Calif. Div. of Mines, Bull. 118.
Oakshott, G.B., M.D. Turner, and C.W. Jennings, 1954, Correlation Chart of Sedimentary Formations in Southern California: Calif. Div. of Mines, Bull. 170, Chap. III, Plate I.
Putnam, W.C., 1942, Geology of the Ventura Region, California: Geological Society of America Bulletin 53.
Reed, R.D., 1943, California Record in the Geologic History of the World: Calif. Div. of Mines, Bull 118, Chap. V.

DATE: May 1983

CALIFORNIA DIVISION OF OIL AND GAS

COUNTY: VENTURA

OJAI OIL FIELD
LION MOUNTAIN 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	Ezra Taylor No. 2	Same as present	12 4N 23W	SB	333	Lower Sespe	
Deepest well	Exxon Corp. "Berylwood Inv. Co." B-1	Humble Oil & Ref. Co. "Berylwood Inv. Co." B-1	18 4N 22W	SB	4,622		Coldwater Eocene

POOL DATA

ITEM	LOWER SESPE	EOCENE				FIELD OR AREA DATA
Discovery date	1893	June 1949				
Initial production rates						
Oil (bbl/day)	20	52				
Gas (Mcf/day)	-	27				
Flow pressure (psi)						
Bean size (in.)						
Initial reservoir pressure (psi)						
Reservoir temperature (°F)						
Initial oil content (STB/ac.-ft.)						
Initial gas content (MSCF/ac.-ft.)						
Formation	Sespe	Coldwater				
Geologic age	Oligocene	late Eocene				
Average depth (ft.)	1,544	4,101				
Average net thickness (ft.)	400	650				
Maximum productive area (acres)						100
RESERVOIR ROCK PROPERTIES						
Porosity (%)						
So_i (%)						
Sw_i (%)						
Sg_i (%)						
Permeability to air (md)						
RESERVOIR FLUID PROPERTIES						
Oil:						
Oil gravity (°API)	18-27	25-29				
Sulfur content (% by wt.)						
Initial solution GOR (SCF/STB)						
Initial oil FVF (RB/STB)						
Bubble point press. (psia)						
Viscosity (cp) @ °F						
Gas:						
Specific gravity (air = 1.0)						
Heating value (Btu/cu. ft.)						
Water:						
Salinity, NaCl (ppm)	17,100	16,700				
T.D.S. (ppm)						
R_w (ohm/m) (77°F)						
ENHANCED RECOVERY PROJECTS						
Enhanced recovery projects						
Date started						
Date discontinued						
Peak oil production (bbl)						26,377
Year						1965
Peak gas production, net (Mcf)						
Year						

Base of fresh water (ft.): 100

Remarks:

Selected References: Mitchell, W.S., 1963, Lion Mountain Area, Ojai Oil Field: Calif. Div. of Oil and Gas, Summary of Operations -- Calif. Oil Fields, Vol. 49, No. 1.

DATE: May 1983

CALIFORNIA DIVISION OF OIL AND GAS

COUNTY: VENTURA

OJAI OIL FIELD
NORTH SULPHUR MOUNTAIN 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	ARCO Oil & Gas Co. "Ojai" 35	Bard Oil and Asphalt Co. "Ojai" 35	13 4N 22W	SB	3,934	Miocene	
Deepest well	ARCO Oil & Gas Co. "Ojai" 44	Richfield Oil Corp. "Ojai" 44	13 4N 22W	SB	8,755		Monterey Miocene

POOL DATA

ITEM	MIOCENE					FIELD OR AREA DATA
Discovery date	1912					
Initial production rates						
Oil (bbl/day)	50					
Gas (Mcf/day)						
Flow pressure (psi)						
Bean size (in.)						
Initial reservoir pressure (psi)						
Reservoir temperature (°F)						
Initial oil content (STB/ac.-ft.)						
Initial gas content (MSCF/ac.-ft.)						
Formation	Monterey					
Geologic age	Miocene					
Average depth (ft.)	3,694					
Average net thickness (ft.)	1,850					
Maximum productive area (acres)	420					
RESERVOIR ROCK PROPERTIES						
Porosity (%)						
So_i (%)						
Sw_i (%)						
Sg_i (%)						
Permeability to air (md)						
RESERVOIR FLUID PROPERTIES						
Oil:						
Oil gravity (°API)	19-27					
Sulfur content (% by wt.)						
Initial solution GOR (SCF/STB)						
Initial oil FVF (RB/STB)						
Bubble point press. (psia)						
Viscosity (cp) @ °F						
Gas:						
Specific gravity (air = 1.0)						
Heating value (Btu/cu. ft.)						
Water:						
Salinity, NaCl (ppm)	13,700					
T.D.S. (ppm)						
R_w (ohm/m) (77°F)						
ENHANCED RECOVERY PROJECTS						
Enhanced recovery projects	pressure maintenance					
Date started	1948					
Date discontinued	1949					
Peak oil production (bbl)	597,036					
Year	1980					
Peak gas production, net (Mcf)						
Year						

Base of fresh water (ft.): 500

Remarks:

Selected References: Fine, S.F., 1952, North Sulphur Mountain Area, Ojai Oil Field: A.A.P.G.-S.E.P.M.-S.E.G. Guidebook, Joint Ann. Mtg., Los Angeles.
Mitchell, W.S., 1966, North Sulphur Mountain Area, Ojai Oil Field: Calif. Div. of Oil and Gas, Summary of Operations -- Calif. Oil Fields, Vol. 52, No. 2 -- Part 2.

DATE: May 1983

CALIFORNIA DIVISION OF OIL AND GAS

COUNTY: VENTURA

OJAI OIL FIELD
OAKVIEW 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	Argo Petroleum Corp. "Riva" 1	A.N. Macrate "Riva-Kosman" 1	27 4N 23W	SB	5,343	Vaqueros	
Deepest well	L.M. Lockhart "Macrate" 1	Same as present	27 4N 23W	SB	6,710		Rincon Miocene

POOL DATA

ITEM	VAQUEROS					FIELD OR AREA DATA
Discovery date	December 1935					
Initial production rates						
Oil (bbl/day)	8					
Gas (Mcf/day)						
Flow pressure (psi)						
Bean size (in.)						
Initial reservoir pressure (psi)						
Reservoir temperature (°F)						
Initial oil content (STB/ac.-ft.)						
Initial gas content (MSCF/ac.-ft.)						
Formation	Vaqueros					
Geologic age	Miocene					
Average depth (ft.)	3,900					
Average net thickness (ft.)	85					
Maximum productive area (acres)	10					
RESERVOIR ROCK PROPERTIES						
Porosity (%)						
S_{oi} (%)						
S_{wi} (%)						
S_{gi} (%)						
Permeability to air (md)						
RESERVOIR FLUID PROPERTIES						
Oil:						
Oil gravity (°API)	32					
Sulfur content (% by wt.)						
Initial solution GOR (SCF/STB)						
Initial oil FVF (RB/STB)						
Bubble point press. (psia)						
Viscosity (cp) @ °F						
Gas:						
Specific gravity (air = 1.0)						
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						
Date started						
Date discontinued						
Peak oil production (bbl)	646					
Year	1955					
Peak gas production, net (Mcf)						
Year						

Base of fresh water (ft.): None

Remarks: Productivity of Vaqueros zone had been 1/2 to 2 bbl of oil per day. Last production was in 1955. The area was abandoned in 1955. Cumulative production is less than 500 bbl.

Selected References:

DATE: May 1983

CALIFORNIA DIVISION OF OIL AND GAS

COUNTY: VENTURA

OJAI OIL FIELD
SILVERTHREAD 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	Philadelphia Calif. Petroleum Co. "Ojai" 6	Same as present	18 4N 21W	SB	unk.	unnamed	
Deepest well	Argo Petroleum Corp. "Hillside" 3	Richfield Oil Corp. "Hillside" 1	8 4N 21W	SB	9,221		Rincon Miocene

POOL DATA

ITEM	UNNAMED	MIOCENE				FIELD OR AREA DATA
Discovery date	1866	August 1971				
Initial production rates						
Oil (bbl/day)	15	334				
Gas (Mcf/day)						
Flow pressure (psi)						
Bean size (in.)						
Initial reservoir pressure (psi)						
Reservoir temperature (°F)						
Initial oil content (STB/ac.-ft.)						
Initial gas content (MSCF/ac.-ft.)						
Formation	Saugus-Monterey	Monterey				
Geologic age	Pliocene-Miocene	Miocene				
Average depth (ft.)	420	4,000-5,500				
Average net thickness (ft.)	295	35-500				
Maximum productive area (acres)						770
RESERVOIR ROCK PROPERTIES						
Porosity (%)	-	30				
S_{oi} (%)						
S_{wi} (%)	-	22				
S_{gi} (%)						
Permeability to air (md)						
RESERVOIR FLUID PROPERTIES						
Oil:						
Oil gravity (°API)	22	19-36				
Sulfur content (% by wt.)						
Initial solution GOR (SCF/STB)						
Initial oil FVF (RB/STB)	-	1.45				
Bubble point press. (psia)						
Viscosity (cp) @ °F						
Gas:						
Specific gravity (air = 1.0)						
Heating value (Btu/cu. ft.)						
Water:						
Salinity, NaCl (ppm)	1,700	19,200				
T.D.S. (ppm)						
R_w (ohm/m) (77°F)						
ENHANCED RECOVERY PROJECTS						
Enhanced recovery projects		cyclic steam				
Date started		1966				
Date discontinued		1978				
		waterflood				
		1972				
		1978				
		pressure maintenance				
		1972				
		active				
Peak oil production (bbl)						1,101,486
Year						1973
Peak gas production, net (Mcf)						
Year						

Base of fresh water (ft.): 600

Remarks: The productive portion of the Miocene includes several separate pools in the area.

Selected References: Mitchell, W.S., 1968, Silverthread Area of Ojai Field: Calif. Div. of Oil and Gas, Summary of Operations -- Calif. Oil Fields, Vol. 54, No.2 -- Part 2.

DATE: May 1983

CALIFORNIA DIVISION OF OIL AND GAS

COUNTY: VENTURA

OJAI OIL FIELD
SISAR CREEK 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	ARCO Oil and Gas Co. "Vogel" 3	Whidden Double Oil Co. No. 2	11 4N 22W	SB	160	Saugus	
Deepest well	ARCO Oil and Gas Co. "Ojai" 404	Atlantic Richfield Co. "Ojai" 404	11 4N 22W	SB	9,077		Miocene

POOL DATA

ITEM	SAUGUS	PLIOCENE	MIOCENE			FIELD OR AREA DATA
Discovery date	1900	January 1977	December 1976			
Initial production rates						
Oil (bbl/day)	-	6	130			
Gas (Mcf/day)	-	-	39			
Flow pressure (psi)						
Bean size (in.)						
Initial reservoir pressure (psi)						
Reservoir temperature (°F)	110*	110	110			
Initial oil content (STB/ac.-ft.)						
Initial gas content (MSCF/ac.-ft.)						
Formation	Saugus-Monterey	Saugus-Rincon	Monterey			
Geologic age	Pleistocene-Mio	Pleistocene-Mio	Miocene			
Average depth (ft.)	750	1,070	3,680			
Average net thickness (ft.)	350	290	156			
Maximum productive area (acres)						300
RESERVOIR ROCK PROPERTIES						
Porosity (%)	25-40	25-40	25-40			
S_{oi} (%)	58	-	-			
S_{wi} (%)	42	-	-			
S_{gi} (%)						
Permeability to air (md)						
RESERVOIR FLUID PROPERTIES						
Oil:						
Oil gravity (°API)	14.0*	14.0	14.0			
Sulfur content (% by wt.)						
Initial solution GOR (SCF/STB)						
Initial oil FVF (RB/STB)	1.050	-	-			
Bubble point press. (psia)						
Viscosity (cp) @ °F	960*	960	960			
Gas:						
Specific gravity (air = 1.0)	0.943**	0.943	0.943			
Heating value (Btu/cu. ft.)	940**	940	940			
Water:						
Salinity, NaCl (ppm)	11,100*	11,100	11,100			
T.D.S. (ppm)	26,200*	26,200	26,200			
R_w (ohm/m) (77°F)	0.24*	0.24	0.24			
ENHANCED RECOVERY PROJECTS						
Enhanced recovery projects						fireflood
Date started						1957
Date discontinued						1960
						cyclic steam
						1965
						1965
Peak oil production (bbl)						69,400
Year						1911
Peak gas production, net (Mcf)						
Year						

Base of fresh water (ft.): 0 - 200

Remarks: All zones pooled together.
The Sisar Creek area now includes the former "Vogel" area in Section 11.

Selected References:

Bailey, T.L., 1954, Geology of Western Ventura Basin, Santa Barbara, Ventura and Los Angeles Counties, Calif.: Calif. Div. of Mines Bulletin 170, Map Sheet 4.
Bush, G.L., 1956, Geology of Upper Ojai Valley, Ventura County, Calif.: unpublished thesis, University of Calif., Los Angeles
Durham, J.W., 1954, The Marine Cenozoic of Southern Calif.: Calif. Div. of Mines Bull. 170, Chap. III.
Mitchell, W.S., 1967, Sisar Creek Area, Ojai Oil Field: Calif. Div. of Oil and Gas, Summary of Operations -- Calif. Oil Fields, Vol. 53, No. 2.

DATE: May 1983 * Average value ** Estimated value

CALIFORNIA DIVISION OF OIL AND GAS

COUNTY: VENTURA

OJAI OIL FIELD
SULPHUR CREST 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	Union Oil Co. of Calif. "Sulphur Crest" 1-23	Union Oil Co. of Calif. "Sulfur Mtn" 1-23	23 4N 22W	SB	5,381	unnamed	
Deepest well	Union Oil Co. of Calif. "Sulphur Crest" 101-23	Same as present	23 4N 22W	SB	7,354		Miocene

POOL DATA

ITEM	UNNAMED					FIELD OR AREA DATA
Discovery date	August 1979					
Initial production rates						
Oil (bbl/day)	483					
Gas (Mcf/day)	192					
Flow pressure (psi)						
Bean size (in.)						
Initial reservoir pressure (psi)	1,785					
Reservoir temperature (°F)	85**					
Initial oil content (STB/ac.-ft.)						
Initial gas content (MSCF/ac.-ft.)						
Formation	Miocene					
Geologic age	3,900					
Average depth (ft.)	250					
Average net thickness (ft.)						
Maximum productive area (acres)	80					
RESERVOIR ROCK PROPERTIES						
Porosity (%)						
So_i (%)						
Sw_i (%)						
Sg_i (%)						
Permeability to air (md)						
RESERVOIR FLUID PROPERTIES						
Oil:						
Oil gravity (°API)	24.7-29.7					
Sulfur content (% by wt.)						
Initial solution GOR (SCF/STB)						
Initial oil FVF (RB/STB)						
Bubble point press. (psia)						
Viscosity (cp) @ °F						
Gas:						
Specific gravity (air = 1.0)	0.827					
Heating value (Btu/cu. ft.)	795					
Water:						
Salinity, NaCl (ppm)	25,911					
T.D.S. (ppm)						
R_w (ohm/m) (77°F)						
ENHANCED RECOVERY PROJECTS						
Enhanced recovery projects						
Date started						
Date discontinued						
Peak oil production (bbl)	93,325					
Year	1980					
Peak gas production, net (Mcf)	137,748					
Year	1981					

Base of fresh water (ft.): 600

Remarks: Five-acre spacing was adopted for this area.

Selected References:

DATE: May 1983 **Estimated value

CALIFORNIA DIVISION OF OIL AND GAS

COUNTY: VENTURA

OJAI OIL FIELD
SULPHUR MOUNTAIN 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	Bradford & Geis "S.M.P." 1	Bradford & Geis Trustees No. 1	21 4N 22W	SB	2,400	Miocene	
Deepest well	Conoco Inc. "S.M.P." 3	Continental Oil Co. "S.M.P." 3	21 4N 22W	SB	6,569		Sespe Oligocene

POOL DATA

ITEM	MIOCENE					FIELD OR AREA DATA
Discovery date	September 1927					
Initial production rates						
Oil (bbl/day)	210					
Gas (Mcf/day)						
Flow pressure (psi)						
Bean size (in.)						
Initial reservoir pressure (psi)						
Reservoir temperature (°F)						
Initial oil content (STB/ac.-ft.)						
Initial gas content (MSCF/ac.-ft.)						
Formation	Monterey					
Geologic age	Miocene					
Average depth (ft.)	1,861					
Average net thickness (ft.)	450					
Maximum productive area (acres)	80					
RESERVOIR ROCK PROPERTIES						
Porosity (%)						
So_i (%)						
Sw_i (%)						
Sg_i (%)						
Permeability to air (md)						
RESERVOIR FLUID PROPERTIES						
Oil:						
Oil gravity (°API)	15-16					
Sulfur content (% by wt.)						
Initial solution GOR (SCF/STB)						
Initial oil FVF (RB/STB)						
Bubble point press. (psia)						
Viscosity (cp) @ °F						
Gas:						
Specific gravity (air = 1.0)						
Heating value (Btu/cu. ft.)						
Water:						
Salinity, NaCl (ppm)	12,000					
T.D.S. (ppm)						
R_w (ohm/m) (77°F)						
ENHANCED RECOVERY PROJECTS						
Enhanced recovery projects	cyclic steam					
Date started	1965					
Date discontinued	1965					
Peak oil production (bbl)	23,211					
Year	1956					
Peak gas production, net (Mcf)						
Year						

Base of fresh water (ft.): 730

Remarks:

Selected References:

DATE: May 1983

CALIFORNIA DIVISION OF OIL AND GAS

COUNTY: VENTURA

OJAI OIL FIELD
TIP TOP 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	E.L. Henthorn No. 1	New Mexico Oil Co. No. 1	33 4N 23W	SB	753	unnamed	
Deepest well	E.L. Henthorn No. 20	Calif. Ventura Oil Co. No. 1	4 3N 23W	SB	5,518		Rincon Miocene

POOL DATA

ITEM	UNNAMED					FIELD OR AREA DATA
Discovery date	February 1918					
Initial production rates						
Oil (bbl/day)	15					
Gas (Mcf/day)						
Flow pressure (psi)						
Bean size (in.)						
Initial reservoir pressure (psi)						
Reservoir temperature (°F)						
Initial oil content (STB/ac.-ft.)						
Initial gas content (MSCF/ac.-ft.)						
Formation	Santa Margarita					
Geologic age	Miocene					
Average depth (ft.)	430					
Average net thickness (ft.)	350					
Maximum productive area (acres)	90					
RESERVOIR ROCK PROPERTIES						
Porosity (%)						
So_i (%)						
Sw_i (%)						
Sg_i (%)						
Permeability to air (md)						
RESERVOIR FLUID PROPERTIES						
Oil:						
Oil gravity (°API)	23					
Sulfur content (% by wt.)						
Initial solution GOR (SCF/STB)						
Initial oil FVF (RB/STB)						
Bubble point press. (psia)						
Viscosity (cp) @ °F						
Gas:						
Specific gravity (air = 1.0)						
Heating value (Btu/cu. ft.)						
Water:						
Salinity, NaCl (ppm)	5,100					
T.D.S. (ppm)						
R_w (ohm/m) (77°F)						
ENHANCED RECOVERY PROJECTS						
Enhanced recovery projects						
Date started						
Date discontinued						
Peak oil production (bbl)	6,729					
Year	1935					
Peak gas production, net (Mcf)						
Year						

Base of fresh water (ft.): None

Remarks: The last production from the area was in 1964. The area was abandoned in 1971. Cumulative production is 232,000 bbl of oil and 67,000 Mcf of gas.

Selected References: Kaplow, E.J., 1950, The Tip Top Area of the Ojai Field: Calif. Div. of Oil and Gas, Summary of Operations -- Calif. Oil Fields, Vol. 36, No. 2.

DATE: May 1983

CALIFORNIA DIVISION OF OIL AND GAS

COUNTY: VENTURA

OJAI OIL FIELD
WELDON CANYON 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	Union Oil Co. of Calif. "Weldon Canyon" 2	Union Oil Co. of Calif. "Ex-Mission Weldon Canyon Core Hole" 2	3 3N 23W	SB	3,171	unnamed	
Deepest well	Union Oil Co. of Calif. "Weldon Canyon" 1	Union Oil Co. of Calif. "Weldon Canyon Core Hole" 1	3 3N 23W	SB	4,816		Pico Pliocene

POOL DATA

ITEM	UNNAMED					FIELD OR AREA DATA
Discovery date	June 1951					
Initial production rates						
Oil (bbl/day)	133					
Gas (Mcf/day)	44					
Flow pressure (psi)						
Bean size (in.)						
Initial reservoir pressure (psi)						
Reservoir temperature (°F)						
Initial oil content (STB/ac.-ft.)						
Initial gas content (MSCF/ac.-ft.)						
Formation	Pico					
Geologic age	Pliocene					
Average depth (ft.)	3,161					
Average net thickness (ft.)	95					
Maximum productive area (acres)	30					
RESERVOIR ROCK PROPERTIES						
Porosity (%)						
S_{oi} (%)						
S_{wi} (%)						
S_{gi} (%)						
Permeability to air (md)						
RESERVOIR FLUID PROPERTIES						
Oil:						
Oil gravity (°API)	28-30					
Sulfur content (% by wt.)						
Initial solution GOR (SCF/STB)						
Initial oil FVF (RB/STB)						
Bubble point press. (psia)						
Viscosity (cp) @ °F						
Gas:						
Specific gravity (air = 1.0)						
Heating value (Btu/cu. ft.)						
Water:						
Salinity, NaCl (ppm)	12,000					
T.D.S. (ppm)						
R_w (ohm/m) (77°F)						
ENHANCED RECOVERY PROJECTS						
Enhanced recovery projects						
Date started						
Date discontinued						
Peak oil production (bbl)	43,017					
Year	1954					
Peak gas production, net (Mcf)	22,852					
Year	1961					

Base of fresh water (ft.): None

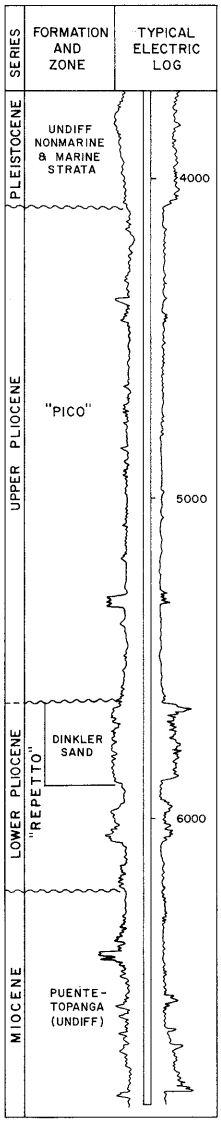
Remarks:

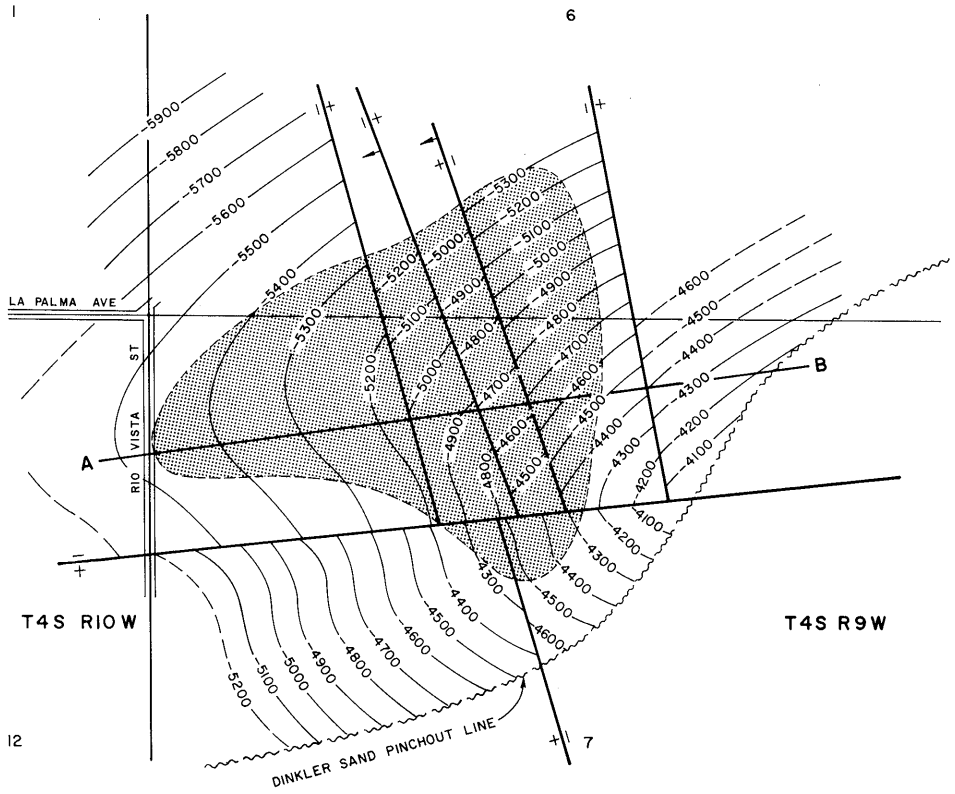
Selected References:

DATE: May 1983

CALIFORNIA DIVISION OF OIL AND GAS

OLIVE OIL FIELD





CONTOURS ON TOP OF DINKLER SAND

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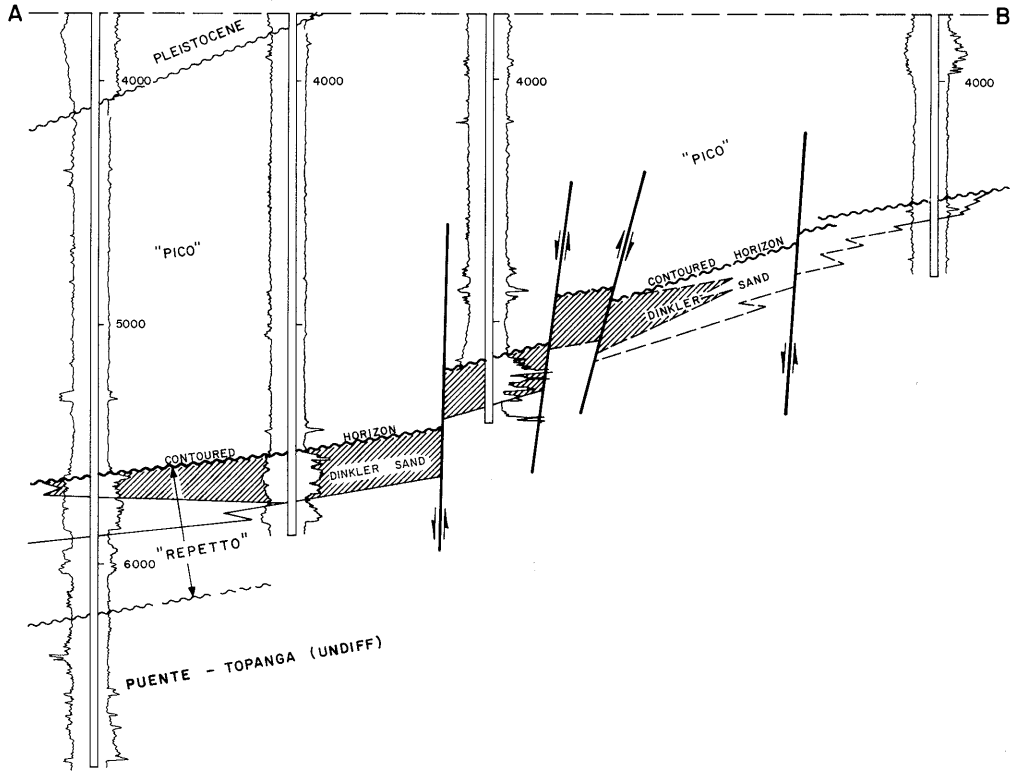


COUNTY: ORANGE

OLIVE 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	Texaco Inc. "Olive Unit One" 1	The Texas Co. "Dinkler" 1	7 4S 9W	SB	7,392	Dinkler	
Deepest well	Texaco Inc. "Ruff" 1	The Texas Co. "Ruff" 1	1 4S 10W	SB	8,497		Puente-Topanga Miocene

POOL DATA

ITEM	DINKLER					FIELD OR AREA DATA
Discovery date	April 1953					
Initial production rates						
Oil (bbl/day)	94					
Gas (Mcf/day)	18					
Flow pressure (psi)						
Bean size (in.)						
Initial reservoir pressure (psi)	2,010					
Reservoir temperature (°F)	122					
Initial oil content (STB/ac.-ft.)	775					
Initial gas content (MSCF/ac.-ft.)						
Formation	"Repetto"					
Geologic age	early Pliocene					
Average depth (ft.)	4,900					
Average net thickness (ft.)	200					
Maximum productive area (acres)	100					
RESERVOIR ROCK PROPERTIES						
Porosity (%)	22					
S_{oi} (%)						
S_{wi} (%)						
S_{gi} (%)						
Permeability to air (md)	82					
RESERVOIR FLUID PROPERTIES						
Oil:						
Oil gravity (°API)	13-15					
Sulfur content (% by wt.)						
Initial solution GOR (SCF/STB)	200					
Initial oil FVF (RB/STB)	1.08					
Bubble point press. (psia)						
Viscosity (cp) @ °F						
Gas:						
Specific gravity (air = 1.0)	0.586					
Heating value (Btu/cu. ft.)						
Water:						
Salinity, NaCl (ppm)	2,400					
T.D.S. (ppm)						
R_w (ohm/m) (77°F)	2.0					
ENHANCED RECOVERY PROJECTS						
Enhanced recovery projects						
Date started						
Date discontinued						
Peak oil production (bbl)	184,861					
Year	1958					
Peak gas production, net (Mcf)	40,000					
Year	1955					

Base of fresh water (ft.): 1,700

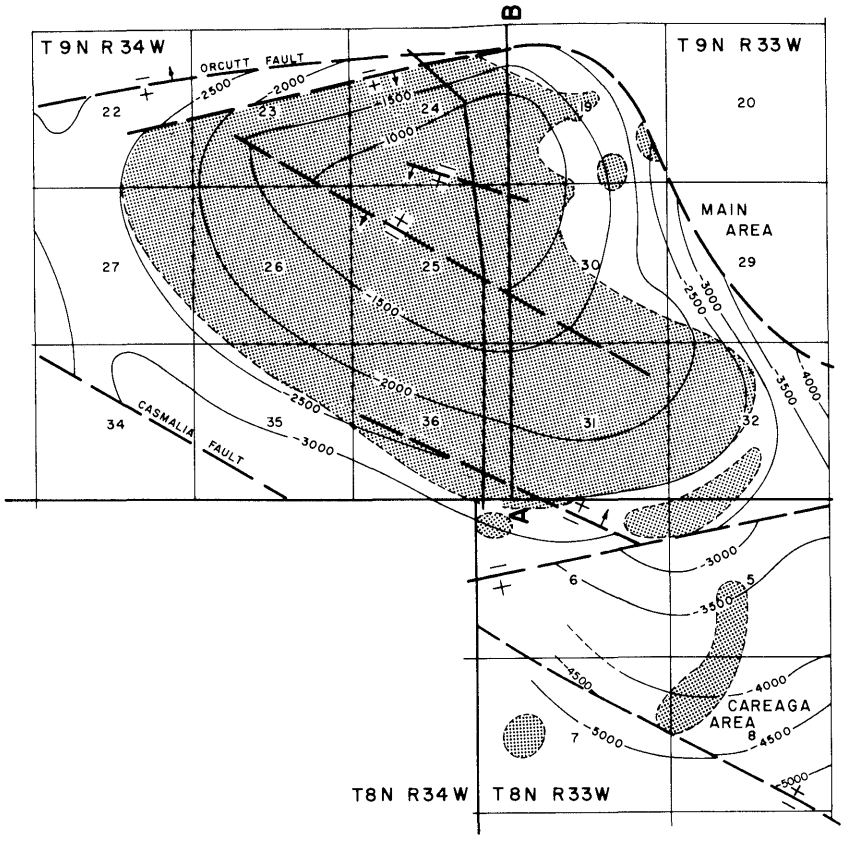
Remarks:

Selected References: Gaede, V.F., 1958, Olive Oil Field: Calif. Div. of Oil and Gas, Summary of Operations -- Calif. Oil Fields, Vol. 44, No. 2.

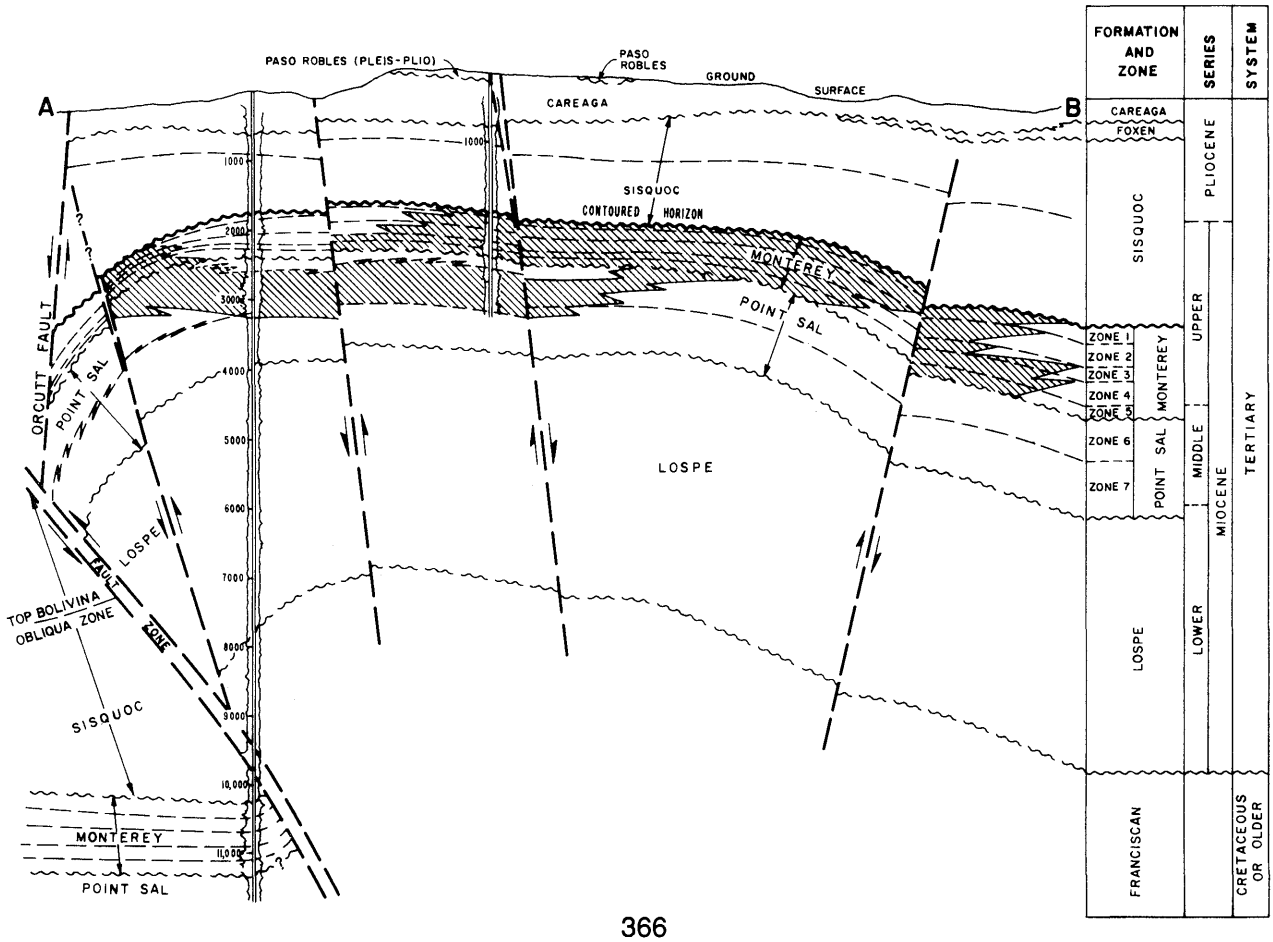
DATE: August 1983

CALIFORNIA DIVISION OF OIL AND GAS

ORCUTT OIL FIELD



CONTOURS ON TOP OF MONTEREY



COUNTY: **SANTA BARBARA**

ORCUTT 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	Shell Western Expl. & Prod. Inc. "Careaga" 3	Western Union Oil Co. Well No. 3	31 9N 33W	SB	4,010	Monterey	
Deepest well	Union Oil Co. of Calif. "Dome" 18	Same as present	24 9N 34W	SB	11,639		Pt. Sal Miocene

POOL DATA

ITEM	MONTEREY					FIELD OR AREA DATA
Discovery date	October 1901					
Initial production rates						
Oil (bbl/day)	150					
Gas (Mcf/day)						
Flow pressure (psi)						
Bean size (in.)						
Initial reservoir pressure (psi)	700**					
Reservoir temperature (°F)	120-160					
Initial oil content (STB/ac.-ft.)						
Initial gas content (MSCF/ac.-ft.)						
Formation	Monterey					
Geologic age	Miocene					
Average depth (ft.)	1,700					
Average net thickness (ft.)	950					
Maximum productive area (acres)						4,220
RESERVOIR ROCK PROPERTIES						
Porosity (%)	fractured shale					
S_{oi} (%)						
S_{wi} (%)						
S_{gi} (%)						
Permeability to air (md)						
RESERVOIR FLUID PROPERTIES						
Oil:						
Oil gravity (°API)	14-17					
Sulfur content (% by wt.)						
Initial solution GOR (SCF/STB)						
Initial oil FVF (RB/STB)						
Bubble point press. (psia)						
Viscosity (cp) @ °F						
Gas:						
Specific gravity (air = 1.0)						
Heating value (Btu/cu. ft.)						
Water:						
Salinity, NaCl (ppm)	11,000-18,500					
T.D.S. (ppm)	15,000-21,500					
R_w (ohm/m) (77°F)	0.33-0.60					
ENHANCED RECOVERY PROJECTS						
Enhanced recovery projects	waterflood					
Date started	1951					
Date discontinued	1985					
Peak oil production (bbl)						8,675,685
Year						1908
Peak gas production, net (Mcf)						1,998,211
Year						1958

Base of fresh water (ft.): See areas

Remarks: Field name was changed from Santa Maria to Orcutt in January 1947.

Selected References: See areas

DATE: January 1989 **Estimated value

CALIFORNIA DIVISION OF OIL AND GAS

COUNTY: SANTA BARBARA

ORCUTT OIL FIELD
CAREAGA 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	E.C. Arnold Oil Corp. "Arnold-Apache" 2	Same as present	8 8N 33W	SB	6,373	Monterey	
Deepest well	GEO Petroleum Inc. "Long Canyon" 1	Coastal Oil and Gas Corp. "Long Canyon" 1	7 8N 33W	SB	9,912		Lospe Miocene

POOL DATA

ITEM	MONTEREY	PT. SAL	LOSPE			FIELD OR AREA DATA
Discovery date	September 1937	June 1985	March 1985			
Initial production rates						
Oil (bbl/day)	2	96	156			
Gas (Mcf/day)	3	-	116			
Flow pressure (psi)	90**	-	6			
Bean size (in.)						
Initial reservoir pressure (psi)	1,350	3,250	2,500			
Reservoir temperature (°F)	176	230	255			
Initial oil content (STB/ac.-ft.)	690	-	-			
Initial gas content (MSCF/ac.-ft.)						
Formation	Monterey	Pt. Sal	Lospe			
Geologic age	Miocene	Miocene	Miocene			
Average depth (ft.)	5,020	9,020	9,676			
Average net thickness (ft.)	1,040	120	100			
Maximum productive area (acres)						40
RESERVOIR ROCK PROPERTIES						
Porosity (%)	fractured shale	22-34	25-42			
So_i (%)						
Sw_i (%)						
Sg_i (%)						
Permeability to air (md)	-	10-30	10-15			
RESERVOIR FLUID PROPERTIES						
Oil:						
Oil gravity (°API)	22-34	28-30	31-34			
Sulfur content (% by wt.)	2.170	0.614	1.648			
Initial solution GOR (SCF/STB)	2,426	-	-			
Initial oil FVF (RB/STB)	1.10	-	-			
Bubble point press. (psia)						
Viscosity (cp) @ °F	-	58.7 @ 100	138.6 @ 100			
Gas:						
Specific gravity (air = 1.0)						
Heating value (Btu/cu. ft.)						
Water:						
Salinity, NaCl (ppm)	15,650	10,218	-			
T.D.S. (ppm)	18,001	17,164	-			
R_w (ohm/m) (77°F)	0.42	-	-			
ENHANCED RECOVERY PROJECTS						
Enhanced recovery projects						
Date started						
Date discontinued						
Peak oil production (bbl)	7,088					13,476
Year	1938					1985
Peak gas production, net (Mcf)						
Year						

Base of fresh water (ft.): 1,250

Remarks: The area was abandoned in 1954 and reactivated in 1982.

Selected References: Dolman, S.G., 1937, Operations in District No. 3, Div. of Oil and Gas, Summary of Operations--Calif. Oil Fields, Vol. 23, No. 3.

DATE: January 1989 **Estimated value

CALIFORNIA DIVISION OF OIL AND GAS

COUNTY: SANTA BARBARA

ORCUTT 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	Shell Western Expl. & Prod. Inc. "Careaga" 3	Western Union Oil Co. Well No. 3	31 9N 33W	SB	4,010	Monterey	
Deepest well	Union Oil Co. of Calif. "Dome" 18	Same as present	24 9N 34W	SB	11,639		Pt. Sal Miocene

POOL DATA

ITEM	DIATOMITE	MONTEREY	MONTEREY DEEP	PT. SAL		FIELD OR AREA DATA
Discovery date	July 1979	October 1901	November 1981	May 1905		
Initial production rates						
Oil (bbl/day)	55	150	360	80a/		
Gas (Mcf/day)	-	-	123	-		
Flow pressure (psi)						
Bean size (in.)						
Initial reservoir pressure (psi)	500	700**	3,168	1,620		
Reservoir temperature (°F)	107	120-160	245	165		
Initial oil content (STB/ac.-ft.)	-	-	-	980		
Initial gas content (MSCF/ac.-ft.)	-	-	-	339		
Formation	Sisquoc	Monterey	Monterey	Pt. Sal		
Geologic age	late Miocene	Miocene	Miocene	Miocene		
Average depth (ft.)	1,400	1,700	9,295	2,700		
Average net thickness (ft.)	100	950	400	550		
Maximum productive area (acres)						4,180
RESERVOIR ROCK PROPERTIES						
Porosity (%)	51	fractured shale	fractured shale	22-24		
So_i (%)	-	-	-	64		
Sw_i (%)	-	-	-	36		
Sg_i (%)						
Permeability to air (md)	1.1	-	-	78.0-90.0		
RESERVOIR FLUID PROPERTIES						
Oil:						
Oil gravity (°API)	-	14-17	32-36	22-24		
Sulfur content (% by wt.)						
Initial solution GOR (SCF/STB)	-	-	470	285		
Initial oil FVF (RB/STB)	-	-	1.38	1.16		
Bubble point press. (psia)	-	-	1,700	1,620		
Viscosity (cp) @ °F	-	-	-	8 @ 165		
Gas:						
Specific gravity (air = 1.0)	-	-	0.90	0.89		
Heating value (Btu/cu. ft.)						
Water:						
Salinity, NaCl (ppm)	-	11,000-18,500	-	13,600-20,400		
T.D.S. (ppm)	-	15,000-21,500	-	-		
R_w (ohm/m) (77°F)	-	0.60-0.33	-	-		
ENHANCED RECOVERY PROJECTS						
Enhanced recovery projects		waterflood		gas injection		
Date started		1951		1928		
Date discontinued		1985		1933		
				waterflood		
				1963		
				active		
				alkaline flood		
				1981		
				1984		
Peak oil production (bbl)	3,285	-	40,879	-		8,675,685
Year	1985		1983			1908
Peak gas production, net (Mcf)	2,398	-	65,849	-		1,998,211
Year	1984		1983			1958

Base of fresh water (ft.): 0-250

Remarks: Much early well and production history not available.
a/ Production commingled with Monterey pool.

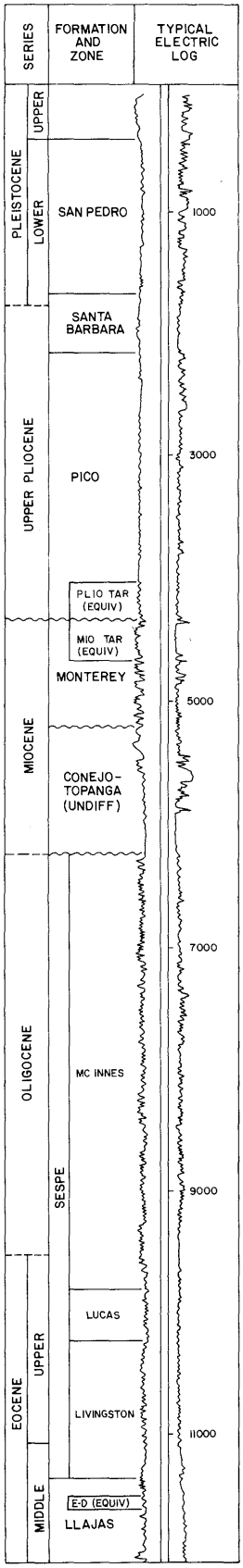
Selected References:

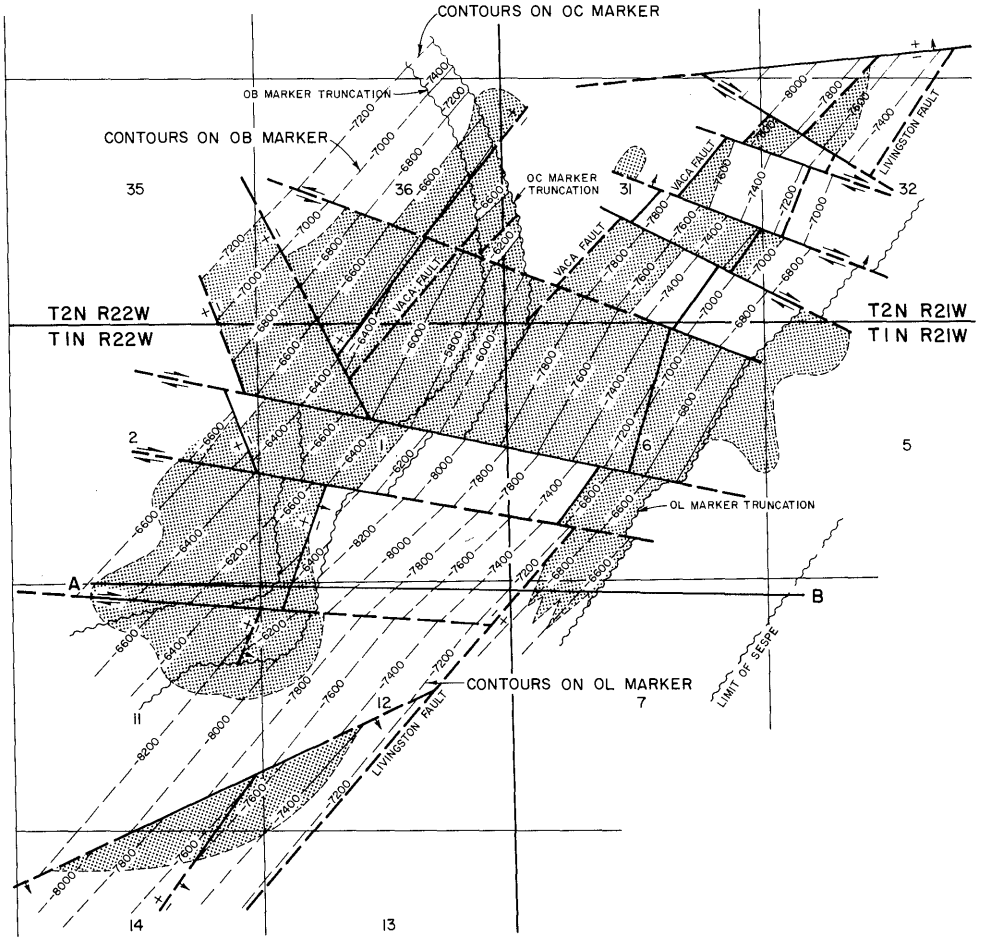
Arnold, R., and R. Anderson, 1907, Geology and Oil Resources of the Santa Maria Oil District, Santa Barbara County, Calif.: U.S. Geol. Survey Bull. 322.
Collom, R.E., 1916, Bituminous Monterey Shales of the Santa Maria District: Calif. State Mining Bureau Bull. 73, p. 205.
Dreyer, F.E., 1940, Santa Maria (Orcutt) Oil Field: Calif. Div. of Mines Bull. 118, p. 431.
Hamilton, F., 1913, Petroleum in Southern California: Calif. State Mining Bureau Bull. 63, p. 362.
Correlation Section Across the Santa Maria Basin, 1959, AAPG.
Railroad Commission of the State of California, 1941, Santa Maria Oil Field: Case No. 4591, p. 214.
Regan, L.J., and A.W. Hughes, 1949, Fractured Reservoirs of the Santa Maria District, California: AAPG Bull., Vol. 33, No. 1, p. 32.
Woodring, W.P., and M.N. Bramlette, 1950: Geology and Paleontology of the Santa Maria District: U.S. Geol. Survey Prof. Paper 222, p. 119.

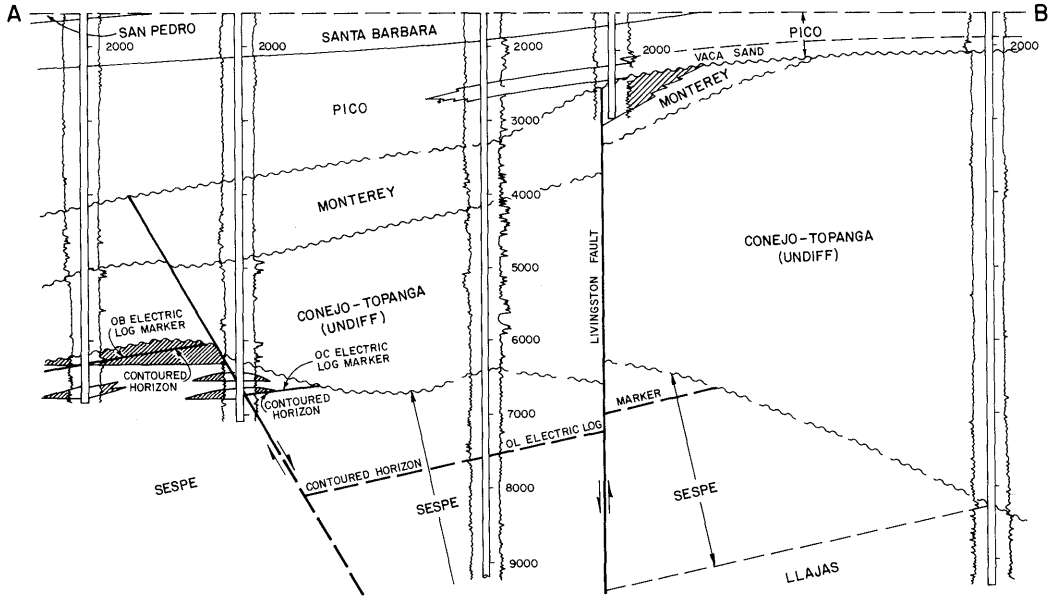
DATE: January 1989 **Estimated value

CALIFORNIA DIVISION OF OIL AND GAS

OXNARD OIL FIELD







COUNTY: VENTURA

OXNARD 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	Vaca Oil Exploration Co., Inc. No. 1	Same as present	6 1N 21W	SB	2,822	Pliocene Tar	
Deepest well	Lloyd Corp. Ltd. "Lloyd Corp. W.R. Livingston" 4	Same as present	31 2N 21W	SB	12,460		Llajas Eocene

POOL DATA

ITEM	PLIOCENE TAR	MIOCENE TAR	MCINNES	LUCAS	LIVINGSTON	FIELD OR AREA DATA
Discovery date	January 1937	May 1937	July 1953	May 1954	March 1954	
Initial production rates						
Oil (bbl/day)	50	90	112	30	610	
Gas (Mcf/day)	10	20	27	10	663	
Flow pressure (psi)						
Bean size (in.)						
Initial reservoir pressure (psi)	800**	-	2,770	-	-	
Reservoir temperature (°F)	100	102	165	-	-	
Initial oil content (STB/ac.-ft.)	2,000	-	1,405	-	-	
Initial gas content (MSCF/ac.-ft.)	150	-	-	-	-	
Formation	Pico	Monterey	Sespe	Sespe	Sespe	
Geologic age	Pliocene	Miocene	Oligocene	Eocene	Eocene	
Average depth (ft.)	2,176	2,951	6,500	8,750	9,311	
Average net thickness (ft.)	282	400	300	380	450	
Maximum productive area (acres)						1,350
RESERVOIR ROCK PROPERTIES						
Porosity (%)	35	5-30	28	-	15	
Soi (%)	76	10	70	-	50	
Swi (%)	24	90	24	-	-	
Sgi (%)						
Permeability to air (md)	5,000-6,000	-	-	-	-	
RESERVOIR FLUID PROPERTIES						
Oil:						
Oil gravity (°API)	7	7	24	32	25-38	
Sulfur content (% by wt.)	5.00-7.00	7.47	-	-	-	
Initial solution GOR (SCF/STB)	75	-	425	-	806	
Initial oil FVF (RB/STB)	1.04	-	1.18	-	1.20	
Bubble point press. (psia)						
Viscosity (cp) @ °F	33,000.0 @ 160	28,000.0 @ 150	4.6 @ 165	-	-	
Gas:						
Specific gravity (air = 1.0)	0.8	-	-	-	-	
Heating value (Btu/cu. ft.)						
Water:						
Salinity, NaCl (ppm)	5,400	22,200	23,900	20,500	23,900	
T.D.S. (ppm)	5,000**	-	-	-	-	
R_w (ohm/m) (77°F)	2.0**	-	-	-	-	
ENHANCED RECOVERY PROJECTS						
Enhanced recovery projects	cyclic steam	waterflood	waterflood			
Date started	1964	1977	1963			
Date discontinued	active	active	1966			
		cyclic steam				
		1966				
		1982				
Peak oil production (bbl)						
Year						
Peak gas production, net (Mcf)						
Year						

Base of fresh water (ft.): 1,800

Remarks:

Selected References:

Kaplow, E.J., 1947, Oxnard Oil Field: Calif. Div. of Oil and Gas, Summary of Operations -- Calif. Oil Fields, Vol. 33, No. 2.
Dosch, M.W., and W.S. Mitchell, 1964, Oxnard Oil Field: Div. of Oil and Gas, Summary of Operations -- Calif. Oil Fields, Vol. 50, No. 1.
Dosch, M.W., 1965, Pliocene Tar Sands in Oxnard Oil Field: Calif. Div. of Oil and Gas, Summary of Operations -- Calif. Oil Fields, Vol 51, No. 2.

DATE: May 1983 **Estimated value

CALIFORNIA DIVISION OF OIL AND GAS

COUNTY: VENTURA

OXNARD 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	E-D					FIELD OR AREA DATA
Discovery date	January 1959					
Initial production rates						
Oil (bbl/day)	372					
Gas (Mcf/day)	361					
Flow pressure (psi)						
Bean size (in.)						
Initial reservoir pressure (psi)						
Reservoir temperature (°F)						
Initial oil content (STB/ac.-ft.)						
Initial gas content (MSCF/ac.-ft.)						
Formation	Llajas					
Geologic age	Eocene					
Average depth (ft.)	10,200					
Average net thickness (ft.)	110					
Maximum productive area (acres)						
RESERVOIR ROCK PROPERTIES						
Porosity (%)						
So_i (%)						
Sw_i (%)						
Sg_i (%)						
Permeability to air (md)						
RESERVOIR FLUID PROPERTIES						
Oil:						
Oil gravity (°API)	36					
Sulfur content (% by wt.)						
Initial solution GOR (SCF/STB)						
Initial oil FVF (RB/STB)						
Bubble point press. (psia)						
Viscosity (cp) @ °F						
Gas:						
Specific gravity (air = 1.0)						
Heating value (Btu/cu. ft.)						
Water:						
Salinity, NaCl (ppm)	30,800					
T.D.S. (ppm)						
R_w (ohm/m) (77°F)						
ENHANCED RECOVERY PROJECTS						
Enhanced recovery projects						
Date started						
Date discontinued						
Peak oil production (bbl)						3,196,804
Year						1959
Peak gas production, net (Mcf)						2,032,799
Year						1961

Base of fresh water (ft.):

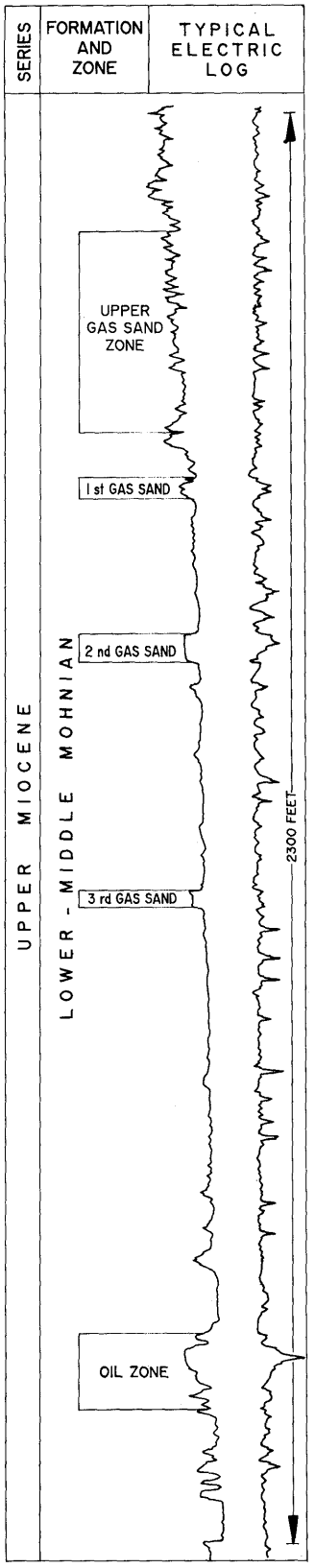
Remarks:

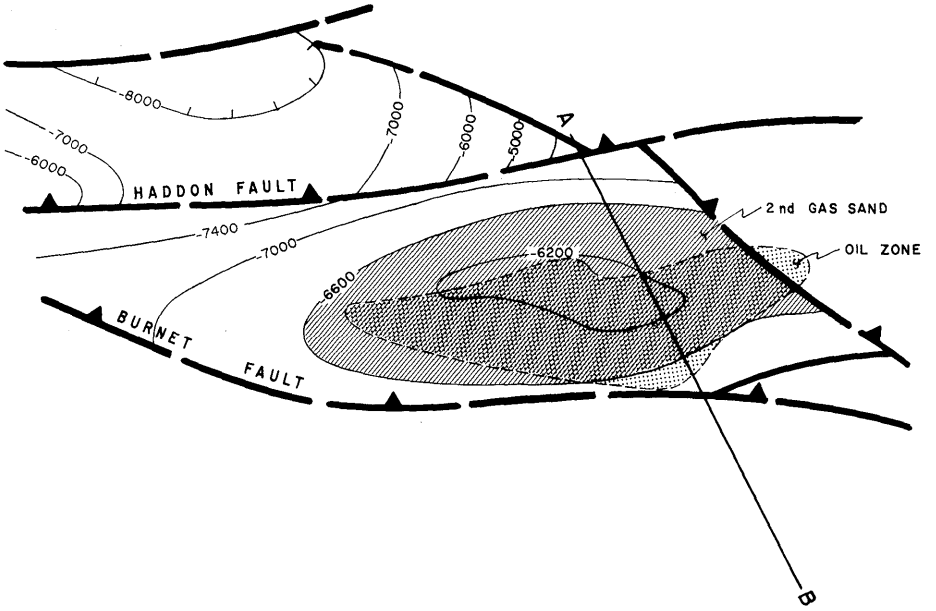
Selected References:

DATE: May 1983

CALIFORNIA DIVISION OF OIL AND GAS

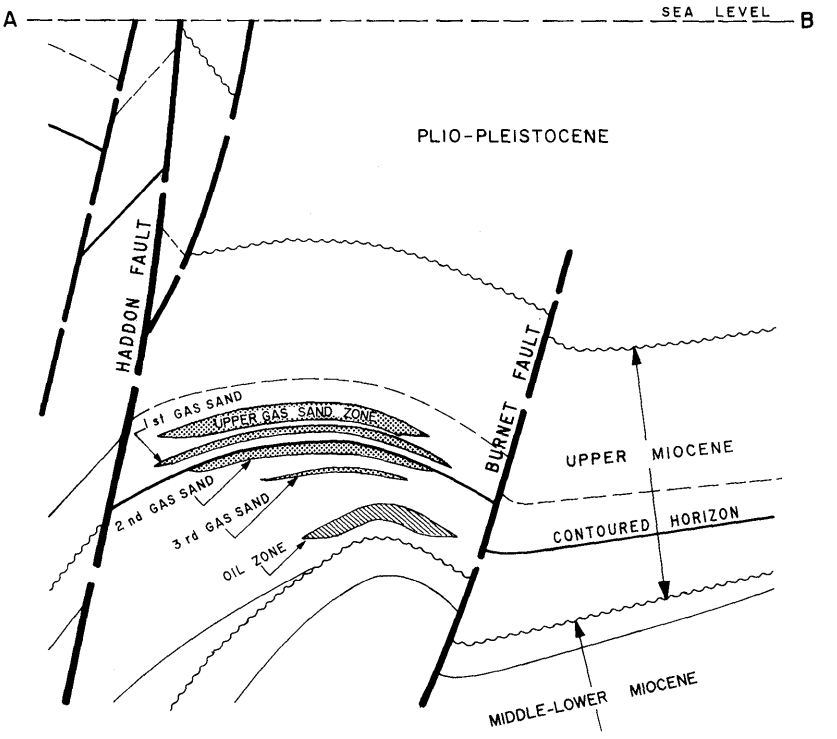
PACOIMA OIL FIELD





CONTOURS ON TOP OF SECOND GAS SAND

SCALE
1" = 3800'



COUNTY: LOS ANGELES

PACOIMA 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	Tidelands Oil Prod. Co. "Pacoima" 1	Chevron U.S.A. Inc. "Pacoima" 1	11 2N 15W	SB	9,995	Oil Zone	
Deepest well	Tidelands Oil Prod. Co. "Pacoima" 9	Chevron U.S.A. Inc. "Pacoima" 9	15 2N 15W	SB	10,284		Modelo upper Miocene

POOL DATA

ITEM	GAS SANDS	OIL ZONE				FIELD OR AREA DATA
Discovery date	December 1974	December 1974				
Initial production rates						
Oil (bbl/day)		260				
Gas (Mcf/day)	4,800					
Flow pressure (psi)						
Bean size (in.)						
Initial reservoir pressure (psi)	3,200	4,000				
Reservoir temperature (°F)	165	186				
Initial oil content (STB/ac.-ft.)	-	840				
Initial gas content (MSCF/ac.-ft.)	1,130					
Formation	Modelo	Modelo				
Geologic age	upper Miocene	upper Miocene				
Average depth (ft.)	6,000	7,200				
Average net thickness (ft.)	120	66				
Maximum productive area (acres)	470	315				
RESERVOIR ROCK PROPERTIES						
Porosity (%)	23	24				
So_i (%)	-	70				
Sw_i (%)	55	30				
Sg_i (%)	45	-				
Permeability to air (md)	480	160				
RESERVOIR FLUID PROPERTIES						
Oil:						
Oil gravity (°API)	-	34				
Sulfur content (% by wt.)						
Initial solution GOR (SCF/STB)	-	1,040				
Initial oil FVF (RB/STB)	-	1.575				
Bubble point press. (psia)						
Viscosity (cp) @ °F	-	0.47				
Gas:						
Specific gravity (air = 1.0)	0.65	-				
Heating value (Btu/cu. ft.)						
Water:						
Salinity, NaCl (ppm)	8,540	-				
T.D.S. (ppm)						
R_w (ohm/m) (77°F)	0.6512	-				
ENHANCED RECOVERY PROJECTS.						
Enhanced recovery projects						
Date started						
Date discontinued						
Peak oil production (bbl)	72,999	370,976				443,975
Year	1985	1985				1985
Peak gas production, net (Mcf)	1,153,705	1,668,275				2,374,548
Year	1987	1986				1986

Base of fresh water (ft.): 500-700

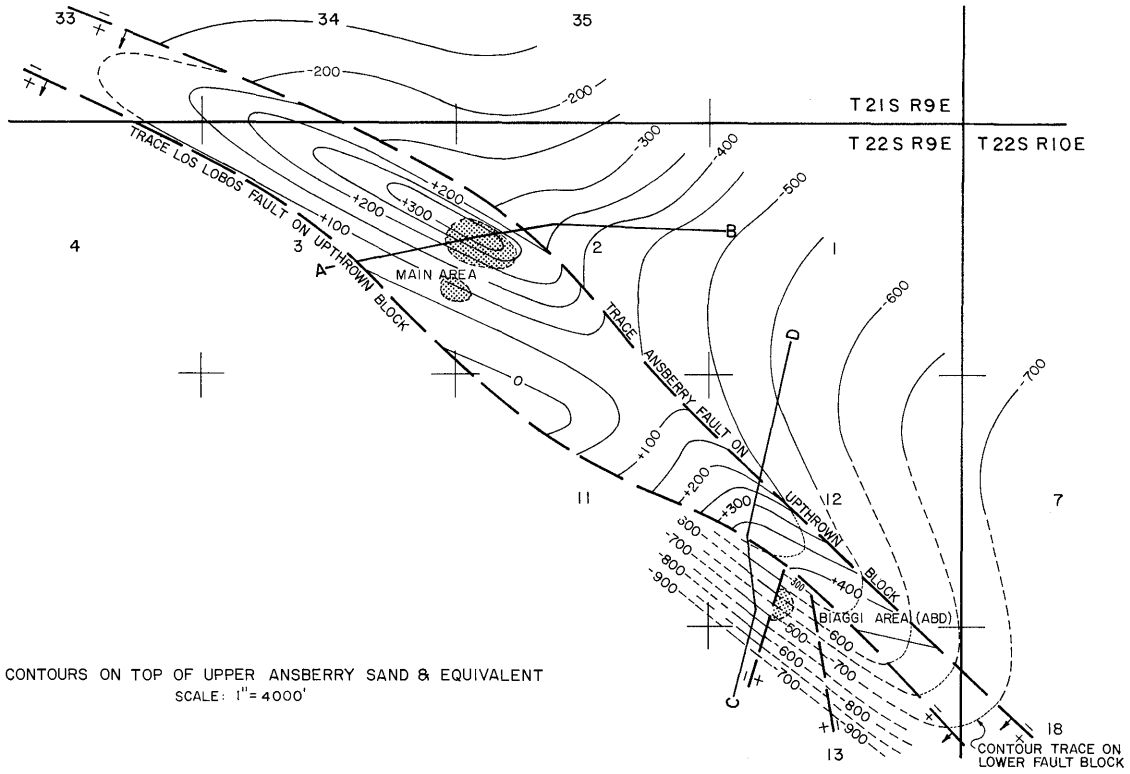
Remarks:

Selected References: Schnurr, P.E., & C.E. Kock, 1989, Pacoima Field, Pacific Section AAPG Field Summaries.

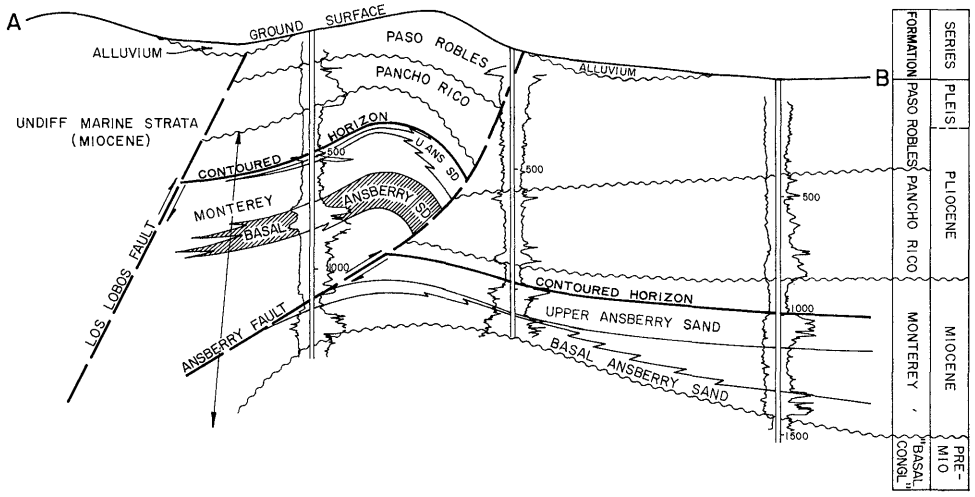
DATE: September 1990

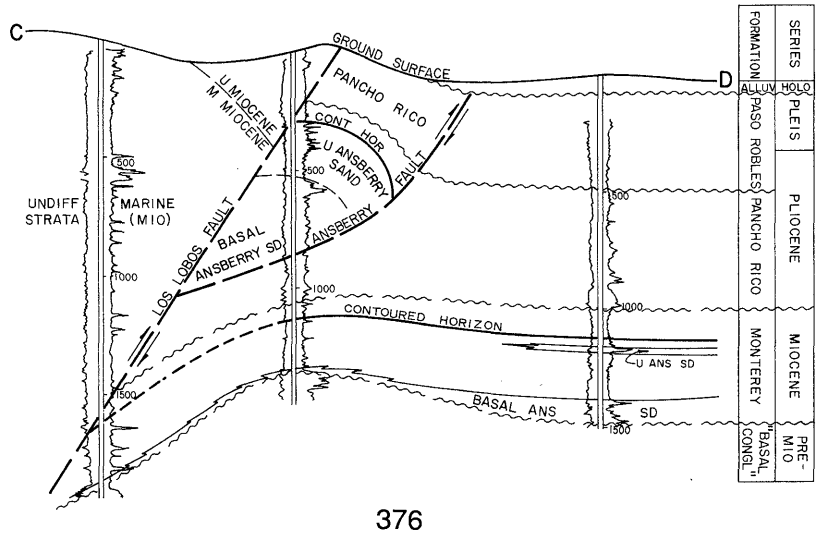
CALIFORNIA DIVISION OF OIL AND GAS

PARIS VALLEY OIL FIELD



CONTOURS ON TOP OF UPPER ANSBERRY SAND & EQUIVALENT
SCALE: 1" = 4000'





COUNTY: MONTEREY

PARIS VALLEY 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. "Biaggi" 2	The Texas Co. "Paris Valley Anticline Core Hole" 1-12	12 22S 9E	MD	1,159	Basal Ansberry	
Deepest well	Petroleum Securities Co. "Anoitzbehere" 1	Same as present	2 22S 9E	MD	2,655		Pre-Miocene

POOL DATA

ITEM	BASAL ANSBERRY					FIELD OR AREA DATA
Discovery date	August 1948					
Initial production rates						
Oil (bbl/day)	20					
Gas (Mcf/day)						
Flow pressure (psi)						
Bean size (in.)						
Initial reservoir pressure (psi)						
Reservoir temperature (°F)						
Initial oil content (STB/ac.-ft.)	2,009					
Initial gas content (MSCF/ac.-ft.)						
Formation	Monterey					
Geologic age	Miocene					
Average depth (ft.)	1,090					
Average net thickness (ft.)	70					
Maximum productive area (acres)						50
RESERVOIR ROCK PROPERTIES						
Porosity (%)	34					
So_i (%)	46-60					
Sw_i (%)	40-54					
Sg_i (%)						
Permeability to air (md)	3,113					
RESERVOIR FLUID PROPERTIES						
Oil:						
Oil gravity (°API)	12-13					
Sulfur content (% by wt.)						
Initial solution GOR (SCF/STB)	50					
Initial oil FVF (RB/STB)	1.07					
Bubble point press. (psia)						
Viscosity (cp) @ °F						
Gas:						
Specific gravity (air = 1.0)						
Heating value (Btu/cu. ft.)						
Water:						
Salinity, NaCl (ppm)	30,150					
T.D.S. (ppm)						
R_w (ohm/m) (77°F)						
ENHANCED RECOVERY PROJECTS						
Enhanced recovery projects						
Date started						
Date discontinued						
Peak oil production (bbl)						58,293
Year						1977
Peak gas production, net (Mcf)						
Year						

Base of fresh water (ft.): See areas

Remarks:

Selected References: See areas

DATE: January 1989

CALIFORNIA DIVISION OF OIL AND GAS

COUNTY: MONTEREY

PARIS VALLEY OIL FIELD
BIAGGI 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. "Biaggi" 2	The Texas Co. "Paris Valley Anticline Core Hole" 1-12	12 22S 9E	MD	1,159	Basal Ansberry	
Deepest well	Occidental Petroleum Corp. "Hocker et al" 38X	Same as present	12 22S 9E	MD	2,052		basement(schist) Mesozoic

POOL DATA

ITEM	BASAL ANSBERRY					FIELD OR AREA DATA
Discovery date	August 1948					
Initial production rates						
Oil (bbl/day)	20					
Gas (Mcf/day)						
Flow pressure (psi)						
Bean size (in.)						
Initial reservoir pressure (psi)						
Reservoir temperature (°F)						
Initial oil content (STB/ac.-ft.)	2,009					
Initial gas content (MSCF/ac.-ft.)						
Formation	Monterey					
Geologic age	Miocene					
Average depth (ft.)	1,090					
Average net thickness (ft.)	70					
Maximum productive area (acres)	10					
RESERVOIR ROCK PROPERTIES						
Porosity (%)	34					
S_{oi} (%)	46-60					
S_{wi} (%)	40-54					
S_{gi} (%)						
Permeability to air (md)	3,113					
RESERVOIR FLUID PROPERTIES						
Oil:						
Oil gravity (°API)	12-13					
Sulfur content (% by wt.)						
Initial solution GOR (SCF/STB)	50					
Initial oil FVF (RB/STB)	1.07					
Bubble point press. (psia)						
Viscosity (cp) @ °F						
Gas:						
Specific gravity (air = 1.0)						
Heating value (Btu/cu. ft.)						
Water:						
Salinity, NaCl (ppm)	30,150					
T.D.S. (ppm)						
R_w (ohm/m) (77°F)						
ENHANCED RECOVERY PROJECTS						
Enhanced recovery projects						
Date started						
Date discontinued						
Peak oil production (bbl)	316					
Year	1948					
Peak gas production, net (Mcf)						
Year						

Base of fresh water (ft.): None

Remarks: The area was abandoned in 1954. Cumulative production is 316 bbl of oil and no gas.

Selected References: Hallmark, F.O., 1971, Paris Valley and Biaggi Oil Fields: Calif. Div. of Oil and Gas, Summary of Operations--Calif. Oil Fields, Vol. 57, No. 1.
Hart, E.W., 1963, Mines and Mineral Resources of Monterey County, Calif.: Calif. Div. of Mines and Geology County Report No. 5.

DATE: January 1989

CALIFORNIA DIVISION OF OIL AND GAS

COUNTY: MONTEREY

PARIS VALLEY 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	Concord Oil Co. "M-A" 1	W. Frank Jones, Opr. "M-A" 1	2 22S 9E	MD	785	Basal Ansberry	
Deepest well	Petroleum Securities Co. "Aniotzbehere" 1	Same as present	2 22S 9E	MD	2,655		Pre-Miocene

POOL DATA

ITEM	BASAL ANSBERRY					FIELD OR AREA DATA
Discovery date	September 1958					
Initial production rates						
Oil (bbl/day)	6					
Gas (Mcf/day)						
Flow pressure (psi)						
Bean size (in.)						
Initial reservoir pressure (psi)	235					
Reservoir temperature (°F)	87					
Initial oil content (STB/ac.-ft.)	2,662					
Initial gas content (MSCF/ac.-ft.)						
Formation	Monterey					
Geologic age	Miocene					
Average depth (ft.)	710					
Average net thickness (ft.)	150					
Maximum productive area (acres)	40					
RESERVOIR ROCK PROPERTIES						
Porosity (%)	31-40					
So_i (%)	55-80**					
Sw_i (%)	20-45**					
Sg_i (%)						
Permeability to air (md)	3,015-4,454					
RESERVOIR FLUID PROPERTIES						
Oil:						
Oil gravity (°API)	10-12					
Sulfur content (% by wt.)	1.5					
Initial solution GOR (SCF/STB)	40-50**					
Initial oil FVF (RB/STB)	1.00-1.07					
Bubble point press. (psia)						
Viscosity (cp) @ °F	a/					
Gas:						
Specific gravity (air = 1.0)						
Heating value (Btu/cu. ft.)						
Water:						
Salinity, NaCl (ppm)	460-1,500					
T.D.S. (ppm)	1,680					
R_w (ohm/m) (77°F)	4.3					
ENHANCED RECOVERY PROJECTS						
Enhanced recovery projects	cyclic steam					
Date started	1962					
Date discontinued	1964					
	steamflood					
	1963					
	1964					
	combination thermal drive					
	1975					
	1979					
Peak oil production (bbl)	58,293					
Year	1977					
Peak gas production, net (Mcf)						
Year						

Base of fresh water (ft.): 300

Remarks: a/ The oil in the upper lobe averages 227,000 cp @ 87 degrees F whereas the lower lobe averages 23,000 cp @ 87 degrees F.

Selected References:

Hallmark, F.O., 1971, Paris Valley and Biaggi Oil Fields: Calif. Div. of Oil and Gas, Summary of Operations--Calif. Oil Fields, Vol. 57, No. 1.

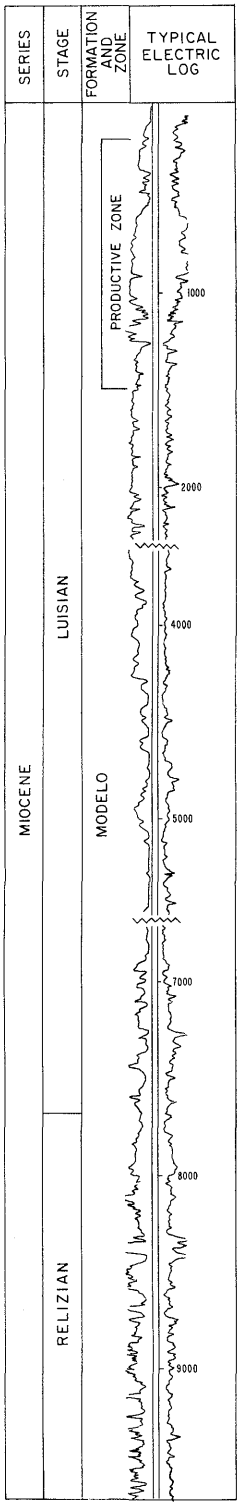
Hart, E.W., 1963, Mines and Mineral Resources of Monterey County, Calif: Calif. Div. of Mines and Geology County Report No. 5.

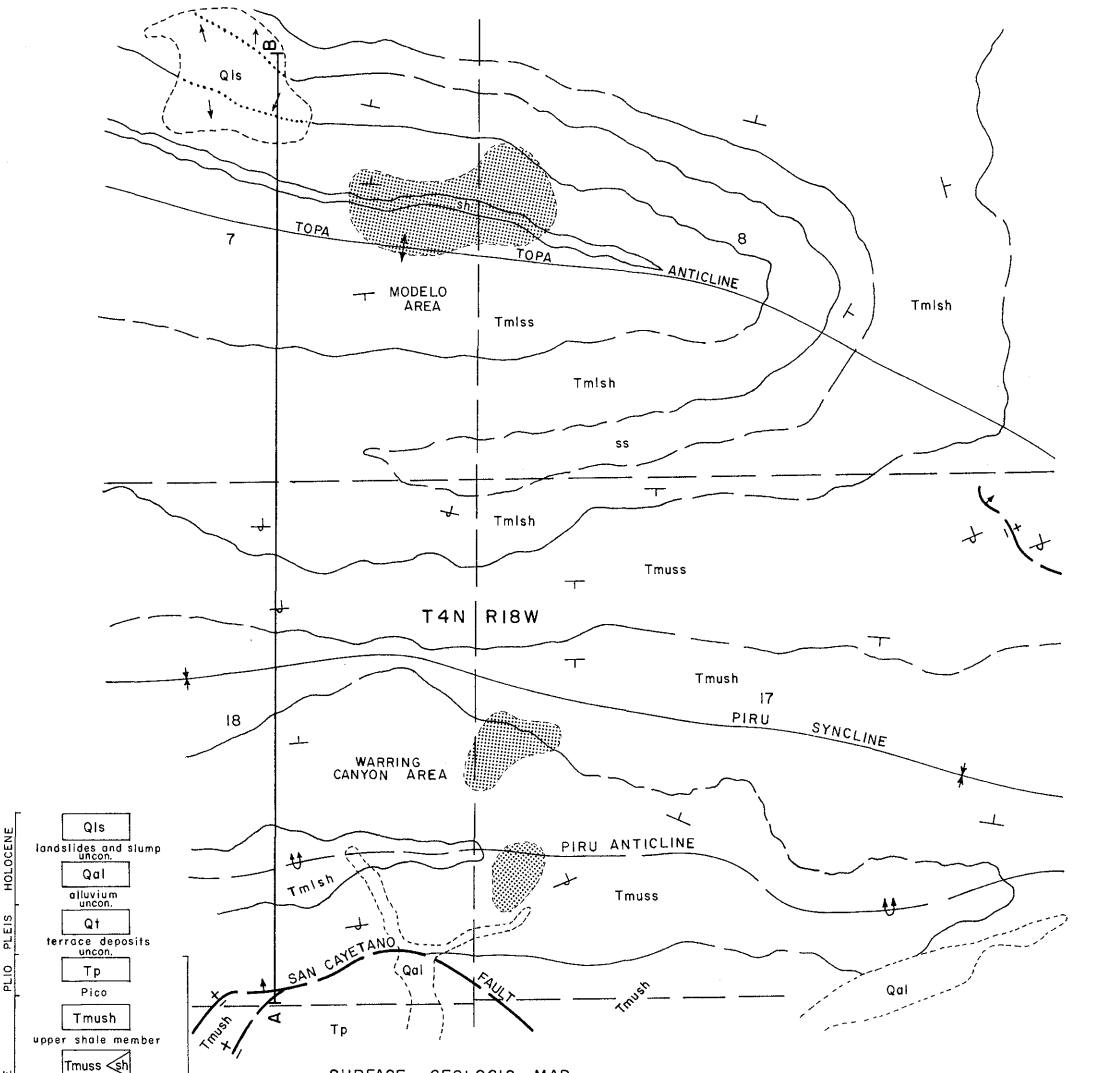
Smith, F.E., Jr., 1963, Paris Valley Oil Field: A.A.P.G.-S.E.P.M. Guidebook to the Geology of Salinas Valley and the San Andreas Fault.

DATE: January 1989 **Estimated value

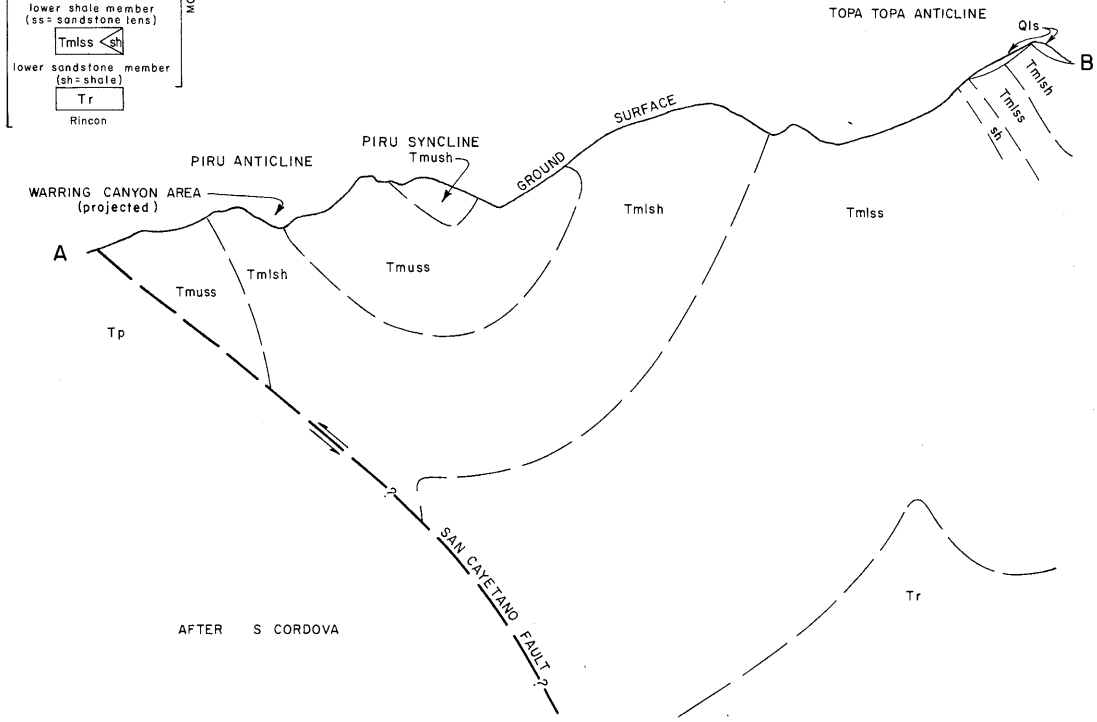
CALIFORNIA DIVISION OF OIL AND GAS

PIRU OIL FIELD





SURFACE GEOLOGIC MAP
SCALE : 1" = 2000'
AFTER S CORDOVA



AFTER S CORDOVA

COUNTY: VENTURA

PIRU 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 Producing Inc. "Crocker Fee" 1	Modelo Oil Co. No. 1	8 4N 18W	SB	605	Modelo	
Deepest well	Texaco Producing Inc. "Crocker Fee" 1-D	Pacific Western Oil Co. "Crocker Fee" 1-D	7 4N 18W	SB	10,504		Modelo Miocene

POOL DATA

ITEM	MIOCENE					FIELD OR AREA DATA
Discovery date	1897					
Initial production rates						
Oil (bbl/day)	15					
Gas (Mcf/day)						
Flow pressure (psi)						
Bean size (in.)						
Initial reservoir pressure (psi)						
Reservoir temperature (°F)						
Initial oil content (STB/ac.-ft.)						
Initial gas content (MSCF/ac.-ft.)						
Formation	Modelo					
Geologic age	Miocene					
Average depth (ft.)	900					
Average net thickness (ft.)	320					
Maximum productive area (acres)						150
RESERVOIR ROCK PROPERTIES						
Porosity (%)						
So_i (%)						
Sw_i (%)						
Sg_i (%)						
Permeability to air (md)						
RESERVOIR FLUID PROPERTIES						
Oil:						
Oil gravity (°API)	26					
Sulfur content (% by wt.)						
Initial solution GOR (SCF/STB)						
Initial oil FVF (RB/STB)						
Bubble point press. (psia)						
Viscosity (cp) @ °F						
Gas:						
Specific gravity (air = 1.0)						
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						
Date started						
Date discontinued						
Peak oil production (bbl)						17,000
Year						1911
Peak gas production, net (Mcf)						
Year						

Base of fresh water (ft.): See areas

Remarks:

Selected References:

Cordova, S., 1956, Geology of the Piru Area, Ventura County, Calif., unpublished thesis, University of Calif. at Los Angeles.

Eldridge, G.H., and R. Arnold, 1907, Santa Clara, Puente Hills and Los Angeles Oil Districts, Southern Calif.: U.S. Geol. Survey Bulletin 309.

Kew, W.S.W., 1924, Geology and Oil Resources of a Part of Los Angeles and Ventura Counties, Calif.: U.S. Geol. Survey Bulletin 753.

DATE: May 1983

CALIFORNIA DIVISION OF OIL AND GAS

COUNTY: VENTURA

PIRU OIL FIELD
MODELO 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	Texaco Producing Inc. "Crocker Fee" 1	Modelo Oil Co. No. 1	8 4N 18W	SB	605	Modelo	
Deepest well	Texaco Producing Inc. "Crocker Fee" 1-D	Pacific Western Oil Co. "Crocker Fee" 1-D	7 4N 18W	SB	10,504		Modelo Miocene

POOL DATA

ITEM	MODELO					FIELD OR AREA DATA
Discovery date	1897					
Initial production rates						
Oil (bbl/day)	15					
Gas (Mcf/day)						
Flow pressure (psi)						
Bean size (in.)						
Initial reservoir pressure (psi)						
Reservoir temperature (°F)						
Initial oil content (STB/ac.-ft.)						
Initial gas content (MSCF/ac.-ft.)						
Formation	Modelo					
Geologic age	Miocene					
Average depth (ft.)	900					
Average net thickness (ft.)	320					
Maximum productive area (acres)	90					
RESERVOIR ROCK PROPERTIES						
Porosity (%)						
So_i (%)						
Sw_i (%)						
Sg_i (%)						
Permeability to air (md)						
RESERVOIR FLUID PROPERTIES						
Oil:						
Oil gravity (°API)	26					
Sulfur content (% by wt.)						
Initial solution GOR (SCF/STB)						
Initial oil FVF (RB/STB)						
Bubble point press. (psia)						
Viscosity (cp) @ °F						
Gas:						
Specific gravity (air = 1.0)						
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						
Date started						
Date discontinued						
Peak oil production (bbl)	9,785					
Year	1921					
Peak gas production, net (Mcf)						
Year						

Base of fresh water (ft.): 1,550

Remarks: Zone waters are exceptionally high in bicarbonate concentration.

Selected References:

DATE: May 1983

CALIFORNIA DIVISION OF OIL AND GAS

COUNTY: VENTURA

PIRU OIL FIELD
WARRING CANYON 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	Santa Fe Petroleum Co. No. 1	Same as present	17 4N 18W	SB	509	Modelo	
Deepest well	Kenneth H. Hunter, Jr., Co. "Colonia" 1	Same as present	17 4N 18W	SB	7,510		Pico Pliocene

POOL DATA

ITEM	MODELO					FIELD OR AREA DATA
Discovery date	September 1921					
Initial production rates						
Oil (bbl/day)	12					
Gas (Mcf/day)						
Flow pressure (psi)						
Bean size (in.)						
Initial reservoir pressure (psi)						
Reservoir temperature (°F)						
Initial oil content (STB/ac.-ft.)						
Initial gas content (MSCF/ac.-ft.)						
Formation	Modelo					
Geologic age	Miocene					
Average depth (ft.)	530					
Average net thickness (ft.)	200					
Maximum productive area (acres)	60					
RESERVOIR ROCK PROPERTIES						
Porosity (%)						
S_{oi} (%)						
S_{wi} (%)						
S_{gi} (%)						
Permeability to air (md)						
RESERVOIR FLUID PROPERTIES						
Oil:						
Oil gravity (°API)	21					
Sulfur content (% by wt.)						
Initial solution GOR (SCF/STB)						
Initial oil FVF (RB/STB)						
Bubble point press. (psia)						
Viscosity (cp) @ °F						
Gas:						
Specific gravity (air = 1.0)						
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						
Date started						
Date discontinued						
Peak oil production (bbl)	668					
Year	1924					
Peak gas production, net (Mcf)						
Year						

Base of fresh water (ft.): 1,550

Remarks: Zone waters are exceptionally high in bicarbonate concentration.

Selected References:

Cordova, S., 1956, Geology of the Piru Area, Ventura County, Calif., unpublished thesis, University of Calif. at Los Angeles.

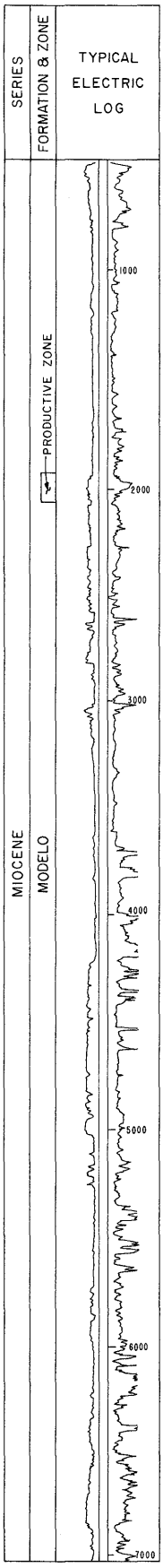
Eldridge, G.H., and R. Arnold, 1907, Santa Clara, Puente Hills, and Los Angeles Oil Districts, Southern Calif.: U.S. Geol. Survey Bulletin 309.

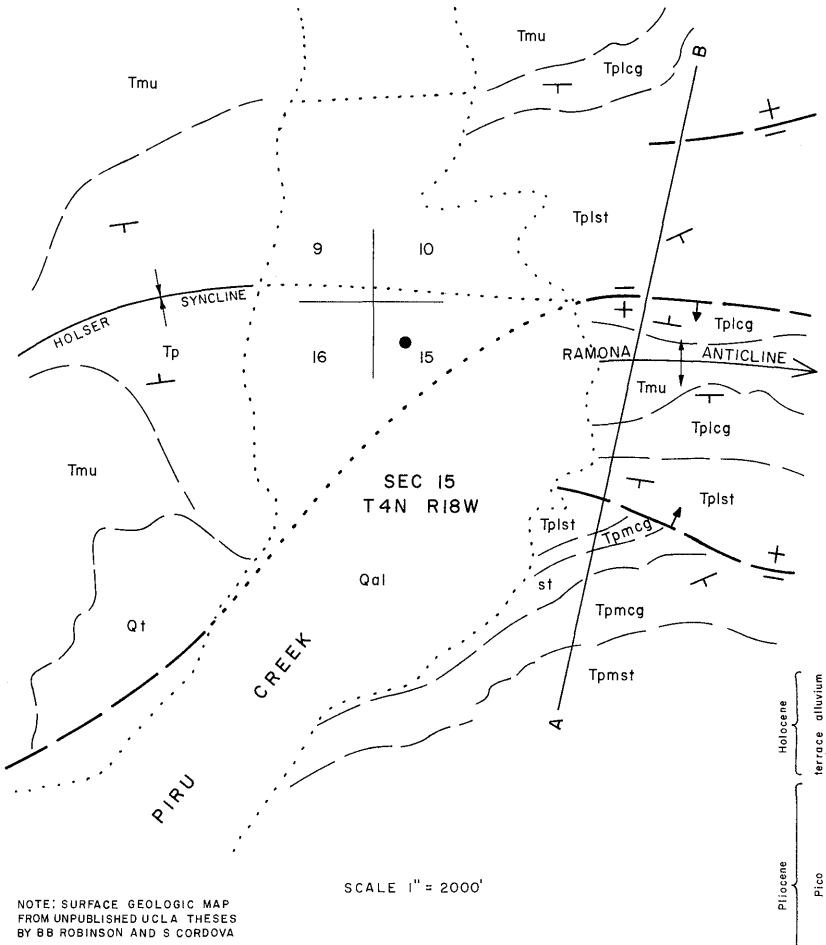
Kew, W.S.W., 1924, Geology and Oil Resources of a Part of Los Angeles and Ventura Counties, Calif.: U.S. Geol. Survey Bulletin 753.

DATE: May 1983

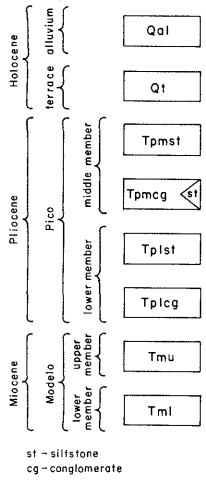
CALIFORNIA DIVISION OF OIL AND GAS

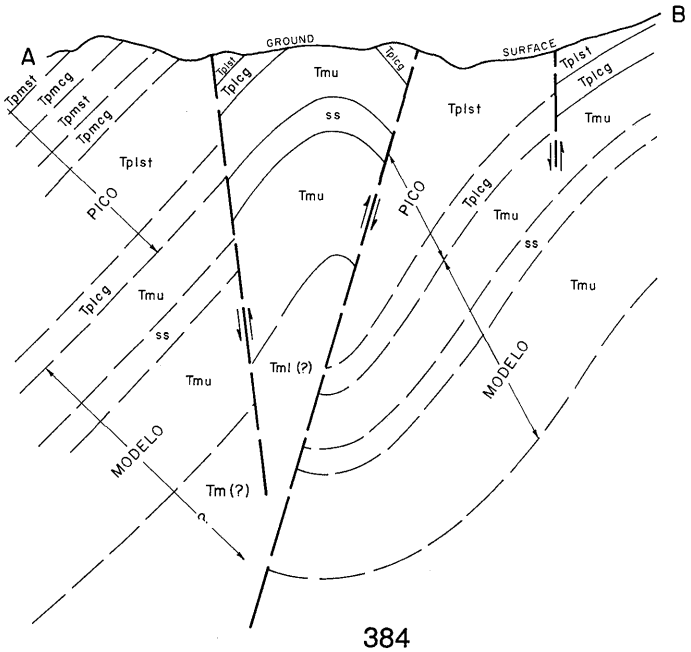
PIRU CREEK OIL FIELD





NOTE: SURFACE GEOLOGIC MAP FROM UNPUBLISHED UCLA THESES BY BB ROBINSON AND S CORDOVA





COUNTY: VENTURA

PIRU CREEK 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	Texaco Producing Inc. "Temescal" 33	Same as present	15 4N 18W	SB	7,002	unnamed	Modelo Miocene
Deepest well	Same as above	"	"	"	"	"	"

POOL DATA

ITEM	UNNAMED					FIELD OR AREA DATA
Discovery date	June 1956					
Initial production rates						
Oil (bbl/day)	18					
Gas (Mcf/day)						
Flow pressure (psi)						
Bean size (in.)						
Initial reservoir pressure (psi)						
Reservoir temperature (°F)						
Initial oil content (STB/ac.-ft.)						
Initial gas content (MSCF/ac.-ft.)						
Formation	Modelo					
Geologic age	Miocene					
Average depth (ft.)	2,000					
Average net thickness (ft.)	100					
Maximum productive area (acres)	20					
RESERVOIR ROCK PROPERTIES						
Porosity (%)						
So_i (%)						
Sw_i (%)						
Sg_i (%)						
Permeability to air (md)						
RESERVOIR FLUID PROPERTIES						
Oil:						
Oil gravity (°API)	23					
Sulfur content (% by wt.)						
Initial solution GOR (SCF/STB)						
Initial oil FVF (RB/STB)						
Bubble point press. (psia)						
Viscosity (cp) @ °F						
Gas:						
Specific gravity (air = 1.0)						
Heating value (Btu/cu. ft.)						
Water:						
Salinity, NaCl (ppm)	7,400					
T.D.S. (ppm)						
R_w (ohm/m) (77°F)						
ENHANCED RECOVERY PROJECTS						
Enhanced recovery projects						
Date started						
Date discontinued						
Peak oil production (bbl)	1,068					
Year	1957					
Peak gas production, net (Mcf)						
Year						

Base of fresh water (ft.): 810

Remarks:

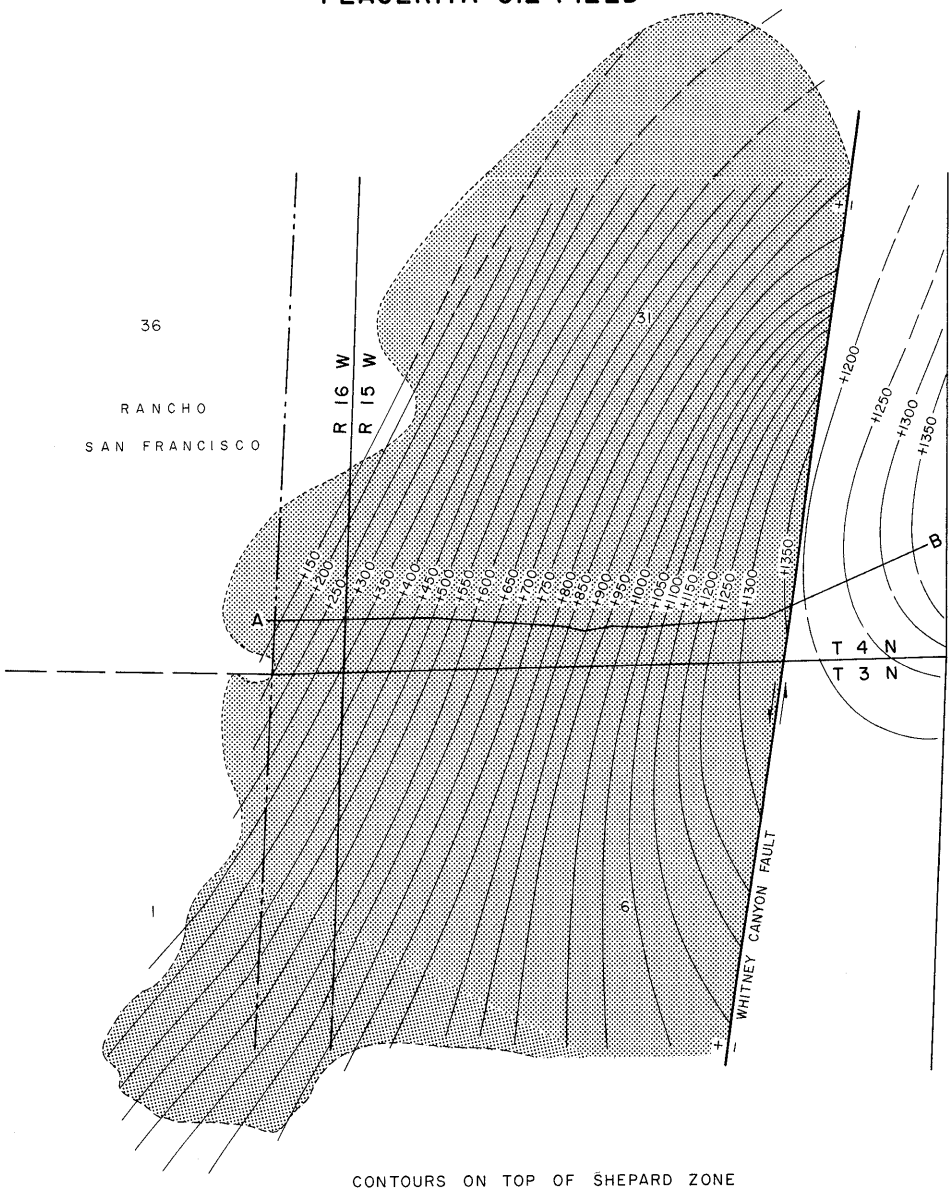
Selected References:

Cordova, S., 1956, Geology of the Piru Area, Ventura County, Calif., unpublished thesis, University of Calif. at Los Angeles.
Kew, W.S.W., 1924, Geology and Oil Resources of a Part of Los Angeles and Ventura Counties, Calif., U.S. Geol. Survey Bulletin 753.
Robinson, B.B., 1956, Geology of the Holser Canyon Area, Ventura County, Calif., unpublished thesis.

DATE: May 1983

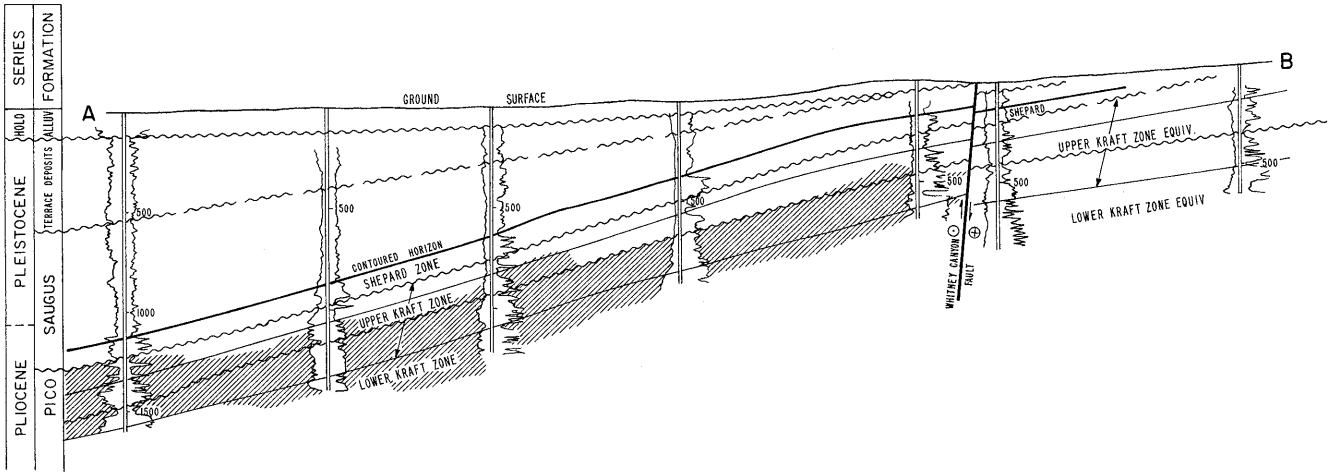
CALIFORNIA DIVISION OF OIL AND GAS

PLACERITA OIL FIELD



CONTOURS ON TOP OF SHEPARD ZONE

SCALE 1"= 1650'



COUNTY: LOS ANGELES

PLACERITA 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	Grace Petroleum Corp. "York" 1	Equity Oil Co. "Daisy" 1	6 3N 15W	SB	1,394	Upper Kraft	
Deepest well	Grace Petroleum Corp. "PRI FEE" WD 2	Same as present	1 3N 16W	SB	4,466		Modelo

POOL DATA

ITEM	SHEPARD	UPPER KRAFT	LOWER KRAFT			FIELD OR AREA DATA
Discovery date	April 1951	July 1920	July 1920			
Initial production rates						
Oil (bbl/day)	15	-	-			
Gas (Mcf/day)	0	-	-			
Flow pressure (psi)						
Bean size (in.)						
Initial reservoir pressure (psi)	-	440	-			
Reservoir temperature (°F)						
Initial oil content (STB/ac.-ft.)	-	1,560	-			
Initial gas content (MSCF/ac.-ft.)						
Formation	Saugus	Pico	Pico			
Geologic age	Pliocene	Pliocene	Pliocene			
Average depth (ft.)	600	1,000	1,700			
Average net thickness (ft.)	60	176	400			
Maximum productive area (acres)						870
RESERVOIR ROCK PROPERTIES						
Porosity (%)	-	35	-			
So_i (%)	-	50	-			
Sw_i (%)	-	50	-			
Sg_i (%)						
Permeability to air (md)	-	2,000	-			
RESERVOIR FLUID PROPERTIES						
Oil:						
Oil gravity (°API)	12	12	18-25			
Sulfur content (% by wt.)	-	1.3	1.3			
Initial solution GOR (SCF/STB)	-	50	-			
Initial oil FVF (RB/STB)	-	1.03	-			
Bubble point press. (psia)						
Viscosity (cp) @ °F	-	1,000 @ 90	-			
Gas:						
Specific gravity (air = 1.0)						
Heating value (Btu/cu. ft.)						
Water:						
Salinity, NaCl (ppm)	3,800	3,800	4,300			
T.D.S. (ppm)						
R_w (ohm/m) (77°F)						
ENHANCED RECOVERY PROJECTS						
Enhanced recovery projects	fireflood	waterflood	waterflood			cyclic steam
Date started	1964	1965	1954			1964
Date discontinued	1967	1968	1986			active
Peak oil production (bbl)						5,743,108
Year						1950
Peak gas production, net (Mcf)						3,258,616
Year						1949

Base of fresh water (ft.): 100 - 500

Remarks:

Selected References:

Barton, C.L., and N.N. Sampson, 1949, Placerita Oil Field: Calif. Div. of Oil and Gas, Summary of Operations -- Calif. Oil Fields, Vol. 35, No. 2.

Kew, W.S.W., 1943, Newhall Oil Field: Geologic Formations and Economic Development of the Oil and Gas Fields of California, State Div. of Mines Bulletin 118, p. 415.

Oakeshott, G.B., 1950, Geology of Placerita Oil Field, Los Angeles County, California: California Journal of Mines and Geology Vol. 46, No. 1, pp. 43-80.

Tudor, R.B., 1962, Recent Developments in Kraft-York Area of Placerita Oil Field: Calif. Div. of Oil and Gas, Summary of Operations -- Calif. Oil Fields, Vol. 48, No. 1.

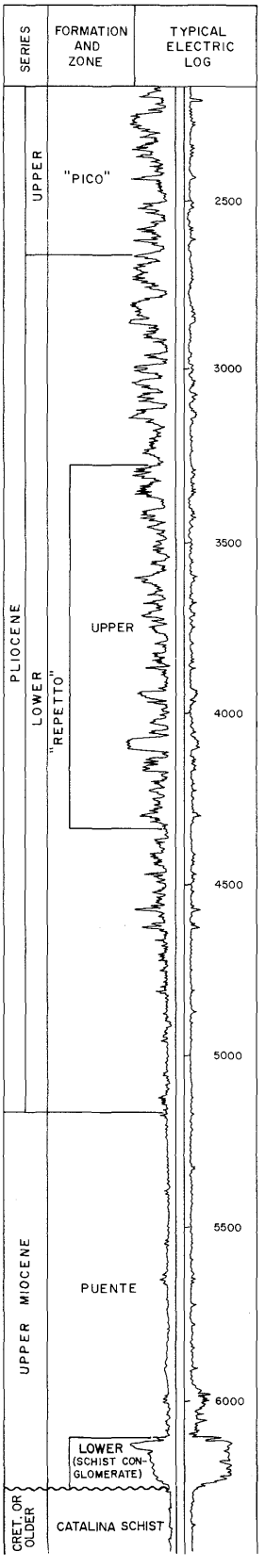
Walling, R.W., 1934, Report on Newhall Oil Field: Calif. Div. of Oil and Gas, Summary of Operations -- Calif. Oil Fields, Vol. 20, No. 2.

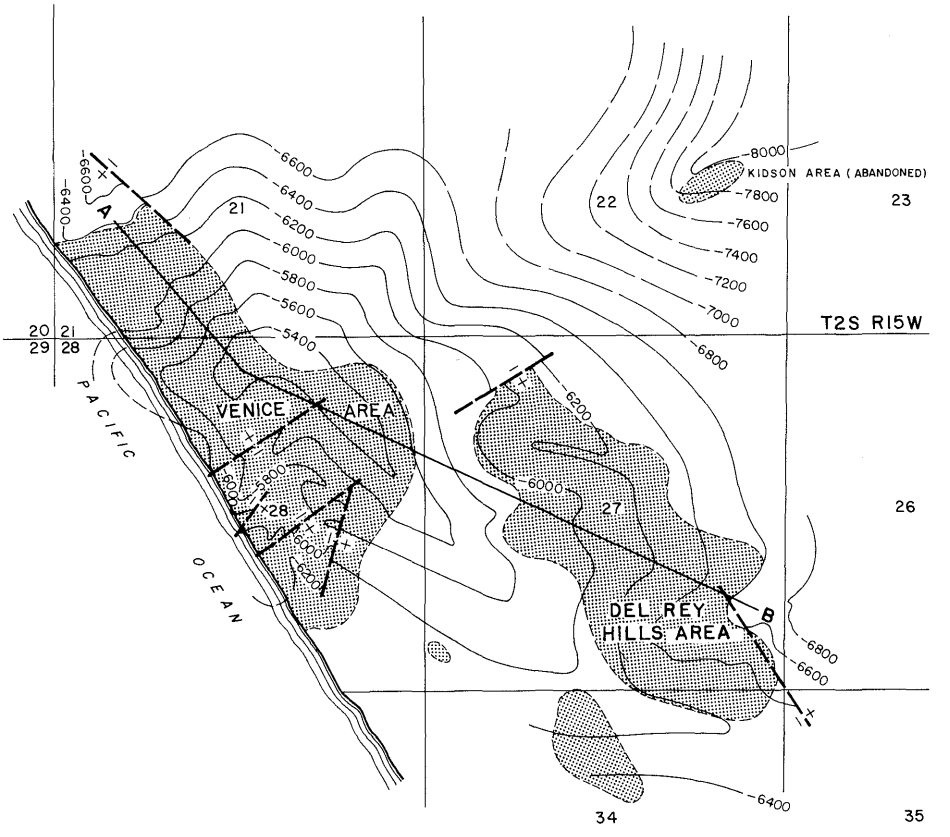
Winterer, E.L., and D.L. Durham, 1962, Geology of Southeastern Ventura Basin, Los Angeles County, Calif.: U.S. Geol. Survey Professional Paper 334-H.

DATE: May 1986

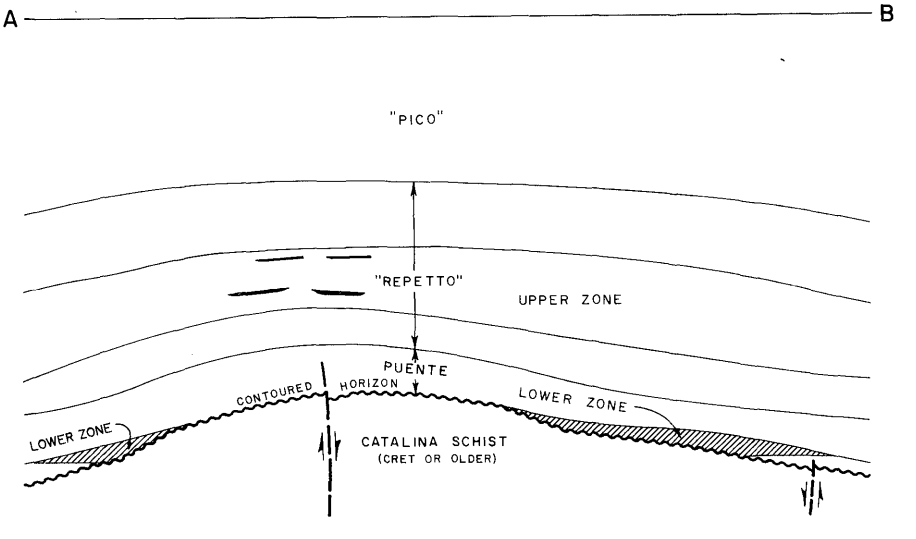
CALIFORNIA DIVISION OF OIL AND GAS

PLAYA DEL REY OIL FIELD





CONTOURS ON TOP OF CATALINA SCHIST



COUNTY: LOS ANGELES

PLAYA DEL REY 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	County of Los Angeles "Ohio RGC" 1	The Ohio Oil Co. "Recreation Gun Club" 1	21 2S 15W	SB	6,202	Lower	
Deepest well	Edwin W. Pauley & Donald Frankel "Hughes" 1	Same as present	22 2S 15W	SB	8,725		Catalina Schist Cret. or older

POOL DATA

ITEM	LOWER					FIELD OR AREA DATA
Discovery date	December 1929					
Initial production rates						
Oil (bbl/day)	2,500					
Gas (Mcf/day)	1,500					
Flow pressure (psi)						
Bean size (in.)						
Initial reservoir pressure (psi)						
Reservoir temperature (°F)						
Initial oil content (STB/ac.-ft.)						
Initial gas content (MSCF/ac.-ft.)						
Formation	Puente					
Geologic age	late Miocene					
Average depth (ft.)						
Average net thickness (ft.)	180					
Maximum productive area (acres)						600
RESERVOIR ROCK PROPERTIES						
Porosity (%)						
S_{oi} (%)						
S_{wi} (%)						
S_{gi} (%)						
Permeability to air (md)						
RESERVOIR FLUID PROPERTIES						
Oil:						
Oil gravity (°API)	21-24					
Sulfur content (% by wt.)						
Initial solution GOR (SCF/STB)						
Initial oil FVF (RB/STB)						
Bubble point press. (psia)						
Viscosity (cp) @ °F						
Gas:						
Specific gravity (air = 1.0)						
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						
Date started						
Date discontinued						
Peak oil production (bbl)						9,210,838
Year						1931
Peak gas production, net (Mcf)						269,941
Year						1931

Base of fresh water (ft.): See areas

Remarks: See areas

Selected References: See areas

DATE: December 1988

CALIFORNIA DIVISION OF OIL AND GAS

COUNTY: LOS ANGELES

PLAYA DEL REY OIL FIELD
DEL REY HILLS 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	Southern Calif. Gas Co. "Vidor" 1	Union Oil Co. of Calif. "King Vidor" 1	27 2S 15W	SB	5,991	Lower	
Deepest well	Southern Calif. Gas Co. "Rite Lube" 1	Raymond J. Rassmussen "Ray" 1	27 2S 15W	SB	7,054		Puente late Miocene

POOL DATA

ITEM	LOWER					FIELD OR AREA DATA
Discovery date	May 1931					
Initial production rates						
Oil (bbl/day)	625					
Gas (Mcf/day)						
Flow pressure (psi)						
Bean size (in.)						
Initial reservoir pressure (psi)	2,750					
Reservoir temperature (°F)	210					
Initial oil content (STB/ac.-ft.)	1,502					
Initial gas content (MSCF/ac.-ft.)	725					
Formation	Puente					
Geologic age	late Miocene					
Average depth (ft.)	6,200					
Average net thickness (ft.)	200					
Maximum productive area (acres)	248					
RESERVOIR ROCK PROPERTIES						
Porosity (%)	26					
So_i (%)						
Sw_i (%)	26					
Sg_i (%)						
Permeability to air (md)	500					
RESERVOIR FLUID PROPERTIES						
Oil:						
Oil gravity (°API)	21-24					
Sulfur content (% by wt.)	3.20					
Initial solution GOR (SCF/STB)	775					
Initial oil FVF (RB/STB)	1.29					
Bubble point press. (psia)	5,000					
Viscosity (cp) @ °F	220 @ 130					
Gas:						
Specific gravity (air = 1.0)	0.633					
Heating value (Btu/cu. ft.)	1,117					
Water:						
Salinity, NaCl (ppm)	15,821					
T.D.S. (ppm)	22,000					
R_w (ohm/m) (77°F)						
ENHANCED RECOVERY PROJECTS						
Enhanced recovery projects						
Date started						
Date discontinued						
Peak oil production (bbl)	2,805,000					
Year	1935					
Peak gas production, net (Mcf)						
Year						

Base of fresh water (ft.): 700

Remarks: The Lower zone is being used by Southern Calif. Gas Co. for gas storage.

Selected References:

DATE: July 1983

CALIFORNIA DIVISION OF OIL AND GAS

COUNTY: LOS ANGELES

PLAYA DEL REY OIL FIELD
KIDSON 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	Donald Frankel, Opr. "Kidson" 1-1	Bolsa Chica Oil Corp. "Kidson" 1-1	22 2S 15W	SB	7,418	Lower	
Deepest well	Edwin W. Pauley & Donald Frankel "Hughes" 1	Same as present	22 2S 15W	SB	8,725		Catalina Schist Cret. or older

POOL DATA

ITEM	SCHIST CONGLOMERATE					FIELD OR AREA DATA
Discovery date	December 1951					
Initial production rates						
Oil (bbl/day)	69					
Gas (Mcf/day)	500					
Flow pressure (psi)	200					
Bean size (in.)						
Initial reservoir pressure (psi)						
Reservoir temperature (°F)						
Initial oil content (STB/ac.-ft.)						
Initial gas content (MSCF/ac.-ft.)						
Formation	Puente					
Geologic age	late Miocene					
Average depth (ft.)	9,400					
Average net thickness (ft.)	15					
Maximum productive area (acres)	10					
RESERVOIR ROCK PROPERTIES						
Porosity (%)						
S_{oi} (%)						
S_{wi} (%)						
S_{gi} (%)						
Permeability to air (md)						
RESERVOIR FLUID PROPERTIES						
Oil:						
Oil gravity (°API)	30					
Sulfur content (% by wt.)						
Initial solution GOR (SCF/STB)						
Initial oil FVF (RB/STB)						
Bubble point press. (psia)						
Viscosity (cp) @ °F						
Gas:						
Specific gravity (air = 1.0)						
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						
Date started						
Date discontinued						
Peak oil production (bbl)	8,617					
Year	1952					
Peak gas production, net (Mcf)						
Year						

Base of fresh water (ft.): 700

Remarks: Area was abandoned in 1956. Cumulative production is 17,434 bbl of oil and 37,250 Mcf of gas.

Selected References:

DATE: July 1983

CALIFORNIA DIVISION OF OIL AND GAS

COUNTY: LOS ANGELES

PLAYA DEL REY OIL FIELD
VENICE 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	County of Los Angeles "Ohio RGC" 1	The Ohio Oil Co. "Recreation Gun Club" 1	21 2S 15W	SB	6,202	Lower	
Deepest well	Calstar Petroleum Co. "V" 2	Star Petroleum Co. "V" 2	21 2S 15W	SB	6,778		Puente late Miocene

POOL DATA

ITEM	UPPER	LOWER				FIELD OR AREA DATA
Discovery date	June 1930	December 1929				
Initial production rates						
Oil (bbl/day)	250	2,500				
Gas (Mcf/day)	-	1,500				
Flow pressure (psi)						
Bean size (in.)						
Initial reservoir pressure (psi)						
Reservoir temperature (°F)						
Initial oil content (STB/ac.-ft.)						
Initial gas content (MSCF/ac.-ft.)						
Formation	"Repetto"	Puente				
Geologic age	early Pliocene	late Miocene				
Average depth (ft.)						
Average net thickness (ft.)	1,050	180				
Maximum productive area (acres)						342
RESERVOIR ROCK PROPERTIES						
Porosity (%)						
S_{oi} (%)						
S_{wi} (%)						
S_{gi} (%)						
Permeability to air (md)						
RESERVOIR FLUID PROPERTIES						
Oil:						
Oil gravity (°API)	20	21-24				
Sulfur content (% by wt.)						
Initial solution GOR (SCF/STB)						
Initial oil FVF (RB/STB)						
Bubble point press. (psia)						
Viscosity (cp) @ °F						
Gas:						
Specific gravity (air = 1.0)						
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	waterflood					
Date started	1971					
Date discontinued	1973					
Peak oil production (bbl)						9,210,838
Year						1931
Peak gas production, net (Mcf)						
Year						

Base of fresh water (ft.): 700

Remarks:

Selected References:

Barton, Cecil L., 1931-1932, Report of Playa Del Rey Oil Field: Calif. Div. of Oil and Gas, Summary of Operations -- Calif. Oil Fields.

Hodges, F.C., 1944, Gas Storage and Recent Developments in the Playa Del Rey Oil Field: Calif. Div. of Oil and Gas, Summary of Operations -- Calif. Oil Fields.

Metzner, L.H., 1935-1936, The Del Rey Hills of the Playa Del Rey Oil Field: Calif. Div of Oil and Gas, Summary of Operations -- Calif. Oil Fields.

Riegle, John Jr., 1952, Petroleum Transactions, A.I.M.E.

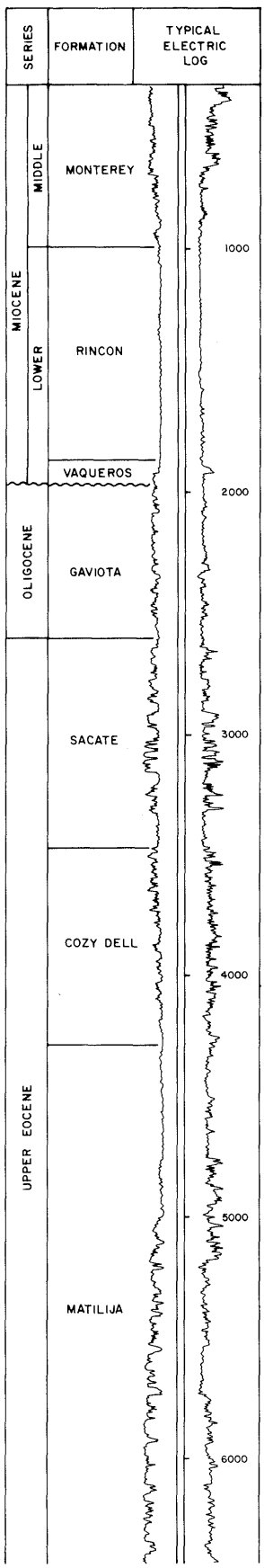
Riegle, John Jr., 1953, Gas Storage in the Playa Del Rey Oil Field: Calif. Div. of Oil and Gas, Summary of Operations -- Calif. Oil Fields, Vol. 39.

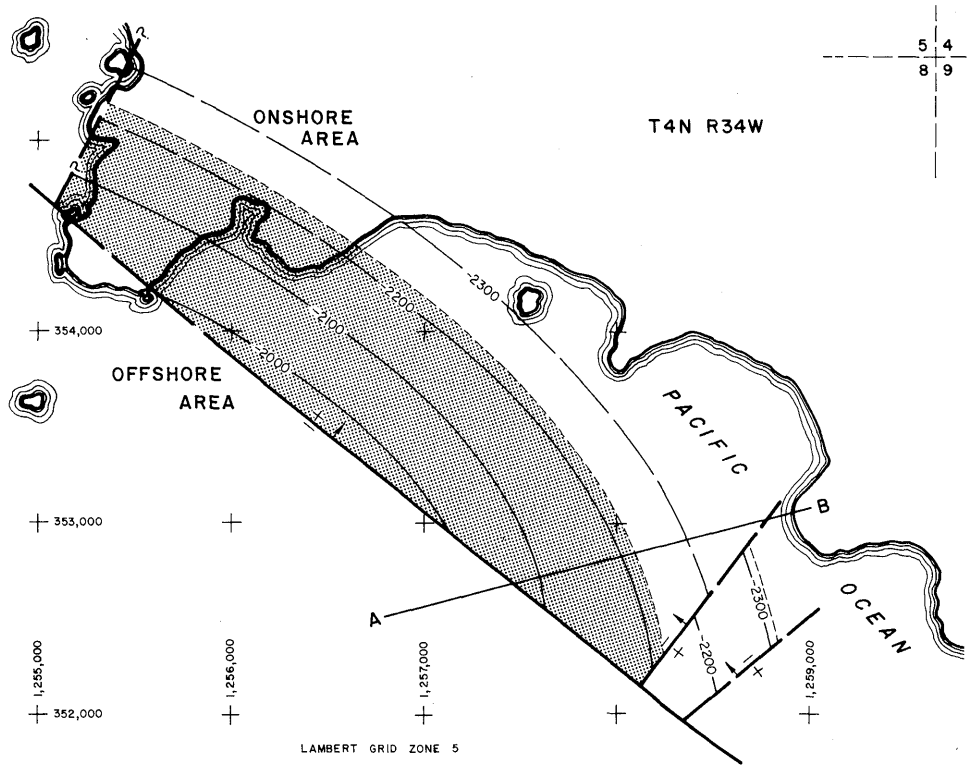
Riegle, John Jr., 1966, Underground Storage at Playa Del Rey, Southern Calif. Gas Co.

DATE: July 1983

CALIFORNIA DIVISION OF OIL AND GAS

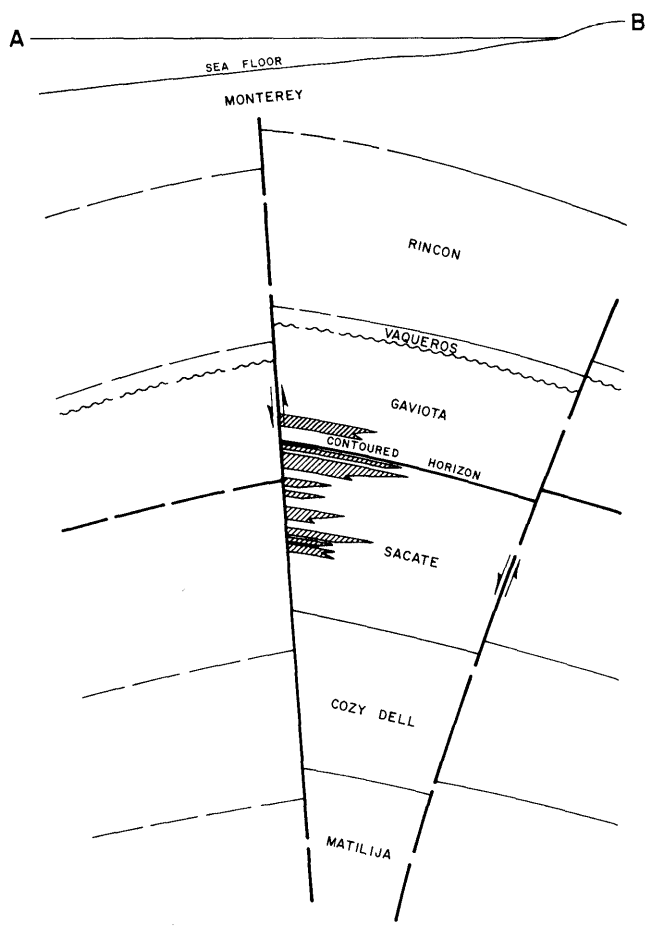
POINT CONCEPTION OIL FIELD





CONTOURS ON TOP OF SACATE

SCALE: 1" = 500'



COUNTY: **SANTA BARBARA**

POINT CONCEPTION OIL FIELD

(SEE AREA 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	Union Oil Co. of Calif. "State 2879" 10-6	Same as present	8 4N 34W	SB	7,491 a/	Sacate	
Deepest well	Union Oil Co. of Calif. "State 2879" 5-6	Same as present	16 4N 34W	SB	8,780 b/		Matilija Eocene

POOL DATA

ITEM	SACATE					FIELD OR AREA DATA
Discovery date	February 1965					
Initial production rates						
Oil (bbl/day)	169					
Gas (Mcf/day)	60					
Flow pressure (psi)	40					
Bean size (in.)	1					
Initial reservoir pressure (psi)	890-1,470					
Reservoir temperature (°F)	110					
Initial oil content (STB/ac.-ft.)						
Initial gas content (MSCF/ac.-ft.)						
Formation	Sacate					
Geologic age	Eocene					
Average depth (ft.)	2,800					
Average net thickness (ft.)	500					
Maximum productive area (acres)						80
RESERVOIR ROCK PROPERTIES						
Porosity (%)	25-29					
S_{oi} (%)	22-38					
S_{wi} (%)	62-78					
S_{gi} (%)						
Permeability to air (md)	210					
RESERVOIR FLUID PROPERTIES						
Oil:						
Oil gravity (°API)	30-33					
Sulfur content (% by wt.)						
Initial solution GOR (SCF/STB)	375					
Initial oil FVF (RB/STB)	1.10					
Bubble point press. (psia)						
Viscosity (cp) @ °F						
Gas:						
Specific gravity (air = 1.0)						
Heating value (Btu/cu. ft.)						
Water:						
Salinity, NaCl (ppm)	16,743					
T.D.S. (ppm)	18,340					
R_w (ohm/m) (77°F)	0.29-0.40					
ENHANCED RECOVERY PROJECTS						
Enhanced recovery projects						
Date started						
Date discontinued						
Peak oil production (bbl)						175,235
Year						1972
Peak gas production, net (Mcf)						73,842
Year						1972

Base of fresh water (ft.): See areas

Remarks: a/ Directional well; true vertical depth is 7,104 feet.
b/ Directional well; true vertical depth is 8,202 feet.

Selected References: Curran, J.F., K.B. Hall, and R.F. Herron, 1971, Geology, Oil Fields, and Future Petroleum Potential of Santa Barbara Channel Area, California: Am. Assoc. Petroleum Geologists Memoir 15, p. 192.
Yerkes, R.F., H.C. Wagner, and K.A. Yenne, 1969, Petroleum Development in the Region of the Santa Barbara Channel: U.S. Geol. Survey Prof. Paper 679-B, p. 20.

DATE: January 1989

CALIFORNIA DIVISION OF OIL AND GAS

COUNTY: SANTA BARBARA

POINT CONCEPTION OIL FIELD ONSHORE 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	Union Oil Co. of Calif. "Coast Guard" 1	Same as present	8 4N 34W	SB	4,121 a/	Gaviota-Sacate	
Deepest well	Union Oil Co. of Calif. "Coast Guard" 2	Same as present	8 4N 34W	SB	Conf.		Confidential

POOL DATA

ITEM	GAVIOTA	SACATE				FIELD OR AREA DATA
Discovery date	March 1972	March 1972				
Initial production rates						
Oil (bbl/day)	b/	50				
Gas (Mcf/day)	b/	65				
Flow pressure (psi)						
Bean size (in.)						
Initial reservoir pressure (psi)						
Reservoir temperature (°F)	105	110				
Initial oil content (STB/ac.-ft.)						
Initial gas content (MSCF/ac.-ft.)						
Formation	Gaviota	Sacate				
Geologic age	Oligocene	Eocene				
Average depth (ft.)	2,500	2,750				
Average net thickness (ft.)	200	600				
Maximum productive area (acres)						20
RESERVOIR ROCK PROPERTIES						
Porosity (%)	16***	25-29***				
So_i (%)	49***	22-38***				
Sw_i (%)	51***	62-78***				
Sg_i (%)						
Permeability to air (md)	51***	210***				
RESERVOIR FLUID PROPERTIES						
Oil:						
Oil gravity (°API)	29-30	29-30				
Sulfur content (% by wt.)						
Initial solution GOR (SCF/STB)	375	375				
Initial oil FVF (RB/STB)	1.10	1.10				
Bubble point press. (psia)						
Viscosity (cp) @ °F						
Gas:						
Specific gravity (air = 1.0)						
Heating value (Btu/cu. ft.)						
Water:						
Salinity, NaCl (ppm)	22,968	22,968				
T.D.S. (ppm)						
R_w (ohm/m) (77°F)	0.29	0.29				
ENHANCED RECOVERY PROJECTS						
Enhanced recovery projects						
Date started						
Date discontinued						
Peak oil production (bbl)						22,450
Year						1972
Peak gas production, net (Mcf)						13,315
Year						1972

Base of fresh water (ft.): None

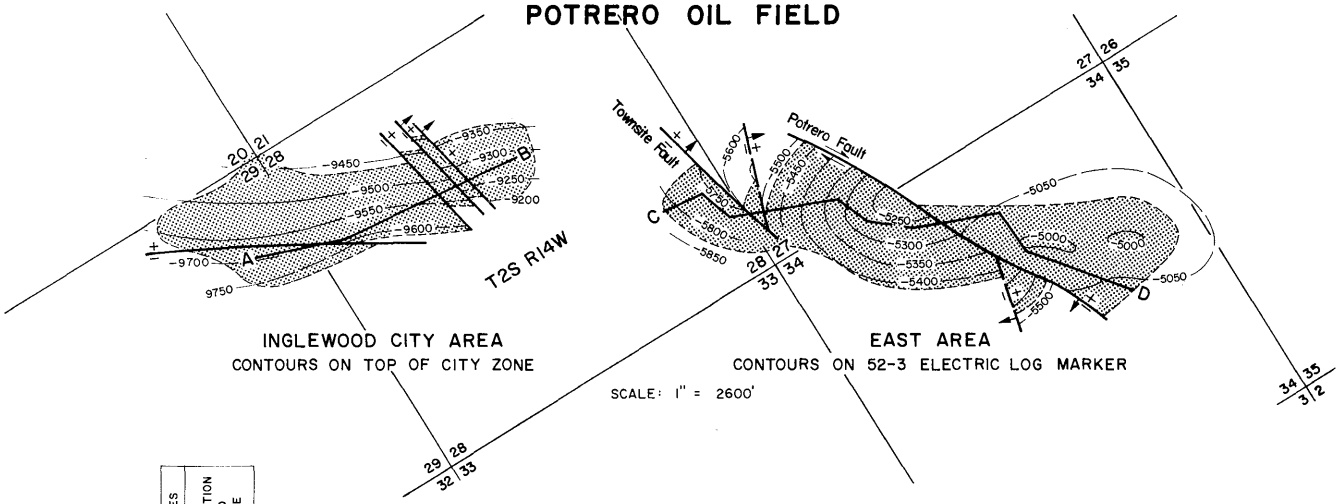
Remarks: a/ Directional well; true vertical depth is confidential.
b/ Commingled with production from the Gaviota zone.

Selected References: Zulberti, J.L., 1972, Operations in District No. 3: Calif. Div. of Oil and Gas--Summary of Operations, Vol. 58, No. 2.

DATE: January 1989 ***Representative values for area, formation, and depth

CALIFORNIA DIVISION OF OIL AND GAS

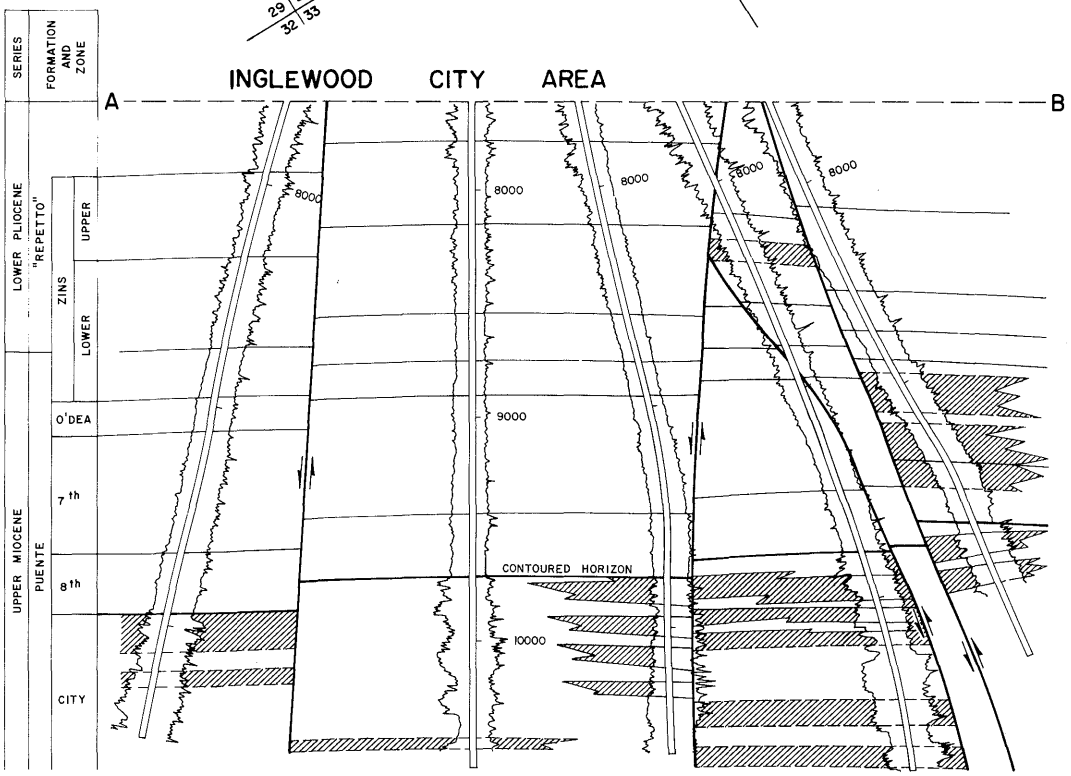
POTRERO OIL FIELD

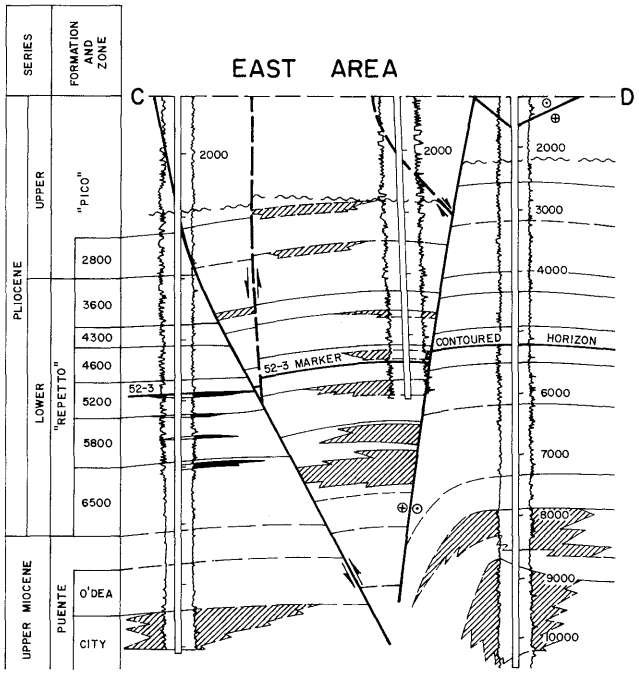


INGLEWOOD CITY AREA
CONTOURS ON TOP OF CITY ZONE

EAST AREA
CONTOURS ON 52-3 ELECTRIC LOG MARKER

SCALE: 1" = 2600'





COUNTY: LOS ANGELES

POTRERO 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 Producing Inc. "Cypress" 1	Associated Oil Co. "Cypress" 1	34 2S 14W	SB	5,408	5,200-foot zone	
Deepest well	Chevron U.S.A. Inc. "Hardy Community" 3	Standard Oil Co. of Calif. "Hardy Community" 3	34 2S 14W	SB	12,932		Topanga middle Miocene

POOL DATA

ITEM	5,200-FOOT ZONE					FIELD OR AREA DATA
Discovery date	February 1928					
Initial production rates						
Oil (bbl/day)	15					
Gas (Mcf/day)						
Flow pressure (psi)						
Bean size (in.)						
Initial reservoir pressure (psi)						
Reservoir temperature (°F)						
Initial oil content (STB/ac.-ft.)						
Initial gas content (MSCF/ac.-ft.)						
Formation	"Repetto"					
Geologic age	early Pliocene					
Average depth (ft.)	4,930					
Average net thickness (ft.)	50					
Maximum productive area (acres)						365
RESERVOIR ROCK PROPERTIES						
Porosity (%)						
So_i (%)						
Sw_i (%)						
Sg_i (%)						
Permeability to air (md)						
RESERVOIR FLUID PROPERTIES						
Oil:						
Oil gravity (°API)	44					
Sulfur content (% by wt.)						
Initial solution GOR (SCF/STB)						
Initial oil FVF (RB/STB)						
Bubble point press. (psia)						
Viscosity (cp) @ °F						
Gas:						
Specific gravity (air = 1.0)						
Heating value (Btu/cu. ft.)						
Water:						
Salinity, NaCl (ppm)						
T.D.S. (ppm)	13,300					
R_w (ohm/m) (77°F)						
ENHANCED RECOVERY PROJECTS						
Enhanced recovery projects						
Date started						
Date discontinued						
Peak oil production (bbl)						707,164
Year						1941
Peak gas production, net (Mcf)						6,589,791
Year						1949

Base of fresh water (ft.): See areas

Remarks: See areas

Selected References: See areas

DATE: May 1991

CALIFORNIA DIVISION OF OIL AND GAS

COUNTY: LOS ANGELES

POTRERO OIL FIELD
EAST AREA

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	Texaco Producing Inc. "Cypress" 1	Associated Oil Co. "Cypress" 1	34 2S 14W	SB	5,408	5,200-foot zone	
Deepest well	Chevron U.S.A. Inc. "Hardy Community" 3	Standard Oil Co. of Calif. "Hardy Community" 3	34 2S 14W	SB	12,932		Topanga middle Miocene

POOL DATA

ITEM	2,800-FOOT ZONE	3,600-FOOT ZONE	4,300-FOOT ZONE	4,600-FOOT ZONE	5,200-FOOT ZONE	FIELD OR AREA DATA
Discovery date	May 1929	December 1928	April 1930	April 1928	February 1928	
Initial production rates						
Oil (bbl/day)	350	1,100	1,800	1,049	15	
Gas (Mcf/day)	-	7,500	-	-	-	
Flow pressure (psi)						
Bean size (in.)						
Initial reservoir pressure (psi)						
Reservoir temperature (°F)						
Initial oil content (STB/ac.-ft.)						
Initial gas content (MSCF/ac.-ft.)						
Formation	"Pico"	"Repetto"	"Repetto"	"Repetto"	"Repetto"	
Geologic age	late Pliocene	early Pliocene	early Pliocene	early Pliocene	early Pliocene	
Average depth (ft.)	2,800	3,600	4,300	4,500	4,930	
Average net thickness (ft.)	150	175	50	120	50	
Maximum productive area (acres)						
RESERVOIR ROCK PROPERTIES						
Porosity (%)						
So_i (%)						
Sw_i (%)						
Sg_i (%)						
Permeability to air (md)	-	100	-	-	-	
RESERVOIR FLUID PROPERTIES						
Oil:						
Oil gravity (°API)	32-45	38-51	43	37-48	44	
Sulfur content (% by wt.)						
Initial solution GOR (SCF/STB)						
Initial oil FVF (RB/STB)						
Bubble point press. (psia)						
Viscosity (cp) @ °F						
Gas:						
Specific gravity (air = 1.0)						
Heating value (Btu/cu. ft.)						
Water:						
Salinity, NaCl (ppm)						
T.D.S. (ppm)	30,300	29,300	29,100	28,200	13,300	
R_w (ohm/m) (77°F)						
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.): 1,500

Remarks: All wells are abandoned, except those in Section 34.

Selected References: Johnson, R.A., 1961, East Area of Potrero Oil Field: Calif. Div. of Oil and Gas, Summary of Operations -- Calif. Oil Fields, Vol. 47, No. 2.

DATE: May 1991

CALIFORNIA DIVISION OF OIL AND GAS

COUNTY: LOS ANGELES

POTRERO OIL FIELD
EAST 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	5,800-FOOT ZONE	6,500-FOOT ZONE	O'DEA	CITY		FIELD OR AREA DATA
Discovery date	August 1929	February 1935	February 1935	March 1944		
Initial production rates						
Oil (bbl/day)	172	1,096a/	a/	180		
Gas (Mcf/day)	-	-	-	113		
Flow pressure (psi)						
Bean size (in.)						
Initial reservoir pressure (psi)						
Reservoir temperature (°F)						
Initial oil content (STB/ac.-ft.)						
Initial gas content (MSCF/ac.-ft.)						
Formation	"Repetto"	"Repetto"	Puente	Puente		
Geologic age	early Pliocene	early Pliocene	late Miocene	late Miocene		
Average depth (ft.)	5,500	6,230	7,800	8,800		
Average net thickness (ft.)	50	550	600	800		
Maximum productive area (acres)						200
RESERVOIR ROCK PROPERTIES						
Porosity (%)						
So_i (%)						
Sw_i (%)						
Sg_i (%)						
Permeability to air (md)						
RESERVOIR FLUID PROPERTIES						
Oil:						
Oil gravity (°API)	34-48	38-57	47-59	23-45		
Sulfur content (% by wt.)						
Initial solution GOR (SCF/STB)						
Initial oil FVF (RB/STB)						
Bubble point press. (psia)						
Viscosity (cp) @ °F						
Gas:						
Specific gravity (air = 1.0)						
Heating value (Btu/cu. ft.)						
Water:						
Salinity, NaCl (ppm)						
T.D.S. (ppm)	21,400	24,100	13,700	8,560		
R_w (ohm/m) (77°F)						
ENHANCED RECOVERY PROJECTS						
Enhanced recovery projects						
Date started						
Date discontinued						
Peak oil production (bbl)						707,164
Year						1941
Peak gas production, net (Mcf)						2,629,967
Year						1960

Base of fresh water (ft.): 1,500

Remarks: a/ Production commingled.

Selected References:

DATE: June 1983

CALIFORNIA DIVISION OF OIL AND GAS

COUNTY: LOS ANGELES

POTRERO OIL FIELD
INGLEWOOD CITY 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. "Standard Brick" 10	Basin Oil Co. of Calif. "Standard Brick" 1	28 2S 14W	SB	10,418	City	
Deepest well	Mobil Oil Corp. "Community" 12	Basin Oil Co. of Calif. "Inglewood Community" 1-2	28 2S 14W	SB	11,263		Topanga middle Miocene

POOL DATA

ITEM	LOWER ZINS	7TH	8TH	CITY		FIELD OR AREA DATA
Discovery date	January 1952	April 1949	April 1949	October 1946		
Initial production rates						
Oil (bbl/day)	32	29a/	a/	170		
Gas (Mcf/day)	1,400	210a/	a/	1,940		
Flow pressure (psi)						
Bean size (in.)						
Initial reservoir pressure (psi)						
Reservoir temperature (°F)						
Initial oil content (STB/ac.-ft.)						
Initial gas content (MSCF/ac.-ft.)						
Formation	"Repetto"	Puente	Puente	Puente		
Geologic age	early Pliocene	late Miocene	late Miocene	late Miocene		
Average depth (ft.)	8,170	8,900	9,475	9,750		
Average net thickness (ft.)	90	240	100	300		
Maximum productive area (acres)						165
RESERVOIR ROCK PROPERTIES						
Porosity (%)	19.2	16.0	17.0	15.8		
So_i (%)	61	35	35	38		
Sw_i (%)	39	65	65	62		
Sg_i (%)						
Permeability to air (md)	9	-	-	45		
RESERVOIR FLUID PROPERTIES						
Oil:						
Oil gravity (°API)	28-51	37-53	37-53	24-56		
Sulfur content (% by wt.)						
Initial solution GOR (SCF/STB)	6,575	39,215	40,569	16,906		
Initial oil FVF (RB/STB)						
Bubble point press. (psia)						
Viscosity (cp) @ °F						
Gas:						
Specific gravity (air = 1.0)						
Heating value (Btu/cu. ft.)						
Water:						
Salinity, NaCl (ppm)						
T.D.S. (ppm)	-	-	7,530	11,100		
R_w (ohm/m) (77°F)						
ENHANCED RECOVERY PROJECTS						
Enhanced recovery projects						
Date started						
Date discontinued						
Peak oil production (bbl)						315,095
Year						1949
Peak gas production, net (Mcf)						6,213,047
Year						1949

Base of fresh water (ft.): 1,500

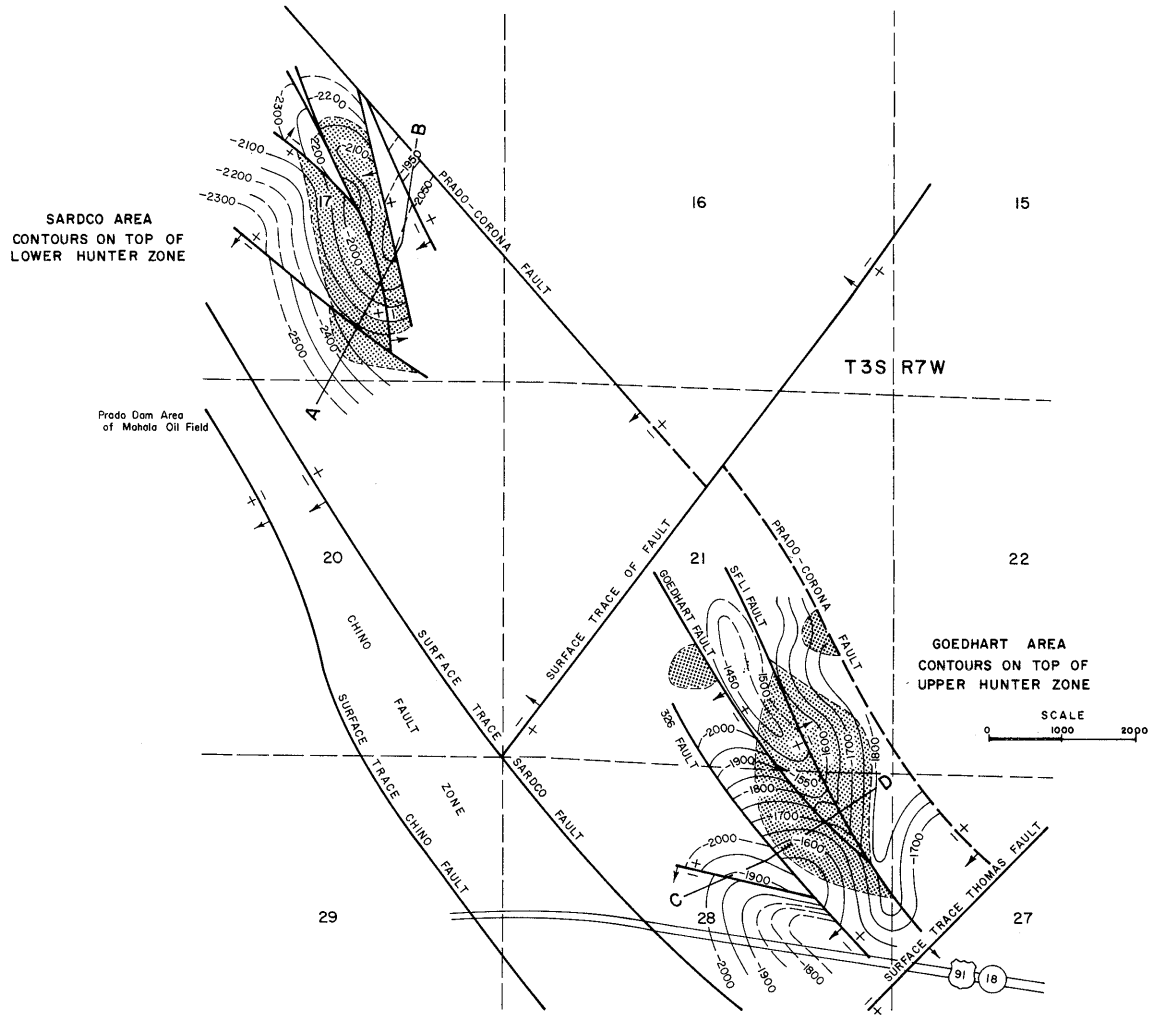
Remarks: Wells are drilled directionally.
a/ Production commingled.

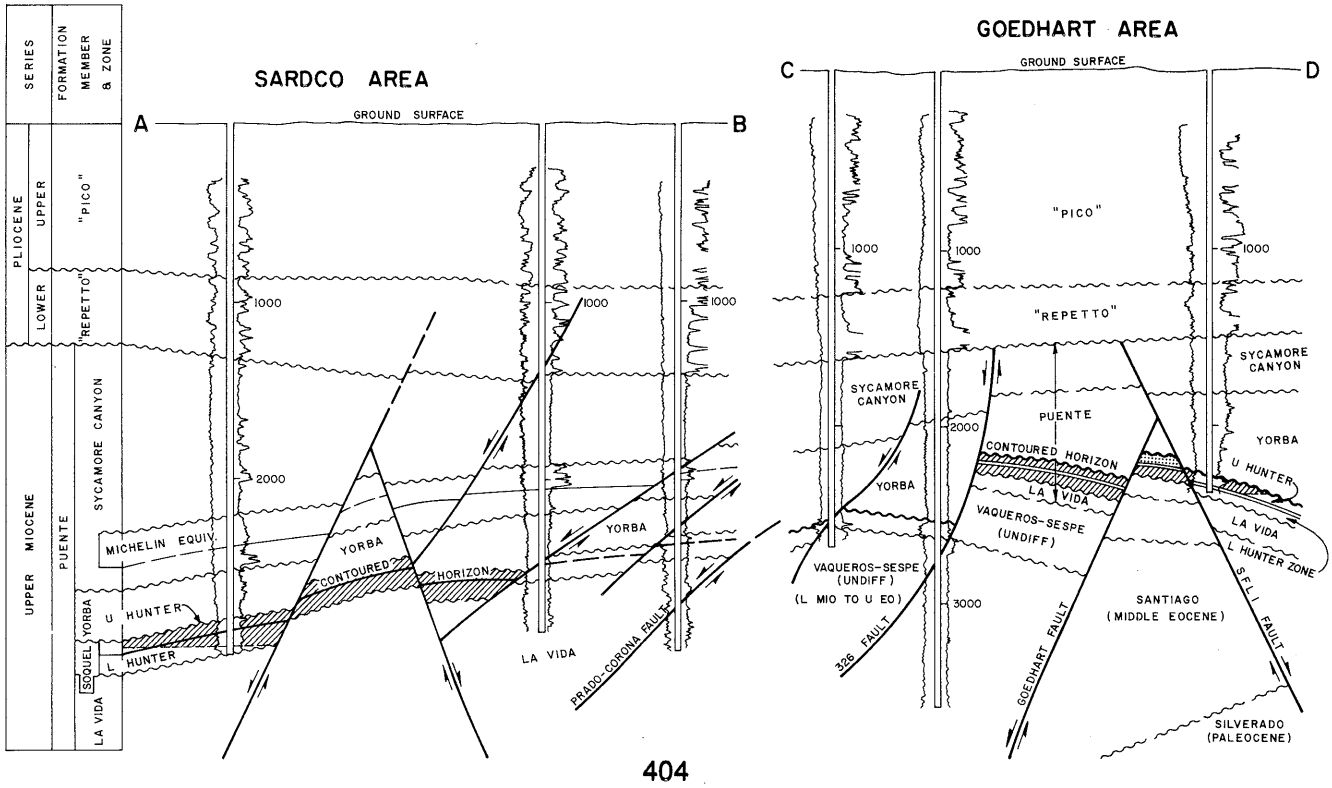
Selected References: Crowder, R.E., 1958, Inglewood City Area of Potrero Oil Field: Calif. Div. of Oil and Gas, Summary of Operations -- Calif. Oil Fields, Vol. 44, No. 1.

DATE: June 1983

CALIFORNIA DIVISION OF OIL AND GAS

PRADO - CORONA OIL FIELD





COUNTY: RIVERSIDE

PRADO - CORONA 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	Prado Petroleum Co. "Sardco" 1	Prado Corona Co. and Dorial Corp. "Sardco" 1	17 3S 7W	SB	2,740	Upper Hunter	
Deepest well	Prado Petroleum Co. "Gov." 165-1	Santa Fe Minerals, Inc. "Gov." 165-1	17 3S 7W	SB	5,991		Ladd Cretaceous

POOL DATA

ITEM	UPPER HUNTER	LOWER HUNTER				FIELD OR AREA DATA
Discovery date	September 1966	September 1966				
Initial production rates						
Oil (bbl/day)	168a/	a/				
Gas (Mcf/day)	25a/	a/				
Flow pressure (psi)						
Bean size (in.)						
Initial reservoir pressure (psi)						
Reservoir temperature (°F)						
Initial oil content (STB/ac.-ft.)						
Initial gas content (MSCF/ac.-ft.)						
Formation	Puente	Puente				
Geologic age	late Miocene	late Miocene				
Average depth (ft.)	2,400	2,425				
Average net thickness (ft.)	75	45				
Maximum productive area (acres)						225
RESERVOIR ROCK PROPERTIES						
Porosity (%)						
So_i (%)						
Sw_i (%)						
Sg_i (%)						
Permeability to air (md)						
RESERVOIR FLUID PROPERTIES						
Oil:						
Oil gravity (°API)						
Sulfur content (% by wt.)						
Initial solution GOR (SCF/STB)						
Initial oil FVF (RB/STB)						
Bubble point press. (psia)						
Viscosity (cp) @ °F						
Gas:						
Specific gravity (air = 1.0)						
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						
Date started						
Date discontinued						
Peak oil production (bbl)						166,297
Year						1972
Peak gas production, net (Mcf)						593,376
Year						1969

Base of fresh water (ft.): See areas

Remarks: Most easterly production in the Los Angeles Basin.
a/ Initial production was commingled.

Selected References: Durham, D.L., and R.F. Yerkes, 1964, Geology and Oil Resources of the Eastern Puente Hills Area, Southern California: U.S. Geol. Survey Prof. Paper 420-B.
Gaede, V.F., 1969, Prado-Corona Oil Field: Calif. Div. of Oil and Gas, Summary of Operations -- Calif. Oil Fields, Vol. 55, No. 1.

DATE: July 1983

CALIFORNIA DIVISION OF OIL AND GAS

COUNTY: RIVERSIDE

PRADO - CORONA OIL FIELD
GOEDHART 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	Hampton Oil Co. "Goedhart" 1	Pacific Drilling Co. "Goedhart" 1	28 3S 7W	SB	2,302	Upper Hunter (Gas)	
Deepest well	C.D. Draucker "Draucker" 1	Same as present	28 3S 7W	SB	4,858		Puente late Miocene

POOL DATA

ITEM	UPPER HUNTER (GAS)	UPPER HUNTER	LOWER HUNTER			FIELD OR AREA DATA
Discovery date	January 1968	May 1968	January 1968			
Initial production rates						
Oil (bbl/day)	-	21	12			
Gas (Mcf/day)	1,215	-	-			
Flow pressure (psi)						
Bean size (in.)						
Initial reservoir pressure (psi)						
Reservoir temperature (°F)						
Initial oil content (STB/ac.-ft.)						
Initial gas content (MSCF/ac.-ft.)						
Formation	Puente	Puente	Puente			
Geologic age	late Miocene	late Miocene	late Miocene			
Average depth (ft.)	2,100	2,350	2,425			
Average net thickness (ft.)	40	40	45			
Maximum productive area (acres)						130
RESERVOIR ROCK PROPERTIES						
Porosity (%)						
So_i (%)						
Sw_i (%)						
Sg_i (%)						
Permeability to air (md)						
RESERVOIR FLUID PROPERTIES						
Oil:						
Oil gravity (°API)	-	10-18	16			
Sulfur content (% by wt.)						
Initial solution GOR (SCF/STB)						
Initial oil FVF (RB/STB)						
Bubble point press. (psia)						
Viscosity (cp) @ °F						
Gas:						
Specific gravity (air = 1.0)						
Heating value (Btu/cu. ft.)	1,018	-	-			
Water:						
Salinity, NaCl (ppm)	11,555	11,555	11,555			
T.D.S. (ppm)						
R_w (ohm/m) (77°F)						
ENHANCED RECOVERY PROJECTS						
Enhanced recovery projects						
Date started						
Date discontinued						
Peak oil production (bbl)						39,644
Year						1970
Peak gas production, net (Mcf)						592,976
Year						1969

Base of fresh water (ft.): 1,900

Remarks:

Selected References:

DATE: July 1983

CALIFORNIA DIVISION OF OIL AND GAS

COUNTY: RIVERSIDE

PRADO - CORONA OIL FIELD
SARDCO 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	Prado Petroleum Co. "Sardco" 1	Prado-Corona and Dorial Corp. "Sardco" 1	17 3S 7W	SB	2,740	Upper Hunter	
Deepest well	Prado Petroleum Co. "Gov." 165-1	Santa Fe Minerals, Inc. "Gov." 165-1	17 3S 7W	SB	5,991		Ladd? Cretaceous

POOL DATA

ITEM	UPPER HUNTER	LOWER HUNTER				FIELD OR AREA DATA
Discovery date	September 1966	September 1966				
Initial production rates						
Oil (bbl/day)	168	a/				
Gas (Mcf/day)	25	a/				
Flow pressure (psi)						
Bean size (in.)						
Initial reservoir pressure (psi)						
Reservoir temperature (°F)						
Initial oil content (STB/ac.-ft.)						
Initial gas content (MSCF/ac.-ft.)						
Formation	Puente	Puente				
Geologic age	late Miocene	late Miocene				
Average depth (ft.)	2,350	2,425				
Average net thickness (ft.)	75	80				
Maximum productive area (acres)						95
RESERVOIR ROCK PROPERTIES						
Porosity (%)						
S_{oi} (%)						
S_{wi} (%)						
S_{gi} (%)						
Permeability to air (md)						
RESERVOIR FLUID PROPERTIES						
Oil:						
Oil gravity (°API)	15	15				
Sulfur content (% by wt.)						
Initial solution GOR (SCF/STB)						
Initial oil FVF (RB/STB)						
Bubble point press. (psia)						
Viscosity (cp) @ °F						
Gas:						
Specific gravity (air = 1.0)						
Heating value (Btu/cu. ft.)						
Water:						
Salinity, NaCl (ppm)	11,555	11,555				
T.D.S. (ppm)						
R_w (ohm/m) (77°F)						
ENHANCED RECOVERY PROJECTS						
Enhanced recovery projects						
Date started						
Date discontinued						
Peak oil production (bbl)						92,985
Year						1972
Peak gas production, net (Mcf)						60,465
Year						1972

Base of fresh water (ft.): 2,000

Remarks: a/ Production commingled with Upper Hunter zone.

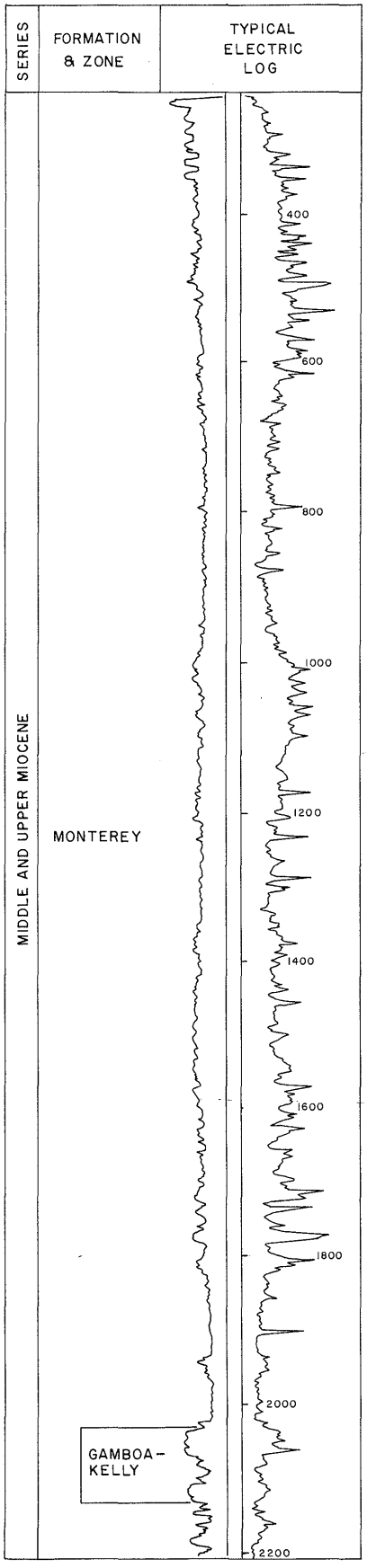
Selected References:

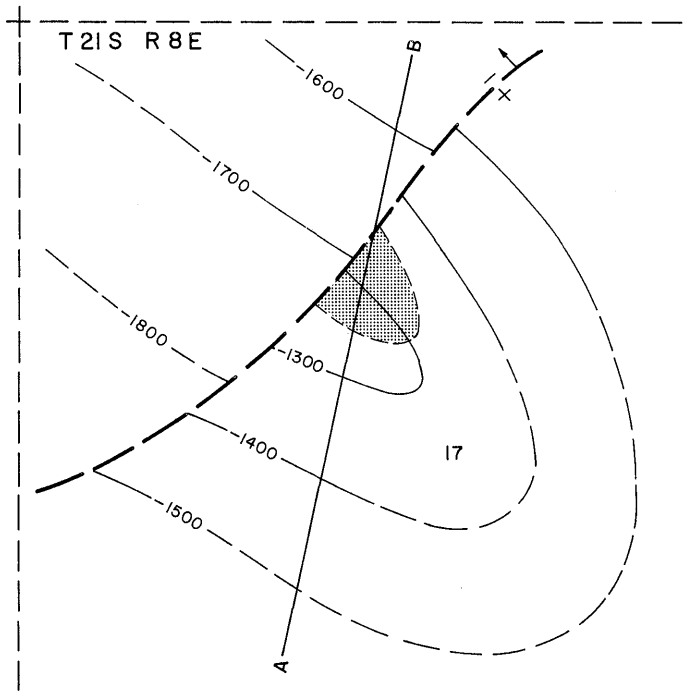
DATE: July 1983

CALIFORNIA DIVISION OF OIL AND GAS

QUINADO CANYON OIL FIELD

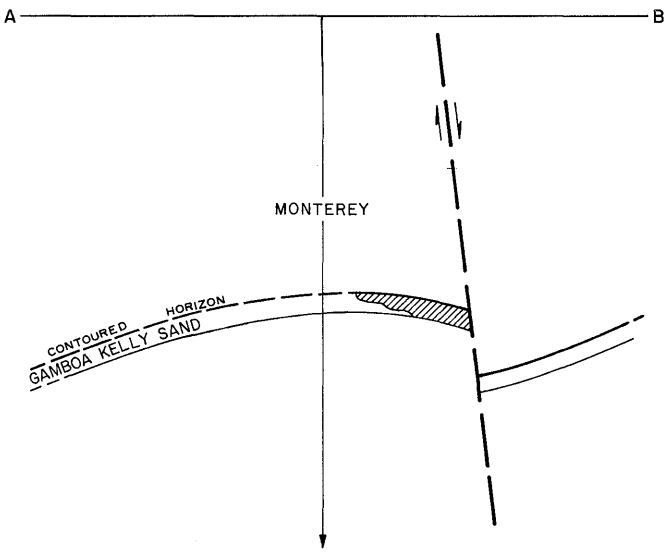
(Abandoned)





CONTOURS ON TOP OF GAMBOA KELLY SAND

SCALE 1" = 650'



COUNTY: MONTEREY

QUINADO CANYON OIL FIELD (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	R.H. Beel Development Co. "Gamboa-Kelly" 1	Barron Kidd "Gamboa-Kelly" 1	17 21S 8E	MD	2,197 a/	Gamboa-Kelly	
Deepest well	Barron Kidd "Gamboa-Kelly" 3	Same as present	17 21S 8E	MD	3,004		Monterey Miocene

POOL DATA

ITEM	GAMBOA-KELLY					FIELD OR AREA DATA
Discovery date	April 1963					
Initial production rates						
Oil (bbl/day)	21					
Gas (Mcf/day)						
Flow pressure (psi)						
Bean size (in.)						
Initial reservoir pressure (psi)	800					
Reservoir temperature (°F)	110					
Initial oil content (STB/ac.-ft.)						
Initial gas content (MSCF/ac.-ft.)						
Formation	Monterey					
Geologic age	Miocene					
Average depth (ft.)	2,030					
Average net thickness (ft.)	90					
Maximum productive area (acres)	10					
RESERVOIR ROCK PROPERTIES						
Porosity (%)	20-26†					
S_{oi} (%)	33-45†					
S_{wi} (%)	55-67†					
S_{gi} (%)						
Permeability to air (md)						
RESERVOIR FLUID PROPERTIES						
Oil:						
Oil gravity (°API)	18-19					
Sulfur content (% by wt.)						
Initial solution GOR (SCF/STB)	883					
Initial oil FVF (RB/STB)						
Bubble point press. (psia)						
Viscosity (cp) @ °F						
Gas:						
Specific gravity (air = 1.0)						
Heating value (Btu/cu. ft.)						
Water:						
Salinity, NaCl (ppm)	4,200†					
T.D.S. (ppm)						
R_w (ohm/m) (77°F)	1.37†					
ENHANCED RECOVERY PROJECTS						
Enhanced recovery projects						
Date started						
Date discontinued						
Peak oil production (bbl)	1,192					
Year	1964					
Peak gas production, net (Mcf)	1,272					
Year	1964					

Base of fresh water (ft.): 1,800

Remarks: a/ Well was deepened to 2,255 feet in July 1963.

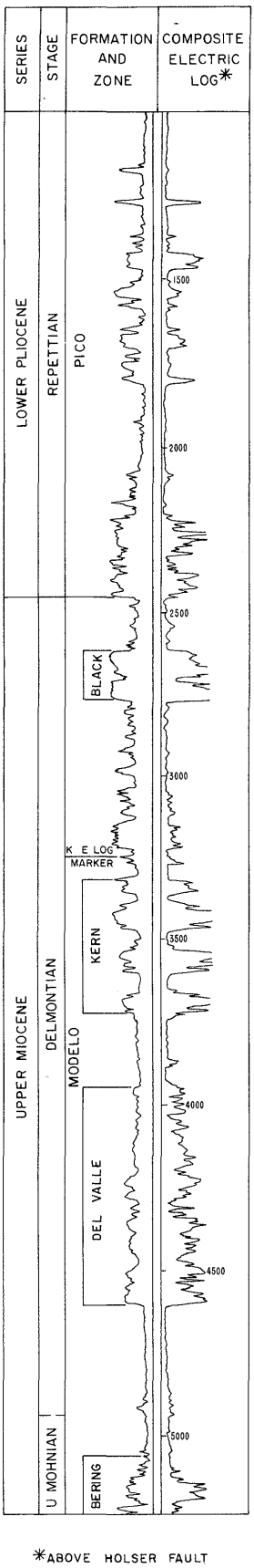
Only one well produced in this field. The field was abandoned in 1988. Cumulative production is 9,705 bbl of oil and 2,571 Mcf of gas.

Selected References:

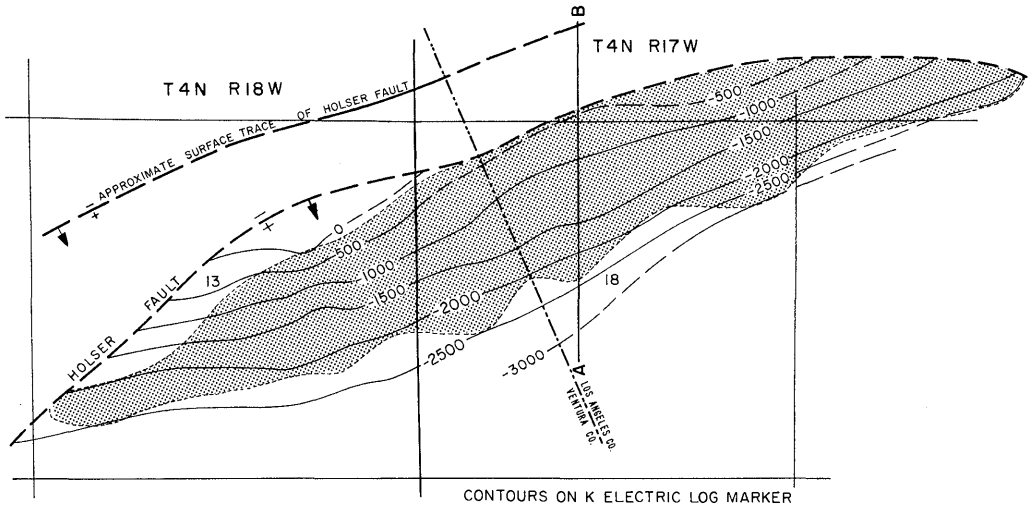
DATE: January 1989 †Log derived value

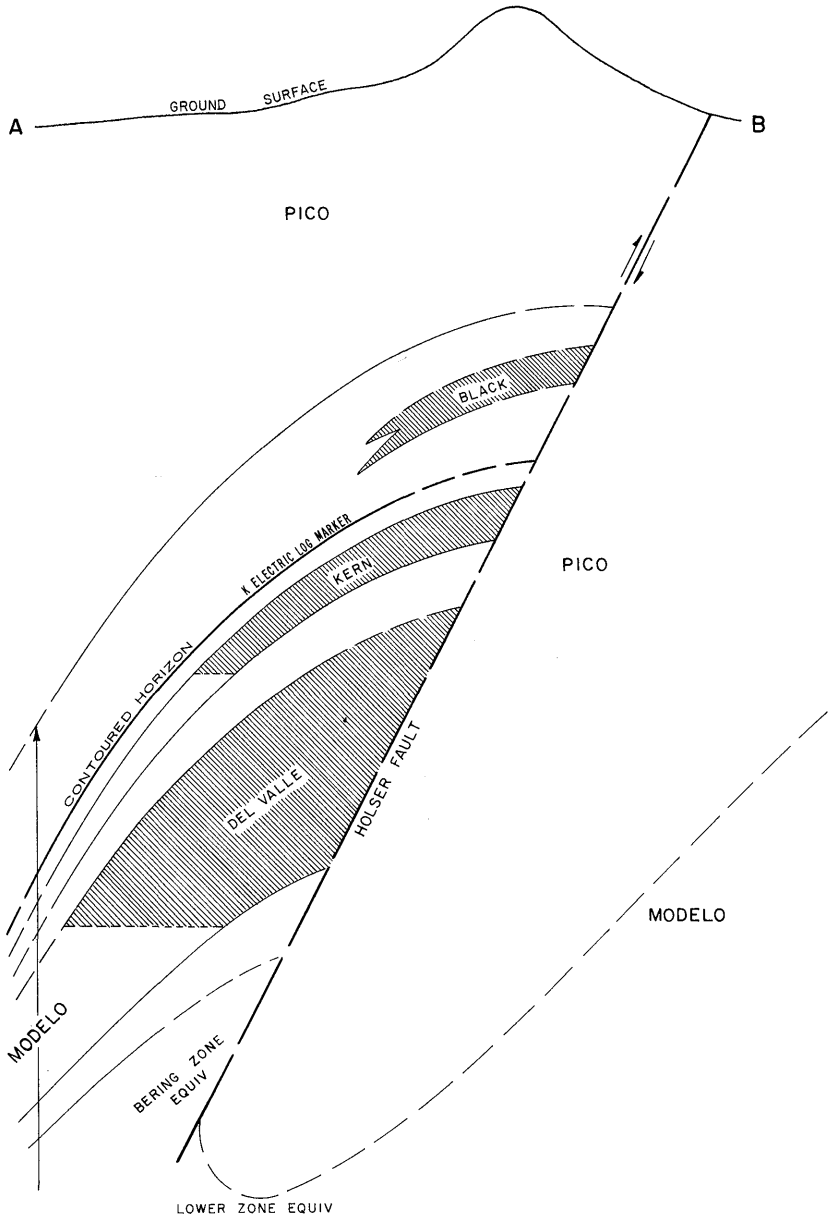
CALIFORNIA DIVISION OF OIL AND GAS

RAMONA OIL FIELD



*ABOVE HOLSER FAULT





COUNTY: VENTURA AND LOS ANGELES

RAMONA 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	Herley Kelley Co. "Orduno" 1	Jack Herley and Paul C. Kelley "Orduno" 1	18 4N 17W	SB	6,366	Del Valle	
Deepest well	The Superior Oil Co. "Black" 15	Same as present	13 4N 18W	SB	9,323		Modelo late Miocene

POOL DATA

ITEM	BLACK	KERN	DEL VALLE	BERING	LOWER	FIELD OR AREA DATA
Discovery date	June 1946	April 1945	October 1943	March 1974	December 1951	
Initial production rates						
Oil (bbl/day)	120	209	28	120	195	
Gas (Mcf/day)	70	85	-	-	-	
Flow pressure (psi)						
Bean size (in.)						
Initial reservoir pressure (psi)						
Reservoir temperature (°F)						
Initial oil content (STB/ac.-ft.)	978	953	303	-	-	
Initial gas content (MSCF/ac.-ft.)						
Formation	Modelo	Modelo	Modelo	Modelo	Modelo	
Geologic age	late Miocene	late Miocene	late Miocene	late Miocene	late Miocene	
Average depth (ft.)	2,498	3,500	4,500	6,500	7,900	
Average net thickness (ft.)	116	197	511	550	150	
Maximum productive area (acres)	16	131	104	-	-	540
RESERVOIR ROCK PROPERTIES						
Porosity (%)	27.0	15.4-26.6	11.8-23.3	-	-	
S_{oi} (%)	63	62	48	-	-	
S_{wi} (%)	30	25	35	-	-	
S_{gi} (%)						
Permeability to air (md)	100.0	165.0	42.0*	1.5-15.0**	-	
RESERVOIR FLUID PROPERTIES						
Oil:	23-30	16-30	15-20	19	14-20	
Oil gravity (°API)	-	2.45	2.45	-	-	
Sulfur content (% by wt.)						
Initial solution GOR (SCF/STB)						
Initial oil FVF (RB/STB)						
Bubble point press. (psia)						
Viscosity (cp) @ °F						
Gas:						
Specific gravity (air = 1.0)						
Heating value (Btu/cu. ft.)						
Water:						
Salinity, NaCl (ppm)	17,800	16,900	9,700	-	9,400	
T.D.S. (ppm)						
R_w (ohm/m) (77°F)						
ENHANCED RECOVERY PROJECTS						
Enhanced recovery projects					cyclic steam	
Date started					1965	
Date discontinued					1965	
Peak oil production (bbl)						2,048,370
Year						1949
Peak gas production, net (Mcf)						2,892,951
Year						1952

Base of fresh water (ft.): 100 - 350

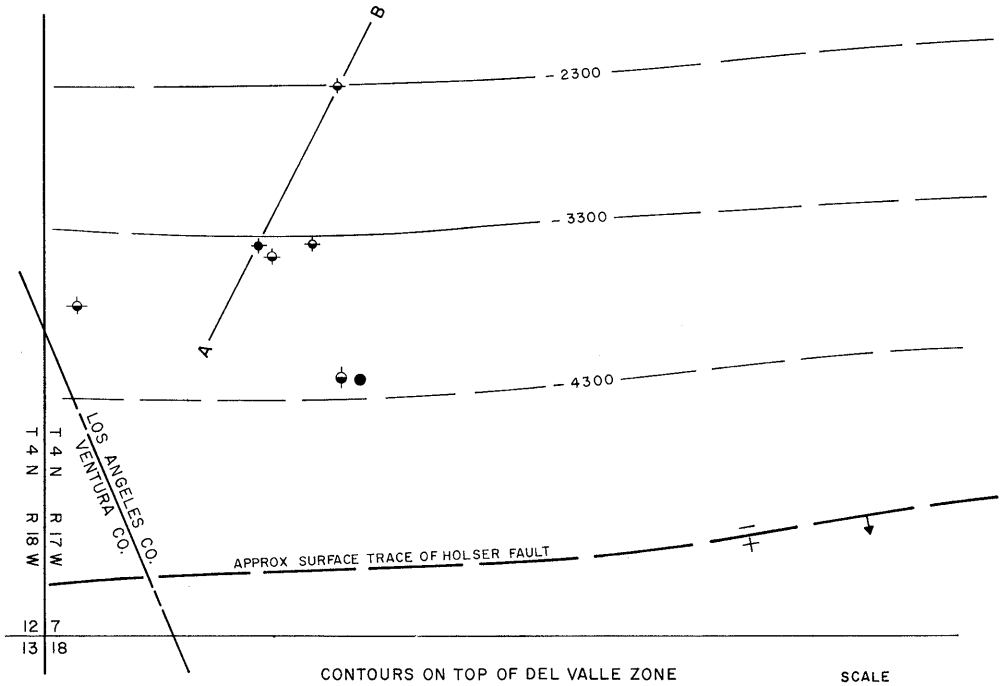
Remarks: Only one well produced from the Bering zone, and only two wells produced from the Lower zone.

Selected References: Driggs, J.L., and N.N. Sampson, 1951, Ramona Oil Field: Calif. Div. of Oil and Gas, Summary of Operations -- Calif. Oil Fields, Vol. 37, No. 1.

DATE: May 1983 *Average value **Estimated value

CALIFORNIA DIVISION OF OIL AND GAS

NORTH RAMONA OIL FIELD



CONTOURS ON TOP OF DEL VALLE ZONE

SCALE
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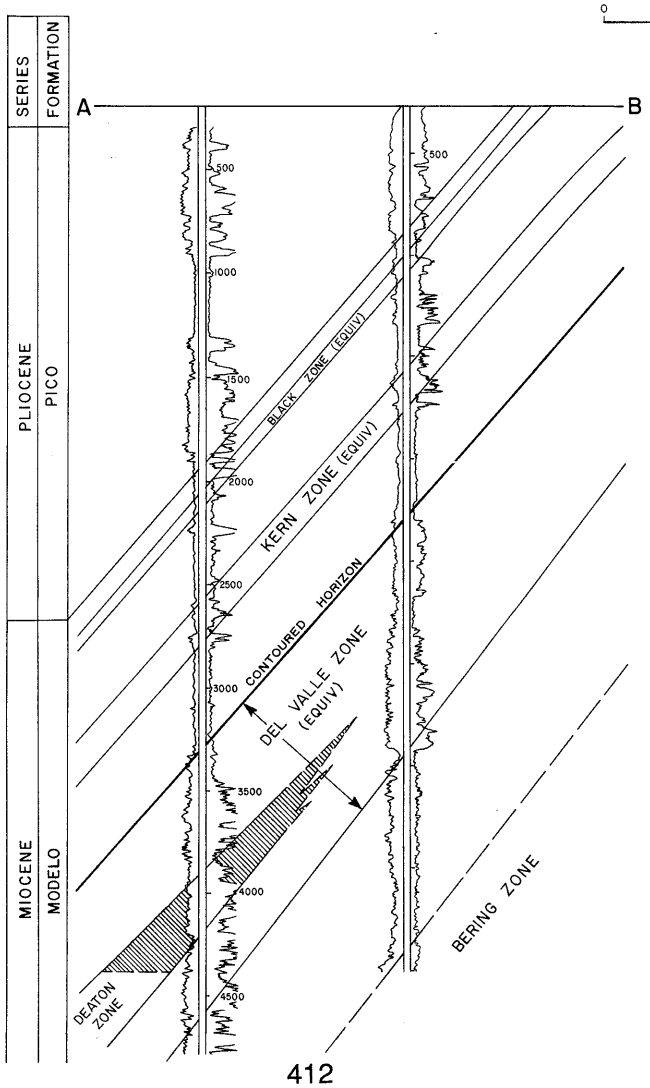


COUNTY: LOS ANGELES

RAMONA, 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	Texaco Inc. "Deaton" 1	The Texas Co. "Deaton" 1	7 4N 17W	SB	4,802	Deaton	
Deepest well	Benteley-Simonson Partnership "North Ramona" 1-7	Nahama & Weagant Energy Co. "North Ramona" 1-7	7 4N 17W	SB	5,483a/		Modelo Miocene

POOL DATA

ITEM	BLACK	DEATON				FIELD OR AREA DATA
Discovery date	May 1984	January 1946				
Initial production rates						
Oil (bbl/day)	31	34				
Gas (Mcf/day)	0	0				
Flow pressure (psi)						
Bean size (in.)						
Initial reservoir pressure (psi)						
Reservoir temperature (°F)						
Initial oil content (STB/ac.-ft.)						
Initial gas content (MSCF/ac.-ft.)						
Formation	Modelo	Modelo				
Geologic age	late Miocene	Miocene				
Average depth (ft.)	3,100	3,500				
Average net thickness (ft.)	150	150				
Maximum productive area (acres)	20	20				
RESERVOIR ROCK PROPERTIES						
Porosity (%)	15	-				
S_{oi} (%)	50	-				
S_{wi} (%)						
S_{gi} (%)						
Permeability to air (md)	380	-				
RESERVOIR FLUID PROPERTIES						
Oil:						
Oil gravity (°API)	17	19				
Sulfur content (% by wt.)						
Initial solution GOR (SCF/STB)						
Initial oil FVF (RB/STB)						
Bubble point press. (psia)						
Viscosity (cp) @ °F						
Gas:						
Specific gravity (air = 1.0)						
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						
Date started						
Date discontinued						
Peak oil production (bbl)	1,606	2,305				
Year	1946	1985				
Peak gas production, net (Mcf)						
Year						

Base of fresh water (ft.): None

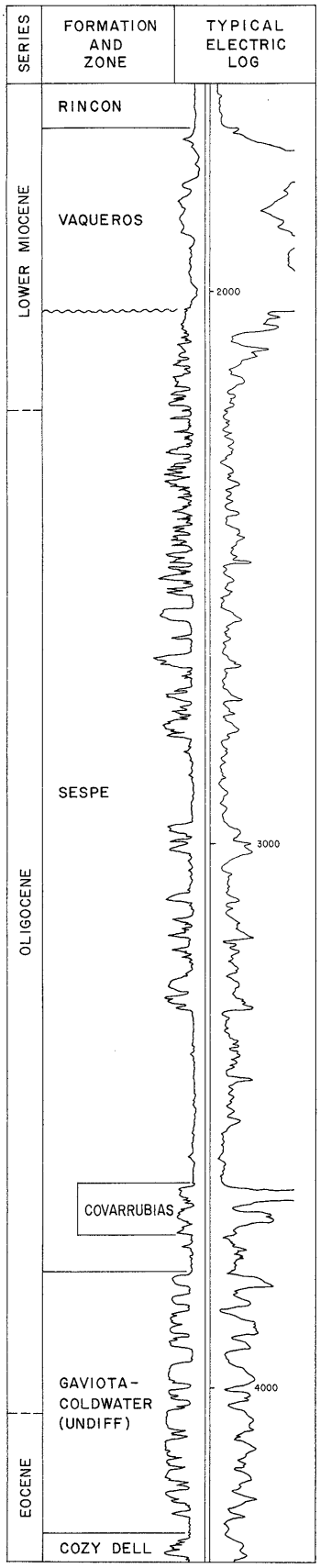
Remarks: Field was abandoned in March 1947 and reactivated in May 1984.
a/Directional well.

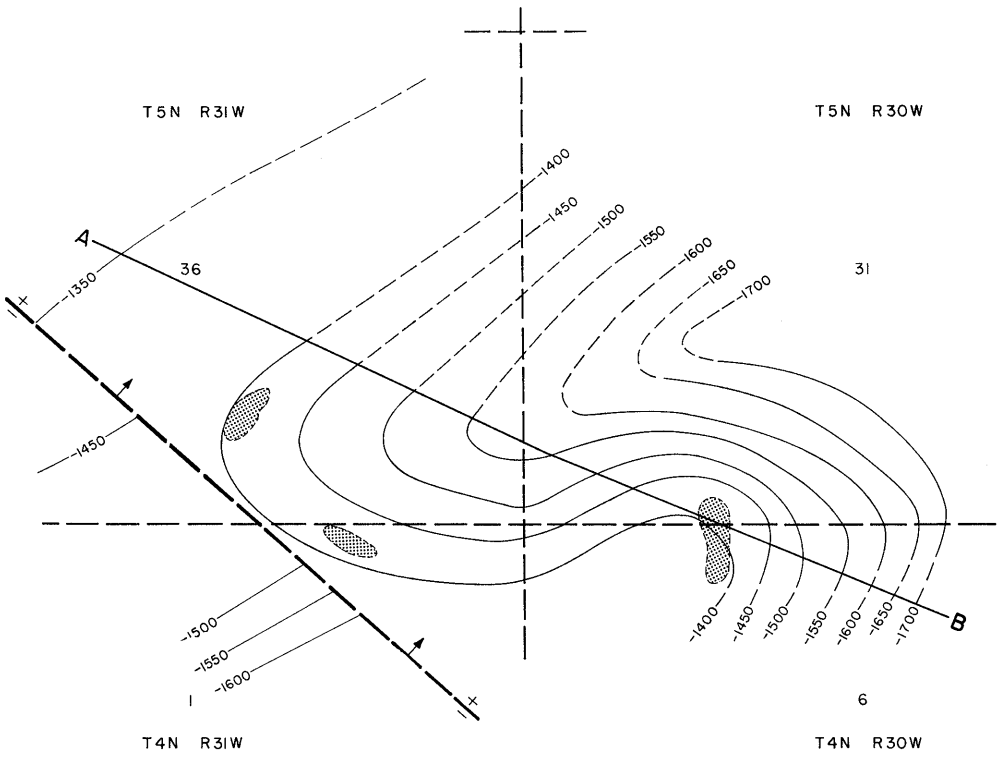
Selected References:

DATE: January 1990

CALIFORNIA DIVISION OF OIL AND GAS

REFUGIO COVE GAS FIELD
(Abandoned)





CONTOURS ON TOP OF VAQUEROS
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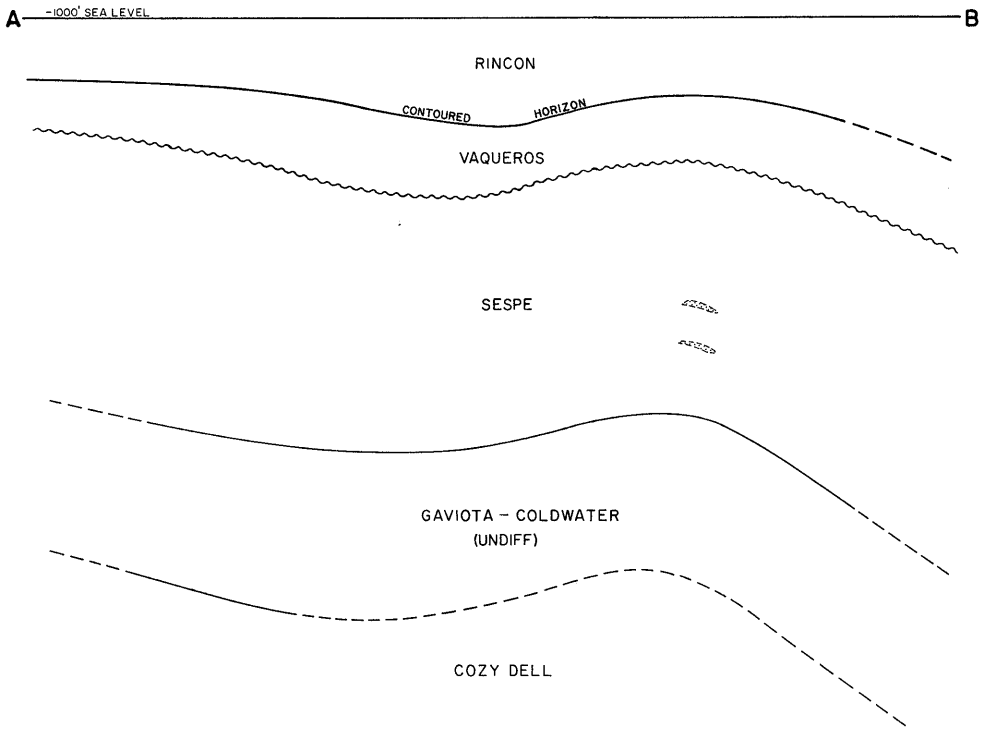


COUNTY: SANTA BARBARA

REFUGIO COVE GAS FIELD (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	Rothschild Oil Co. "Orella" 1	Same as present	31 5N 30W	SB	3,130	Covarrubias	
Deepest well	Texaco Inc. "State 2955" 2	Same as present	31 5N 30W	SB	7,020 a/		Gaviota Eocene

POOL DATA

ITEM	VAQUEROS	COVARRUBIAS b/				FIELD OR AREA DATA
Discovery date	December 1988	December 1946				
Initial production rates						
Oil (bbl/day)						
Gas (Mcf/day)	135	5,000				
Flow pressure (psi)	475	450				
Bean size (in.)						
Initial reservoir pressure (psi)	550	1,080				
Reservoir temperature (°F)	-	120				
Initial oil content (STB/ac.-ft.)	0	0				
Initial gas content (MSCF/ac.-ft.)						
Formation	Vaqueros	Sespe				
Geologic age	Miocene	Oligocene				
Average depth (ft.)	1,500	2,900				
Average net thickness (ft.)	20	50				
Maximum productive area (acres)	40	90				
RESERVOIR ROCK PROPERTIES						
Porosity (%)	-	26-28				
So_i (%)	-	0				
Sw_i (%)	-	50-70				
Sg_i (%)	-	30-50				
Permeability to air (md)	-	40-130				
RESERVOIR FLUID PROPERTIES						
Oil:						
Oil gravity (°API)						
Sulfur content (% by wt.)						
Initial solution GOR (SCF/STB)						
Initial oil FVF (RB/STB)						
Bubble point press. (psia)						
Viscosity (cp) @ °F						
Gas:						
Specific gravity (air = 1.0)	0.61	0.61				
Heating value (Btu/cu. ft.)	1,102	1,082				
Water:						
Salinity, NaCl (ppm)	800	2,054				
T.D.S. (ppm)						
R_w (ohm/m) (77°F)	-	3.0				
ENHANCED RECOVERY PROJECTS						
Enhanced recovery projects						
Date started						
Date discontinued						
Peak oil production (bbl)						
Year						
Peak gas production, net (Mcf)	475,905					
Year	1959					

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

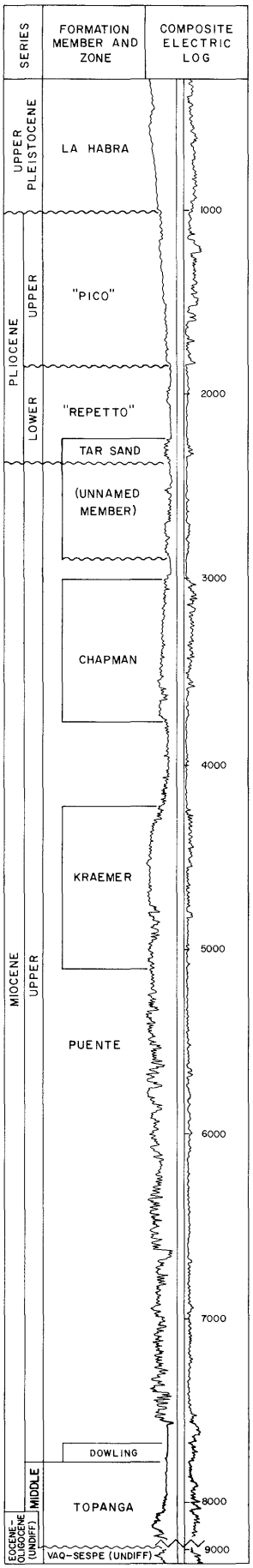
Remarks: The eastern productive area was formerly known as the Refugio Area. The field was abandoned in 1964, reactivated in 1984, and reabandoned in 1990. Cumulative production is 3,199 bbl of oil and 1,034,366 Mcf of gas.
a/ Directional well; true vertical depth is 6,264 feet.
b/ Consists of several different sands within the Sespe Formation.

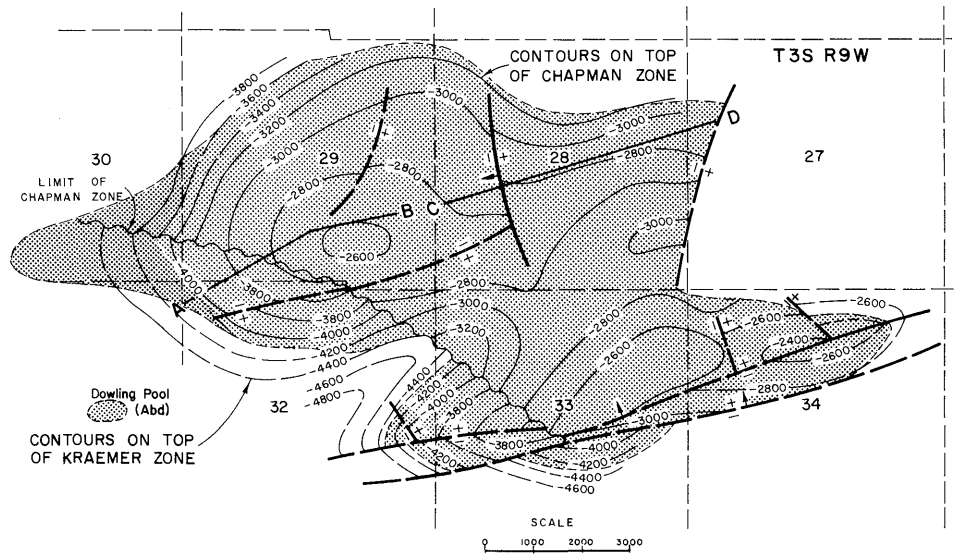
Selected References: Dolman, S.G., 1947, Operations in District No. 3: Calif. Div. of Oil and Gas, Summary of Operations--Calif. Oil Fields, Vol. 33, No. 2.
Kribbs, G.R., 1943, Capitan Oil Field, Cross Section of Coastal Fault Block: Calif. Div. of Mines Bull. 118, p. 374.
Yerkes, R.F., H.C. Wagner, and K.A. Yenne, 1969, Petroleum Development in the Region of the Santa Barbara Channel: U.S. Geol. Survey Prof. Paper 679B, p. 19.

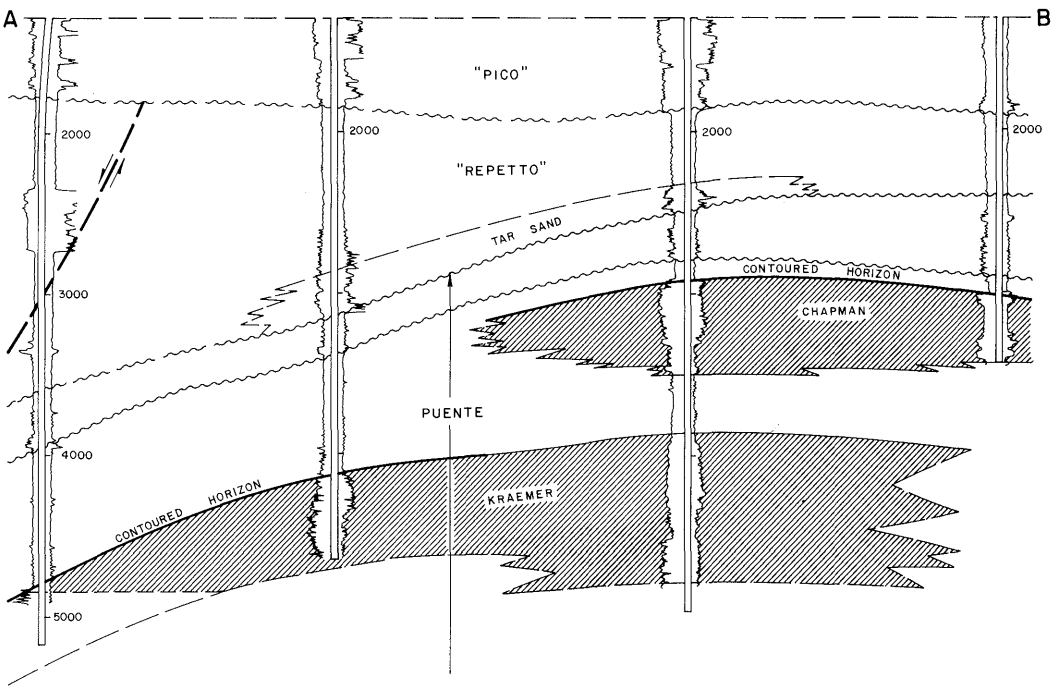
DATE: May 1991

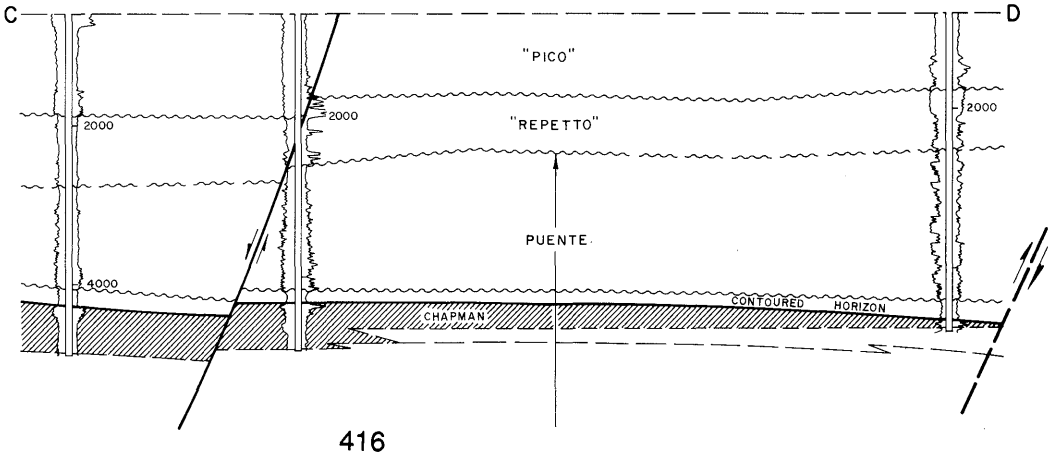
CALIFORNIA DIVISION OF OIL AND GAS

RICHFIELD OIL FIELD









COUNTY: ORANGE

RICHFIELD 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	Union Oil Co. of Calif. "Chapman" 1	Same as present	29 3S 9W	SB	3,085	Chapman	
Deepest well	Union Oil Co. of Calif. "Chapman" 29	Same as present	29 3S 9W	SB	10,496		Vaqueros-Sespe Oligocene

POOL DATA

ITEM	TAR SAND	CHAPMAN	BREEN	KRAEMER	DOWLING	FIELD OR AREA DATA
Discovery date	July 1957	March 1919	July 1933	June 1920	August 1956	
Initial production rates						
Oil (bbl/day)	20	1,732	650	675	162	
Gas (Mcf/day)	-	-	3,500	-	16	
Flow pressure (psi)	-	-	-	-	312	
Bean size (in.)						
Initial reservoir pressure (psi)	-	1,371	1,559	1,863	-	
Reservoir temperature (°F)	115	117	125	138	186	
Initial oil content (STB/ac.-ft.)	445	1,524	1,247	1,267	-	
Initial gas content (MSCF/ac.-ft.)	-	345	328	465	-	
Formation	"Repetto"	Puente	Puente	Puente	Puente	
Geologic age	early Pliocene	late Miocene	late Miocene	late Miocene	late Miocene	
Average depth (ft.)	2,000	2,900	3,500	3,800	7,950	
Average net thickness (ft.)	80	500	250	600	250	
Maximum productive area (acres)						1,610
RESERVOIR ROCK PROPERTIES						
Porosity (%)	22.7	30.0	27.4	25.0	-	
S_{oi} (%)	22.5	75.0	67.0	77.0	-	
S_{wi} (%)	49.4	25.0	33.0	23.0	-	
S_{gi} (%)						
Permeability to air (md)	1,200	1,000	537	1,095	-	
RESERVOIR FLUID PROPERTIES						
Oil:						
Oil gravity (°API)	12-14	16-20	16-19	21-25	21	
Sulfur content (% by wt.)	-	1.38	-	1.74	-	
Initial solution GOR (SCF/STB)	-	226	263	367	-	
Initial oil FVF (RB/STB)	1.110	1.118	1.142	1.202	-	
Bubble point press. (psia)						
Viscosity (cp) @ °F	-	5.7 @ 117	4.7 @ 125	4.5 @ 130	5.2 @ 186	
Gas:						
Specific gravity (air = 1.0)						
Heating value (Btu/cu. ft.)						
Water:						
Salinity, NaCl (ppm)	-	6,567	6,306	6,044	-	
T.D.S. (ppm)	-	6,609	6,850	10,926	-	
R_w (ohm/m) (77°F)	-	0.683	0.640	0.570	-	
ENHANCED RECOVERY PROJECTS						
Enhanced recovery projects		waterflood		waterflood		
Date started		1944		1973		
Date discontinued		active		active		
		cyclic steam				
		1964				
		1965				
Peak oil production (bbl)						8,182,668
Year						1922
Peak gas production, net (Mcf)						14,000,000
Year						1921

Base of fresh water (ft.): 800-3,200

Remarks: This was the first field in California to use waterflooding for secondary recovery. Union Oil Co. of Calif. started waterflooding in the Chapman zone on March 29, 1944. A cyclic-steam project was started in 1964 and was terminated in 1965 after injecting 29,950 bbl of water-converted to-steam into three wells.

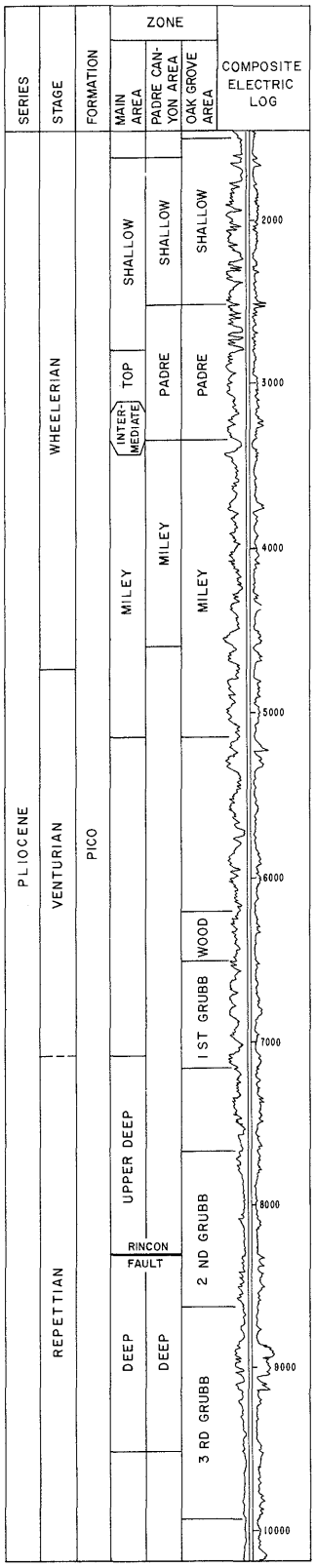
Selected References: Ingram, W.L., 1961, Richfield Oil Field: Calif. Div. of Oil and Gas, Summary of Operations -- Calif. Oil Fields, Vol. 47, No. 2.

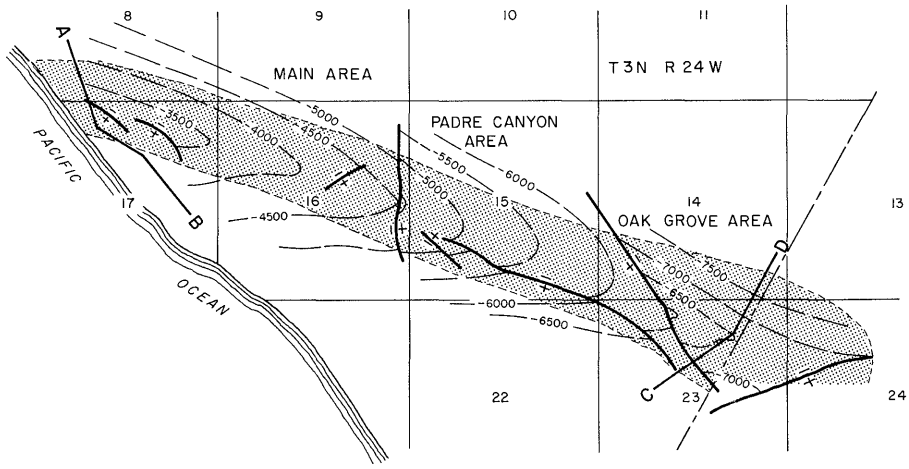
DATE: January 1989

CALIFORNIA DIVISION OF OIL AND GAS

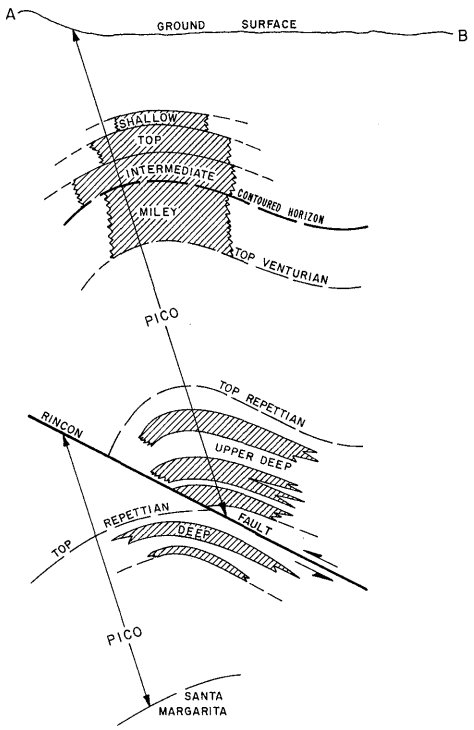
RINCON OIL FIELD

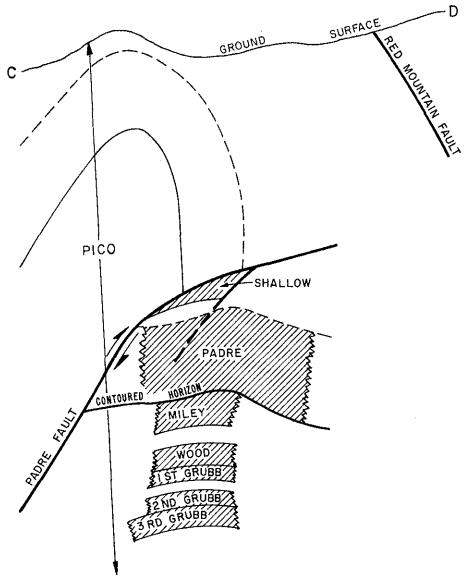
Onshore Area





CONTOURS ON TOP OF MILEY ZONE





COUNTY: VENTURA

RINCON 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	ARCO Oil and Gas Co. "Hobson Fee" 3	Pan America Pet. Co. "Hobson Fee" 3	17 3N 24W	SB	2,557	Shallow & Top	
Deepest well	Conoco Inc. "Grubb" 160	Same as present	23 3N 24W	SB	15,878		Santa Margarita late Miocene

POOL DATA

ITEM	SHALLOW & TOPa/					FIELD OR AREA DATA
Discovery date	December 1927					
Initial production rates						
Oil (bbl/day)	328					
Gas (Mcf/day)						
Flow pressure (psi)						
Bean size (in.)						
Initial reservoir pressure (psi)						
Reservoir temperature (°F)						
Initial oil content (STB/ac.-ft.)						
Initial gas content (MSCF/ac.-ft.)						
Formation	Pico					
Geologic age	Pliocene					
Average depth (ft.)	3,400					
Average net thickness (ft.)	1,400					
Maximum productive area (acres)						1,760
RESERVOIR ROCK PROPERTIES						
Porosity (%)						
So_i (%)						
Sw_i (%)						
Sg_i (%)						
Permeability to air (md)						
RESERVOIR FLUID PROPERTIES						
Oil:						
Oil gravity (°API)	30					
Sulfur content (% by wt.)						
Initial solution GOR (SCF/STB)						
Initial oil FVF (RB/STB)						
Bubble point press. (psia)						
Viscosity (cp) @ °F						
Gas:						
Specific gravity (air = 1.0)						
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						
Date started						
Date discontinued						
Peak oil production (bbl)						4,663,226
Year						1972
Peak gas production, net (Mcf)						6,736,000
Year						1961

Base of fresh water (ft.): See areas

Remarks: Some operators report injection data by fault block designation.
a/ Production commingled.

Selected References:

DATE: May 1983

CALIFORNIA DIVISION OF OIL AND GAS

COUNTY: VENTURA

RINCON 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	ARCO Oil and Gas Co. "Hobson Fee" 3	Pan American Pet. Co. "Hobson Fee" 3	17 3N 24W	SB	7,449	Shallow	
Deepest well	Santa Fe Energy Operating Partners, L.P. "Hobson" C-11	Chanslor-Canfield Midway Oil Co. "Hobson" C-11	17 3N 24W	SB	14,155		Santa Margarita late Miocene

POOL DATA

ITEM	SHALLOW	TOP	INTERMEDIATE	MILEY	UPPER DEEP	FIELD OR AREA DATA
Discovery date	December 1927	December 1927	November 1929	June 1928	July 1929	
Initial production rates						
Oil (bbl/day)	328	328	418	107	-	
Gas (Mcf/day)						
Flow pressure (psi)						
Bean size (in.)						
Initial reservoir pressure (psi)	1,500	1,780	1,900	2,060	-	
Reservoir temperature (°F)	-	125	129	134	-	
Initial oil content (STB/ac.-ft.)	930	868	723	648	465	
Initial gas content (MSCF/ac.-ft.)						
Formation	Pico	Pico	Pico	Pico	Pico	
Geologic age	Pliocene	Pliocene	Pliocene	Pliocene	Pliocene	
Average depth (ft.)	3,400	4,100	4,390	4,750	5,550	
Average net thickness (ft.)	140	120	140	640	2,200	
Maximum productive area (acres)						
RESERVOIR ROCK PROPERTIES						
Porosity (%)	24*	22*	20*	19*	15*	
S_{oi} (%)	60	60	55	55	52	
S_{wi} (%)	40	40	45	45	48	
S_{gi} (%)	0	0	-	0	0	
Permeability to air (md)	277	50-200	40-100	-	30*	
RESERVOIR FLUID PROPERTIES						
Oil:						
Oil gravity (°API)	30	29	29	30	30	
Sulfur content (% by wt.)	-	-	-	1.08	-	
Initial solution GOR (SCF/STB)	160	460	460	460	-	
Initial oil FVF (RB/STB)	1.20	1.18	1.18	1.25	1.30	
Bubble point press. (psia)	1,500	1,780	1,900	2,060	-	
Viscosity (cp) @ °F						
Gas:						
Specific gravity (air = 1.0)	0.70	0.70	0.70	0.70	0.70	
Heating value (Btu/cu. ft.)						
Water:						
Salinity, NaCl (ppm)	25,000	25,000	25,000	25,000	25,000	
T.D.S. (ppm)						
R_w (ohm/m) (77°F)	-	0.125 @ 150	0.126 @ 150	1.250 @ 150	1.250 @ 150	
ENHANCED RECOVERY PROJECTS						
Enhanced recovery projects	waterflood	waterflood	waterflood	waterflood		
Date started	1961	1963	1963	1963		
Date discontinued	active	1976	active	active		
Peak oil production (bbl)						
Year						
Peak gas production, net (Mcf)						
Year						

Base of fresh water (ft.): None

Remarks:

Selected References: Bailey, W.C., 1941, Rincon Oil Field: Calif. Div. of Oil and Gas, Summary of Operations -- Calif. Oil and Gas Fields, Vol. 27, No. 1.

DATE: May 1983 *Average value

CALIFORNIA DIVISION OF OIL AND GAS

COUNTY: VENTURA

RINCON 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							
Deepest well							

POOL DATA

ITEM	DEEP					FIELD OR AREA DATA
Discovery date	June 1929					
Initial production rates						
Oil (bbl/day)	222					
Gas (Mcf/day)						
Flow pressure (psi)						
Bean size (in.)						
Initial reservoir pressure (psi)						
Reservoir temperature (°F)						
Initial oil content (STB/ac.-ft.)	465					
Initial gas content (MSCF/ac.-ft.)						
Formation	Pico					
Geologic age	Pliocene					
Average depth (ft.)	7,800					
Average net thickness (ft.)	2,600					
Maximum productive area (acres)						540
RESERVOIR ROCK PROPERTIES						
Porosity (%)	15					
S_{oi} (%)	52					
S_{wi} (%)	48					
S_{gi} (%)	0					
Permeability to air (md)	30					
RESERVOIR FLUID PROPERTIES						
Oil:						
Oil gravity (°API)	26					
Sulfur content (% by wt.)						
Initial solution GOR (SCF/STB)						
Initial oil FVF (RB/STB)	1.3					
Bubble point press. (psia)						
Viscosity (cp) @ °F						
Gas:						
Specific gravity (air = 1.0)	0.70					
Heating value (Btu/cu. ft.)						
Water:						
Salinity, NaCl (ppm)	25,000					
T.D.S. (ppm)						
R_w (ohm/m) (77°F)	1.25 @ 150					
ENHANCED RECOVERY PROJECTS						
Enhanced recovery projects						
Date started						
Date discontinued						
Peak oil production (bbl)						2,458,301 a/
Year						1961
Peak gas production, net (Mcf)						7,833,671
Year						1951

Base of fresh water (ft.):

Remarks: a/Production for onshore areas.

Selected References:

DATE: May 1983

CALIFORNIA DIVISION OF OIL AND GAS

COUNTY: VENTURA

RINCON OIL FIELD
OAK GROVE 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	Santa Fe Energy Operating Partners, L.P. "Hobson" A-2	Chanslor-Canfield Midway Oil Co. "Hobson" A-2	23 3N 24W	SB	10,030	Shallow	
Deepest well	Conoco Inc. "Grubb" 160	Same as present	23 3N 24W	SB	15,878		Santa Margarita late Miocene

POOL DATA

ITEM	SHALLOW	PADRE	MILEY	WOOD	1ST GRUBB	FIELD OR AREA DATA
Discovery date	September 1931	September 1931	September 1931	September 1945	May 1961	
Initial production rates						
Oil (bbl/day)	88	88	88	258	269	
Gas (Mcf/day)	210	210	210	154	169	
Flow pressure (psi)						
Bean size (in.)						
Initial reservoir pressure (psi)						
Reservoir temperature (°F)	-	176	-	-	-	
Initial oil content (STB/ac.-ft.)						
Initial gas content (MSCF/ac.-ft.)						
Formation	Pico	Pico	Pico	Pico	Pico	
Geologic age	Pliocene	Pliocene	Pliocene	Pliocene	Pliocene	
Average depth (ft.)	5,700	6,600	7,700	10,700	10,900	
Average net thickness (ft.)	800	1,000	1,800	700	1,000	
Maximum productive area (acres)						
RESERVOIR ROCK PROPERTIES						
Porosity (%)	-	21	-	-	-	
S_{oi} (%)	-	56	-	-	-	
S_{wi} (%)	-	28	-	-	-	
S_{gi} (%)	-	16	-	-	-	
Permeability to air (md)	-	32	-	-	-	
RESERVOIR FLUID PROPERTIES						
Oil:						
Oil gravity (°API)	30	30	30	30	28	
Sulfur content (% by wt.)						
Initial solution GOR (SCF/STB)						
Initial oil FVF (RB/STB)						
Bubble point press. (psia)						
Viscosity (cp) @ °F						
Gas:						
Specific gravity (air = 1.0)						
Heating value (Btu/cu. ft.)						
Water:						
Salinity, NaCl (ppm)	25,600	25,600	25,600	25,600	25,600	
T.D.S. (ppm)						
R_w (ohm/m) (77°F)						
ENHANCED RECOVERY PROJECTS						
Enhanced recovery projects		waterflood				
Date started		1966				
Date discontinued		active				
Peak oil production (bbl)						
Year						
Peak gas production, net (Mcf)						
Year						

Base of fresh water (ft.): None

Remarks:

Selected References: Bailey, W.C., 1941, Rincon Oil Field: Calif. Div. of Oil and Gas, Summary of Operations -- Calif. Oil and Gas Fields, Vol. 27, No. 1.

DATE: May 1983

CALIFORNIA DIVISION OF OIL AND GAS

COUNTY: VENTURA

RINCON OIL FIELD
OAK GROVE 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 GRUBB	3RD GRUBB				FIELD OR AREA DATA
Discovery date	July 1969	July 1969				
Initial production rates						
Oil (bbl/day)	891	891				
Gas (Mcf/day)	900	900				
Flow pressure (psi)						
Bean size (in.)						
Initial reservoir pressure (psi)	6,970	6,970				
Reservoir temperature (°F)						
Initial oil content (STB/ac.-ft.)						
Initial gas content (MSCF/ac.-ft.)						
Formation	Pico	Pico				
Geologic age	Pliocene	Pliocene				
Average depth (ft.)	11,900	13,000				
Average net thickness (ft.)	1,100	1,000				
Maximum productive area (acres)						390
RESERVOIR ROCK PROPERTIES						
Porosity (%)	13	13				
So_i (%)						
Sw_i (%)	40	40				
Sg_i (%)						
Permeability to air (md)	20	20				
RESERVOIR FLUID PROPERTIES						
Oil:						
Oil gravity (°API)	28	28				
Sulfur content (% by wt.)						
Initial solution GOR (SCF/STB)						
Initial oil FVF (RB/STB)	1.4	1.4				
Bubble point press. (psia)	3,900	3,900				
Viscosity (cp) @ °F						
Gas:						
Specific gravity (air = 1.0)						
Heating value (Btu/cu. ft.)						
Water:						
Salinity, NaCl (ppm)	16,200	16,200				
T.D.S. (ppm)						
R_w (ohm/m) (77°F)						
ENHANCED RECOVERY PROJECTS						
Enhanced recovery projects						
Date started						
Date discontinued						
Peak oil production (bbl)						2,989,405
Year						1972
Peak gas production, net (Mcf)						7,833,671
Year						1951

Base of fresh water (ft.):

Remarks:

Selected References:

DATE: May 1983

CALIFORNIA DIVISION OF OIL AND GAS

COUNTY: VENTURA

RINCON OIL FIELD
PADRE CANYON 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	Conoco Inc. "Hobson" 1	Continental Oil Co. "Hobson" 1	15 3N 24W	SB	6,390	Shallow	
Deepest well	Conoco Inc. "Conoco-M.P." 1	Continental Oil Co. "Conoco-M.P." 1	15 3N 24W	SB	15,336		Santa Margarita late Miocene

POOL DATA

ITEM	SHALLOW	PADRE	MILEY	DEEP		FIELD OR AREA DATA
Discovery date	March 1936	March 1936	March 1936	October 1953		
Initial production rates						
Oil (bbl/day)	379	379	379	156		
Gas (Mcf/day)	121	121	121	91		
Flow pressure (psi)						
Bean size (in.)						
Initial reservoir pressure (psi)	-	2,050 @ 4,500	-	-		
Reservoir temperature (°F)	-	130 @ 4,400	-	-		
Initial oil content (STB/ac.-ft.)	-	1,010	-	-		
Initial gas content (MSCF/ac.-ft.)	-	6.9**	-	-		
Formation	Pico	Pico	Pico	Pico		
Geologic age	Pliocene	Pliocene	Pliocene	Pliocene		
Average depth (ft.)	3,700	4,350	5,600	10,800		
Average net thickness (ft.)	800	390	500	1,100		
Maximum productive area (acres)	-	225	-	-		280
RESERVOIR ROCK PROPERTIES						
Porosity (%)	-	20-25	-	-		
S_{oi} (%)	-	62	-	-		
S_{wi} (%)	-	28	-	-		
S_{gi} (%)	-	20**	-	-		
Permeability to air (md)	-	100-210*	-	-		
RESERVOIR FLUID PROPERTIES						
Oil:						
Oil gravity (°API)	30	30	30	26		
Sulfur content (% by wt.)	-	0.2	-	-		
Initial solution GOR (SCF/STB)	-	328	-	-		
Initial oil FVF (RB/STB)	-	1.20	-	-		
Bubble point press. (psia)	-	1,860	-	-		
Viscosity (cp) @ °F	-	15	-	-		
Gas:						
Specific gravity (air = 1.0)	-	0.71	-	-		
Heating value (Btu/cu. ft.)						
Water:						
Salinity, NaCl (ppm)	25,600	9,900	25,600	16,200		
T.D.S. (ppm)	-	23,770	-	-		
R_w (ohm/m) (77°F)	-	0.45 @ 80	-	-		
ENHANCED RECOVERY PROJECTS						
Enhanced recovery projects		waterflood				
Date started		1965				
Date discontinued		active				
Peak oil production (bbl)						4,051,825
Year						1960
Peak gas production, net (Mcf)						7,833,671
Year						1951

Base of fresh water (ft.): None

Remarks:

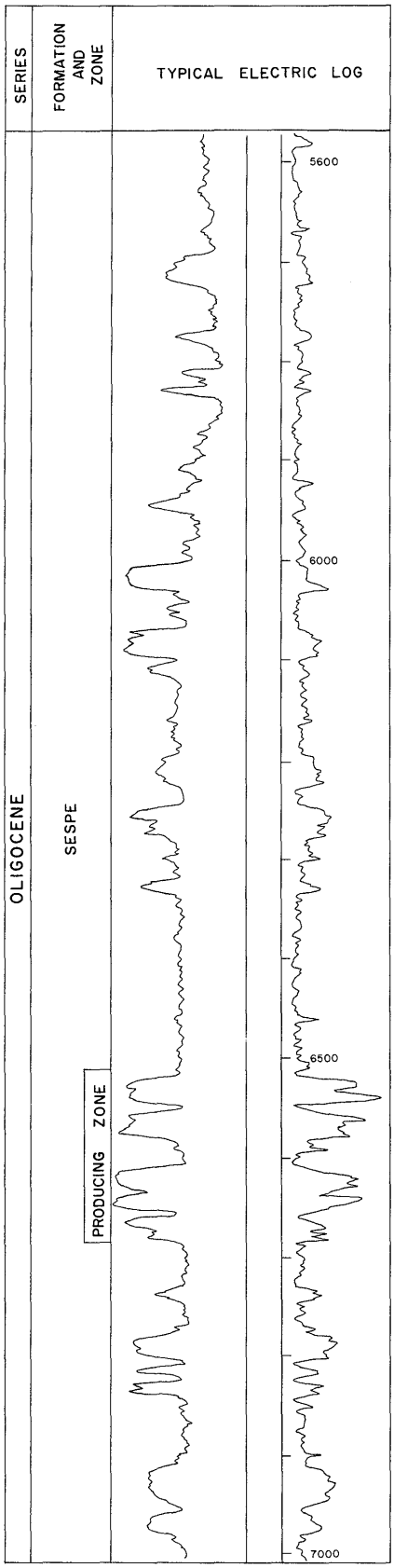
Selected References: Bailey, W.C., 1941, Rincon Oil Field: Calif. Div. of Oil and Gas, Summary of Operations -- Calif. Oil and Gas Fields, Vol. 27, No. 1.

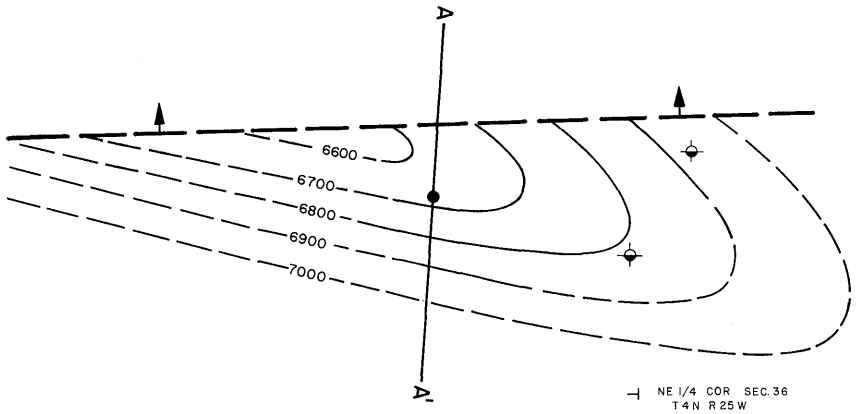
DATE: May 1983 *Average value **Estimated value

CALIFORNIA DIVISION OF OIL AND GAS

RINCON CREEK OIL FIELD

(Abandoned)





CONTOURS ON PRODUCING INTERVAL

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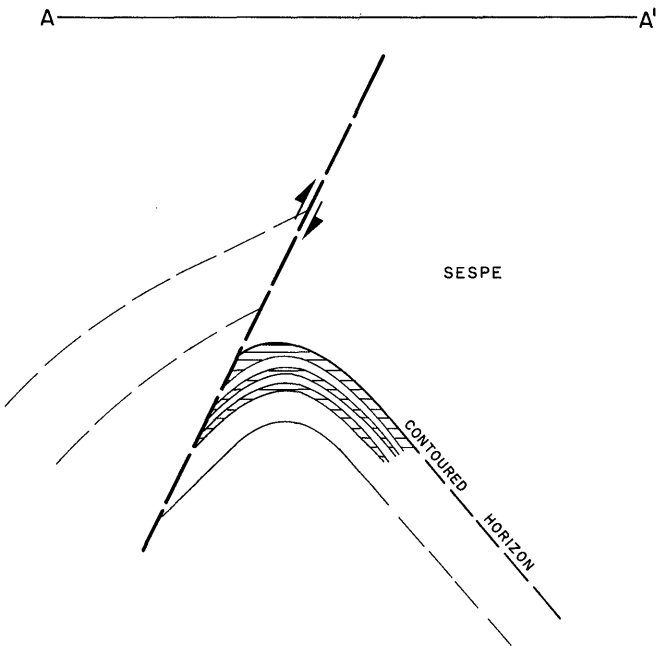
1" = 400'



COUNTY: VENTURA

RINCON CREEK OIL FIELD (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	Rincon Oil Co. "Del Mar" 32-35	Energetics Inc. "Del Mar" 32-35	35 4N 25W	SB	8,590a/	Sespe	Sespe Oligocene
Deepest well	Same as above	"	"	"	"	"	"

POOL DATA

ITEM	SESPE					FIELD OR AREA DATA
Discovery date	April 1982					
Initial production rates						
Oil (bbl/day)	696					
Gas (Mcf/day)	2,510					
Flow pressure (psi)	2,219					
Bean size (in.)	14/64					
Initial reservoir pressure (psi)	2,870					
Reservoir temperature (°F)	143					
Initial oil content (STB/ac.-ft.)						
Initial gas content (MSCF/ac.-ft.)						
Formation	Sespe					
Geologic age	Oligocene					
Average depth (ft.)	6,700					
Average net thickness (ft.)	42					
Maximum productive area (acres)	40					
RESERVOIR ROCK PROPERTIES						
Porosity (%)	26					
So_i (%)						
Sw_i (%)	37-50					
Sg_i (%)						
Permeability to air (md)	40-90					
RESERVOIR FLUID PROPERTIES						
Oil:						
Oil gravity (°API)	42					
Sulfur content (% by wt.)	0					
Initial solution GOR (SCF/STB)	992					
Initial oil FVF (RB/STB)	1.525					
Bubble point press. (psia)	2,950					
Viscosity (cp) @ °F	0.348 @ 143					
Gas:						
Specific gravity (air = 1.0)	0.706					
Heating value (Btu/cu. ft.)	1,200-1,300					
Water:						
Salinity, NaCl (ppm)						
T.D.S. (ppm)						
R_w (ohm/m) (77°F)						
ENHANCED RECOVERY PROJECTS						
Enhanced recovery projects						
Date started						
Date discontinued						
Peak oil production (bbl)						24,545
Year						1983
Peak gas production, net (Mcf)						99,595
Year						1983

Base of fresh water (ft.):

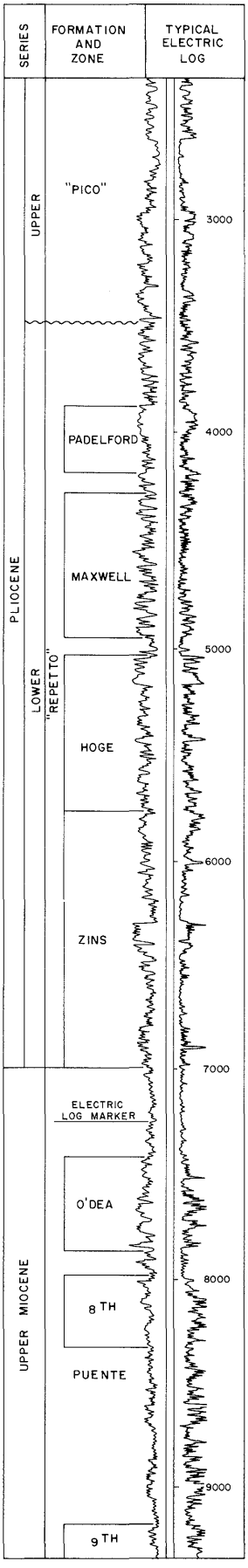
Remarks: a/ Directional well.

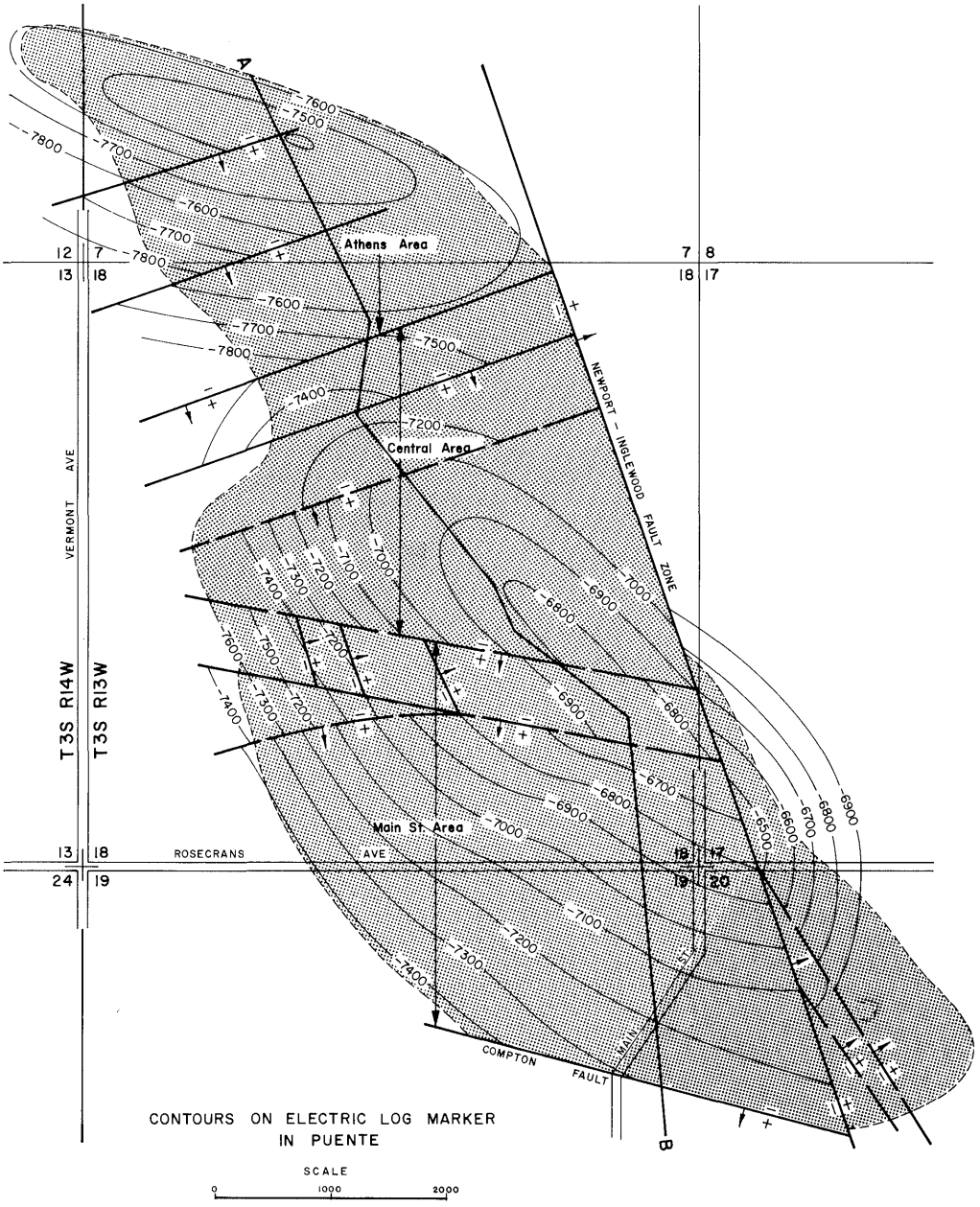
Selected References:

DATE: January 1991

CALIFORNIA DIVISION OF OIL AND GAS

ROSECRANS OIL FIELD





CONTOURS ON ELECTRIC LOG MARKER IN PUENTE

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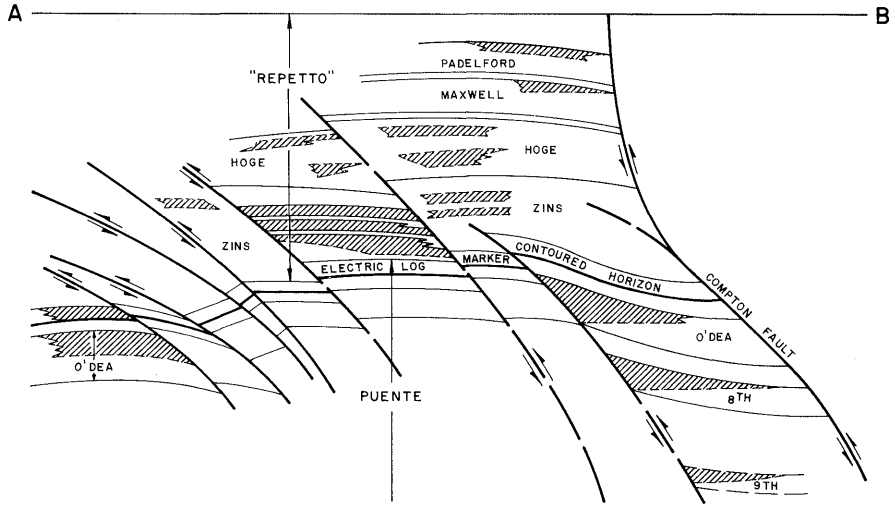


COUNTY: LOS ANGELES

ROSECRANS 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	Petro Lewis Corp. "Howard Park" 1	Potter Oil Co. of Calif. "Howard Park" 1	18 3S 13W	SB	6,283	Zins	
Deepest well	Petro Lewis Corp. "Rosecrans" 48	Beren Corp. "Rosecrans" 48	19 3S 13W	SB	11,884		Puente lower Miocene

POOL DATA

ITEM	PADELFORD	MAXWELL	HOGE	ZINS	O'DEA	FIELD OR AREA DATA
Discovery date	January 1925	February 1925	May 1924	November 1927	March 1937	
Initial production rates						
Oil (bbl/day)	1,200	550	723	1,640	1,086	
Gas (Mcf/day)	-	-	-	-	3,500	
Flow pressure (psi)						
Bean size (in.)						
Initial reservoir pressure (psi)	-	-	-	2,920	2,700	
Reservoir temperature (°F)	-	-	-	185	200	
Initial oil content (STB/ac.-ft.)						
Initial gas content (MSCF/ac.-ft.)						
Formation	"Repetto"	"Repetto"	"Repetto"	"Repetto"	Puente	
Geologic age	early Pliocene	early Pliocene	early Pliocene	early Pliocene	late Miocene	
Average depth (ft.)	3,750	4,250	4,820	5,700	7,200	
Average net thickness (ft.)	150	100	250	350	270	
Maximum productive area (acres)						
RESERVOIR ROCK PROPERTIES						
Porosity (%)	-	-	-	23	23-28	
So_i (%)	-	-	-	14	70	
Sw_i (%)	-	-	-	63	30	
Sg_i (%)	-	-	-	23	-	
Permeability to air (md)	-	-	-	40	25-34	
RESERVOIR FLUID PROPERTIES						
Oil:						
Oil gravity (°API)	37	29-40	32-40	31-46	31-36	
Sulfur content (% by wt.)	-	-	-	-	1.14	
Initial solution GOR (SCF/STB)	-	-	-	-	800	
Initial oil FVF (RB/STB)	-	-	-	-	1.4	
Bubble point press. (psia)						
Viscosity (cp) @ °F	-	-	-	0.6 @ 70	0.7 @ 70	
Gas:						
Specific gravity (air = 1.0)	-	-	-	0.76	0.78	
Heating value (Btu/cu. ft.)						
Water:						
Salinity, NaCl (ppm)	33,300	32,800	-	26,300	27,800	
T.D.S. (ppm)	-	34,300	-	32,000	29,300	
R_w (ohm/m) (77°F)	-	0.27	-	0.27	0.22	
ENHANCED RECOVERY PROJECTS						
Enhanced recovery projects				waterflood	waterflood	
Date started				1968	1968	
Date discontinued				active	active	
Peak oil production (bbl)						
Year						
Peak gas production, net (Mcf)						
Year						

Base of fresh water (ft.): 2,000-2,400

Remarks:

Selected References: Foster, J.F., 1954, Rosecrans and So. Rosecrans Oil Fields: Calif. Div. of Oil and Gas, Summary of Operations -- Calif. Oil Fields, Vol. 40, No. 2.
Musser, E.H., 1925, The Rosecrans Oil Field: Calif. Div. of Oil and Gas, Summary of Operations -- Calif. Oil Fields, Vol. 11, No. 5.

DATE: January 1989

CALIFORNIA DIVISION OF OIL AND GAS

COUNTY: LOS ANGELES

ROSECRANS 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	8TH	9TH				FIELD OR AREA DATA
Discovery date	October 1940	March 1940				
Initial production rates						
Oil (bbl/day)	243	144				
Gas (Mcf/day)	225	40				
Flow pressure (psi)						
Bean size (in.)						
Initial reservoir pressure (psi)						
Reservoir temperature (°F)						
Initial oil content (STB/ac.-ft.)						
Initial gas content (MSCF/ac.-ft.)						
Formation	Puente	Puente				
Geologic age	late Miocene	late Miocene				
Average depth (ft.)	8,200	9,100				
Average net thickness (ft.)	130	100				
Maximum productive area (acres)						725
RESERVOIR ROCK PROPERTIES						
Porosity (%)	20-21	17-18				
So_i (%)						
Sw_i (%)						
Sg_i (%)						
Permeability to air (md)	36*	40*				
RESERVOIR FLUID PROPERTIES						
Oil:						
Oil gravity (°API)	29-36	28				
Sulfur content (% by wt.)						
Initial solution GOR (SCF/STB)						
Initial oil FVF (RB/STB)						
Bubble point press. (psia)						
Viscosity (cp) @ °F						
Gas:						
Specific gravity (air = 1.0)						
Heating value (Btu/cu. ft.)						
Water:						
Salinity, NaCl (ppm)	23,300	-				
T.D.S. (ppm)	26,200	-				
R_w (ohm/m) (77°F)	0.25	-				
ENHANCED RECOVERY PROJECTS						
Enhanced recovery projects						
Date started						
Date discontinued						
Peak oil production (bbl)						7,726,383
Year						1925
Peak gas production, net (Mcf)						
Year						

Base of fresh water (ft.):

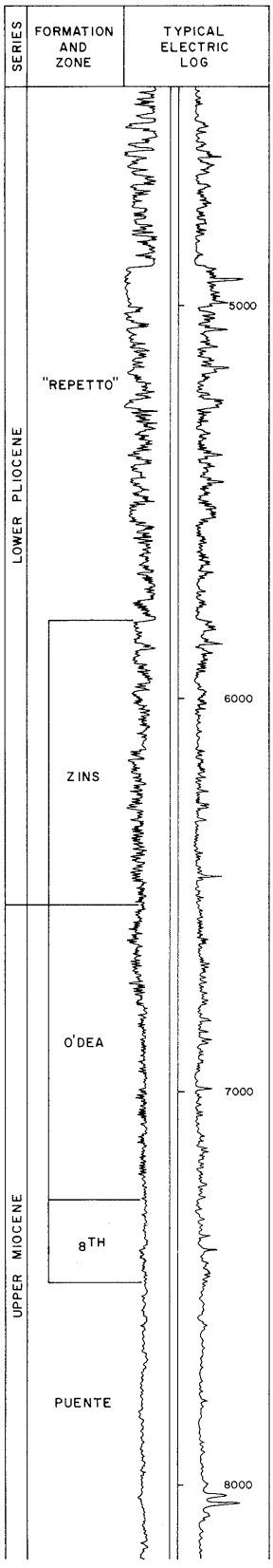
Remarks:

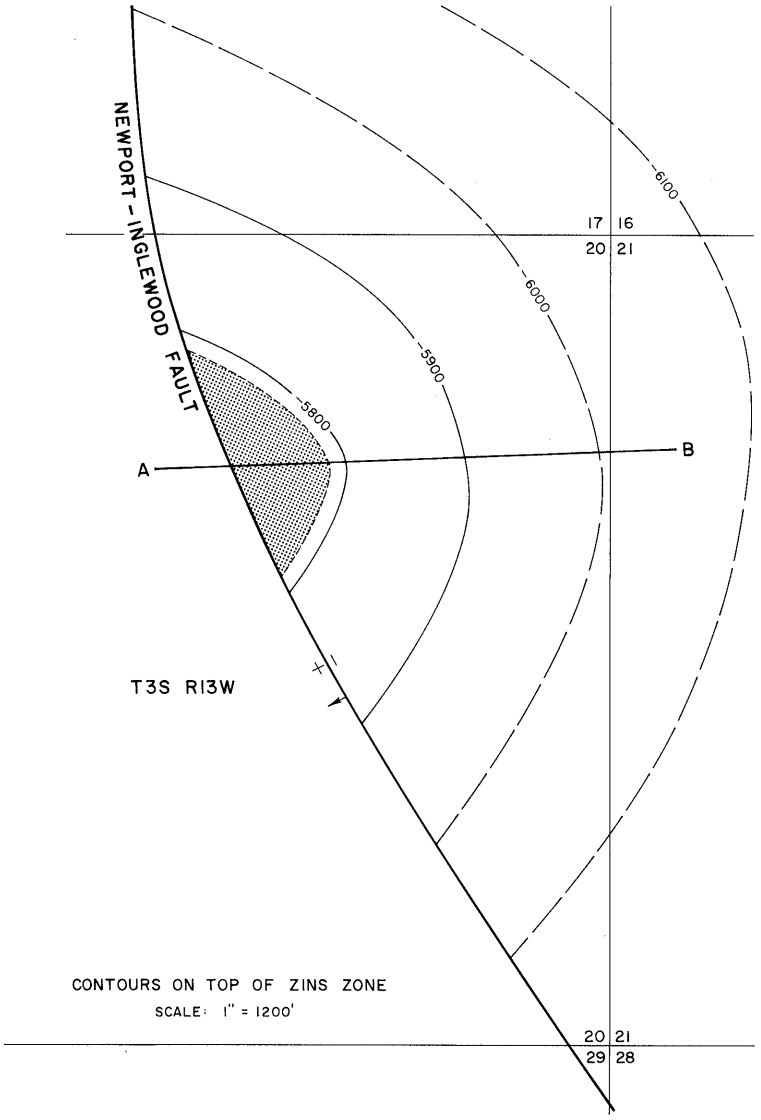
Selected References:

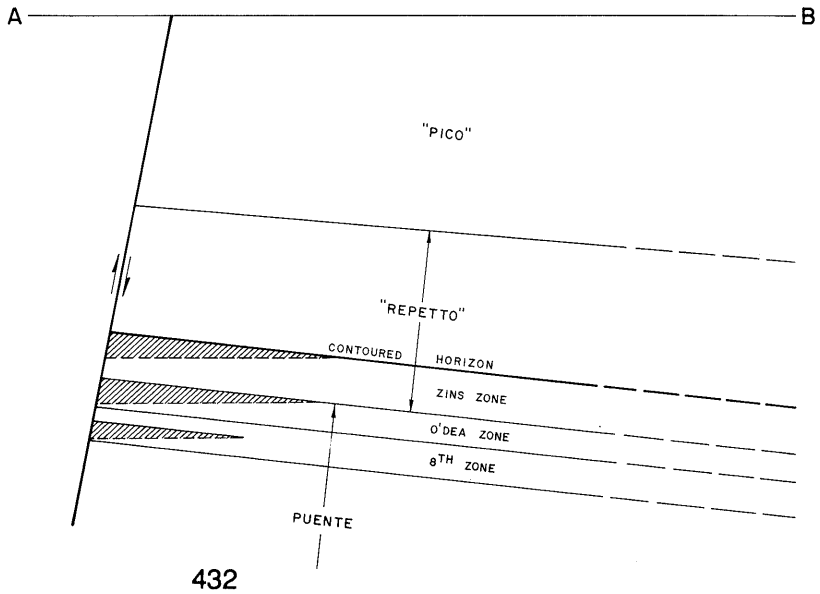
DATE: January 1989 * Average value

CALIFORNIA DIVISION OF OIL AND GAS

EAST ROSECRANS OIL FIELD







COUNTY: LOS ANGELES

ROSECRANS, EAST, 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	Gardena Oil Co. "Bucher" 1	G.R. Nance "Bucher" 1	20 3S 13W	SB	8,200	Zins	Puente late Miocene
Deepest well	Same as above	"	"	"	"	"	"

POOL DATA

ITEM	ZINS	O'DEA	8th			FIELD OR AREA DATA
Discovery date	February 1959	February 1959	February 1959			
Initial production rates						
Oil (bbl/day)	373a/	a/	a/			
Gas (Mcf/day)	500a/	a/	a/			
Flow pressure (psi)						
Bean size (in.)						
Initial reservoir pressure (psi)						
Reservoir temperature (°F)						
Initial oil content (STB/ac.-ft.)						
Initial gas content (MSCF/ac.-ft.)						
Formation	"Repetto"	Puente	Puente			
Geologic age	early Pliocene	late Miocene	late Miocene			
Average depth (ft.)	5,800	6,800	7,500			
Average net thickness (ft.)	350	550	180			
Maximum productive area (acres)						20
RESERVOIR ROCK PROPERTIES						
Porosity (%)	23**	23-28**	20-21**			
S_{oi} (%)						
S_{wi} (%)						
S_{gi} (%)						
Permeability to air (md)						
RESERVOIR FLUID PROPERTIES						
Oil:						
Oil gravity (°API)	30	30	30			
Sulfur content (% by wt.)						
Initial solution GOR (SCF/STB)						
Initial oil FVF (RB/STB)						
Bubble point press. (psia)						
Viscosity (cp) @ °F						
Gas:						
Specific gravity (air = 1.0)						
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						
Date started						
Date discontinued						
Peak oil production (bbl)						23,635
Year						1959
Peak gas production, net (Mcf)						
Year						

Base of fresh water (ft.): 2,000-2,400

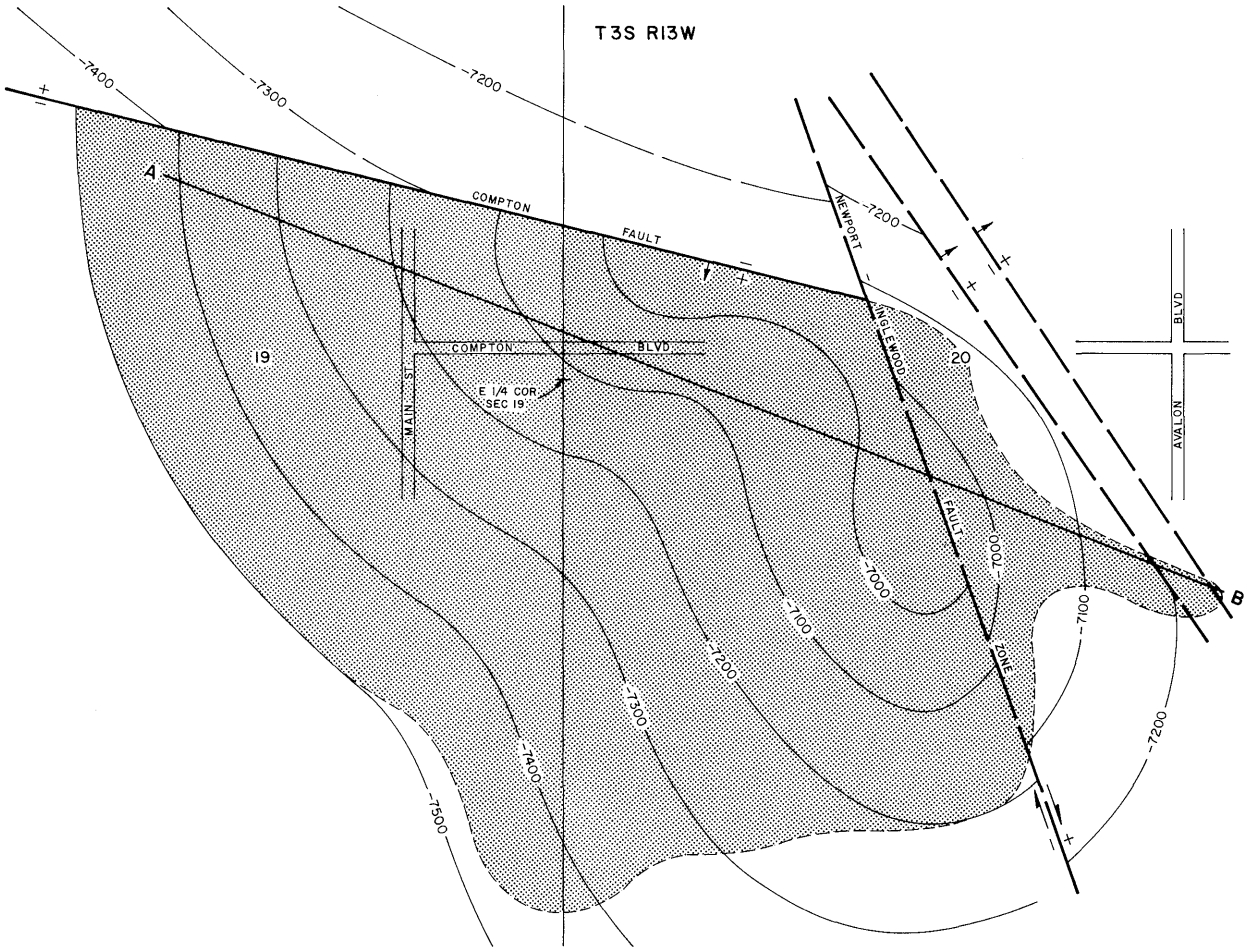
Remarks: a/ Production was commingled in the Zins, O'Dea & 8th zones.

Selected References:

DATE: January 1989 ** Estimated value

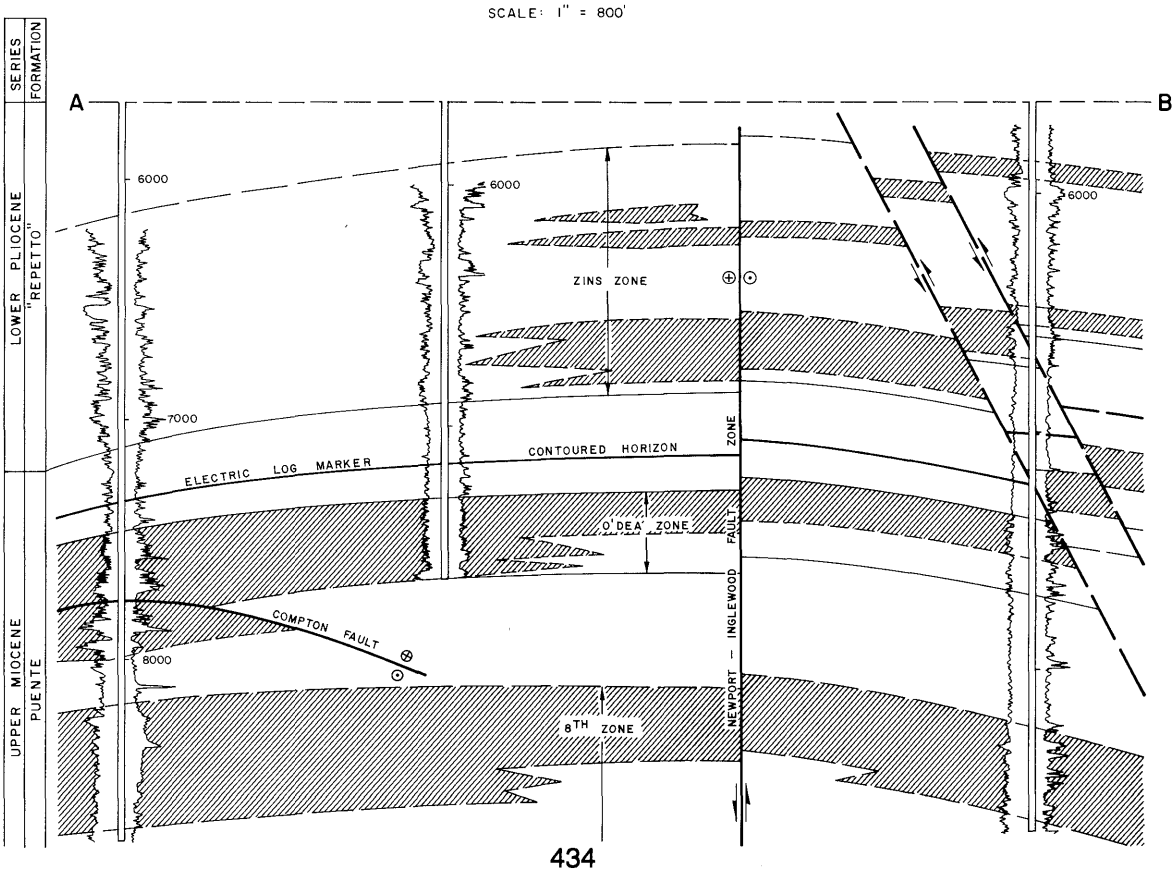
CALIFORNIA DIVISION OF OIL AND GAS

SOUTH ROSECRANS OIL FIELD



CONTOURS ON ELECTRIC LOG MARKER IN PUENTE

SCALE: 1" = 800'



COUNTY: LOS ANGELES

ROSECRANS, 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	Belmont Oil Co. "Averill" 1	Howard Oil Associates "H.O." 1	20 3S 13W	SB	7,644	O'Dea	
Deepest well	American Titan Oil Co. "Hatfield" 1	Apex Petroleum Corp., Ltd. "Hatfield" 1	20 3S 13W	SB	9,214		Puente late Miocene

POOL DATA

ITEM	ZINS	O'DEA	8TH			FIELD OR AREA DATA
Discovery date	October 1951	August 1939	February 1940			
Initial production rates						
Oil (bbl/day)	35	100	69			
Gas (Mcf/day)	2,500	-	595			
Flow pressure (psi)						
Bean size (in.)						
Initial reservoir pressure (psi)						
Reservoir temperature (°F)						
Initial oil content (STB/ac.-ft.)						
Initial gas content (MSCF/ac.-ft.)						
Formation	"Repetto"	Puente	Puente			
Geologic age	early Pliocene	late Miocene	late Miocene			
Average depth (ft.)	6,200	7,300	8,600			
Average net thickness (ft.)	250	325	375			
Maximum productive area (acres)						195
RESERVOIR ROCK PROPERTIES						
Porosity (%)	23**	23-28**	20-21**			
S_{oi} (%)						
S_{wi} (%)						
S_{gi} (%)						
Permeability to air (md)	40**	25-34**	36**			
RESERVOIR FLUID PROPERTIES						
Oil:						
Oil gravity (°API)	30-46	30-33	28-36			
Sulfur content (% by wt.)						
Initial solution GOR (SCF/STB)						
Initial oil FVF (RB/STB)						
Bubble point press. (psia)						
Viscosity (cp) @ °F						
Gas:						
Specific gravity (air = 1.0)						
Heating value (Btu/cu. ft.)						
Water:						
Salinity, NaCl (ppm)	30,420	29,070	26,676			
T.D.S. (ppm)						
R_w (ohm/m) (77°F)						
ENHANCED RECOVERY PROJECTS						
Enhanced recovery projects						
Date started						
Date discontinued						
Peak oil production (bbl)						1,487,620
Year						1940
Peak gas production, net (Mcf)						
Year						

Base of fresh water (ft.): 2,000-2,400

Remarks: The 9th zone has doubtful commercial value. It is only open to production in the field in one well, which also produces from the 8th zone.

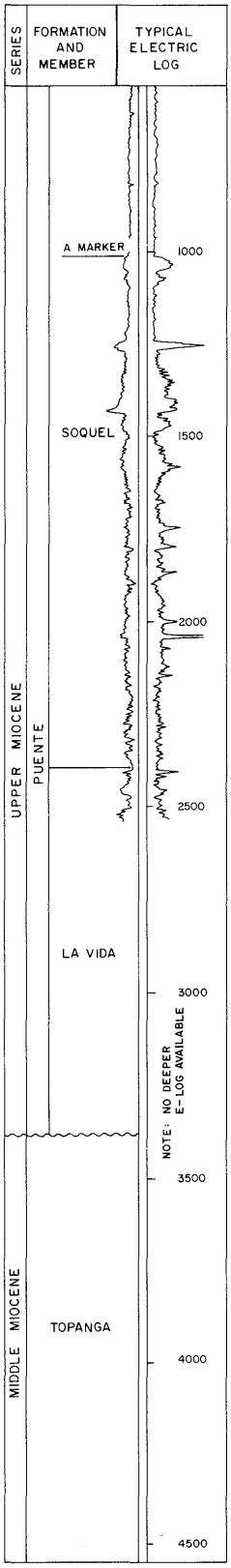
Selected References: Foster, J.F., 1954, Rosecrans and South Rosecrans Oil Field: Calif. Div. of Oil and Gas, Summary of Operations -- Calif. Oil Fields, Vol. 40, No. 2.

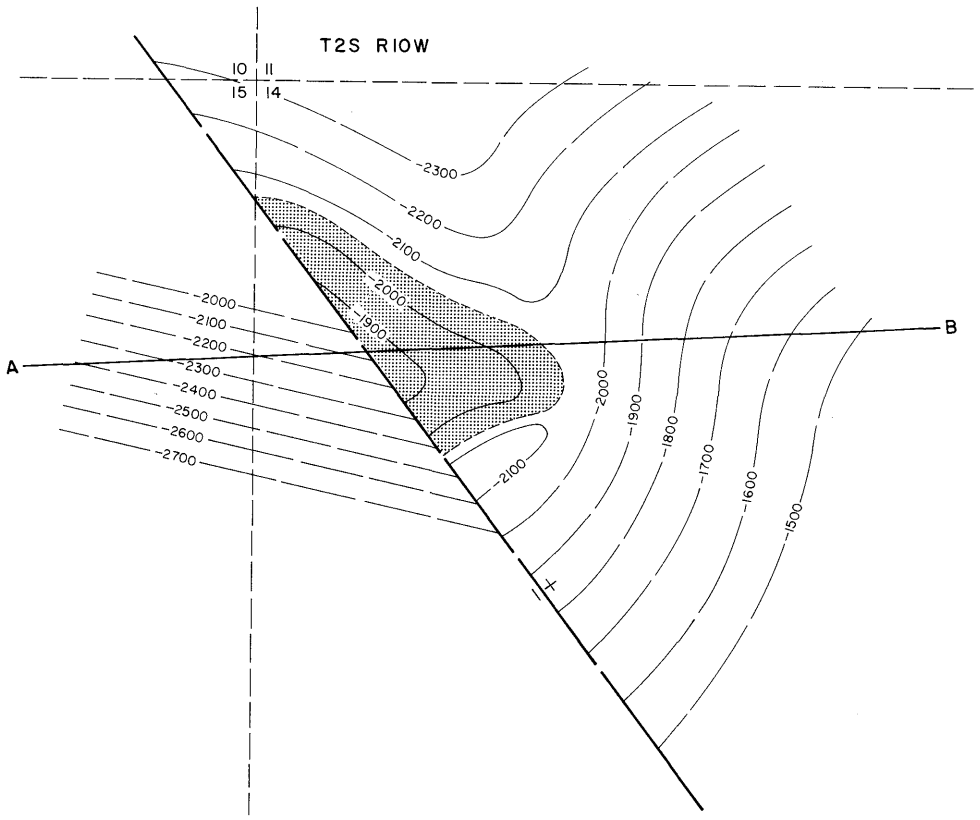
DATE: January 1989 ** Estimated value

CALIFORNIA DIVISION OF OIL AND GAS

ROWLAND OIL FIELD

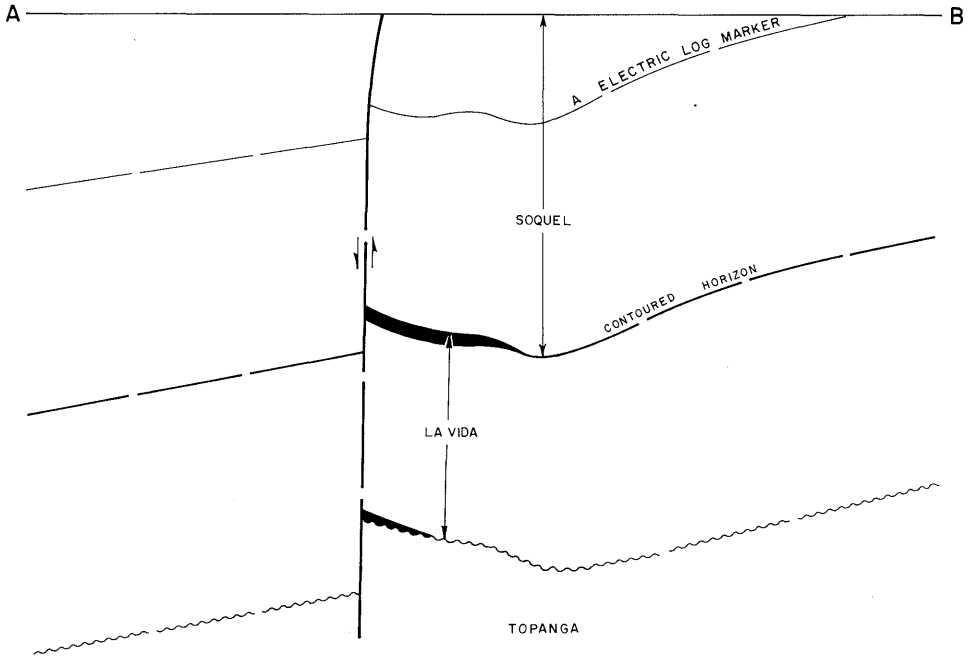
(Abandoned)





CONTOURS ON TOP OF LA VIDA

SCALE: 1" = 1200'



COUNTY: LOS ANGELES

ROWLAND OIL FIELD (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	J.W. Dietzel "Rowland" 1	Western American Petroleum Co. 1	14 2S 10W	SB	4,908	unnamed	Puente late Miocene
Deepest well	Same as above	"	"	"	"	"	"

POOL DATA

ITEM	UNNAMED	UNNAMED				FIELD OR AREA DATA
Discovery date	March 1943	October 1937				
Initial production rates						
Oil (bbl/day)	8	24				
Gas (Mcf/day)	0	0				
Flow pressure (psi)						
Bean size (in.)						
Initial reservoir pressure (psi)						
Reservoir temperature (°F)						
Initial oil content (STB/ac.-ft.)						
Initial gas content (MSCF/ac.-ft.)						
Formation	Puente	Puente				
Geologic age	late Miocene	late Miocene				
Average depth (ft.)	2,382	3,350				
Average net thickness (ft.)	35	50				
Maximum productive area (acres)						10
RESERVOIR ROCK PROPERTIES						
Porosity (%)						
S_{oi} (%)						
S_{wi} (%)						
S_{gi} (%)						
Permeability to air (md)						
RESERVOIR FLUID PROPERTIES						
Oil:						
Oil gravity (°API)	20	26				
Sulfur content (% by wt.)						
Initial solution GOR (SCF/STB)						
Initial oil FVF (RB/STB)						
Bubble point press. (psia)						
Viscosity (cp) @ °F						
Gas:						
Specific gravity (air = 1.0)						
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						
Date started						
Date discontinued						
Peak oil production (bbl)						800
Year						1943
Peak gas production, net (Mcf)						
Year						

Base of fresh water (ft.): 300

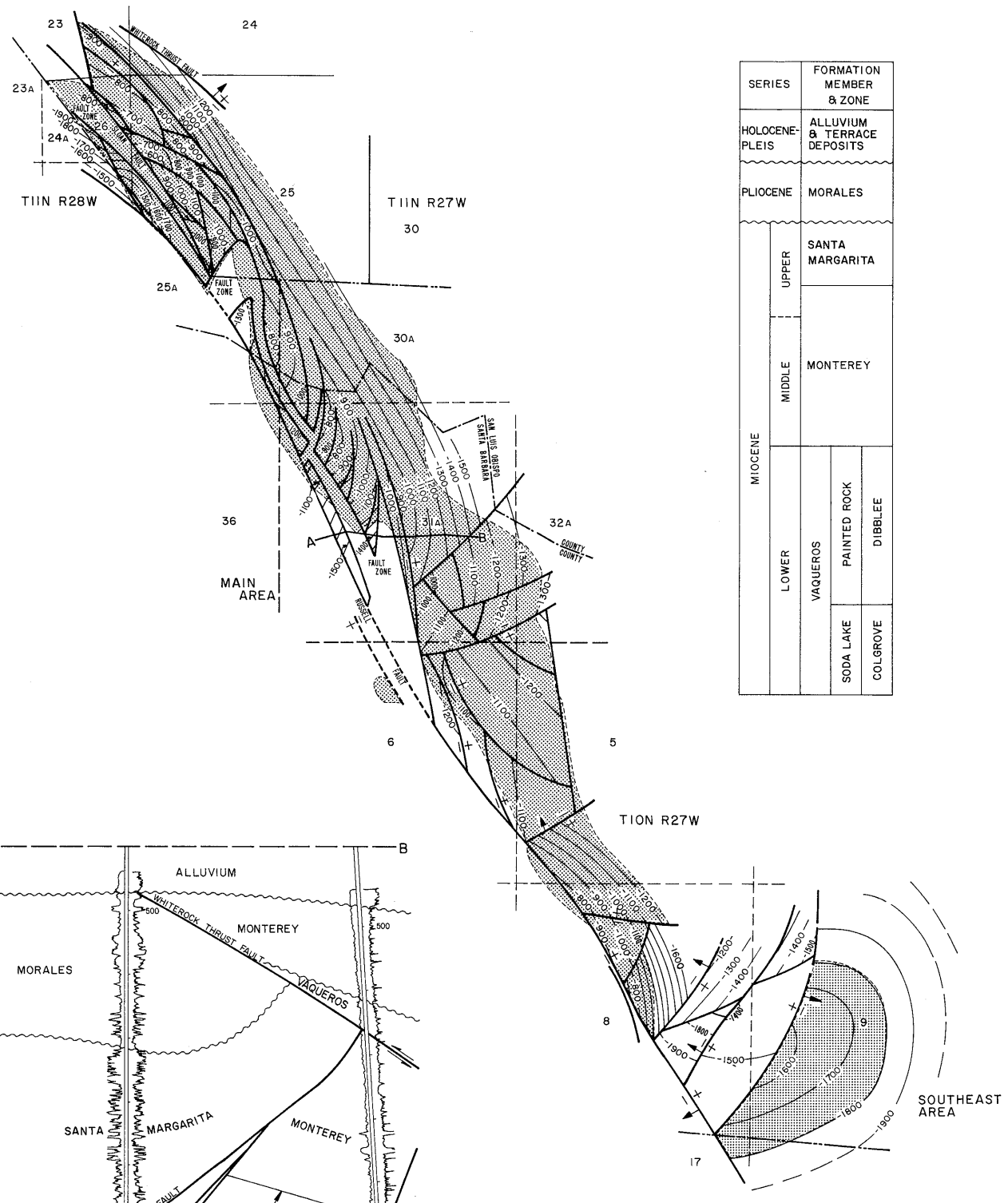
Remarks: Last production was in 1945. The field was abandoned in 1946. Cumulative production is 1,885 bbl of oil and no gas.

Selected References:

DATE: January 1989

CALIFORNIA DIVISION OF OIL AND GAS

RUSSELL RANCH OIL FIELD



CONTOURS ON TOP OF MAIN DIBBLEE SAND

COUNTY: SAN LUIS OBISPO AND SANTA BARBARA

RUSSELL RANCH 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	West America Resources "G.D.U." 2-25A	Norris Oil Co. "Cuyama" 2	25 11N 28W	SB	1,973	Santa Margarita	
Deepest well	West America Resources "F.R. Anderson" 73-36	Richfield Oil Corp. "F.R. Anderson" 73-36	36 11N 28W	SB	5,636		undifferentiated marine Mio-Oligocene(?)

POOL DATA

ITEM	SANTA MARGARITA					FIELD OR AREA DATA
Discovery date	January 1948					
Initial production rates						
Oil (bbl/day)	190					
Gas (Mcf/day)	10					
Flow pressure (psi)	220-250					
Bean size (in.)	18/64					
Initial reservoir pressure (psi)	850					
Reservoir temperature (°F)						
Initial oil content (STB/ac.-ft.)						
Initial gas content (MSCF/ac.-ft.)						
Formation	Santa Margarita					
Geologic age	late Miocene					
Average depth (ft.)	2,500					
Average net thickness (ft.)	50-200					
Maximum productive area (acres)						1,540
RESERVOIR ROCK PROPERTIES						
Porosity (%)	32					
So_i (%)						
Sw_i (%)						
Sg_i (%)						
Permeability to air (md)	1,330					
RESERVOIR FLUID PROPERTIES						
Oil:						
Oil gravity (°API)	25-26					
Sulfur content (% by wt.)	0.26-0.45					
Initial solution GOR (SCF/STB)						
Initial oil FVF (RB/STB)						
Bubble point press. (psia)						
Viscosity (cp) @ °F						
Gas:						
Specific gravity (air = 1.0)						
Heating value (Btu/cu. ft.)						
Water:						
Salinity, NaCl (ppm)	13,700-18,000					
T.D.S. (ppm)	15,000-21,000					
R_w (ohm/m) (77°F)						
ENHANCED RECOVERY PROJECTS						
Enhanced recovery projects						
Date started						
Date discontinued						
Peak oil production (bbl)						7,929,497
Year						1950
Peak gas production, net (Mcf)						4,218,503
Year						1958

Base of fresh water (ft.): See areas

Remarks:

Selected References:

Barger, R.M., and J.L. Zulberti, 1952, Russell Ranch Oil Field: Calif. Div. of Oil and Gas, Summary of Operations--Calif. Oil Fields, Vol. 38, No. 2.

Hill, M.L., S.A. Carlson, and T.W. Dibblee, Jr., 1958, Stratigraphy of Cuyama Valley - Caliente Range Areas, California: Am. Assoc. of Petroleum Geologists Bull., Vol. 42, No. 12, p. 2973.

DATE: January 1989

CALIFORNIA DIVISION OF OIL AND GAS

COUNTY: SAN LUIS OBISPO AND SANTA BARBARA

RUSSELL RANCH 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	West America Resources "G.D.U." 2-25A	Norris Oil Co. "Cuyama" 2	25 11N 28W	SB	1,973	Santa Margarita	
Deepest well	West America Resources "F.R. Anderson" 73-36	Richfield Oil Corp. "F.R. Anderson" 73-36	36 11N 28W	SB	5,636		undifferentiated marine Mio-Oligocene(?)

POOL DATA

ITEM	SANTA MARGARITA	DIBBLEE	GRIGGS-DIBBLEE	COLGROVE		FIELD OR AREA DATA
Discovery date	January 1948	June 1948	October 1949	February 1949		
Initial production rates						
Oil (bbl/day)	190	351	240	568		
Gas (Mcf/day)	10	181	-	-		
Flow pressure (psi)	220-250	150	-	-		
Bean size (in.)	18/64	-	-	-		
Initial reservoir pressure (psi)	850	1,285	-	-		
Reservoir temperature (°F)	-	140	150	-		
Initial oil content (STB/ac.-ft.)	-	1,097	-	-		
Initial gas content (MSCF/ac.-ft.)	-	300	-	-		
Formation	Santa Margarita	Vaqueros	Vaqueros	Vaqueros		
Geologic age	late Miocene	early Miocene	early Miocene	early Miocene		
Average depth (ft.)	2,500	2,800-3,200	3,400	3,500		
Average net thickness (ft.)	50-200	120-160	150	100		
Maximum productive area (acres)						1,410
RESERVOIR ROCK PROPERTIES						
Porosity (%)	32	23-25	25	-		
So_i (%)	-	25-40	44	-		
Sw_i (%)	-	40-55	34	-		
Sg_i (%)	-	10-20	22	-		
Permeability to air (md)	1,330	102-350	237	-		
RESERVOIR FLUID PROPERTIES						
Oil:						
Oil gravity (°API)	25-26	30-38	38	35-40		
Sulfur content (% by wt.)	0.26-0.45	0.26-0.45	0.26-0.45	0.26-0.45		
Initial solution GOR (SCF/STB)	-	273	-	-		
Initial oil FVF (RB/STB)	-	1.16	-	-		
Bubble point press. (psia)	-	1,085	-	-		
Viscosity (cp) @ °F	-	0.99-1.43 @ 140	-	-		
Gas:						
Specific gravity (air = 1.0)						
Heating value (Btu/cu. ft.)						
Water:						
Salinity, NaCl (ppm)	13,700-18,000	7,960-9,075	19,688-22,427	9,159-24,825		
T.D.S. (ppm)	15,000-21,000	9,978-14,500	22,005	-		
R_w (ohm/m) (77°F)	-	-	0.33	-		
ENHANCED RECOVERY PROJECTS						
Enhanced recovery projects		waterflood	waterflood			cyclic steam
Date started		1953	1976			1966
Date discontinued		active pressure maintenance 1949 active air injection 1971 1973	1982			1968
Peak oil production (bbl)						7,929,497
Year						1950
Peak gas production, net (Mcf)						4,218,503
Year						1958

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

Remarks:

Selected References: Dolman, S.G., 1948, Operations in District No. 3: Calif. Div. of Oil and Gas, Summary of Operations--Calif. Oil Fields, Vol. 34, No. 2.

DATE: January 1989

CALIFORNIA DIVISION OF OIL AND GAS

COUNTY: SANTA BARBARA

RUSSELL RANCH OIL FIELD
SOUTHEAST 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	West America Resources "Russell A" 15-9	Richfield Oil Corp. "Russell A" 15-9	9 10N 27W	SB	4,190	Dibblee	
Deepest well	West America Resources "Russell A" 23-9	Richfield Oil Corp. "Russell A" 23-9	9 10N 27W	SB	5,085		Vaqueros Miocene

POOL DATA

ITEM	DIBBLEE					FIELD OR AREA DATA
Discovery date	November 1952					
Initial production rates						
Oil (bbl/day)	162					
Gas (Mcf/day)	65					
Flow pressure (psi)	360					
Bean size (in.)	12/64					
Initial reservoir pressure (psi)	1,125					
Reservoir temperature (°F)	116					
Initial oil content (STB/ac.-ft.)	1,100***					
Initial gas content (MSCF/ac.-ft.)	300***					
Formation	Vaqueros					
Geologic age	early Miocene					
Average depth (ft.)	3,600					
Average net thickness (ft.)	70					
Maximum productive area (acres)	130					
RESERVOIR ROCK PROPERTIES						
Porosity (%)	24-25					
S_{oi} (%)	25-40					
S_{wi} (%)	40-55					
S_{gi} (%)	10-20					
Permeability to air (md)	102-350					
RESERVOIR FLUID PROPERTIES						
Oil:						
Oil gravity (°API)	39					
Sulfur content (% by wt.)	0.26-0.45					
Initial solution GOR (SCF/STB)	422					
Initial oil FVF (RB/STB)	1.10***					
Bubble point press. (psia)	1,050***					
Viscosity (cp) @ °F	0.99 @ 110					
Gas:						
Specific gravity (air = 1.0)						
Heating value (Btu/cu. ft.)						
Water:						
Salinity, NaCl (ppm)	7,900-9,075					
T.D.S. (ppm)	9,978-14,500					
R_w (ohm/m) (77°F)						
ENHANCED RECOVERY PROJECTS						
Enhanced recovery projects						
Date started						
Date discontinued						
Peak oil production (bbl)	125,473					
Year	1954					
Peak gas production, net (Mcf)						
Year						

Base of fresh water (ft.): 1,100

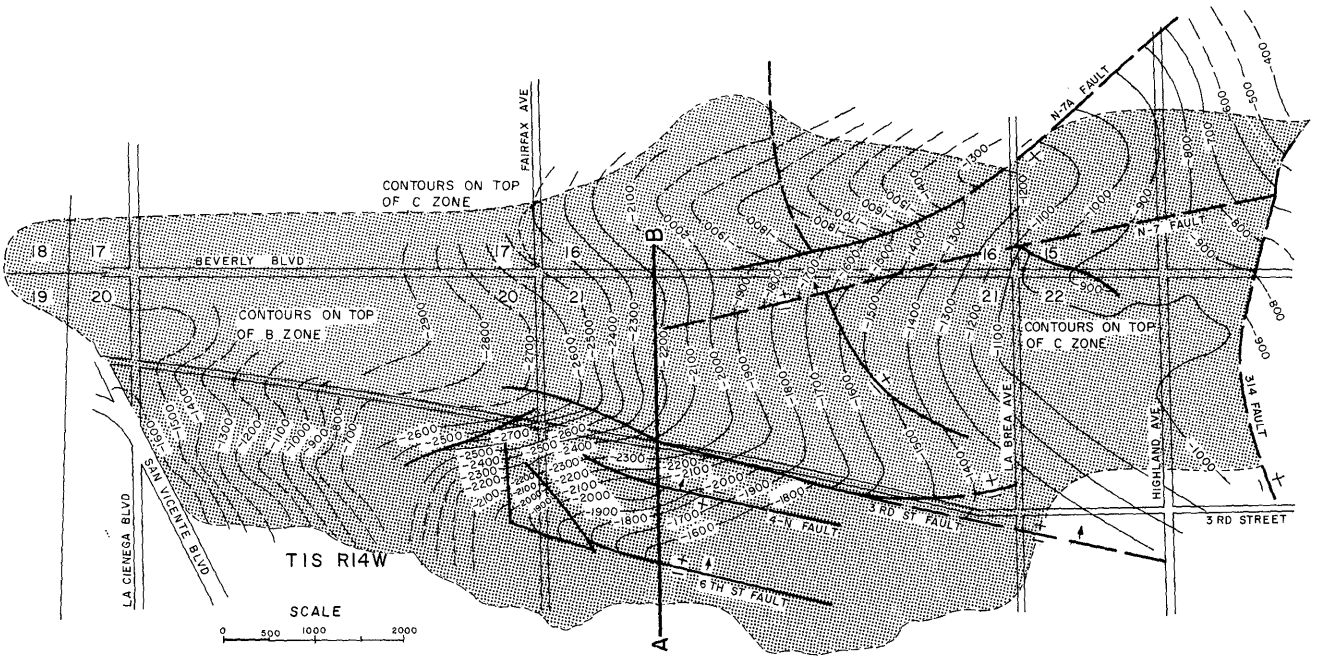
Remarks:

Selected References: Bailey, Wm. C., 1952, Operations in District No. 3: Calif. Div. of Oil and Gas, Summary of Operations--Calif. Oil Fields, Vol. 38, No. 2.

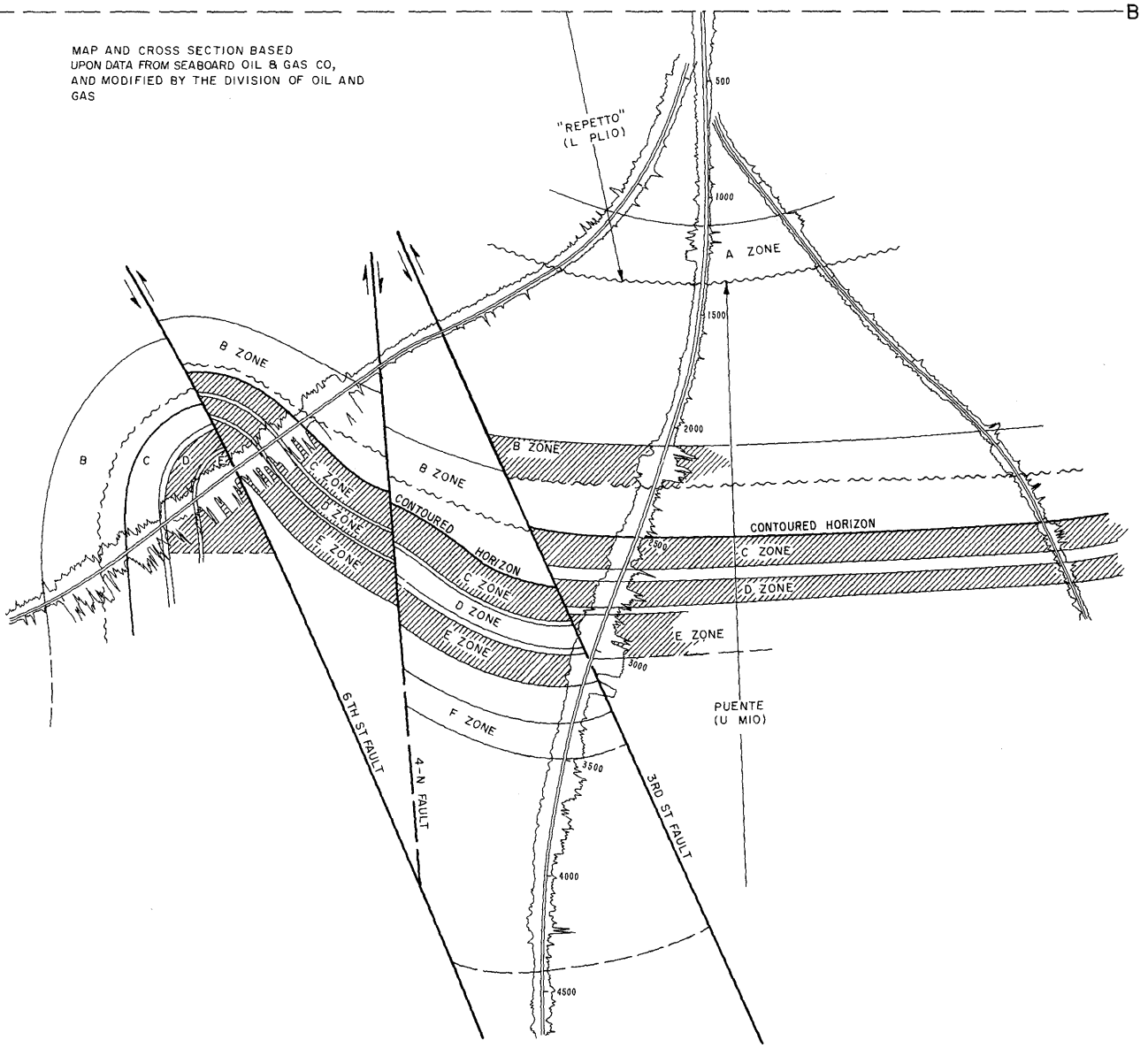
DATE: January 1989 ***Representative values for area, formation, and depth

CALIFORNIA DIVISION OF OIL AND GAS

SALT LAKE OIL FIELD



MAP AND CROSS SECTION BASED UPON DATA FROM SEABOARD OIL & GAS CO, AND MODIFIED BY THE DIVISION OF OIL AND GAS



COUNTY: LOS ANGELES

SALT LAKE 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	Texaco Producing Inc. well number unknown	Salt Lake Oil Co. of Calif. well number unknown	unknown	SB	unk.	A	
Deepest well	McFarland Energy, Inc. "U-93" 5	Jade Oil and Gas Co. "U-93" 5	21 1S 14W	SB	10,446		Puente late Miocene

POOL DATA

ITEM	A	B	C	D	E	FIELD OR AREA DATA
Discovery date	1902	unknown	August 1904	May 1960	May 1960	
Initial production rates						
Oil (bbl/day)	-	-	250	75a/	a/	
Gas (Mcf/day)	-	-	-	33a/	a/	
Flow pressure (psi)						
Bean size (in.)						
Initial reservoir pressure (psi)	-	-	880	-	-	
Reservoir temperature (°F)	-	-	120	123	125	
Initial oil content (STB/ac.-ft.)						
Initial gas content (MSCF/ac.-ft.)						
Formation	"Repetto"	Puente	Puente	Puente	Puente	
Geologic age	early Pliocene	late Miocene	late Miocene	late Miocene	late Miocene	
Average depth (ft.)	1,000	2,300	2,650	2,850		
Average net thickness (ft.)	200	250	275	200	100	
Maximum productive area (acres)						
RESERVOIR ROCK PROPERTIES						
Porosity (%)	-	-	34	62	-	
S_{oi} (%)	-	-	69	-	-	
S_{wi} (%)	-	-	31	-	-	
S_{gi} (%)	-	-	0.0	-	-	
Permeability to air (md)	-	-	311	-	-	
RESERVOIR FLUID PROPERTIES						
Oil:						
Oil gravity (°API)	14-18	18	9-22	14	18	
Sulfur content (% by wt.)	2.73	2.73	2.73	2.73	2.73	
Initial solution GOR (SCF/STB)	-	-	65	-	-	
Initial oil FVF (RB/STB)	-	-	1.045	-	-	
Bubble point press. (psia)	-	-	600	-	-	
Viscosity (cp) @ °F	7.7 @ 108	-	3.0 @ 108	-	-	
Gas:						
Specific gravity (air = 1.0)	-	-	0.69	-	-	
Heating value (Btu/cu. ft.)						
Water:						
Salinity, NaCl (ppm)	-	-	7,190	-	-	
T.D.S. (ppm)						
R_w (ohm/m) (77°F)						
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.): 250

Remarks: a/ D, E, & F production commingled.

Selected References: Crowder, R.E., and R.A. Johnson, 1963, Recent Developments in Jade-Buttram Area of Salt Lake Oil Field: Calif. Div. of Oil and Gas, Summary of Operations -- Calif. Oil Fields, Vol. 49, No. 1.

DATE: June 1983

CALIFORNIA DIVISION OF OIL AND GAS

COUNTY: LOS ANGELES

SALT LAKE 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	F					FIELD OR AREA DATA
Discovery date	May 1960					
Initial production rates						
Oil (bbl/day)	a/					
Gas (Mcf/day)	a/					
Flow pressure (psi)						
Bean size (in.)						
Initial reservoir pressure (psi)						
Reservoir temperature (°F)	128					
Initial oil content (STB/ac.-ft.)						
Initial gas content (MSCF/ac.-ft.)						
Formation	Puente					
Geologic age	late Miocene					
Average depth (ft.)	3,300					
Average net thickness (ft.)	100					
Maximum productive area (acres)						1,380
RESERVOIR ROCK PROPERTIES						
Porosity (%)						
So_i (%)						
Sw_i (%)						
Sg_i (%)						
Permeability to air (md)						
RESERVOIR FLUID PROPERTIES						
Oil:						
Oil gravity (°API)	20					
Sulfur content (% by wt.)	2.73					
Initial solution GOR (SCF/STB)						
Initial oil FVF (RB/STB)						
Bubble point press. (psia)						
Viscosity (cp) @ °F						
Gas:						
Specific gravity (air = 1.0)						
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						
Date started						
Date discontinued						
Peak oil production (bbl)						4,535,800
Year						1908
Peak gas production, net (Mcf)						
Year						

Base of fresh water (ft.):

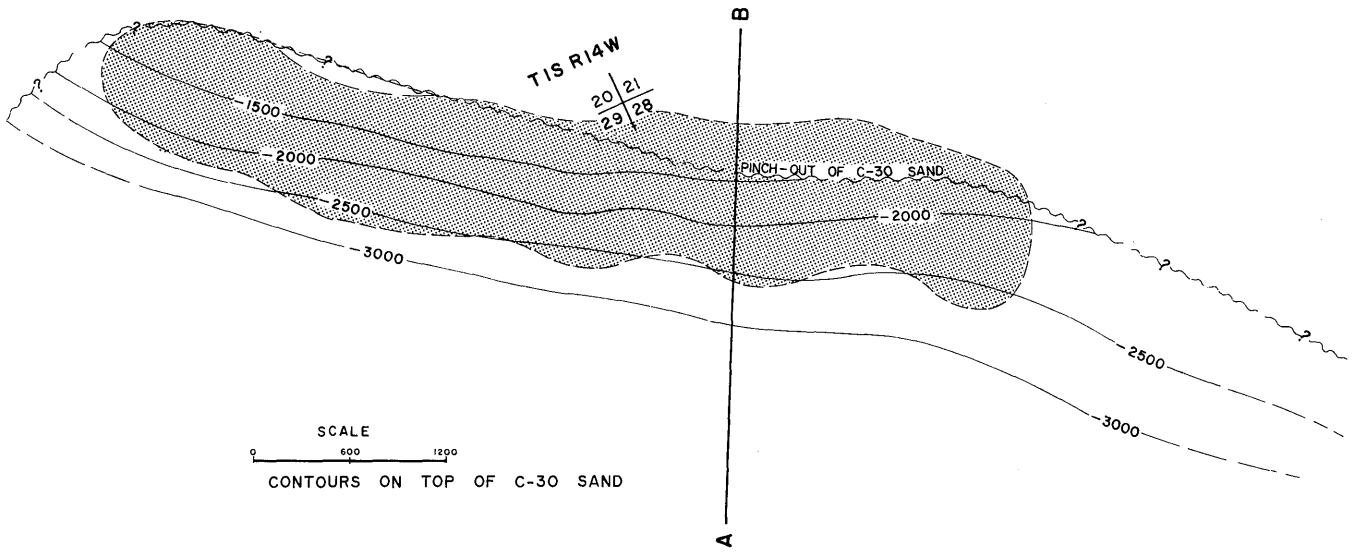
Remarks: a/ D, E, & F production commingled.

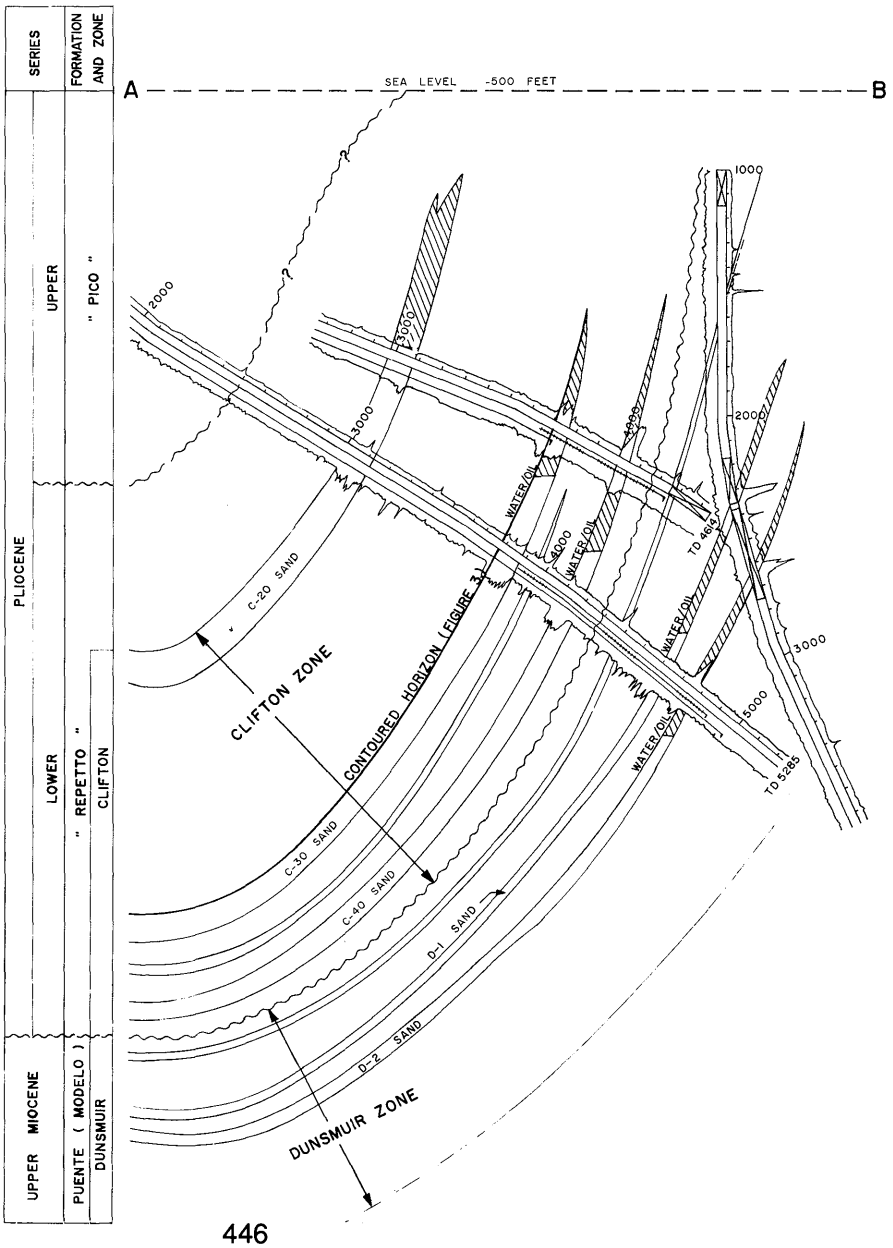
Selected References:

DATE: June 1983

CALIFORNIA DIVISION OF OIL AND GAS

SOUTH SALT LAKE OIL FIELD





COUNTY: LOS ANGELES

SALT LAKE, 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	Chevron U.S.A. Inc. P-60	Standard Oil Co. of Calif. P-60	29 1S 14W	SB	5,247	Dunsmuir sands	
Deepest well	Chevron U.S.A. Inc. "Seibu Corehole" 1	Standard Oil Co. of Calif. "Seibu Corehole" 1	29 1S 14W	SB	7,467		Puente late Miocene

POOL DATA

ITEM	CLIFTON SANDS	DUNSMUIR SANDS				FIELD OR AREA DATA
Discovery date	October 1970	March 1970				
Initial production rates						
Oil (bbl/day)	200	18				
Gas (Mcf/day)	198	230				
Flow pressure (psi)	-	260				
Bean size (in.)						
Initial reservoir pressure (psi)						
Reservoir temperature (°F)	127*	135*				
Initial oil content (STB/ac.-ft.)						
Initial gas content (MSCF/ac.-ft.)						
Formation	"Repetto"	Puente				
Geologic age	early Pliocene	late Miocene				
Average depth (ft.)	1,000	2,500				
Average net thickness (ft.)	445	110				
Maximum productive area (acres)						200
RESERVOIR ROCK PROPERTIES						
Porosity (%)	29	23				
So_i (%)						
Sw_i (%)						
Sg_i (%)						
Permeability to air (md)	400	150				
RESERVOIR FLUID PROPERTIES						
Oil:						
Oil gravity (°API)	22	26				
Sulfur content (% by wt.)						
Initial solution GOR (SCF/STB)	605a/	a/				
Initial oil FVF (RB/STB)						
Bubble point press. (psia)						
Viscosity (cp) @ °F						
Gas:						
Specific gravity (air = 1.0)						
Heating value (Btu/cu. ft.)						
Water:						
Salinity, NaCl (ppm)	24,282	27,360				
T.D.S. (ppm)						
R_w (ohm/m) (77°F)	0.73	0.52				
ENHANCED RECOVERY PROJECTS						
Enhanced recovery projects						
Date started						
Date discontinued						
Peak oil production (bbl)						1,336,107
Year						1972
Peak gas production, net (Mcf)						593,134
Year						1972

Base of fresh water (ft.): 250

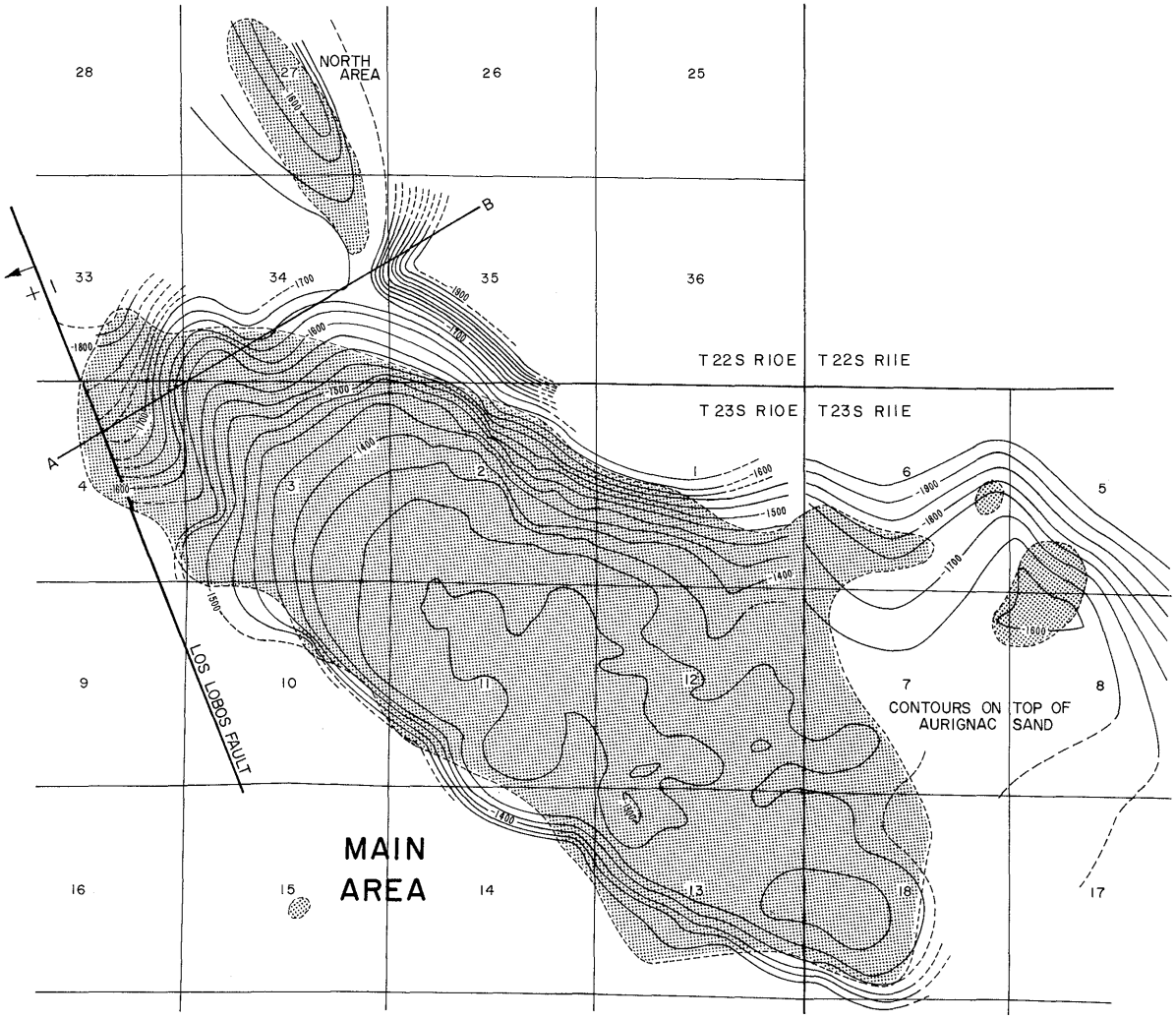
Remarks: All wells directionally drilled from urban drillsites.
a/ Production was commingled.

Selected References: Samuelian, R.H., 1984, South Salt Lake Oil Field, Calif. Div. of Oil and Gas publication No. TR 32.

DATE: January 1989 *Average value

CALIFORNIA DIVISION OF OIL AND GAS

SAN ARDO OIL FIELD



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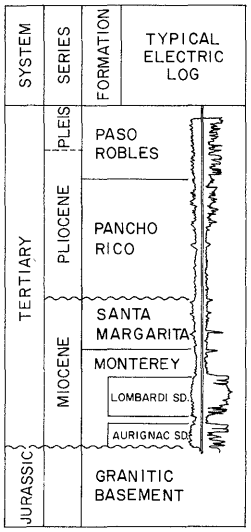
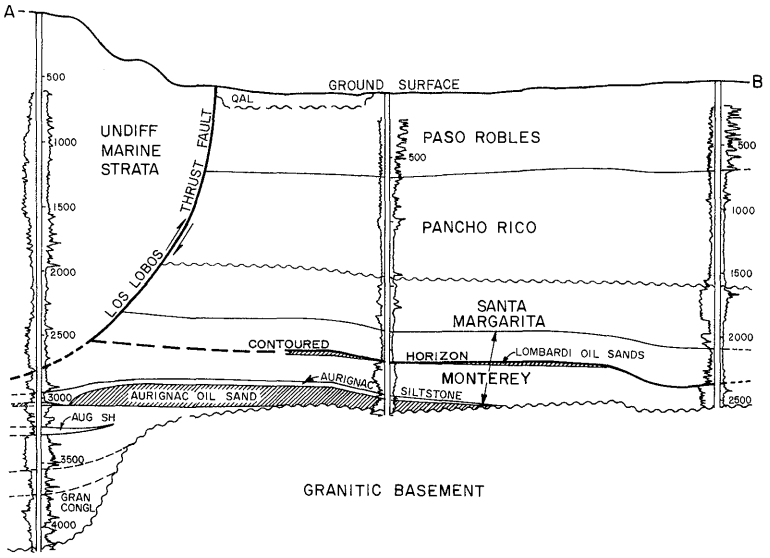




COUNTY: MONTEREY

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	fireflood					
Date started	1963					
Date discontinued	1967					
	cyclic steam					
	1964					
	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:

Barger, R.M., and J.L. Zulberti, 1949, San Ardo Oil Field: Calif. Div. of Oil and Gas, Summary of Operations--Calif. Oil Fields, Vol. 35, No. 2.

Bradford, W.C., and E.D. Lawrence, 1956, San Ardo Oil Field: Calif. Div. of Oil and Gas, Summary of Operations--Calif. Oil Fields, Vol. 42, No. 2.

Bramlette, M.N., and S.N. Daviess, 1944, Geology and Oil Possibilities of the Salinas Valley, California: U.S. Geol. Survey Oil and Gas Investigations, Preliminary Map 24.

Colvin, R.G., 1963, San Ardo Oil Field, Monterey County, Calif.: A.A.P.G.-S.E.P.M. Guidebook to the Geology of Salinas Valley and the San Andreas Fault.

Davis, F.F., 1966, Economic Mineral Deposits in the Coast Ranges: U.S. Geol. Survey Bull. 190, p. 321.

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.

DATE: January 1989

CALIFORNIA DIVISION OF OIL AND GAS

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			
So_i (%)	-	63-73	68-73			
Sw_i (%)	18-30	27-37	27-32			
Sg_i (%)	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		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.

Selected References: Dolman, S.G., 1948, Operations in District No. 3: Calif. Div. of Oil and Gas, Summary of Operations--Calif. Oil Fields, Vol. 34, No. 2.
Traverse, E.F., A.D. Deibert, and A.J. Sustek, 1982, San Ardo - A Case History of a Successful Steamflood: Energy Progress, September 1982, Vol. 2, No. 3, p. 177.

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					
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	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:

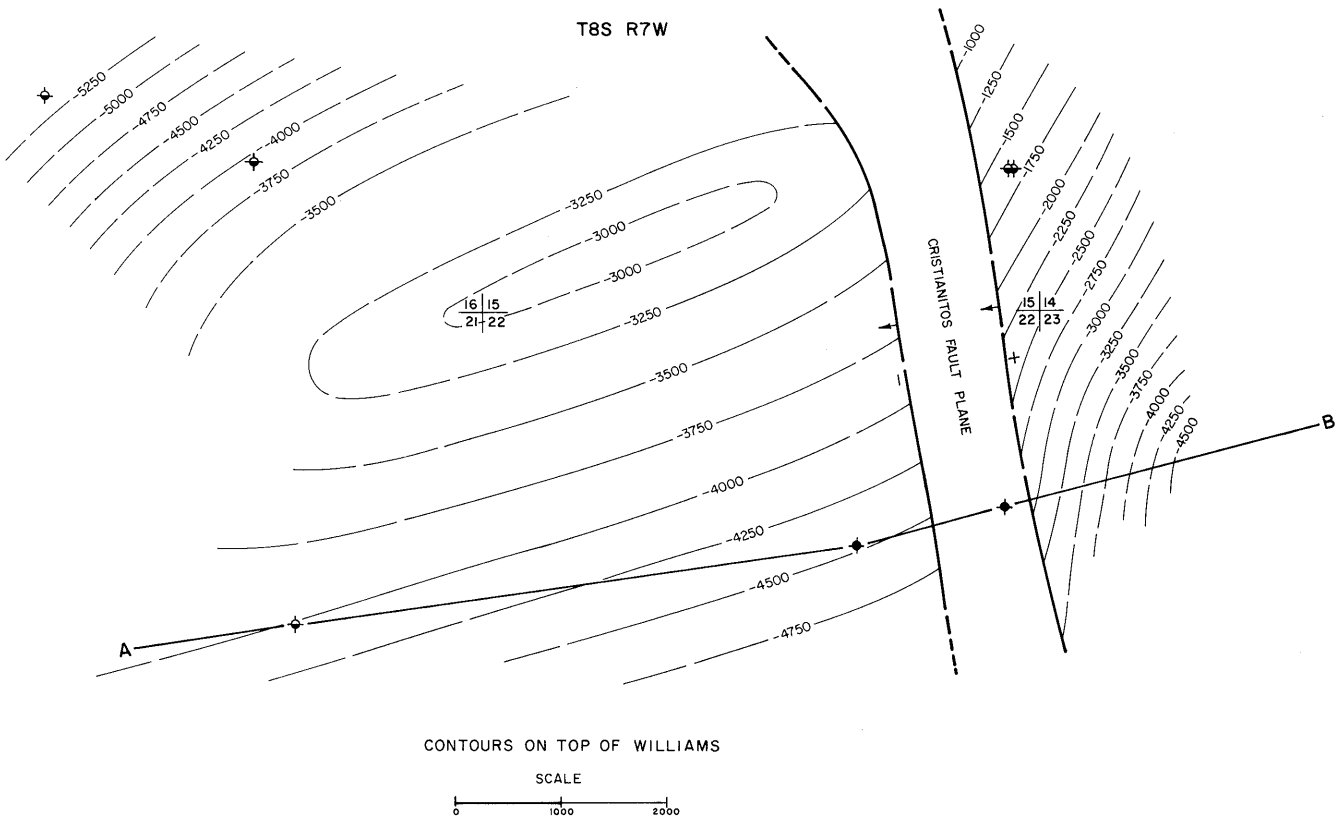
Dolman, S.G., 1947, Operations in District No. 3: Calif. Div. of Oil and Gas, Summary of Operations--Calif. Oil Fields, Vol. 33, No. 2.
Hart, E.W., 1963, Mines and Mineral Resources of Monterey County, Calif.: Div. of Mines and Geology, County Report No. 5, p. 77.
Vander Leck, L., 1921, Petroleum Resources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

DATE: January 1989

CALIFORNIA DIVISION OF OIL AND GAS

SAN CLEMENTE OIL FIELD

(Abandoned)



CONTOURS ON TOP OF WILLIAMS

SCALE

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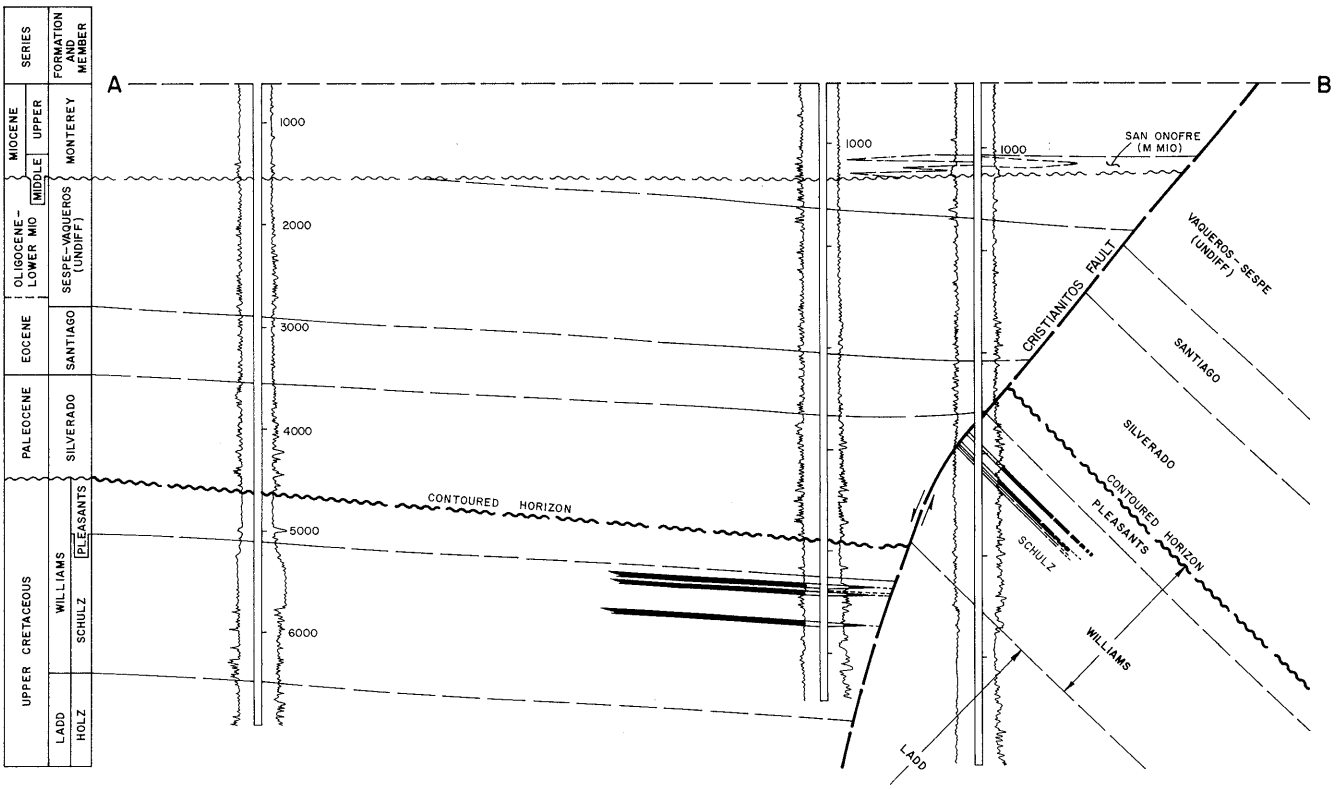


COUNTY: ORANGE

SAN CLEMENTE OIL FIELD (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. "O'Neill Estate (NCT-1)" 1	The Texas Co. "O'Neill Estate (NCT-1)" 1	22 8S 7W	SB	7,044	Schultz	Williams Late Cretaceous
Deepest well	Same as above	"	"	"	"	"	"

POOL DATA

ITEM	SCHULTZ					FIELD OR AREA DATA
Discovery date	April 1954					
Initial production rates						
Oil (bbl/day)	14					
Gas (Mcf/day)	6					
Flow pressure (psi)						
Bean size (in.)						
Initial reservoir pressure (psi)	1,850					
Reservoir temperature (°F)	138					
Initial oil content (STB/ac.-ft.)	375					
Initial gas content (MSCF/ac.-ft.)						
Formation	Williams					
Geologic age	Late Cretaceous					
Average depth (ft.)	5,350					
Average net thickness (ft.)	100					
Maximum productive area (acres)	10					
RESERVOIR ROCK PROPERTIES						
Porosity (%)	18					
So_i (%)	39					
Sw_i (%)	61					
Sg_i (%)						
Permeability to air (md)						
RESERVOIR FLUID PROPERTIES						
Oil:						
Oil gravity (°API)	45					
Sulfur content (% by wt.)	0.03					
Initial solution GOR (SCF/STB)	750					
Initial oil FVF (RB/STB)	1.45					
Bubble point press. (psia)						
Viscosity (cp) @ °F	0.43 @ 70					
Gas:						
Specific gravity (air = 1.0)	0.8					
Heating value (Btu/cu. ft.)						
Water:						
Salinity, NaCl (ppm)	15,000					
T.D.S. (ppm)	16,140					
R_w (ohm/m) (77°F)	0.4					
ENHANCED RECOVERY PROJECTS						
Enhanced recovery projects						
Date started						
Date discontinued						
Peak oil production (bbl)	1,452					
Year	1954					
Peak gas production, net (Mcf)						
Year						

Base of fresh water (ft.): 300

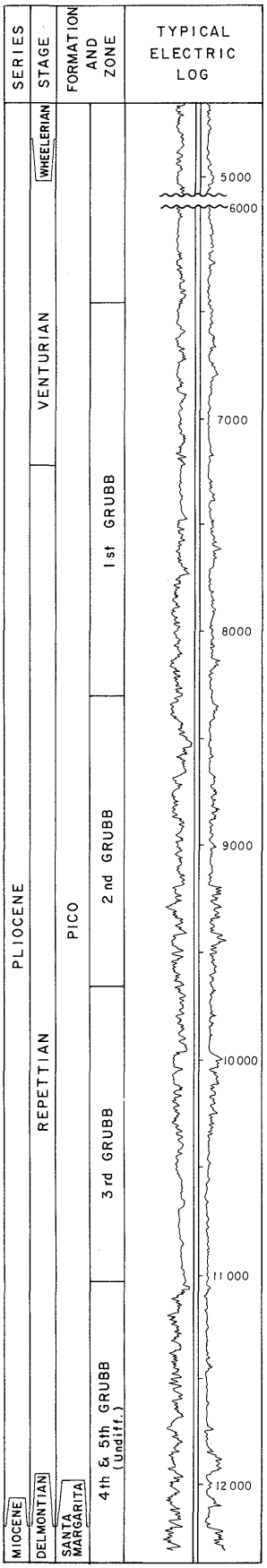
Remarks: Last production was in 1954. The field was abandoned in 1955. Cumulative production is 1,452 bbl of oil and 446 Mcf of gas.

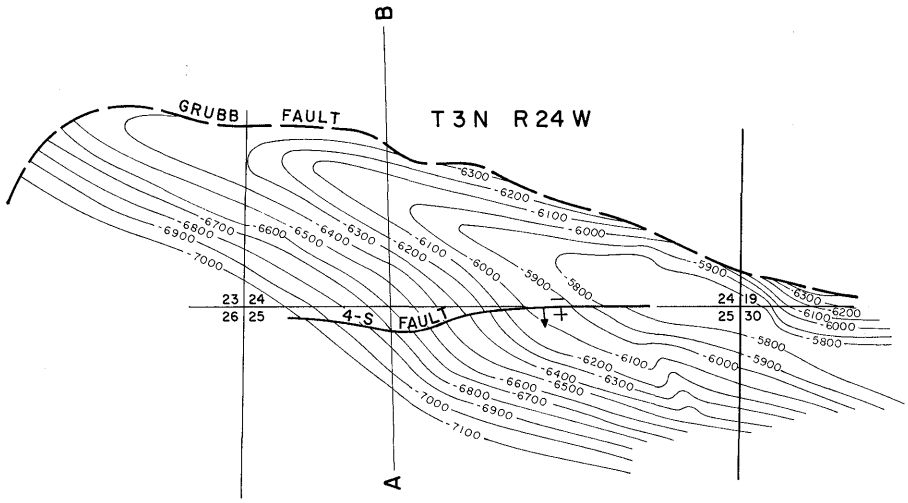
Selected References: Lang, H.R., 1972, San Clemente Oil Field: Calif. Div. of Oil and Gas, Summary of Operations -- Calif. Oil Fields, Vol. 58, No. 1.

DATE: August 1983

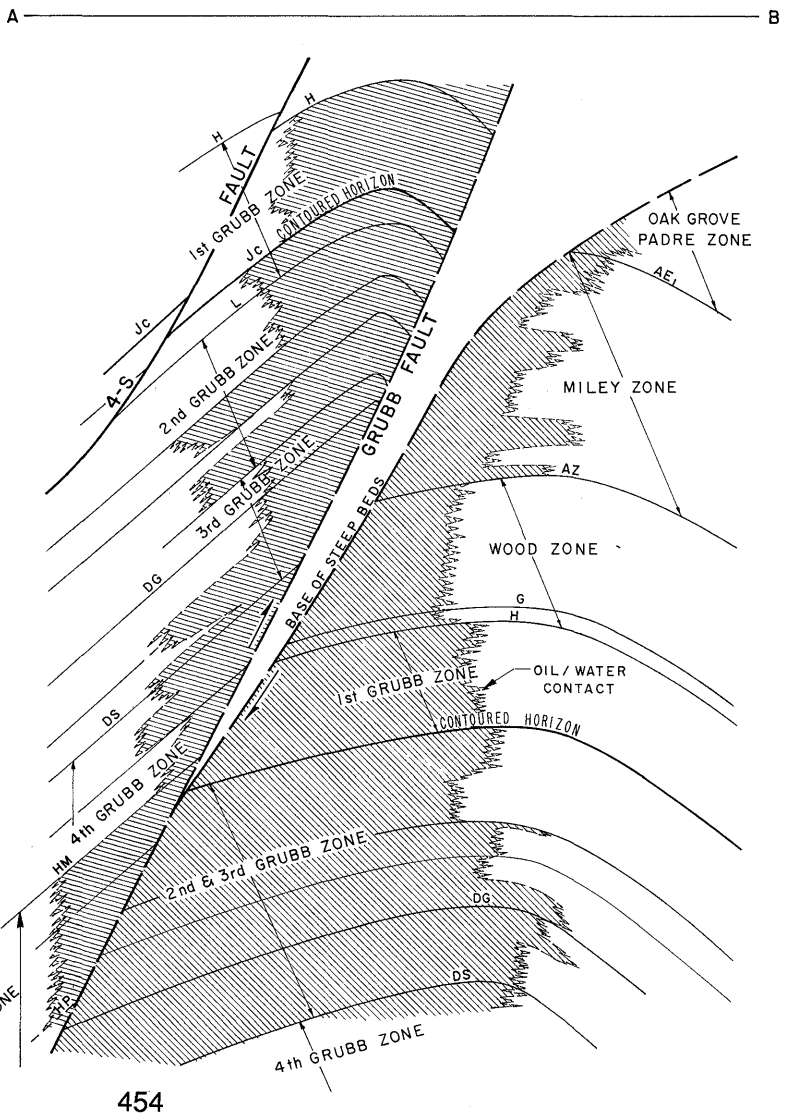
CALIFORNIA DIVISION OF OIL AND GAS

SAN MIGUELITO OIL FIELD





CONTOURS ON 2ND GRUBB



COUNTY: VENTURA

SAN MIGUELITO 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	Conoco Inc. "Grubb" 1	Continental Oil Co. "Grubb" 1	23 3N 24W	SB	7,623	1st Grubb	
Deepest well	Conoco Inc. "Grubb" 370	Same as present	26 3N 24W	SB	14,752		Santa Margarita late Miocene

POOL DATA

ITEM	1ST GRUBB	2ND GRUBB	3RD GRUBB	4TH GRUBB	5TH GRUBB	FIELD OR AREA DATA
Discovery date	November 1931	April 1944	November 1950	February 1970	November 1979	
Initial production rates						
Oil (bbl/day)	616	1,538	1,311	610	212	
Gas (Mcf/day)	506	1,600	1,157	303	137	
Flow pressure (psi)						
Bean size (in.)	-	-	-	-	6/64	
Initial reservoir pressure (psi)	3,200	4,200	5,000	-	-	
Reservoir temperature (°F)	160	180	205	-	-	
Initial oil content (STB/ac.-ft.)	685	584	440	-	-	
Initial gas content (MSCF/ac.-ft.)	534	423	88	-	-	
Formation	Pico	Pico	Pico	Pico-Santa Margarita	Santa Margarita	
Geologic age	Pliocene	Pliocene	Pliocene	Pliocene-Miocene	Miocene	
Average depth (ft.)	6,803	8,300	8,600	12,300	14,257	
Average net thickness (ft.)	427	411	173	800	473	
Maximum productive area (acres)						940
RESERVOIR ROCK PROPERTIES						
Porosity (%)	10.0-25.0	15.0-20.0	15.1	-	-	
So_i (%)	66.0	62.3	36.0	-	-	
Sw_i (%)	34.0	37.7	42.7	-	-	
Sg_i (%)	0.0	0.0	21.0	-	-	
Permeability to air (md)	32.4	29.0	33.0	-	-	
RESERVOIR FLUID PROPERTIES						
Oil:						
Oil gravity (°API)	31	31	31	31	25	
Sulfur content (% by wt.)	0.93	0.87	-	-	-	
Initial solution GOR (SCF/STB)	780	850	800	-	-	
Initial oil FVF (RB/STB)	1.390	1.440	1.526	-	-	
Bubble point press. (psia)	3,000	3,200	4,000	-	-	
Viscosity (cp) @ °F	-	-	0.7 @ 205	-	-	
Gas:						
Specific gravity (air = 1.0)	0.75	0.75	0.75	-	-	
Heating value (Btu/cu. ft.)	1,300	1,300	1,300	-	-	
Water:						
Salinity, NaCl (ppm)	24,500	24,500	24,500	24,500	-	
T.D.S. (ppm)	27,200	27,200	27,200	-	-	
R_w (ohm/m) (77°F)	25 @ 75	25 @ 75	25 @ 75	-	-	
ENHANCED RECOVERY PROJECTS						
Enhanced recovery projects	waterflood	waterflood	waterflood			
Date started	1968	1961	1955			
Date discontinued	active pressure maintenance 1940 1949	active	active			
Peak oil production (bbl)						4,464,109
Year						1951
Peak gas production, net (Mcf)						15,614,359
Year						1952

Base of fresh water (ft.): 200

Remarks: In the eastern part of the field, Conoco Inc. has waterflood projects in the 2nd and 3rd Grubb zones, designated in the annual report of the Division of Oil and Gas as D-5 and D-6, respectively, in conjunction with waterflood projects by Shell California Production Inc. in Ventura Field.

Selected References:

Glenn, W.E., 1950, A Study of Reservoir Performance of the First Grubb Pool, San Miguelito field, Ventura County, California: Am. Inst. Min. Met. Eng., Petroleum Trans., Vol. 189, p. 243-260.

Kaplow, E.J., 1953, San Miguelito Oil Field, Calif. Div. of Oil and Gas, Summary of Operations -- Calif. Oil Fields, Vol. 39, No. 2.

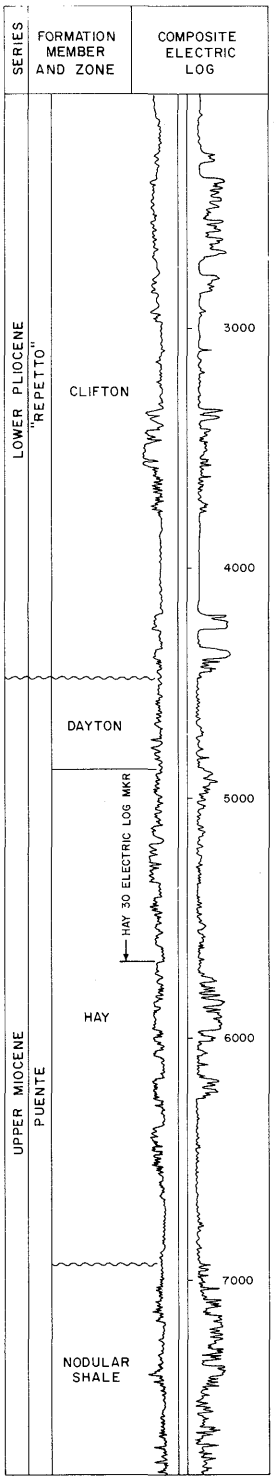
McClellan, H.W., and R.R. Haines, 1951, San Miguelito Oil Field, Ventura County, California: Am. Assoc. Petroleum Geologists Bulletin, Vol. 35, pp. 2542-2560.

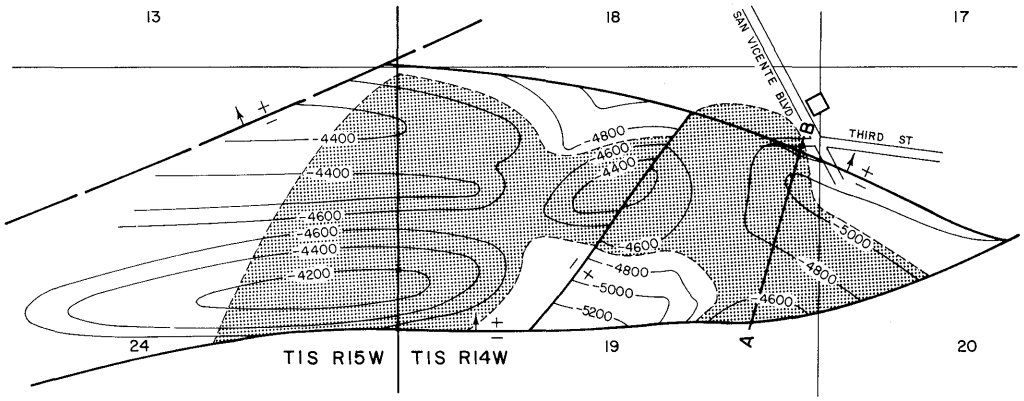
Natland, M.L., 1953, Pleistocene and Pliocene Stratigraphy of Southern California: Paper read before the Am. Assoc. Petroleum Geologists, Los Angeles, California, March 24-27, 1952. Also, see chart in Pacific Petroleum Geologist, Vol. 7, No. 2, p. 2.

DATE: May 1983

CALIFORNIA DIVISION OF OIL AND GAS

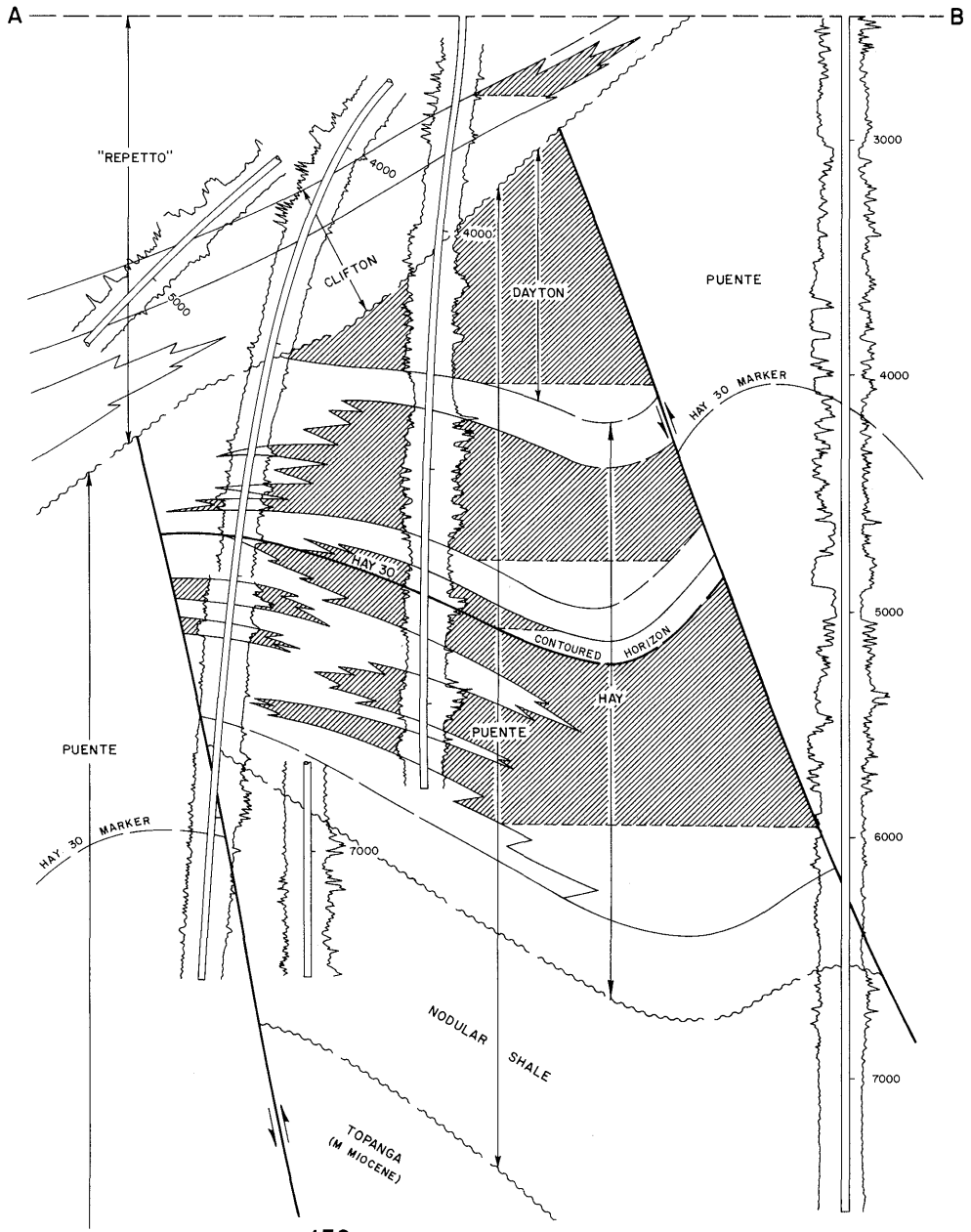
SAN VICENTE OIL FIELD





CONTOURS ON HAY 30 ELECTRIC LOG MARKER

SCALE: 1" = 2400'



COUNTY: LOS ANGELES

SAN VICENTE 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	Chevron U.S.A. Inc. S-3	Standard Oil Co. of Calif. "Dorothy Hay Corehole" 2	20 1S 14W	SB	7,716	Clifton	
Deepest well	Chevron U.S.A. Inc. S-39	Standard Oil Co. of Calif. S-38	20 1S 14W	SB	14,076		Puente late Miocene

POOL DATA

ITEM	CLIFTON	DAYTON	HAY			FIELD OR AREA DATA
Discovery date	October 1968	October 1968	October 1968			
Initial production rates						
Oil (bbl/day)	90a/	a/	a/			
Gas (Mcf/day)	250a/	a/	a/			
Flow pressure (psi)						
Bean size (in.)						
Initial reservoir pressure (psi)						
Reservoir temperature (°F)	-	113	-			
Initial oil content (STB/ac.-ft.)						
Initial gas content (MSCF/ac.-ft.)						
Formation	"Repetto"	Puente	Puente			
Geologic age	early Pliocene	late Miocene	late Miocene			
Average depth (ft.)	2,000	3,200	4,200			
Average net thickness (ft.)	1,000	1,000	2,000			
Maximum productive area (acres)						300
RESERVOIR ROCK PROPERTIES						
Porosity (%)	22	23	22			
So_i (%)	75	75	65			
Sw_i (%)	25	25	35			
Sg_i (%)						
Permeability to air (md)	2,000	100	680			
RESERVOIR FLUID PROPERTIES						
Oil:						
Oil gravity (°API)	25	22	24			
Sulfur content (% by wt.)						
Initial solution GOR (SCF/STB)						
Initial oil FVF (RB/STB)						
Bubble point press. (psia)						
Viscosity (cp) @ °F						
Gas:						
Specific gravity (air = 1.0)						
Heating value (Btu/cu. ft.)						
Water:						
Salinity, NaCl (ppm)	24,300	27,450	28,850			
T.D.S. (ppm)	27,750	28,250	30,650			
R_w (ohm/m) (77°F)	0.256	0.236	0.227			
ENHANCED RECOVERY PROJECTS						
Enhanced recovery projects	waterflood	waterflood	waterflood			
Date started	1970	1970	1970			
Date discontinued	active	active	active			
Peak oil production (bbl)						1,726,233
Year						1973
Peak gas production, net (Mcf)						1,747,529
Year						1973

Base of fresh water (ft.): 250

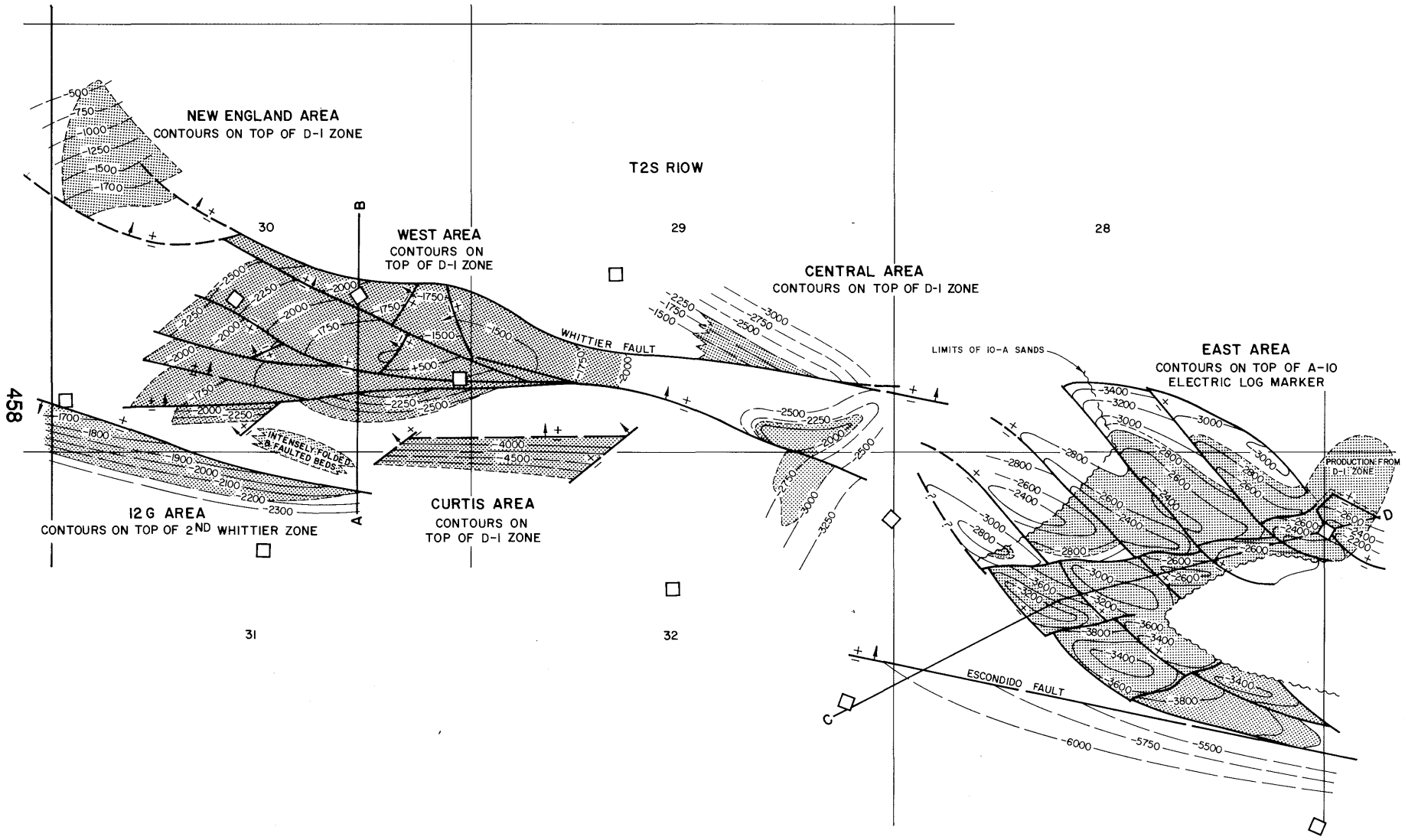
Remarks: a/ Production from all zones was commingled.

All wells were directionally drilled from an urban drillsite.

Selected References:

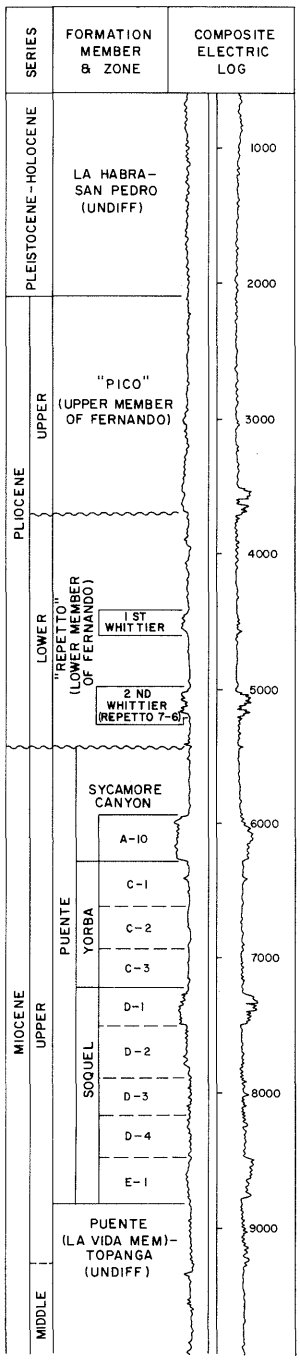
DATE: August 1983

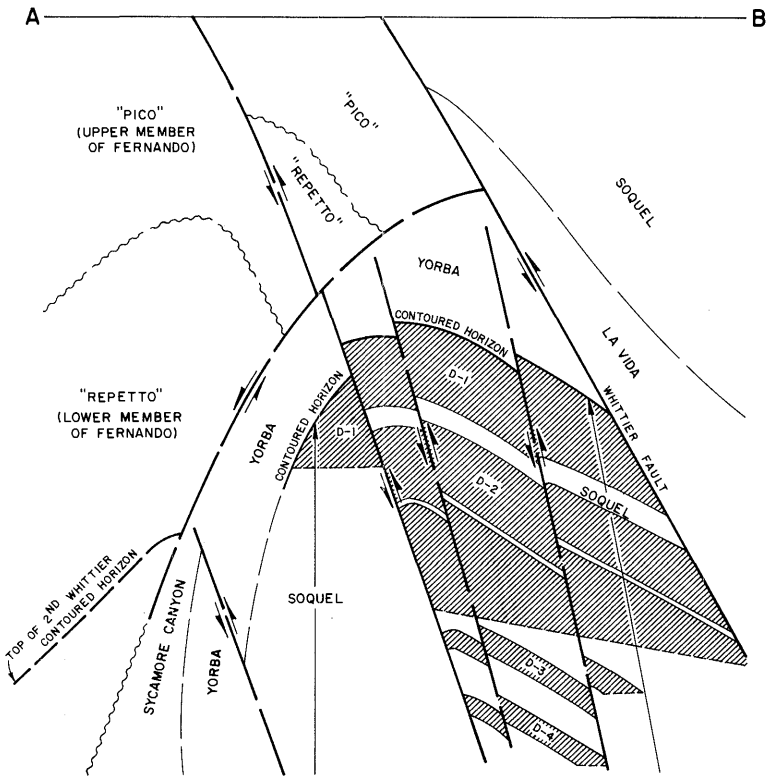
CALIFORNIA DIVISION OF OIL AND GAS

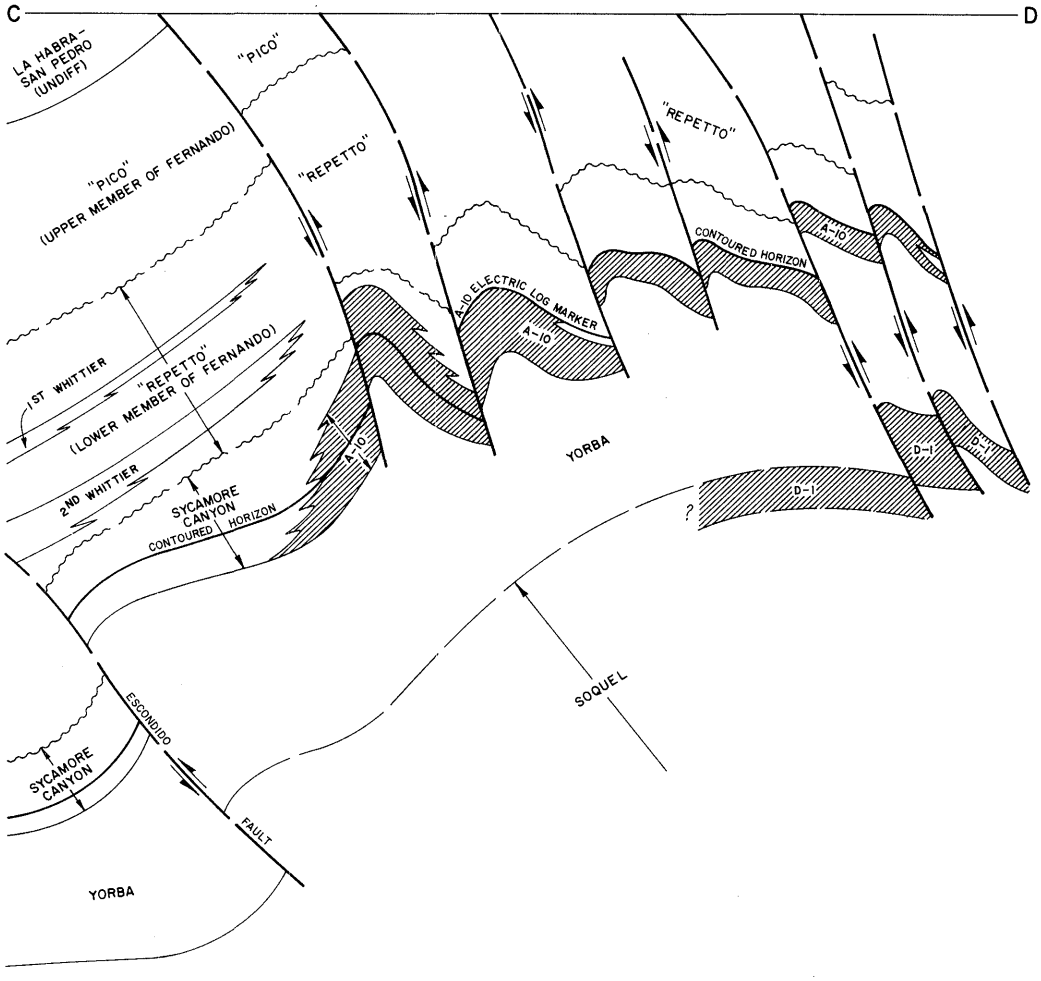


SANSINENA OIL FIELD

SANSINENA OIL FIELD







COUNTY: LOS ANGELES

SANSINENA 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	McFarland Energy, Inc. "Sansinena" 4	Union Oil Co. of Calif. "Sansinena" 4	30 2S 10W	SB	1,295	2nd Whittier	
Deepest well	Union Oil Co. of Calif. "Sansinena" 10 A 3	Same as present	32 2S 10W	SB	9,586		Puente-Topanga (Undiff) 1t to middle Miocene

POOL DATA

ITEM	2ND WHITTIER					FIELD OR AREA DATA
Discovery date	May 1898					
Initial production rates						
Oil (bbl/day)	3					
Gas (Mcf/day)						
Flow pressure (psi)						
Bean size (in.)						
Initial reservoir pressure (psi)						
Reservoir temperature (°F)						
Initial oil content (STB/ac.-ft.)						
Initial gas content (MSCF/ac.-ft.)						
Formation	"Repetto"					
Geologic age	early Pliocene					
Average depth (ft.)	1,300					
Average net thickness (ft.)	100					
Maximum productive area (acres)						675
RESERVOIR ROCK PROPERTIES						
Porosity (%)						
So_i (%)						
Sw_i (%)						
Sg_i (%)						
Permeability to air (md)						
RESERVOIR FLUID PROPERTIES						
Oil:						
Oil gravity (°API)	17					
Sulfur content (% by wt.)						
Initial solution GOR (SCF/STB)						
Initial oil FVF (RB/STB)						
Bubble point press. (psia)						
Viscosity (cp) @ °F						
Gas:						
Specific gravity (air = 1.0)						
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						
Date started						
Date discontinued						
Peak oil production (bbl)						3,823,656
Year						1956
Peak gas production, net (Mcf)						2,034,557
Year						1956

Base of fresh water (ft.): See areas

Remarks: See areas

Selected References: See areas

DATE: July 1983

CALIFORNIA DIVISION OF OIL AND GAS

COUNTY: LOS ANGELES

SANSINENA OIL FIELD
12 -G 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	Rothschild Oil Co. "Nuckols" 1	Same as present	30 2S 10W	SB	5,526	Pliocene	
Deepest well	Southern California Gas Co. "Sansinena So. Pool" 12-G-3	Union Oil Co. of Calif. "Sansinena" 12-G-1	31 2S 10W	SB	6,181		Puente late Miocene

POOL DATA

ITEM	(1ST WHITTIER) PLIOCENE	C-3	D-1			FIELD OR AREA DATA
Discovery date	February 1952	February 1952	February 1952			
Initial production rates						
Oil (bbl/day)	195a/	a/	a/			
Gas (Mcf/day)						
Flow pressure (psi)						
Bean size (in.)						
Initial reservoir pressure (psi)						
Reservoir temperature (°F)						
Initial oil content (STB/ac.-ft.)						
Initial gas content (MSCF/ac.-ft.)						
Formation	"Repetto"	Puente	Puente			
Geologic age	early Pliocene	late Miocene	late Miocene			
Average depth (ft.)	1,800	3,100	4,700			
Average net thickness (ft.)	300	400	200			
Maximum productive area (acres)						20
RESERVOIR ROCK PROPERTIES						
Porosity (%)						
So_i (%)						
Sw_i (%)						
Sg_i (%)						
Permeability to air (md)						
RESERVOIR FLUID PROPERTIES						
Oil:						
Oil gravity (°API)	17	14	22			
Sulfur content (% by wt.)						
Initial solution GOR (SCF/STB)						
Initial oil FVF (RB/STB)						
Bubble point press. (psia)						
Viscosity (cp) @ °F						
Gas:						
Specific gravity (air = 1.0)						
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						
Date started						
Date discontinued						
Peak oil production (bbl)						1,527
Year						1906
Peak gas production, net (Mcf)						
Year						

Base of fresh water (ft.): 600

Remarks: a/ Production from all zones commingled.

Selected References:

DATE: July 1983

CALIFORNIA DIVISION OF OIL AND GAS

COUNTY: LOS ANGELES

SANSINENA OIL FIELD CENTRAL 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	Union Oil Co. of Calif. "Sansinena" 3 B 41	Union Oil Co. of Calif. "Sansinena" 41	29 2S 10W	SB	5,188	C-1	
Deepest well	Union Oil Co. of Calif. "Sansinena" 11 B 6	Same as present	33 2S 10W	SB	5,500		Puente late Miocene

POOL DATA

ITEM	C-1					FIELD OR AREA DATA
Discovery date	September 1951					
Initial production rates						
Oil (bbl/day)	160					
Gas (Mcf/day)						
Flow pressure (psi)						
Bean size (in.)						
Initial reservoir pressure (psi)						
Reservoir temperature (°F)						
Initial oil content (STB/ac.-ft.)						
Initial gas content (MSCF/ac.-ft.)						
Formation	Puente					
Geologic age	late Miocene					
Average depth (ft.)	3,720					
Average net thickness (ft.)	450					
Maximum productive area (acres)	35					
RESERVOIR ROCK PROPERTIES						
Porosity (%)						
So_i (%)						
Sw_i (%)						
Sg_i (%)						
Permeability to air (md)						
RESERVOIR FLUID PROPERTIES						
Oil:						
Oil gravity (°API)	20-30					
Sulfur content (% by wt.)						
Initial solution GOR (SCF/STB)						
Initial oil FVF (RB/STB)						
Bubble point press. (psia)						
Viscosity (cp) @ °F						
Gas:						
Specific gravity (air = 1.0)						
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						
Date started						
Date discontinued						
Peak oil production (bbl)	100,349					
Year	1956					
Peak gas production, net (Mcf)	36,923					
Year	1956					

Base of fresh water (ft.): 600

Remarks:

Selected References:

DATE: July 1983

CALIFORNIA DIVISION OF OIL AND GAS

COUNTY: LOS ANGELES

SANSINENA OIL FIELD
CURTIS 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	McFarland Energy, Inc. "Sansinena" 11	Union Oil Co. of Calif. "Sansinena" 11	30 2S 10W	SB	5,200	D-1	
Deepest well	Union Oil Co. of Calif. "Sansinena" 5-A-74	Union Oil Co. of Calif. "Sansinena" 74	30 2S 10W	SB	6,418		Puente late Miocene

POOL DATA

ITEM	D-1	D-2				FIELD OR AREA DATA
Discovery date	August 1943	August 1943				
Initial production rates						
Oil (bbl/day)	81a/	a/				
Gas (Mcf/day)	6a/	a/				
Flow pressure (psi)						
Bean size (in.)						
Initial reservoir pressure (psi)						
Reservoir temperature (°F)	-	143				
Initial oil content (STB/ac.-ft.)	-	808				
Initial gas content (MSCF/ac.-ft.)						
Formation	Puente	Puente				
Geologic age	late Miocene	late Miocene				
Average depth (ft.)	4,950	5,100				
Average net thickness (ft.)	150	5,400				
Maximum productive area (acres)						40
RESERVOIR ROCK PROPERTIES						
Porosity (%)	32	21-31				
S_{oi} (%)	-	55				
S_{wi} (%)	-	45				
S_{gi} (%)						
Permeability to air (md)	390	280-370				
RESERVOIR FLUID PROPERTIES						
Oil:						
Oil gravity (°API)						
Sulfur content (% by wt.)						
Initial solution GOR (SCF/STB)						
Initial oil FVF (RB/STB)						
Bubble point press. (psia)						
Viscosity (cp) @ °F						
Gas:						
Specific gravity (air = 1.0)						
Heating value (Btu/cu. ft.)						
Water:						
Salinity, NaCl (ppm)	-	24,400				
T.D.S. (ppm)						
R_w (ohm/m) (77°F)	-	0.33				
ENHANCED RECOVERY PROJECTS						
Enhanced recovery projects						
Date started						
Date discontinued						
Peak oil production (bbl)						171,066
Year						1953
Peak gas production, net (Mcf)						
Year						

Base of fresh water (ft.): 600

Remarks: a/ Production from both zones is commingled.

Selected References:

DATE: January 1989

CALIFORNIA DIVISION OF OIL AND GAS

COUNTY: LOS ANGELES

SANSINENA OIL FIELD
EAST 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	Union Oil Co. of Calif. "Sansinena" 9 B 1	Union Oil Co. of Calif. "Naranjal" 46-33	33 2S 10W	SB	7,468	A-10	
Deepest well	Union Oil Co. of Calif. "Sansinena" 10 A 3	Same as present	32 2S 10W	SB	9,586		Puente-Topanga (Undiff) late-mid Miocene

POOL DATA

ITEM	2ND WHITTIER	A-10	C-1	C-2	D-1	FIELD OR AREA DATA
Discovery date	December 1957	May 1952	June 1954	October 1956	September 1953	
Initial production rates						
Oil (bbl/day)	9	182	556	52	122	
Gas (Mcf/day)	13	73	385	54	132	
Flow pressure (psi)						
Bean size (in.)						
Initial reservoir pressure (psi)	-	1,450 @ 3,300	-	-	-	
Reservoir temperature (°F)	-	144	-	-	-	
Initial oil content (STB/ac.-ft.)						
Initial gas content (MSCF/ac.-ft.)						
Formation	"Repetto"	Puente	Puente	Puente	Puente	
Geologic age	early Pliocene	late Miocene	late Miocene	late Miocene	late Miocene	
Average depth (ft.)	2,700	4,200	6,400	3,600	4,700	
Average net thickness (ft.)	100	200	150	75	150	
Maximum productive area (acres)						260
RESERVOIR ROCK PROPERTIES						
Porosity (%)	-	23	18	-	24	
So_i (%)						
Sw_i (%)	-	25	-	-	-	
Sg_i (%)						
Permeability to air (md)	-	250	175	-	100	
RESERVOIR FLUID PROPERTIES						
Oil:						
Oil gravity (°API)	16	30	31	28	24-30	
Sulfur content (% by wt.)						
Initial solution GOR (SCF/STB)	-	1.16	-	-	-	
Initial oil FVF (RB/STB)	-	1,450	-	-	-	
Bubble point press. (psia)						
Viscosity (cp) @ °F						
Gas:						
Specific gravity (air = 1.0)						
Heating value (Btu/cu. ft.)						
Water:						
Salinity, NaCl (ppm)	-	20,500	-	-	-	
T.D.S. (ppm)						
R_w (ohm/m) (77°F)						
ENHANCED RECOVERY PROJECTS						
Enhanced recovery projects		waterflood				
Date started		1964				
Date discontinued		1967				
		pressure maintenance				
		1955				
		1972				
Peak oil production (bbl)						2,209,769
Year						1956
Peak gas production, net (Mcf)						
Year						

Base of fresh water (ft.): 600

Remarks: A waterflood project was started in 1964 and terminated in 1967 after injecting 3,328,991 bbl of water into three wells.

Selected References: Ledingham, G.W., Jr., 1974, East Area of Sansinena Oil Field: Calif. Div. of Oil and Gas, Summary of Operations -- California Oil Fields, Vol. 59 No. 1

DATE: July 1983

CALIFORNIA DIVISION OF OIL AND GAS

COUNTY: LOS ANGELES

SANSINENA OIL FIELD
NEW ENGLAND 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	Walter P. Temple Oil Co. No. 1	Same as present	30 2S 10W	SB	2,067	1st Whittier	
Deepest well	Walter P. Temple Oil Co. No. 2	Same as present	30 2S 10W	SB	4,789		Puente late Miocene

POOL DATA

ITEM	1ST WHITTIER	C-3	D-1	D-2	D-3	FIELD OR AREA DATA
Discovery date	1921	April 1954	October 1925	October 1925	October 1925	
Initial production rates						
Oil (bbl/day)	-	50	6a/	a/	a/	
Gas (Mcf/day)	-	50	-	-	-	
Flow pressure (psi)						
Bean size (in.)						
Initial reservoir pressure (psi)						
Reservoir temperature (°F)						
Initial oil content (STB/ac.-ft.)						
Initial gas content (MSCF/ac.-ft.)						
Formation	"Repetto"	Puente	Puente	Puente	Puente	
Geologic age	early Pliocene	late Miocene	late Miocene	late Miocene	late Miocene	
Average depth (ft.)	1,760	2,600	2,900	3,300	3,600	
Average net thickness (ft.)	100	100	300	500	120	
Maximum productive area (acres)						
RESERVOIR ROCK PROPERTIES						
Porosity (%)	-	30	32	-	-	
Soi (%)						
Swi (%)						
Sgi (%)						
Permeability to air (md)	-	280	390	-	-	
RESERVOIR FLUID PROPERTIES						
Oil:						
Oil gravity (°API)	17	14	22	19-26	20	
Sulfur content (% by wt.)						
Initial solution GOR (SCF/STB)						
Initial oil FVF (RB/STB)						
Bubble point press. (psia)						
Viscosity (cp) @ °F						
Gas:						
Specific gravity (air = 1.0)						
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						
Date started						
Date discontinued						
Peak oil production (bbl)						
Year						
Peak gas production, net (Mcf)						
Year						

Base of fresh water (ft.): 600

Remarks: a/ Initial production from D-1, D-2, D-3, and D-4 zones was commingled.

Selected References:

DATE: January 1989

CALIFORNIA DIVISION OF OIL AND GAS

COUNTY: LOS ANGELES

SANSINENA OIL FIELD
NEW ENGLAND AREA

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	D-4	E-1				FIELD OR AREA DATA
Discovery date	October 1925	January 1954				
Initial production rates						
Oil (bbl/day)	a/	50				
Gas (Mcf/day)	-	15				
Flow pressure (psi)						
Bean size (in.)						
Initial reservoir pressure (psi)						
Reservoir temperature (°F)						
Initial oil content (STB/ac.-ft.)						
Initial gas content (MSCF/ac.-ft.)						
Formation	Puente	Puente				
Geologic age	late Miocene	late Miocene				
Average depth (ft.)	3,700	3,800				
Average net thickness (ft.)	110	150				
Maximum productive area (acres)						50
RESERVOIR ROCK PROPERTIES						
Porosity (%)	25	33				
So_i (%)						
Sw_i (%)						
Sg_i (%)						
Permeability to air (md)	110	200				
RESERVOIR FLUID PROPERTIES						
Oil:						
Oil gravity (°API)	30	18				
Sulfur content (% by wt.)						
Initial solution GOR (SCF/STB)						
Initial oil FVF (RB/STB)						
Bubble point press. (psia)						
Viscosity (cp) @ °F						
Gas:						
Specific gravity (air = 1.0)						
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						
Date started						
Date discontinued						
Peak oil production (bbl)						27,642
Year						1954
Peak gas production, net (Mcf)						
Year						

Base of fresh water (ft.):

Remarks: a/ Initial production from D-1, D-2, D-3, and D-4 zones was commingled.

Selected References:

DATE: January 1989

CALIFORNIA DIVISION OF OIL AND GAS

COUNTY: LOS ANGELES

SANSINENA OIL FIELD WEST 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	McFarland Energy, Inc. "Sansinena" 4	Union Oil Co. of Calif. "Sansinena" 4	30 2S 10W	SB	1,295	2nd Whittier	
Deepest well	Union Oil Co. of Calif. "Sansinena" 3 B 65	Union Oil Co. of Calif. "Sansinena" 65	29 2S 10W	SB	8,357		Puente late Miocene

POOL DATA

ITEM	2ND WHITTIER	C-3	D-1	D-2	D-3	FIELD OR AREA DATA
Discovery date	May 1898	November 1951	May 1945	September 1945	April 1949	
Initial production rates						
Oil (bbl/day)	3	140	102	156	1	
Gas (Mcf/day)						
Flow pressure (psi)						
Bean size (in.)						
Initial reservoir pressure (psi)						
Reservoir temperature (°F)						
Initial oil content (STB/ac.-ft.)						
Initial gas content (MSCF/ac.-ft.)						
Formation	"Repetto"	Puente	Puente	Puente	Puente	
Geologic age	early Pliocene	late Miocene	late Miocene	late Miocene	late Miocene	
Average depth (ft.)	1,300	2,100	2,900	3,600	4,500	
Average net thickness (ft.)	100	100	300	475	120	
Maximum productive area (acres)						
RESERVOIR ROCK PROPERTIES						
Porosity (%)	-	30-33	32	26	23	
So_i (%)	-	50	-	-	34	
Sw_i (%)	-	20	-	-	47	
Sg_i (%)	-	-	-	-	30	
Permeability to air (md)	-	280-300	390	320-280	300-450	
RESERVOIR FLUID PROPERTIES						
Oil:						
Oil gravity (°API)	17	14	22	19-26	20	
Sulfur content (% by wt.)						
Initial solution GOR (SCF/STB)						
Initial oil FVF (RB/STB)	-	-	-	-	1.15	
Bubble point press. (psia)						
Viscosity (cp) @ °F						
Gas:						
Specific gravity (air = 1.0)						
Heating value (Btu/cu. ft.)						
Water:						
Salinity, NaCl (ppm)	-	-	-	21,900	-	
T.D.S. (ppm)	-	-	-	22,500	-	
R_w (ohm/m) (77°F)						
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.): 600

Remarks: 6-A Area was merged with the West Area in 1974.

Selected References:

DATE: January 1989

CALIFORNIA DIVISION OF OIL AND GAS

COUNTY: LOS ANGELES

SANSINENA OIL FIELD WEST 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	D-4					FIELD OR AREA DATA
Discovery date	July 1984					
Initial production rates						
Oil (bbl/day)	27					
Gas (Mcf/day)	30					
Flow pressure (psi)						
Bean size (in.)						
Initial reservoir pressure (psi)						
Reservoir temperature (°F)						
Initial oil content (STB/ac.-ft.)						
Initial gas content (MSCF/ac.-ft.)						
Formation	Puente					
Geologic age	late Miocene					
Average depth (ft.)	5,200					
Average net thickness (ft.)	110					
Maximum productive area (acres)						270
RESERVOIR ROCK PROPERTIES						
Porosity (%)						
S_{oi} (%)						
S_{wi} (%)						
S_{gi} (%)						
Permeability to air (md)						
RESERVOIR FLUID PROPERTIES						
Oil:						
Oil gravity (°API)						
Sulfur content (% by wt.)						
Initial solution GOR (SCF/STB)						
Initial oil FVF (RB/STB)						
Bubble point press. (psia)						
Viscosity (cp) @ °F						
Gas:						
Specific gravity (air = 1.0)						
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						
Date started						
Date discontinued						
Peak oil production (bbl)						2,599,902
Year						1953
Peak gas production, net (Mcf)						
Year						

Base of fresh water (ft.): 600

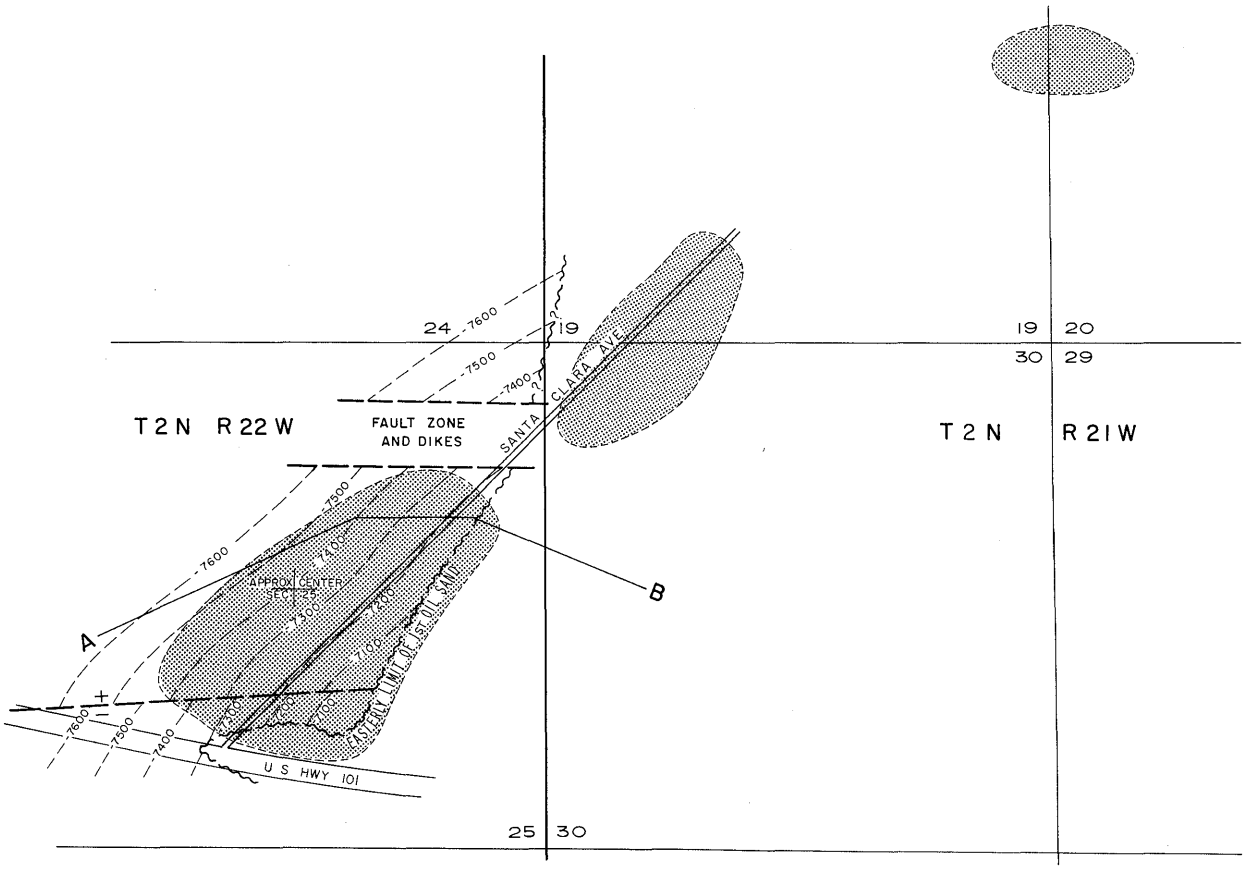
Remarks:

Selected References:

DATE: January 1989

CALIFORNIA DIVISION OF OIL AND GAS

SANTA CLARA AVENUE OIL FIELD



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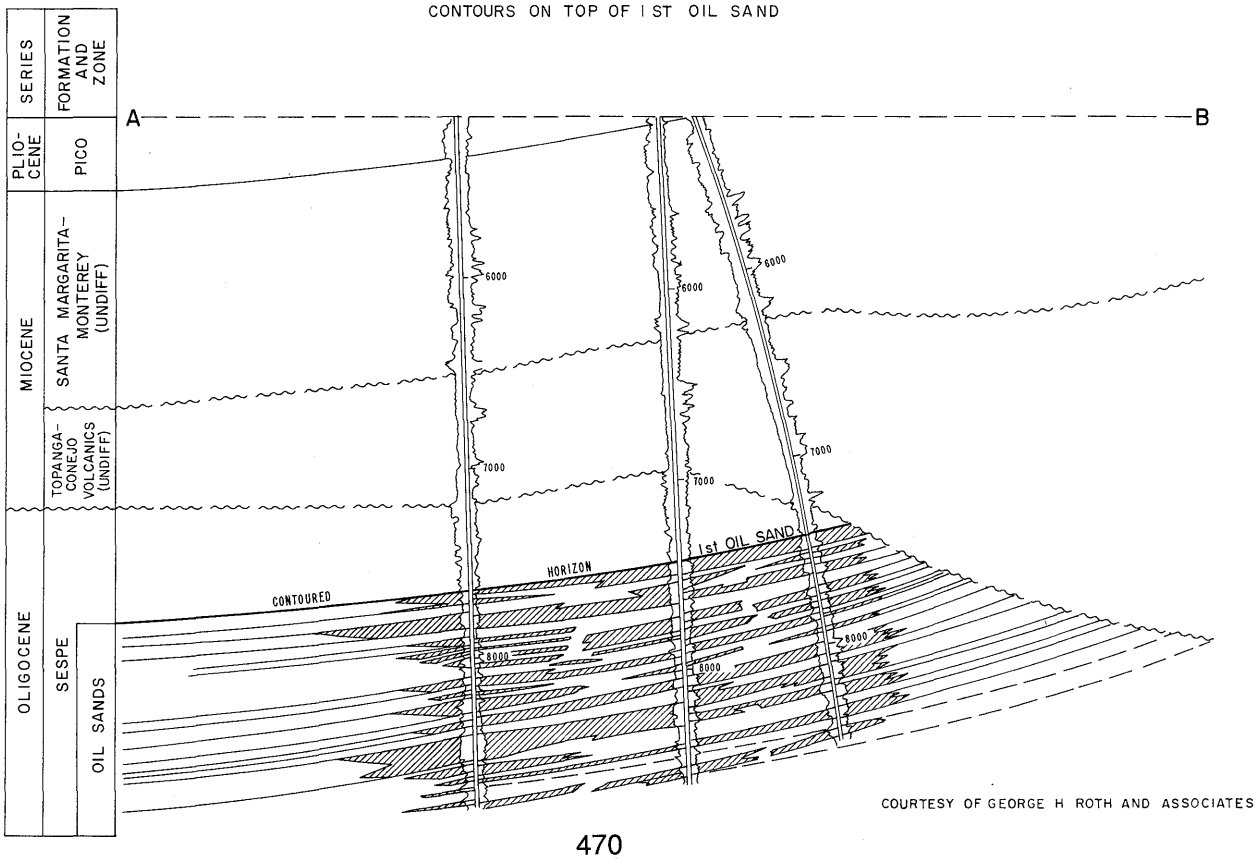


COURTESY OF GEORGE H ROTH AND ASSOCIATES

COUNTY: VENTURA

SANTA CLARA AVENUE 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	Concordia Resources, Inc. "Friedrich Unit 1" 1	McCulloch Oil Corp. "Friedrich Unit 1" 1	25 2N 22W	SB	8,567	Sespe	
Deepest well	Concordia Resources, Inc. "Friedrich Unit 3" 2	Hunnicutt and Camp Drilling Co. "Friedrich Unit 3" 2	25 2N 22W	SB	11,065		Sespe Oligocene

POOL DATA

ITEM	SESPE	SESPE				FIELD OR AREA DATA
Discovery date	January 1972	July 1973				
Initial production rates						
Oil (bbl/day)	427	360				
Gas (Mcf/day)	150	-				
Flow pressure (psi)						
Bean size (in.)						
Initial reservoir pressure (psi)	3,500	-				
Reservoir temperature (°F)	180-220	-				
Initial oil content (STB/ac.-ft.)						
Initial gas content (MSCF/ac.-ft.)						
Formation	Sespe	Sespe				
Geologic age	Oligocene	Oligocene				
Average depth (ft.)	9,000	8,630				
Average net thickness (ft.)	150	570				
Maximum productive area (acres)						180
RESERVOIR ROCK PROPERTIES						
Porosity (%)	24	-				
S_{oi} (%)	60	-				
S_{wi} (%)	40	-				
S_{gi} (%)						
Permeability to air (md)						
RESERVOIR FLUID PROPERTIES						
Oil:						
Oil gravity (°API)	16.0-28.0	26.5				
Sulfur content (% by wt.)	2*	-				
Initial solution GOR (SCF/STB)	570	-				
Initial oil FVF (RB/STB)	1.24	-				
Bubble point press. (psia)	2,650	-				
Viscosity (cp) @ °F						
Gas:						
Specific gravity (air = 1.0)	0.71	-				
Heating value (Btu/cu. ft.)	1,300	-				
Water:						
Salinity, NaCl (ppm)	28,000	-				
T.D.S. (ppm)	39,000	-				
R_w (ohm/m) (77°F)						
ENHANCED RECOVERY PROJECTS						
Enhanced recovery projects						
Date started						
Date discontinued						
Peak oil production (bbl)						395,671
Year						1977
Peak gas production, net (Mcf)						135,031
Year						1973

Base of fresh water (ft.): 1,750

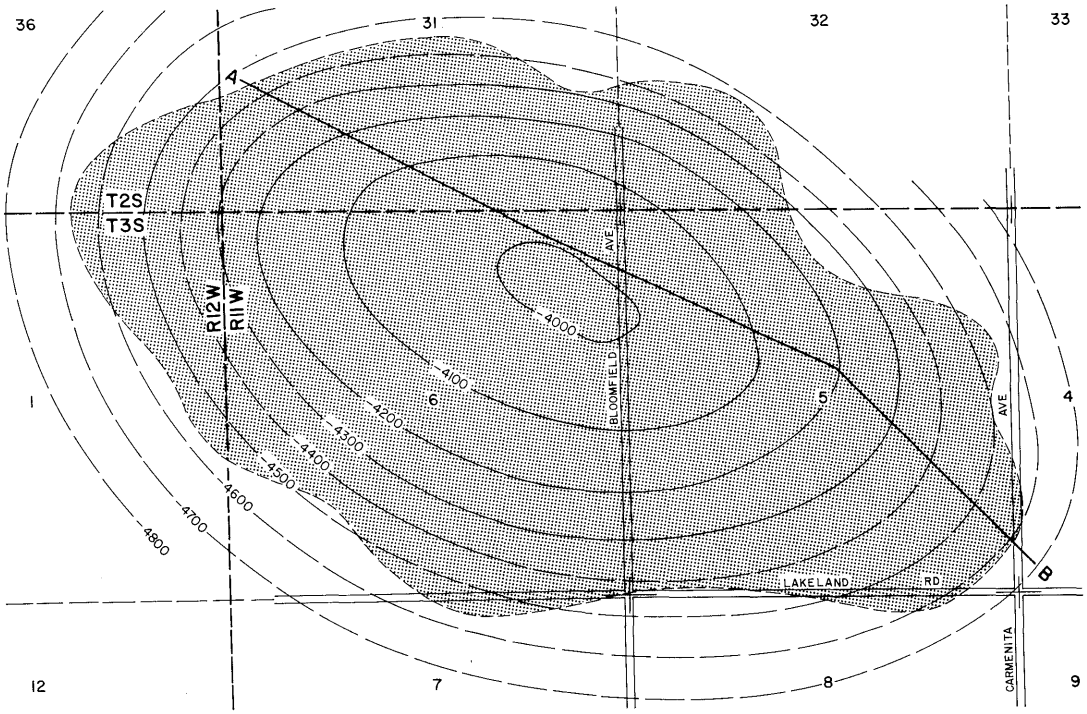
Remarks:

Selected References:

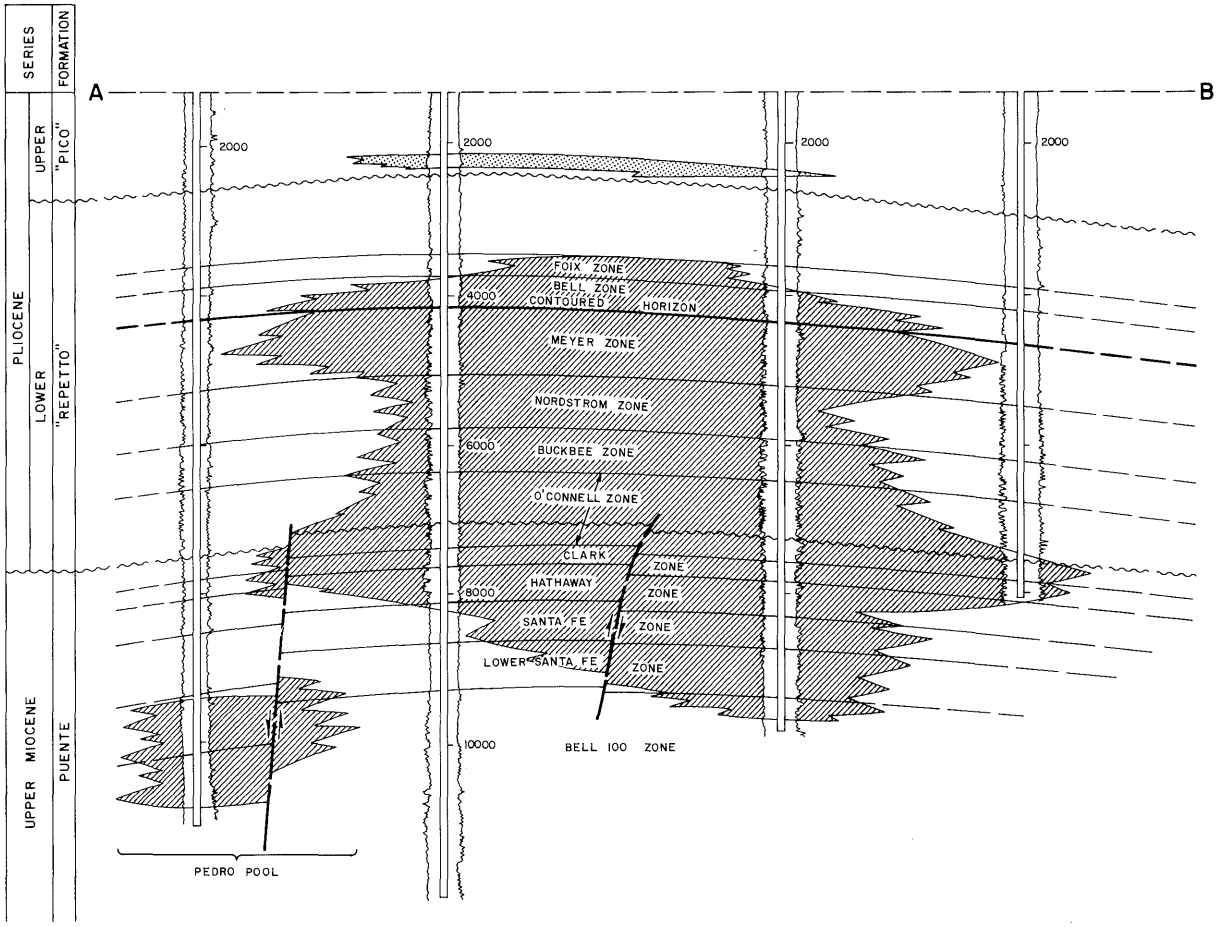
DATE: January 1990 *Average value

CALIFORNIA DIVISION OF OIL AND GAS

SANTA FE SPRINGS OIL FIELD



CONTOURS ON TOP OF MEYER ZONE



COUNTY: LOS ANGELES

SANTA FE SPRINGS 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	Union Oil Co. of Calif. "Meyer" 3	Same as present	4 3S 11W	SB	4,736	Meyer	
Deepest well	Mobil Oil Corp. 428-F	Union Oil Co. of Calif. "Bell" 107	6 3S 11W	SB	13,541		Puente late Miocene

POOL DATA

ITEM	GAS ZONE	FOIX	BELL	MEYER	NORDSTROM	FIELD OR AREA DATA
Discovery date	July 1922	May 1922	November 1921	October 1919	November 1928	
Initial production rates						
Oil (bbl/day)	-	575	2,588	150	2,560	
Gas (Mcf/day)	700,000	-	-	-	35	
Flow pressure (psi)						
Bean size (in.)						
Initial reservoir pressure (psi)	-	1,480	1,700	1,900	2,200	
Reservoir temperature (°F)	-	130	140	150	160	
Initial oil content (STB/ac.-ft.)	-	1,620	1,620	1,576	1,481	
Initial gas content (MSCF/ac.-ft.)						
Formation	"Pico"	"Repetto"	"Repetto"	"Repetto"	"Repetto"	
Geologic age	late Pliocene	early Pliocene	early Pliocene	early Pliocene	early Pliocene	
Average depth (ft.)	2,000	3,580	3,900	4,600	5,400	
Average net thickness (ft.)	35	180	300	700	500	
Maximum productive area (acres)						
RESERVOIR ROCK PROPERTIES						
Porosity (%)	-	31.7	30.0	32.3	31.4	
S_{oi} (%)	-	78	79	78	76	
S_{wi} (%)	-	22	21	22	24	
S_{gi} (%)	-	-	-	36	-	
Permeability to air (md)	-	820	945	720	650	
RESERVOIR FLUID PROPERTIES						
Oil:						
Oil gravity (°API)	-	28	31	35	35	
Sulfur content (% by wt.)	-	-	-	0.44	-	
Initial solution GOR (SCF/STB)	-	-	370	-	-	
Initial oil FVF (RB/STB)	-	1.18	1.21	1.24	1.25	
Bubble point press. (psia)	-	-	1,700	-	-	
Viscosity (cp) @ °F	-	-	1.7 @ 140	2.7 @ 150	-	
Gas:						
Specific gravity (air = 1.0)	-	-	0.8	-	-	
Heating value (Btu/cu. ft.)						
Water:						
Salinity, NaCl (ppm)	3,420	4,275	7,500	12,600	11,800	
T.D.S. (ppm)	-	7,500	9,000	14,300	12,700	
R_w (ohm/m) (77°F)	-	0.075	1.770	0.310	0.290	
ENHANCED RECOVERY PROJECTS						
Enhanced recovery projects				waterflood		
Date started				1971		
Date discontinued				active		
Peak oil production (bbl)						
Year						
Peak gas production, net (Mcf)						
Year						

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

Remarks:

Selected References: Ybarra, R.A., 1957, Recent Developments in the Santa Fe Springs Oil Field: Calif. Div. of Oil and Gas, Summary of Operations -- Calif. Oil Fields, Vol.43, No. 2.

DATE: June 1983

CALIFORNIA DIVISION OF OIL AND GAS

COUNTY: LOS ANGELES

SANTA FE SPRINGS 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	BUCKBEE	O'CONNELL	CLARK-HATHAWAY	SANTA FE	BELL 100	FIELD OR AREA DATA
Discovery date	July 1928	February 1929	June 1929	February 1956	March 1938	
Initial production rates						
Oil (bbl/day)	2,000	1,300	1,114	1,187	59	
Gas (Mcf/day)	-	-	-	1,240	-	
Flow pressure (psi)						
Bean size (in.)						
Initial reservoir pressure (psi)	2,520	2,870	3,200	3,600	-	
Reservoir temperature (°F)	177	188	210	220	-	
Initial oil content (STB/ac.-ft.)	1,276	1,070	871	779	-	
Initial gas content (MSCF/ac.-ft.)						
Formation	"Repetto"	"Repetto"-Puente	Puente	Puente	Puente	
Geologic age	early Pliocene	e Plio./l Miocene	late Miocene	late Miocene	late Miocene	
Average depth (ft.)	6,000	6,700	7,400	8,200	9,100	
Average net thickness (ft.)	400	700	600	900	800	
Maximum productive area (acres)						1,480
RESERVOIR ROCK PROPERTIES						
Porosity (%)	28.9	28.7	21.2	21.0	17.0-22.0	
S_{oi} (%)	74.0	73.0	69.4	65.0	-	
S_{wi} (%)	26.0	27.0	30.6	35.0	-	
S_{gi} (%)						
Permeability to air (md)	320	318	131	30	16	
RESERVOIR FLUID PROPERTIES						
Oil:						
Oil gravity (°API)	35	34	33	34	34	
Sulfur content (% by wt.)	-	-	0.26	-	-	
Initial solution GOR (SCF/STB)						
Initial oil FVF (RB/STB)	1.30	1.31	1.31	1.36	-	
Bubble point press. (psia)						
Viscosity (cp) @ °F						
Gas:						
Specific gravity (air = 1.0)						
Heating value (Btu/cu. ft.)						
Water:						
Salinity, NaCl (ppm)	13,000	28,500	17,700	15,700	17,118	
T.D.S. (ppm)	14,300	31,200	20,500	18,900	-	
R_w (ohm/m) (77°F)	0.20	0.14	0.13	0.13	-	
ENHANCED RECOVERY PROJECTS						
Enhanced recovery projects			waterflood	waterflood		
Date started			1973	1961		
Date discontinued			active	1979		
Peak oil production (bbl)						81,464,415
Year						1923
Peak gas production, net (Mcf)						134,792,406
Year						1929

Base of fresh water (ft.):

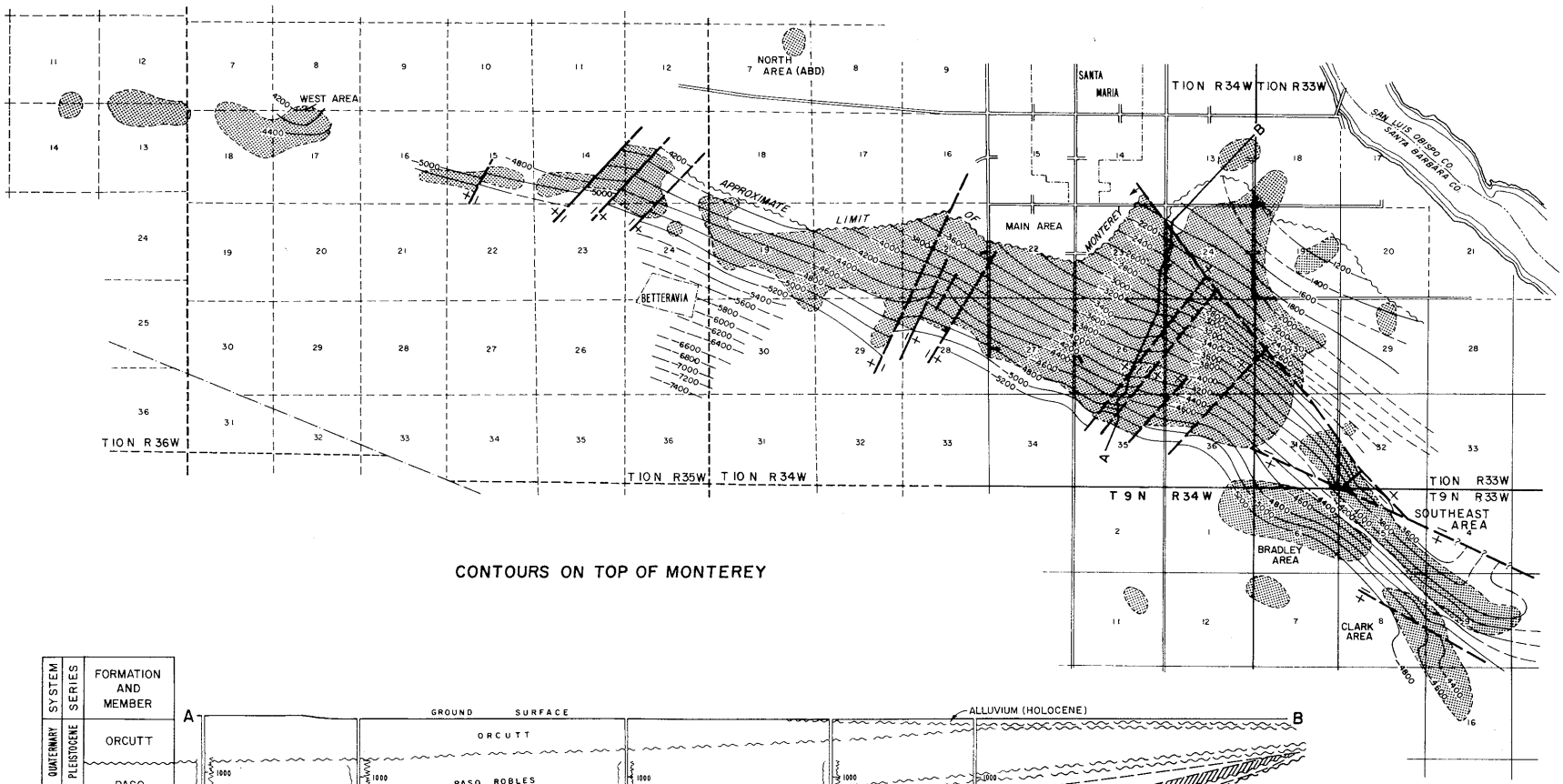
Remarks:

Selected References:

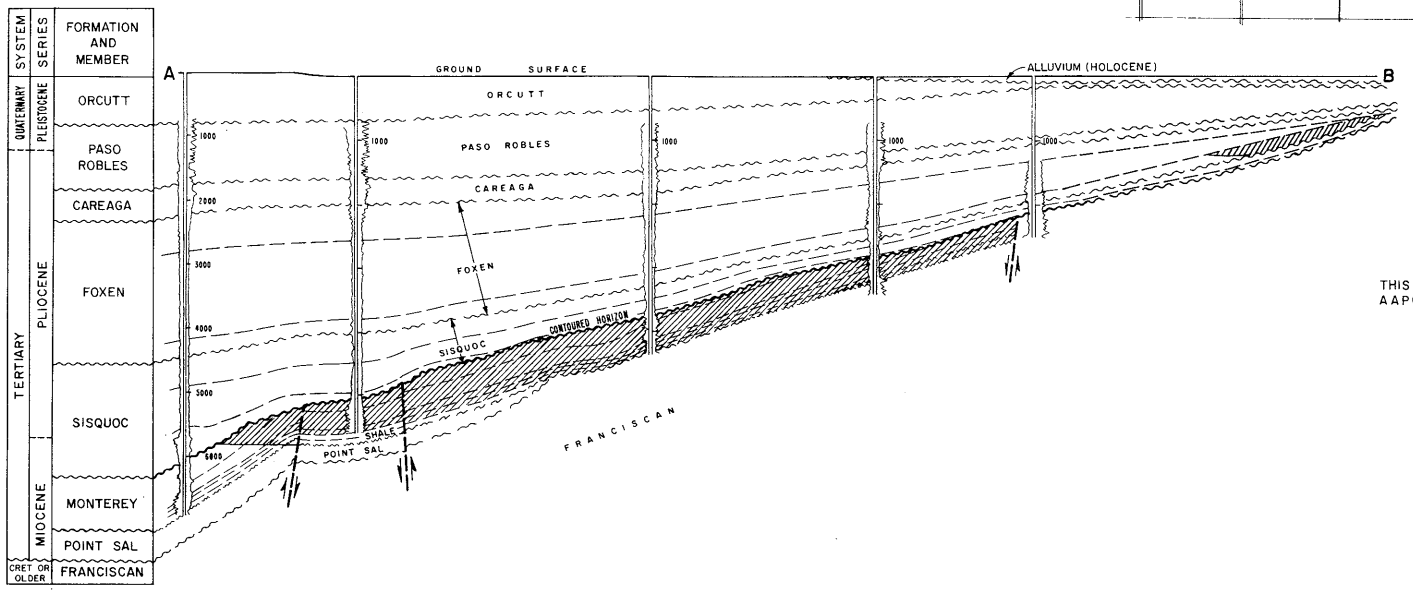
DATE: June 1983

CALIFORNIA DIVISION OF OIL AND GAS

SANTA MARIA VALLEY OIL FIELD



CONTOURS ON TOP OF MONTEREY



THIS CROSS SECTION IS MODIFIED FROM AAPG CORRELATION SECTION NO 12

COUNTY: SANTA BARBARA

SANTA MARIA VALLEY 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	Union Oil Co. of Calif. "Moretti" 1-1	Same as present	24 10N 34W	SB	2,389	Foxen-Sisquoc-Monterey	
Deepest well	Gilliland Oil and Land Co. "Bradley" 5-2	Western Gulf Oil Co. "Bradley B" 1	5 9N 33W	SB	10,296		Knoxville Cretaceous

POOL DATA

ITEM	FOXEN	SISQUOC	MONTEREY			FIELD OR AREA DATA
Discovery date	July 1934	July 1934	July 1934			
Initial production rates						
Oil (bbl/day)	a/	a/	42a/			
Gas (Mcf/day)						
Flow pressure (psi)						
Bean size (in.)						
Initial reservoir pressure (psi)						
Reservoir temperature (°F)						
Initial oil content (STB/ac.-ft.)						
Initial gas content (MSCF/ac.-ft.)						
Formation	Foxen	Sisquoc	Monterey			
Geologic age	Pliocene	Pliocene	Miocene			
Average depth (ft.)	2,000	3,330	3,360			
Average net thickness (ft.)	200	75	960			
Maximum productive area (acres)						8,850
RESERVOIR ROCK PROPERTIES						
Porosity (%)	34-40	20-30***	fractured shale			
S_{oi} (%)	31-57	30-40	-			
S_{wi} (%)	43-69	60-70	-			
S_{gi} (%)						
Permeability to air (md)	45-1,540	800-2,000	-			
RESERVOIR FLUID PROPERTIES						
Oil:						
Oil gravity (°API)	16.5	12.0-17.0	12.0-17.0			
Sulfur content (% by wt.)	-	-	3.0			
Initial solution GOR (SCF/STB)						
Initial oil FVF (RB/STB)						
Bubble point press. (psia)						
Viscosity (cp) @ °F						
Gas:						
Specific gravity (air = 1.0)						
Heating value (Btu/cu. ft.)						
Water:						
Salinity, NaCl (ppm)	5,000	24,770	19,175-24,635			
T.D.S. (ppm)	-	26,505	21,233-30,585			
R_w (ohm/m) (77°F)	1.15	0.25	0.53-0.21			
ENHANCED RECOVERY PROJECTS						
Enhanced recovery projects	steamflood		waterflood			
Date started	1966		1951			
Date discontinued	1970		1983			
Peak oil production (bbl)						13,464,517
Year						1945
Peak gas production, net (Mcf)						
Year						

Base of fresh water (ft.): See areas

Remarks: Shell Western Exploration & Production Inc. "Lakeview" 1, originally O. C. Field Gasoline Corp., "Norswing" 1, Sec. 8, T. 9 N., R. 33 W., produced only 1,520 bbl of oil in April 1932 from a 100-foot sand at 5,035, probably Basal Sisquoc. The well remained idle for several years thereafter. Subsequent attempts to produce it were unsuccessful and it was abandoned.

a/ Commingled production from the Foxen, Sisquoc, & Monterey zones.

Selected References:

Arnold, R., and R. Anderson, 1907, Geo. and Oil Res. of the Santa Maria Oil Dist., Santa Barbara Co., Calif.: U.S.G.S. Bull. 322, p. 1-161.

Chung-Hsiang, P., 1982, Petroleum in Basement Rocks: A.A.P.G. Bull. 60, No. 10, p. 1611.

McLaughlin, R.P., and C.A. Waring, Petroleum Industry of California: Calif. Mining Bureau Bull. 69, p. 403.

Wissler, S.G., and F.E. Dreyer, 1941, Correlation of the Oil Fields of the Santa Maria District: Calif. Div. Mines Bull. 118, pt. 2, (preprint) p. 236-239.

Woodring, W.P., and M.N. Bramlette, 1950, Geology and Paleontology of the Santa Maria District, California: U.S. Geol. Prof. Paper 222.

Woodring, W.P., M.N. Bramlette, and K.E. Lohman, 1943, Strat. and Paleo. of Santa Maria Dist., Calif.: A.A.P.G. Bull. Vol. 27, p. 1335-1360.

DATE: August 1987 ***Representative values for area, formation, and depth

CALIFORNIA DIVISION OF OIL AND GAS

COUNTY: SANTA BARBARA

SANTA MARIA VALLEY OIL FIELD
BRADLEY 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	Shell Western Expl. & Prod. Inc. "Bradley Consolidated" 3-1	Shell Oil Co. "Shell-Standard-Bradley Land Co." 3-1	6 9N 33W	SB	8,040 a/	Monterey	
Deepest well	Shell Western Expl. & Prod. Inc. "Shell-Standard-Payne" 21-7	Shell Oil Co. "Shell-Standard-Payne" 21-7	7 9N 33W	SB	9,015 b/		Pt. Sal Miocene

POOL DATA

ITEM	BASAL SISQUOC	MONTEREY				FIELD OR AREA DATA
Discovery date	September 1972	May 1972				
Initial production rates						
Oil (bbl/day)	530	237				
Gas (Mcf/day)						
Flow pressure (psi)						
Bean size (in.)						
Initial reservoir pressure (psi)	2,450	-				
Reservoir temperature (°F)	170-190	-				
Initial oil content (STB/ac.-ft.)	1,008	-				
Initial gas content (MSCF/ac.-ft.)	233	-				
Formation	Sisquoc	Monterey				
Geologic age	Pliocene	Miocene				
Average depth (ft.)	5,000	5,610				
Average net thickness (ft.)	160	295				
Maximum productive area (acres)	500	50				550
RESERVOIR ROCK PROPERTIES						
Porosity (%)	24-27	fractured shale				
S_{oi} (%)	65	-				
S_{wi} (%)	35	-				
S_{gi} (%)						
Permeability to air (md)	0.1-300	-				
RESERVOIR FLUID PROPERTIES						
Oil:						
Oil gravity (°API)	12-16	14				
Sulfur content (% by wt.)	4.13	-				
Initial solution GOR (SCF/STB)	231	843				
Initial oil FVF (RB/STB)	1.20	-				
Bubble point press. (psia)	2,253	-				
Viscosity (cp) @ °F	16 @ 170	-				
Gas:						
Specific gravity (air = 1.0)						
Heating value (Btu/cu. ft.)						
Water:						
Salinity, NaCl (ppm)	26,500	16,000-20,000				
T.D.S. (ppm)	29,035	21,000-27,000				
R_w (ohm/m) (77°F)	0.19	0.27-0.25				
ENHANCED RECOVERY PROJECTS						
Enhanced recovery projects	waterflood					
Date started	1976					
Date discontinued	active					
Peak oil production (bbl)	1,837,638	84,649				1,861,164
Year	1973	1977				1973
Peak gas production, net (Mcf)	3,042,543	35,644				3,042,543
Year	1974	1983				1974

Base of fresh water (ft.): 2,100

Remarks: Most completed wells have been directionally drilled from selected drillsites. In this area, Basal Sisquoc is sometimes referred to as Santa Margarita.
a/ Directional well; true vertical depth is 8,013 feet.
b/ Directional well; true vertical depth is 8,982 feet.

Selected References: Zulberti, J.L., 1973, Operations in District No. 3: Calif. Div. of Oil and Gas, Summary of Operations--Calif. Oil Fields, Vol. 59, No. 2.

DATE: January 1989

CALIFORNIA DIVISION OF OIL AND GAS

COUNTY: SANTA BARBARA

SANTA MARIA VALLEY OIL FIELD
CLARK 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	Shell Western Expl. & Prod. Inc. "Lakeview" 76A-8	Standard Oil Co. of Calif. "Lakeview Unit" 1A	8 9N 33W	SB	7,320 a/	Monterey	
Deepest well	Union Oil Co. of Calif. "Gilliland" 38-8	Same as present	8 9N 33W	SB	10,055		Knoxville Cretaceous

POOL DATA

ITEM	FOXEN	BASAL SISQUOC	MONTEREY			FIELD OR AREA DATA
Discovery date	September 1974	September 1970	July 1968			
Initial production rates						
Oil (bbl/day)	4	70	205			
Gas (Mcf/day)						
Flow pressure (psi)						
Bean size (in.)						
Initial reservoir pressure (psi)	760	2,075	2,730			
Reservoir temperature (°F)	-	118-150	210			
Initial oil content (STB/ac.-ft.)						
Initial gas content (MSCF/ac.-ft.)						
Formation	Foxen	Sisquoc	Monterey			
Geologic age	Pliocene	Pliocene	Miocene			
Average depth (ft.)	2,600	4,500	6,725-7,490			
Average net thickness (ft.)	250	250	850			
Maximum productive area (acres)						310
RESERVOIR ROCK PROPERTIES						
Porosity (%)	30-40***	10-30***	fractured shale			
S_{oi} (%)	30-60	30-60	-			
S_{wi} (%)	40-70	40-70	-			
S_{gi} (%)						
Permeability to air (md)	80	200-800	-			
RESERVOIR FLUID PROPERTIES						
Oil:						
Oil gravity (°API)	10.0	8.5	9.5			
Sulfur content (% by wt.)	-	4.35	-			
Initial solution GOR (SCF/STB)						
Initial oil FVF (RB/STB)						
Bubble point press. (psia)						
Viscosity (cp) @ °F						
Gas:						
Specific gravity (air = 1.0)						
Heating value (Btu/cu. ft.)						
Water:						
Salinity, NaCl (ppm)	7,000†	23,000-26,000***	16,370			
T.D.S. (ppm)	-	24,000-29,000***	23,370			
R_w (ohm/m) (77°F)	0.80†	0.20-0.30***	0.31			
ENHANCED RECOVERY PROJECTS						
Enhanced recovery projects		cyclic steam				
Date started		1964				
Date discontinued		1964				
Peak oil production (bbl)	84	24,452	670,890			686,495
Year	1974	1973	1971			1971
Peak gas production, net (Mcf)		3,000	382,062			383,396
Year		1977	1982			1982

Base of fresh water (ft.): 1,850

Remarks: The Clark area was formerly included in Cat Canyon field.
In January 1975, the Foxen zone was shutin.
a/ Directional well; originally drilled as a straight hole to a total depth of 9,049 feet. Redrilled from 680 feet; true vertical depth is 7,250 feet

Selected References: Barton, C.L., 1968, Operations in District No. 3, Calif. Div. of Oil and Gas, Summary of Operations--Calif. Oil Fields, Vol. 54, No. 2--Part 1.

DATE: January 1989 ***Representative value for area, formation, and depth †Log derived value

CALIFORNIA DIVISION OF OIL AND GAS

COUNTY: SANTA BARBARA

SANTA MARIA VALLEY 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	Union Oil Co. of Calif. "Moretti" 1-1	Same as present	24 10N 34W	SB	2,389	Foxen-Sisquoc-Monterey	
Deepest well	Union Oil Co. of Calif. "Paderewski" 1-29	Same as present	29 10N 34W	SB	7,873		Franciscan Cretaceous

POOL DATA

ITEM	FOXEN	SISQUOC	MONTEREY[a/]	POINT SAL[b/]		FIELD OR AREA DATA
Discovery date	July 1934	July 1934	July 1934	March 1936		
Initial production rates						
Oil (bbl/day)	c/	c/	42[c/]	2,376[d/]		
Gas (Mcf/day)	-	-	-	306		
Flow pressure (psi)						
Bean size (in.)						
Initial reservoir pressure (psi)						
Reservoir temperature (°F)						
Initial oil content (STB/ac.-ft.)						
Initial gas content (MSCF/ac.-ft.)						
Formation	Foxen	Sisquoc	Monterey	Point Sal		
Geologic age	Pliocene	Pliocene	Miocene	Miocene		
Average depth (ft.)	2,000	3,330	3,360	4,330		
Average net thickness (ft.)	200	75	960	200		
Maximum productive area (acres)						6,720
RESERVOIR ROCK PROPERTIES						
Porosity (%)	34-40	20-30***	fractured shale	16-24		
So_i (%)	31-57	30-40	-	60		
Sw_i (%)	43-69	60-70	-	40		
Sg_i (%)						
Permeability to air (md)	45-1,540	800-2,000	-	54-68		
RESERVOIR FLUID PROPERTIES						
Oil:						
Oil gravity (°API)	16.5	12.0-17.0	12.0-17.0	15.0		
Sulfur content (% by wt.)	-	-	3.0	-		
Initial solution GOR (SCF/STB)						
Initial oil FVF (RB/STB)						
Bubble point press. (psia)						
Viscosity (cp) @ °F	-	-	-	15-30 @ 185		
Gas:						
Specific gravity (air = 1.0)						
Heating value (Btu/cu. ft.)						
Water:						
Salinity, NaCl (ppm)	5,000	24,770	19,175-24,635	23,600		
T.D.S. (ppm)	-	26,505	21,233-30,585	25,700		
R_w (ohm/m) (77°F)	1.15	0.25	0.21-0.53	0.28		
ENHANCED RECOVERY PROJECTS						
Enhanced recovery projects	steamflood		waterflood	waterflood		
Date started	1966		1951	1956		
Date discontinued	1970		1983	active		
				fireflood		
				1964		
				1966		
Peak oil production (bbl)						13,464,517
Year						1945
Peak gas production, net (Mcf)						15,272
Year						1947

Base of fresh water (ft.): 2,000

Remarks:
a/ Monterey pool includes the Arenaceous, Cherty, Bentonitic Brown, Buff and Brown, and Dark Brown zones.
b/ Point Sal pool includes the Oil Sand, and Siltstone and Shell zones.
c/ Commingled production from Foxen, Sisquoc, and Monterey zones.
d/ Production commingled with Monterey.

Selected References:

Am. Assoc. Petroleum Geologists, 1959, Correlation Section Across Santa Maria Basin.
Canfield, C.R., 1939, Santa Maria Valley Oil Field: Calif. State Div. of Mines, Bull. 118, p. 440.
Canfield, C.R., 1939, Subsurface Stratigraphy of Santa Maria Valley Oil Field and Adjacent Parts of The Santa Maria Valley, California: Am. Assoc. Petroleum Geologists Bull. Vol. 23, No. 1.
Frame, R., 1959, Santa Maria Valley Oil Field: Calif. Div. of Oil and Gas, Summary of Operations--Calif. Oil Fields, Vol. 24, No. 2.
Porter, W.W., II, 1937, Santa Maria Valley--Another Great Field: Petroleum World, July 1937.
Regan, J.L., Jr., and A.W. Hughes, 1949, Fractured Reservoirs of Santa Maria District, California: Am. Assoc. Petroleum Geologists Bull. Vol. 33, No. 1, p. 32.

DATE: January 1989 ***Representative value for area, formation, and depth

CALIFORNIA DIVISION OF OIL AND GAS

COUNTY: SANTA BARBARA

SANTA MARIA VALLEY 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	Phillips Oil Co. "Souza" 1	Signal Oil & Gas Co. "Souza" 1	7 10N 34W	SB	2,954	Foxen	Foxen Pliocene
Deepest well	Same as above	"	"	"	"	"	"

POOL DATA

ITEM	FOXEN					FIELD OR AREA DATA
Discovery date	June 1965					
Initial production rates						
Oil (bbl/day)	92					
Gas (Mcf/day)						
Flow pressure (psi)						
Bean size (in.)						
Initial reservoir pressure (psi)						
Reservoir temperature (°F)	100					
Initial oil content (STB/ac.-ft.)						
Initial gas content (MSCF/ac.-ft.)						
Formation	Foxen					
Geologic age	Pliocene					
Average depth (ft.)	2,250					
Average net thickness (ft.)	340					
Maximum productive area (acres)	10					
RESERVOIR ROCK PROPERTIES						
Porosity (%)	20-30***					
So_i (%)	30-50†					
Sw_i (%)	50-70†					
Sg_i (%)						
Permeability to air (md)						
RESERVOIR FLUID PROPERTIES						
Oil:						
Oil gravity (°API)	13					
Sulfur content (% by wt.)						
Initial solution GOR (SCF/STB)						
Initial oil FVF (RB/STB)						
Bubble point press. (psia)						
Viscosity (cp) @ °F						
Gas:						
Specific gravity (air = 1.0)						
Heating value (Btu/cu. ft.)						
Water:						
Salinity, NaCl (ppm)	4,500-5,200+					
T.D.S. (ppm)						
R_w (ohm/m) (77°F)	1.1-1.2†					
ENHANCED RECOVERY PROJECTS						
Enhanced recovery projects	cyclic steam					
Date started	1965					
Date discontinued	1965					
Peak oil production (bbl)	904					
Year	1965					
Peak gas production, net (Mcf)						
Year						

Base of fresh water (ft.): 1,450

Remarks: The area was abandoned in 1966. Cumulative production is 904 bbl of oil.

Selected References:

DATE: January 1989 ***Representative for area, formation, and depth † Log derived value

CALIFORNIA DIVISION OF OIL AND GAS

COUNTY: SANTA BARBARA

SANTA MARIA VALLEY OIL FIELD
SOUTHEAST 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	Shell Western Expl. & Prod. Inc. "Kemp" 6	Rock Island Oil Co. "Kemp" 1	31 10N 33W	SB	4,585	Basal Sisquoc	
Deepest well	Gilliland Oil & Land Co. "Bradley" 5-2	Western Gulf Oil Co. "Bradley B" 1	5 9N 33W	SB	10,296		Knoxville Cretaceous

POOL DATA

ITEM	FOXEN	BASAL SISQUOC	HOUK	MONTEREY		FIELD OR AREA DATA
Discovery date	January 1977	September 1941	February 1952	November 1956		
Initial production rates						
Oil (bbl/day)	15	70	235	108		
Gas (Mcf/day)	-	-	-	10		
Flow pressure (psi)						
Bean size (in.)						
Initial reservoir pressure (psi)	-	1,250	-	-		
Reservoir temperature (°F)	-	120	145-180	195		
Initial oil content (STB/ac.-ft.)						
Initial gas content (MSCF/ac.-ft.)						
Formation	Foxen	Sisquoc	Monterey	Monterey		
Geologic age	Pliocene	Pliocene	Miocene	Miocene		
Average depth (ft.)	2,600	4,500	6,000	7,000		
Average net thickness (ft.)	315	250	1,000	1,000		
Maximum productive area (acres)						820
RESERVOIR ROCK PROPERTIES						
Porosity (%)	27-35	19-35	fractured shale	fractured shale		
S_{oi} (%)	27-54	25-80	-	-		
S_{wi} (%)	46-73	20-75	-	-		
S_{gi} (%)						
Permeability to air (md)	61-520	40-1,000	-	-		
RESERVOIR FLUID PROPERTIES						
Oil:						
Oil gravity (°API)	10	8-15	9-14	8		
Sulfur content (% by wt.)						
Initial solution GOR (SCF/STB)						
Initial oil FVF (RB/STB)						
Bubble point press. (psia)						
Viscosity (cp) @ °F						
Gas:						
Specific gravity (air = 1.0)						
Heating value (Btu/cu. ft.)						
Water:						
Salinity, NaCl (ppm)	7,000***	22,800-26,200	17,000-21,000	17,000-21,000		
T.D.S. (ppm)	-	23,900-27,100	24,000-28,000	24,000-28,000		
R_w (ohm/m) (77°F)	0.80***	0.30	0.25	0.25		
ENHANCED RECOVERY PROJECTS						
Enhanced recovery projects		waterflood		waterflood		
Date started		1962		1972		
Date discontinued		1990		1976		
Peak oil production (bbl)	761	654,052	283,858	30,114		762,918
Year	1981	1978	1971	1981		1975
Peak gas production, net (Mcf)		393,000	55,590	64,558		441,000
Year		1977	1953	1976		1977

Base of fresh water (ft.): 1,800

Remarks:

Selected References: Bailey, W.C., 1952, Operations in District No. 3, Calif. Div. of Oil and Gas, Summary of Operations--Calif. Oil Fields, Vol. 38, No. 2.

DATE: January 1991 ***Representative value for area, formation, and depth

CALIFORNIA DIVISION OF OIL AND GAS

COUNTY: SANTA BARBARA

SANTA MARIA VALLEY OIL FIELD
WEST 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. "Mahoney" 1	General Petroleum Corp. "Mahoney" 1	9 1ON 35W	SB	4,501	Foxen-Franciscan	
Deepest well	Union Oil Co. of Calif. "Leroy" 1-18	Same as present	18 1ON 35W	SB	5,392 a/		Franciscan Cretaceous

POOL DATA

ITEM	FOXEN	SISQUOC	MONTEREY	FRANCISCAN		FIELD OR AREA DATA
Discovery date	December 1953	November 1953	November 1953	October 1953		
Initial production rates						
Oil (bbl/day)	b/	b/	b/	207 b/		
Gas (Mcf/day)						
Flow pressure (psi)						
Bean size (in.)						
Initial reservoir pressure (psi)	-	-	1,600	1,800		
Reservoir temperature (°F)	90	-	170-185	120		
Initial oil content (STB/ac.-ft.)						
Initial gas content (MSCF/ac.-ft.)						
Formation	Foxen	Sisquoc	Monterey	Franciscan		
Geologic age	Pliocene	Pliocene	Miocene	Cretaceous		
Average depth (ft.)	3,490	3,610	4,410	4,660		
Average net thickness (ft.)	160	280	200	10-300		
Maximum productive area (acres)						440
RESERVOIR ROCK PROPERTIES						
Porosity (%)	27-35***	25-35***	fractured shale	24		
S_{oi} (%)	27-42	40-70	-	-		
S_{wi} (%)	58-73	30-60	-	-		
S_{gi} (%)						
Permeability to air (md)	61-520	1,000-4,000	-	-		
RESERVOIR FLUID PROPERTIES						
Oil:						
Oil gravity (°API)	14	19	14	14		
Sulfur content (% by wt.)	-	-	0.6	-		
Initial solution GOR (SCF/STB)						
Initial oil FVF (RB/STB)	-	-	1.18	-		
Bubble point press. (psia)	-	-	1,548	-		
Viscosity (cp) @ °F	-	-	15.2 @ 212	-		
Gas:						
Specific gravity (air = 1.0)						
Heating value (Btu/cu. ft.)						
Water:						
Salinity, NaCl (ppm)	5,000***	-	17,300	-		
T.D.S. (ppm)	-	-	25,200	-		
R_w (ohm/m) (77°F)	-	-	0.33	-		
ENHANCED RECOVERY PROJECTS						
Enhanced recovery projects			waterflood c/			cyclic steam
Date started			1966			1965
Date discontinued			active			1966
Peak oil production (bbl)						269,621
Year						1981
Peak gas production, net (Mcf)						388,195
Year						1981

Base of fresh water (ft.): 1,750

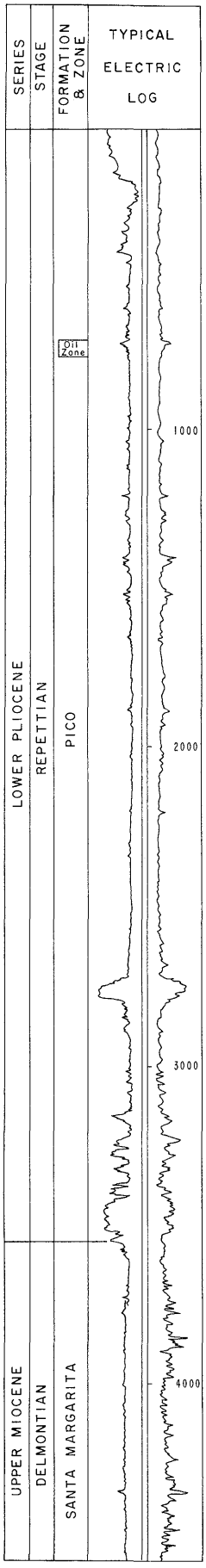
Remarks: a/ Directional well; true vertical depth is 5,249 feet.
b/ After initial test of the Franciscan zone, shallower zones were added and production was commingled. Initial production figure is for all four zones commingled in December 1953.
c/ Initial injection was for water disposal purposes.

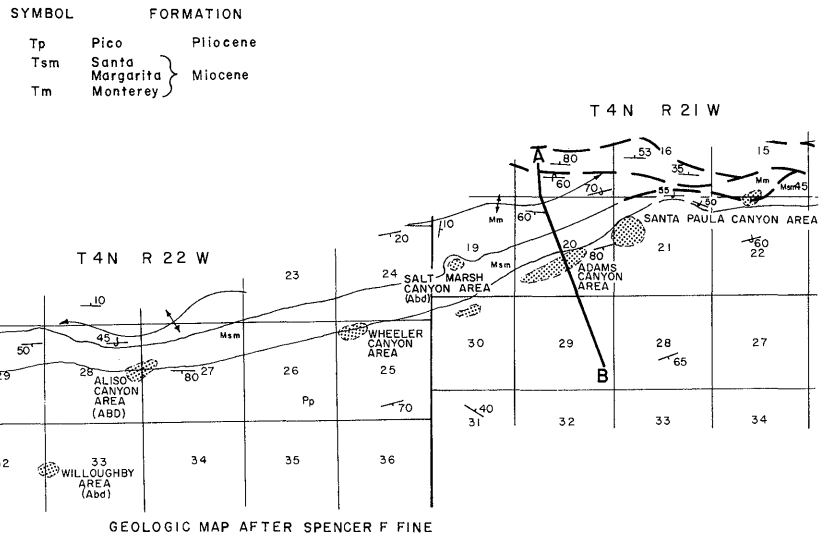
Selected References: Bailey, W.C., 1954, Operations in District No. 3, Calif. Div. of Oil and Gas, Summary of Operations--Calif. Oil Fields, Vol. 40, No. 2.

DATE: January 1989 ***Representative value for area, formation, and depth

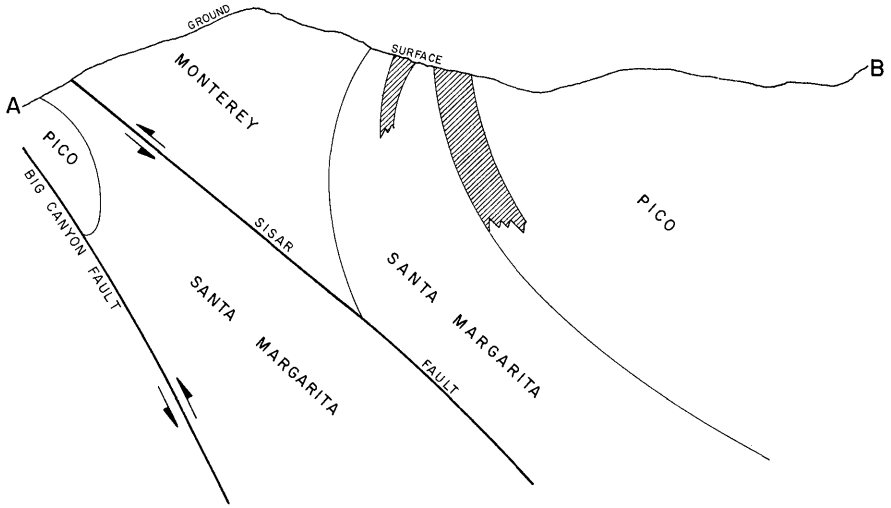
CALIFORNIA DIVISION OF OIL AND GAS

SANTA PAULA OIL FIELD





GEOLOGIC MAP AFTER SPENCER F FINE



COUNTY: VENTURA

SANTA PAULA 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	Union Oil Co. of Calif.	Wheeler, Trask and Coleman Tunnel	25 4N 22W	SB	unk.	unnamed	
Deepest well	Union Oil Co. of Calif. "Ex-Mission" X-7	Same as present	33 4N 22W	SB	9,327		Monterey Miocene

POOL DATA

ITEM	UNNAMED	UNNAMED				FIELD OR AREA DATA
Discovery date	1861	December 1977				
Initial production rates						
Oil (bbl/day)	60	50				
Gas (Mcf/day)	0	-				
Flow pressure (psi)						
Bean size (in.)						
Initial reservoir pressure (psi)						
Reservoir temperature (°F)						
Initial oil content (STB/ac.-ft.)						
Initial gas content (MSCF/ac.-ft.)						
Formation	Pico/Santa Margarita	Mohnian				
Geologic age	Pliocene-1 Miocene	Miocene				
Average depth (ft.)	150-2,000	3,130				
Average net thickness (ft.)	a/	1,800				
Maximum productive area (acres)						490
RESERVOIR ROCK PROPERTIES						
Porosity (%)						
S_{oi} (%)						
S_{wi} (%)						
S_{gi} (%)						
Permeability to air (md)						
RESERVOIR FLUID PROPERTIES						
Oil:						
Oil gravity (°API)	20.0-30.0	29.6				
Sulfur content (% by wt.)						
Initial solution GOR (SCF/STB)						
Initial oil FVF (RB/STB)						
Bubble point press. (psia)						
Viscosity (cp) @ °F						
Gas:						
Specific gravity (air = 1.0)						
Heating value (Btu/cu. ft.)						
Water:						
Salinity, NaCl (ppm)	3,400	-				
T.D.S. (ppm)						
R_w (ohm/m) (77°F)						
ENHANCED RECOVERY PROJECTS						
Enhanced recovery projects						
Date started						
Date discontinued						
Peak oil production (bbl)						162,179
Year						1888
Peak gas production, net (Mcf)						6,471
Year						1972

Base of fresh water (ft.): 0 - 1,000

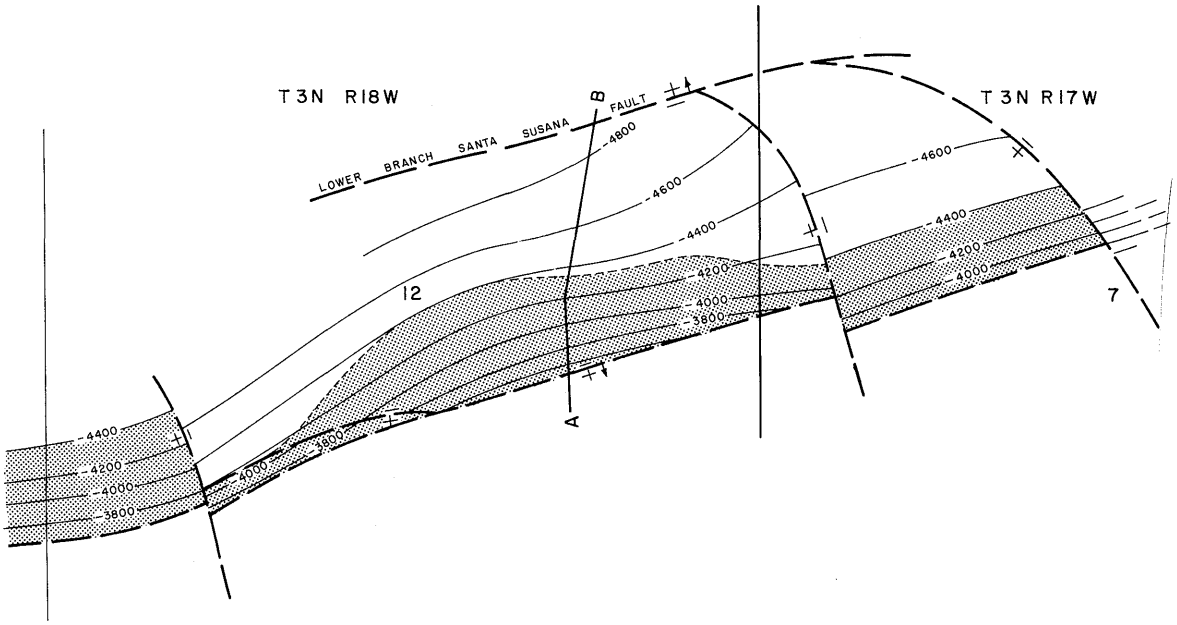
Remarks: About 45 tunnels were dug in this field, a few of which are still capable of production. Most wells were drilled with cable tools.
a/ Thin sand stringers and fractured shale.

Selected References:
Fine, S.F., 1954, Geology and Occurrence of Oil in the Ojai-Santa Paula Area, Ventura, Calif, in Geol. of Southern Calif.: Div. of Mines Bulletin 170, Map Sheet 28.

DATE: May 1983

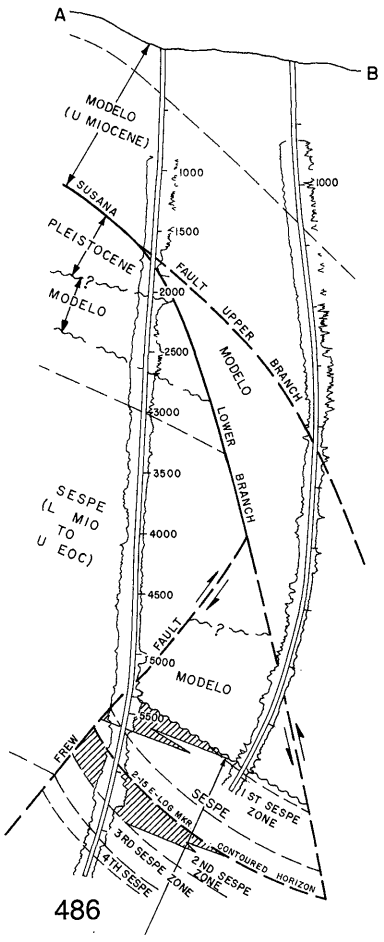
CALIFORNIA DIVISION OF OIL AND GAS

SANTA SUSANA OIL FIELD



COUNTOURS ON 2-15 ELECTRIC
LOG MARKER

SCALE 1" = 1420'



COUNTY: VENTURA

SANTA SUSANA 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	Union Oil Co. of Calif. "Broadoaks" 101	Union Oil Co. of Calif. "Simi" 30	12 3N 18W	SB	9,800	2nd & 3rd Sespe	
Deepest well	Union Oil Co. of Calif. "Broadoaks" 119	Same as present	7 3N 17W	SB	11,414		undiff. Marine strata, Paleocene

POOL DATA

ITEM	1ST SESPE	2ND & 3RD SESPE				FIELD OR AREA DATA
Discovery date	December 1963	November 1963				
Initial production rates						
Oil (bbl/day)	64	336				
Gas (Mcf/day)	22	173				
Flow pressure (psi)						
Bean size (in.)						
Initial reservoir pressure (psi)	-	2,600				
Reservoir temperature (°F)						
Initial oil content (STB/ac.-ft.)						
Initial gas content (MSCF/ac.-ft.)						
Formation	Sespe	Sespe				
Geologic age	Oligocene	Oligocene				
Average depth (ft.)	5,500	6,500				
Average net thickness (ft.)	150	500				
Maximum productive area (acres)						250
RESERVOIR ROCK PROPERTIES						
Porosity (%)						
S_{oi} (%)						
S_{wi} (%)						
S_{gi} (%)						
Permeability to air (md)						
RESERVOIR FLUID PROPERTIES						
Oil:						
Oil gravity (°API)	44	38				
Sulfur content (% by wt.)						
Initial solution GOR (SCF/STB)						
Initial oil FVF (RB/STB)	-	2,200				
Bubble point press. (psia)						
Viscosity (cp) @ °F						
Gas:						
Specific gravity (air = 1.0)						
Heating value (Btu/cu. ft.)						
Water:						
Salinity, NaCl (ppm)	-	18,800				
T.D.S. (ppm)						
R_w (ohm/m) (77°F)						
ENHANCED RECOVERY PROJECTS						
Enhanced recovery projects		pressure maintenance				
Date started		1965				
Date discontinued		1982				
Peak oil production (bbl)						1,070,679
Year						1966
Peak gas production, net (Mcf)						3,266,493
Year						1969

Base of fresh water (ft.): None

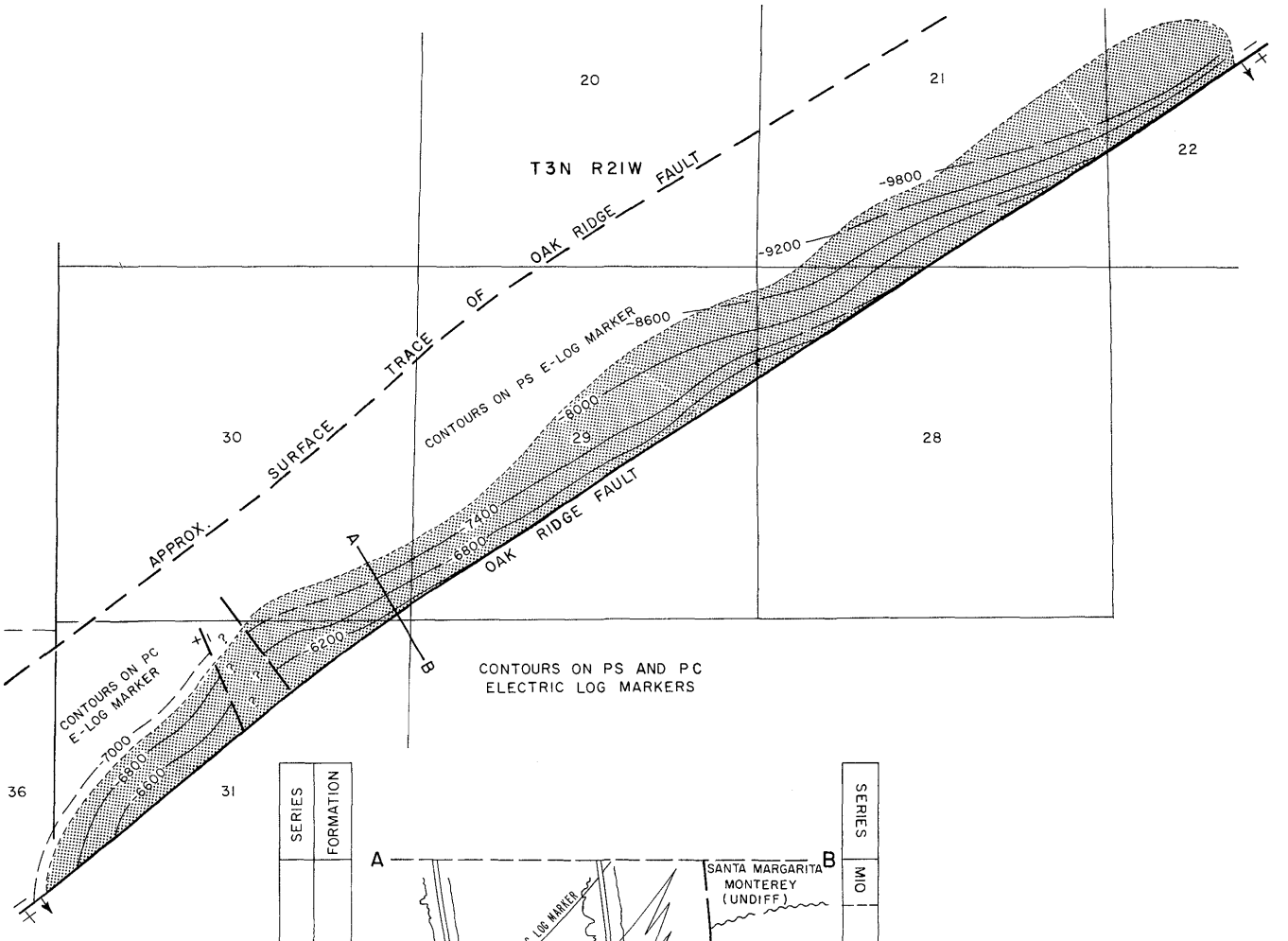
Remarks:

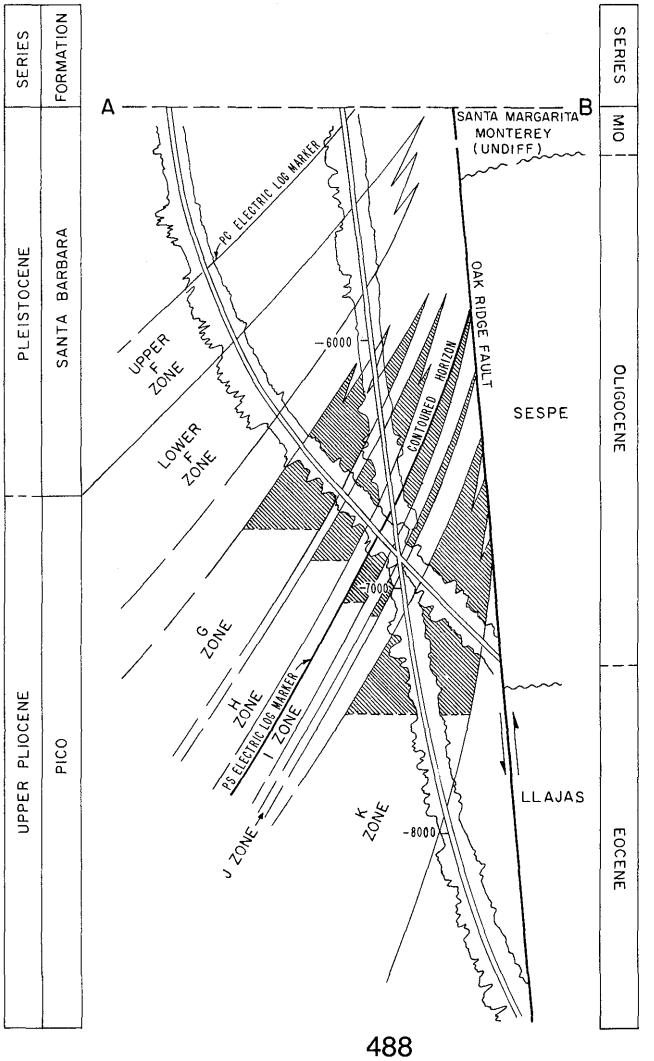
Selected References: Mitchell, W.S. and M. Wolf, 1971, Santa Susana Oil Field: Calif. Div. of Oil and Gas, Summary of Operations -- Calif. Oil Fields, Vol. 57, No. 1.

DATE: May 1983

CALIFORNIA DIVISION OF OIL AND GAS

SATICOY OIL FIELD





COUNTY: VENTURA

SATICOY 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	Whiting Petroleum Corp. "S.P.S." 2	Shell Oil Co. "S.P.S." 2	29 3N 21W	SB	12,020	J	
Deepest well	Sage-California "Edwards" 13	Shell Oil Co. "Edwards" 13	30 3N 21W	SB	12,275		Santa Margarita late Miocene

POOL DATA

ITEM	UPPER F	LOWER F	G	H	I	FIELD OR AREA DATA
Discovery date	August 1956	August 1956	September 1955	September 1955	January 1956	
Initial production rates						
Oil (bbl/day)	883	883[a/]	516	516[b/]	325	
Gas (Mcf/day)	440	440	150	150	190	
Flow pressure (psi)						
Bean size (in.)						
Initial reservoir pressure (psi)	2,800	2,800	3,200	3,450	3,630	
Reservoir temperature (°F)	160	160	165	170	175	
Initial oil content (STB/ac.-ft.)	1,040	1,040	800	750	610	
Initial gas content (MSCF/ac.-ft.)						
Formation	Santa Barbara-Pico	Pico	Pico	Pico	Pico	
Geologic age	Pleistocene-Pliocene	Pliocene	Pliocene	Pliocene	Pliocene	
Average depth (ft.)	6,350	-	7,300	7,830	8,250	
Average net thickness (ft.)	450	-	250	185	110	
Maximum productive area (acres)						390
RESERVOIR ROCK PROPERTIES						
Porosity (%)	25.0	25.0	21.0-23.0	18.0-23.0	16.6-21.0	
S_{oi} (%)	71.0	71.0	62.5	59.5	56.0	
S_{wi} (%)	29.0	29.0	37.5	40.5	44.0	
S_{gi} (%)						
Permeability to air (md)	200	200	128	131	58*	
RESERVOIR FLUID PROPERTIES						
Oil:						
Oil gravity (°API)	35	35	30	35	35	
Sulfur content (% by wt.)						
Initial solution GOR (SCF/STB)						
Initial oil FVF (RB/STB)	1.33	1.33	1.33	1.33	1.33	
Bubble point press. (psia)	1,950	1,950	1,950	1,950	1,950	
Viscosity (cp) @ °F	0.7 @ 160	0.7 @ 160	0.7 @ 160	0.7 @ 160	0.7 @ 160	
Gas:						
Specific gravity (air = 1.0)						
Heating value (Btu/cu. ft.)						
Water:						
Salinity, NaCl (ppm)	17,100	17,100	17,100	17,100	17,100	
T.D.S. (ppm)						
R_w (ohm/m) (77°F)						
ENHANCED RECOVERY PROJECTS						
Enhanced recovery projects			waterflood	waterflood	waterflood	
Date started			1963	1963	1963	
Date discontinued			1968	1968	1968	
Peak oil production (bbl)						
Year						
Peak gas production, net (Mcf)						
Year						

Base of fresh water (ft.): 400 - 1,500

Remarks: a/ Production from the Upper and Lower F zones was commingled.
b/ Production from the G and H zones was commingled.

Selected References: Schultz, C.H., 1960, Saticoy Oil Field: Calif. Div. of Oil and Gas, Summary of Operations -- Calif. Oil Fields, Vol. 46, No. 1.

DATE: May 1991 *Average value

CALIFORNIA DIVISION OF OIL AND GAS

COUNTY: VENTURA

SATICOY 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	J	K				FIELD OR AREA DATA
Discovery date	May 1955	May 1955				
Initial production rates						
Oil (bbl/day)	236	90				
Gas (Mcf/day)	130	920				
Flow pressure (psi)						
Bean size (in.)						
Initial reservoir pressure (psi)	3,770	4,000				
Reservoir temperature (°F)	180	185				
Initial oil content (STB/ac.-ft.)	610	470				
Initial gas content (MSCF/ac.-ft.)						
Formation	Pico	Pico				
Geologic age	Pliocene	Pliocene				
Average depth (ft.)	8,570	9,035				
Average net thickness (ft.)						
Maximum productive area (acres)						640
RESERVOIR ROCK PROPERTIES						
Porosity (%)	16.5-22.3	13.8-20.6				
S_{oi} (%)	54	47				
S_{wi} (%)	46	53				
S_{gi} (%)						
Permeability to air (md)	42.0	53.5*				
RESERVOIR FLUID PROPERTIES						
Oil:						
Oil gravity (°API)	35	35				
Sulfur content (% by wt.)						
Initial solution GOR (SCF/STB)						
Initial oil FVF (RB/STB)	1.33	1.33				
Bubble point press. (psia)						
Viscosity (cp) @ °F	0.7 @ 160	0.7 @ 160				
Gas:						
Specific gravity (air = 1.0)						
Heating value (Btu/cu. ft.)						
Water:						
Salinity, NaCl (ppm)	17,100	17,100				
T.D.S. (ppm)						
R_w (ohm/m) (77°F)						
ENHANCED RECOVERY PROJECTS						
Enhanced recovery projects	waterflood					
Date started	1963					
Date discontinued	1968					
Peak oil production (bbl)						2,809,296
Year						1958
Peak gas production, net (Mcf)						6,354,503
Year						1958

Base of fresh water (ft.):

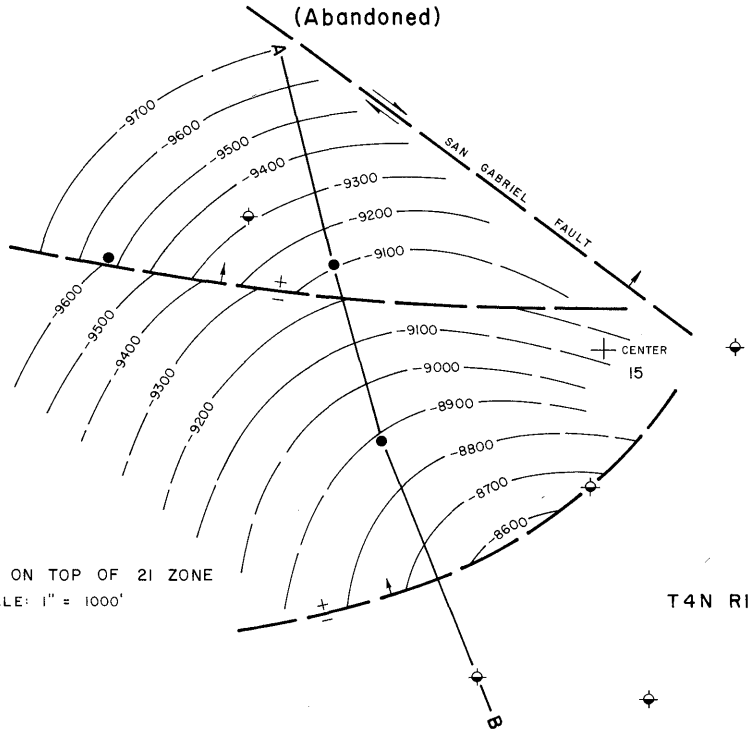
Remarks:

Selected References:

DATE: May 1983 *Average value

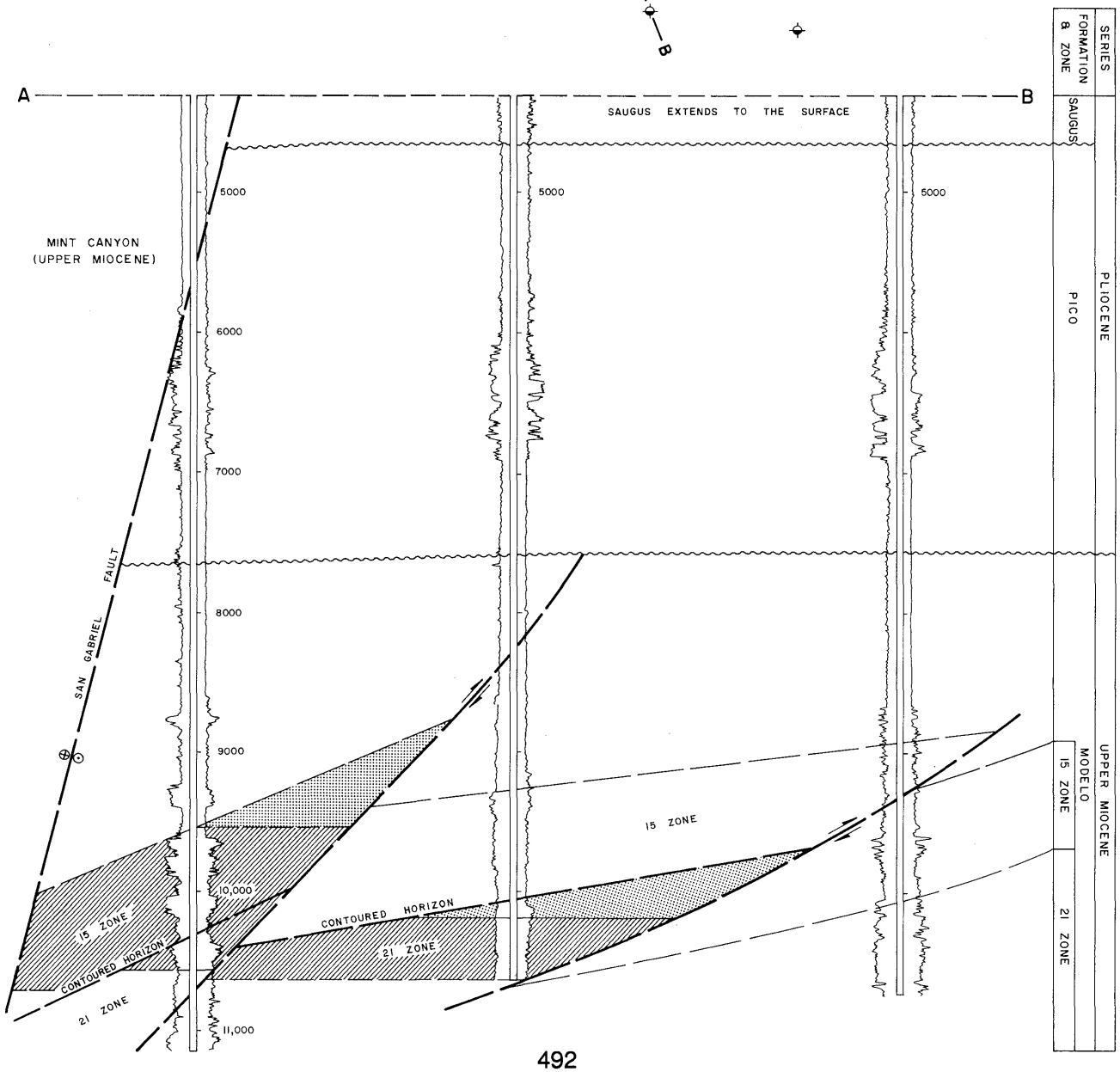
CALIFORNIA DIVISION OF OIL AND GAS

SAUGUS OIL FIELD
(Abandoned)



CONTOURS ON TOP OF 21 ZONE
SCALE: 1" = 1000'

T4N R16W



COUNTY: LOS ANGELES

SAUGUS OIL FIELD (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	James C. Thomas III "N.L.& F." B-1	Union Oil Co. of Calif. "N.L.& F." 4	15 4N 16W	SB	11,545	15	Modelo late Miocene
Deepest well	Same as above	"	"	"	"	"	"

POOL DATA

ITEM	15	21				FIELD OR AREA DATA
Discovery date	November 1957	May 1958				
Initial production rates						
Oil (bbl/day)	54	374				
Gas (Mcf/day)	22	280				
Flow pressure (psi)						
Bean size (in.)						
Initial reservoir pressure (psi)	5,190	5,190				
Reservoir temperature (°F)						
Initial oil content (STB/ac.-ft.)						
Initial gas content (MSCF/ac.-ft.)						
Formation	Modelo	Modelo				
Geologic age	late Miocene	late Miocene				
Average depth (ft.)	9,500	10,000				
Average net thickness (ft.)	200	250				
Maximum productive area (acres)						40
RESERVOIR ROCK PROPERTIES						
Porosity (%)	15*	15*				
S_{oi} (%)						
S_{wi} (%)	40	40				
S_{gi} (%)						
Permeability to air (md)	1.6*	1.6*				
RESERVOIR FLUID PROPERTIES						
Oil:						
Oil gravity (°API)	28	30				
Sulfur content (% by wt.)						
Initial solution GOR (SCF/STB)						
Initial oil FVF (RB/STB)						
Bubble point press. (psia)						
Viscosity (cp) @ °F						
Gas:						
Specific gravity (air = 1.0)						
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						
Date started						
Date discontinued						
Peak oil production (bbl)						74,566
Year						1959
Peak gas production, net (Mcf)						139,843
Year						1959

Base of fresh water (ft.): 600

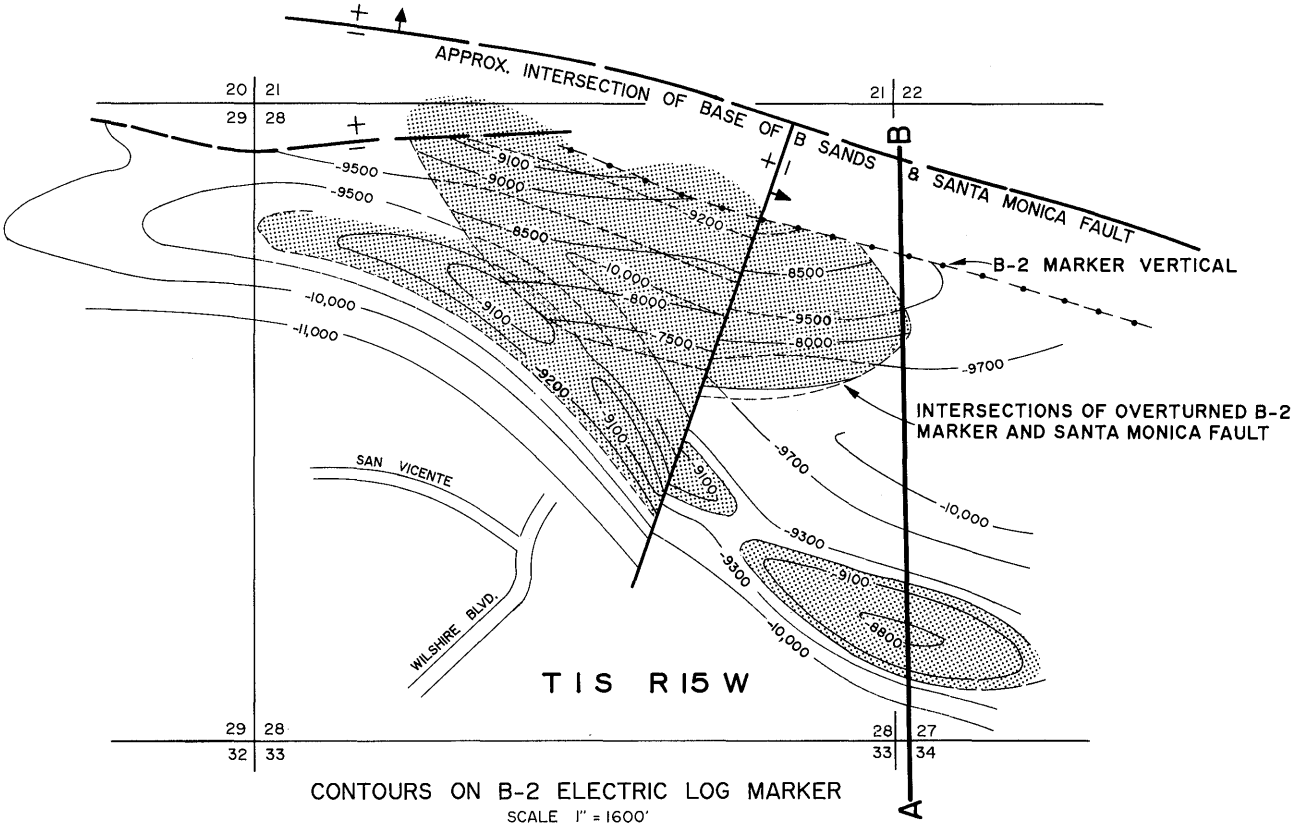
Remarks: Field was abandoned in 1989. Cumulative production is 571,027 bbl of oil and 783,626 Mcf of gas.

Selected References: Cordova, S., 1962, Saugus Oil Field: Calif. Div. of Oil and Gas, Summary of Operations -- Calif. Oil Fields, Vol. 48, No. 2.

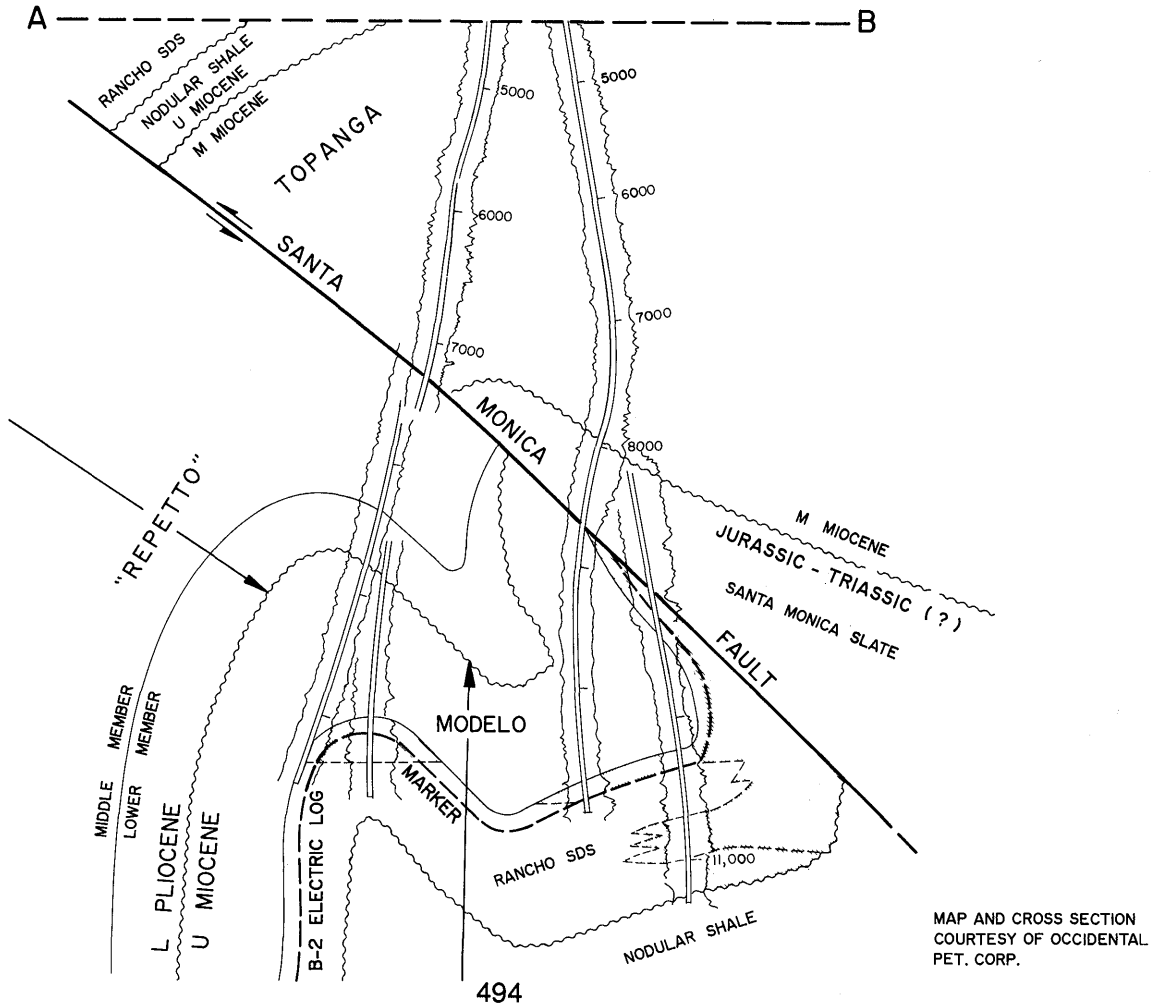
DATE: May 1983 *Average value

CALIFORNIA DIVISION OF OIL AND GAS

SAWTELLE OIL FIELD



CONTOURS ON B-2 ELECTRIC LOG MARKER
SCALE 1" = 1600'



MAP AND CROSS SECTION COURTESY OF OCCIDENTAL PET. CORP.

COUNTY: LOS ANGELES

SAWTELLE 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	Oxy U.S.A. Inc. "Dowlen-Federal" 1	Gulf Oil Corp. of Calif. "Dowlen-Federal" 1	28 1S 15W	SB	10,432	a/ Rancho	
Deepest well	Argo Petroleum and Aladdin Oil Corp. "Argo and Aladdin Addhoc" 179-1	Same as present	28 1S 15W	SB	12,085	b/	Modelo late Miocene

POOL DATA

ITEM	RANCHO					FIELD OR AREA DATA
Discovery date	August 1965					
Initial production rates						
Oil (bbl/day)	567					
Gas (Mcf/day)	210					
Flow pressure (psi)	590					
Bean size (in.)	18/64					
Initial reservoir pressure (psi)	4,400					
Reservoir temperature (°F)	274					
Initial oil content (STB/ac.-ft.)	616					
Initial gas content (MSCF/ac.-ft.)	240					
Formation	Modelo					
Geologic age	late Miocene					
Average depth (ft.)	9,500					
Average net thickness (ft.)	350					
Maximum productive area (acres)	300					
RESERVOIR ROCK PROPERTIES						
Porosity (%)	24					
So_i (%)	62					
Sw_i (%)	38					
Sg_i (%)						
Permeability to air (md)	30					
RESERVOIR FLUID PROPERTIES						
Oil:						
Oil gravity (°API)	20-26					
Sulfur content (% by wt.)	2.4					
Initial solution GOR (SCF/STB)	388					
Initial oil FVF (RB/STB)	1.25					
Bubble point press. (psia)	2,470					
Viscosity (cp) @ °F						
Gas:						
Specific gravity (air = 1.0)	0.75					
Heating value (Btu/cu. ft.)	1,295					
Water:						
Salinity, NaCl (ppm)	16,370					
T.D.S. (ppm)	26,270					
R_w (ohm/m) (77°F)	33.8					
ENHANCED RECOVERY PROJECTS						
Enhanced recovery projects	waterflood					
Date started	1984					
Date discontinued	active					
Peak oil production (bbl)	1,508,312					
Year	1968					
Peak gas production, net (Mcf)	1,295,417					
Year	1968					

Base of fresh water (ft.): 550

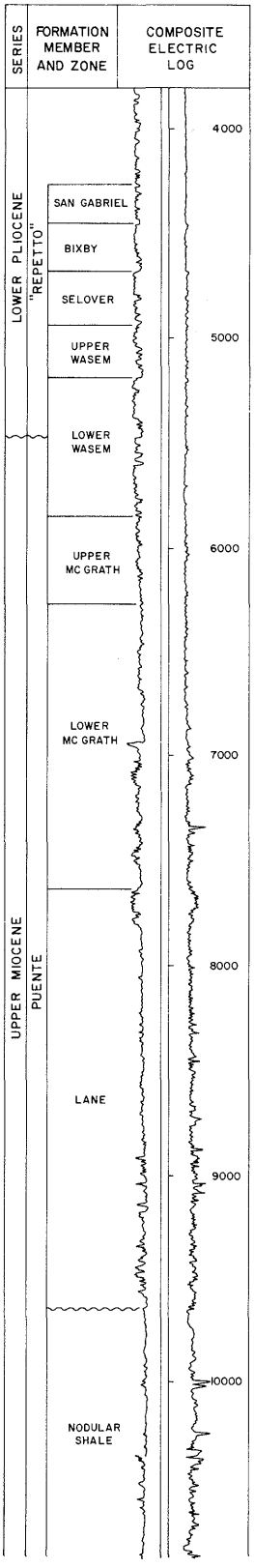
Remarks: a/ Directional well, true vertical depth 10,061 feet.
b/ Directional well, true vertical depth 11,203 feet.

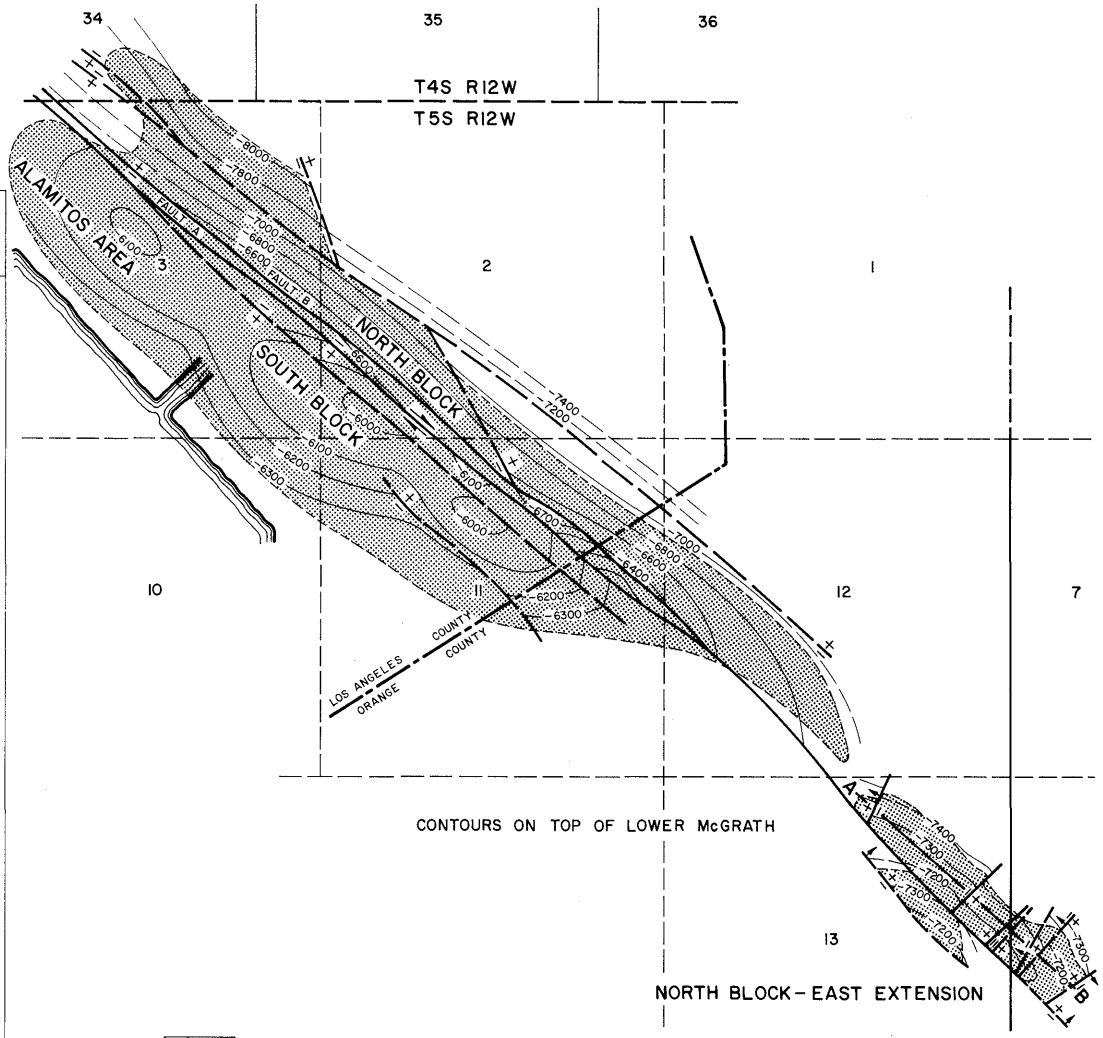
Selected References:

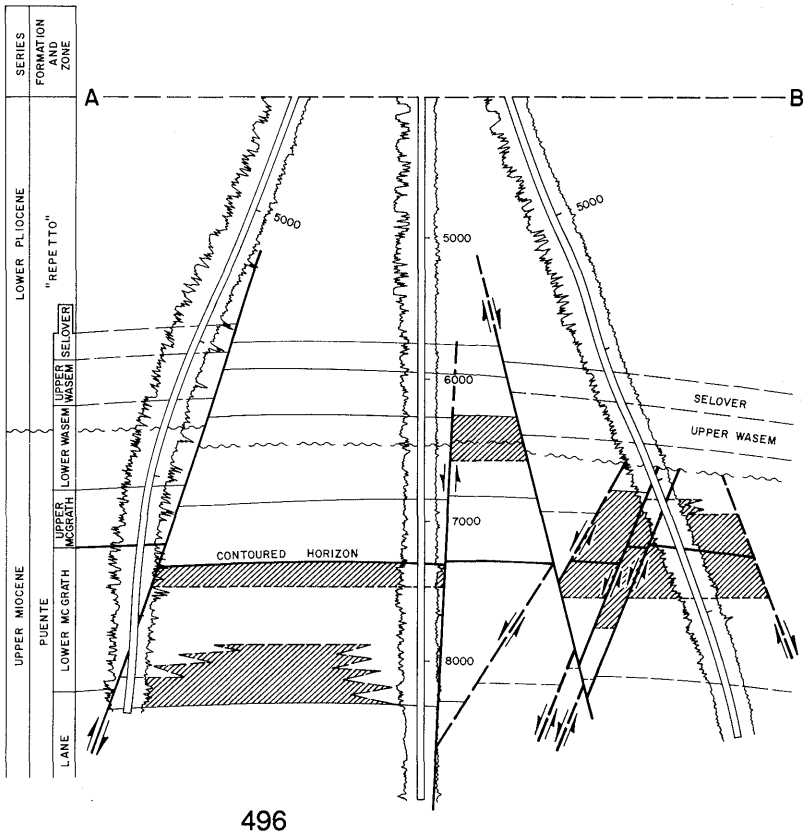
DATE: July 1983

CALIFORNIA DIVISION OF OIL AND GAS

SEAL BEACH OIL FIELD







COUNTY: LOS ANGELES AND ORANGE COUNTIES

SEAL BEACH 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	Shell Oil Co. "Bryant" 1	Same as present	11 5S 12W	SB	4,620	San Gabriel	
Deepest well	McFarland Energy, Inc. "Bixby A" 62	Same as present	2 5S 11W	SB	12,162		Catalina Schist Cret. or older

POOL DATA

ITEM	SAN GABRIEL					FIELD OR AREA DATA
Discovery date	September 1924					
Initial production rates						
Oil (bbl/day)	67					
Gas (Mcf/day)						
Flow pressure (psi)						
Bean size (in.)						
Initial reservoir pressure (psi)	1,850					
Reservoir temperature (°F)	125					
Initial oil content (STB/ac.-ft.)	1,050					
Initial gas content (MSCF/ac.-ft.)	315					
Formation	"Repetto"					
Geologic age	early Pliocene					
Average depth (ft.)	2,610					
Average net thickness (ft.)						
Maximum productive area (acres)						870
RESERVOIR ROCK PROPERTIES						
Porosity (%)						
So_i (%)						
Sw_i (%)						
Sg_i (%)						
Permeability to air (md)						
RESERVOIR FLUID PROPERTIES						
Oil:						
Oil gravity (°API)	20-27					
Sulfur content (% by wt.)						
Initial solution GOR (SCF/STB)	300					
Initial oil FVF (RB/STB)	1.20					
Bubble point press. (psia)	1,550					
Viscosity (cp) @ °F	10					
Gas:						
Specific gravity (air = 1.0)	0.90					
Heating value (Btu/cu. ft.)						
Water:						
Salinity, NaCl (ppm)	31,100					
T.D.S. (ppm)	31,645					
R_w (ohm/m) (77°F)	0.20					
ENHANCED RECOVERY PROJECTS						
Enhanced recovery projects						
Date started						
Date discontinued						
Peak oil production (bbl)						16,500,771
Year						1927
Peak gas production, net (Mcf)						
Year						

Base of fresh water (ft.): See areas

Remarks:

Selected References:

Barnes, R.M., and G.H. Bowes, 1930, Seal Beach Oil Field: Calif. Div. of Oil and Gas, Summary of Operations -- Calif. Oil Fields, Vol. 16, No. 2.

Copp, W.W., and G.H. Bowes, 1927, Seal Beach Oil Field: Calif. Div. of Oil and Gas, Summary of Operations -- Calif. Oil Fields, Vol. 13, No. 3.

DATE: June 1983

CALIFORNIA DIVISION OF OIL AND GAS

COUNTY: LOS ANGELES

SEAL BEACH OIL FIELD
ALAMITOS 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	Pan Western Petroleum Co. "Naples" 1	Petroleum Securities Co. "Naples" 1	3 5S 12W	SB	4,757	Selover	
Deepest well	Texaco Producing Inc. "Bryant" 8-A	Pacific Western Oil Corp. "Bryant" 8-A	3 5S 12W	SB	9,942		Puente late Miocene

POOL DATA

ITEM	SELOVER	WASEM	MCGRATH			FIELD OR AREA DATA
Discovery date	February 1927	June 1927	November 1929			
Initial production rates						
Oil (bbl/day)	2,279	214	670			
Gas (Mcf/day)	-	-	135			
Flow pressure (psi)						
Bean size (in.)						
Initial reservoir pressure (psi)						
Reservoir temperature (°F)	110	120	120			
Initial oil content (STB/ac.-ft.)						
Initial gas content (MSCF/ac.-ft.)						
Formation	"Repetto"	"Repetto"-Puente	Puente			
Geologic age	early Pliocene	e Plio./l Miocene	late Miocene			
Average depth (ft.)	4,100	4,600	5,500			
Average net thickness (ft.)	240	900	835			
Maximum productive area (acres)						110
RESERVOIR ROCK PROPERTIES						
Porosity (%)	30	28	25			
S_{oi} (%)						
S_{wi} (%)						
S_{gi} (%)						
Permeability to air (md)	280	200	125			
RESERVOIR FLUID PROPERTIES						
Oil:						
Oil gravity (°API)	25-28	28-32	28			
Sulfur content (% by wt.)	-	-	55			
Initial solution GOR (SCF/STB)						
Initial oil FVF (RB/STB)						
Bubble point press. (psia)						
Viscosity (cp) @ °F						
Gas:						
Specific gravity (air = 1.0)						
Heating value (Btu/cu. ft.)						
Water:						
Salinity, NaCl (ppm)	27,389	25,677	33,038			
T.D.S. (ppm)						
R_w (ohm/m) (77°F)	0.16	0.16	0.13			
ENHANCED RECOVERY PROJECTS						
Enhanced recovery projects						
Date started						
Date discontinued						
Peak oil production (bbl)						142,229
Year						1981
Peak gas production, net (Mcf)						162,287
Year						1981

Base of fresh water (ft.): 1,800

Remarks:

Selected References: Hesson, B.H., & H. Olilang, 1990, Seal Beach Oil Field, Alamitos and Marine Areas: Calif. Div. of Oil and Gas Publication TR39.

DATE: May 1991

CALIFORNIA DIVISION OF OIL AND GAS

COUNTY: LOS ANGELES

SEAL BEACH OIL FIELD
MARINE 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	Elliot & Ten Eyck "ET" 1	Same as present	3 5S 12W	SB	8,700	Wasem and Lower McGrath	
Deepest well	Elliot & Ten Eyck "ET" 6	Same as present	3 5S 12W	SB	9,934		Lane, Capitol Miocene

POOL DATA

ITEM	WASEM	LOWER MCGRATH	LANE			FIELD OR AREA DATA
Discovery date	January 1979	January 1979	April 1981			
Initial production rates						
Oil (bbl/day)	-	105	138			
Gas (Mcf/day)	-	100	21			
Flow pressure (psi)	-	-	150			
Bean size (in.)	-	-	3/4			
Initial reservoir pressure (psi)	2,291	3,026	3,362			
Reservoir temperature (°F)	165	195	211			
Initial oil content (STB/ac.-ft.)						
Initial gas content (MSCF/ac.-ft.)						
Formation	Puente	Puente	Puente			
Geologic age	Pliocene/l Miocene	late Miocene	late Miocene			
Average depth (ft.)	5,490	7,240	8,040			
Average net thickness (ft.)	400	1,000	1,000			
Maximum productive area (acres)	49.5	49.5	49.5			
RESERVOIR ROCK PROPERTIES						
Porosity (%)	21.5	21.5	15.0			
S_{oi} (%)	75	75	60			
S_{wi} (%)	25	25	40			
S_{gi} (%)	Solution Gas	Solution Gas	Solution Gas			
Permeability to air (md)	36	36	20			
RESERVOIR FLUID PROPERTIES						
Oil:						
Oil gravity (°API)	24-32	25	25			
Sulfur content (% by wt.)						
Initial solution GOR (SCF/STB)	375	490	520			
Initial oil FVF (RB/STB)	1.2	1.275	1.3			
Bubble point press. (psia)	2,291	3,026	3,362			
Viscosity (cp) @ °F	-	4 @ 160	-			
Gas:						
Specific gravity (air = 1.0)	0.70	0.70	0.70			
Heating value (Btu/cu. ft.)	1,009.7	1,009.7	1,009.7			
Water:						
Salinity, NaCl (ppm)						
T.D.S. (ppm)						
R_w (ohm/m) (77°F)						
ENHANCED RECOVERY PROJECTS						
Enhanced recovery projects						
Date started						
Date discontinued						
Peak oil production (bbl)						629,562
Year						1984
Peak gas production, net (Mcf)						618,192
Year						1984

Base of fresh water (ft.): 1,800

Remarks:

Selected References: Hesson, B.H., & H. Olilang, 1990, Seal Beach Oil Field, Alamitos and Marine Areas: Calif. Div. of Oil and Gas publication TR39.

DATE: July 1983

CALIFORNIA DIVISION OF OIL AND GAS

COUNTY: LOS ANGELES AND ORANGE

SEAL BEACH OIL FIELD
NORTH BLOCK 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	Shell Oil Co. "Bryant" 1	Same as present	11 5S 12W	SB	4,620	San Gabriel	
Deepest well	Shell Oil Co. "Bryant Four" 1	Same as present	11 5S 12W	SB	10,992		Puente late Miocene

POOL DATA

ITEM	B GAS	SAN GABRIEL	BIXBY	SELOVER	WASEM	FIELD OR AREA DATA
Discovery date	January 1969	September 1924	August 1927	May 1927	May 1927	
Initial production rates						
Oil (bbl/day)	-	67	1,110	1,170	a/	
Gas (Mcf/day)	1,060	-	-	-		
Flow pressure (psi)						
Bean size (in.)						
Initial reservoir pressure (psi)	-	1,850	1,515-1,950	1,600	2,200	
Reservoir temperature (°F)	-	125	135	152	180	
Initial oil content (STB/ac.-ft.)	-	1,050	1,400	1,230	1,020	
Initial gas content (MSCF/ac.-ft.)	-	315	450	-	-	
Formation	"Repetto"	"Repetto"	"Repetto"	"Repetto"	"Repetto"-Puente	
Geologic age	early Pliocene	early Pliocene	early Pliocene	early Pliocene	e Plio./l Miocene	
Average depth (ft.)	3,900	2,610	4,350	3,470	3,820	
Average net thickness (ft.)	120	40	171	120	350	
Maximum productive area (acres)						
RESERVOIR ROCK PROPERTIES						
Porosity (%)	-	34	28-37	29	24	
So_i (%)	-	40	50-77	77	53	
Sw_i (%)	-	60	23-50	23	45	
Sg_i (%)	-	0	-	-	-	
Permeability to air (md)	-	-	200	600	175	
RESERVOIR FLUID PROPERTIES						
Oil:						
Oil gravity (°API)	-	20-27	-	27	20-28	
Sulfur content (% by wt.)						
Initial solution GOR (SCF/STB)	-	300	330	-	400	
Initial oil FVF (RB/STB)	-	1.200	1.220	-	1.225	
Bubble point press. (psia)	-	1,550	1,600	-	-	
Viscosity (cp) @ °F	-	3.6 @ 130	3.6 @ 130	3.6 @ 130	3.6 @ 130	
Gas:						
Specific gravity (air = 1.0)	0.89	0.90	0.89	0.89	0.89	
Heating value (Btu/cu. ft.)						
Water:						
Salinity, NaCl (ppm)	-	31,100	28,000	28,000	28,000	
T.D.S. (ppm)	-	31,645	31,000	26,600	27,800	
R_w (ohm/m) (77°F)	-	0.20	0.20	0.20	0.20	
ENHANCED RECOVERY PROJECTS						
Enhanced recovery projects					waterflood	
Date started					1974	
Date discontinued					active	
Peak oil production (bbl)						
Year						
Peak gas production, net (Mcf)						
Year						

Base of fresh water (ft.): 1,800

Remarks: a/Selover and Wasem commingled.

Selected References:

DATE: June 1983

CALIFORNIA DIVISION OF OIL AND GAS

COUNTY: LOS ANGELES AND ORANGE

SEAL BEACH OIL FIELD
NORTH BLOCK 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	MCGRATH					FIELD OR AREA DATA
Discovery date	November 1944					
Initial production rates						
Oil (bbl/day)	422					
Gas (Mcf/day)	400					
Flow pressure (psi)						
Bean size (in.)						
Initial reservoir pressure (psi)	2,000					
Reservoir temperature (°F)	200					
Initial oil content (STB/ac.-ft.)	1,190					
Initial gas content (MSCF/ac.-ft.)						
Formation	Puente					
Geologic age	late Miocene					
Average depth (ft.)	6,500					
Average net thickness (ft.)	550					
Maximum productive area (acres)						330
RESERVOIR ROCK PROPERTIES						
Porosity (%)	22					
So_i (%)	70					
Sw_i (%)	30					
Sg_i (%)	0					
Permeability to air (md)	60					
RESERVOIR FLUID PROPERTIES						
Oil:						
Oil gravity (°API)	26-34					
Sulfur content (% by wt.)	0.55					
Initial solution GOR (SCF/STB)	535					
Initial oil FVF (RB/STB)	1.39					
Bubble point press. (psia)						
Viscosity (cp) @ °F	3.6 @ 130					
Gas:						
Specific gravity (air = 1.0)						
Heating value (Btu/cu. ft.)						
Water:						
Salinity, NaCl (ppm)	28,000					
T.D.S. (ppm)	20,000					
R_w (ohm/m) (77°F)	0.20					
ENHANCED RECOVERY PROJECTS						
Enhanced recovery projects	waterflood					
Date started	1961					
Date discontinued	active					
Peak oil production (bbl)						2,801,694
Year						1947
Peak gas production, net (Mcf)						
Year						

Base of fresh water (ft.):

Remarks:

Selected References:

DATE: June 1983

CALIFORNIA DIVISION OF OIL AND GAS

COUNTY: ORANGE

SEAL BEACH OIL FIELD
NORTH BLOCK-EAST EXTENSION 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	Breitburn Energy Corp."Alamitos" 1	Hancock Oil Co. "Alamitos" 1	13 5S 12W	SB	8,976	McGrath	
Deepest well	Breitburn Energy Corp. "Alamitos" 23	Hancock Oil Co. "Alamitos" 23	13 5S 12W	SB	9,763		Puente late Miocene

POOL DATA

ITEM	WASEM	MCGRATH				FIELD OR AREA DATA
Discovery date	July 1956	December 1954				
Initial production rates						
Oil (bbl/day)	472	344				
Gas (Mcf/day)	210	75				
Flow pressure (psi)						
Bean size (in.)						
Initial reservoir pressure (psi)	2,150	3,215				
Reservoir temperature (°F)	152	186				
Initial oil content (STB/ac.-ft.)						
Initial gas content (MSCF/ac.-ft.)						
Formation	"Repetto"-Puente	Puente				
Geologic age	e Plio./l Miocene	late Miocene				
Average depth (ft.)	6,641	8,100				
Average net thickness (ft.)	400	600				
Maximum productive area (acres)						140
RESERVOIR ROCK PROPERTIES						
Porosity (%)	25.0	21.4				
S_{oi} (%)						
S_{wi} (%)						
S_{gi} (%)						
Permeability to air (md)	125	107				
RESERVOIR FLUID PROPERTIES						
Oil:						
Oil gravity (°API)	28	27-33				
Sulfur content (% by wt.)	-	0.55				
Initial solution GOR (SCF/STB)	540	440				
Initial oil FVF (RB/STB)						
Bubble point press. (psia)						
Viscosity (cp) @ °F						
Gas:						
Specific gravity (air = 1.0)						
Heating value (Btu/cu. ft.)						
Water:						
Salinity, NaCl (ppm)	25,677	29,225				
T.D.S. (ppm)						
R_w (ohm/m) (77°F)	0.14	0.09				
ENHANCED RECOVERY PROJECTS						
Enhanced recovery projects		waterflood				
Date started		1975				
Date discontinued		active				
Peak oil production (bbl)						946,403
Year						1958
Peak gas production, net (Mcf)						953,905
Year						1958

Base of fresh water (ft.): 1,800

Remarks:

Selected References: Ingram, W.L., 1966, North Block-East Extension of Seal Beach Oil Field: Calif. Div. of Oil and Gas, Summary of Operations -- Calif. Oil Fields, Vol. 52, No. 1.

DATE: May 1991

CALIFORNIA DIVISION OF OIL AND GAS

COUNTY: LOS ANGELES AND ORANGE

SEAL BEACH OIL FIELD
SOUTH BLOCK 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	McFarland Energy, Inc. "Bixby A" 2	Marland Oil Co. of Calif. "Bixby" 2	11 5S 12W	SB	4,427	Bixby	
Deepest well	McFarland Energy, Inc. "Bixby A" 62	Continental Oil Co. "Bixby A" 62	2 5S 12W	SB	12,162		Catalina Schist Cret. or older

POOL DATA

ITEM	BIXBY	SELOVER	WASEM	MCGRATH	LANE	FIELD OR AREA DATA
Discovery date	August 1926	November 1926	July 1929	February 1928	February 1952	
Initial production rates						
Oil (bbl/day)	1,853	2,950	1,224	650	278	
Gas (Mcf/day)	-	-	-	850	-	
Flow pressure (psi)						
Bean size (in.)						
Initial reservoir pressure (psi)	1,500	2,100	2,200	2,800	3,400-3,760	
Reservoir temperature (°F)	149	135	150	170	190-260	
Initial oil content (STB/ac.-ft.)	168	1,200	1,600	1,150	600	
Initial gas content (MSCF/ac.-ft.)	-	420	590	515	320	
Formation	"Repetto"	"Repetto"	"Repetto"-Puente	Puente	Puente	
Geologic age	early Pliocene	early Pliocene	e Plio./l Miocene	late Miocene	late Miocene	
Average depth (ft.)	4,100	4,100	4,600	5,500	7,600	
Average net thickness (ft.)	115	200	900	800	1,000	
Maximum productive area (acres)						290
RESERVOIR ROCK PROPERTIES						
Porosity (%)	28	30	28	23	16-18	
S_{oi} (%)	77	50	75	65	40-70	
S_{wi} (%)	23	50	25	35	30-60	
S_{gi} (%)						
Permeability to air (md)	200	400-600	70-390	50-150	20	
RESERVOIR FLUID PROPERTIES						
Oil:						
Oil gravity (°API)	21-25	24-28	22-28	25-33	28-32	
Sulfur content (% by wt.)	1.23	1.23	-	0.55	-	
Initial solution GOR (SCF/STB)	330	350	370	450	530	
Initial oil FVF (RB/STB)	1.22	1.24	1.32	1.36	1.38	
Bubble point press. (psia)	1,600	1,700	1,850	1,850	2,200	
Viscosity (cp) @ °F	3.6 @ 130	3.5 @ 130	3.5 @ 130	3.5 @ 130	3.5 @ 130	
Gas:						
Specific gravity (air = 1.0)	0.89	0.90	0.90	0.90	0.89	
Heating value (Btu/cu. ft.)						
Water:						
Salinity, NaCl (ppm)	30,800	27,400	25,700	33,000	10,300	
T.D.S. (ppm)	31,000	-	31,000	22,000	31,000	
R_w (ohm/m) (77°F)	0.20	0.28	0.37	0.32	0.25	
ENHANCED RECOVERY PROJECTS						
Enhanced recovery projects			waterflood	waterflood	waterflood	
Date started			1976	1976	1976	
Date discontinued			active	active	active	
Peak oil production (bbl)						1,792,923
Year						1936
Peak gas production, net (Mcf)						
Year						

Base of fresh water (ft.): 1,800

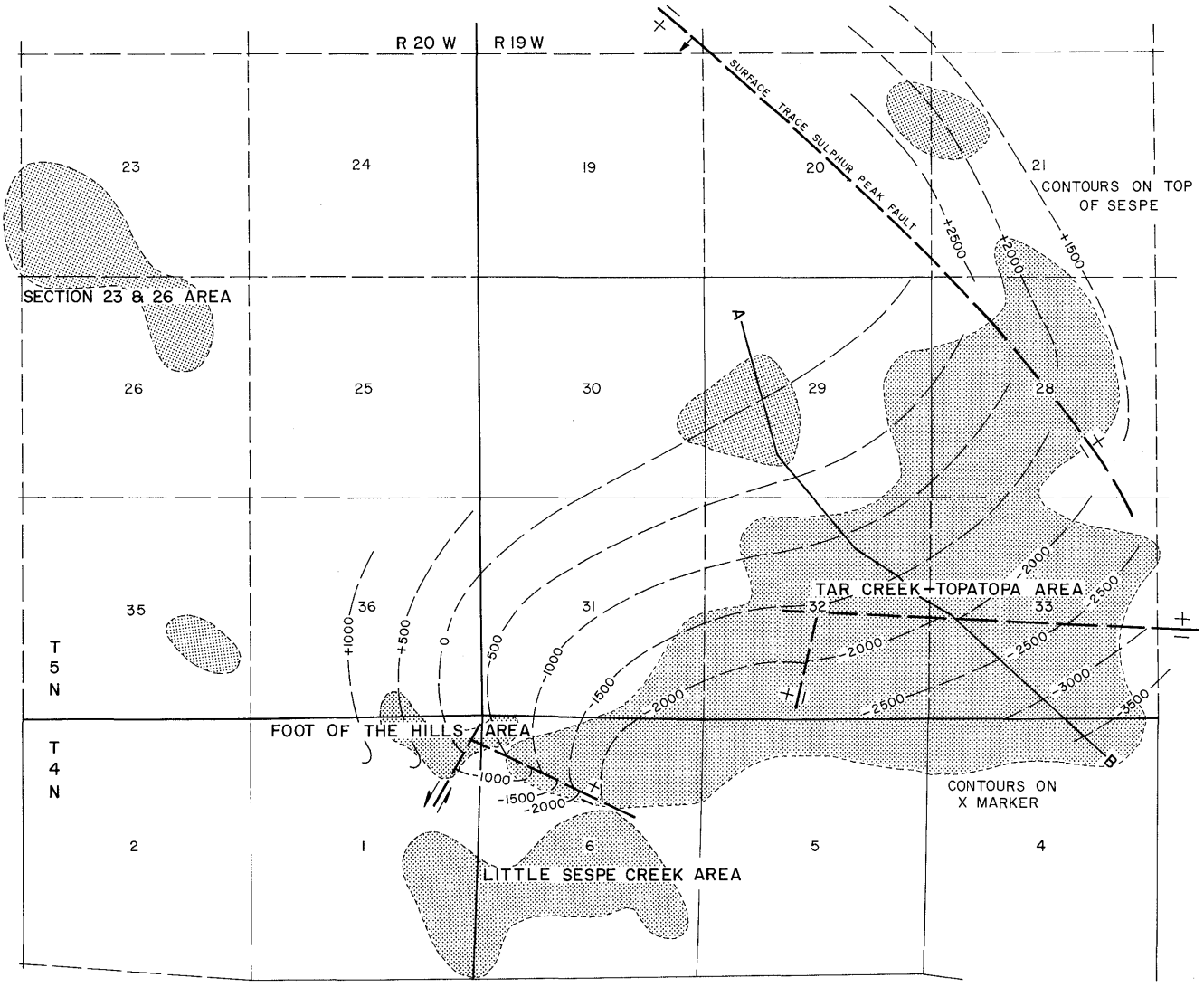
Remarks:

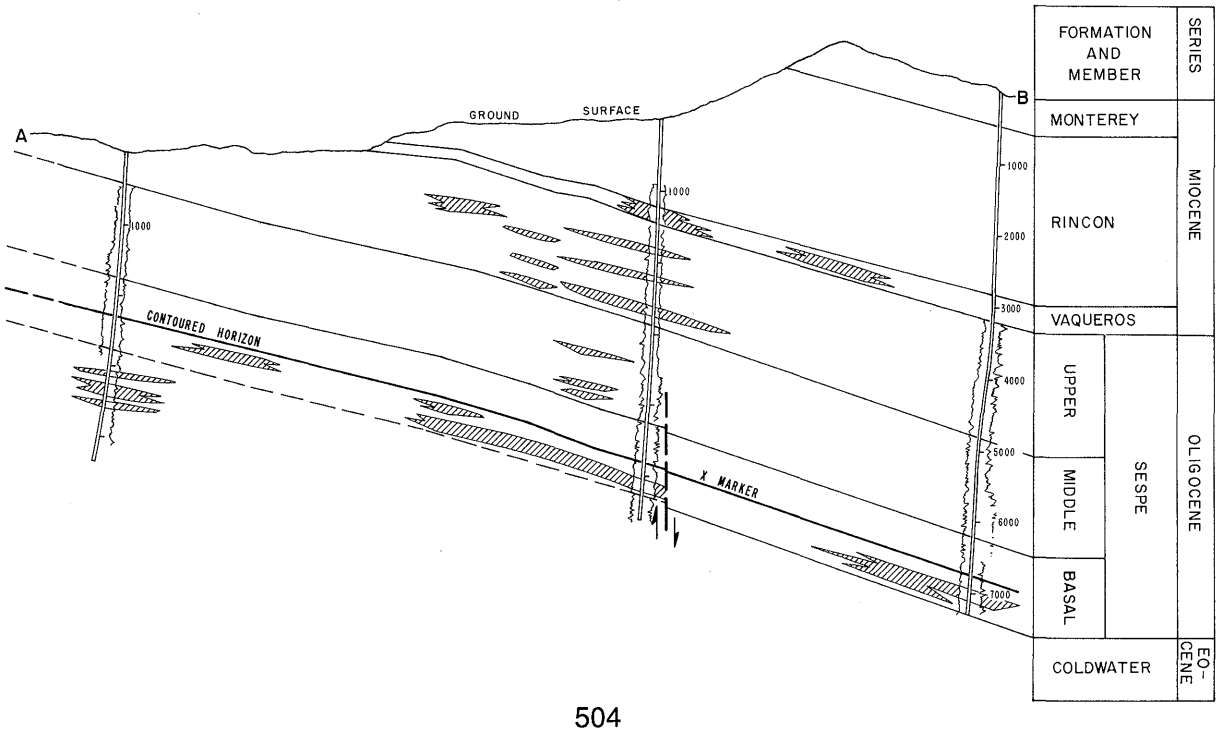
Selected References:

DATE: May 1991

CALIFORNIA DIVISION OF OIL AND GAS

SESPE OIL FIELD





COUNTY: VENTURA

SESPE 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	Santa Fe Energy Co. "Cesapi" T.C.A.	Union Oil Co. of Calif. "Tar Creek" 1	28 5N 19W	SB	unk.	Rincon-Vaqueros	
Deepest well	Kentuck Trust I and II "Ivers-Van Trees" 1	Western Gulf Oil Co. "Ivers-Van Trees" 1	1 4N 20W	SB	13,126		Pico Pliocene

POOL DATA

ITEM	RINCON-VAQUEROS					FIELD OR AREA DATA
Discovery date	1887					
Initial production rates						
Oil (bbl/day)	185					
Gas (Mcf/day)						
Flow pressure (psi)						
Bean size (in.)						
Initial reservoir pressure (psi)						
Reservoir temperature (°F)						
Initial oil content (STB/ac.-ft.)						
Initial gas content (MSCF/ac.-ft.)						
Formation	Rincon-Vaqueros					
Geologic age	Miocene					
Average depth (ft.)	900					
Average net thickness (ft.)	200					
Maximum productive area (acres)						3,140
RESERVOIR ROCK PROPERTIES						
Porosity (%)	5-20**					
So_i (%)						
Sw_i (%)						
Sg_i (%)						
Permeability to air (md)						
RESERVOIR FLUID PROPERTIES						
Oil:						
Oil gravity (°API)	32					
Sulfur content (% by wt.)						
Initial solution GOR (SCF/STB)						
Initial oil FVF (RB/STB)						
Bubble point press. (psia)						
Viscosity (cp) @ °F						
Gas:						
Specific gravity (air = 1.0)						
Heating value (Btu/cu. ft.)						
Water:						
Salinity, NaCl (ppm)	2,900					
T.D.S. (ppm)						
R_w (ohm/m) (77°F)						
ENHANCED RECOVERY PROJECTS						
Enhanced recovery projects						
Date started						
Date discontinued						
Peak oil production (bbl)						2,577,676
Year						1970
Peak gas production, net (Mcf)						2,770,151
Year						1970

Base of fresh water (ft.):

Remarks: See areas

Selected References:

DATE: May 1983 **Estimated value

CALIFORNIA DIVISION OF OIL AND GAS

COUNTY: VENTURA

SESPE OIL FIELD
FOOT OF THE HILLS 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	Damson Oil Corp. No. 1	California Oil Co. "Razzle-Dazzle" 1	1 4N 20W	SB	1,100	Middle Sespe	
Deepest well	Damson Oil Corp. "Nellie Bell" 10	Merchants Oil Co. "Nellie Bell" 10	6 4N 19W	SB	3,957		Coldwater Eocene

POOL DATA

ITEM	MIDDLE SESPE	BASAL SESPE	COLDWATER			FIELD OR AREA DATA
Discovery date	1981	1935	April 1967			
Initial production rates						
Oil (bbl/day)	-	320	20			
Gas (Mcf/day)	-	-	30			
Flow pressure (psi)						
Bean size (in.)						
Initial reservoir pressure (psi)	1,075**	1,075**	1,075**			
Reservoir temperature (°F)						
Initial oil content (STB/ac.-ft.)						
Initial gas content (MSCF/ac.-ft.)						
Formation	Sespe	Sespe	Coldwater			
Geologic age	Oligocene	Oligocene	Eocene			
Average depth (ft.)	600	2,800	3,250			
Average net thickness (ft.)	45	70	315			
Maximum productive area (acres)						150
RESERVOIR ROCK PROPERTIES						
Porosity (%)						
So_i (%)						
Sw_i (%)						
Sg_i (%)						
Permeability to air (md)						
RESERVOIR FLUID PROPERTIES						
Oil:						
Oil gravity (°API)	20	24	24			
Sulfur content (% by wt.)						
Initial solution GOR (SCF/STB)						
Initial oil FVF (RB/STB)						
Bubble point press. (psia)						
Viscosity (cp) @ °F						
Gas:						
Specific gravity (air = 1.0)						
Heating value (Btu/cu. ft.)						
Water:						
Salinity, NaCl (ppm)	18,500	18,500	4,800			
T.D.S. (ppm)						
R_w (ohm/m) (77°F)						
ENHANCED RECOVERY PROJECTS						
Enhanced recovery projects						
Date started						
Date discontinued						
Peak oil production (bbl)						77,619
Year						1946
Peak gas production, net (Mcf)						
Year						

Base of fresh water (ft.): 0 - 100

Remarks:

Selected References:

DATE: May 1983 **Estimated value

CALIFORNIA DIVISION OF OIL AND GAS

COUNTY: VENTURA

SESPE OIL FIELD
LITTLE SESPE CREEK 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	Kentuck Trust I & II "Kentuck" 1	Kentuck Oil Co. "Kentuck" 1	1 4N 20W	SB	905	Upper Sespe	
Deepest well	Kentuck Trust I & II "Ivers-Van Trees" 1	Western Gulf Oil Co. "Ivers-Van Trees" 1	1 4N 20W	SB	13,126		Pico Pliocene

POOL DATA

ITEM	UPPER SESPE	MIDDLE SESPE	BASAL SESPE			FIELD OR AREA DATA
Discovery date	October 1889	May 1936	February 1970			
Initial production rates						
Oil (bbl/day)	15	15	102			
Gas (Mcf/day)	-	-	85			
Flow pressure (psi)						
Bean size (in.)						
Initial reservoir pressure (psi)						
Reservoir temperature (°F)						
Initial oil content (STB/ac.-ft.)						
Initial gas content (MSCF/ac.-ft.)						
Formation	Sespe	Sespe	Sespe			
Geologic age	Oligocene	Oligocene	Oligocene			
Average depth (ft.)	610	2,360	4,280			
Average net thickness (ft.)	210	370	210			
Maximum productive area (acres)						390
RESERVOIR ROCK PROPERTIES						
Porosity (%)						
So_i (%)						
Sw_i (%)						
Sg_i (%)						
Permeability to air (md)						
RESERVOIR FLUID PROPERTIES						
Oil:						
Oil gravity (°API)	28	29	31			
Sulfur content (% by wt.)						
Initial solution GOR (SCF/STB)						
Initial oil FVF (RB/STB)						
Bubble point press. (psia)						
Viscosity (cp) @ °F						
Gas:						
Specific gravity (air = 1.0)						
Heating value (Btu/cu. ft.)						
Water:						
Salinity, NaCl (ppm)	1,700	1,700	12,800			
T.D.S. (ppm)						
R_w (ohm/m) (77°F)						
ENHANCED RECOVERY PROJECTS						
Enhanced recovery projects						
Date started						
Date discontinued						
Peak oil production (bbl)						141,747
Year						1963
Peak gas production, net (Mcf)						
Year						

Base of fresh water (ft.): 0 - 100

Remarks:

Selected References:

DATE: May 1983

CALIFORNIA DIVISION OF OIL AND GAS

COUNTY: VENTURA

SESPE OIL FIELD
SECTION 23 AND 26 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	U.S. Forest Service "Nathan" 1	Union Consolidated Oil Co. "Nathan" 1	23 5N 20W	SB	540	Coldwater	
Deepest well	Same as above	Pacific Supply Cooperative "Nathan" 1[a/]	23 5N 20W	SB	4,014		Coldwater Eocene

POOL DATA

ITEM	COLDWATER					FIELD OR AREA DATA
Discovery date	1901					
Initial production rates						
Oil (bbl/day)	60					
Gas (Mcf/day)						
Flow pressure (psi)						
Bean size (in.)						
Initial reservoir pressure (psi)						
Reservoir temperature (°F)						
Initial oil content (STB/ac.-ft.)						
Initial gas content (MSCF/ac.-ft.)						
Formation	Coldwater					
Geologic age	Eocene					
Average depth (ft.)	825					
Average net thickness (ft.)	220					
Maximum productive area (acres)	70					
RESERVOIR ROCK PROPERTIES						
Porosity (%)	35					
So_i (%)						
Sw_i (%)	70					
Sg_i (%)						
Permeability to air (md)						
RESERVOIR FLUID PROPERTIES						
Oil:						
Oil gravity (°API)	12					
Sulfur content (% by wt.)						
Initial solution GOR (SCF/STB)						
Initial oil FVF (RB/STB)	1					
Bubble point press. (psia)						
Viscosity (cp) @ °F						
Gas:						
Specific gravity (air = 1.0)						
Heating value (Btu/cu. ft.)						
Water:						
Salinity, NaCl (ppm)	3,400					
T.D.S. (ppm)						
R_w (ohm/m) (77°F)						
ENHANCED RECOVERY PROJECTS						
Enhanced recovery projects						
Date started						
Date discontinued						
Peak oil production (bbl)	10,727					
Year	1953					
Peak gas production, net (Mcf)						
Year						

Base of fresh water (ft.): 0 - 50

Remarks: a/ The discovery well was deepened from 540 feet to 4,014 feet in 1954 by Pacific Supply Cooperative.

Selected References:

DATE: May 1983

CALIFORNIA DIVISION OF OIL AND GAS

COUNTY: VENTURA

SESPE OIL FIELD
TAR CREEK-TOPATOPA 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	Santa Fe Energy Operating Partners, L.P. "Cesapi" T.C.A.	Union Oil Co. of Calif. "Tar Creek" 1	28 5N 19W	SB	unk.	Rincon-Vaqueros	
Deepest well	Santa Fe Energy Operating Partners, L.P. "Orcutt" 83C-33	Shell Oil Co. "Orcutt" 83C-33	33 5N 19W	SB	8,471		Coldwater Eocene

POOL DATA

ITEM	RINCON-VAQUEROS	VAQUEROS	UPPER SESPE	MIDDLE SESPE	BASAL SESPE	FIELD OR AREA DATA
Discovery date	1887	1887	1891	April 1942	February 1938	
Initial production rates						
Oil (bbl/day)	185	185	30	12	8	
Gas (Mcf/day)	-	-	-	5	-	
Flow pressure (psi)						
Bean size (in.)						
Initial reservoir pressure (psi)	-	-	-	-	2,000**	
Reservoir temperature (°F)	-	-	85	-	135	
Initial oil content (STB/ac.-ft.)	-	-	-	-	400	
Initial gas content (MSCF/ac.-ft.)	-	-	-	-	240	
Formation	Rincon-Vaqueros	Vaqueros	Sespe	Sespe	Sespe	
Geologic age	Miocene	Miocene	Oligocene	Oligocene	Oligocene	
Average depth (ft.)	900	900	1,750	2,550	5,400	
Average net thickness (ft.)	200	200	600	300	1,000	
Maximum productive area (acres)						
RESERVOIR ROCK PROPERTIES						
Porosity (%)	5-20**	5-20**	3	10**	10**	
So_i (%)	-	-	50	-	60	
Sw_i (%)	-	-	0	-	40	
Sg_i (%)	-	-	50	-	-	
Permeability to air (md)	-	-	500	-	300-500	
RESERVOIR FLUID PROPERTIES						
Oil:						
Oil gravity (°API)	32	32	28	28	31	
Sulfur content (% by wt.)						
Initial solution GOR (SCF/STB)	-	-	-	-	600	
Initial oil FVF (RB/STB)	-	-	-	-	1.19	
Bubble point press. (psia)	-	-	-	-	1,700	
Viscosity (cp) @ °F						
Gas:						
Specific gravity (air = 1.0)	-	-	-	-	0.70	
Heating value (Btu/cu. ft.)						
Water:						
Salinity, NaCl (ppm)	2,900	2,900	4,600	4,600	9,000**	
T.D.S. (ppm)						
R_w (ohm/m) (77°F)						
ENHANCED RECOVERY PROJECTS						
Enhanced recovery projects		waterflood	waterflood		waterflood	
Date started		1962	1970		1971	
Date discontinued		active	1971		active	
Peak oil production (bbl)						
Year						
Peak gas production, net (Mcf)						
Year						

Base of fresh water (ft.): 0 - 100

Remarks: Tar Creek and Topatopa were separate areas until they were combined in 1965.

Selected References:

DATE: May 1983 **Estimated value

CALIFORNIA DIVISION OF OIL AND GAS

COUNTY: VENTURA

SESPE OIL FIELD
TAR CREEK-TOPATOPA 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	COLDWATER					FIELD OR AREA DATA
Discovery date	February 1966					
Initial production rates						
Oil (bbl/day)	33					
Gas (Mcf/day)	20					
Flow pressure (psi)						
Bean size (in.)						
Initial reservoir pressure (psi)						
Reservoir temperature (°F)						
Initial oil content (STB/ac.-ft.)						
Initial gas content (MSCF/ac.-ft.)						
Formation	Coldwater					
Geologic age	Eocene					
Average depth (ft.)	4,650					
Average net thickness (ft.)	300					
Maximum productive area (acres)						2,250
RESERVOIR ROCK PROPERTIES						
Porosity (%)						
S_{oi} (%)						
S_{wi} (%)						
S_{gi} (%)						
Permeability to air (md)						
RESERVOIR FLUID PROPERTIES						
Oil:						
Oil gravity (°API)	30					
Sulfur content (% by wt.)						
Initial solution GOR (SCF/STB)						
Initial oil FVF (RB/STB)						
Bubble point press. (psia)						
Viscosity (cp) @ °F						
Gas:						
Specific gravity (air = 1.0)						
Heating value (Btu/cu. ft.)						
Water:						
Salinity, NaCl (ppm)	5,100					
T.D.S. (ppm)						
R_w (ohm/m) (77°F)						
ENHANCED RECOVERY PROJECTS						
Enhanced recovery projects						
Date started						
Date discontinued						
Peak oil production (bbl)						2,519,840
Year						1970
Peak gas production, net (Mcf)						
Year						

Base of fresh water (ft.):

Remarks:

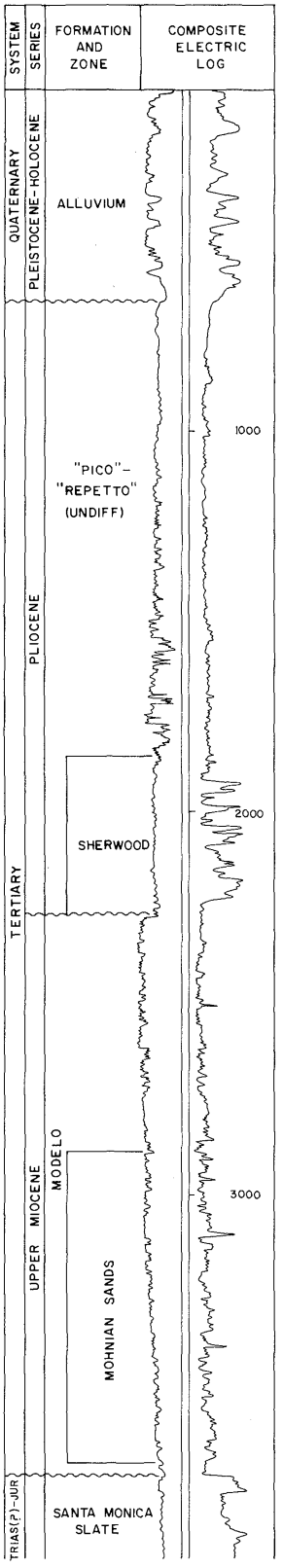
Selected References:

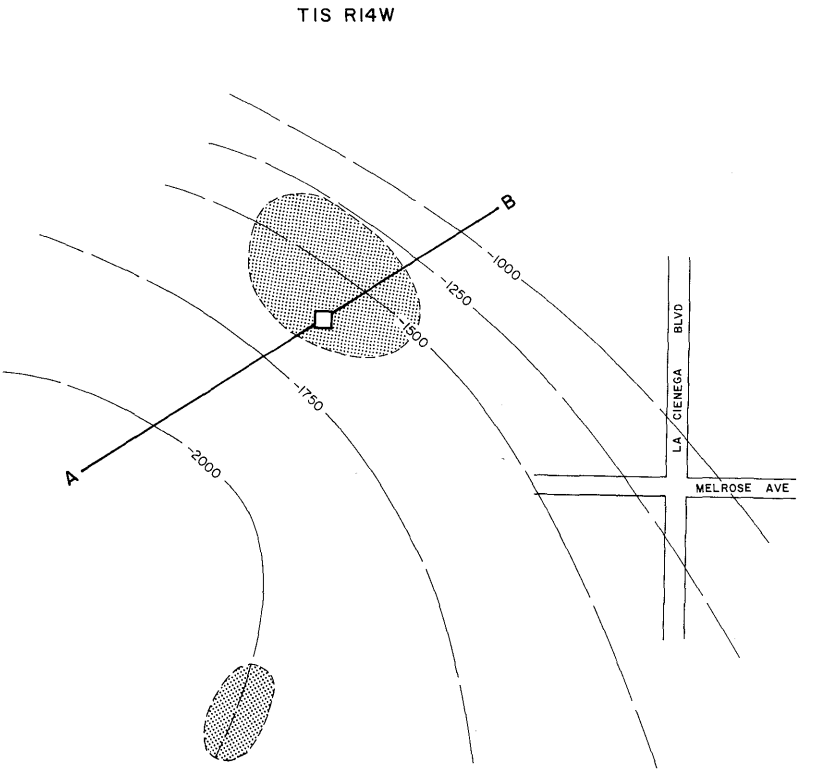
DATE: May 1983

CALIFORNIA DIVISION OF OIL AND GAS

SHERMAN OIL FIELD
(Abandoned)

7	8
18	17





CONTOURS ON TOP OF SHERWOOD ZONE
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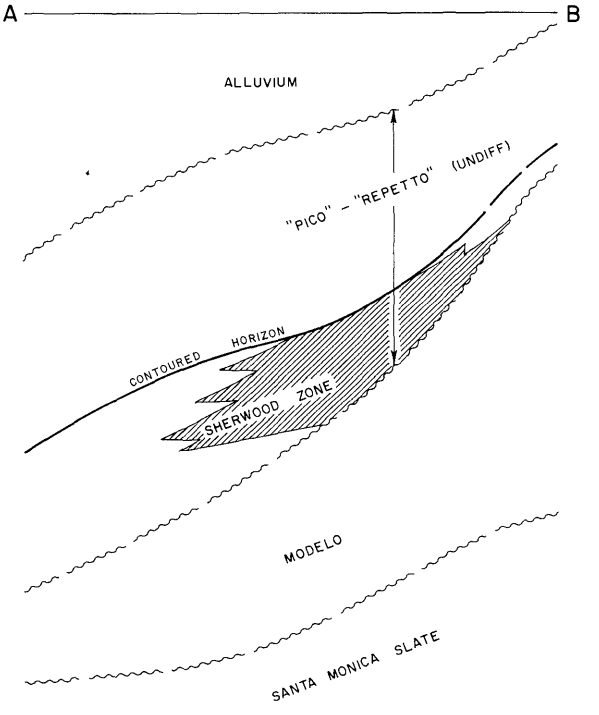


COUNTY: LOS ANGELES

SHERMAN OIL FIELD
(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	Chevron U.S.A. Inc. "Arden P.E." 1	Standard Oil Co. of Calif. "P.E." 1	18 1S 14W	SB	2,274	Sherwood	Santa Monica slate
Deepest well	Chevron U.S.A. Inc. "Laurel" 1B	Standard Oil Co. of Calif. "P.E.-Laurel" 1	18 1S 14W	SB	6,496		Triassic-Jurassic

POOL DATA

ITEM	SHERWOOD	MOHNIAN SANDS				FIELD OR AREA DATA
Discovery date	April 1965	June 1972				
Initial production rates						
Oil (bbl/day)	46	31				
Gas (Mcf/day)	10	25				
Flow pressure (psi)						
Bean size (in.)						
Initial reservoir pressure (psi)						
Reservoir temperature (°F)						
Initial oil content (STB/ac.-ft.)						
Initial gas content (MSCF/ac.-ft.)						
Formation	"Repetto"	Modelo				
Geologic age	early Pliocene	late Miocene				
Average depth (ft.)	1,650	2,980				
Average net thickness (ft.)	350	50				
Maximum productive area (acres)						30
RESERVOIR ROCK PROPERTIES						
Porosity (%)						
S_{oi} (%)						
S_{wi} (%)						
S_{gi} (%)						
Permeability to air (md)						
RESERVOIR FLUID PROPERTIES						
Oil:						
Oil gravity (°API)	23	22				
Sulfur content (% by wt.)	217††	806††				
Initial solution GOR (SCF/STB)						
Initial oil FVF (RB/STB)						
Bubble point press. (psia)						
Viscosity (cp) @ °F						
Gas:						
Specific gravity (air = 1.0)						
Heating value (Btu/cu. ft.)						
Water:						
Salinity, NaCl (ppm)	11,127	11,983				
T.D.S. (ppm)						
R_w (ohm/m) (77°F)						
ENHANCED RECOVERY PROJECTS						
Enhanced recovery projects	cyclic steam					
Date started	1965					
Date discontinued	1965					
Peak oil production (bbl)						14,292
Year						1971
Peak gas production, net (Mcf)						
Year						

Base of fresh water (ft.): 650

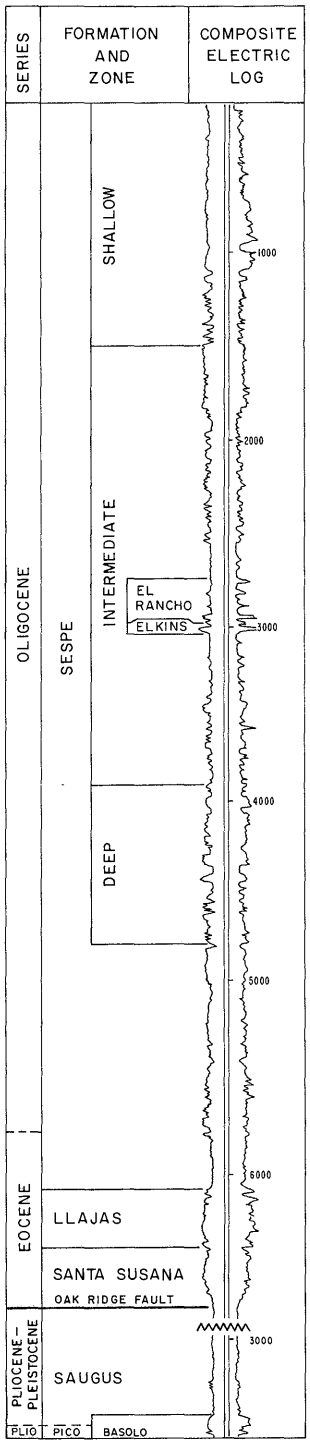
Remarks: Last production was in June 1973. The field was abandoned in 1973. Cumulative production is 93,000 bbls of oil and 50,000 Mcf of gas.

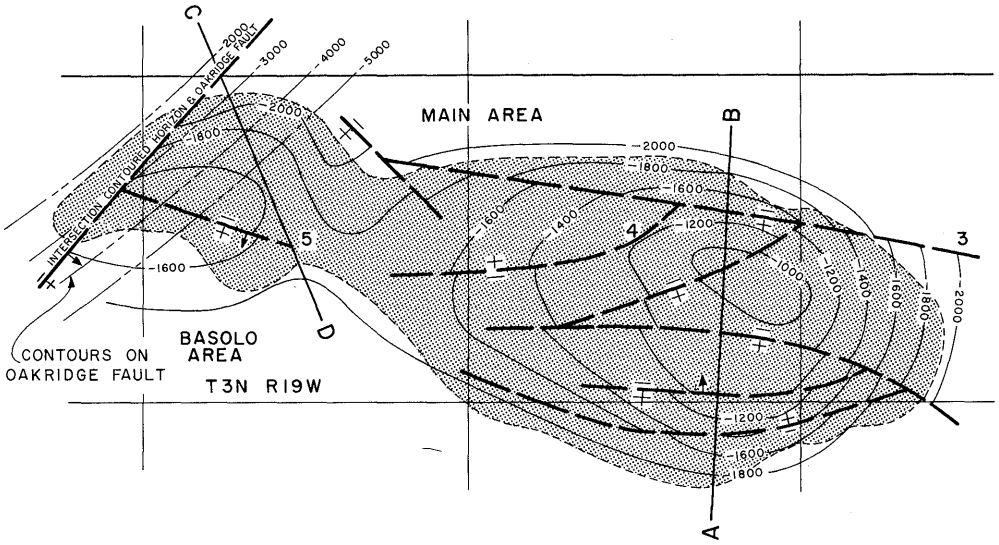
Selected References:

DATE: August 1983 †† Calculated value

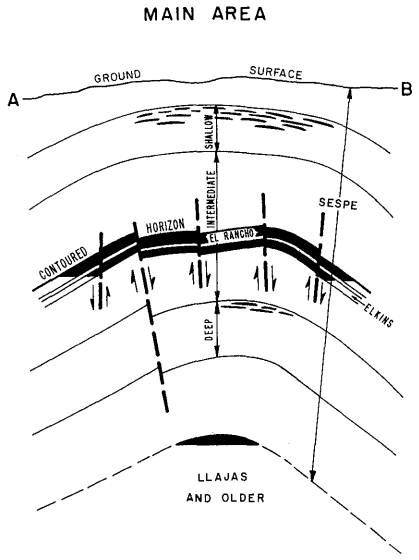
CALIFORNIA DIVISION OF OIL AND GAS

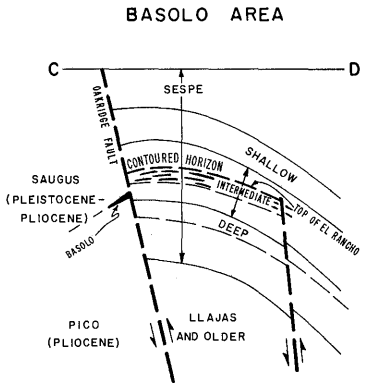
SHIELLS CANYON OIL FIELD





CONTOURS ON TOP OF EL RANCHO ZONE





COUNTY: VENTURA

SHIELLS CANYON 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	Texaco Inc. "Shiells" 1	Montebello Oil Co. "Shiells" 1	4 3N 19W	SB	650	Shallow	
Deepest well	Lobodo, Inc. "Elkins" 20	The Texas Co. "Elkins" 20	5 3N 19W	SB	14,206		Pico Pliocene

POOL DATA

ITEM	BASOLO	SHALLOW	INTERMEDIATE	DEEP	EOCENE	FIELD OR AREA DATA
Discovery date	September 1952	April 1911	July 1912	August 1918	August 1959	
Initial production rates						
Oil (bbl/day)	46	20	20	90	125	
Gas (Mcf/day)	8	-	-	-	540	
Flow pressure (psi)						
Bean size (in.)						
Initial reservoir pressure (psi)	-	450	-	-	-	
Reservoir temperature (°F)	-	236	-	-	-	
Initial oil content (STB/ac.-ft.)	595	662	657	662	243	
Initial gas content (MSCF/ac.-ft.)						
Formation	Saugus-Pico	Sespe	Sespe	Sespe	Llajas	
Geologic age	Pleistocene-Pliocene	Oligocene	Oligocene	Oligocene	Eocene	
Average depth (ft.)	3,400	1,000	2,250	4,300	6,600	
Average net thickness (ft.)	105	230	87	230	1,000	
Maximum productive area (acres)	25	460	964	460	245	960
RESERVOIR ROCK PROPERTIES						
Porosity (%)	17	18-33	18	18	12-13	
So_i (%)	55	27-48	55	48	50-52	
Sw_i (%)	-	10-52	-	-	-	
Sg_i (%)	-	42	-	-	-	
Permeability to air (md)	120	100-140	121	95	-	
RESERVOIR FLUID PROPERTIES						
Oil:						
Oil gravity (°API)	30	32	32	32	32-34	
Sulfur content (% by wt.)	-	-	0.78	-	-	
Initial solution GOR (SCF/STB)						
Initial oil FVF (RB/STB)						
Bubble point press. (psia)						
Viscosity (cp) @ °F	-	8.5-13.0 @ 125	-	-	-	
Gas:						
Specific gravity (air = 1.0)						
Heating value (Btu/cu. ft.)						
Water:						
Salinity, NaCl (ppm)	5,900-8,200	35,900	35,900	35,900	4,300	
T.D.S. (ppm)						
R_w (ohm/m) (77°F)						
ENHANCED RECOVERY PROJECTS						
Enhanced recovery projects		waterflood	waterflood			
Date started		1949	1961			
Date discontinued		1963	active			
		steamflood				
		1973				
		1983				
Peak oil production (bbl)						624,735
Year						1945
Peak gas production, net (Mcf)						1,045,587
Year						1946

Base of fresh water (ft.): 200

Remarks: Originally was Montebello Dome area of Bardsdale oil field, and was designated Shiells Canyon oil field on January 1, 1955. The 164 zone (1 well) is included in the Shallow zone.

Selected References: Bailey, Wm. C., 1934, Shiells Canyon Area of Bardsdale Field: Calif. Div. of Oil and Gas, Summary of Operations -- Calif. Oil Fields, Vol. 20, No. 1.

DATE: May 1983

CALIFORNIA DIVISION OF OIL AND GAS

SIMI OIL FIELD

Index Map

COUNTY: VENTURA

SIMI 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	M.H. Marr "Marr Ranch" 11	Simi Oil Co. No. 11	30 3N 17W	SB	748	unknown	
Deepest well	Condor Oil Co., Inc. "Pacific Western Marr" 1	Pacific Western Oil Corp. "Pacific Western Marr" 1	36 3N 18W	SB	7,644		Chico Cretaceous

POOL DATA

ITEM	UNKNOWN					FIELD OR AREA DATA
Discovery date	1901					
Initial production rates						
Oil (bbl/day)						
Gas (Mcf/day)						
Flow pressure (psi)						
Bean size (in.)						
Initial reservoir pressure (psi)						
Reservoir temperature (°F)						
Initial oil content (STB/ac.-ft.)						
Initial gas content (MSCF/ac.-ft.)						
Formation	Sespe					
Geologic age	Oligocene					
Average depth (ft.)	100					
Average net thickness (ft.)	70					
Maximum productive area (acres)						650
RESERVOIR ROCK PROPERTIES						
Porosity (%)						
So_i (%)						
Sw_i (%)						
Sg_i (%)						
Permeability to air (md)						
RESERVOIR FLUID PROPERTIES						
Oil:						
Oil gravity (°API)	26					
Sulfur content (% by wt.)						
Initial solution GOR (SCF/STB)						
Initial oil FVF (RB/STB)						
Bubble point press. (psia)						
Viscosity (cp) @ °F						
Gas:						
Specific gravity (air = 1.0)						
Heating value (Btu/cu. ft.)						
Water:						
Salinity, NaCl (ppm)	17,100					
T.D.S. (ppm)						
R_w (ohm/m) (77°F)						
ENHANCED RECOVERY PROJECTS						
Enhanced recovery projects						
Date started						
Date discontinued						
Peak oil production (bbl)						127,561
Year						1920
Peak gas production, net (Mcf)						99,000
Year						1923

Base of fresh water (ft.): See areas

Remarks:

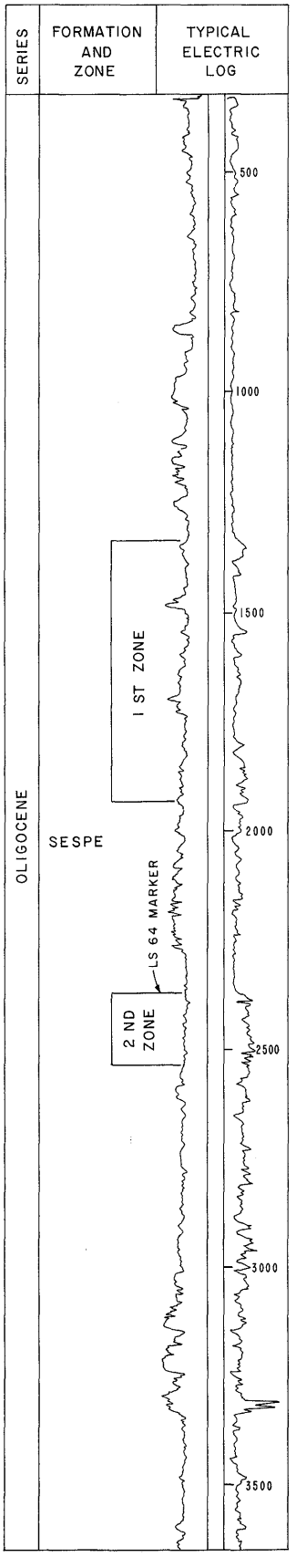
Selected References:

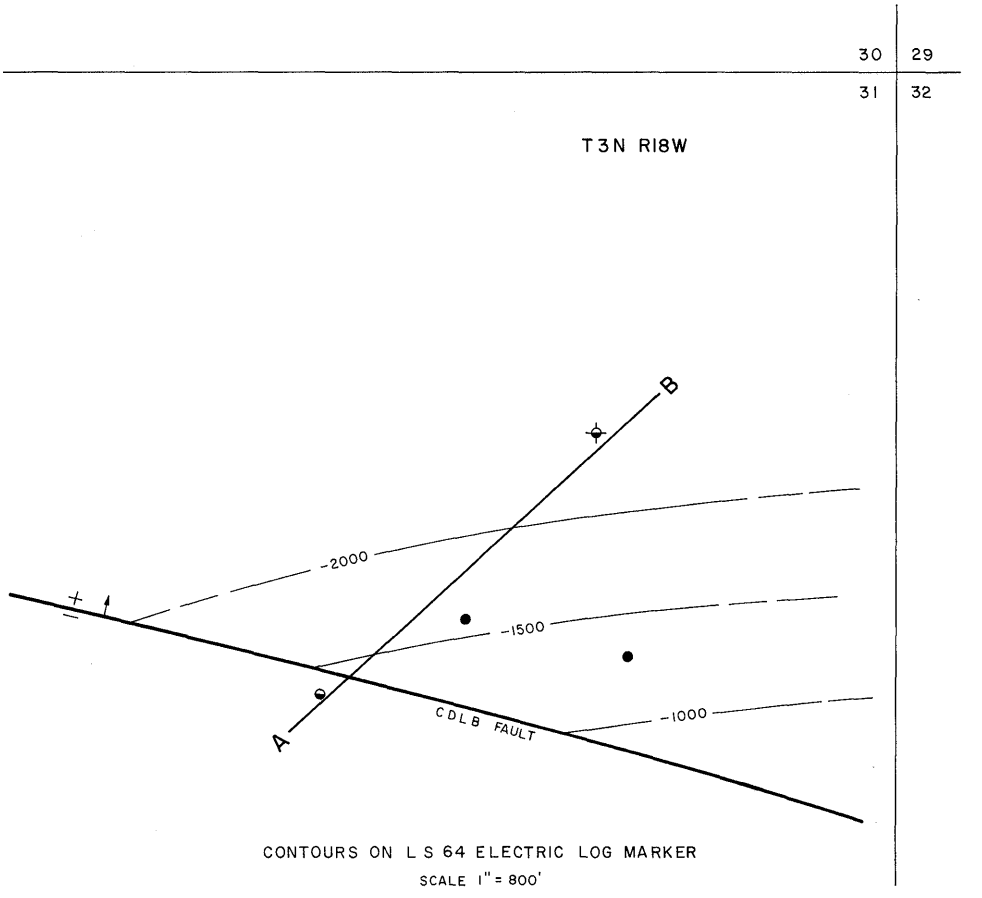
DATE: May 1983

CALIFORNIA DIVISION OF OIL AND GAS

SIMI OIL FIELD

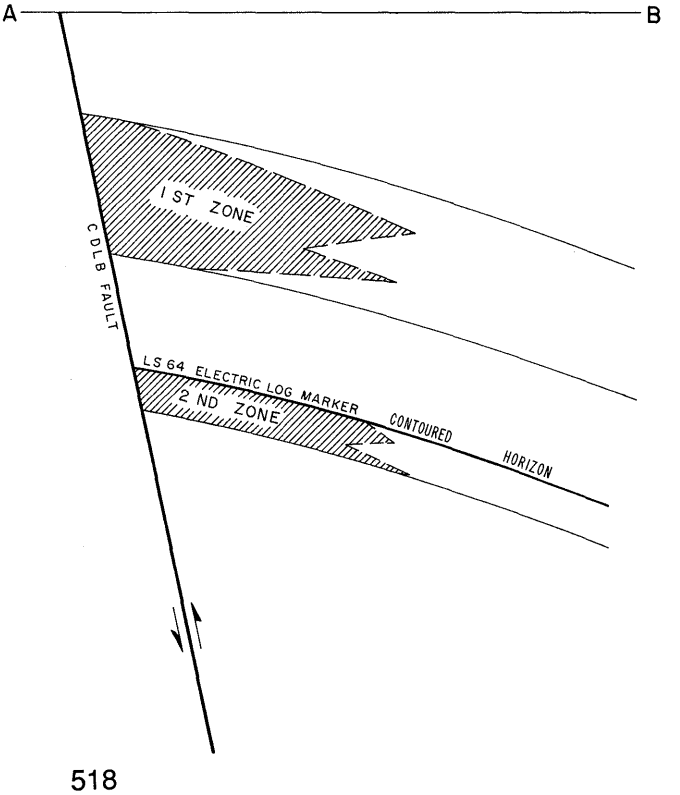
Alamos Area





CONTOURS ON L S 64 ELECTRIC LOG MARKER

SCALE 1" = 800'



COUNTY: VENTURA

SIMI OIL FIELD
ALAMOS 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	Union Oil Co. of Calif. "Alamos" 3-31	Union Oil Co. of Calif. "Simi" 3-31	31 3N 18W	SB	4,000	1st	Sespe Oligocene
Deepest well	Same as above	"	"	"	"	"	"

POOL DATA

ITEM	1ST	2ND				FIELD OR AREA DATA
Discovery date	January 1977	January 1971				
Initial production rates						
Oil (bbl/day)	65	a/				
Gas (Mcf/day)	12					
Flow pressure (psi)						
Bean size (in.)						
Initial reservoir pressure (psi)						
Reservoir temperature (°F)						
Initial oil content (STB/ac.-ft.)						
Initial gas content (MSCF/ac.-ft.)						
Formation	Sespe	Sespe				
Geologic age	Oligocene	Oligocene				
Average depth (ft.)	1,450	2,450				
Average net thickness (ft.)	550	140				
Maximum productive area (acres)						40
RESERVOIR ROCK PROPERTIES						
Porosity (%)						
Soi (%)						
Swi (%)						
Sgi (%)						
Permeability to air (md)						
RESERVOIR FLUID PROPERTIES						
Oil:						
Oil gravity (°API)	19	22				
Sulfur content (% by wt.)						
Initial solution GOR (SCF/STB)						
Initial oil FVF (RB/STB)						
Bubble point press. (psia)						
Viscosity (cp) @ °F						
Gas:						
Specific gravity (air = 1.0)						
Heating value (Btu/cu. ft.)						
Water:						
Salinity, NaCl (ppm)	20,500	6,200				
T.D.S. (ppm)						
R_w (ohm/m) (77°F)						
ENHANCED RECOVERY PROJECTS						
Enhanced recovery projects						
Date started						
Date discontinued						
Peak oil production (bbl)						17,077
Year						1971
Peak gas production, net (Mcf)						
Year						

Base of fresh water (ft.): 100

Remarks: a/ Initial production from 1st and 2nd Sespe zones was commingled.

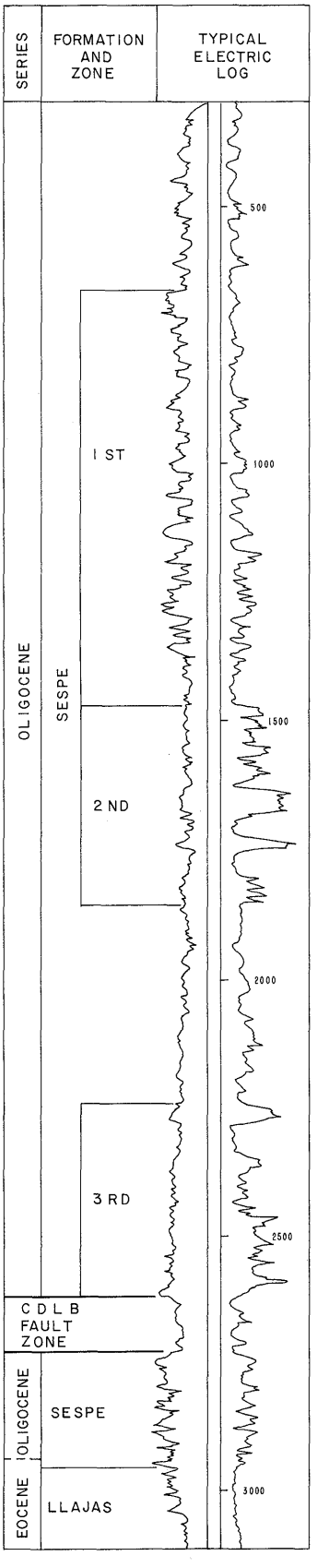
Selected References:

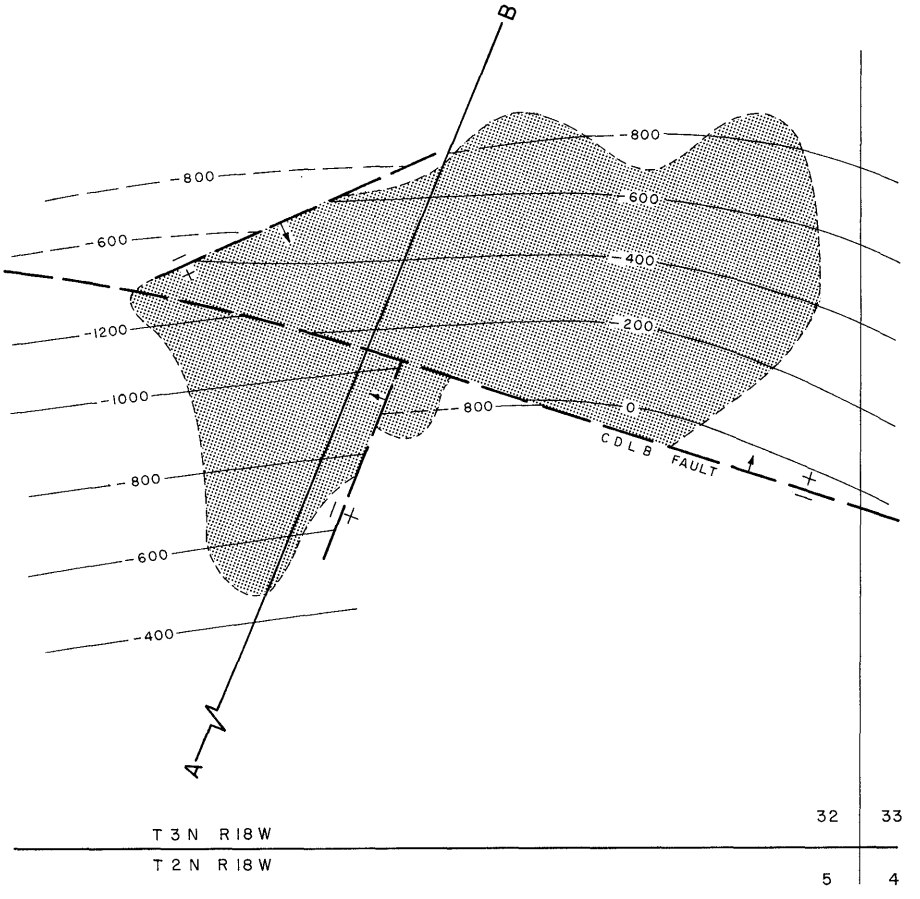
DATE: May 1983

CALIFORNIA DIVISION OF OIL AND GAS

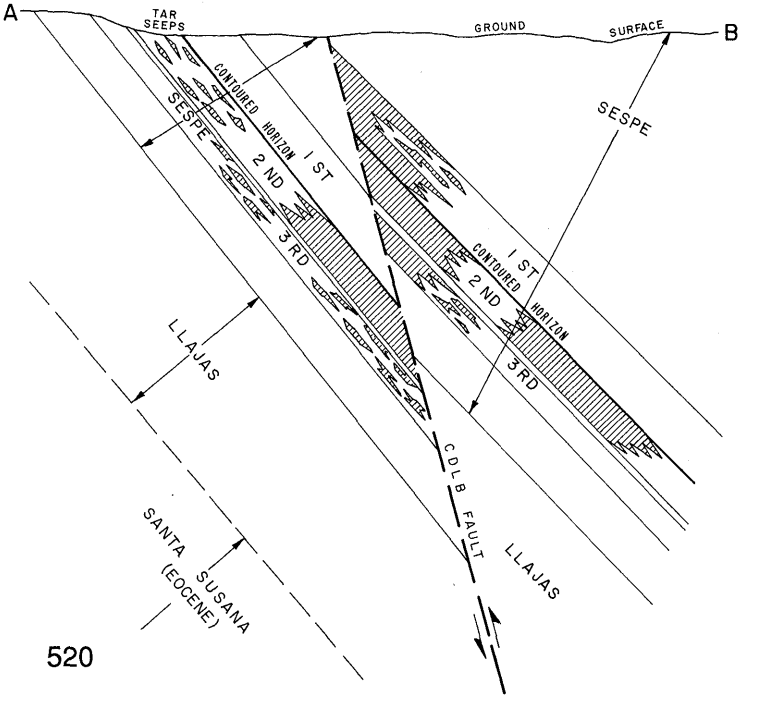
SIMI OIL FIELD

Canada de la Brea Area





CONTOURS ON TOP OF THE 2ND SESPE ZONE
SCALE 1" = 800'



COUNTY: VENTURA

SIMI OIL FIELD
CANADA DE LA BREA 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	Union Oil Co. of Calif. "Canada de la Brea" 1	Same as present	32 3N 18W	SB	1,048	Sespe	
Deepest well	Union Oil Co. of Calif. "Canada de la Brea" 15	Same as present	32 3N 18W	SB	5,336		Santa Susana Eocene

POOL DATA

ITEM	1ST (UPPER)	1ST (LOWER)	2ND	3RD		FIELD OR AREA DATA
Discovery date	1909	1909	1909	January 1910		
Initial production rates						
Oil (bbl/day)	40[a/]	[a/]	[a/]	[a/]		
Gas (Mcf/day)						
Flow pressure (psi)						
Bean size (in.)						
Initial reservoir pressure (psi)						
Reservoir temperature (°F)						
Initial oil content (STB/ac.-ft.)						
Initial gas content (MSCF/ac.-ft.)						
Formation	Sespe	Sespe	Sespe	Sespe		
Geologic age	Oligocene	Oligocene	Oligocene	Oligocene		
Average depth (ft.)	650	975	1,600	2,235		
Average net thickness (ft.)	220	300	325	200		
Maximum productive area (acres)						140
RESERVOIR ROCK PROPERTIES						
Porosity (%)						
So_i (%)						
Sw_i (%)						
Sg_i (%)						
Permeability to air (md)						
RESERVOIR FLUID PROPERTIES						
Oil:						
Oil gravity (°API)	15	17	19	20		
Sulfur content (% by wt.)						
Initial solution GOR (SCF/STB)						
Initial oil FVF (RB/STB)						
Bubble point press. (psia)						
Viscosity (cp) @ °F						
Gas:						
Specific gravity (air = 1.0)						
Heating value (Btu/cu. ft.)						
Water:						
Salinity, NaCl (ppm)	25,700	29,200	29,500	29,800		
T.D.S. (ppm)						
R_w (ohm/m) (77°F)						
ENHANCED RECOVERY PROJECTS						
Enhanced recovery projects	cyclic steam					fireflood
Date started	1964					1973
Date discontinued	1982					1973
Peak oil production (bbl)						41,470
Year						1956
Peak gas production, net (Mcf)						
Year						

Base of fresh water (ft.): None

Remarks: a/ All four zones tested together.

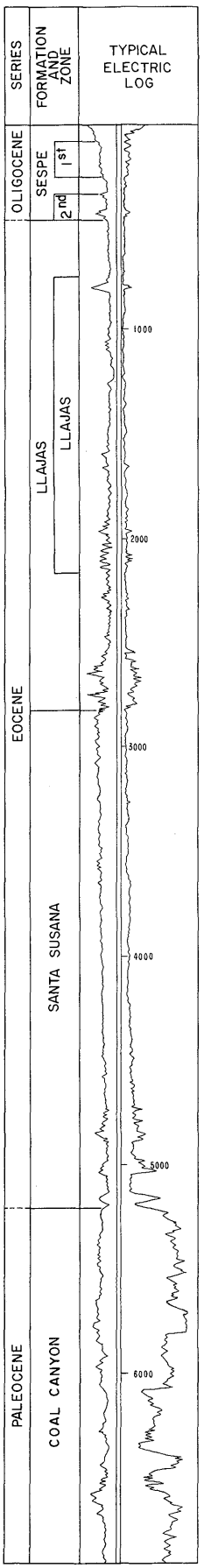
Selected References:

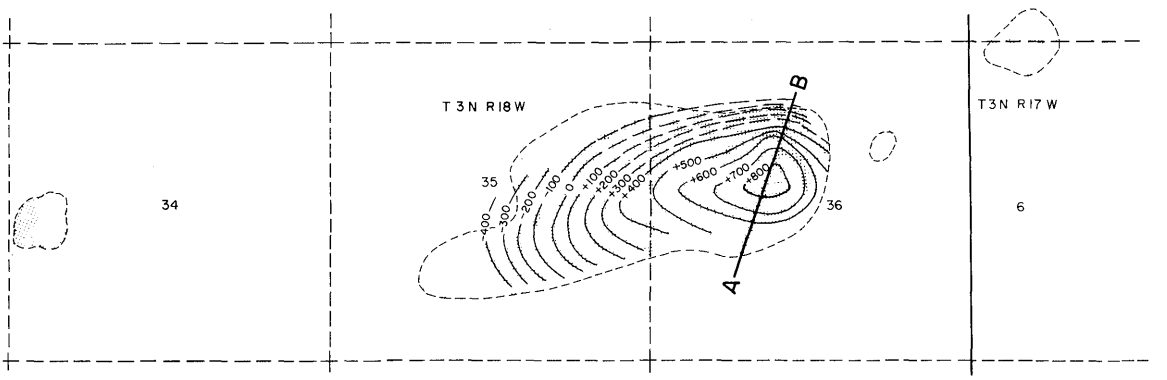
DATE: May 1983

CALIFORNIA DIVISION OF OIL AND GAS

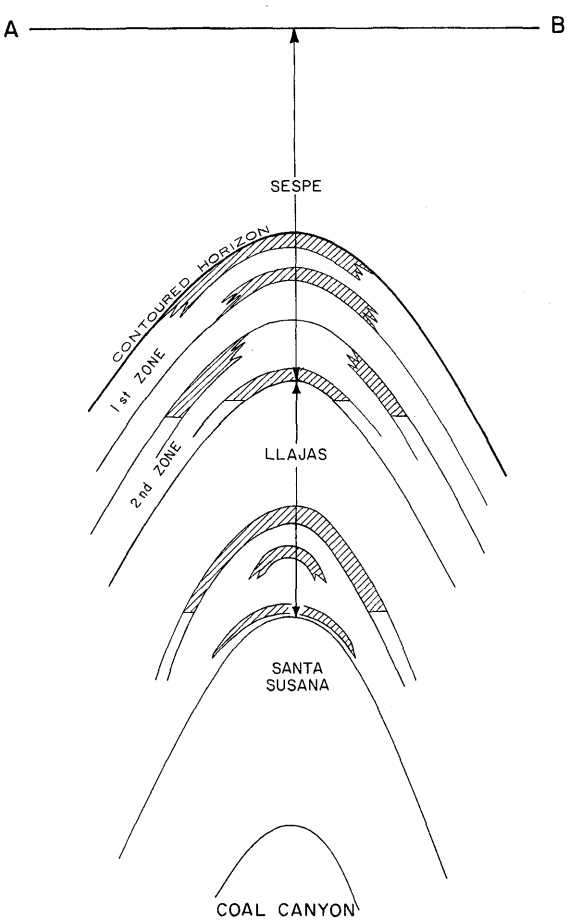
SIMI OIL FIELD

Old Area





CONTOURS ON TOP OF FIRST SESPE ZONE



COUNTY: VENTURA

SIMI OIL FIELD
OLD 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	M.H. Marr "Marr Ranch" 11	Simi Oil Co. No. 11	30 3N 17W	SB	746	unknown	
Deepest well	Condor Oil Co., Inc. "Pacific Western Marr" 1	Pacific Western Oil Corp. "Pacific Western Marr" 1	36 3N 18W	SB	7,644		Chico Cretaceous

POOL DATA

ITEM	1ST	2ND	LLAJAS	SOUTH SUSANA		FIELD OR AREA DATA
Discovery date	1901	-	-	-		
Initial production rates						
Oil (bbl/day)						
Gas (Mcf/day)						
Flow pressure (psi)						
Bean size (in.)						
Initial reservoir pressure (psi)						
Reservoir temperature (°F)						
Initial oil content (STB/ac.-ft.)						
Initial gas content (MSCF/ac.-ft.)						
Formation	Sespe	Sespe	Eocene	Eocene		
Geologic age	Oligocene	Oligocene	Llajas	Santa Susana		
Average depth (ft.)	100	300	1,100	2,100		
Average net thickness (ft.)	70	60	400	400		
Maximum productive area (acres)						540
RESERVOIR ROCK PROPERTIES						
Porosity (%)						
Soi (%)						
Swi (%)						
Sgi (%)						
Permeability to air (md)						
RESERVOIR FLUID PROPERTIES						
Oil:						
Oil gravity (°API)	26	28	30	32		
Sulfur content (% by wt.)						
Initial solution GOR (SCF/STB)						
Initial oil FVF (RB/STB)						
Bubble point press. (psia)						
Viscosity (cp) @ °F						
Gas:						
Specific gravity (air = 1.0)						
Heating value (Btu/cu. ft.)						
Water:						
Salinity, NaCl (ppm)	17,100	17,100	13,680	8,550		
T.D.S. (ppm)						
R_w (ohm/m) (77°F)						
ENHANCED RECOVERY PROJECTS						
Enhanced recovery projects						
Date started						
Date discontinued						
Peak oil production (bbl)						94,345
Year						1920
Peak gas production, net (Mcf)						
Year						

Base of fresh water (ft.): 1300 (waters are sulphurous)

Remarks:

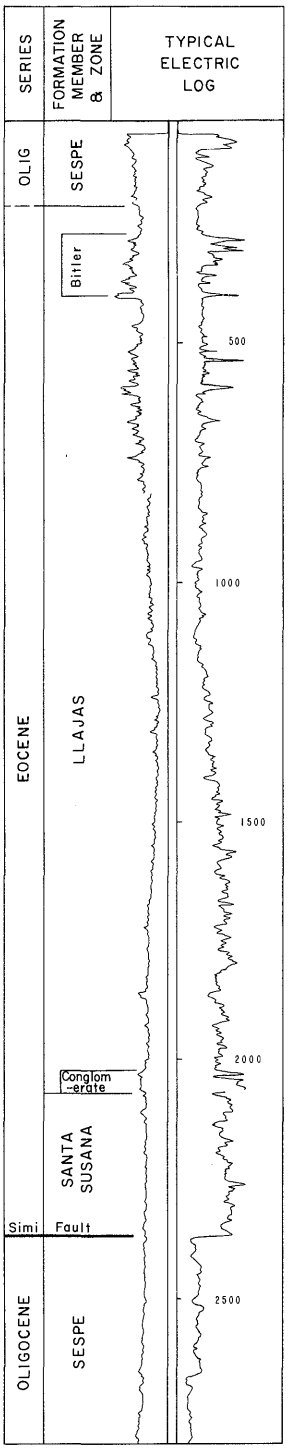
Selected References: Godde, H.A., 1924, Oil Fields of Ventura County: Calif. Div. of Oil and Gas, Summary of Operations -- Calif. Oil Fields, Vol. 10, No. 5.

DATE: May 1983

CALIFORNIA DIVISION OF OIL AND GAS

SIMI OIL FIELD

Strathearn Area (abandoned)



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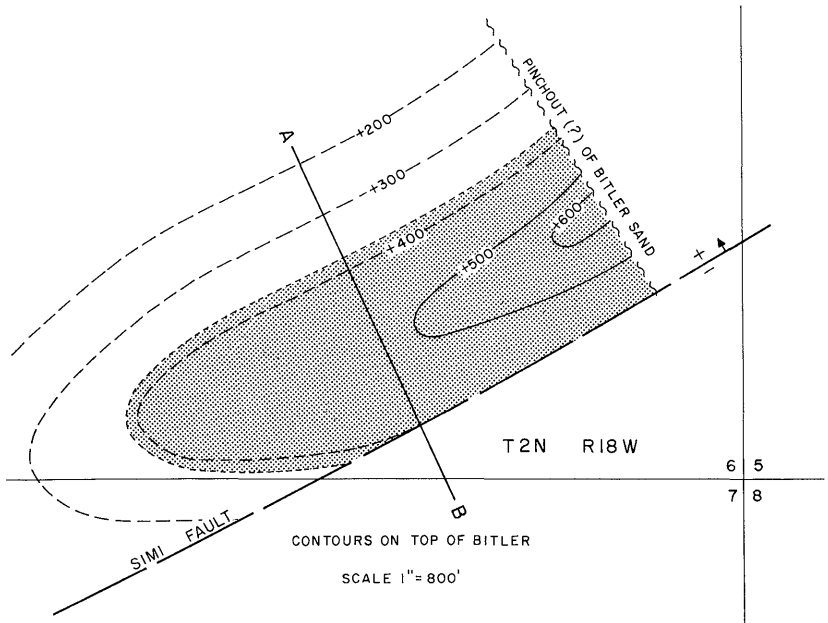
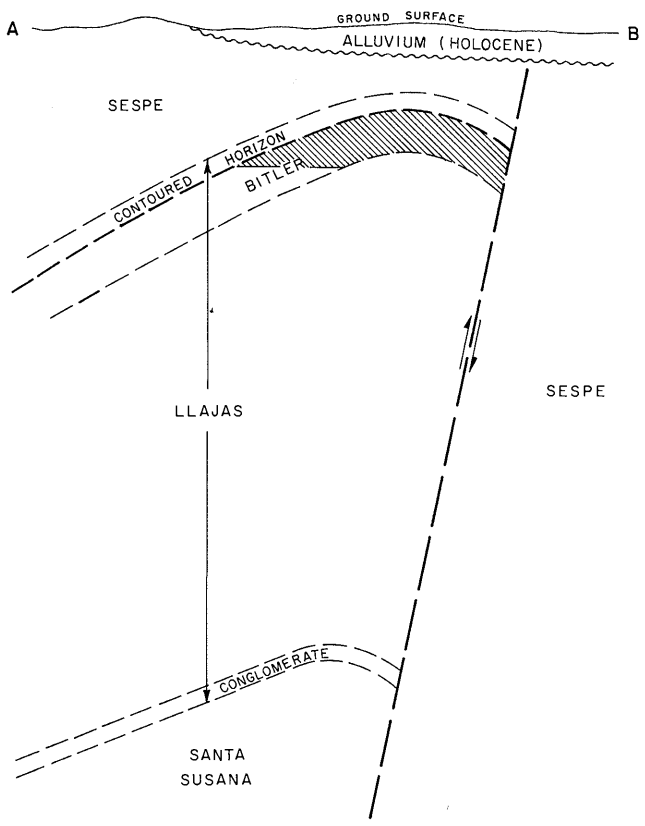




COUNTY: VENTURA

SIMI OIL FIELD
STRATHEARN 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	Moreland Investment Co. "Strathearn" 1	Macson Oil Co. "Strathearn" 1	6 2N 18W	SB	2,828	Bitler	Sespe Oligocene
Deepest well	Same as above	"	"	"	"	"	"

POOL DATA

ITEM	BITLER					FIELD OR AREA DATA
Discovery date	December 1953					
Initial production rates						
Oil (bbl/day)	5					
Gas (Mcf/day)						
Flow pressure (psi)						
Bean size (in.)						
Initial reservoir pressure (psi)						
Reservoir temperature (°F)						
Initial oil content (STB/ac.-ft.)						
Initial gas content (MSCF/ac.-ft.)						
Formation	Llajas					
Geologic age	Eocene					
Average depth (ft.)	335					
Average net thickness (ft.)	315					
Maximum productive area (acres)	40					
RESERVOIR ROCK PROPERTIES						
Porosity (%)						
So_i (%)						
Sw_i (%)						
Sg_i (%)						
Permeability to air (md)						
RESERVOIR FLUID PROPERTIES						
Oil:						
Oil gravity (°API)	33					
Sulfur content (% by wt.)						
Initial solution GOR (SCF/STB)						
Initial oil FVF (RB/STB)						
Bubble point press. (psia)						
Viscosity (cp) @ °F						
Gas:						
Specific gravity (air = 1.0)						
Heating value (Btu/cu. ft.)						
Water:						
Salinity, NaCl (ppm)	10,300					
T.D.S. (ppm)						
R_w (ohm/m) (77°F)						
ENHANCED RECOVERY PROJECTS						
Enhanced recovery projects						
Date started						
Date discontinued						
Peak oil production (bbl)	2,055					
Year	1956					
Peak gas production, net (Mcf)						
Year						

Base of fresh water (ft.): 140

Remarks: The final production was in 1970. The area was abandoned in 1973. Cumulative production is 12,919 bbl of oil and 24 Mcf of gas.

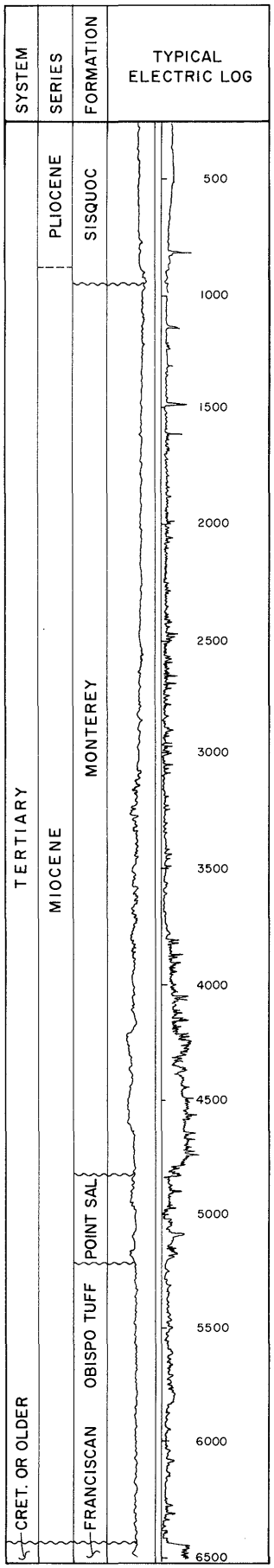
Selected References:

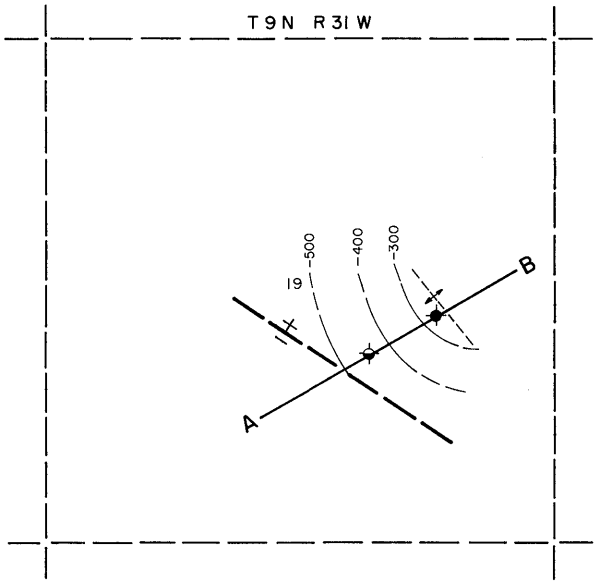
DATE: May 1983

CALIFORNIA DIVISION OF OIL AND GAS

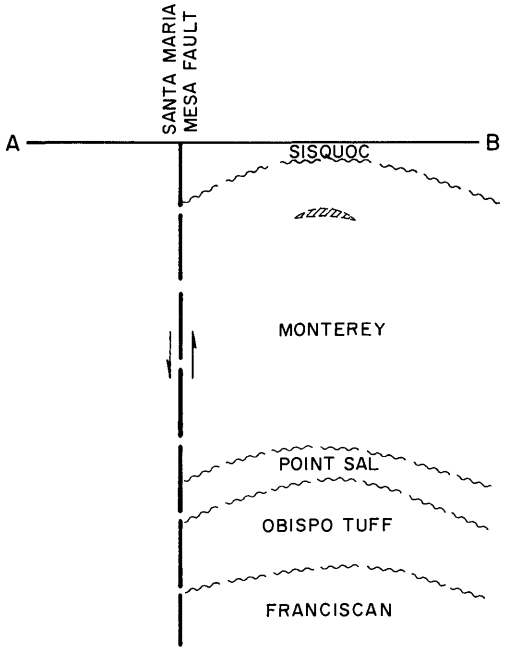
SISQUOC RANCH OIL FIELD

(Abandoned)





CONTOURS ON TOP OF MONTEREY



COUNTY: SANTA BARBARA

SISQUOC RANCH OIL FIELD (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	Chevron U.S.A. Inc. "Chevron-Sulpetro Sisquoc Ranch" 1	Same as present	19 9N 31W	SB	6,506	Monterey	Franciscan Cretaceous
Deepest well	Same as above	"	"	"	"	"	"

POOL DATA

ITEM	MONTEREY					FIELD OR AREA DATA
Discovery date	June 1980					
Initial production rates						
Oil (bbl/day)	20					
Gas (Mcf/day)						
Flow pressure (psi)						
Bean size (in.)						
Initial reservoir pressure (psi)	800					
Reservoir temperature (°F)	110					
Initial oil content (STB/ac.-ft.)						
Initial gas content (MSCF/ac.-ft.)						
Formation	Monterey					
Geologic age	Miocene					
Average depth (ft.)	1,900					
Average net thickness (ft.)	150					
Maximum productive area (acres)	10					
RESERVOIR ROCK PROPERTIES						
Porosity (%)	fractured shale					
So_i (%)						
Sw_i (%)						
Sg_i (%)						
Permeability to air (md)						
RESERVOIR FLUID PROPERTIES						
Oil:						
Oil gravity (°API)	11-16					
Sulfur content (% by wt.)						
Initial solution GOR (SCF/STB)						
Initial oil FVF (RB/STB)						
Bubble point press. (psia)						
Viscosity (cp) @ °F						
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)	2.1					
ENHANCED RECOVERY PROJECTS						
Enhanced recovery projects	cyclic steam					
Date started	1980					
Date discontinued	1980					
Peak oil production (bbl)	4,192					
Year	1981					
Peak gas production, net (Mcf)						
Year						

Base of fresh water (ft.): None

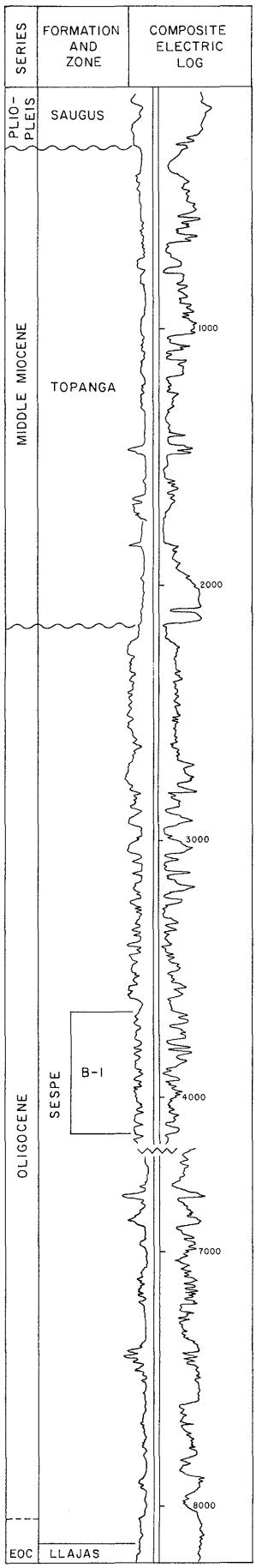
Remarks: Only one well produced in this field. The field was abandoned in 1982. Cumulative production is 5,554 bbl of oil and no gas.

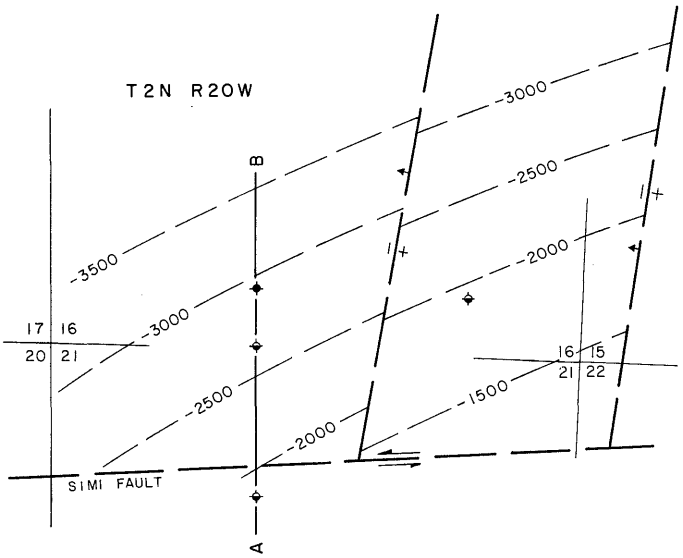
Selected References:

DATE: January 1989

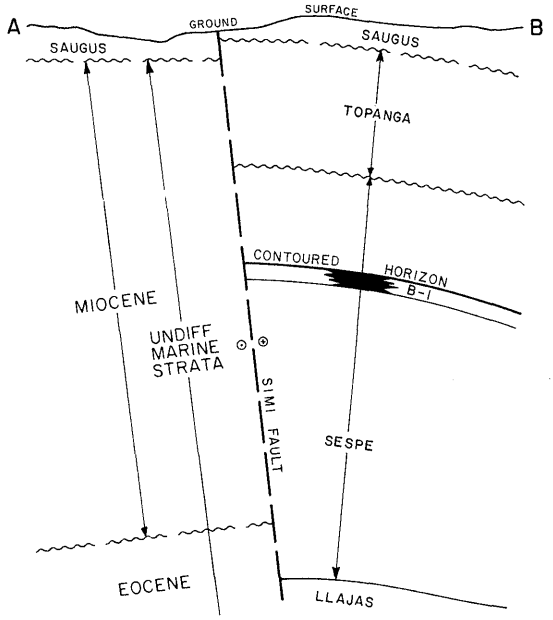
CALIFORNIA DIVISION OF OIL AND GAS

SOMIS OIL FIELD
(Abandoned)





CONTOURS ON TOP OF B-1 ZONE



COUNTY: VENTURA

SOMIS OIL FIELD (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	Aminoil U.S.A. Inc. "Berylwood" 1	The Texas Co. "Berylwood" 1	16 2N 20W	SB	6,235	B-1	
Deepest well	Texaco Inc. "Berylwood" 2	The Texas Co. "Berylwood" 2	16 2N 20W	SB	8,190		Llajas Eocene

POOL DATA

ITEM	B-1					FIELD OR AREA DATA
Discovery date	March 1955					
Initial production rates						
Oil (bbl/day)	57					
Gas (Mcf/day)	5					
Flow pressure (psi)						
Bean size (in.)						
Initial reservoir pressure (psi)						
Reservoir temperature (°F)						
Initial oil content (STB/ac.-ft.)						
Initial gas content (MSCF/ac.-ft.)						
Formation	Sespe					
Geologic age	Oligocene					
Average depth (ft.)	3,950					
Average net thickness (ft.)	500					
Maximum productive area (acres)	10					
RESERVOIR ROCK PROPERTIES						
Porosity (%)						
So_i (%)						
Sw_i (%)						
Sg_i (%)						
Permeability to air (md)						
RESERVOIR FLUID PROPERTIES						
Oil:						
Oil gravity (°API)	16					
Sulfur content (% by wt.)						
Initial solution GOR (SCF/STB)						
Initial oil FVF (RB/STB)						
Bubble point press. (psia)						
Viscosity (cp) @ °F						
Gas:						
Specific gravity (air = 1.0)						
Heating value (Btu/cu. ft.)						
Water:						
Salinity, NaCl (ppm)	16,800					
T.D.S. (ppm)						
R_w (ohm/m) (77°F)						
ENHANCED RECOVERY PROJECTS						
Enhanced recovery projects						
Date started						
Date discontinued						
Peak oil production (bbl)	2,088					
Year	1955					
Peak gas production, net (Mcf)	805					
Year	1955					

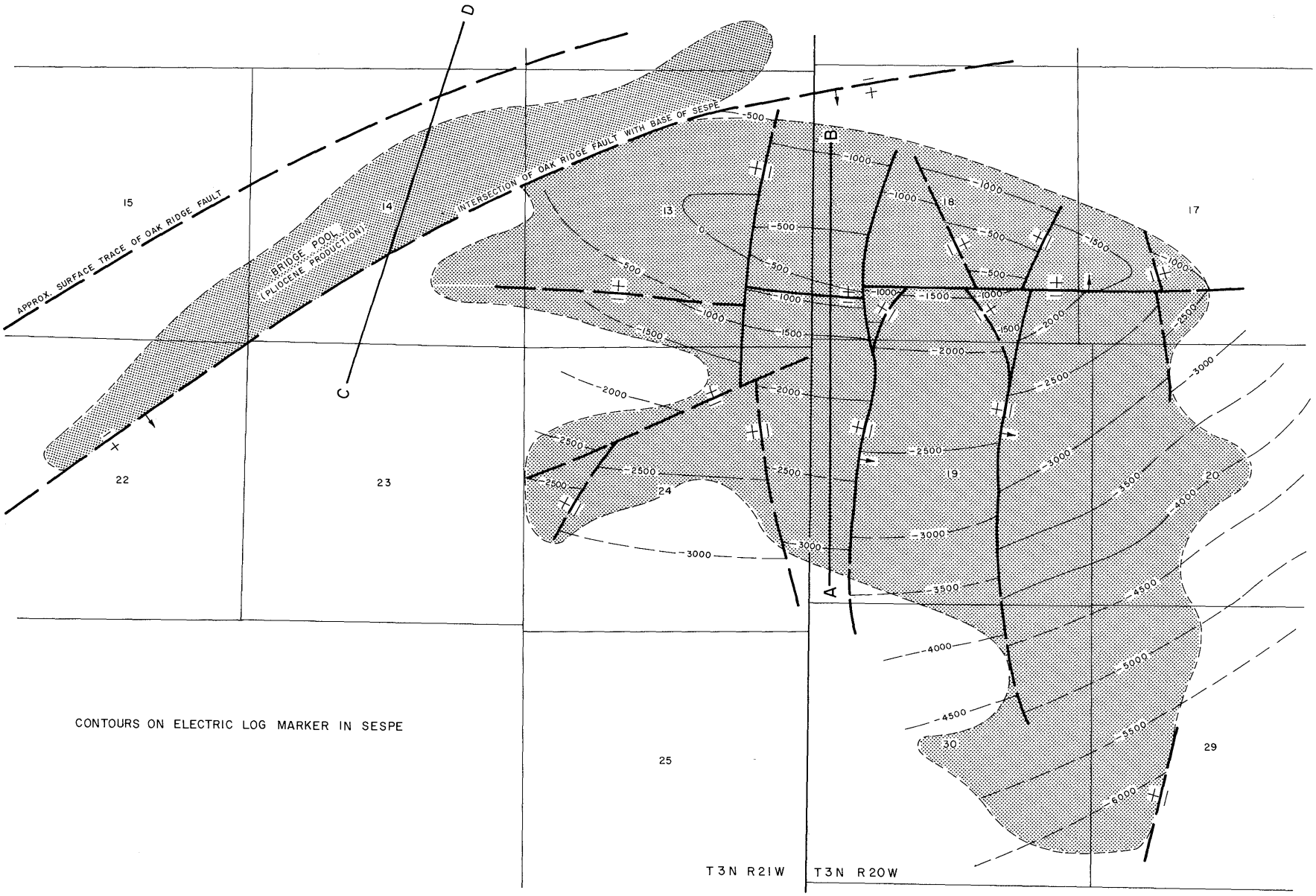
Base of fresh water (ft.): 1,180 - 1,400

Remarks: The field was abandoned in May 1956. Cumulative production is 2,088 bbl of oil and 805 Mcf of gas.

Selected References:

DATE: May 1983

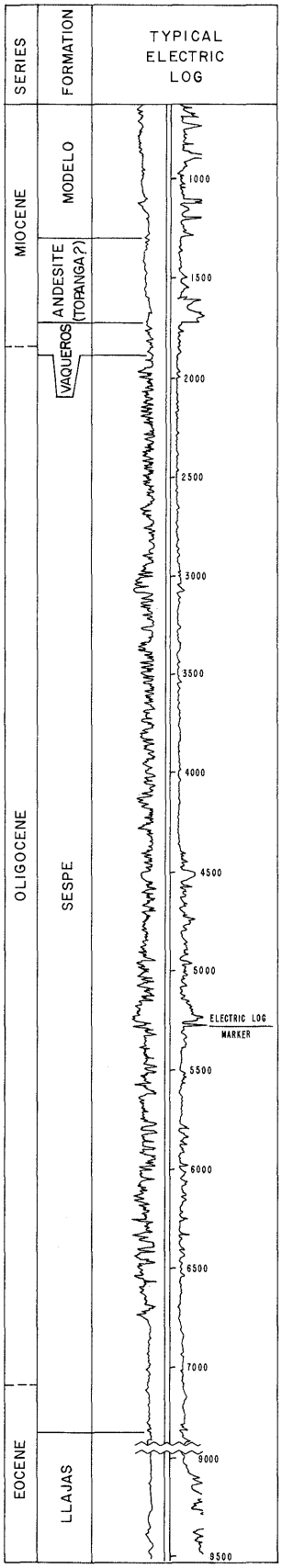
CALIFORNIA DIVISION OF OIL AND GAS

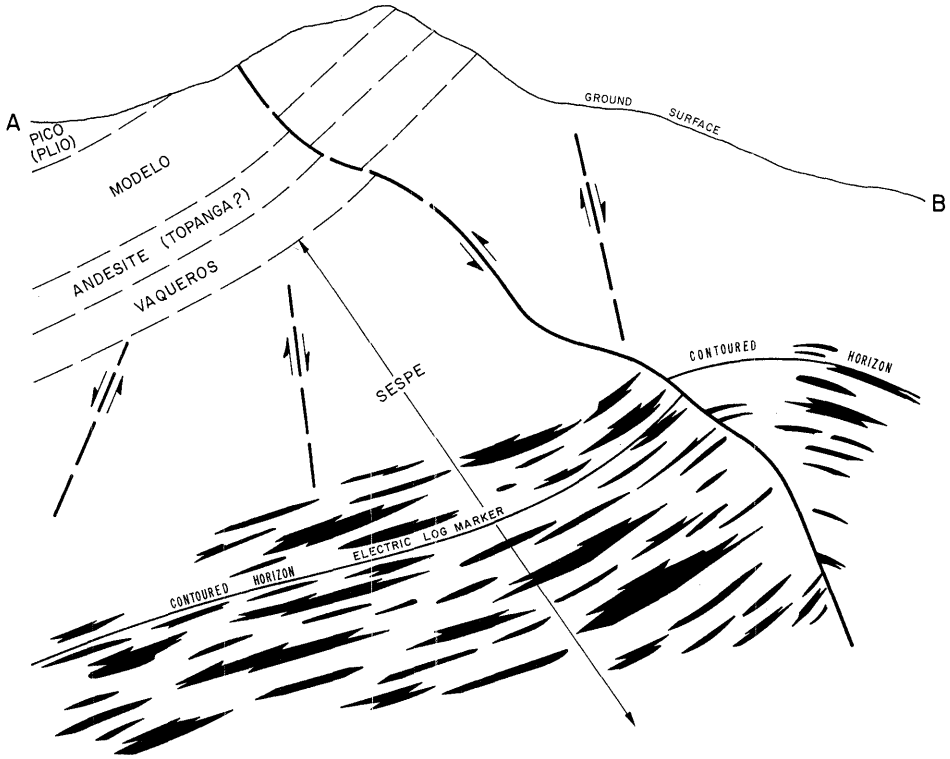


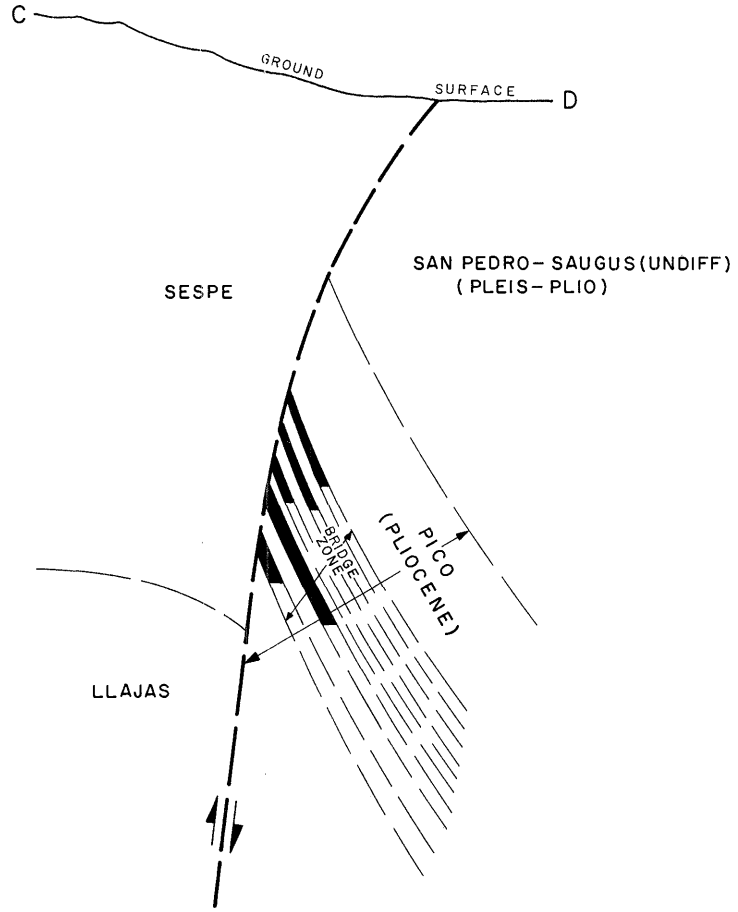
CONTOURS ON ELECTRIC LOG MARKER IN SESPE

SOUTH MOUNTAIN OIL FIELD

SOUTH MOUNTAIN OIL FIELD







COUNTY: VENTURA

SOUTH MOUNTAIN 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	Texaco Inc. "South Mountain" 1	Oak Ridge Oil Co. "S.M." 1	13 3N 21W	SB	3,000	Sespe	
Deepest well	Texaco Inc. "T-U Norman Richardson Heirs" 1	The Texas Co. "Texas-Union-Norman Richardson Heirs" 1	14 3N 21W	SB	13,412		Pico Pliocene

POOL DATA

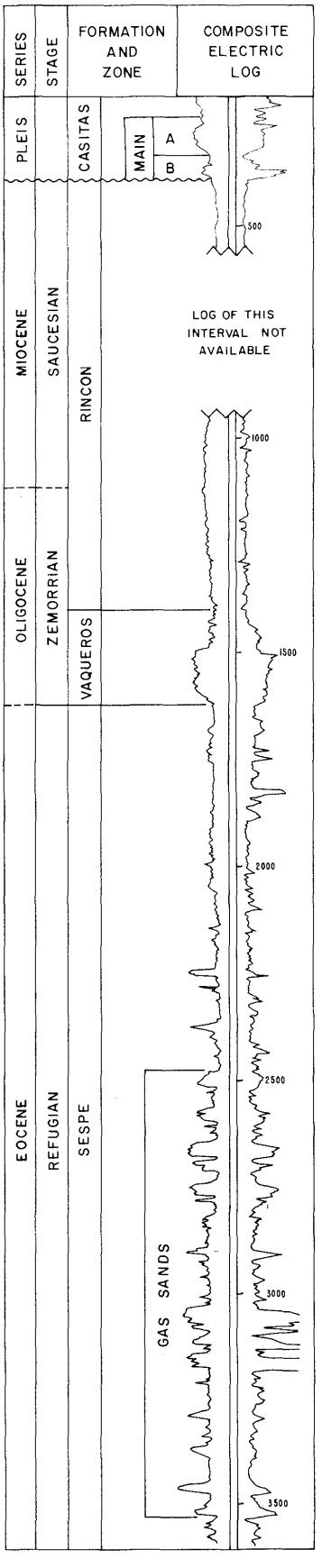
ITEM	SESPE	BRIDGE				FIELD OR AREA DATA
Discovery date	April 1916	December 1955				
Initial production rates						
Oil (bbl/day)	25	205				
Gas (Mcf/day)	-	248				
Flow pressure (psi)						
Bean size (in.)						
Initial reservoir pressure (psi)	-	2,500				
Reservoir temperature (°F)	100	280				
Initial oil content (STB/ac.-ft.)	688	895				
Initial gas content (MSCF/ac.-ft.)						
Formation	Sespe	Pico				
Geologic age	Oligocene	Pliocene				
Average depth (ft.)	3,500	7,500				
Average net thickness (ft.)	1,000	600				
Maximum productive area (acres)						2,670
RESERVOIR ROCK PROPERTIES						
Porosity (%)	15	26				
So_i (%)	55	65				
Sw_i (%)	35	-				
Sg_i (%)	10	-				
Permeability to air (md)	24	43				
RESERVOIR FLUID PROPERTIES						
Oil:						
Oil gravity (°API)	22	33				
Sulfur content (% by wt.)	2.79	-				
Initial solution GOR (SCF/STB)						
Initial oil FVF (RB/STB)						
Bubble point press. (psia)						
Viscosity (cp) @ °F	60.0	12.5				
Gas:						
Specific gravity (air = 1.0)						
Heating value (Btu/cu. ft.)						
Water:						
Salinity, NaCl (ppm)	15,646-35,739	8,977				
T.D.S. (ppm)						
R_w (ohm/m) (77°F)						
ENHANCED RECOVERY PROJECTS						
Enhanced recovery projects	waterflood	steam injection				
Date started	1956	1963				
Date discontinued	active	active				
Peak oil production (bbl)						7,436,184
Year						1959
Peak gas production, net (Mcf)						15,613,073
Year						1960

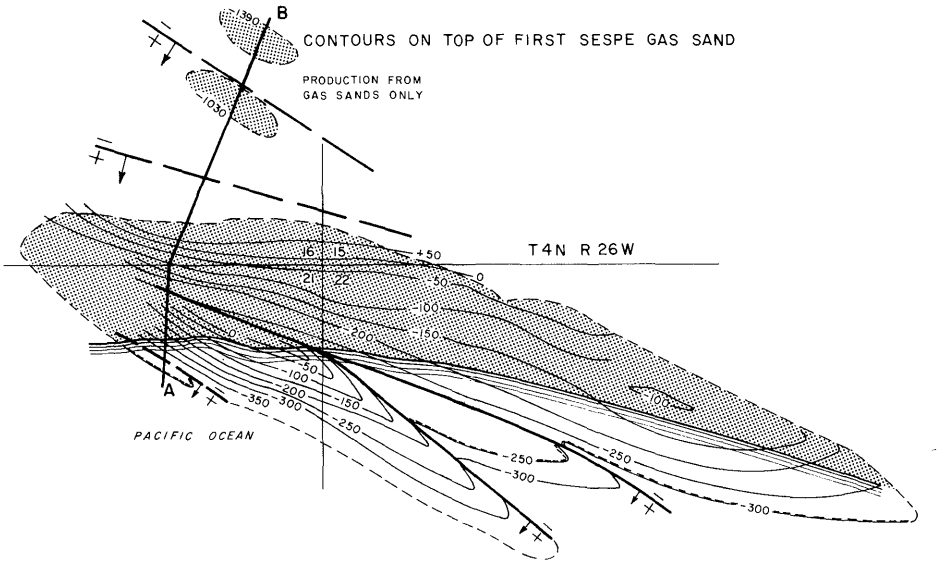
Base of fresh water (ft.): None south of Oakridge fault, and 1,650 feet deep north of Oakridge fault.

Remarks:

Selected References: Bailey, W.C., 1943, South Mountain Oil Field: Calif. Div. of Oil and Gas, Summary of Operations -- Calif. Oil Fields, Vol. 29, No. 2.
Godde, H.A., 1924, Oil Fields of Ventura County, Calif. Div. of Oil and Gas, Summary of Operations -- Calif. Oil Fields, Vol. 10, No. 5.

SUMMERLAND OIL FIELD
Onshore Area





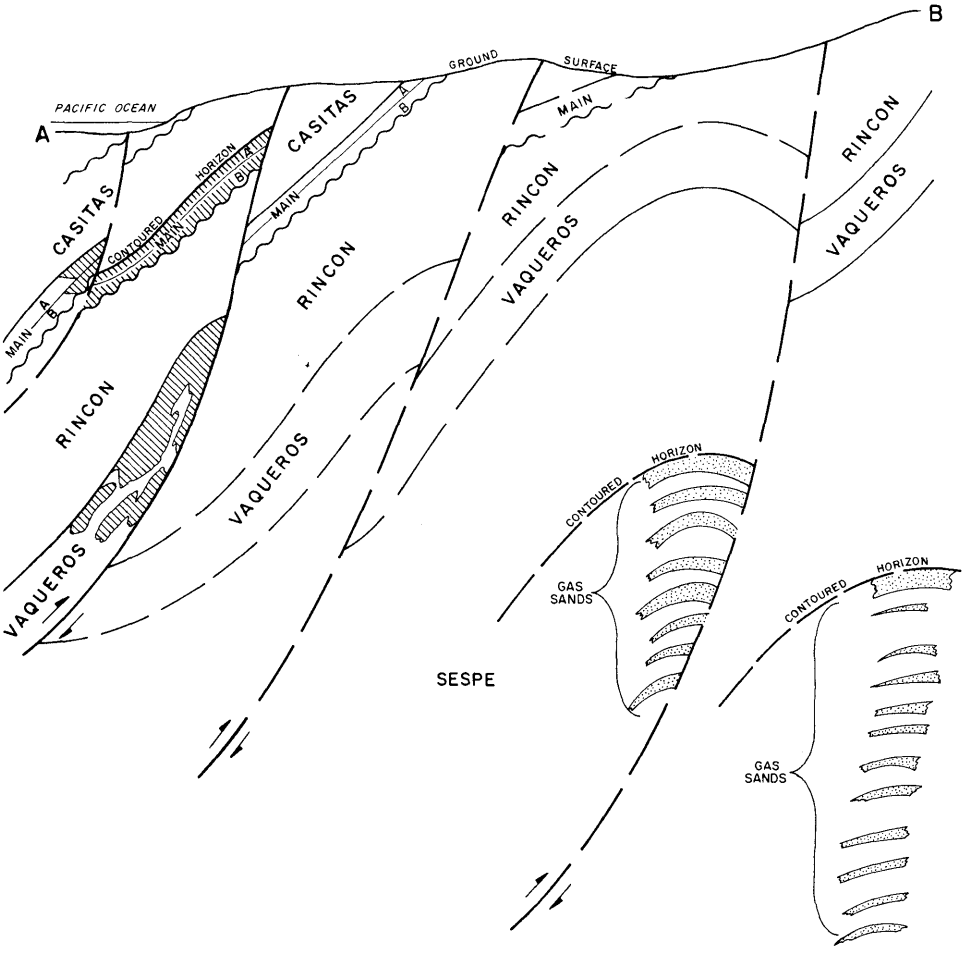
CONTOURS ON TOP OF FIRST SESPE GAS SAND

PRODUCTION FROM GAS SANDS ONLY

CONTOURS ON TOP OF MAIN (A) SAND

SCALE: 1" = 600'

MAP AND CROSS SECTION BASED UPON DATA BY R ARNOLD, AND MODIFIED BY THE DIVISION OF OIL AND GAS.



COUNTY: SANTA BARBARA

SUMMERLAND 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	Same as present	22 4N 26W	SB	unk.	Main	
Deepest well	Texaco Producing Inc. "Seaside-State" 1	Tidewater Oil Co. "Seaside-State" 1	22 4N 26W	SB	6,191		Sespe Oligocene

POOL DATA

ITEM	MAIN					FIELD OR AREA DATA
Discovery date	Prior to 1894					
Initial production rates						
Oil (bbl/day)	-					
Gas (Mcf/day)	-					
Flow pressure (psi)						
Bean size (in.)						
Initial reservoir pressure (psi)						
Reservoir temperature (°F)						
Initial oil content (STB/ac.-ft.)						
Initial gas content (MSCF/ac.-ft.)						
Formation	Casitas					
Geologic age	Pleistocene					
Average depth (ft.)	140					
Average net thickness (ft.)	100					
Maximum productive area (acres)						740
RESERVOIR ROCK PROPERTIES						
Porosity (%)						
S_{oi} (%)						
S_{wi} (%)						
S_{gi} (%)						
Permeability to air (md)						
RESERVOIR FLUID PROPERTIES						
Oil:						
Oil gravity (°API)	7					
Sulfur content (% by wt.)						
Initial solution GOR (SCF/STB)						
Initial oil FVF (RB/STB)						
Bubble point press. (psia)						
Viscosity (cp) @ °F						
Gas:						
Specific gravity (air = 1.0)						
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						
Date started						
Date discontinued						
Peak oil production (bbl)						
Year						
Peak gas production, net (Mcf)						
Year						

Base of fresh water (ft.): See areas

Remarks: See areas

Selected References: See areas

DATE: May 1991

CALIFORNIA DIVISION OF OIL AND GAS

COUNTY: SANTA BARBARA

SUMMERLAND OIL FIELD
ONSHORE 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	Same as present	22 4N 26W	SB	unk.	Main	
Deepest well	Chevron U.S.A. Inc. "Ortega Community" 1	Same as present	16 4N 26W	SB	5,987		Sespe Oligocene

POOL DATA

ITEM	MAIN	VAQUEROS	SESPE			FIELD OR AREA DATA
Discovery date	Prior to 1894	August 1929	December 1948			
Initial production rates						
Oil (bbl/day)	-	190	-			
Gas (Mcf/day)	-	1	4,353			
Flow pressure (psi)						
Bean size (in.)						
Initial reservoir pressure (psi)						
Reservoir temperature (°F)						
Initial oil content (STB/ac.-ft.)						
Initial gas content (MSCF/ac.-ft.)						
Formation	Casitas	Vaqueros	Sespe			
Geologic age	Pleistocene	Miocene	Oligocene			
Average depth (ft.)	140	1,400	3,200			
Average net thickness (ft.)	100	300	1,000			
Maximum productive area (acres)						380
RESERVOIR ROCK PROPERTIES						
Porosity (%)						
So_i (%)						
Sw_i (%)						
Sg_i (%)						
Permeability to air (md)						
RESERVOIR FLUID PROPERTIES						
Oil:						
Oil gravity (°API)	7		16			
Sulfur content (% by wt.)						
Initial solution GOR (SCF/STB)						
Initial oil FVF (RB/STB)						
Bubble point press. (psia)						
Viscosity (cp) @ °F						
Gas:						
Specific gravity (air = 1.0)						
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						
Date started						
Date discontinued						
Peak oil production (bbl)						118,519
Year						1930
Peak gas production, net (Mcf)						537,624
Year						1949

Base of fresh water (ft.): 40

Remarks: Two Sespe dry-gas wells were completed; they were both abandoned by June 1955. Maximum, proved dry-gas acreage was 60, peak production 537,624 Mcf in 1949, cumulative production 1,704,062 Mcf. Some of the original old wells were dug by hand. The production piers once extending into the ocean are gone.

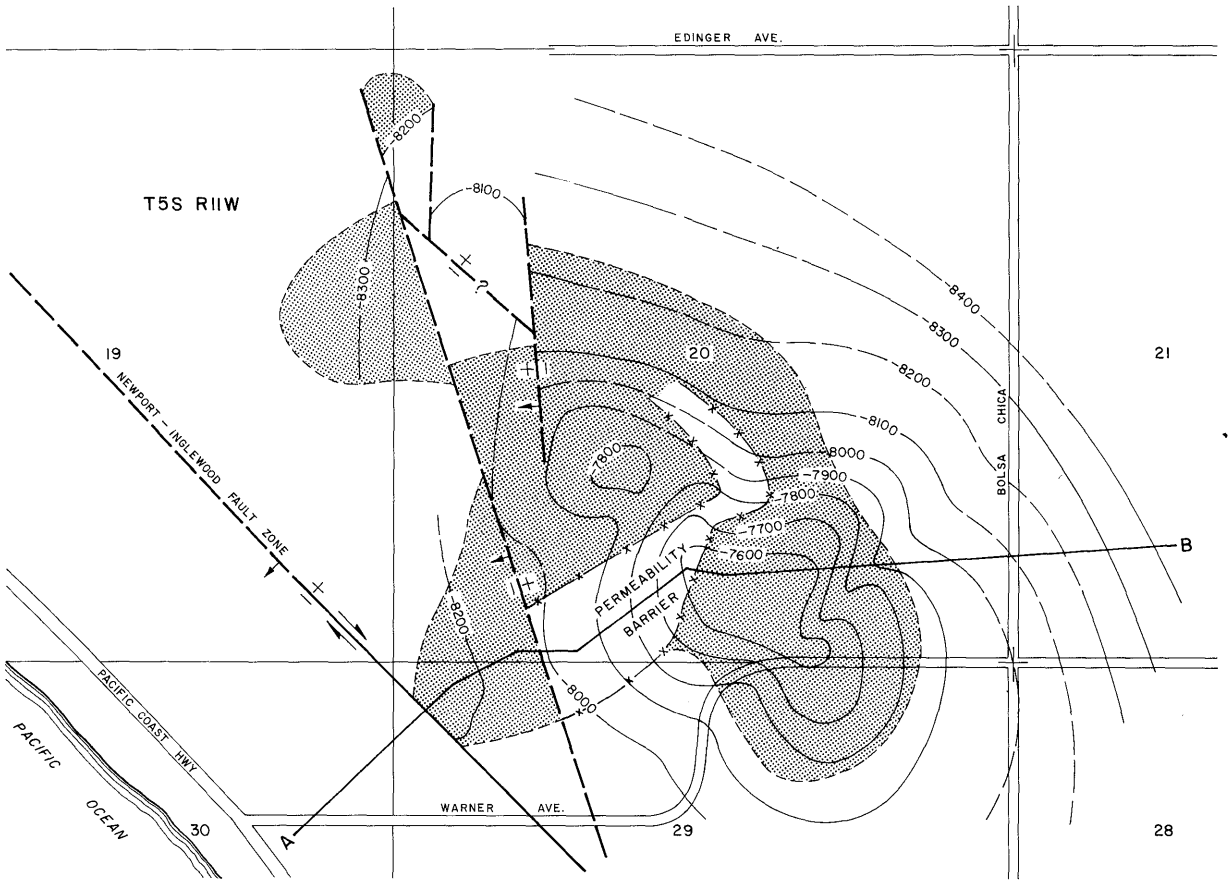
Selected References:

Arnold, R., 1907, Geology and Oil Resources of the Summerland District: U.S. Geol. Survey Bull. 321.
Lian, Harold M., 1954, Geology of The Carpinteria District, Santa Barbara County, Calif. Div. of Mines Bull. 170, Geology of Southern California: Map Sheet 25.

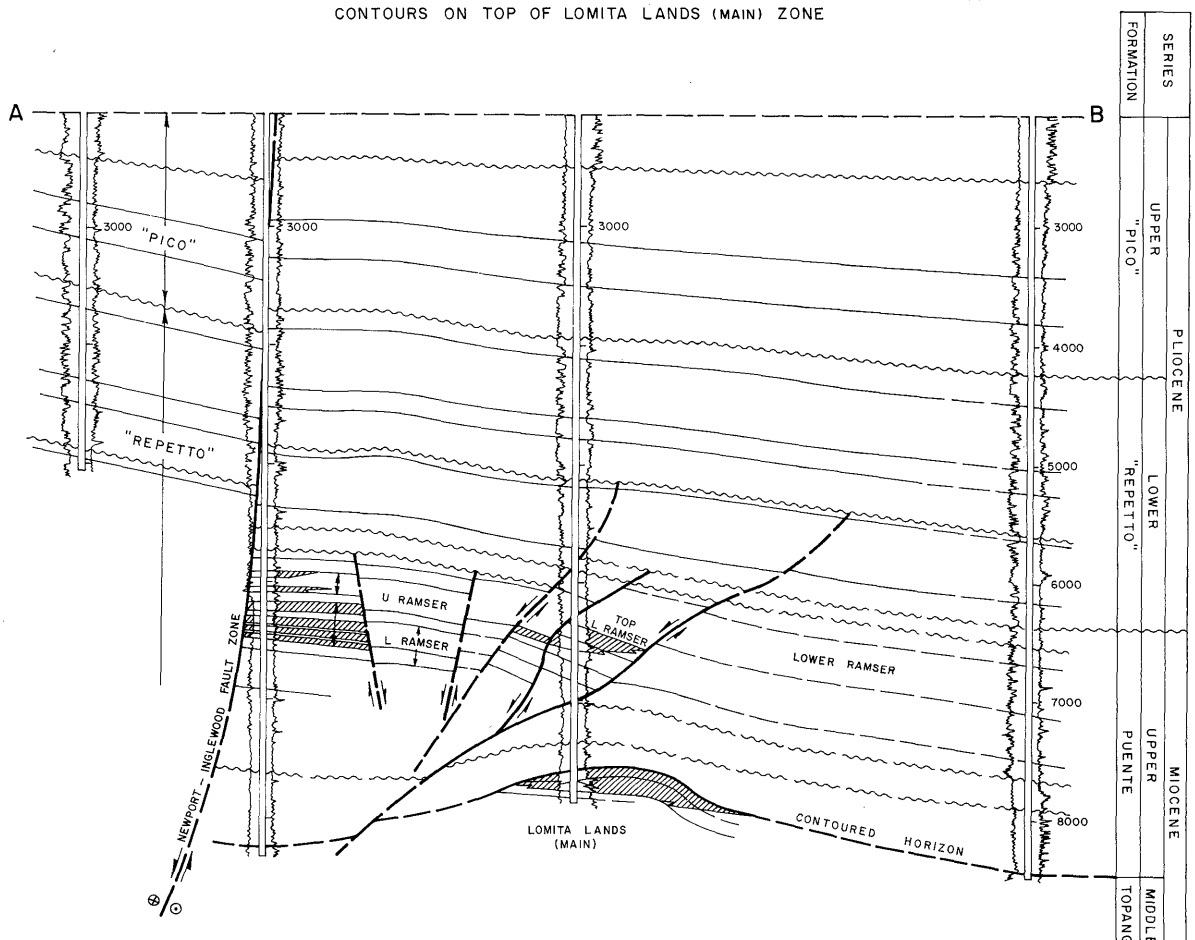
DATE: May 1983

CALIFORNIA DIVISION OF OIL AND GAS

SUNSET BEACH OIL FIELD



CONTOURS ON TOP OF LOMITA LANDS (MAIN) ZONE



COUNTY: ORANGE

SUNSET BEACH 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	Huntington Harbour Corp. "F.A.F." 6-2	Bert Aston "Lomita" 1	19 5S 11W	SB	7,185	Lower Ramser	
Deepest well	Atlantic Oil Co. "B.A." 1	Same as present	19 5S 11W	SB	9,550		Topanga middle Miocene

POOL DATA

ITEM	UPPER RAMSER	LOWER RAMSER	LOMITA LANDS			FIELD OR AREA DATA
Discovery date	November 1954	June 1954	December 1954			
Initial production rates						
Oil (bbl/day)	650	500	820			
Gas (Mcf/day)	200a/	150a/	150a/			
Flow pressure (psi)						
Bean size (in.)						
Initial reservoir pressure (psi)						
Reservoir temperature (°F)						
Initial oil content (STB/ac.-ft.)						
Initial gas content (MSCF/ac.-ft.)						
Formation	Puente	Puente	Topanga			
Geologic age	late Miocene	late Miocene	middle Miocene			
Average depth (ft.)	5,800	6,250	2,750			
Average net thickness (ft.)	110	100	100			
Maximum productive area (acres)						280
RESERVOIR ROCK PROPERTIES						
Porosity (%)	25	25	b/			
S_{oi} (%)						
S_{wi} (%)						
S_{gi} (%)						
Permeability to air (md)	400	400	b/			
RESERVOIR FLUID PROPERTIES						
Oil:						
Oil gravity (°API)	30	29	26-29			
Sulfur content (% by wt.)						
Initial solution GOR (SCF/STB)						
Initial oil FVF (RB/STB)						
Bubble point press. (psia)						
Viscosity (cp) @ °F						
Gas:						
Specific gravity (air = 1.0)						
Heating value (Btu/cu. ft.)						
Water:						
Salinity, NaCl (ppm)	22,253	22,253	19,686			
T.D.S. (ppm)						
R_w (ohm/m) (77°F)						
ENHANCED RECOVERY PROJECTS						
Enhanced recovery projects						
Date started						
Date discontinued						
Peak oil production (bbl)						1,795,617
Year						1955
Peak gas production, net (Mcf)						2,556,018
Year						1955

Base of fresh water (ft.): 1,850-2,850

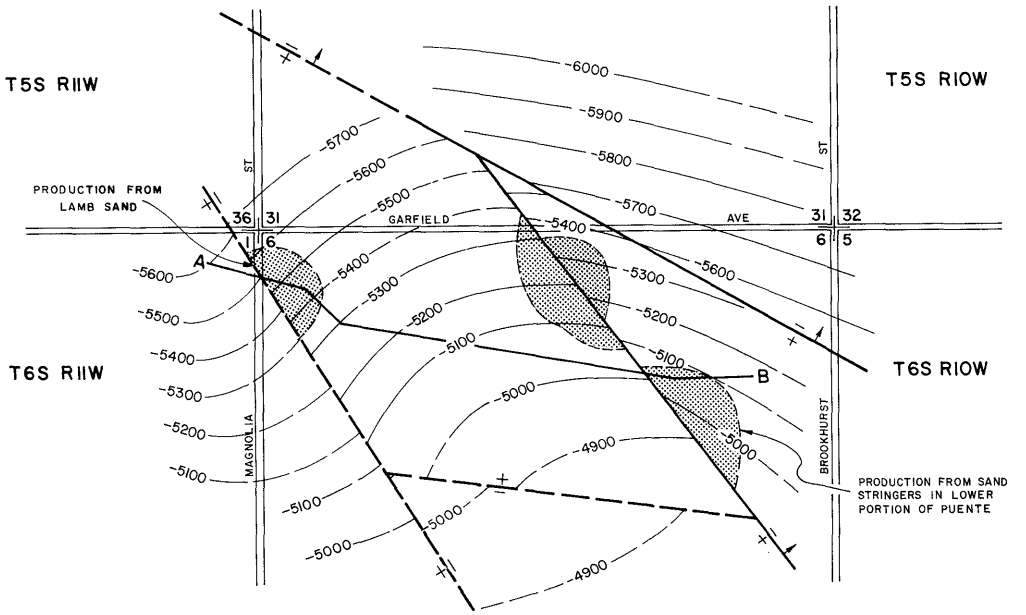
Remarks: a/ Average daily gas production for first 30 days.
b/ No exact figures available; individual beds change character rapidly, both horizontally and vertically.

Selected References: Allen, D.R., and G.C. Hazenbush, 1957, Sunset Beach Oil Field: Calif. Div. of Oil and Gas, Summary of Operations -- Calif. Oil Fields, Vol. 43, No. 2.

DATE: July 1983

CALIFORNIA DIVISION OF OIL AND GAS

TALBERT OIL FIELD
(Abandoned)



CONTOURS ON C-2 ELECTRIC LOG MARKER

SCALE

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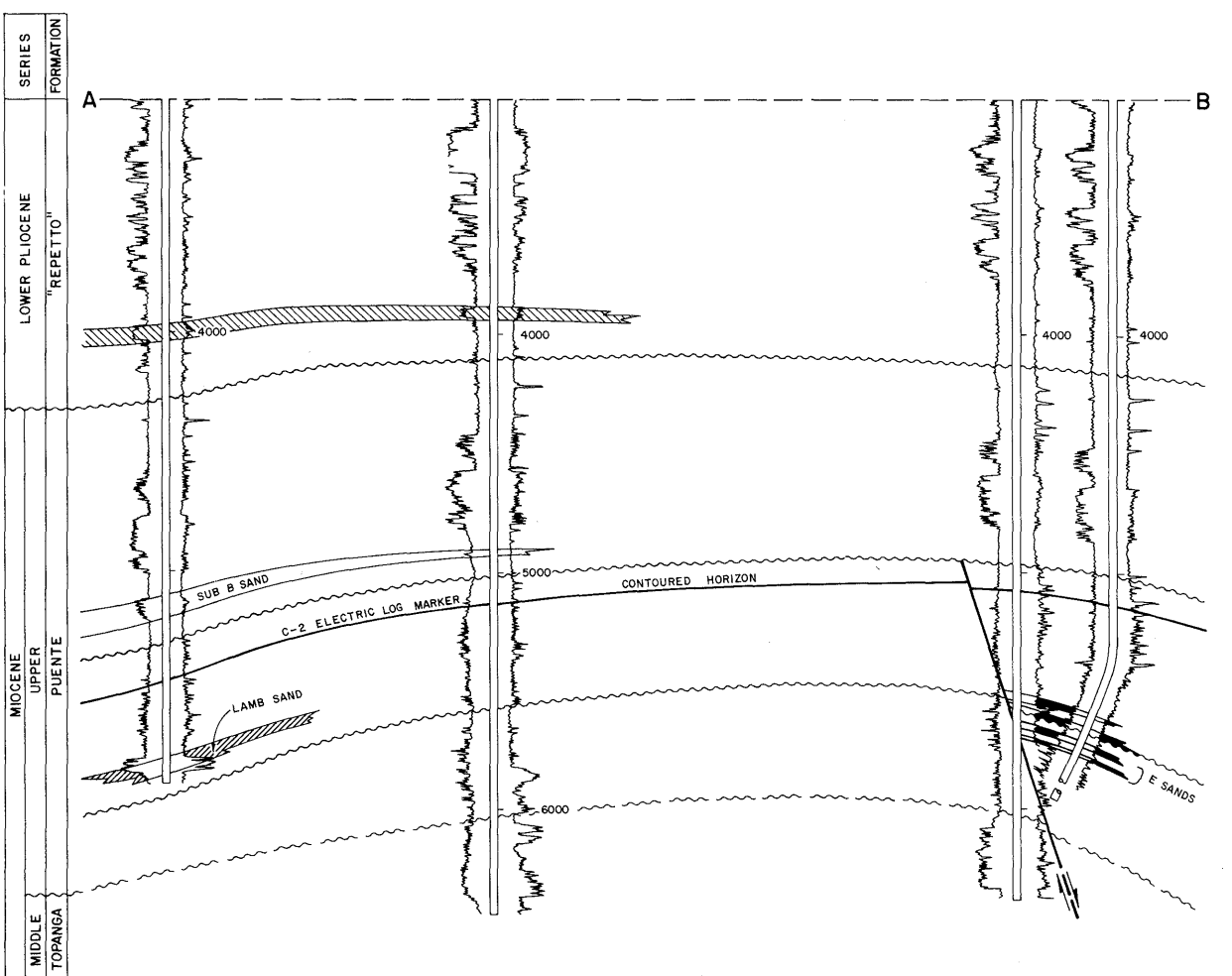


COUNTY: ORANGE

TALBERT OIL FIELD
(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 Producing Inc. "Lamb" 1	Honolulu Oil Corp. "Lamb" 1	6 6S 10W	SB	5,968	Lamb and E sands	
Deepest well	Coast Supply Co., Ltd. "Lamb" 51-6	Shell Oil Company "Lamb" 51-6	6 6S 10W	SB	7,835		Topanga middle Miocene

POOL DATA

ITEM	LAMB	E SANDS				FIELD OR AREA DATA
Discovery date	September 1947	March 1948				
Initial production rates						
Oil (bbl/day)	54	33				
Gas (Mcf/day)	8	-				
Flow pressure (psi)						
Bean size (in.)						
Initial reservoir pressure (psi)						
Reservoir temperature (°F)						
Initial oil content (STB/ac.-ft.)						
Initial gas content (MSCF/ac.-ft.)						
Formation	Puente	Puente				
Geologic age	late Miocene	late Miocene				
Average depth (ft.)	5,400	5,700				
Average net thickness (ft.)	100	100				
Maximum productive area (acres)						35
RESERVOIR ROCK PROPERTIES						
Porosity (%)						
So_i (%)						
Sw_i (%)						
Sg_i (%)						
Permeability to air (md)						
RESERVOIR FLUID PROPERTIES						
Oil:						
Oil gravity (°API)	19	19				
Sulfur content (% by wt.)						
Initial solution GOR (SCF/STB)						
Initial oil FVF (RB/STB)						
Bubble point press. (psia)						
Viscosity (cp) @ °F						
Gas:						
Specific gravity (air = 1.0)						
Heating value (Btu/cu. ft.)						
Water:						
Salinity, NaCl (ppm)	14,200	14,200				
T.D.S. (ppm)						
R_w (ohm/m) (77°F)						
ENHANCED RECOVERY PROJECTS						
Enhanced recovery projects						
Date started						
Date discontinued						
Peak oil production (bbl)						28,537
Year						1957
Peak gas production, net (Mcf)						3,435
Year						1948

Base of fresh water (ft.): 1,700-2,000

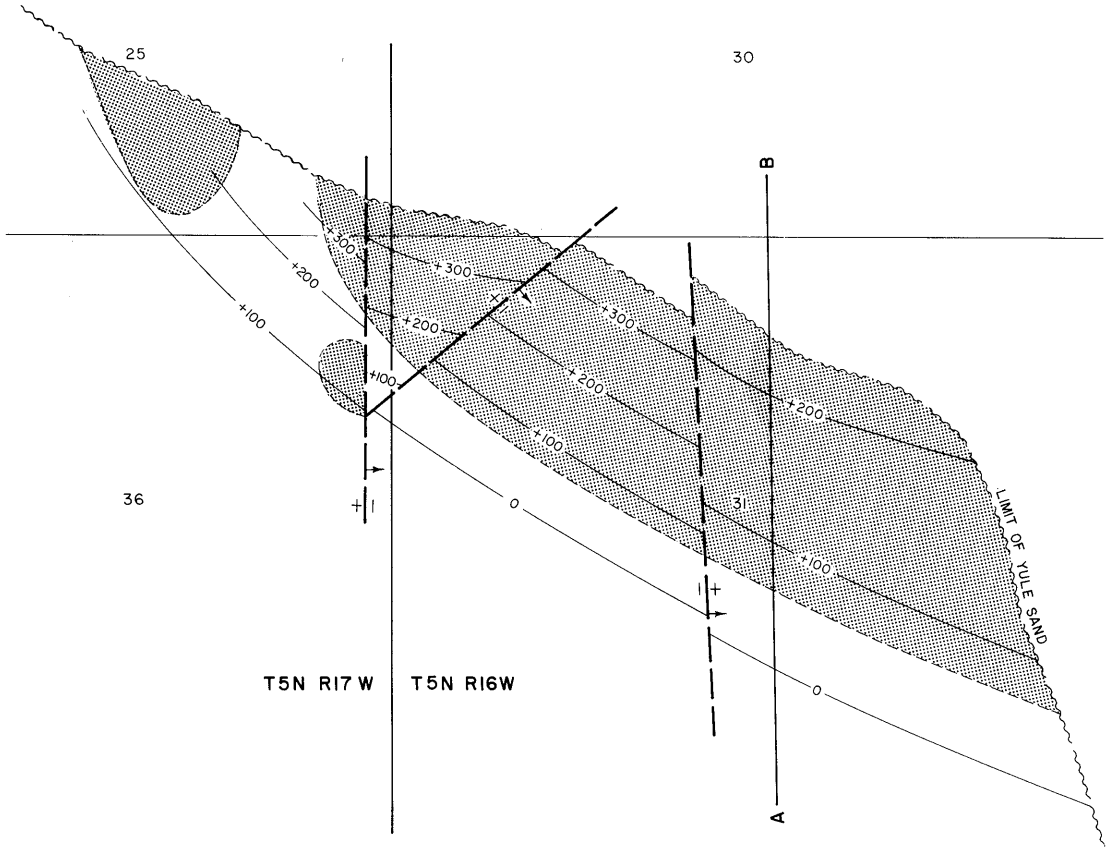
Remarks: Last production was in February 1963. The field was abandoned in April 1963. Cumulative production is 126,275 bbl of oil and 4,481 Mcf of gas.

Selected References: Loken, K.P., 1963, Talbert Oil Field: Calif. Div. of Oil and Gas, Summary of Operations -- Calif. Oil Fields, Vol. 49., No. 1.

DATE: May 1991

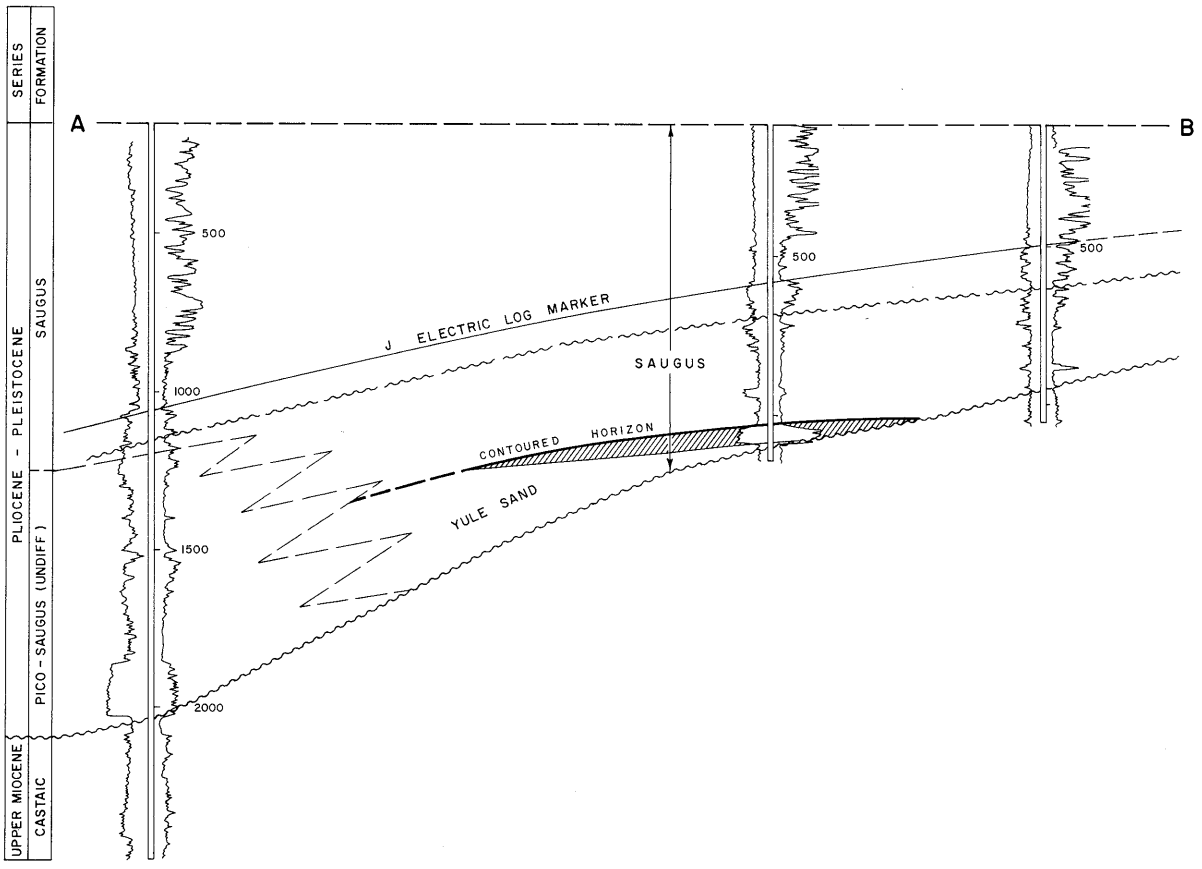
CALIFORNIA DIVISION OF OIL AND GAS

TAPIA OIL FIELD



CONTOURS ON TOP OF YULE SAND

SCALE: 1" = 1000'



COUNTY: LOS ANGELES

TAPIA 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	Crown Central Pet. Corp. "Yule" 2	Intex Oil Co. "Yule" 2	31 5N 16W	SB	1,352	Yule	
Deepest well	Texaco Inc. "Yule" 1	The Texas Co. "Yule" 1	30 5N 16W	SB	6,010		Mint Canyon late Miocene

POOL DATA

ITEM	YULE					FIELD OR AREA DATA
Discovery date	August 1957					
Initial production rates						
Oil (bbl/day)	120					
Gas (Mcf/day)	0					
Flow pressure (psi)						
Bean size (in.)						
Initial reservoir pressure (psi)						
Reservoir temperature (°F)						
Initial oil content (STB/ac.-ft.)						
Initial gas content (MSCF/ac.-ft.)						
Formation	Saugus					
Geologic age	Pleistocene-Pliocene					
Average depth (ft.)	1,050					
Average net thickness (ft.)	100					
Maximum productive area (acres)	160					
RESERVOIR ROCK PROPERTIES						
Porosity (%)						
So_i (%)						
Sw_i (%)						
Sg_i (%)						
Permeability to air (md)						
RESERVOIR FLUID PROPERTIES						
Oil:						
Oil gravity (°API)	17					
Sulfur content (% by wt.)						
Initial solution GOR (SCF/STB)						
Initial oil FVF (RB/STB)						
Bubble point press. (psia)						
Viscosity (cp) @ °F						
Gas:						
Specific gravity (air = 1.0)						
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						
Date started						
Date discontinued						
Peak oil production (bbl)	118,731					
Year	1958					
Peak gas production, net (Mcf)						
Year						

Base of fresh water (ft.): 450 - 700

Remarks:

Selected References:

Crowell, J.C., 1954, Geology of the Ridge Basin Area, Los Angeles and Ventura Counties, Geology of Southern California; Calif. Div. of Mines Bull. 170, Vol. 2, Map Sheet No. 7.

Dosch, M.W., and G.W. Beecroft, 1959, Tapia Oil Field: Calif. Djv. of Oil and Gas, Summary of Operations -- Calif. Oil Fields, Vol. 45, No. 1.

Kew, W.S., 1924, Geology and Oil Resources of a part of Los Angeles and Ventura Counties, Calif.: U.S. Geol. Survey Bull. 753.

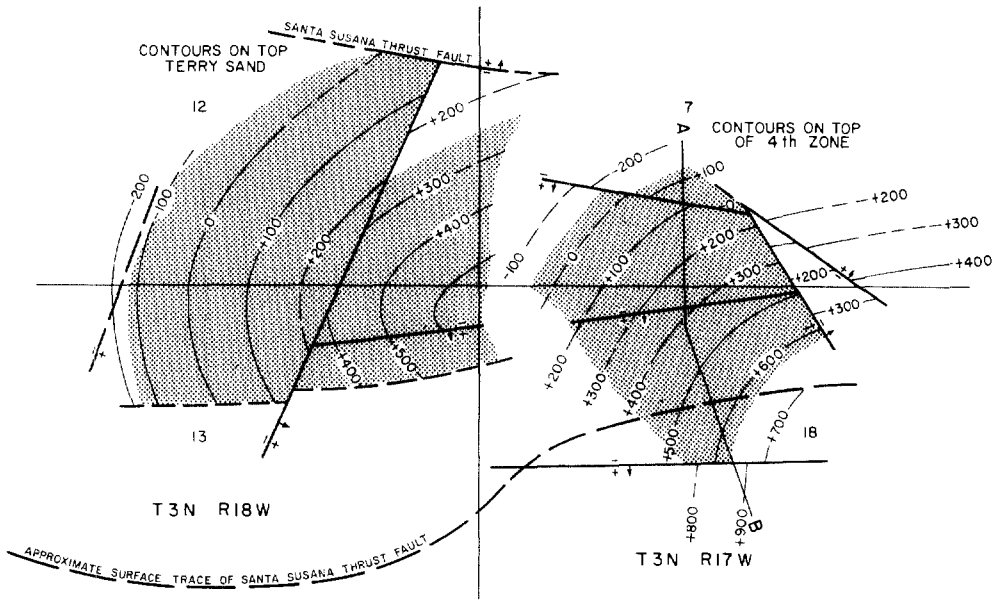
Miller, H., and R. Turner; 1959, Tapia Field: Geol. Society, Occasional Papers No. 1.

Winterer, E.L. and D.L. Durham, 1962, Geology of Southeastern Ventura Basin, Los Angeles County, California: U.S. Geol. Survey Prof Paper 334H.

DATE: May 1983

CALIFORNIA DIVISION OF OIL AND GAS

SOUTH TAPO CANYON OIL FIELD



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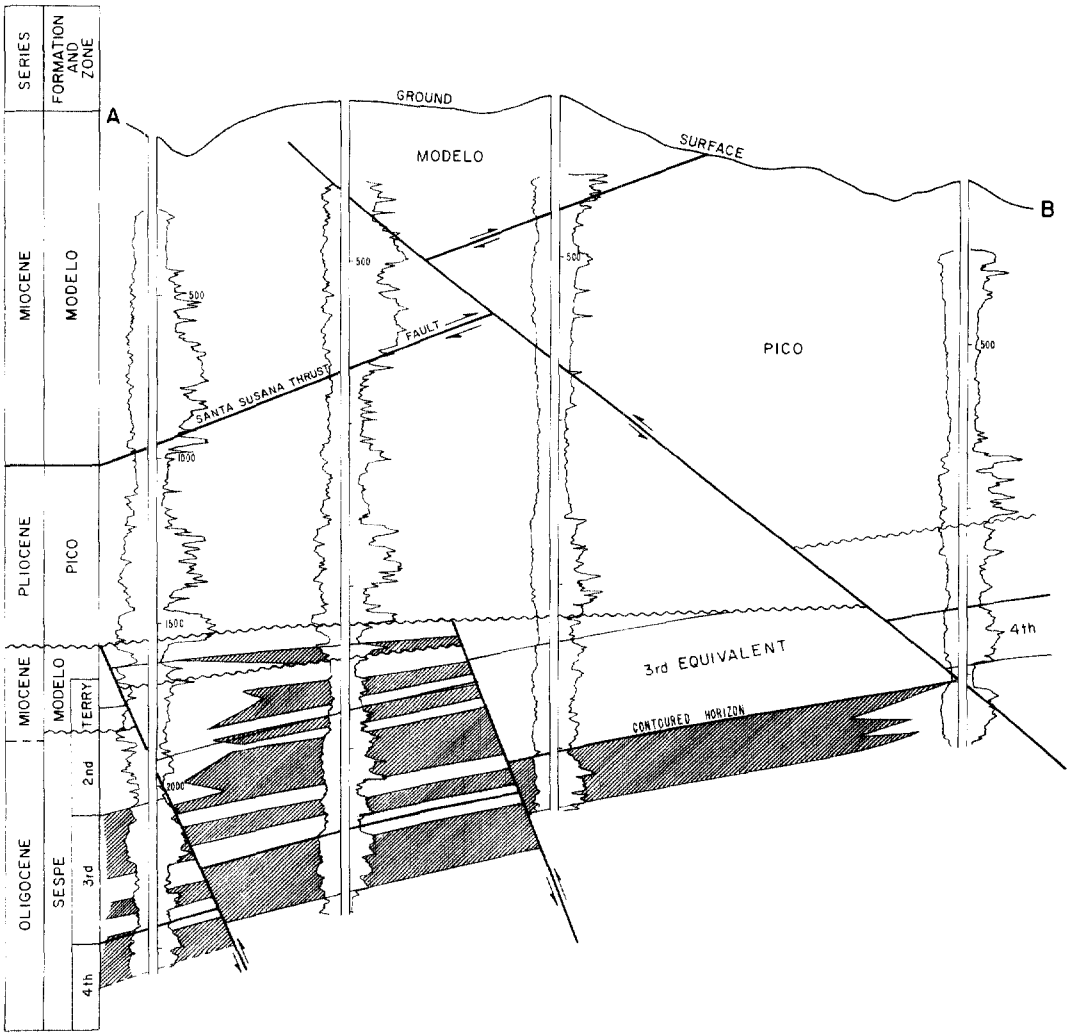


COUNTY: VENTURA

TAPO CANYON, 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	Murray-Teague Associates "Tapo" 2	Terry and Jensen "Tapo" 2	13 3N 18W	SB	3,746	Terry	
Deepest well	Havenstrite Oil Co. "Tapo" 1	Same as present	13 3N 18W	SB	8,394		Llajas Eocene

POOL DATA

ITEM	TERRY	2ND SESPE	3RD SESPE	4TH SESPE		FIELD OR AREA DATA
Discovery date	February 1953	July 1954	July 1954	July 1954		
Initial production rates						
Oil (bbl/day)	720	99[a/]	-	-		
Gas (Mcf/day)	100	411	-	-		
Flow pressure (psi)						
Bean size (in.)						
Initial reservoir pressure (psi)						
Reservoir temperature (°F)	-	-	-	117		
Initial oil content (STB/ac.-ft.)						
Initial gas content (MSCF/ac.-ft.)						
Formation	Modelo	Sespe	Sespe	Sespe		
Geologic age	Miocene	Oligocene	Oligocene	Oligocene		
Average depth (ft.)	2,200	1,800	1,880	2,200		
Average net thickness (ft.)	60	70	220	180		
Maximum productive area (acres)						290
RESERVOIR ROCK PROPERTIES						
Porosity (%)	33	-	-	25		
So_i (%)	-	-	-	42		
Sw_i (%)	-	-	-	58		
Sg_i (%)						
Permeability to air (md)	62	-	-	400		
RESERVOIR FLUID PROPERTIES						
Oil:						
Oil gravity (°API)	32	18	18	18		
Sulfur content (% by wt.)						
Initial solution GOR (SCF/STB)	-	-	-	1.05		
Initial oil FVF (RB/STB)						
Bubble point press. (psia)						
Viscosity (cp) @ °F						
Gas:						
Specific gravity (air = 1.0)						
Heating value (Btu/cu. ft.)						
Water:						
Salinity, NaCl (ppm)	1,500[b/]	17,600	17,600	17,600		
T.D.S. (ppm)						
R_w (ohm/m) (77°F)						
ENHANCED RECOVERY PROJECTS						
Enhanced recovery projects	cyclic steam					fireflood
Date started	1964					1981
Date discontinued	1965					1982
	waterflood					
	1976					
	1976					
Peak oil production (bbl)						905,009
Year						1953
Peak gas production, net (Mcf)						300,434
Year						1954

Base of fresh water (ft.): 500 - 600

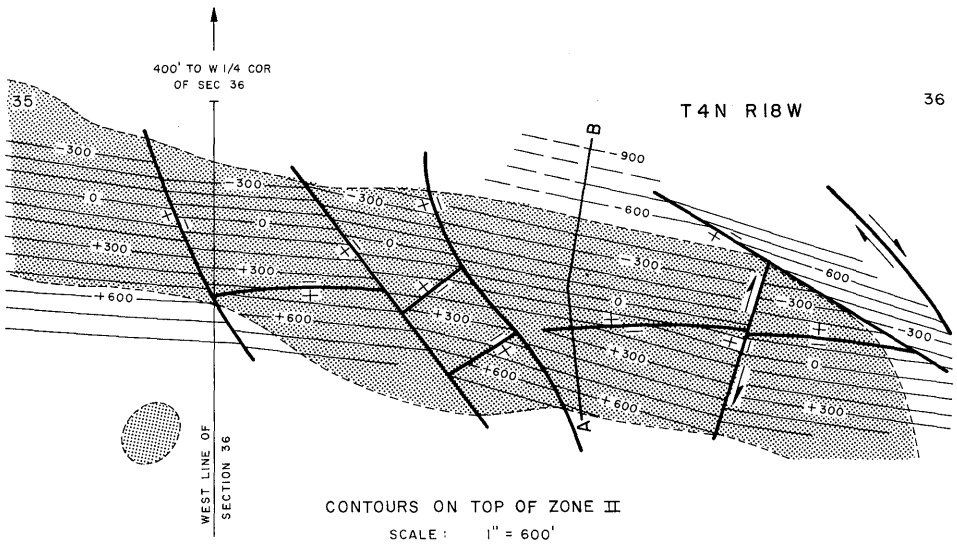
Remarks: a/ Initial production from the 2nd, 3rd, and 4th Sespe zones was commingled.
b/ Terry zone water is high in bicarbonates and total dissolved solids.

Selected References: Hardoin, J.L., 1958, South Tapo Canyon Oil Field, Calif. Div. of Oil and Gas, Summary of Operations -- Calif. Oil Fields, Vol. 44, No. 1.

DATE: May 1983

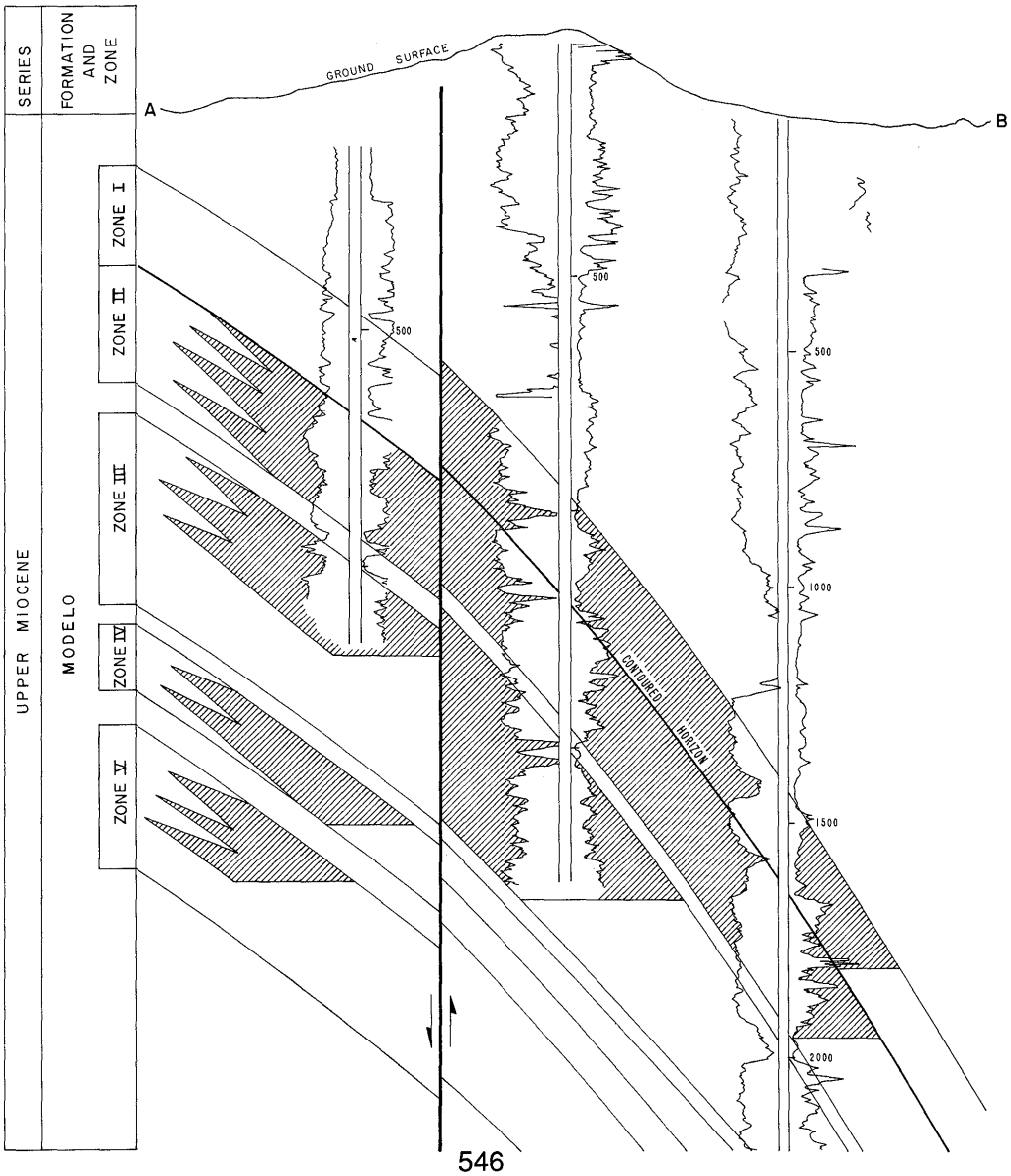
CALIFORNIA DIVISION OF OIL AND GAS

NORTH TAPO OIL FIELD



CONTOURS ON TOP OF ZONE III

SCALE: 1" = 600'



COUNTY: VENTURA

TAPO, 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	Thomas R. Bard Well No. unknown	Same as present	36 4N 18W	SB	unk.	unknown	
Deepest well	Central Lease, Inc. "N.L.& F." O-31	Western Gulf Oil Co. "N.L.& F." 1	35 4N 18W	SB	9,512		Modelo Miocene

POOL DATA

ITEM	I	II	III	IV	V	FIELD OR AREA DATA
Discovery date						
Initial production rates						
Oil (bbl/day)						
Gas (Mcf/day)						
Flow pressure (psi)						
Bean size (in.)						
Initial reservoir pressure (psi)						
Reservoir temperature (°F)						
Initial oil content (STB/ac.-ft.)						
Initial gas content (MSCF/ac.-ft.)						
Formation	Modelo	Modelo	Modelo	Modelo	Modelo	
Geologic age	late Miocene	late Miocene	late Miocene	late Miocene	late Miocene	
Average depth (ft.)	1,000	1,200	1,500	1,800	2,000	
Average net thickness (ft.)	95	120	190	70	150	
Maximum productive area (acres)						200
RESERVOIR ROCK PROPERTIES						
Porosity (%)	-	-	-	-	30	
So_i (%)						
Sw_i (%)	-	-	-	-	42	
Sg_i (%)						
Permeability to air (md)						
RESERVOIR FLUID PROPERTIES						
Oil:						
Oil gravity (°API)	23	21	18	-	-	
Sulfur content (% by wt.)						
Initial solution GOR (SCF/STB)						
Initial oil FVF (RB/STB)	-	-	-	-	1.0	
Bubble point press. (psia)						
Viscosity (cp) @ °F						
Gas:						
Specific gravity (air = 1.0)						
Heating value (Btu/cu. ft.)						
Water:						
Salinity, NaCl (ppm)	5,100	5,100	6,800	-	-	
T.D.S. (ppm)						
R_w (ohm/m) (77°F)						
ENHANCED RECOVERY PROJECTS						
Enhanced recovery projects					waterflood	
Date started					1951	
Date discontinued					active	
Peak oil production (bbl)						41,113
Year						1954
Peak gas production, net (Mcf)						
Year						

Base of fresh water (ft.): 0 - 400

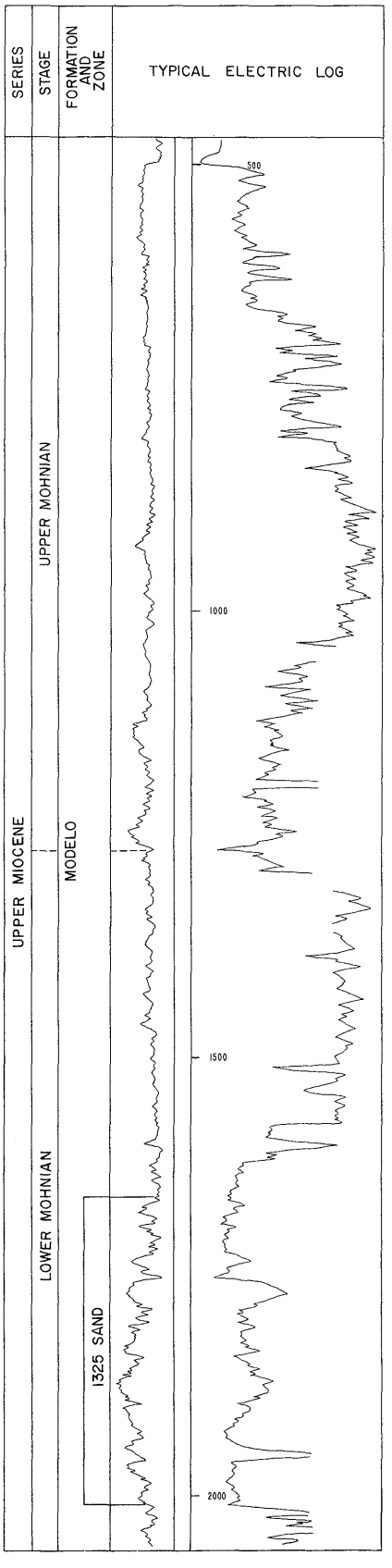
Remarks: Discovery well data are not available for each of the zones. The exact location of the Bard well is unknown.

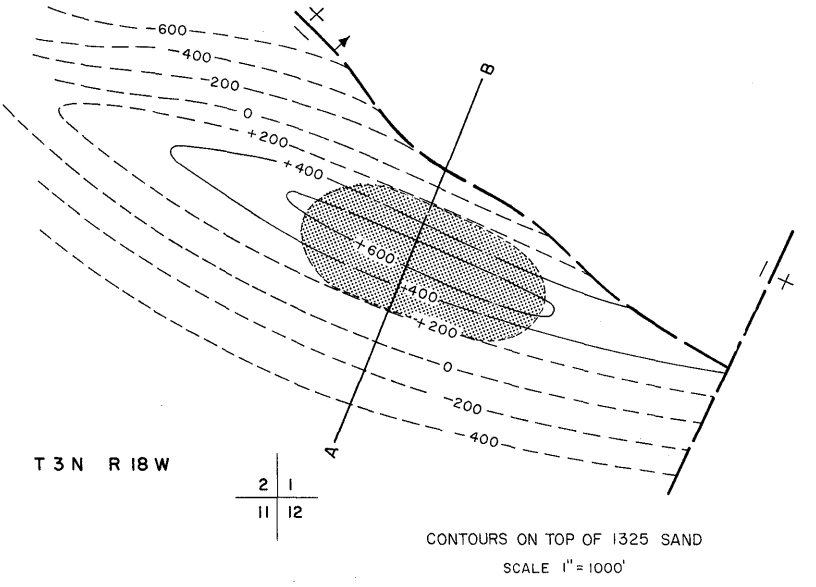
Selected References:

DATE: May 1983

CALIFORNIA DIVISION OF OIL AND GAS

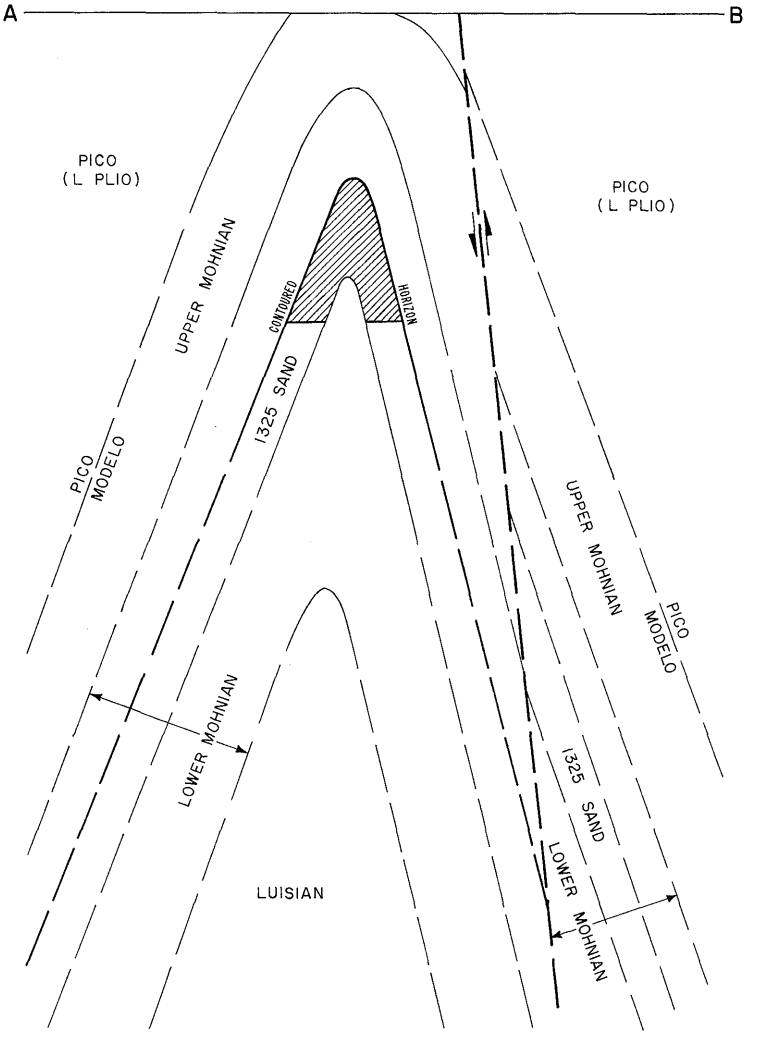
TAPO RIDGE OIL FIELD





CONTOURS ON TOP OF 1325 SAND

SCALE 1" = 1000'



COUNTY: VENTURA

TAPO RIDGE 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	Union Oil Co. of Calif. "Tapo Ridge" 27	Union Oil Co. of Calif. "Simi" 27	1 3N 18W	SB	2,047	1325 Sand	
Deepest well	Union Oil Co. of Calif. "Tapo Ridge" 1-1	Same as present	1 3N 18W	SB	6,033		Sespe Oligocene

POOL DATA

ITEM	1325 SAND					FIELD OR AREA DATA
Discovery date	November 1954					
Initial production rates						
Oil (bbl/day)	21					
Gas (Mcf/day)	0					
Flow pressure (psi)						
Bean size (in.)						
Initial reservoir pressure (psi)						
Reservoir temperature (°F)						
Initial oil content (STB/ac.-ft.)						
Initial gas content (MSCF/ac.-ft.)						
Formation	Modelo					
Geologic age	late Miocene					
Average depth (ft.)	1,750					
Average net thickness (ft.)	160					
Maximum productive area (acres)	20					
RESERVOIR ROCK PROPERTIES						
Porosity (%)						
So_i (%)						
Sw_i (%)						
Sg_i (%)						
Permeability to air (md)						
RESERVOIR FLUID PROPERTIES						
Oil:						
Oil gravity (°API)	16.5					
Sulfur content (% by wt.)						
Initial solution GOR (SCF/STB)						
Initial oil FVF (RB/STB)						
Bubble point press. (psia)						
Viscosity (cp) @ °F						
Gas:						
Specific gravity (air = 1.0)						
Heating value (Btu/cu. ft.)						
Water:						
Salinity, NaCl (ppm)	13,300					
T.D.S. (ppm)						
R_w (ohm/m) (77°F)						
ENHANCED RECOVERY PROJECTS						
Enhanced recovery projects						
Date started						
Date discontinued						
Peak oil production (bbl)	6,000					
Year	1975					
Peak gas production, net (Mcf)						
Year						

Base of fresh water (ft.): 500

Remarks:

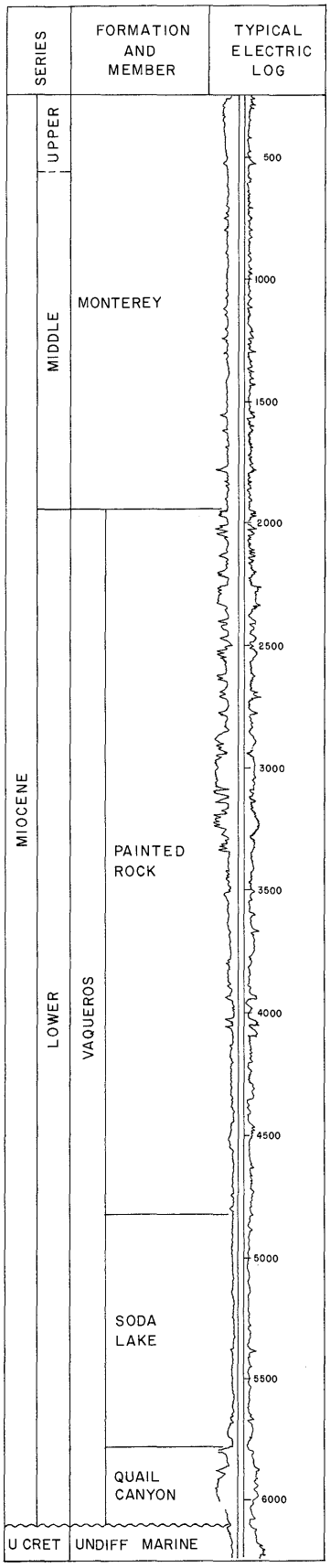
Selected References: Kew, W.S., 1924, Geology and Oil Resources of a Part of Los Angeles and Ventura Counties, Calif.: U.S. Geol. Survey Bulletin 753.
Bailey, T.L., 1954, Geology of the Western Ventura Basin, Santa Barbara, Ventura and Los Angeles Counties, Geology of Southern California: Calif. Div. of Mines Bulletin 170, Vol. 2, Map Sheet No. 4.

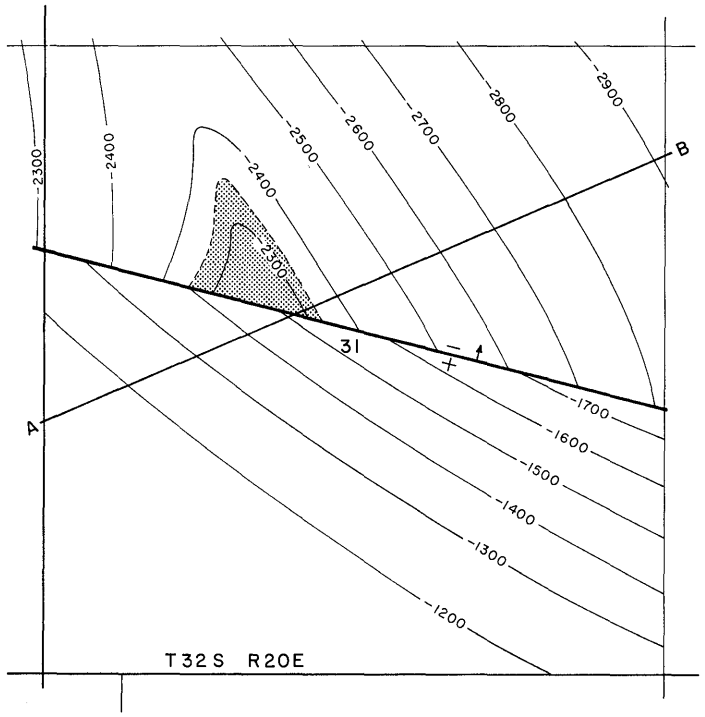
DATE: May 1983

CALIFORNIA DIVISION OF OIL AND GAS

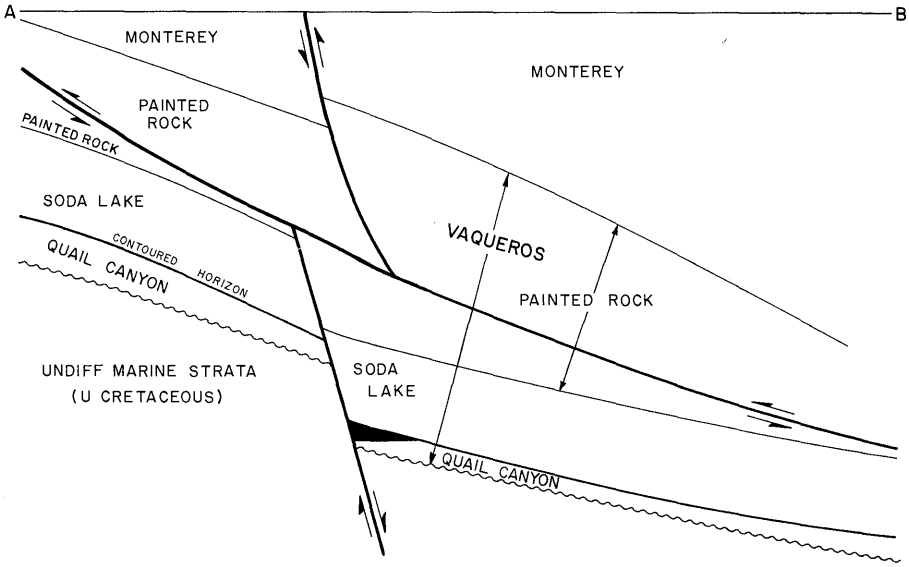
TAYLOR CANYON OIL FIELD

(Abandoned)





CONTOURS ON TOP OF QUAIL CANYON



COUNTY: SAN LUIS OBISPO

TAYLOR CANYON OIL FIELD (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	G. L. Stafford, Jr. "Hancock-Bishop" 44-31	The Hancock Oil Co. of Calif. "Bishop" 44-31	31 32S 20E	MD	6,235	Quail Canyon sand	
Deepest well	Calplans Resources "Haussler-USL" 1-31	Same as present	31 32S 20E	MD	6,465		undiff. marine U Cretaceous

POOL DATA

ITEM	QUAIL CANYON SAND					FIELD OR AREA DATA
Discovery date	August 1950					
Initial production rates						
Oil (bbl/day)	217					
Gas (Mcf/day)	150					
Flow pressure (psi)	40					
Bean size (in.)	1					
Initial reservoir pressure (psi)	1,200					
Reservoir temperature (°F)	125-130					
Initial oil content (STB/ac.-ft.)						
Initial gas content (MSCF/ac.-ft.)						
Formation	Vaqueros					
Geologic age	early Miocene					
Average depth (ft.)	5,620					
Average net thickness (ft.)	200					
Maximum productive area (acres)	20					
RESERVOIR ROCK PROPERTIES						
Porosity (%)	20-30***					
So_i (%)	40-50***					
Sw_i (%)	30-50***					
Sg_i (%)	10-20***					
Permeability to air (md)						
RESERVOIR FLUID PROPERTIES						
Oil:						
Oil gravity (°API)	32-38					
Sulfur content (% by wt.)						
Initial solution GOR (SCF/STB)	460-742					
Initial oil FVF (RB/STB)						
Bubble point press. (psia)						
Viscosity (cp) @ °F						
Gas:						
Specific gravity (air = 1.0)						
Heating value (Btu/cu. ft.)						
Water:						
Salinity, NaCl (ppm)	6,848					
T.D.S. (ppm)						
R_w (ohm/m) (77°F)						
ENHANCED RECOVERY PROJECTS						
Enhanced recovery projects						
Date started						
Date discontinued						
Peak oil production (bbl)	84,145					
Year	1951					
Peak gas production, net (Mcf)	33,468					
Year	1951					

Base of fresh water (ft.): 0-200

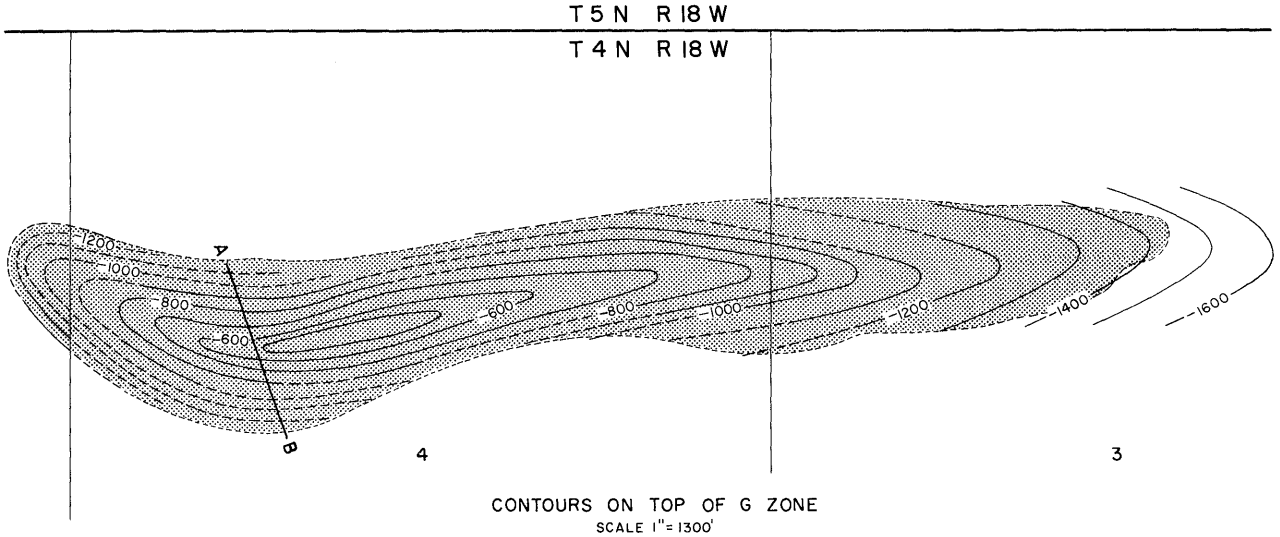
Remarks: The field was abandoned in 1985. Cumulative production is 486,000 bbl of oil and 141,000 Mcf of gas.

Selected References: Dolman, S.B., 1950, Operations in District 3: Calif. Div. of Oil and Gas, Summary of Operations--Calif. Oil Fields, Vol. 36, No. 2.
Hill, J.L., S.A. Carlson, and T.W. Dibblee, Jr., 1958, Stratigraphy of Cuyama Valley-Caliente Range Area, California: Am. Assoc. Petroleum Geologists Bull. Vol. 42, No. 12, p. 2973.

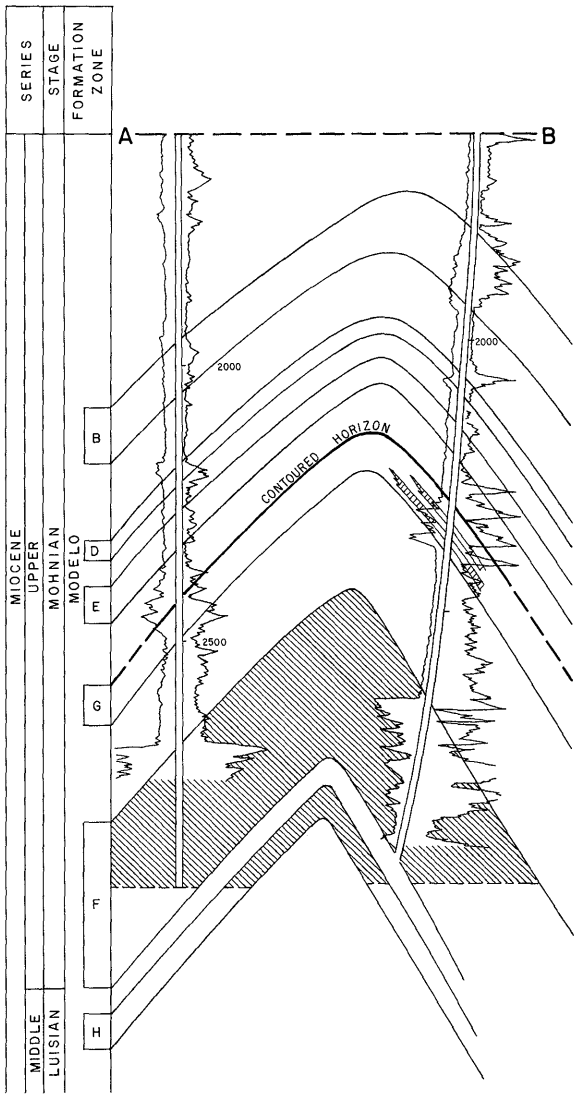
DATE: January 1989 ***Representative value for area, formation, and depth

CALIFORNIA DIVISION OF OIL AND GAS

TEMESCAL OIL FIELD



CONTOURS ON TOP OF G ZONE
SCALE 1"= 1300'



NOTE: MODELO EXTENDS TO THE SURFACE

COUNTY: VENTURA

TEMESCAL 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	Texaco Producing Inc. "Temescal" 1	B & L Oil Co. No. 1	4 4N 18W	SB	1,987	G	
Deepest well	Texaco Producing Inc. "Temescal" 14	Pacific Western Oil Corp. "Temescal" 14	4 4N 18W	SB	10,313		Modelo Miocene

POOL DATA

ITEM	G	F	H			FIELD OR AREA DATA
Discovery date	April 1926	August 1926	January 1937			
Initial production rates						
Oil (bbl/day)	91	78	127			
Gas (Mcf/day)	2,800	-	-			
Flow pressure (psi)						
Bean size (in.)						
Initial reservoir pressure (psi)	-	1,160	-			
Reservoir temperature (°F)						
Initial oil content (STB/ac.-ft.)						
Initial gas content (MSCF/ac.-ft.)						
Formation	Modelo	Modelo	Modelo			
Geologic age	Miocene	Miocene	Miocene			
Average depth (ft.)	2,200	2,600	2,950			
Average net thickness (ft.)	40	300	60			
Maximum productive area (acres)						170
RESERVOIR ROCK PROPERTIES						
Porosity (%)	-	20	-			
So_i (%)						
Sw_i (%)	-	30	-			
Sg_i (%)						
Permeability to air (md)	-	165	-			
RESERVOIR FLUID PROPERTIES						
Oil:						
Oil gravity (°API)	22	22	22			
Sulfur content (% by wt.)	0.55	0.55	0.55			
Initial solution GOR (SCF/STB)						
Initial oil FVF (RB/STB)						
Bubble point press. (psia)						
Viscosity (cp) @ °F						
Gas:						
Specific gravity (air = 1.0)						
Heating value (Btu/cu. ft.)						
Water:						
Salinity, NaCl (ppm)	34,000	34,000	34,000			
T.D.S. (ppm)						
R_w (ohm/m) (77°F)						
ENHANCED RECOVERY PROJECTS						
Enhanced recovery projects	waterflood	waterflood				
Date started	1964	1964				
Date discontinued	active	active				
Peak oil production (bbl)						432,807
Year						1933
Peak gas production, net (Mcf)						190,000
Year						1945

Base of fresh water (ft.): None

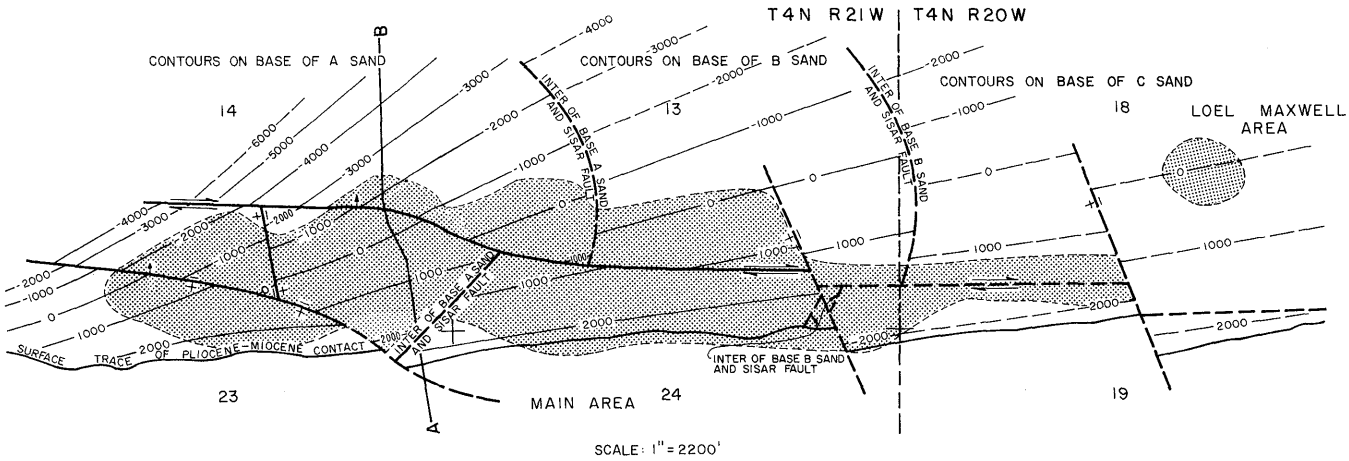
Remarks: All waters are low in salinity but high in sodium bicarbonate and solids.

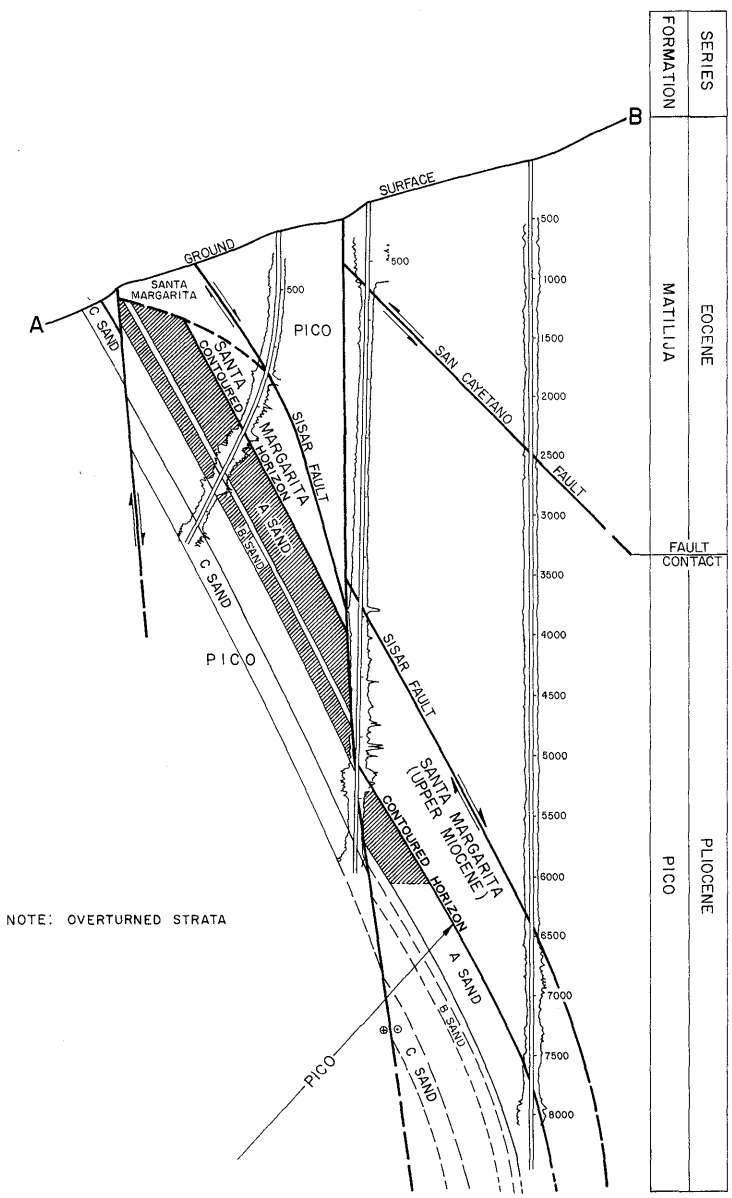
Selected References: Schultz, C.H., 1957, Temescal Oil Field: Calif. Div. of Oil and Gas, Summary of Operations -- Calif. Oil Fields, Vol. 43, No. 2.

DATE: May 1983

CALIFORNIA DIVISION OF OIL AND GAS

TIMBER CANYON OIL FIELD





COUNTY: VENTURA

TIMBER CANYON 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	Empire Oil Co. "Loma" 1	Loma Oil Co. No. 1	13 4N 21W	SB	unk.	Pico	
Deepest well	McFarland Energy, Inc. "Loel-Maxwell" 1	Richfield Oil Corp. "Loel-Maxwell" 1	18 4N 20W	SB	9,028		Santa Margarita late Miocene

POOL DATA

ITEM	PICO					FIELD OR AREA DATA
Discovery date	1889					
Initial production rates						
Oil (bbl/day)						
Gas (Mcf/day)						
Flow pressure (psi)						
Bean size (in.)						
Initial reservoir pressure (psi)						
Reservoir temperature (°F)	120					
Initial oil content (STB/ac.-ft.)						
Initial gas content (MSCF/ac.-ft.)						
Formation	Pico					
Geologic age	Pliocene					
Average depth (ft.)	3,000					
Average net thickness (ft.)	155					
Maximum productive area (acres)						350
RESERVOIR ROCK PROPERTIES						
Porosity (%)	20-31					
S_{oi} (%)	10					
S_{wi} (%)	80					
S_{gi} (%)	10					
Permeability to air (md)	200					
RESERVOIR FLUID PROPERTIES						
Oil:						
Oil gravity (°API)	34					
Sulfur content (% by wt.)						
Initial solution GOR (SCF/STB)						
Initial oil FVF (RB/STB)						
Bubble point press. (psia)						
Viscosity (cp) @ °F						
Gas:						
Specific gravity (air = 1.0)	0.773					
Heating value (Btu/cu. ft.)	1,400*					
Water:						
Salinity, NaCl (ppm)	8,700					
T.D.S. (ppm)	17,080					
R_w (ohm/m) (77°F)	1.33*					
ENHANCED RECOVERY PROJECTS						
Enhanced recovery projects						
Date started						
Date discontinued						
Peak oil production (bbl)						306,942
Year						1955
Peak gas production, net (Mcf)						615,262
Year						1963

Base of fresh water (ft.): 0 - 100

Remarks: Designated as a field January 1, 1957; formerly a part of Santa Paula oil field.

Selected References:

Bertholf, H.W., 1965, Timber Canyon Oil Field: Calif. Div. of Oil and Gas, Summary of Operations -- Calif. Oil Fields, Vol. 51, No. 1.

Fine, S.F., 1954, Geology and Occurrences of Oil in the Ojai, Santa Paula Area, Ventura County, Geology of Southern Calif.: Calif. Div. of Mines Bulletin 170, Map Sheet 28.

McCulloch, T.R., 1957, Geology of the Timber Canyon Area, Ventura County: unpublished thesis on file at University of Calif., Los Angeles Library.

Natland, M.L., and W.T. Ruthwell, Jr., 1954, Fossil Foraminifera of the Los Angeles and Ventura Regions, Geology of Southern California: Calif. Div. of Mines Bulletin 170 p. 33-42.

Prutzman, P.W., 1913, Petroleum in Southern California: Calif. State Mining Bureau Bulletin 63, p. 50-89.

DATE: May 1983 *Average value

CALIFORNIA DIVISION OF OIL AND GAS

COUNTY: VENTURA

TIMBER CANYON OIL FIELD
LOEL-MAXWELL 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	McFarland Energy, Inc. "Loel-Maxwell" 1	Richfield Oil Corp. "Loel-Maxwell" 1	18 4N 20W	SB	9,029	Loel-Maxwell	Santa Margarita late Miocene
Deepest well	Same as above	"	"	"	"	"	"

POOL DATA

ITEM	LOEL-MAXWELL					FIELD OR AREA DATA
Discovery date	January 1954					
Initial production rates						
Oil (bbl/day)	144					
Gas (Mcf/day)	182					
Flow pressure (psi)						
Bean size (in.)						
Initial reservoir pressure (psi)						
Reservoir temperature (°F)						
Initial oil content (STB/ac.-ft.)						
Initial gas content (MSCF/ac.-ft.)						
Formation	Santa Margarita					
Geologic age	late Miocene					
Average depth (ft.)	8,000					
Average net thickness (ft.)	500					
Maximum productive area (acres)	60					
RESERVOIR ROCK PROPERTIES						
Porosity (%)						
S_{oi} (%)						
S_{wi} (%)						
S_{gi} (%)						
Permeability to air (md)						
RESERVOIR FLUID PROPERTIES						
Oil:						
Oil gravity (°API)	37					
Sulfur content (% by wt.)						
Initial solution GOR (SCF/STB)						
Initial oil FVF (RB/STB)						
Bubble point press. (psia)						
Viscosity (cp) @ °F						
Gas:						
Specific gravity (air = 1.0)						
Heating value (Btu/cu. ft.)						
Water:						
Salinity, NaCl (ppm)	7,300					
T.D.S. (ppm)						
R_w (ohm/m) (77°F)						
ENHANCED RECOVERY PROJECTS						
Enhanced recovery projects						
Date started						
Date discontinued						
Peak oil production (bbl)	11,773					
Year	1954					
Peak gas production, net (Mcf)	615,262					
Year	1963					

Base of fresh water (ft.): 0 - 100

Remarks:

Selected References:

DATE: May 1983

CALIFORNIA DIVISION OF OIL AND GAS

COUNTY: VENTURA

TIMBER CANYON 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	Empire Oil Co. "Loma" 1	Loma Oil Co. 1	13 4N 21W	SB	unk.	Pico	
Deepest well	ARCO Oil and Gas Co. "Atlas-Smith" 1	Richfield Oil Corp. "Atlas-Smith" 1	14 4N 21W	SB	8,460		Pico Pliocene

POOL DATA

ITEM	PICO					FIELD OR AREA DATA
Discovery date	1889					
Initial production rates						
Oil (bbl/day)						
Gas (Mcf/day)						
Flow pressure (psi)						
Bean size (in.)						
Initial reservoir pressure (psi)						
Reservoir temperature (°F)	120					
Initial oil content (STB/ac.-ft.)						
Initial gas content (MSCF/ac.-ft.)						
Formation	Pico					
Geologic age	Pliocene					
Average depth (ft.)	3,000					
Average net thickness (ft.)	155					
Maximum productive area (acres)	290					
RESERVOIR ROCK PROPERTIES						
Porosity (%)	20-31					
S_{oi} (%)	10					
S_{wi} (%)	80					
S_{gi} (%)	10					
Permeability to air (md)	200					
RESERVOIR FLUID PROPERTIES						
Oil:						
Oil gravity (°API)	34					
Sulfur content (% by wt.)						
Initial solution GOR (SCF/STB)						
Initial oil FVF (RB/STB)						
Bubble point press. (psia)						
Viscosity (cp) @ °F						
Gas:						
Specific gravity (air = 1.0)	0.773					
Heating value (Btu/cu. ft.)	1,400*					
Water:						
Salinity, NaCl (ppm)	8,700					
T.D.S. (ppm)	17,080					
R_w (ohm/m) (77°F)	1.33*					
ENHANCED RECOVERY PROJECTS						
Enhanced recovery projects						
Date started						
Date discontinued						
Peak oil production (bbl)	297,908					
Year	1955					
Peak gas production, net (Mcf)	615,262					
Year	1963					

Base of fresh water (ft.): 0 - 100

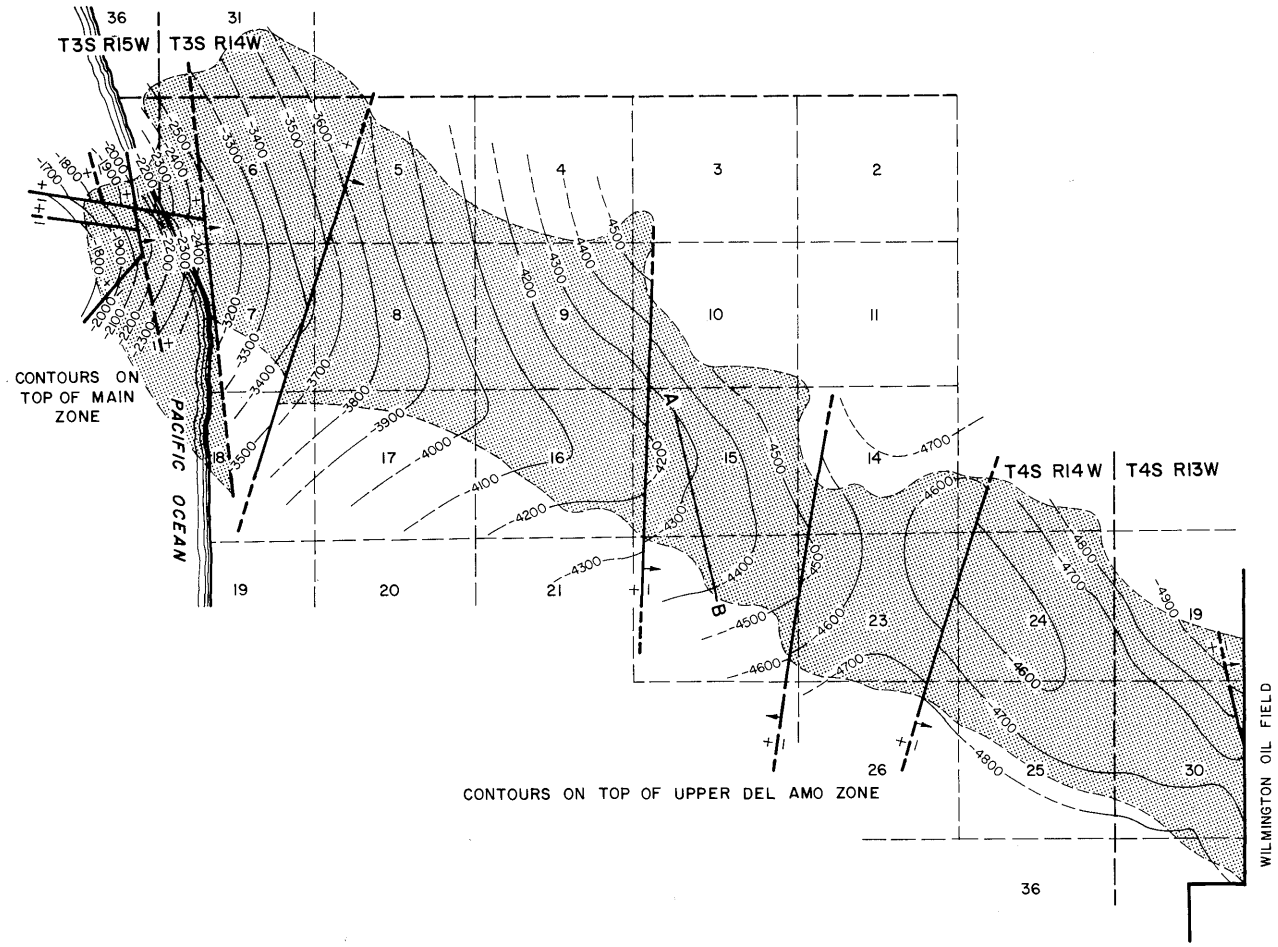
Remarks:

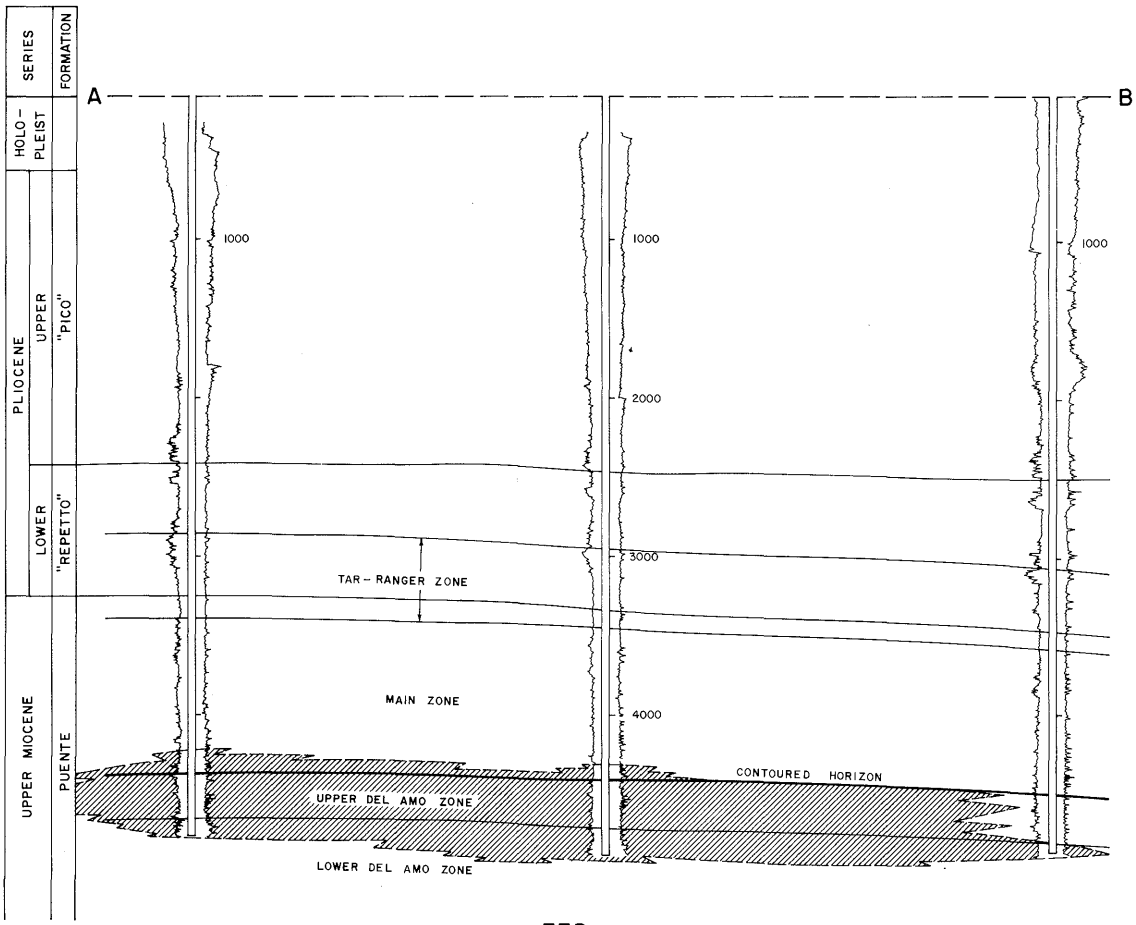
Selected References:

DATE: May 1983 *Average value

CALIFORNIA DIVISION OF OIL AND GAS

TORRANCE OIL FIELD





COUNTY: LOS ANGELES

TORRANCE OIL FIELD

(SEE AREA 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	Del Amo Energy Co. "Del Amo" 1	Petroleum Development Co. "Redondo" 1	9 4S 14W	SB	3,500	Tar-Ranger	
Deepest well	American Pacific International Inc. "City of Redondo Beach" S-12	McCulloch Oil Corp., Inc. "City of Redondo Beach" S-12	6 4S 14W	SB	8,313		Puente late Miocene

POOL DATA

ITEM	TAR-RANGER	MAIN	DEL AMO			FIELD OR AREA DATA
Discovery date	June 1922	June 1922	August 1936			
Initial production rates						
Oil (bbl/day)	300a/	a/	107			
Gas (Mcf/day)						
Flow pressure (psi)						
Bean size (in.)						
Initial reservoir pressure (psi)	1,385	1,565	2,087			
Reservoir temperature (°F)	152	163	190			
Initial oil content (STB/ac.-ft.)	1,788	1,434	1,157			
Initial gas content (MSCF/ac.-ft.)	0-140	116	313			
Formation	"Repetto"	Puente	Puente			
Geologic age	early Pliocene	late Miocene	late Miocene			
Average depth (ft.)	2,800	3,300	4,200			
Average net thickness (ft.)	50	120	40			
Maximum productive area (acres)						7,440
RESERVOIR ROCK PROPERTIES						
Porosity (%)	33	29	29			
S_{oi} (%)	74	69	59			
S_{wi} (%)	24	29	38			
S_{gi} (%)	2	2	3			
Permeability to air (md)	427-1,500	308	114			
RESERVOIR FLUID PROPERTIES						
Oil:						
Oil gravity (°API)	14-24	14-28	26-30			
Sulfur content (% by wt.)	-	1.37	-			
Initial solution GOR (SCF/STB)	99	100-325	318			
Initial oil FVF (RB/STB)	1.074	1.128	1.187			
Bubble point press. (psia)	1,040	1,480	1,990			
Viscosity (cp) @ °F	14-290 @ 153	24 @ 100	20 @ 100			
Gas:						
Specific gravity (air = 1.0)	0.58	0.77	0.69			
Heating value (Btu/cu. ft.)	1,100	1,130	1,135			
Water:						
Salinity, NaCl (ppm)	22,310	22,993	26,635			
T.D.S. (ppm)	23,300	26,970	27,435			
R_w (ohm/m) (77°F)	0.22	0.27	0.18			
ENHANCED RECOVERY PROJECTS						
Enhanced recovery projects						
Date started						
Date discontinued						
Peak oil production (bbl)						16,369,214
Year						1924
Peak gas production, net (Mcf)						
Year						

Base of fresh water (ft.): See areas

Remarks: a/ Tar-Ranger and Main production were commingled in the discovery well.

Selected References: See areas

DATE: June 1983

CALIFORNIA DIVISION OF OIL AND GAS

COUNTY: LOS ANGELES

TORRANCE OIL FIELD
ONSHORE 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	Del Amo Energy Co. "Del Amo" 1	Petroleum Development Co. "Redondo" 1	9 4S 14W	SB	3,500	Tar-Ranger	
Deepest well	Petroleum Midway Co. "Capitol" 3	D & B Oil Co. "D & B" 3	25 4S 14W	SB	6,070		Puente late Miocene

POOL DATA

ITEM	TAR-RANGER	MAIN	DEL AMO			FIELD OR AREA DATA
Discovery date	June 1922	June 1922	August 1936			
Initial production rates						
Oil (bbl/day)	300a/	a/	107			
Gas (Mcf/day)						
Flow pressure (psi)						
Bean size (in.)						
Initial reservoir pressure (psi)	1,385	1,565	2,087			
Reservoir temperature (°F)	152	163	190			
Initial oil content (STB/ac.-ft.)	1,788	1,434	1,157			
Initial gas content (MSCF/ac.-ft.)	0-140	116	313			
Formation	"Repetto"	Puente	Puente			
Geologic age	early Pliocene	late Miocene	late Miocene			
Average depth (ft.)	2,800	3,300	4,200			
Average net thickness (ft.)	50	120	40			
Maximum productive area (acres)						6,750
RESERVOIR ROCK PROPERTIES						
Porosity (%)	33	29	29			
S_{oi} (%)	74	69	59			
S_{wi} (%)	24	29	58			
S_{gi} (%)	2	2	3			
Permeability to air (md)	427-1,500	308	114			
RESERVOIR FLUID PROPERTIES						
Oil:						
Oil gravity (°API)	14-24	14-28	26-30			
Sulfur content (% by wt.)	-	1.37	-			
Initial solution GOR (SCF/STB)	99	100-325	318			
Initial oil FVF (RB/STB)	1.074	1.128	1.187			
Bubble point press. (psia)	1,040	1,480	1,990			
Viscosity (cp) @ °F	14.29 @ 153	24.00 @ 100	20.00 @ 100			
Gas:						
Specific gravity (air = 1.0)	0.580	0.770	0.693			
Heating value (Btu/cu. ft.)	1,100	1,130	1,135			
Water:						
Salinity, NaCl (ppm)	22,310	22,993	26,635			
T.D.S. (ppm)	23,300	26,970	27,435			
R_w (ohm/m) (77°F)	0.220	0.266	0.185			
ENHANCED RECOVERY PROJECTS						
Enhanced recovery projects	waterflood	waterflood				
Date started	1958	1958				
Date discontinued	active	active				
		caustic flood				
		1980				
		active				
Peak oil production (bbl)			4,349,058			16,369,214
Year			1939			1924
Peak gas production, net (Mcf)						
Year						

Base of fresh water (ft.): 1,550 - 1,770

Remarks: a/ Tar-Ranger and Main production were commingled.

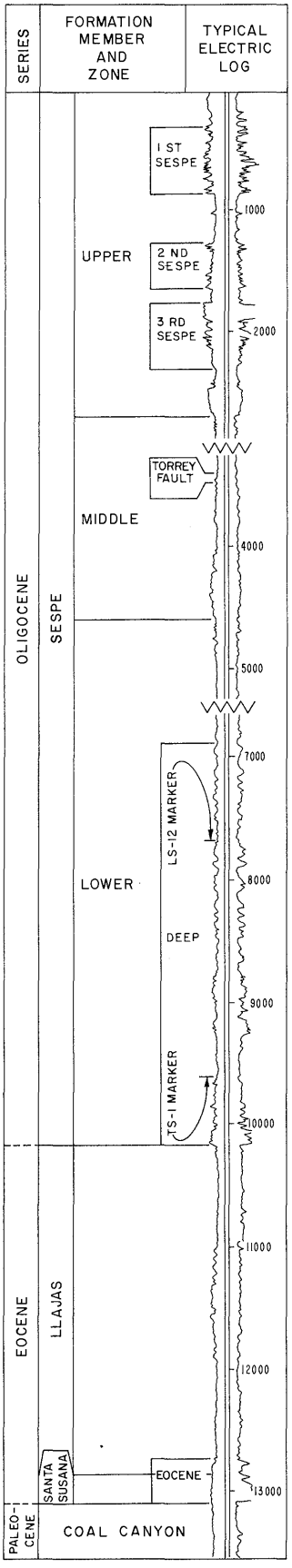
Several cyclic-steam projects were attempted in 1964 and 1965, when 56,890 bbl of water-converted-to-steam was injected into six wells.

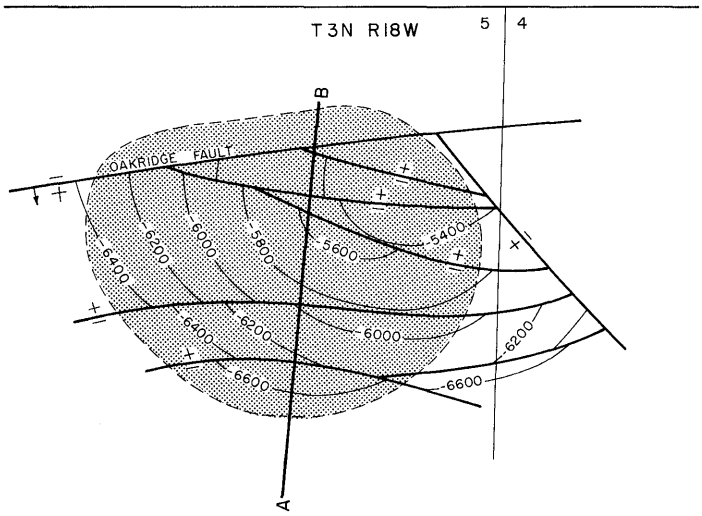
Selected References: Crowder, R.E., 1956, Torrance Oil Field: Calif. Div. of Oil and Gas, Summary of Operations -- Calif. Oil Fields, Vol. 42, No. 2.
Crowder, R.E., 1965, Del Amo Zone of Torrance Oil Field: Calif. Div. of Oil and Gas, Summary of Operations -- Calif. Oil Fields, Vol. 51, No. 1.

DATE: May 1983

CALIFORNIA DIVISION OF OIL AND GAS

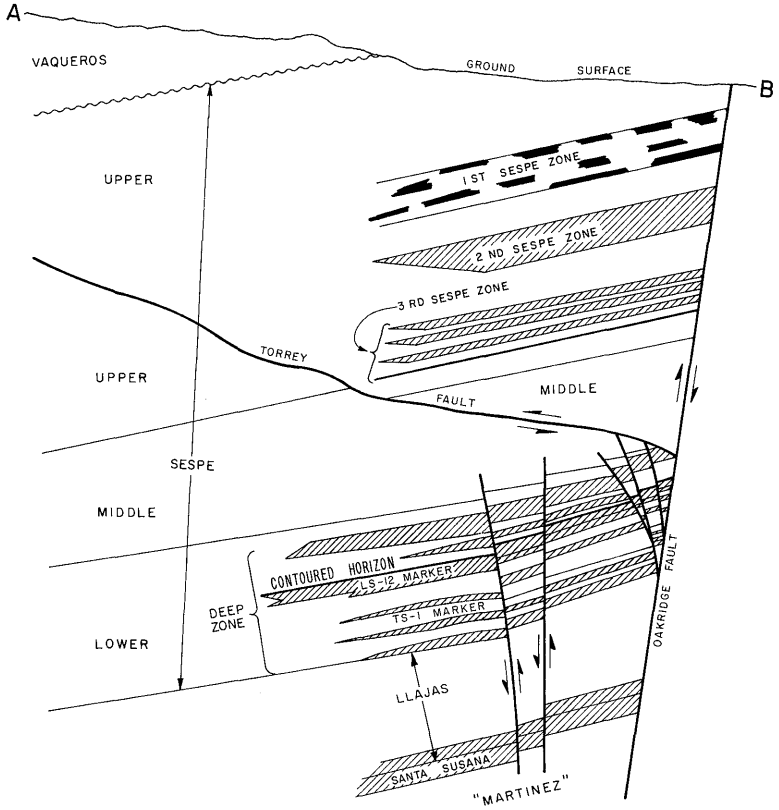
TORREY CANYON OIL FIELD





CONTOURS ON LS 12 ELECTRIC LOG MARKER

SCALE 1" = 1800'



COUNTY: VENTURA

TORREY CANYON 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	Union Oil Co. of Calif. "Torrey" 1	Same as present	5 3N 18W	SB	1,010	2nd Sespe	
Deepest well	Union Oil Co. of Calif. "Torrey" 92	Same as present	5 3N 18W	SB	14,989		undiff. marine strata Paleocene

POOL DATA

ITEM	1ST SESPE	2ND SESPE	3RD SESPE	DEEP	EOCENE	FIELD OR AREA DATA
Discovery date	November 1889	March 1889	June 1880	May 1952	September 1953	
Initial production rates						
Oil (bbl/day)	-	212	50	549	117	
Gas (Mcf/day)	-	-	-	163	-	
Flow pressure (psi)						
Bean size (in.)						
Initial reservoir pressure (psi)	-	-	-	3,660	-	
Reservoir temperature (°F)	-	-	-	174	-	
Initial oil content (STB/ac.-ft.)						
Initial gas content (MSCF/ac.-ft.)						
Formation	Sespe	Sespe	Sespe	Sespe	Llajas/Santa Susana	
Geologic age	Oligocene	Oligocene	Oligocene	Oligocene	Eocene	
Average depth (ft.)	1,800	1,500	2,000	8,700	1,300	
Average net thickness (ft.)	600	400	500	3,000	300	
Maximum productive area (acres)						270
RESERVOIR ROCK PROPERTIES						
Porosity (%)	-	21.0	-	12.2	-	
S_{oi} (%)	-	60	-	-	-	
S_{wi} (%)	-	40	-	-	-	
S_{gi} (%)						
Permeability to air (md)	-	31	-	41	-	
RESERVOIR FLUID PROPERTIES						
Oil:						
Oil gravity (°API)	24	29	18-36	18-36	29	
Sulfur content (% by wt.)	-	-	2.74	-	-	
Initial solution GOR (SCF/STB)	-	-	-	500	-	
Initial oil FVF (RB/STB)						
Bubble point press. (psia)						
Viscosity (cp) @ °F	-	13.5	-	-	-	
Gas:						
Specific gravity (air = 1.0)						
Heating value (Btu/cu. ft.)						
Water:						
Salinity, NaCl (ppm)	25,700	29,100	29,100	29,100	30,800	
T.D.S. (ppm)						
R_w (ohm/m) (77°F)						
ENHANCED RECOVERY PROJECTS						
Enhanced recovery projects	waterflood		waterflood	pressure maintenance		
Date started	1952		1966	1975		
Date discontinued	active		1971	1982		
			cyclic steam			
			1964			
			1964			
Peak oil production (bbl)						1,301,802
Year						1954
Peak gas production, net (Mcf)						3,980,048
Year						1968

Base of fresh water (ft.): None

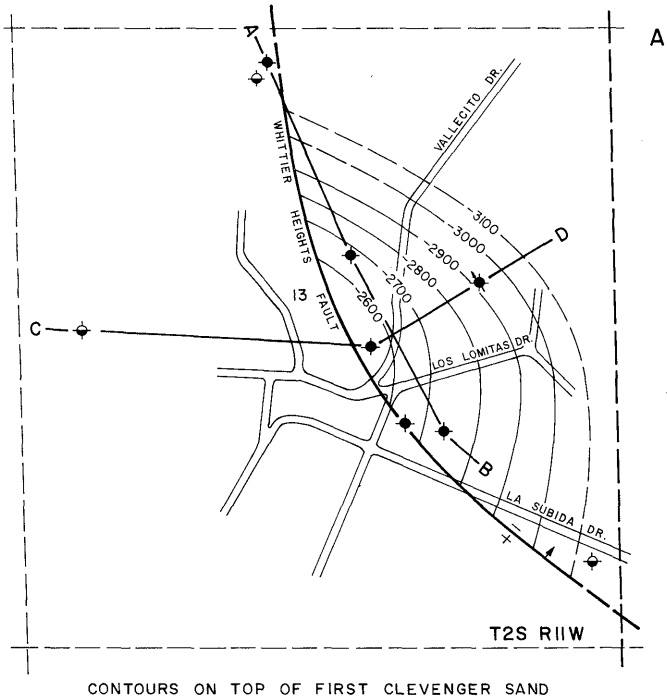
Remarks:

Selected References: Prutzman, P.W., 1913, Petroleum in Southern California: Calif. State Mining Bureau Bulletin 63.

DATE: May 1983

CALIFORNIA DIVISION OF OIL AND GAS

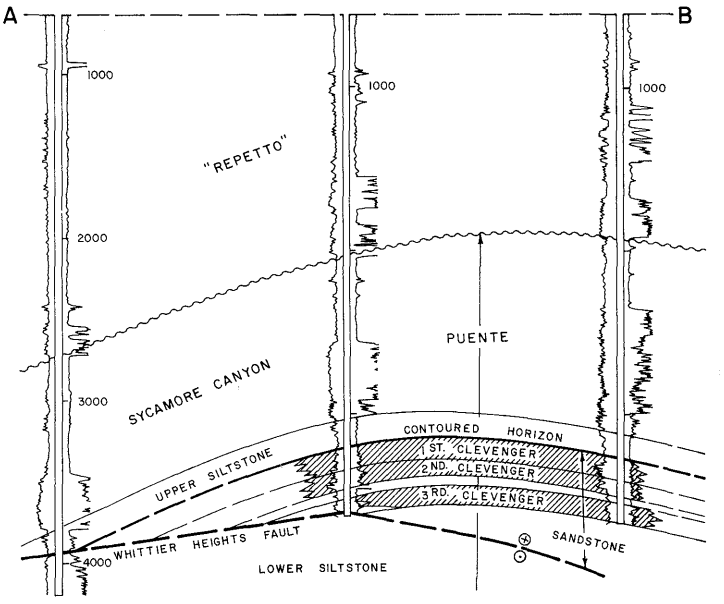
TURNBULL OIL FIELD
(Abandoned)

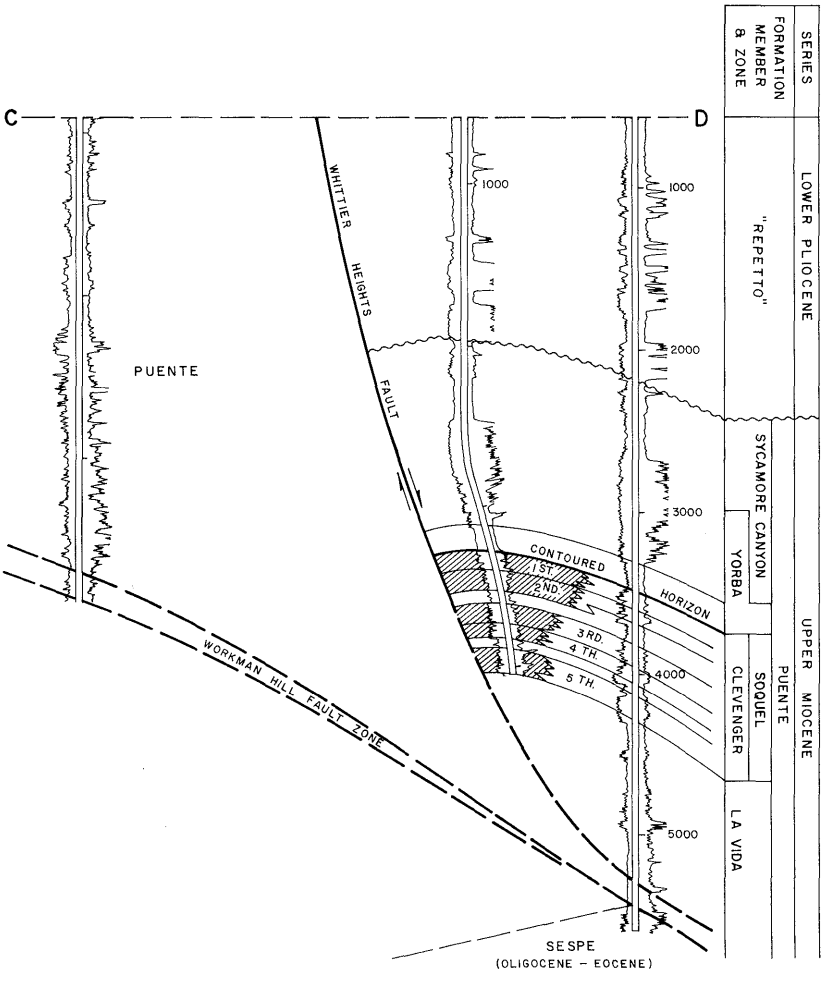


CONTOURS ON TOP OF FIRST CLEVENGER SAND

SCALE

0 500 1000 2000





COUNTY: LOS ANGELES

TURNBULL OIL FIELD
(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	Southern California Gas Co. "Turnbull Community" 1	Continental Oil Co. "Turnbull Community" 1	13 2S 11W	SB	3,447	1st Clevenger	
Deepest well	Southern California Gas Co. "Turnbull Community" 3	Continental Oil Co. "Turnbull Community" 3	13 2S 11W	SB	5,608		Puente late Miocene

POOL DATA

ITEM	1ST CLEVENGER	2ND CLEVENGER	3RD CLEVENGER	4TH CLEVENGER	5TH CLEVENGER	FIELD OR AREA DATA
Discovery date	October 1941	October 1941	October 1941	December 1942	December 1942	
Initial production rates						
Oil (bbl/day)	305a/	a/	a/	240b/	b/	
Gas (Mcf/day)						
Flow pressure (psi)						
Bean size (in.)						
Initial reservoir pressure (psi)						
Reservoir temperature (°F)						
Initial oil content (STB/ac.-ft.)						
Initial gas content (MSCF/ac.-ft.)						
Formation	Puente	Puente	Puente	Puente	Puente	
Geologic age	late Miocene	late Miocene	late Miocene	late Miocene	late Miocene	
Average depth (ft.)	3,370	3,550	3,750	3,800	3,950	
Average net thickness (ft.)	80	120	70	80	60	
Maximum productive area (acres)						75
RESERVOIR ROCK PROPERTIES						
Porosity (%)	27*	27*	27*	27*	-	
S_{oi} (%)	66	66	66	66	-	
S_{wi} (%)	34	34	34	34	-	
S_{gi} (%)						
Permeability to air (md)	105	105	105	105	-	
RESERVOIR FLUID PROPERTIES						
Oil:						
Oil gravity (°API)	28*	28*	28*	28*	28*	
Sulfur content (% by wt.)						
Initial solution GOR (SCF/STB)						
Initial oil FVF (RB/STB)						
Bubble point press. (psia)						
Viscosity (cp) @ °F						
Gas:						
Specific gravity (air = 1.0)						
Heating value (Btu/cu. ft.)						
Water:						
Salinity, NaCl (ppm)	2,200	2,600	2,600	-	-	
T.D.S. (ppm)						
R_w (ohm/m) (77°F)						
ENHANCED RECOVERY PROJECTS						
Enhanced recovery projects						
Date started						
Date discontinued						
Peak oil production (bbl)						122,379
Year						1943
Peak gas production, net (Mcf)						90,535
Year						1943

Base of fresh water (ft.): 500

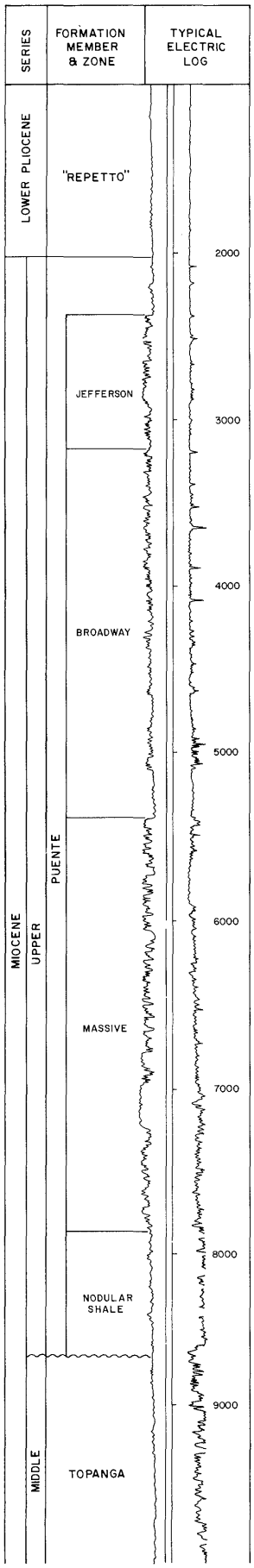
Remarks: Last production was in May 1965; field abandoned 1965. Cumulative production is 765,770 bbl of oil and 582,160 Mcf of gas.
a /Production from the 1st, 2nd, and 3rd Clevenger commingled.
b/ Production from the 4th and 5th Clevenger commingled.

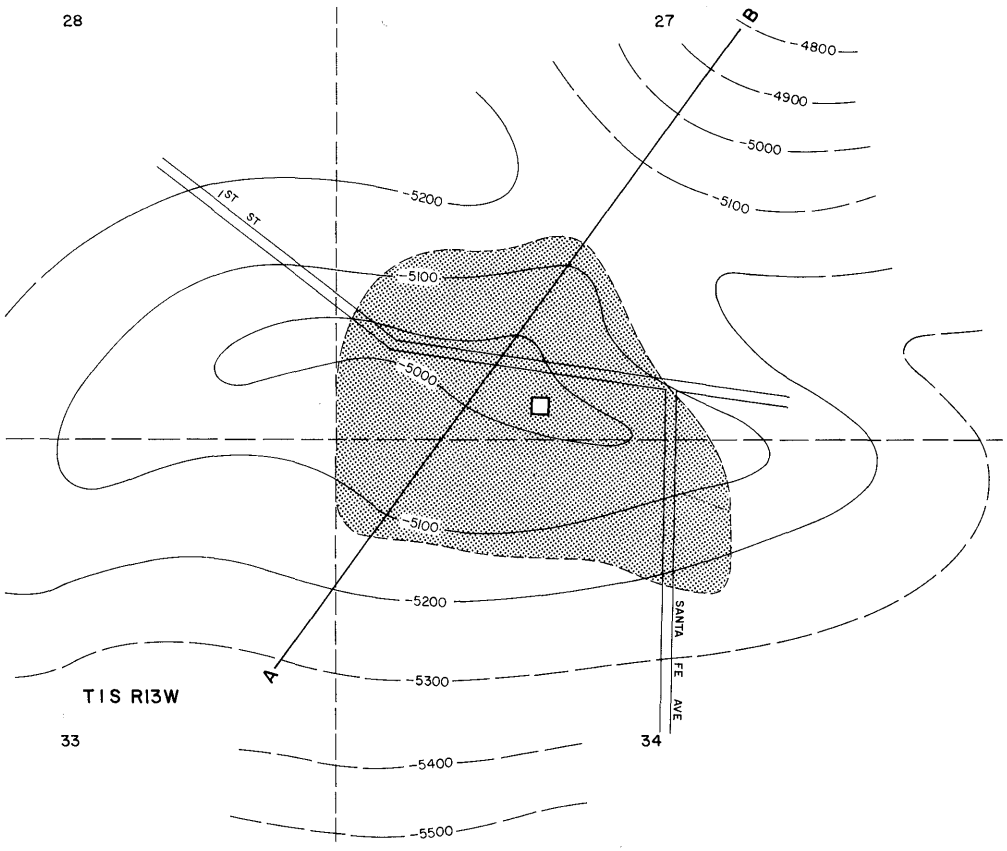
Selected References: Mefferd, M.G., 1962, Turnbull Oil Field: Calif. Div. of Oil and Gas, Summary of Operations -- Calif. Oil Fields, Vol. 48, No. 2.

DATE: January 1989 *Average value

CALIFORNIA DIVISION OF OIL AND GAS

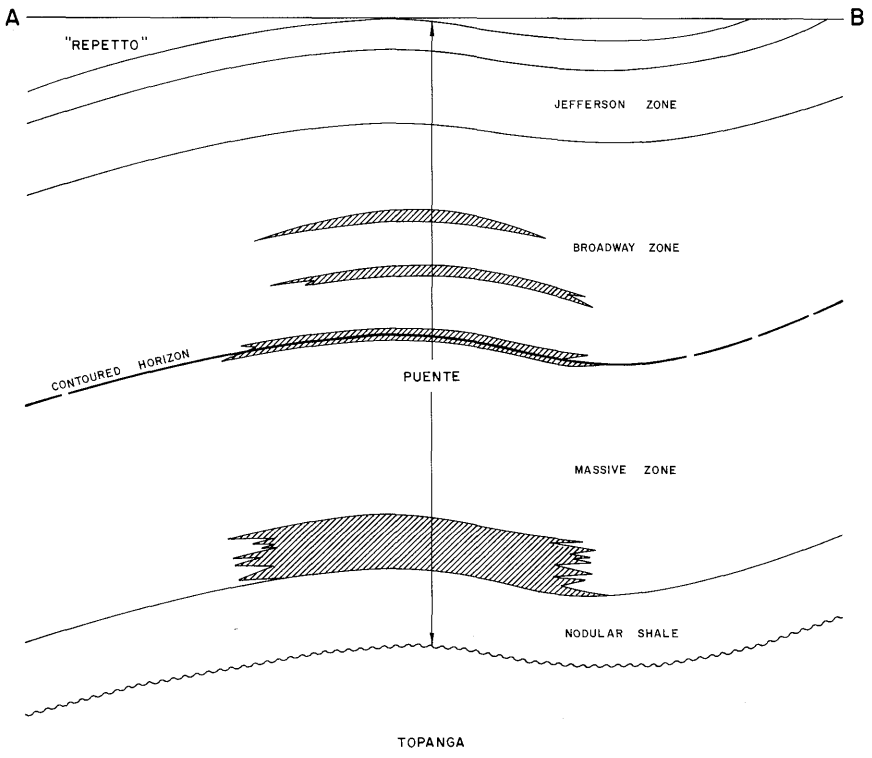
UNION STATION OIL FIELD





CONTOURS ON TOP OF MASSIVE ZONE

SCALE: 1" = 1200'



COUNTY: LOS ANGELES

UNION STATION 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	Chevron U.S.A. Inc. "Garey" 1-C	Standard Oil Co. of Calif. "Challenge Creamery" 1	27 1S 12W	SB	6,000	Lower Broadway & Lower Massive	
Deepest well	Chevron U.S.A. Inc. "Garey" 6	Standard Oil Co. of Calif. "Garey" 4-A	27 1S 12W	SB	9,849		Puente late Miocene

POOL DATA

ITEM	LOWER BROADWAY	UPPER MASSIVE	LOWER MASSIVE			FIELD OR AREA DATA
Discovery date	October 1967	October 1967	October 1967			
Initial production rates						
Oil (bbl/day)	268	105	244			
Gas (Mcf/day)	830	71	502			
Flow pressure (psi)	50	109	60			
Bean size (in.)	34/64	-	-			
Initial reservoir pressure (psi)	1,950	2,300	3,200			
Reservoir temperature (°F)	145	157	186			
Initial oil content (STB/ac.-ft.)						
Initial gas content (MSCF/ac.-ft.)						
Formation	Puente	Puente	Puente			
Geologic age	late Miocene	late Miocene	late Miocene			
Average depth (ft.)	3,520	5,080	7,020			
Average net thickness (ft.)	1,575	1,960	530			
Maximum productive area (acres)	110	96	97			
RESERVOIR ROCK PROPERTIES						
Porosity (%)	23	22	18			
Soi (%)	60	-	-			
Swi (%)	40	-	-			
Sgi (%)	Solution Gas	Solution Gas	Solution Gas			
Permeability to air (md)	20	10	17			
RESERVOIR FLUID PROPERTIES						
Oil:						
Oil gravity (°API)	25-44	42	42			
Sulfur content (% by wt.)						
Initial solution GOR (SCF/STB)	2,990	2,990	1,680**			
Initial oil FVF (RB/STB)						
Bubble point press. (psia)						
Viscosity (cp) @ °F	-	2,300	-			
Gas:						
Specific gravity (air = 1.0)	-	0.7**	0.7**			
Heating value (Btu/cu. ft.)						
Water:						
Salinity, NaCl (ppm)	39,353	41,064	-			
T.D.S. (ppm)						
R_w (ohm/m) (77°F)						
ENHANCED RECOVERY PROJECTS						
Enhanced recovery projects						
Date started						
Date discontinued						
Peak oil production (bbl)						263,170
Year						1969
Peak gas production, net (Mcf)						919,000
Year						1969

Base of fresh water (ft.): 600

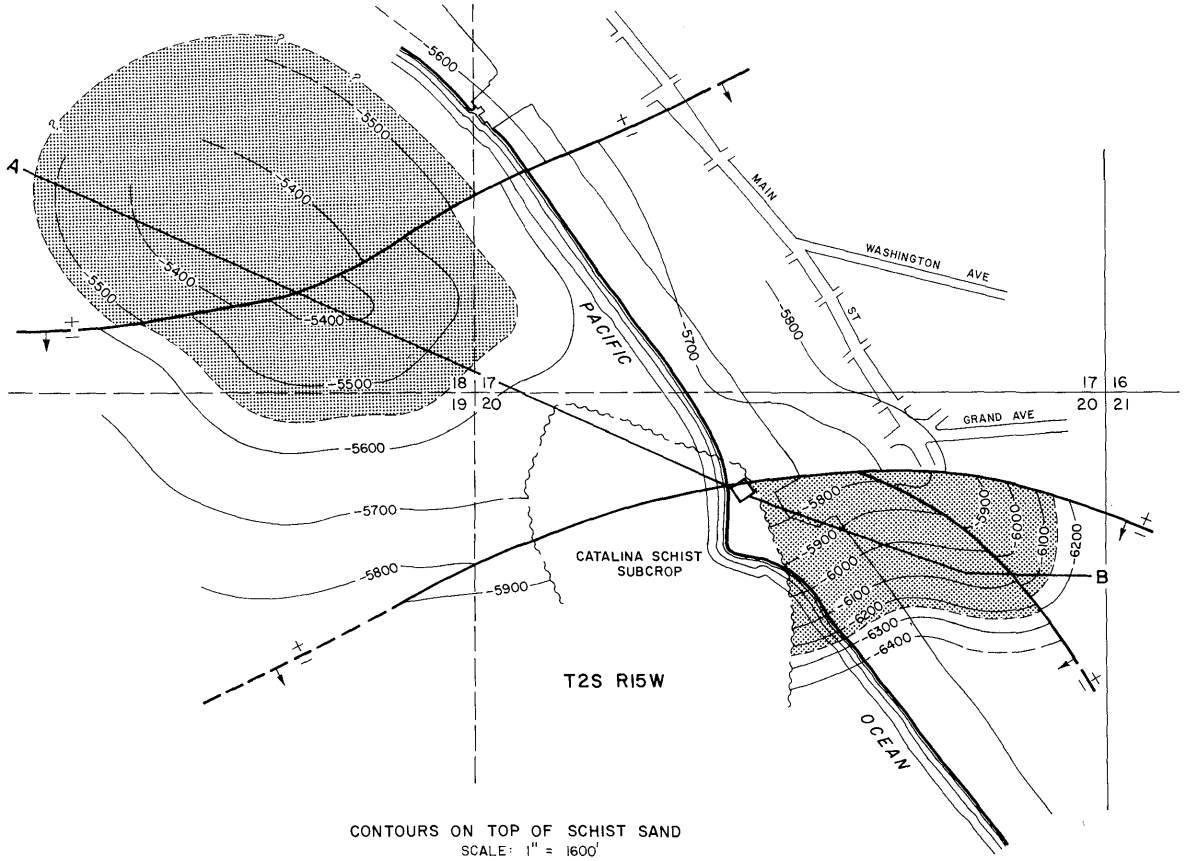
Remarks:

Selected References:

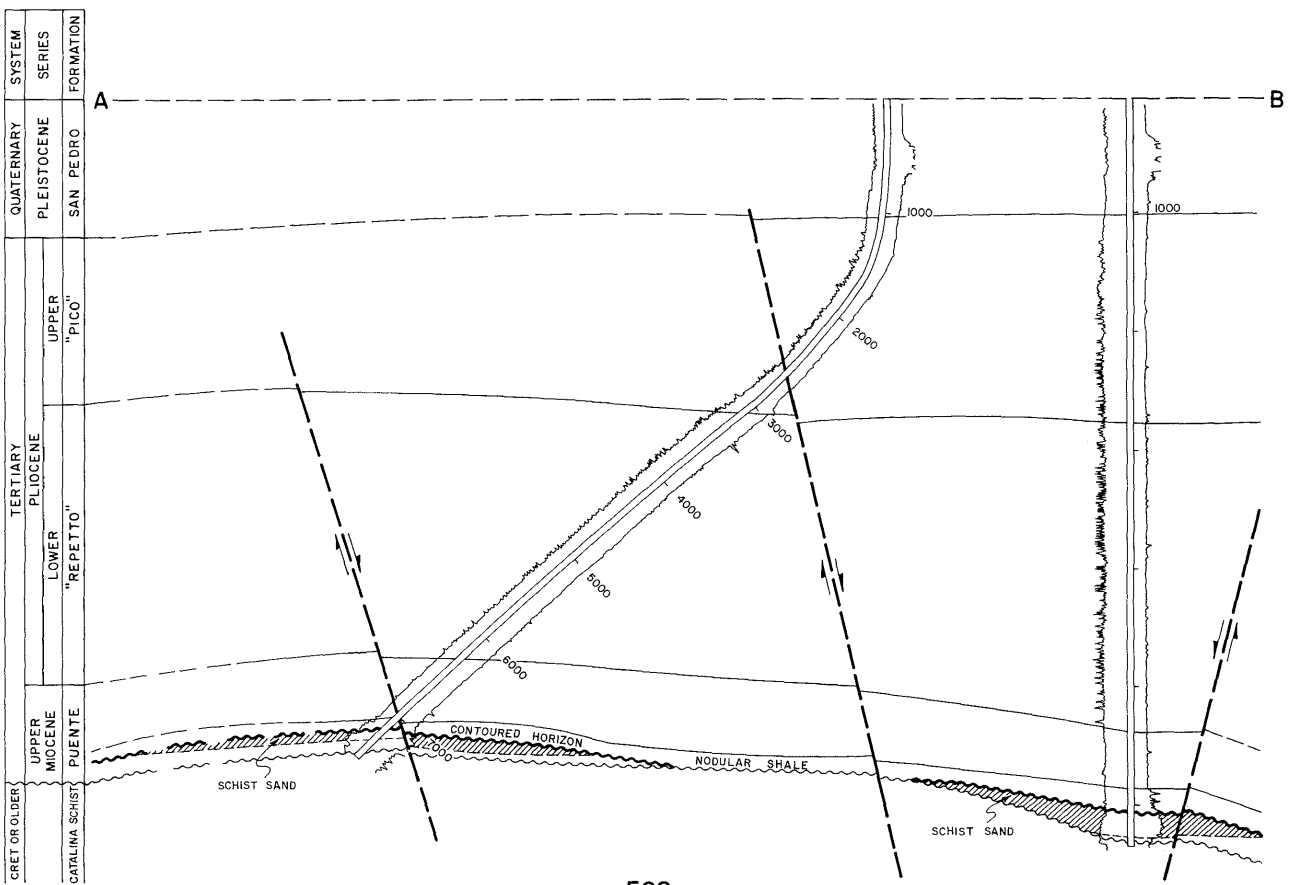
DATE: January 1989 **Estimated value

CALIFORNIA DIVISION OF OIL AND GAS

VENICE BEACH OIL FIELD



CONTOURS ON TOP OF SCHIST SAND
SCALE: 1" = 1600'



COUNTY: LOS ANGELES

VENICE BEACH OIL FIELD

(SEE AREA 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	Damson Oil Corp. "Venice Beach Unit" 1	Mobil Oil Corp. "L.A. City 135" 1	20 2S 15W	SB	6,787	Schist sand	
Deepest well	Damson Oil Corp. "L.A. City 135" 2	Socony Mobil Oil Co., Inc. "L.A. City 135" 2	20 2S 15W	SB	9,082		Catalina Schist Cret. or older

POOL DATA

ITEM	SCHIST SAND					FIELD OR AREA DATA
Discovery date	March 1966					
Initial production rates						
Oil (bbl/day)	573					
Gas (Mcf/day)	229					
Flow pressure (psi)						
Bean size (in.)						
Initial reservoir pressure (psi)	2,060					
Reservoir temperature (°F)						
Initial oil content (STB/ac.-ft.)	1,110					
Initial gas content (MSCF/ac.-ft.)						
Formation	Puente					
Geologic age	late Miocene					
Average depth (ft.)	6,000					
Average net thickness (ft.)						
Maximum productive area (acres)						125
RESERVOIR ROCK PROPERTIES						
Porosity (%)						
So_i (%)						
Sw_i (%)						
Sg_i (%)						
Permeability to air (md)						
RESERVOIR FLUID PROPERTIES						
Oil:						
Oil gravity (°API)	22					
Sulfur content (% by wt.)						
Initial solution GOR (SCF/STB)	400					
Initial oil FVF (RB/STB)						
Bubble point press. (psia)						
Viscosity (cp) @ °F						
Gas:						
Specific gravity (air = 1.0)						
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						
Date started						
Date discontinued						
Peak oil production (bbl)						544,354
Year						1968
Peak gas production, net (Mcf)						
Year						

Base of fresh water (ft.): See areas

Remarks: See areas

Selected References:

DATE: July 1983

CALIFORNIA DIVISION OF OIL AND GAS

COUNTY: LOS ANGELES

VENICE BEACH OIL FIELD
ONSHORE 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	Damson Oil Corp. "Venice Beach Unit" 1	Mobil Oil Corp. "L.A. City 135" 1	20 2S 15W	SB	6,787	Schist sand	
Deepest well	Damson Oil Corp. "Venice Beach Unit" 3	Mobil Oil Corp. "L.A. City 135" 3	20 2S 15W	SB	7,250		Catalina Schist Cret. or older

POOL DATA

ITEM	SCHIST SAND					FIELD OR AREA DATA
Discovery date	March 1966					
Initial production rates						
Oil (bbl/day)	573					
Gas (Mcf/day)	229					
Flow pressure (psi)						
Bean size (in.)						
Initial reservoir pressure (psi)	2,060					
Reservoir temperature (°F)						
Initial oil content (STB/ac.-ft.)	1,110					
Initial gas content (MSCF/ac.-ft.)						
Formation	Puente					
Geologic age	late Miocene					
Average depth (ft.)	6,000					
Average net thickness (ft.)						
Maximum productive area (acres)	45					
RESERVOIR ROCK PROPERTIES						
Porosity (%)						
So_i (%)						
Sw_i (%)						
Sg_i (%)						
Permeability to air (md)						
RESERVOIR FLUID PROPERTIES						
Oil:						
Oil gravity (°API)	22					
Sulfur content (% by wt.)						
Initial solution GOR (SCF/STB)	400					
Initial oil FVF (RB/STB)						
Bubble point press. (psia)						
Viscosity (cp) @ °F						
Gas:						
Specific gravity (air = 1.0)						
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						
Date started						
Date discontinued						
Peak oil production (bbl)	61,379					
Year	1970					
Peak gas production, net (Mcf)						
Year						

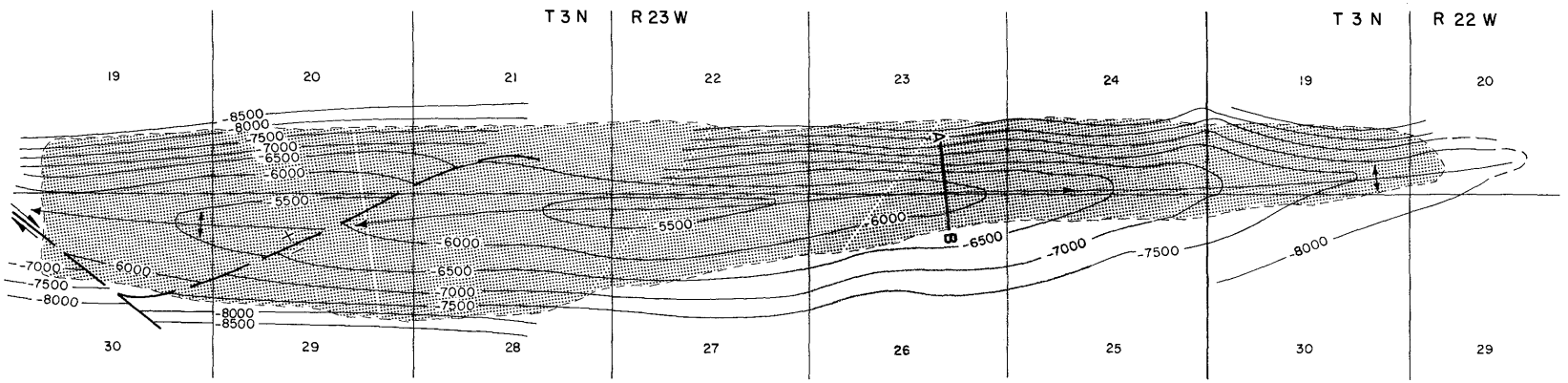
Base of fresh water (ft.): 600-700

Remarks:

Selected References:

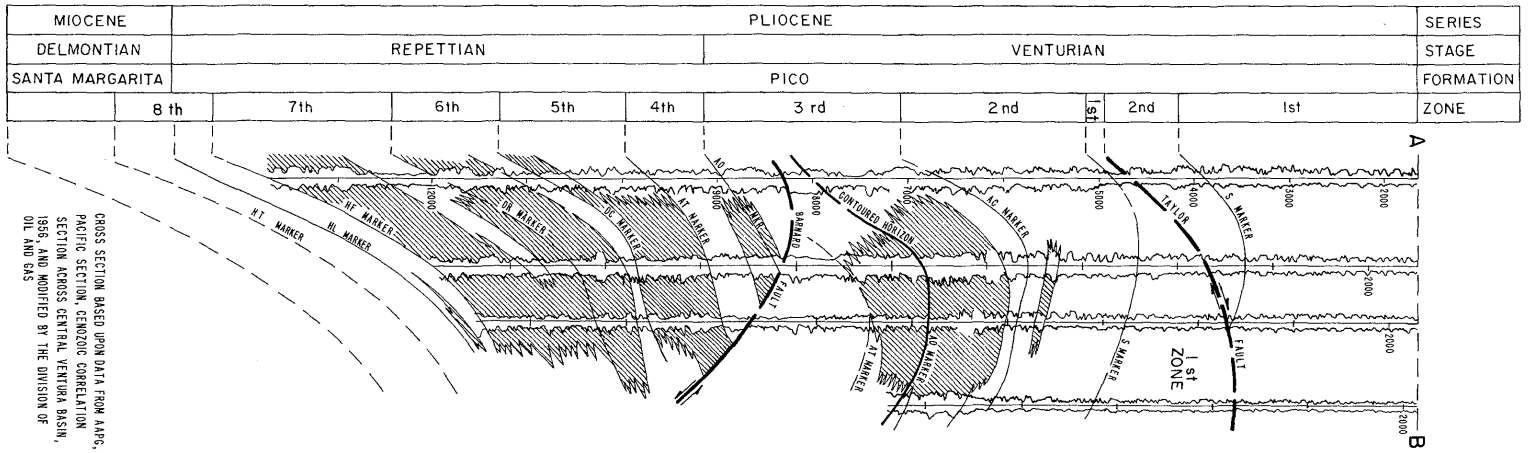
DATE: July 1983

CALIFORNIA DIVISION OF OIL AND GAS



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

COURTESY OF SHELL OIL COMPANY AND PACIFIC SECTION, AAPG



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

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	883[a/]	
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	
So_i (%)	-	65	62	61	67	
Sw_i (%)	-	35	38	39	33	
Sg_i (%)						
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						
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	waterflood	waterflood				
Date started	1966	1979				
Date discontinued	active	active				
Peak oil production (bbl)						31,129,118
Year						1954
Peak gas production, net (Mcf)						60,712,823
Year						1955

Base of fresh water (ft.):

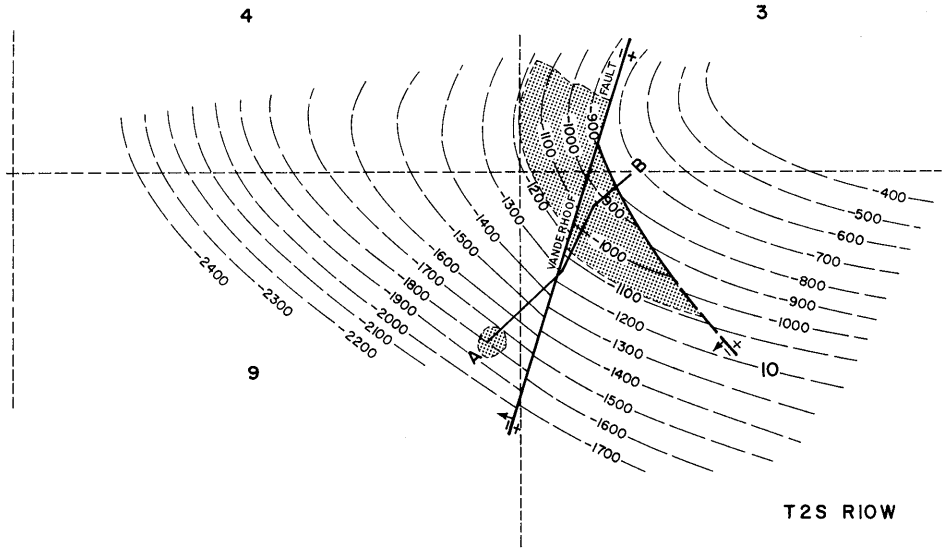
Remarks:

Selected References:

DATE: May 1983

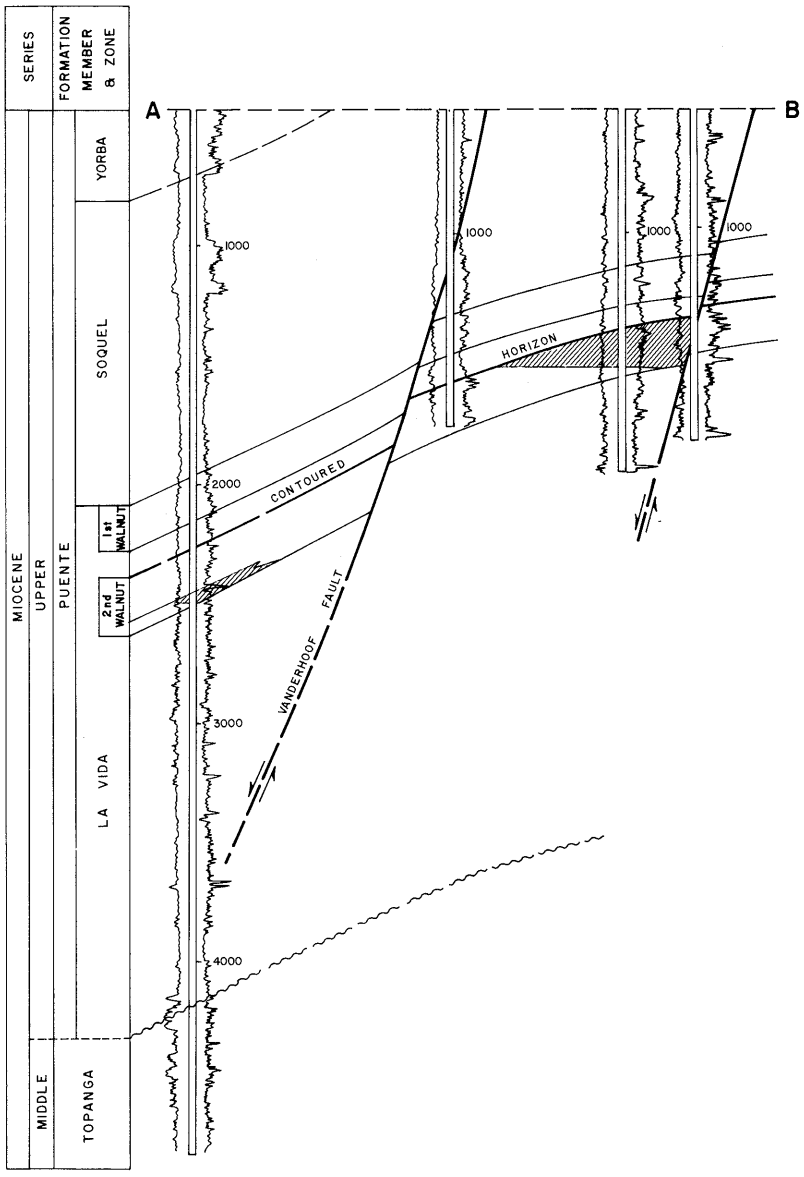
CALIFORNIA DIVISION OF OIL AND GAS

WALNUT OIL FIELD



CONTOURS ON TOP OF 2ND WALNUT ZONE

SCALE: 1" = 1000'



COUNTY: LOS ANGELES

WALNUT 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	Elmar Oil Corp. "Lautenbach" 1	Hugh Allen Bardeen "Lautenbach" 1	10 2S 10W	SB	2,009	2nd Walnut	
Deepest well	B.P. Exploration USA Inc. "Garnier" 1-B	St. Helens Petroleum Co., Ltd. "Garnier" 1-B	3 2S 10W	SB	5,282		Topanga middle Miocene

POOL DATA

ITEM	1ST WALNUT	2ND WALNUT				FIELD OR AREA DATA
Discovery date	August 1951	April 1948				
Initial production rates						
Oil (bbl/day)	117	84				
Gas (Mcf/day)						
Flow pressure (psi)						
Bean size (in.)						
Initial reservoir pressure (psi)						
Reservoir temperature (°F)						
Initial oil content (STB/ac.-ft.)						
Initial gas content (MSCF/ac.-ft.)						
Formation	Puente	Puente				
Geologic age	late Miocene	late Miocene				
Average depth (ft.)	1,200	1,400				
Average net thickness (ft.)	130	180				
Maximum productive area (acres)						40
RESERVOIR ROCK PROPERTIES						
Porosity (%)						
So_i (%)						
Sw_i (%)						
Sg_i (%)						
Permeability to air (md)						
RESERVOIR FLUID PROPERTIES						
Oil:						
Oil gravity (°API)	16	16				
Sulfur content (% by wt.)						
Initial solution GOR (SCF/STB)						
Initial oil FVF (RB/STB)						
Bubble point press. (psia)						
Viscosity (cp) @ °F						
Gas:						
Specific gravity (air = 1.0)						
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						
Date started						
Date discontinued						
Peak oil production (bbl)						21,383
Year						1986
Peak gas production, net (Mcf)						3,037
Year						1986

Base of fresh water (ft.): 400

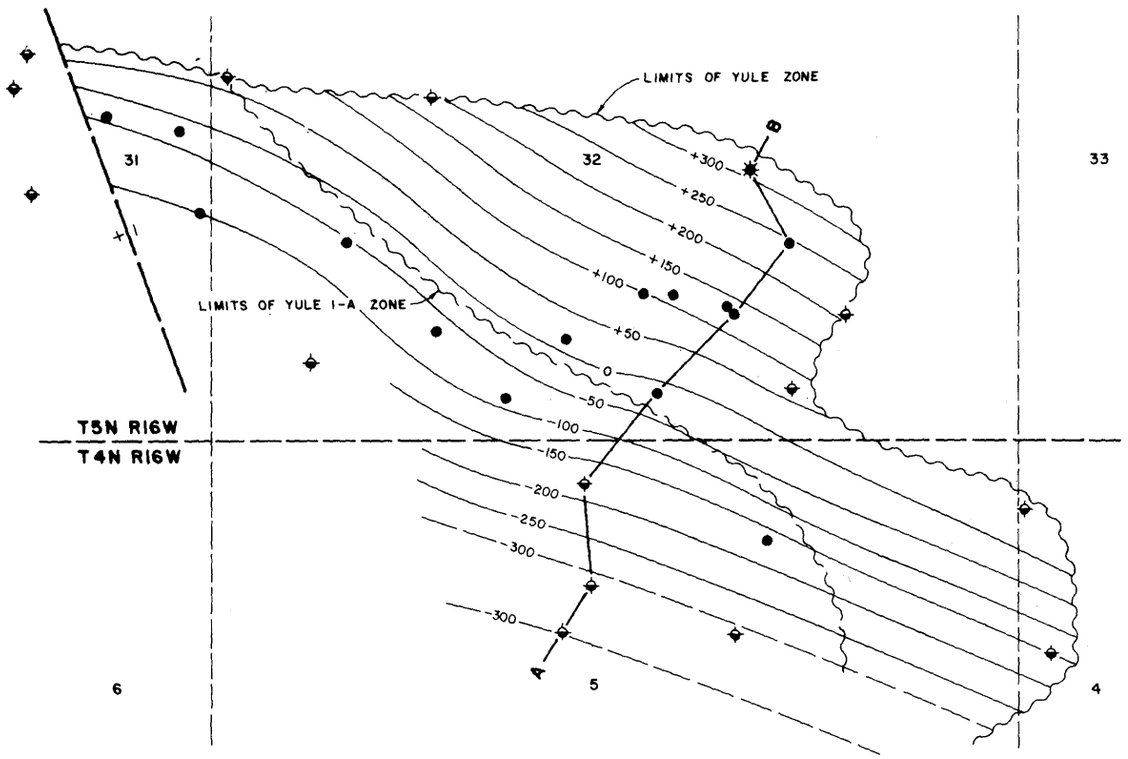
Remarks: The field was abandoned in 1977 and reactivated in 1985.

Selected References: Ingram, W.L., 1960, Walnut Oil Field: Calif. Div. of Oil and Gas, Summary of Operations -- Calif. Oil Fields, Vol. 46, No. 2.

DATE: January 1989

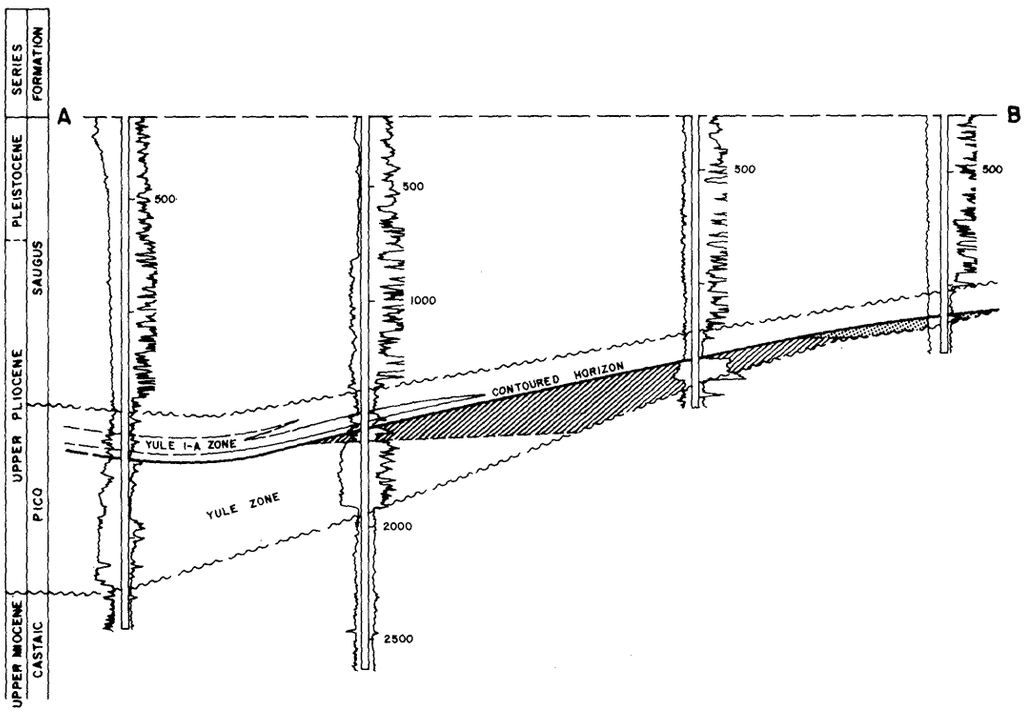
CALIFORNIA DIVISION OF OIL AND GAS

WAYSIDE CANYON OIL FIELD



CONTOURS ON TOP OF YULE ZONE

SCALE: 1" = 1200'



COUNTY: LOS ANGELES

WAYSIDE CANYON 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	Texaco Inc. "Wayside Canyon Unit" 22	Texaco Inc. "Honor Rancho 'A' (NCT-2)" 22	32 5N 16W	SB	1,872	Yule 1-A	
Deepest well	Texaco Inc. "Honor Rancho 'A' (NCT-2)" 12	Same as present	5 4N 16W	SB	2,638		Castaic Miocene

POOL DATA

ITEM	YULE 1-A	YULE				FIELD OR AREA DATA
Discovery date	January 1963	January 1962				
Initial production rates						
Oil (bbl/day)	33	26				
Gas (Mcf/day)						
Flow pressure (psi)						
Bean size (in.)						
Initial reservoir pressure (psi)	525	535				
Reservoir temperature (°F)	95	-				
Initial oil content (STB/ac.-ft.)	975	975				
Initial gas content (MSCF/ac.-ft.)						
Formation	Pico	Pico				
Geologic age	Pliocene	Pliocene				
Average depth (ft.)	1,495	1,600				
Average net thickness (ft.)	81	100				
Maximum productive area (acres)						120
RESERVOIR ROCK PROPERTIES						
Porosity (%)	17	17				
S_{oi} (%)	59	-				
S_{wi} (%)	41	-				
S_{gi} (%)						
Permeability to air (md)	859	859				
RESERVOIR FLUID PROPERTIES						
Oil:						
Oil gravity (°API)	20.9	22.0				
Sulfur content (% by wt.)						
Initial solution GOR (SCF/STB)	94	80				
Initial oil FVF (RB/STB)	1.05	-				
Bubble point press. (psia)	550	-				
Viscosity (cp) @ °F						
Gas:						
Specific gravity (air = 1.0)	0.601	-				
Heating value (Btu/cu. ft.)						
Water:						
Salinity, NaCl (ppm)	13,000	13,000				
T.D.S. (ppm)						
R_w (ohm/m) (77°F)						
ENHANCED RECOVERY PROJECTS						
Enhanced recovery projects		pressure maintenance				
Date started		1966				
Date discontinued		1966				
Peak oil production (bbl)						559,816
Year						1963
Peak gas production, net (Mcf)						
Year						

Base of fresh water (ft.): 1,400

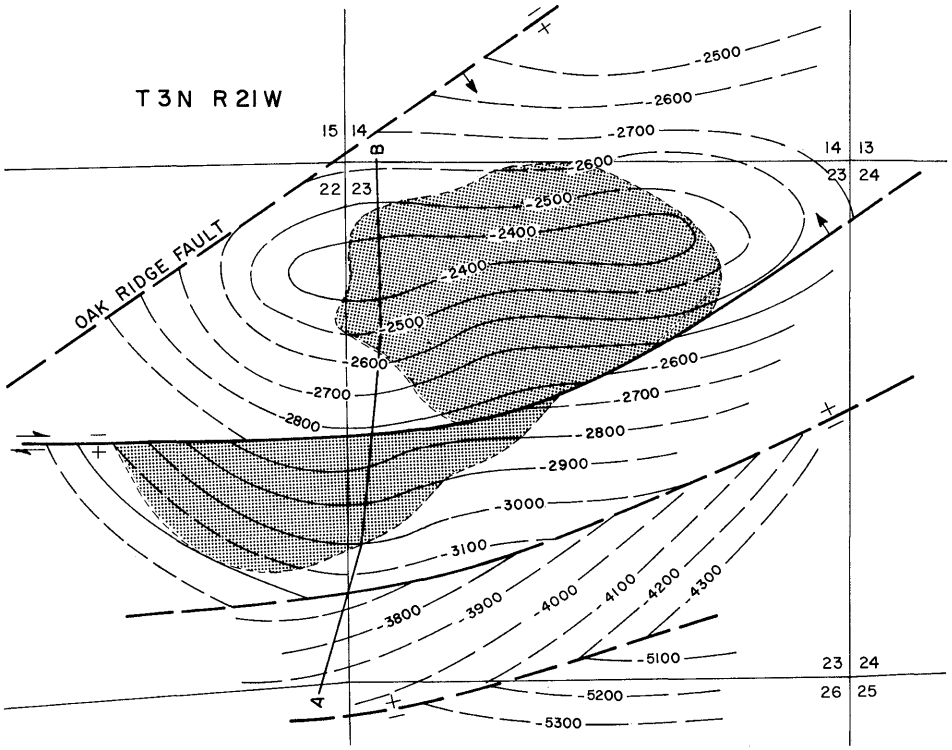
Remarks:

Selected References:

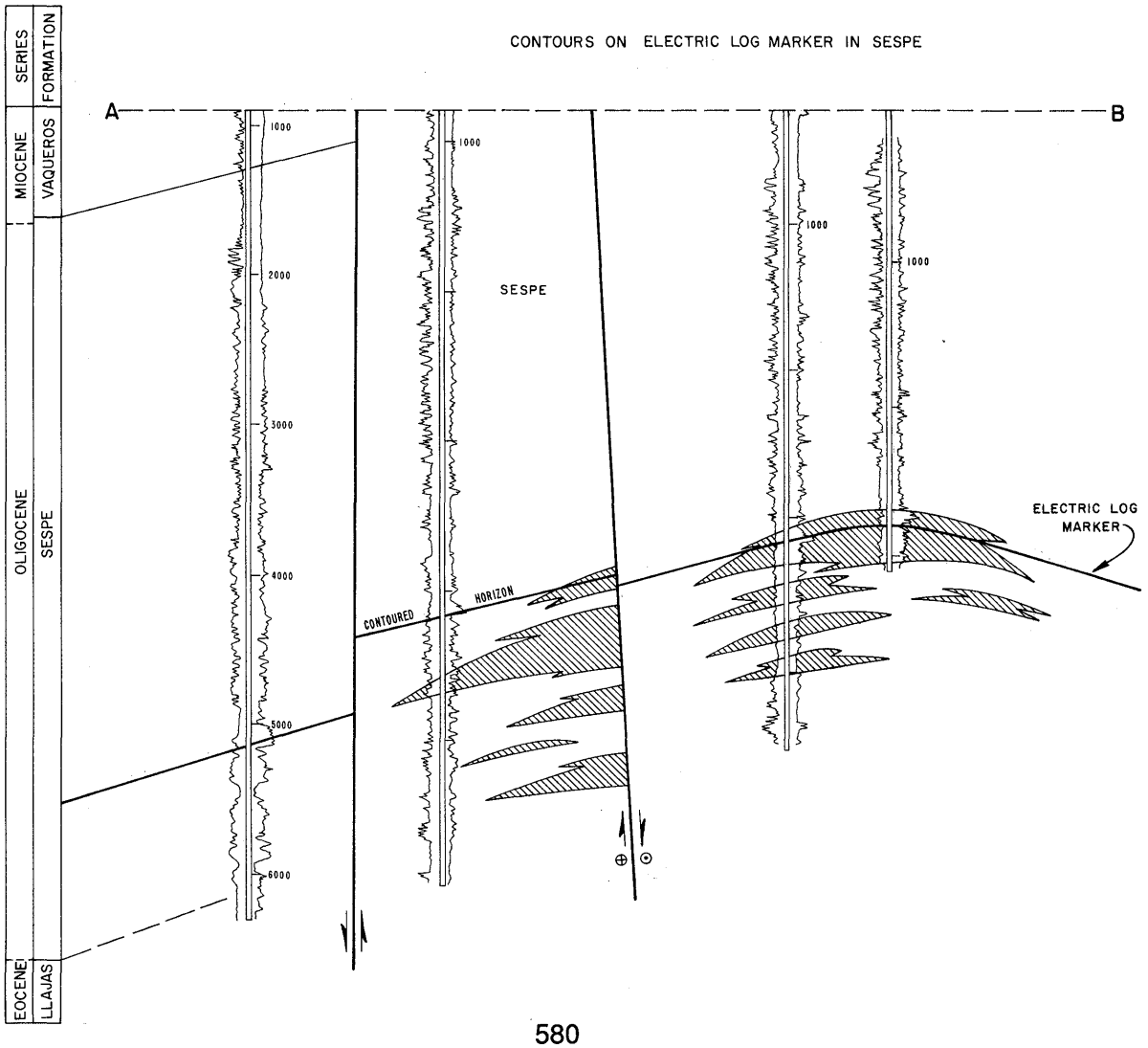
DATE: May 1983

CALIFORNIA DIVISION OF OIL AND GAS

WEST MOUNTAIN OIL FIELD



CONTOURS ON ELECTRIC LOG MARKER IN SESPE



COUNTY: VENTURA

WEST MOUNTAIN 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	South Fork Ranch "Converse" 1	F.E. Fairfield "West Mountain" 1	23 3N 21W	SB	5,047	Sespe	
Deepest well	South Fork Ranch "Lemon" 2	Honolulu Oil Corp. Ltd. "Hobson" 1	23 3N 21W	SB	6,744		Llajas Eocene

POOL DATA

ITEM	SESPE					FIELD OR AREA DATA
Discovery date	July 1946					
Initial production rates						
Oil (bbl/day)	80					
Gas (Mcf/day)						
Flow pressure (psi)						
Bean size (in.)						
Initial reservoir pressure (psi)						
Reservoir temperature (°F)						
Initial oil content (STB/ac.-ft.)						
Initial gas content (MSCF/ac.-ft.)						
Formation	Sespe					
Geologic age	Oligocene					
Average depth (ft.)	4,500					
Average net thickness (ft.)	1,500					
Maximum productive area (acres)	240					
RESERVOIR ROCK PROPERTIES						
Porosity (%)						
S_{oi} (%)						
S_{wi} (%)						
S_{gi} (%)						
Permeability to air (md)						
RESERVOIR FLUID PROPERTIES						
Oil:						
Oil gravity (°API)	20					
Sulfur content (% by wt.)						
Initial solution GOR (SCF/STB)						
Initial oil FVF (RB/STB)						
Bubble point press. (psia)						
Viscosity (cp) @ °F						
Gas:						
Specific gravity (air = 1.0)						
Heating value (Btu/cu. ft.)						
Water:						
Salinity, NaCl (ppm)	34,200					
T.D.S. (ppm)						
R_w (ohm/m) (77°F)						
ENHANCED RECOVERY PROJECTS						
Enhanced recovery projects	waterflood					
Date started	1974					
Date discontinued	1979					
Peak oil production (bbl)	356,504					
Year	1948					
Peak gas production, net (Mcf)	112,000					
Year	1958					

Base of fresh water (ft.): 400

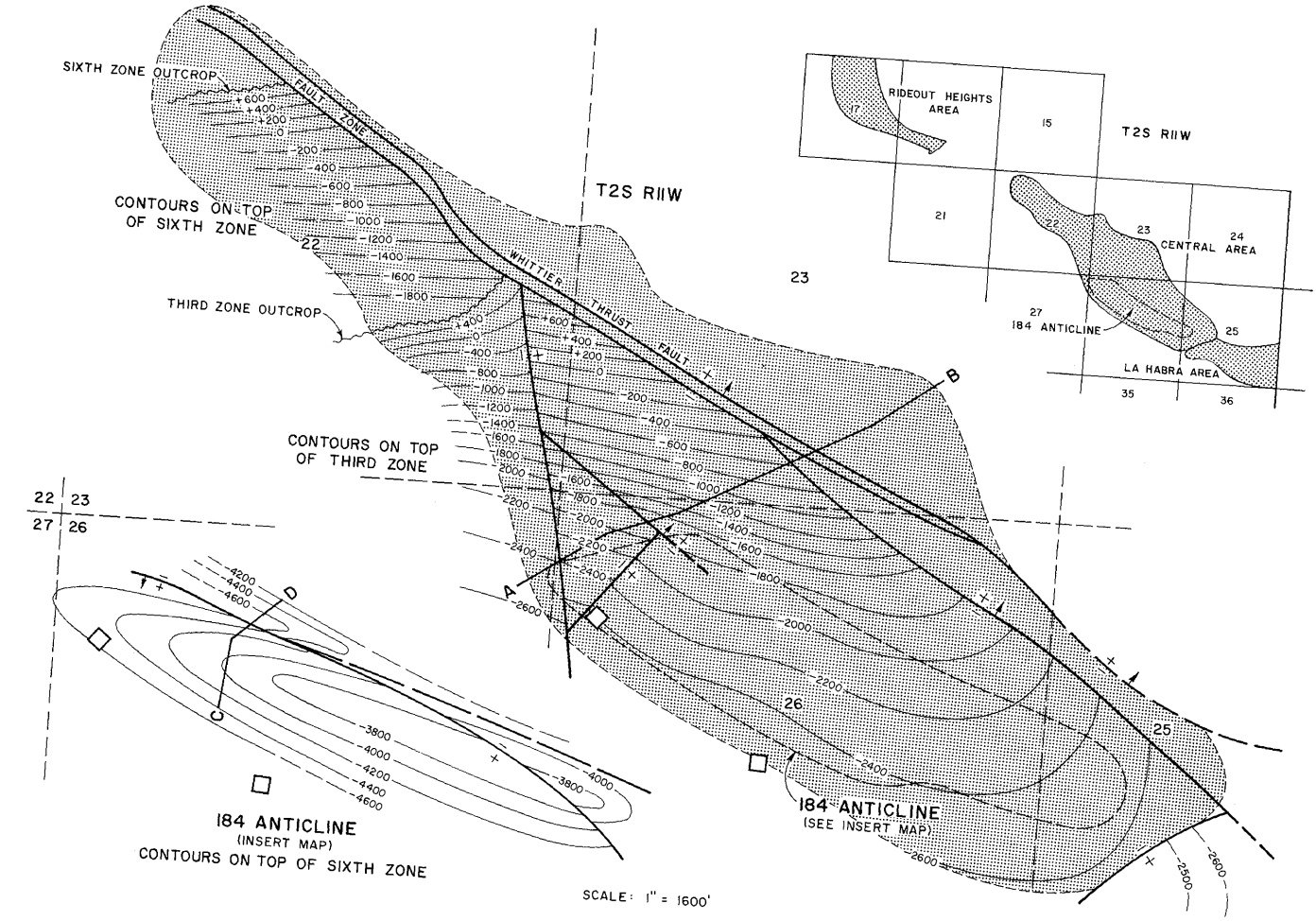
Remarks:

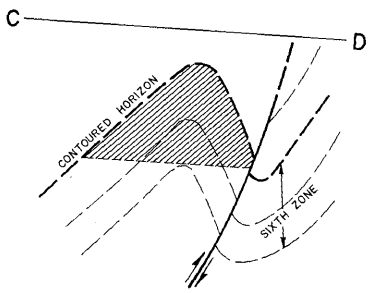
Selected References:

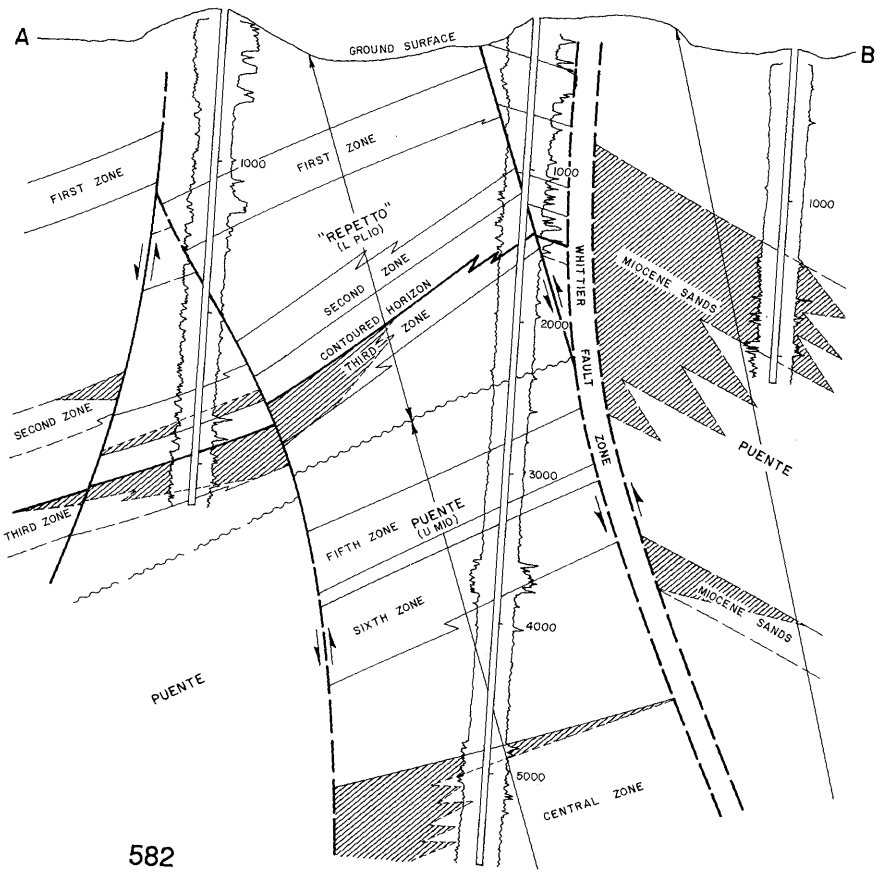
DATE: May 1983

CALIFORNIA DIVISION OF OIL AND GAS

WHITTIER OIL FIELD
Central Area







COUNTY: LOS ANGELES

WHITTIER 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	Chevron U.S.A. Inc. "Central Fee" 1A	Central Oil Co. No. 1-A	23 2S 11W	SB	984	3rd	
Deepest well	Chevron U.S.A. Inc. "Murphy-Whittier" 101	Standard Oil Co. of Calif. "Murphy-Whittier" 101	26 2S 11W	SB	10,950		Puente late Miocene

POOL DATA

ITEM	3RD					FIELD OR AREA DATA
Discovery date	July 1896					
Initial production rates						
Oil (bbl/day)	10					
Gas (Mcf/day)						
Flow pressure (psi)						
Bean size (in.)						
Initial reservoir pressure (psi)						
Reservoir temperature (°F)						
Initial oil content (STB/ac.-ft.)						
Initial gas content (MSCF/ac.-ft.)						
Formation	"Repetto"					
Geologic age	early Pliocene					
Average depth (ft.)	1,600					
Average net thickness (ft.)	200					
Maximum productive area (acres)						1,080
RESERVOIR ROCK PROPERTIES						
Porosity (%)	27.5					
S_{oi} (%)	64					
S_{wi} (%)	36					
S_{gi} (%)						
Permeability to air (md)	174					
RESERVOIR FLUID PROPERTIES						
Oil:						
Oil gravity (°API)	14-20					
Sulfur content (% by wt.)						
Initial solution GOR (SCF/STB)						
Initial oil FVF (RB/STB)	1.077a/					
Bubble point press. (psia)						
Viscosity (cp) @ °F	276 @ 80a/					
Gas:						
Specific gravity (air = 1.0)						
Heating value (Btu/cu. ft.)						
Water:						
Salinity, NaCl (ppm)	3,762a/					
T.D.S. (ppm)	6,656a/					
R_w (ohm/m) (77°F)	0.996a/					
ENHANCED RECOVERY PROJECTS						
Enhanced recovery projects	waterflood					
Date started	1961					
Date discontinued	active					
	alkaline flood					
	1983					
	active					
Peak oil production (bbl)						2,138,763
Year						1966
Peak gas production, net (Mcf)						5,569,754
Year						1966

Base of fresh water (ft.): See areas

Remarks: a/ Composite 2nd and 3rd zones.

Selected References: Norris, B.B., 1930, Report on the Fields on or Adjacent to the Whittier Fault: Calif. Div. of Oil and Gas, Summary of Operations -- Calif. Oil Fields, Vol. 15, No. 4.

DATE: December 1988

CALIFORNIA DIVISION OF OIL AND GAS

COUNTY: LOS ANGELES

WHITTIER OIL FIELD
CENTRAL 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. "Central Fee" 1A	Central Oil Co. No. 1-A	23 2S 11W	SB	984	3rd	
Deepest well	Chevron U.S.A. Inc. "Murphy-Whittier" 101	Standard Oil Co. of Calif. "Murphy-Whittier" 101	26 2S 11W	SB	10,950		Puente late Miocene

POOL DATA

ITEM	1ST	2ND	3RD	4TH	5TH	FIELD OR AREA DATA
Discovery date	August 1916	April 1904	July 1896	unknown	1898	
Initial production rates						
Oil (bbl/day)	202	100	10	-	60	
Gas (Mcf/day)						
Flow pressure (psi)						
Bean size (in.)						
Initial reservoir pressure (psi)	-	950	950	-	-	
Reservoir temperature (°F)	-	115	115	-	-	
Initial oil content (STB/ac.-ft.)	-	1,390	1,268	-	-	
Initial gas content (MSCF/ac.-ft.)						
Formation	"Repetto"	"Repetto"	"Repetto"	"Repetto"	Puente	
Geologic age	early Pliocene	early Pliocene	early Pliocene	early Pliocene	late Miocene	
Average depth (ft.)	900	1,300	1,600	2,100	1,200	
Average net thickness (ft.)	75-300	100-200	200-250	20	150-400	
Maximum productive area (acres)	-	141	176	-	-	
RESERVOIR ROCK PROPERTIES						
Porosity (%)	30.0	28.8	27.5	-	30.0	
S_{oi} (%)	-	67	64	-	-	
S_{wi} (%)	-	33	36	-	-	
S_{gi} (%)						
Permeability to air (md)	380	504	174	-	60	
RESERVOIR FLUID PROPERTIES						
Oil:						
Oil gravity (°API)	13-18	18-20	14-20	12-25	12-33	
Sulfur content (% by wt.)						
Initial solution GOR (SCF/STB)						
Initial oil FVF (RB/STB)	-	1.077a/	1.077a/	-	-	
Bubble point press. (psia)						
Viscosity (cp) @ °F	-	276 @ 80	276 @ 80	-	-	
Gas:						
Specific gravity (air = 1.0)						
Heating value (Btu/cu. ft.)						
Water:						
Salinity, NaCl (ppm)	5,135	5,735a/	5,735a/	-	-	
T.D.S. (ppm)	4,615	6,656a/	6,656a/	-	-	
R_w (ohm/m) (77°F)	1.950	0.996a/	0.996a/	-	-	
ENHANCED RECOVERY PROJECTS						
Enhanced recovery projects		waterflood	waterflood			
Date started		1961	1961			
Date discontinued		active	active			
		alkaline flood	alkaline flood			
		1983	1983			
		active	active			
Peak oil production (bbl)						
Year						
Peak gas production, net (Mcf)						
Year						

Base of fresh water (ft.): 0-1,250

Remarks: a/ Composite 2nd and 3rd zones.

Selected References: Gaede, V.F., 1964, Central Area of Whittier Oil Field: Calif. Div. of Oil and Gas, Summary of Operations -- Calif. Oil Fields, Vol. 50, No. 1.

DATE: August 1983

CALIFORNIA DIVISION OF OIL AND GAS

COUNTY: LOS ANGELES

WHITTIER OIL FIELD
CENTRAL 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	6TH	6TH (184 ANTICLINE)	CENTRAL			FIELD OR AREA DATA
Discovery date	unknown	May 1964	September 1953			
Initial production rates						
Oil (bbl/day)	-	272	214			
Gas (Mcf/day)	-	170	122			
Flow pressure (psi)						
Bean size (in.)						
Initial reservoir pressure (psi)						
Reservoir temperature (°F)						
Initial oil content (STB/ac.-ft.)						
Initial gas content (MSCF/ac.-ft.)						
Formation	Puente	Puente	Puente			
Geologic age	late Miocene	late Miocene	late Miocene			
Average depth (ft.)	2,100	4,050	2,800			
Average net thickness (ft.)	300-550	125	200			
Maximum productive area (acres)						875
RESERVOIR ROCK PROPERTIES						
Porosity (%)	30	-	20-25			
S_{oi} (%)						
S_{wi} (%)	-	-	30*			
S_{gi} (%)						
Permeability to air (md)						
RESERVOIR FLUID PROPERTIES						
Oil:						
Oil gravity (°API)	18-33	36	26-34			
Sulfur content (% by wt.)						
Initial solution GOR (SCF/STB)						
Initial oil FVF (RB/STB)	-	-	1.05*			
Bubble point press. (psia)						
Viscosity (cp) @ °F						
Gas:						
Specific gravity (air = 1.0)						
Heating value (Btu/cu. ft.)						
Water:						
Salinity, NaCl (ppm)	-	17,632	-			
T.D.S. (ppm)	-	19,240	-			
R_w (ohm/m) (77°F)	-	0.51 @ 75	-			
ENHANCED RECOVERY PROJECTS						
Enhanced recovery projects		waterflood				
Date started		1966				
Date discontinued		1972				
Peak oil production (bbl)						2,112,715
Year						1966
Peak gas production, net (Mcf)						5,565,556
Year						1966

Base of fresh water (ft.):

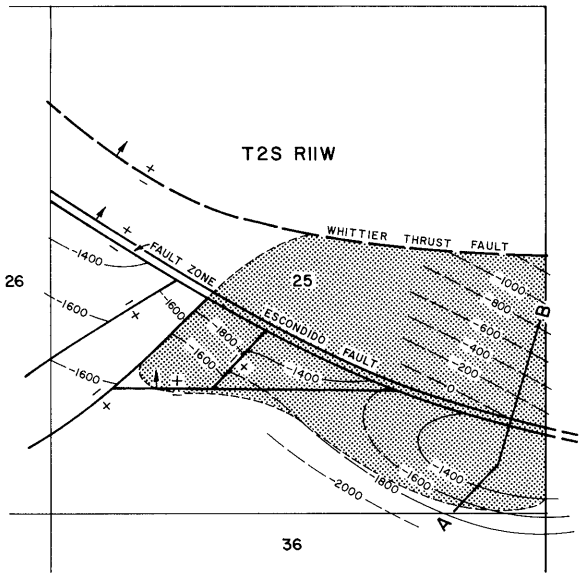
Remarks:

Selected References:

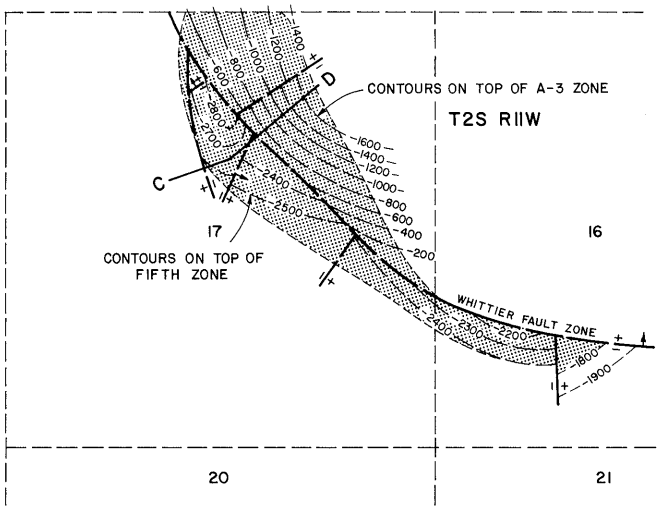
DATE: August 1983 *Average value

CALIFORNIA DIVISION OF OIL AND GAS

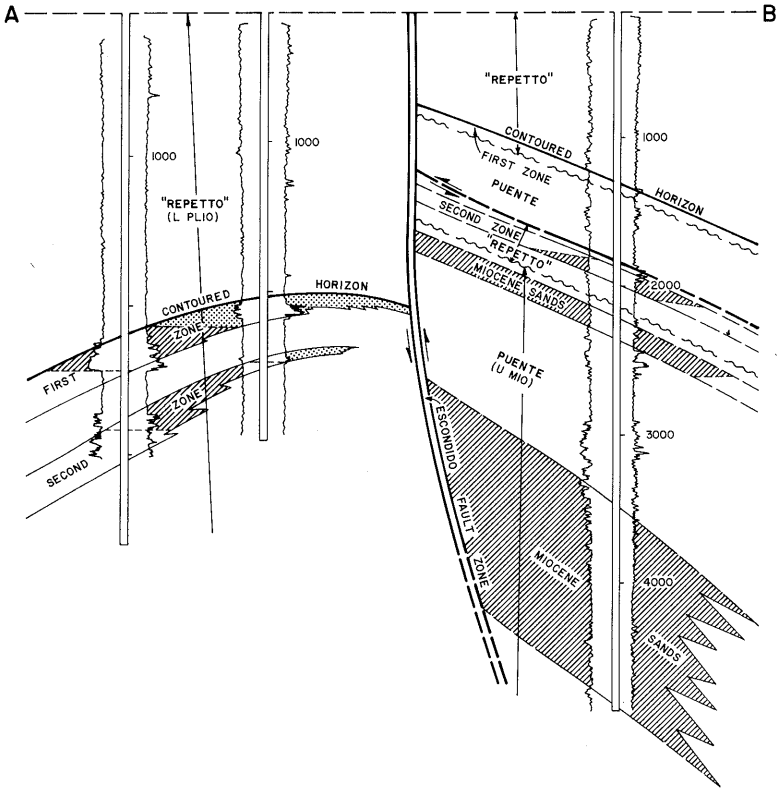
WHITTIER OIL FIELD
La Habra and Rideout Heights Areas

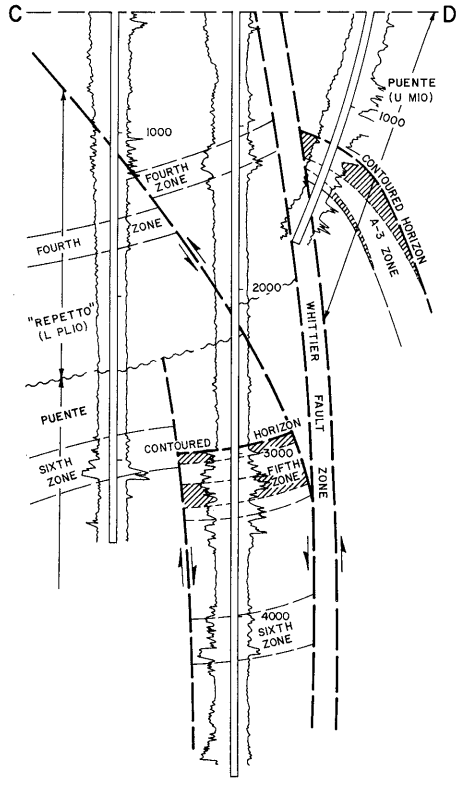


LA HABRA AREA
CONTOURS ON TOP OF FIRST ZONE



RIDEOUT HEIGHTS AREA
CONTOURS ON TOP OF A-3 ZONE
AND ON TOP OF FIFTH ZONE





COUNTY: LOS ANGELES

WHITTIER OIL FIELD
LA HABRA 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	Union Oil Co. of Calif. "Mineral Springs" 1	Same as present	25 2S 11W	SB	3,281	2nd	
Deepest well	Southern Calif. Gas Co. "La Habra Fee" 2	Union Oil Co. of Calif. "Monterey Fee" 2	25 2S 11W	SB	7,289		Puente late Miocene

POOL DATA

ITEM	1ST	2ND	3RD	MIOCENE SANDS		FIELD OR AREA DATA
Discovery date	Prior to 1918	October 1912	October 1912	July 1947		
Initial production rates						
Oil (bbl/day)	unknown	10a/	a/	3		
Gas (Mcf/day)						
Flow pressure (psi)						
Bean size (in.)						
Initial reservoir pressure (psi)	800	-	-	-		
Reservoir temperature (°F)	110	-	-	-		
Initial oil content (STB/ac.-ft.)						
Initial gas content (MSCF/ac.-ft.)	526	-	-	-		
Formation	"Repetto"	"Repetto"	Puente	Puente		
Geologic age	early Pliocene	early Pliocene	late Miocene	late Miocene		
Average depth (ft.)	900	1,150	1,400	3,600		
Average net thickness (ft.)	200	150	175	900		
Maximum productive area (acres)						115
RESERVOIR ROCK PROPERTIES						
Porosity (%)	20-31	-	27	-		
S_{oi} (%)	30	-	-	-		
S_{wi} (%)	25	-	-	-		
S_{gi} (%)	-	-	60	-		
Permeability to air (md)	635	-	-	-		
RESERVOIR FLUID PROPERTIES						
Oil:						
Oil gravity (°API)	15-18	20	20	25		
Sulfur content (% by wt.)						
Initial solution GOR (SCF/STB)	400	-	-	-		
Initial oil FVF (RB/STB)	1.18	-	-	-		
Bubble point press. (psia)	2,900	-	-	-		
Viscosity (cp) @ °F	160	-	-	-		
Gas:						
Specific gravity (air = 1.0)	0.633	-	-	-		
Heating value (Btu/cu. ft.)	1,054	-	-	-		
Water:						
Salinity, NaCl (ppm)						
T.D.S. (ppm)	5,135	5,735	3,766	-		
R_w (ohm/m) (77°F)						
ENHANCED RECOVERY PROJECTS						
Enhanced recovery projects						
Date started						
Date discontinued						
Peak oil production (bbl)						125,345
Year						1971
Peak gas production, net (Mcf)						443,289
Year						1943

Base of fresh water (ft.): None

Remarks: 1st, 2nd, and 3rd zones are used for gas storage (project started in 1952). Only one well produced from the Miocene Sands.
a/ Initial production from the 2nd and 3rd zones was commingled.

Selected References: Gaede, V.F., 1965, La Habra Area of Whittier Oil Field: Calif. Div. of Oil and Gas, Summary of Operations -- Calif. Oil Fields, Vol. 51, No. 1.

DATE: August 1983

CALIFORNIA DIVISION OF OIL AND GAS

COUNTY: LOS ANGELES

WHITTIER OIL FIELD
RIDEOUT HEIGHTS 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	E & E Production "Whitley" 1	C.W. Whitley No. 1	17 2S 11W	SB	3,292	5th	
Deepest well	Mitchell Energy Corp. "Mitchell Energy Corp" W-1	American Petrofina Exploration Co. "Whittier" 1	16 2S 11W	SB	10,138		Puente late Miocene

POOL DATA

ITEM	5TH	A-3				FIELD OR AREA DATA
Discovery date	October 1919	July 1925				
Initial production rates						
Oil (bbl/day)	204	68				
Gas (Mcf/day)						
Flow pressure (psi)						
Bean size (in.)						
Initial reservoir pressure (psi)						
Reservoir temperature (°F)	120	-				
Initial oil content (STB/ac.-ft.)	1,552	-				
Initial gas content (MSCF/ac.-ft.)						
Formation	Puente	Puente				
Geologic age	late Miocene	late Miocene				
Average depth (ft.)	2,300	800				
Average net thickness (ft.)	100-400	100				
Maximum productive area (acres)						90
RESERVOIR ROCK PROPERTIES						
Porosity (%)	28	-				
So_i (%)	75	-				
Sw_i (%)	25	-				
Sg_i (%)						
Permeability to air (md)						
RESERVOIR FLUID PROPERTIES						
Oil:						
Oil gravity (°API)	14-26	13-16				
Sulfur content (% by wt.)	0.53	-				
Initial solution GOR (SCF/STB)						
Initial oil FVF (RB/STB)	1.050	-				
Bubble point press. (psia)						
Viscosity (cp) @ °F						
Gas:						
Specific gravity (air = 1.0)						
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						
Date started						
Date discontinued						
Peak oil production (bbl)						426,743
Year						1977
Peak gas production, net (Mcf)						294,600
Year						1978

Base of fresh water (ft.): None

Remarks:

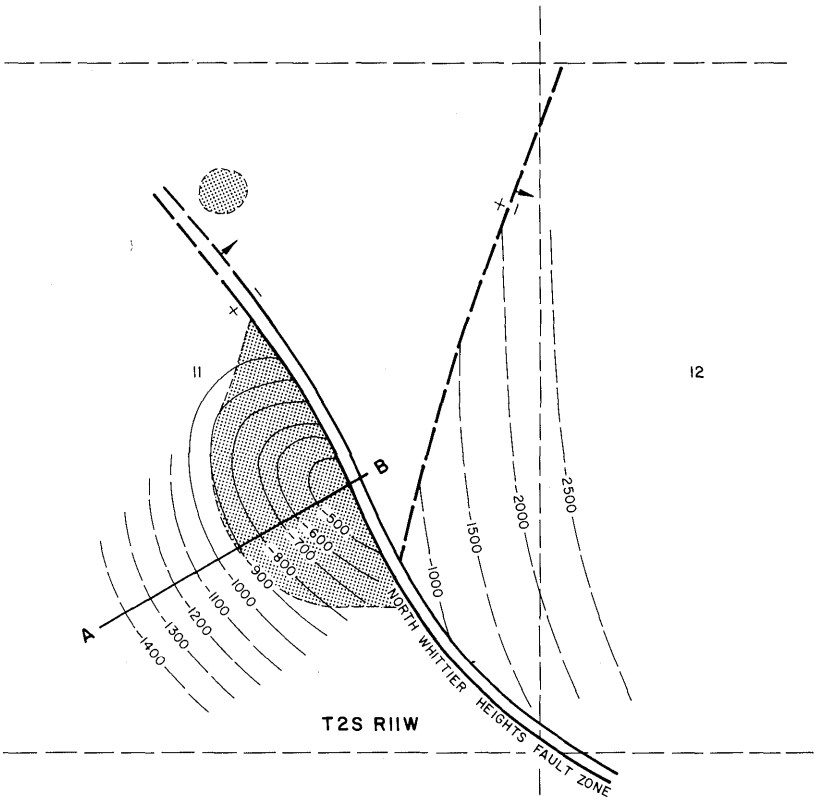
Selected References: Ingram, W.L., 1962, Rideout Heights Area of Whittier Oil Field: Calif. Div. of Oil and Gas, Summary of Operations -- Calif. Oil Fields, Vol. 48, No. 2.

DATE: August 1983

CALIFORNIA DIVISION OF OIL AND GAS

NORTH WHITTIER HEIGHTS OIL FIELD

(Abandoned)



CONTOURS ON TOP OF LA VIDA

SCALE

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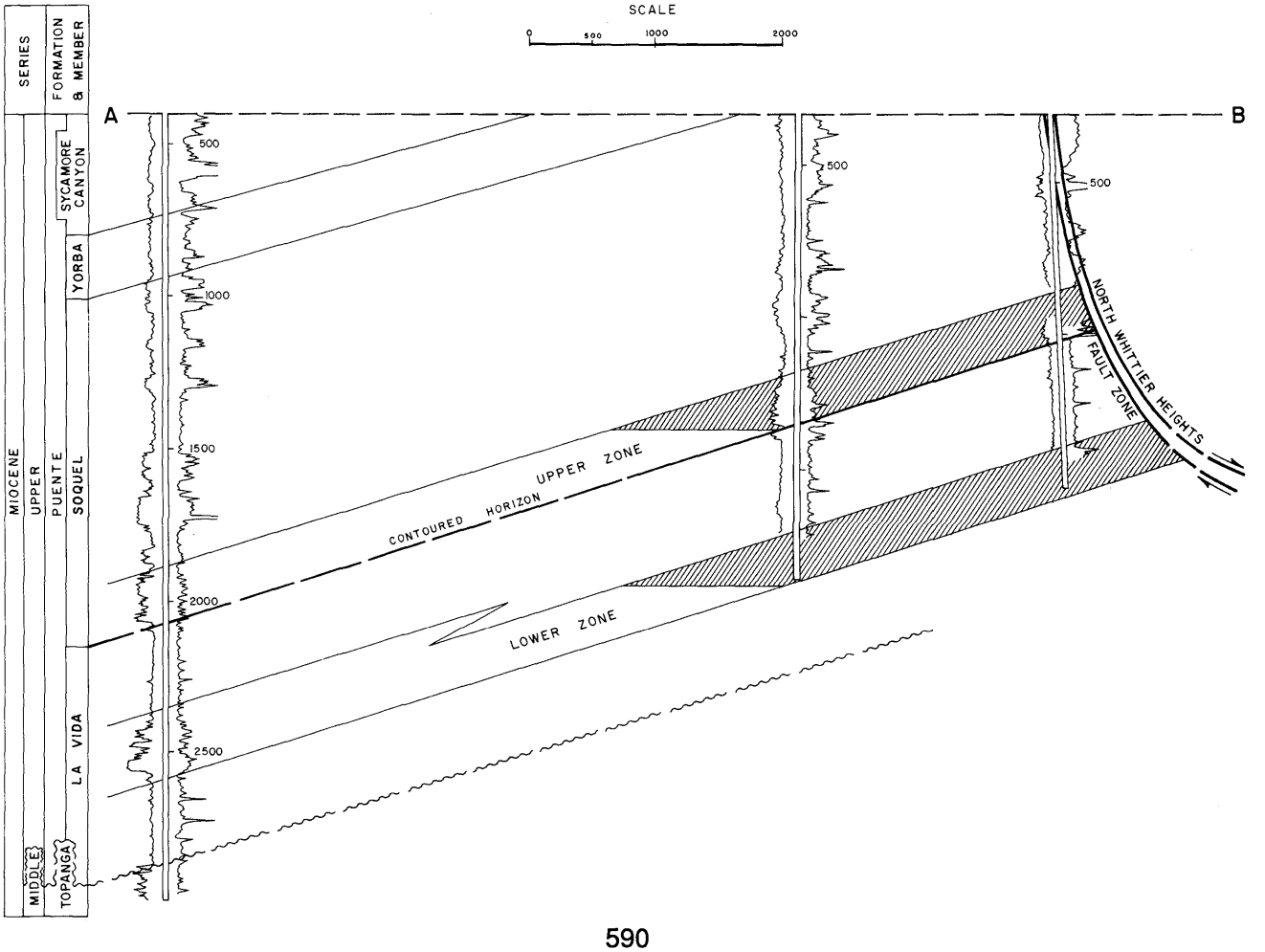


COUNTY: LOS ANGELES

WHITTIER HEIGHTS, NORTH, OIL FIELD (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	Olson and Gregg Inc. "Pellister" 1	Capitol Co. No. 2-1	11 2S 11W	SB	1,285	Upper	
Deepest well	Crown Central Petroleum Corp. "Baldwin" 1	Sunset Oil Company "Baldwin" 1	11 2S 11W	SB	4,681		Topanga middle Miocene

POOL DATA

ITEM	UPPER	LOWER				FIELD OR AREA DATA
Discovery date	July 1944	September 1944				
Initial production rates						
Oil (bbl/day)	40	15				
Gas (Mcf/day)						
Flow pressure (psi)						
Bean size (in.)						
Initial reservoir pressure (psi)						
Reservoir temperature (°F)						
Initial oil content (STB/ac.-ft.)						
Initial gas content (MSCF/ac.-ft.)						
Formation	Puente	Puente				
Geologic age	late Miocene	late Miocene				
Average depth (ft.)	1,100	1,600				
Average net thickness (ft.)	150	140				
Maximum productive area (acres)						40
RESERVOIR ROCK PROPERTIES						
Porosity (%)						
So_i (%)						
Sw_i (%)						
Sg_i (%)						
Permeability to air (md)						
RESERVOIR FLUID PROPERTIES						
Oil:						
Oil gravity (°API)	19	16				
Sulfur content (% by wt.)						
Initial solution GOR (SCF/STB)						
Initial oil FVF (RB/STB)						
Bubble point press. (psia)						
Viscosity (cp) @ °F						
Gas:						
Specific gravity (air = 1.0)						
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						
Date started						
Date discontinued						
Peak oil production (bbl)						8,327
Year						1945
Peak gas production, net (Mcf)						
Year						

Base of fresh water (ft.): 200-500

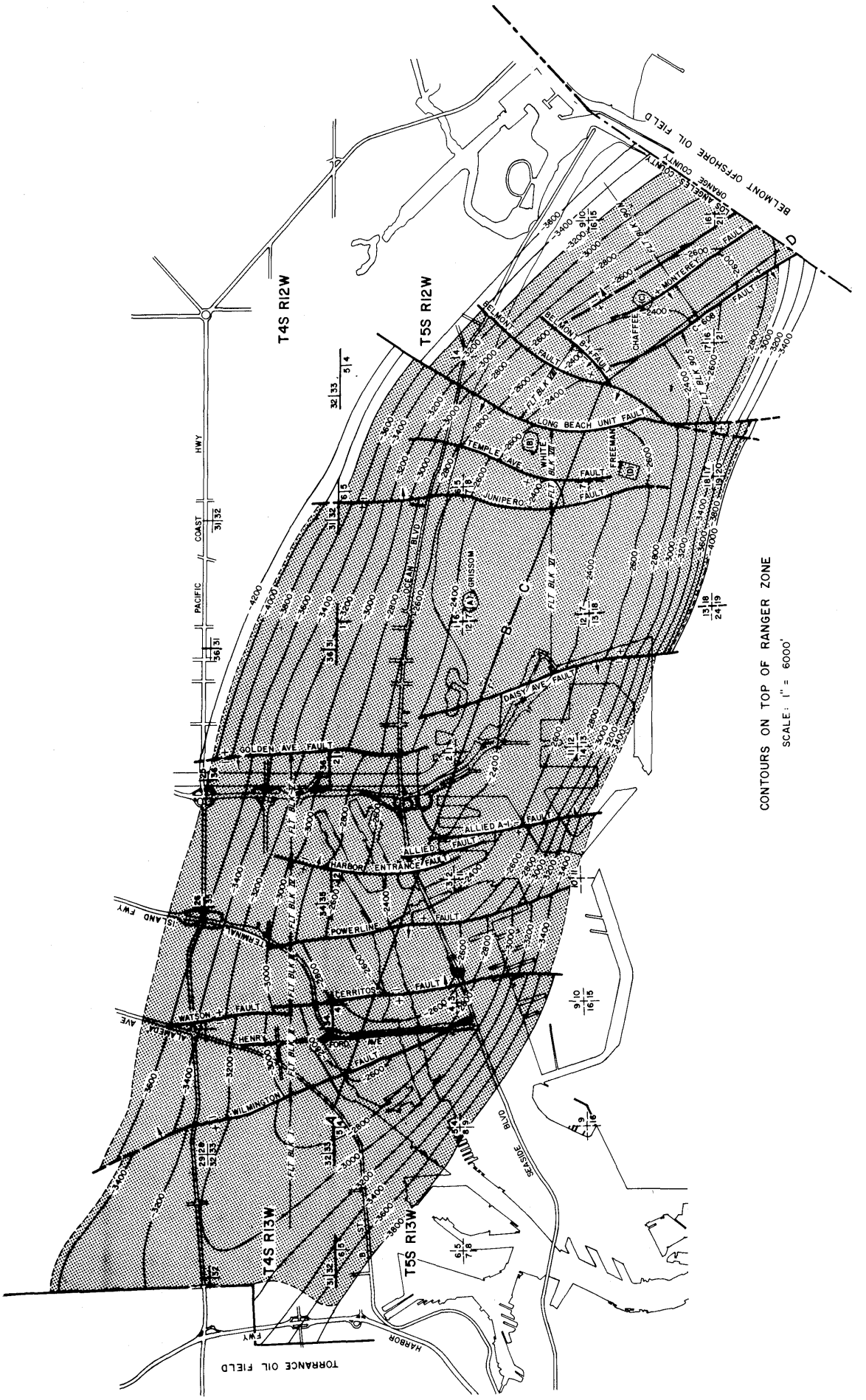
Remarks: Last production was in January 1970. The field was abandoned in 1970. Cumulative production is 84,812 bbl of oil and 83,525 Mcf of gas.

Selected References: Hunter, W.J., 1959, North Whittier Heights Area of Los Angeles County: Calif. Div. of Oil and Gas, Summary of Operations -- Calif. Oil Fields, Vol. 45, No. 1.

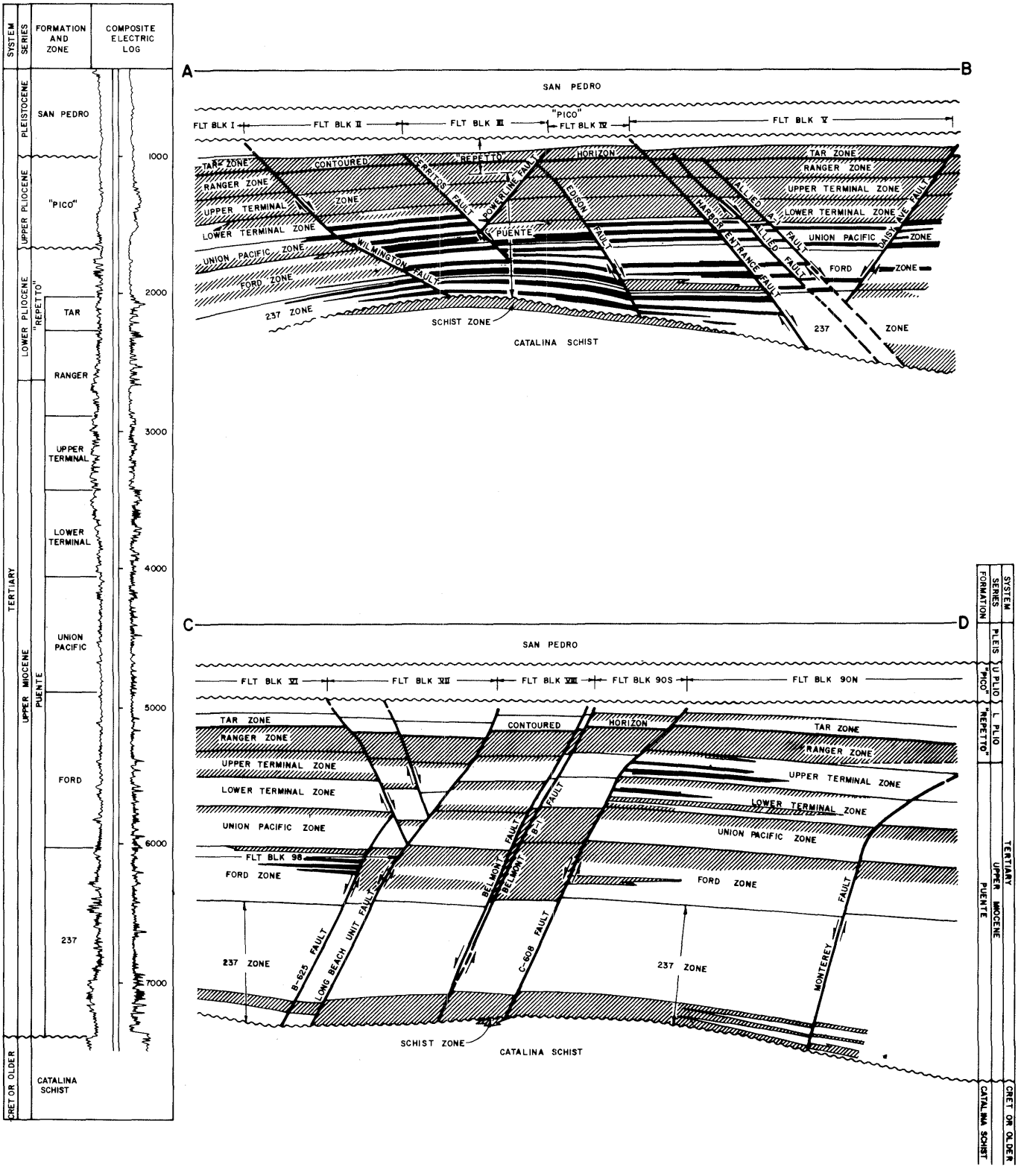
DATE: July 1983

CALIFORNIA DIVISION OF OIL AND GAS

WILMINGTON OIL FIELD



WILMINGTON OIL FIELD



COUNTY: LOS ANGELES

WILMINGTON 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	Decalta International Corp. "Watson A" 2	Ranger Petroleum Corp. "Watson" 2	29 4S 13W	SB	3,784	Ranger	
Deepest well	Thums Long Beach Co. C-520 I	Same as present	16 5S 12W	SB	12,383		Puente late Miocene

POOL DATA

ITEM	RANGER					FIELD OR AREA DATA
Discovery date	January 1932					
Initial production rates						
Oil (bbl/day)	150					
Gas (Mcf/day)						
Flow pressure (psi)						
Bean size (in.)						
Initial reservoir pressure (psi)	1,210					
Reservoir temperature (°F)	145					
Initial oil content (STB/ac.-ft.)	2,031					
Initial gas content (MSCF/ac.-ft.)	275					
Formation	"Repetto"-Puente					
Geologic age	e Plio./l Miocene					
Average depth (ft.)	2,500					
Average net thickness (ft.)	150					
Maximum productive area (acres)						13,267
RESERVOIR ROCK PROPERTIES						
Porosity (%)	32					
S_{oi} (%)	71					
S_{wi} (%)	29					
S_{gi} (%)	0					
Permeability to air (md)	1,638					
RESERVOIR FLUID PROPERTIES						
Oil:						
Oil gravity (°API)	12-25					
Sulfur content (% by wt.)	1.35					
Initial solution GOR (SCF/STB)						
Initial oil FVF (RB/STB)						
Bubble point press. (psia)						
Viscosity (cp) @ °F	80 @ 138					
Gas:						
Specific gravity (air = 1.0)	0.67					
Heating value (Btu/cu. ft.)	1,040					
Water:						
Salinity, NaCl (ppm)	29,000					
T.D.S. (ppm)	31,680					
R_w (ohm/m) (77°F)	0.25					
ENHANCED RECOVERY PROJECTS						
Enhanced recovery projects	waterflood					
Date started	1956					
Date discontinued	active					
	caustic flood					
	1983					
	active					
	polymer flood					
	1969					
	1972					
Peak oil production (bbl)	See areas					81,809,162
Year						1970
Peak gas production, net (Mcf)						
Year						

Base of fresh water (ft.): See areas

Remarks: This is the only oil field in California administered under the Subsidence Abatement Act.

Selected References:

Crown, W.J., 1941, Wilmington Oil Field: Calif. Div. of Oil and Gas, Summary of Operations -- Calif. Oil Fields, Vol. 26.

Frame, R.G., 1952, Earthquake Damage, Its Cause and Prevention in the Wilmington Oil Field: Calif. Div. of Oil and Gas, Summary of Operations, Calif. Oil Fields, Vol. 38, No. 1

See Onshore Area for additional references.

DATE: May 1983

CALIFORNIA DIVISION OF OIL AND GAS

COUNTY: LOS ANGELES

WILMINGTON OIL FIELD
ONSHORE 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	Decalta International Corp. "Watson A" 2	Ranger Petroleum Corp. "Watson" 2	29 4S 13W	SB	3,784	Ranger	
Deepest well	Thums Long Beach Co. THX 2-1	Same as present	35 4S 13W	SB	9,881		"Repetto"-Puente Miocene-Pliocene

POOL DATA

ITEM	SHALLOW GAS SAND	TAR[a/]	RANGER[a/]	UPPER TERMINAL	LOWER TERMINAL	FIELD OR AREA DATA
Discovery date	April 1979	June 1937	January 1932	December 1936	January 1938	
Initial production rates						
Oil (bbl/day)	-	639	150	1,389	3,281	
Gas (Mcf/day)	190	88	-	300	-	
Flow pressure (psi)	588	-	-	-	-	
Bean size (in.)	8/64	-	-	-	-	
Initial reservoir pressure (psi)	1,040	1,040	1,270	1,420	1,633	
Reservoir temperature (°F)	-	124	141	150	166	
Initial oil content (STB/ac.-ft.)	-	2,046	1,733	1,414	1,300	
Initial gas content (MSCF/ac.-ft.)	-	175	279	290	410	
Formation	"Repetto"	"Repetto"	"Repetto"-Puente	Puente	Puente	
Geologic age	early Pliocene	early Pliocene	e Plio./l Miocene	late Miocene	late Miocene	
Average depth (ft.)	2,000	2,200	2,500	3,000	3,600	
Average net thickness (ft.)	30	120	150	300	360	
Maximum productive area (acres)	92					
RESERVOIR ROCK PROPERTIES						
Porosity (%)	22	32	32	30	29	
S_{oi} (%)	0	78	71	67	61	
S_{wi} (%)	30	22	29	33	39	
S_{gi} (%)	70	0	0	0	0	
Permeability to air (md)	-	1,600	1,638	735	500	
RESERVOIR FLUID PROPERTIES						
Oil:						
Oil gravity (°API)	-	12-15	12-25	14-25	25-30	
Sulfur content (% by wt.)	-	1.51	1.35	1.41	1.44	
Initial solution GOR (SCF/STB)	-	94	160	207	310	
Initial oil FVF (RB/STB)	-	1.055	1.094	1.124	1.181	
Bubble point press. (psia)	-	1,046	1,250	1,425	1,615	
Viscosity (cp) @ °F	-	283 @ 125	80 @ 125	45 @ 140	40 @ 163	
Gas:						
Specific gravity (air = 1.0)	0.58	0.59	0.67	0.73	0.77	
Heating value (Btu/cu. ft.)	988	1,040	1,040	1,040	1,040	
Water:						
Salinity, NaCl (ppm)	-	26,000	29,000	31,600	30,820	
T.D.S. (ppm)	-	28,000	31,680	32,600	32,000	
R_w (ohm/m) (77°F)	0.32	0.27	0.25	0.23	0.21	
ENHANCED RECOVERY PROJECTS						
Enhanced recovery projects		waterflood	waterflood	waterflood	waterflood	
Date started		1954	1956	1953	1956	
Date discontinued		active	active	active	active	
		CO_2 waterflood	caustic flood	polymer-micellar flood		
		1981	1983	1979		
		active	active	1981		
		steamflood	steamflood			
		1982	1967			
		active	1968			
			polymer flood			
			1969			
			1972			
Peak oil production (bbl)						
Year						
Peak gas production, net (Mcf)						
Year						

Base of fresh water (ft.): 1,600

Remarks: a/ Production from the Tar and Ranger was commingled.

Selected References:

Frame, R.G., 1957, A Review of Waterflooding in the Wilmington Oil Field: Calif. Div. of Oil and Gas, Summary of Operations -- Calif. Oil Fields, Vol. 43, No. 1.

Huey, W.F., 1964, Subsidence and Repressuring in the Wilmington Oil Field: Calif. Div. of Oil and Gas, Summary of Operations -- Calif. Oil Fields, Vol. 50, No. 2.

Murray-Aaron, E.R., and A.W. Pfiel, 1928, Recent Developments in the Wilmington Oil Field, Calif. Div. of Oil and Gas, Summary of Operations -- Calif. Oil Fields, Vol. 34, No. 2.

Olson, L., 1978, Shallow Aquifers and Surface Casing Requirements for Wilmington and Belmont Offshore Oil Fields: Calif. Div. of Oil and Gas, Pub. No. TR22.

DATE: May 1983

CALIFORNIA DIVISION OF OIL AND GAS

COUNTY: LOS ANGELES

WILMINGTON OIL FIELD ONSHORE 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	UNION PACIFIC	FORD	237	SCHIST		FIELD OR AREA DATA
Discovery date	January 1942	September 1937	November 1945	October 1945		
Initial production rates						
Oil (bbl/day)	232	307	614	417		
Gas (Mcf/day)	173	250	63	85		
Flow pressure (psi)						
Bean size (in.)						
Initial reservoir pressure (psi)	1,880	2,205	2,572	2,715		
Reservoir temperature (°F)	180	208	228	238		
Initial oil content (STB/ac.-ft.)	1,135	753	787	-		
Initial gas content (MSCF/ac.-ft.)	388	346	477	-		
Formation	Puente	Puente	Puente	Catalina Schist		
Geologic age	late Miocene	late Miocene	late Miocene	Cret. or older		
Average depth (ft.)	4,000	4,550	5,550	5,850		
Average net thickness (ft.)	125	300	200	15		
Maximum productive area (acres)						7,242
RESERVOIR ROCK PROPERTIES						
Porosity (%)	29	24	23	12		
S_{oi} (%)	58	53	68	-		
S_{wi} (%)	42	47	32	-		
S_{gi} (%)	0	0	0	-		
Permeability to air (md)	140	80	168	26		
RESERVOIR FLUID PROPERTIES						
Oil:						
Oil gravity (°API)	25-32	28-32	28-32	28-32		
Sulfur content (% by wt.)						
Initial solution GOR (SCF/STB)	338	473	542	-		
Initial oil FVF (RB/STB)	1.204	1.310	1.362	-		
Bubble point press. (psia)	1,860	1,955	2,575	2,715		
Viscosity (cp) @ °F						
Gas:						
Specific gravity (air = 1.0)	-	0.88	0.90	0.80		
Heating value (Btu/cu. ft.)	-	-	-	1,353		
Water:						
Salinity, NaCl (ppm)	34,250	29,110	25,720	30,000		
T.D.S. (ppm)	-	31,323	28,222	43,000		
R_w (ohm/m) (77°F)	-	0.243	0.255	0.220		
ENHANCED RECOVERY PROJECTS						
Enhanced recovery projects	waterflood	waterflood	waterflood			
Date started	1959	1959	1960			
Date discontinued	active	active	active			
Peak oil production (bbl)						34,021,599
Year						1938
Peak gas production, net (Mcf)						
Year						

Base of fresh water (ft.): 1,600

Remarks:

Selected References:

Thomas, J.R., 1957, Extension of Wilmington Oil Field: Calif. Div. of Oil and Gas, Summary of Operations -- Calif. Oil Fields, Vol. 43, No. 1.

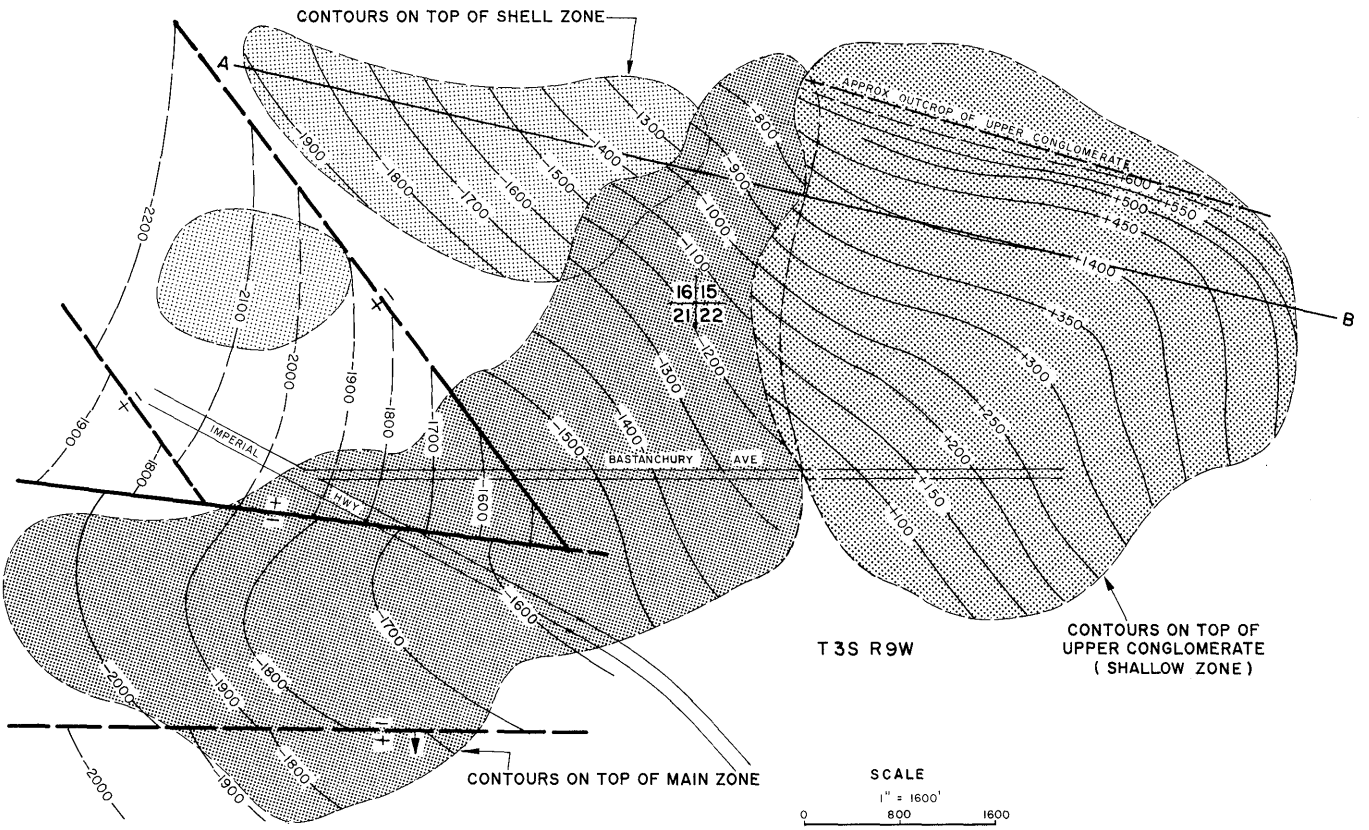
van Wingen, N., 1962, Review of Wilmington Waterfloods: Calif. Div. of Oil and Gas, Summary of Operations -- Calif. Oil Fields, Vol. 48, No. 1.

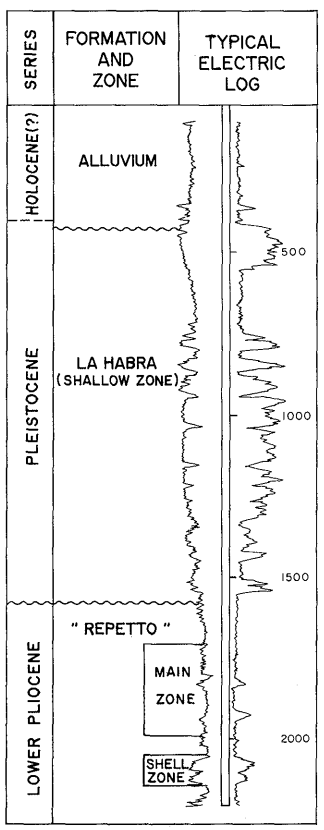
Ybarra, R.A., and A.D. Stockton, 1964, Ford Pool of Fault Block I, Wilmington Oil Field: Calif. Div. of Oil and Gas, Summary of Operations -- Calif. Oil Fields, Vol. 50, No. 1.

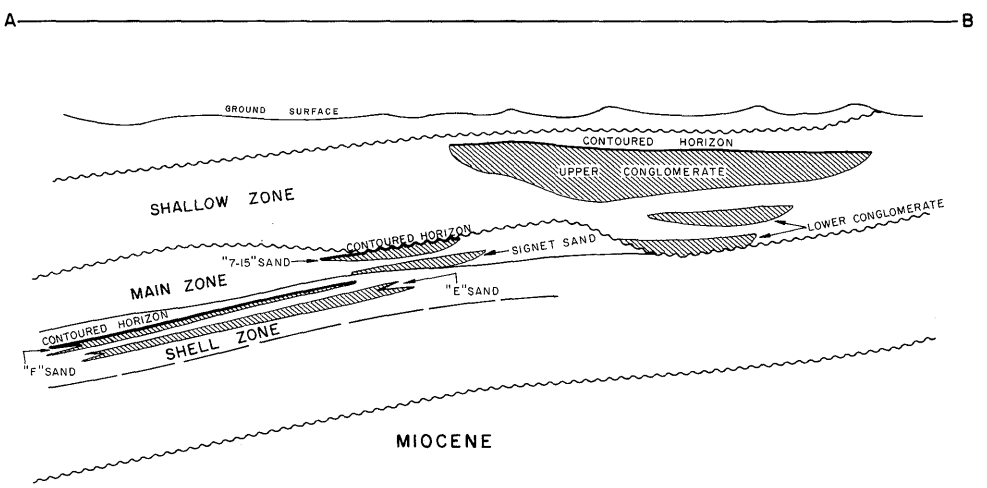
DATE: May 1983

CALIFORNIA DIVISION OF OIL AND GAS

YORBA LINDA OIL FIELD







COUNTY: ORANGE

YORBA LINDA 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	Shell California Production Inc. "P.E. Todd" 1	L.C. Simmel No. 1	22 3S 9W	SB	2,722	Main	
Deepest well	Harold C. Ramser "Y.J.O.G." 1	Western Gulf Oil Co. "Y.J. Orange Grove" 1	21 3S 9W	SB	6,085		Puente late Miocene

POOL DATA

ITEM	SHALLOW (CONGLOMERATE)	MAIN (SIGNET SAND)	SHELL (F SANDS)	MIOCENE CONTACT		FIELD OR AREA DATA
Discovery date	March 1954	June 1930	November 1937	July 1961		
Initial production rates						
Oil (bbl/day)	18	unknown	87	63		
Gas (Mcf/day)						
Flow pressure (psi)						
Bean size (in.)						
Initial reservoir pressure (psi)	15-200	500	600-800	-		
Reservoir temperature (°F)	70-85	85-105	110-115	-		
Initial oil content (STB/ac.-ft.)	1,360-1,475	1,475-1,516	1,516-1,633	-		
Initial gas content (MSCF/ac.-ft.)						
Formation	La Habra	"Repetto"	"Repetto"	Puente		
Geologic age	Pleistocene	early Pliocene	early Pliocene	late Miocene		
Average depth (ft.)	200-650	1,800-2,100	1,700-2,000	2,900		
Average net thickness (ft.)	250	150	125	70		
Maximum productive area (acres)	220	200	120	-		825
RESERVOIR ROCK PROPERTIES						
Porosity (%)	25-30	28-30	30-44	-		
S_{oi} (%)	65	65-74	65-70	-		
S_{wi} (%)	35	26-35	30-35	-		
S_{gi} (%)						
Permeability to air (md)	50-2,000	500-1,800	500	-		
RESERVOIR FLUID PROPERTIES						
Oil:						
Oil gravity (°API)	12-14	13-17	13-20	15		
Sulfur content (% by wt.)						
Initial solution GOR (SCF/STB)						
Initial oil FVF (RB/STB)	1.050	1.050	1.050	-		
Bubble point press. (psia)						
Viscosity (cp) @ °F	6,400 @ 110	1,500 @ 110	85-1,000 @ 110	-		
Gas:						
Specific gravity (air = 1.0)						
Heating value (Btu/cu. ft.)						
Water:						
Salinity, NaCl (ppm)						
T.D.S. (ppm)	1,420	1,100	-	-		
R_w (ohm/m) (77°F)						
ENHANCED RECOVERY PROJECTS						
Enhanced recovery projects	steamflood	steamflood	steamflood			
Date started	1964	1971	1964			
Date discontinued	active	active	active			
	cyclic steam	hot waterflood	hot waterflood			
	1960	1979	1969			
	active	active	active			
		cyclic steam	cyclic steam			
		1963	1965			
		active	active			
Peak oil production (bbl)						3,576,736
Year						1970
Peak gas production, net (Mcf)						144,650
Year						1956

Base of fresh water (ft.): 2,500

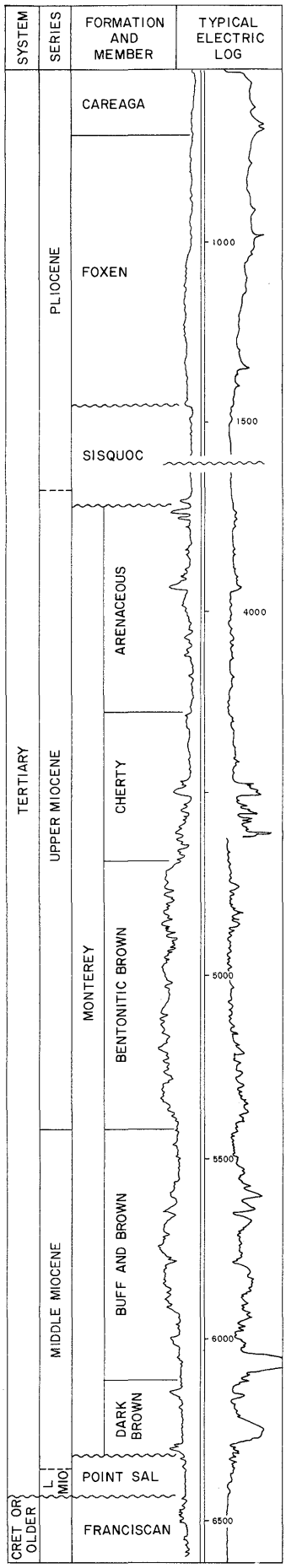
Remarks:

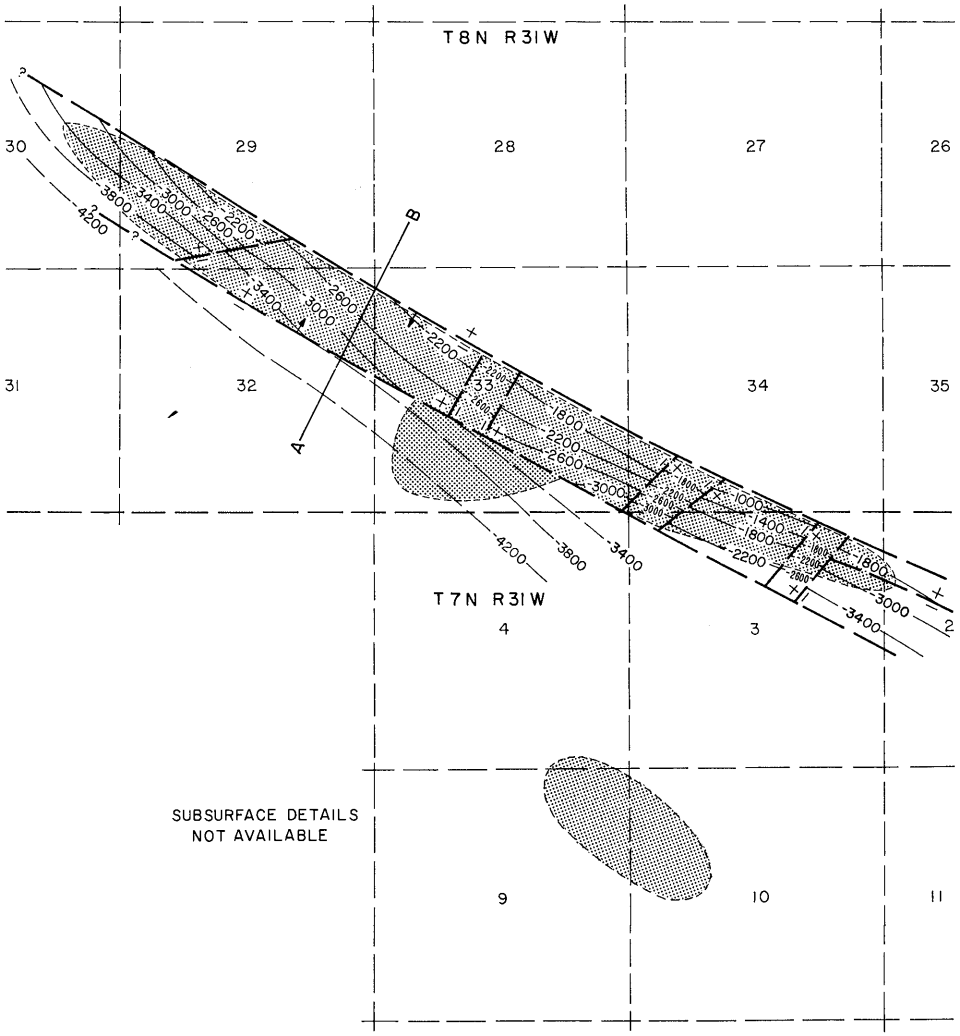
Selected References: Barger, R.M., and V.F. Gaede, 1956, Yorba Linda Oil Field: Calif. Div. of Oil and Gas, Summary of Operations -- Calif. Oil Fields, Vol. 42, No. 2.

DATE: January 1989

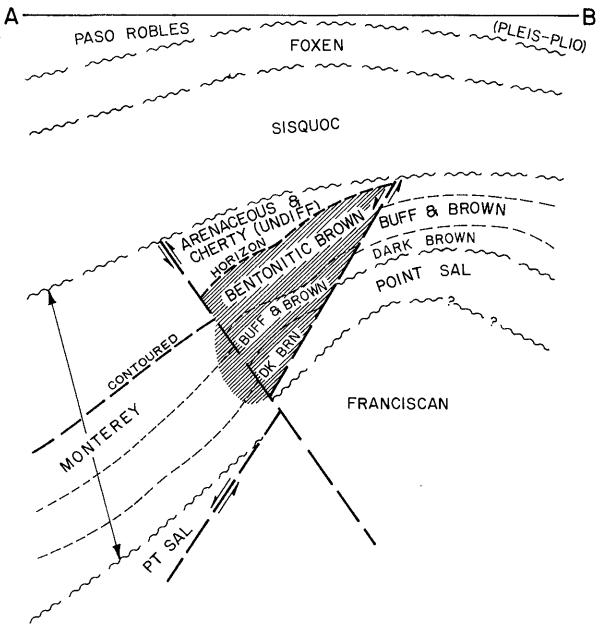
CALIFORNIA DIVISION OF OIL AND GAS

ZACA OIL FIELD





CONTOURS ON TOP OF BENTONITIC BROWN



COUNTY: SANTA BARBARA

ZACA 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	Texaco Producing Inc. "Davis" 1	Tidewater Associated Oil Co. "Davis" 1	33 8N 31W	SB	6,643	Monterey	
Deepest well	Texaco Producing Inc. "Luton" 113	Tidewater Associated Oil Co. "Luton" 113	29 8N 31W	SB	6,685		Monterey Middle Miocene

POOL DATA

ITEM	MONTEREY					FIELD OR AREA DATA
Discovery date	November 1942					
Initial production rates						
Oil (bbl/day)	94					
Gas (Mcf/day)						
Flow pressure (psi)						
Bean size (in.)						
Initial reservoir pressure (psi)	2,200					
Reservoir temperature (°F)	125-160					
Initial oil content (STB/ac.-ft.)	470					
Initial gas content (MSCF/ac.-ft.)						
Formation	Monterey					
Geologic age	Miocene					
Average depth (ft.)	3,500					
Average net thickness (ft.)	1,700					
Maximum productive area (acres)	720					
RESERVOIR ROCK PROPERTIES						
Porosity (%)	fractured shale					
So_i (%)						
Sw_i (%)						
Sg_i (%)						
Permeability to air (md)						
RESERVOIR FLUID PROPERTIES						
Oil:						
Oil gravity (°API)	8.0					
Sulfur content (% by wt.)	6.76-8.00					
Initial solution GOR (SCF/STB)	200					
Initial oil FVF (RB/STB)						
Bubble point press. (psia)						
Viscosity (cp) @ °F						
Gas:						
Specific gravity (air = 1.0)	0.7					
Heating value (Btu/cu. ft.)						
Water:						
Salinity, NaCl (ppm)	5,134					
T.D.S. (ppm)						
R_w (ohm/m) (77°F)	1.1					
ENHANCED RECOVERY PROJECTS						
Enhanced recovery projects	cyclic steam					
Date started	1964					
Date discontinued	1966 waterflood 1953 1973a/					
Peak oil production (bbl)	1,708,887					
Year	1954					
Peak gas production, net (Mcf)	499,862					
Year	1954					

Base of fresh water (ft.): 1,400

Remarks: a/ Because the principal purpose of the project was waste-water disposal, the project was reclassified as a water-disposal project in January 1973. The project is still active, and the injected water has some waterflooding effect.

Selected References:

Am. Assoc. Petroleum Geologists, 1970, Petroleum Potential of the Santa Maria Province, California; Memoir 15, Vol. 1, p. 325.

Dibblee, T.W., Jr., 1950, Geology of Southwestern Santa Barbara County, California: Calif. Div. of Mines Bull. 150, p. 69.

Dolman, S.G., 1942, Operations in Dist. No. 3: Calif. Div. of Oil and Gas, Summary of Operations--Calif. Oil Fields, Vol. 28, No. 2, p. 61.

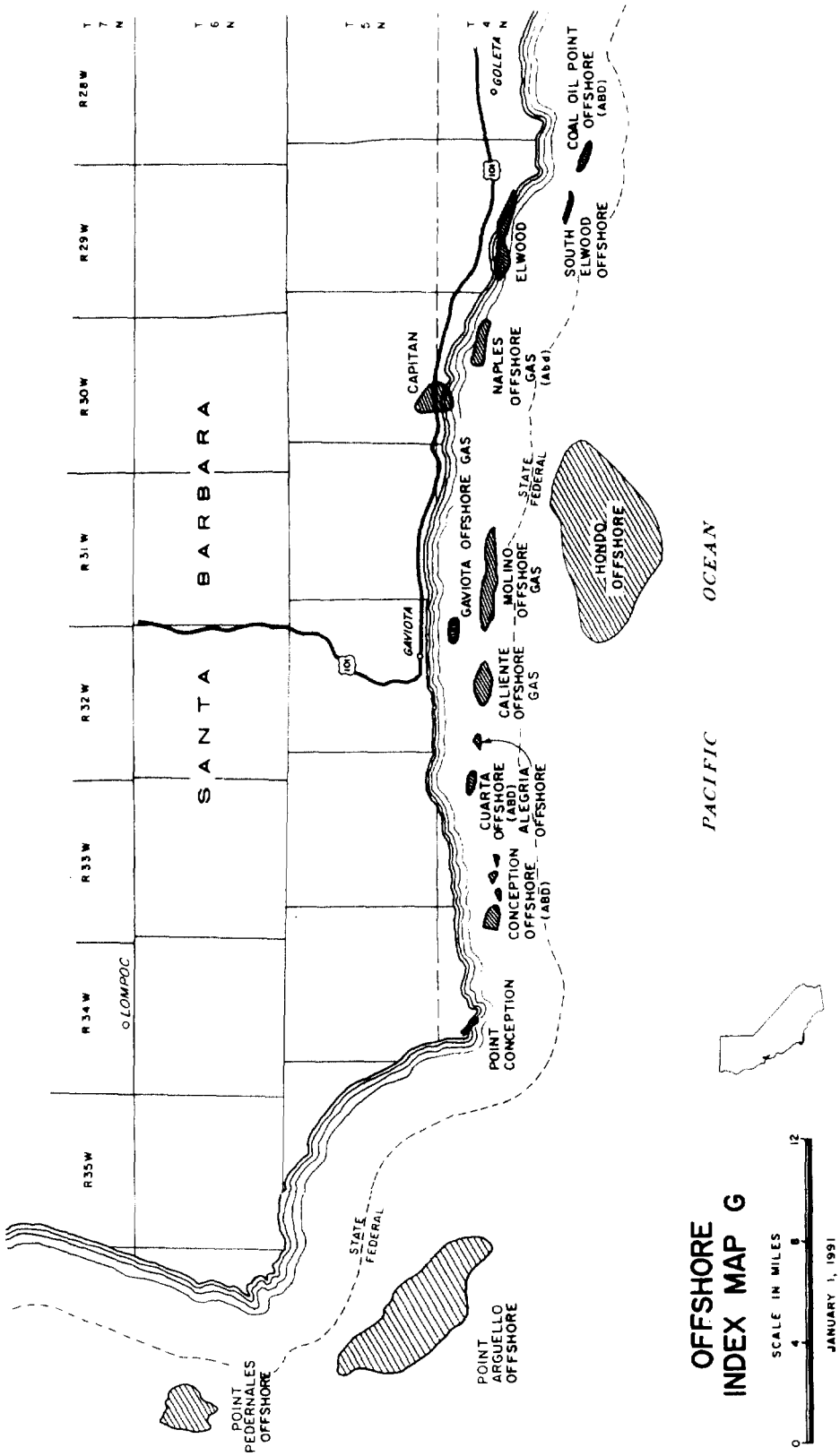
Regan, L.J., and A.W. Hughes, 1950, Fractured Reservoirs of Santa Maria District, California: Am. Assoc. Petroleum Geologists Bull. 150. p. 69.

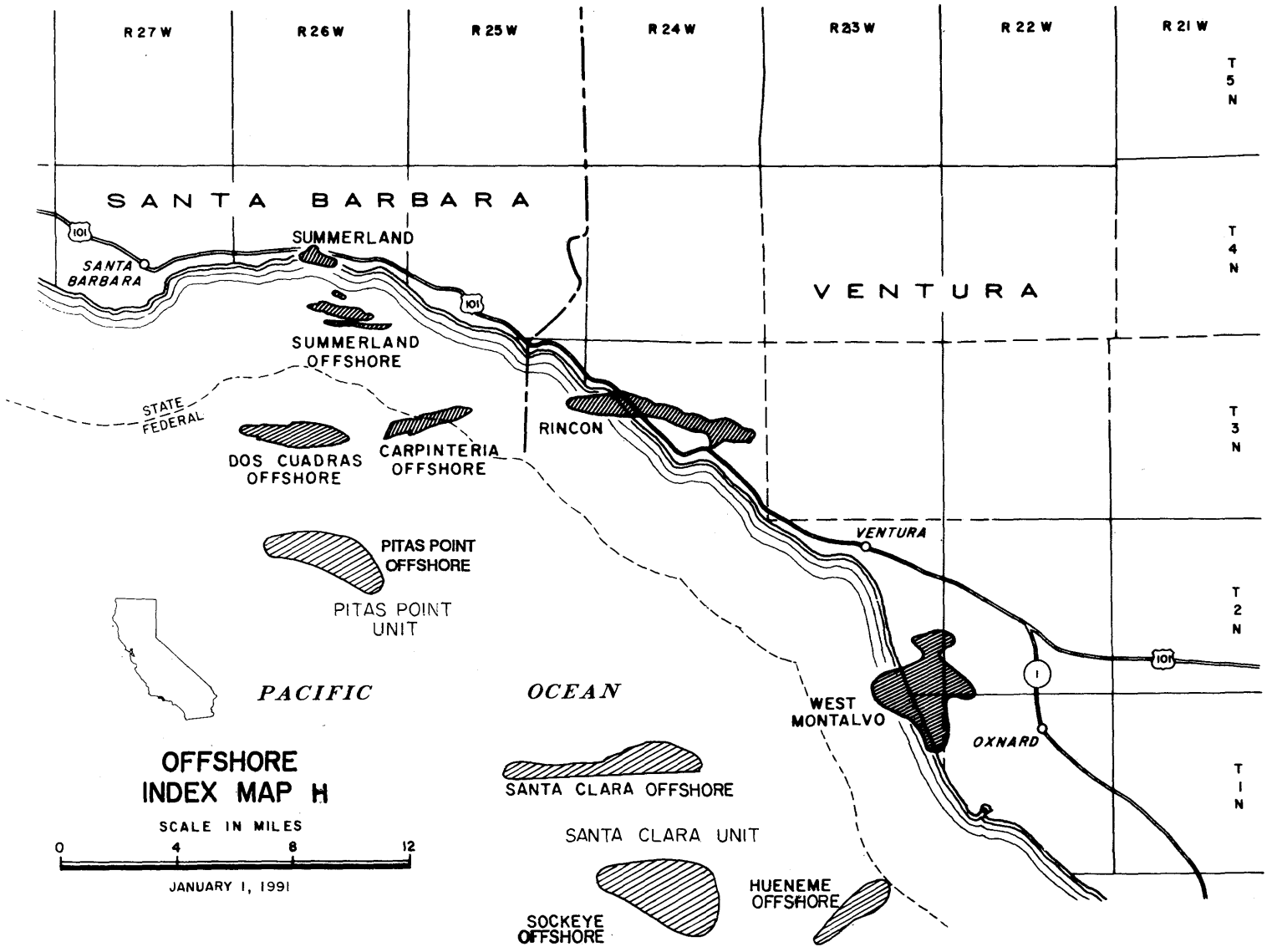
Ziemianski, W., M. Ponek, and B. Newman, 1983, Zaca Field-Santa Maria Basin: Petroleum Generation and Occurrence in the Miocene Monterey Formation, California, the Pacific Section Soc. Econ. Paleontologists and Mineralogists, p. 228.

DATE: January 1989

CALIFORNIA DIVISION OF OIL AND GAS

OFFSHORE


SANTA BARBARA
PACIFIC OCEAN
LOMPOC
GAVIOTA
GOLETA
CAPITAN
POINT CONCEPTION
POINT ARGUELLO OFFSHORE
POINT PEDERNALES OFFSHORE
CONCEPTION OFFSHORE (ABD)
CUARTA OFFSHORE (ABD)
ALEGRIA OFFSHORE
CALIENTE OFFSHORE GAS
MOLINO OFFSHORE GAS
GAVIOTA OFFSHORE GAS
HONDO OFFSHORE
NAPLES OFFSHORE GAS (Abd)
ELWOOD
SOUTH ELWOOD OFFSHORE
COAL OIL POINT OFFSHORE (ABD)
STATE
FEDERAL
R35W
R34W
R33W
R32W
R31W
R30W
R29W
R28W
T7N
T6N
T5N
T4N
OFFSHORE INDEX MAP G
SCALE IN MILES
JANUARY 1, 1991


R 27 W
R 26 W
R 25 W
R 24 W
R 23 W
R 22 W
R 21 W
T 5 N
T 4 N
T 3 N
T 2 N
T 1 N
SANTA BARBARA
VENTURA
101
SUMMERLAND
SANTA BARBARA
SUMMERLAND OFFSHORE
STATE
FEDERAL
DOS CUADRAS OFFSHORE
CARPINTERIA OFFSHORE
RINCON
VENTURA
PITAS POINT OFFSHORE
PITAS POINT UNIT
PACIFIC
OCEAN
WEST MONTALVO
OXNARD
SANTA CLARA OFFSHORE
SANTA CLARA UNIT
HUENEME OFFSHORE
SOCKEYE OFFSHORE
OFFSHORE INDEX MAP H
SCALE IN MILES
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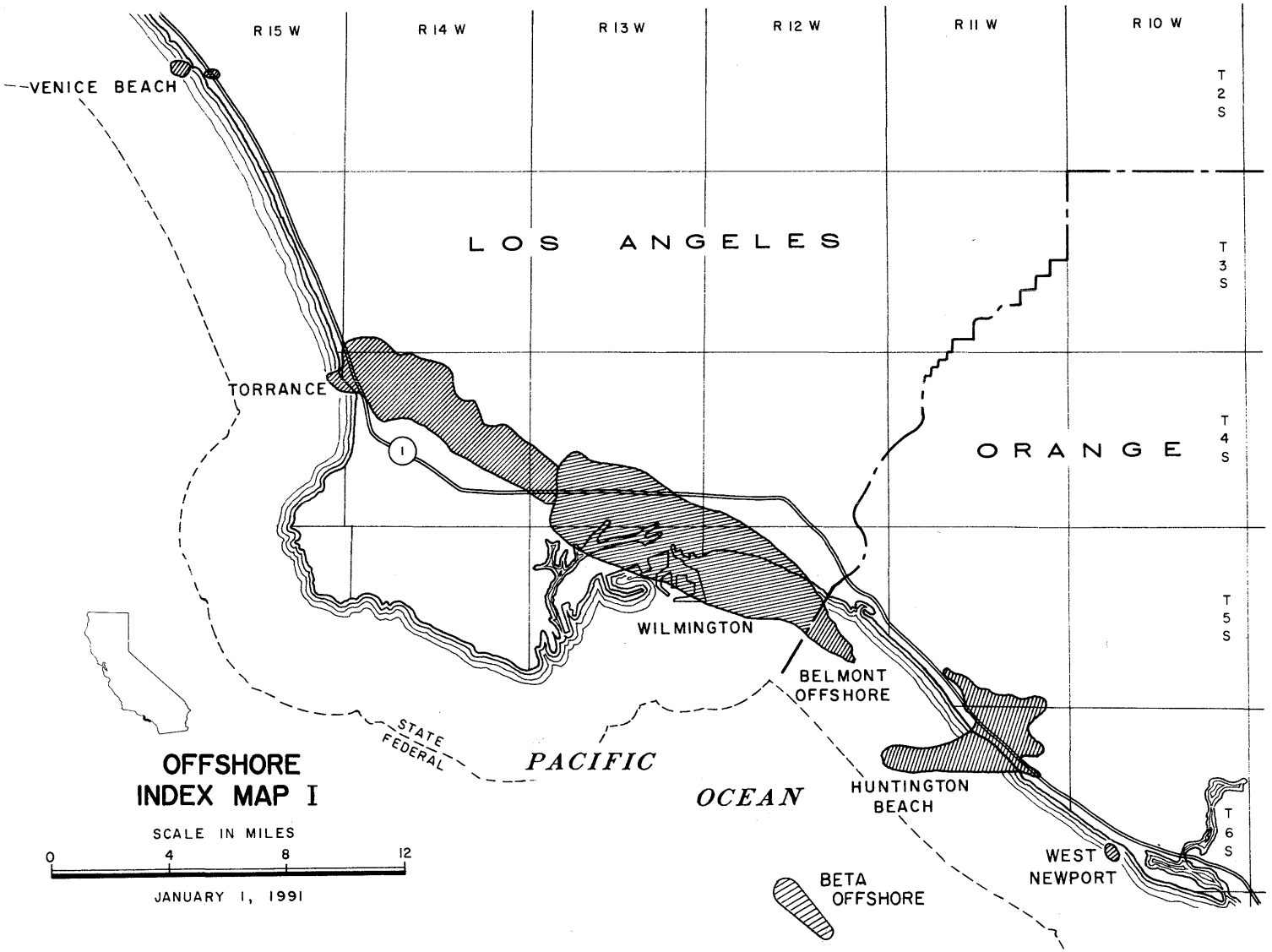
8
12
JANUARY 1, 1991


R 15 W
R 14 W
R 13 W
R 12 W
R 11 W
R 10 W
T 2 S
T 3 S
T 4 S
T 5 S
T 6 S
VENICE BEACH
LOS ANGELES
ORANGE
TORRANCE
1
WILMINGTON
BELMONT OFFSHORE
HUNTINGTON BEACH
WEST NEWPORT
BETA OFFSHORE
STATE
FEDERAL
PACIFIC
OCEAN
OFFSHORE
INDEX MAP I
SCALE IN MILES
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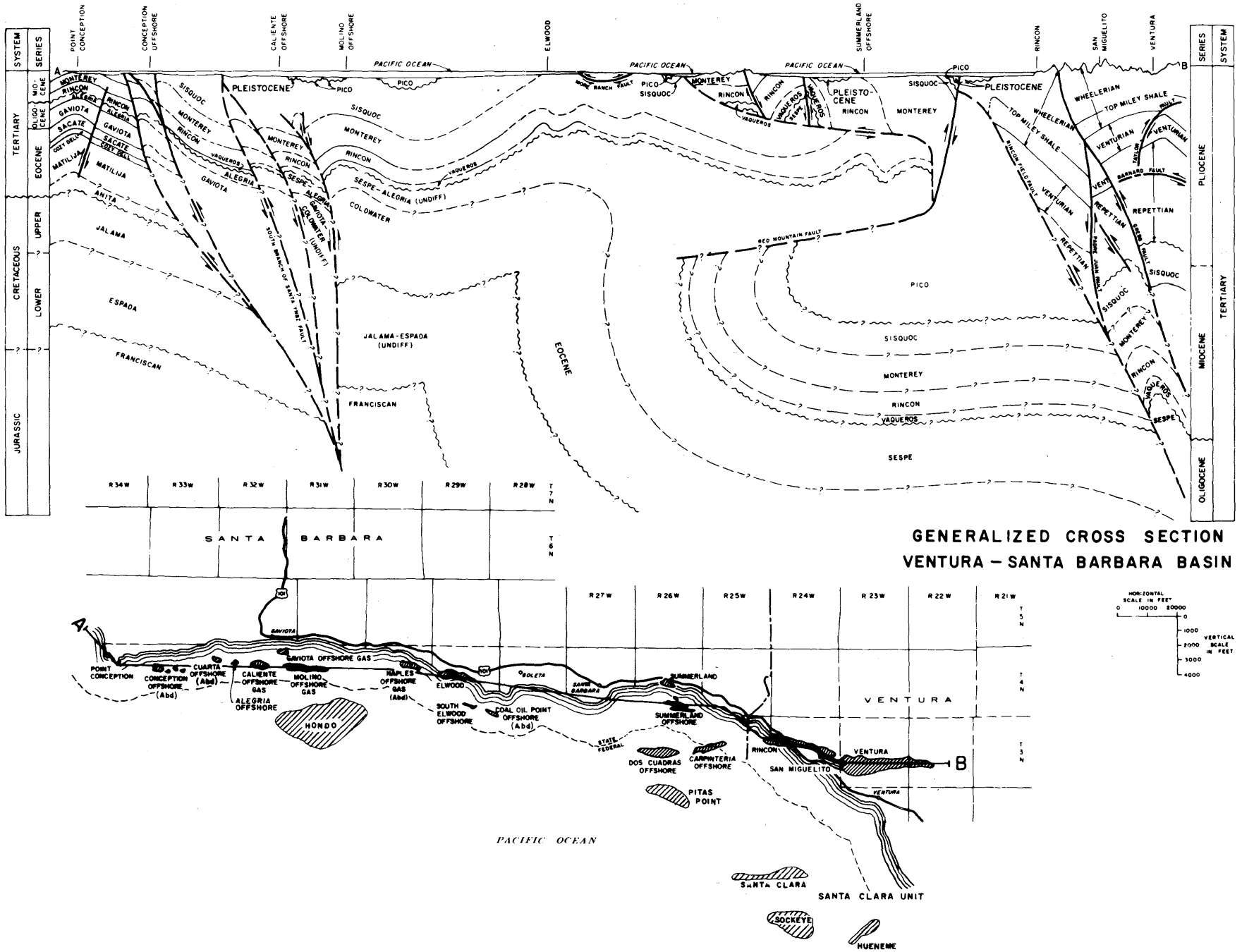
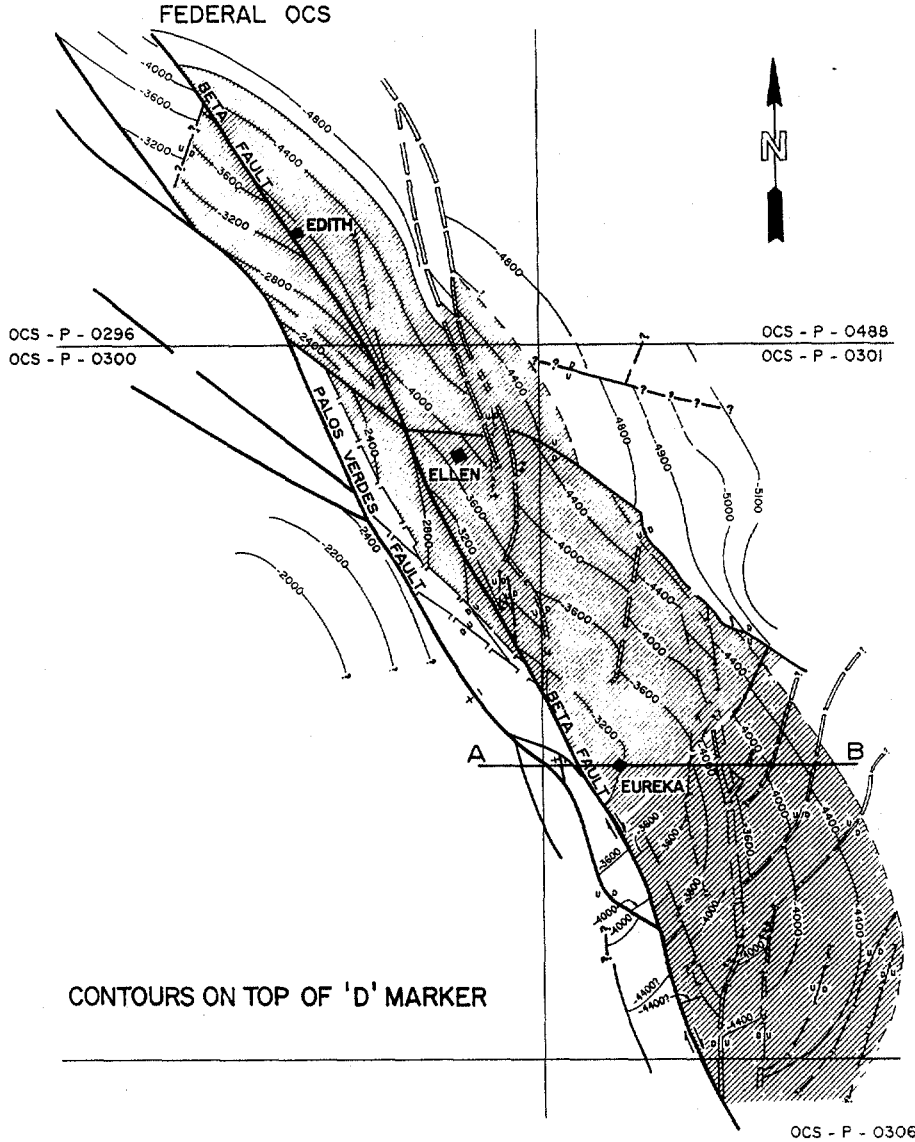
4
8
12
JANUARY 1, 1991

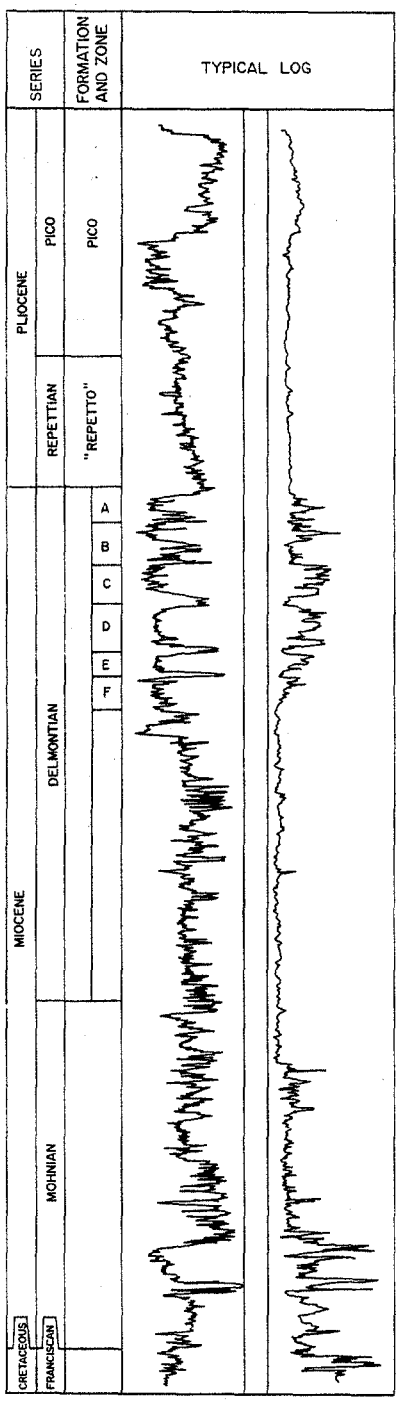


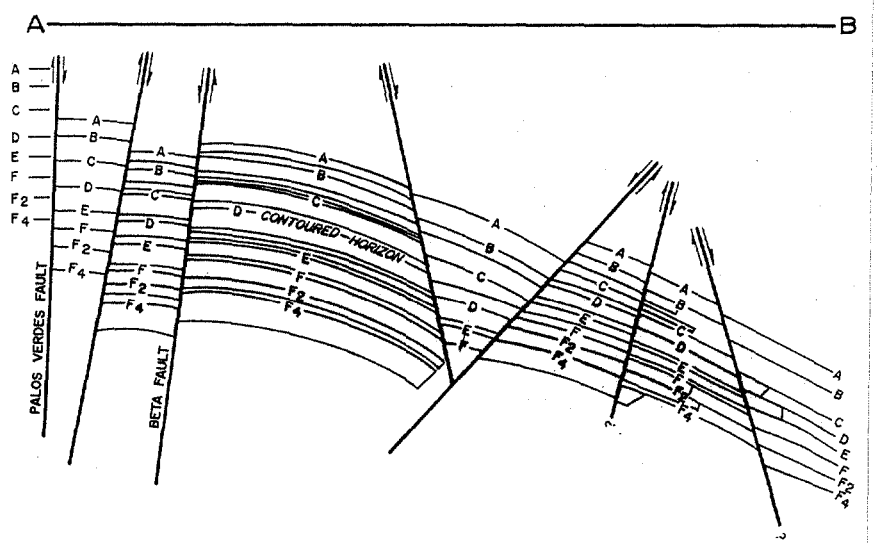
GENERALIZED CROSS SECTION
VENTURA – SANTA BARBARA BASIN

BETA OFFSHORE OIL FIELD

FEDERAL OCS







COURTESY OF SHELL WESTERN E & P, INC.

COUNTY: LOS ANGELES

BETA OFFSHORE OIL FIELD
FEDERAL OCS

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. OCS-P-300-1	Shell Oil Company OCS-P-300-1			4,850	Delmontian Miocene	
Deepest well	Shell Western Expl. & Prod. Inc. OCS-P-300-A51R	Shell California Production, Inc. OCS-P-300-A51R			10,262		Franciscan

POOL DATA

ITEM						FIELD OR AREA DATA
Discovery date	August 1976					
Initial production rates						
Oil (bbl/day)	1,186					
Gas (Mcf/day)	225					
Flow pressure (psi)						
Bean size (in.)	on gas lift					
Initial reservoir pressure (psi)	1,700					
Reservoir temperature (°F)	140					
Initial oil content (STB/ac.-ft.)	1,000					
Initial gas content (MSCF/ac.-ft.)						
Formation	Delmontian					
Geologic age	Miocene					
Average depth (ft.)	3,900					
Average net thickness (ft.)	350					
Maximum productive area (acres)	1,900					
RESERVOIR ROCK PROPERTIES						
Porosity (%)	26					
So_i (%)	60					
Sw_i (%)	40					
Sg_i (%)	0					
Permeability to air (md)	100					
RESERVOIR FLUID PROPERTIES						
Oil:						
Oil gravity (°API)	10-22					
Sulfur content (% by wt.)	3.8					
Initial solution GOR (SCF/STB)	186					
Initial oil FVF (RB/STB)	1.09					
Bubble point press. (psia)	1,700					
Viscosity (cp) @ °F	10-200 @ 140					
Gas:						
Specific gravity (air = 1.0)	0.6					
Heating value (Btu/cu. ft.)	1,050					
Water:						
Salinity, NaCl (ppm)	31,500					
T.D.S. (ppm)	33,000					
R_w (ohm/m) (77°F)	0.13					
ENHANCED RECOVERY PROJECTS						
Enhanced recovery projects	waterflood					
Date started	1983					
Date discontinued	active					
Peak oil production (bbl)	7,040,207					
Year	1986					
Peak gas production, net (Mcf)	2,444,898					
Year	1986					

Base of fresh water (ft.):

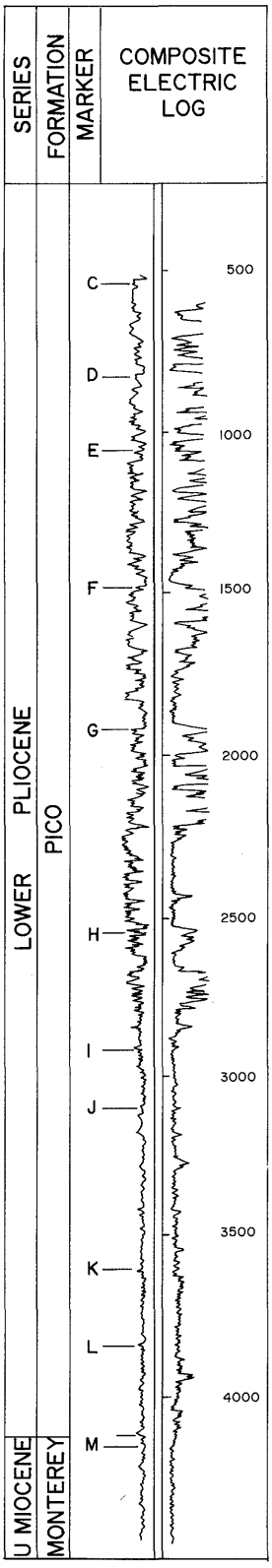
Remarks:

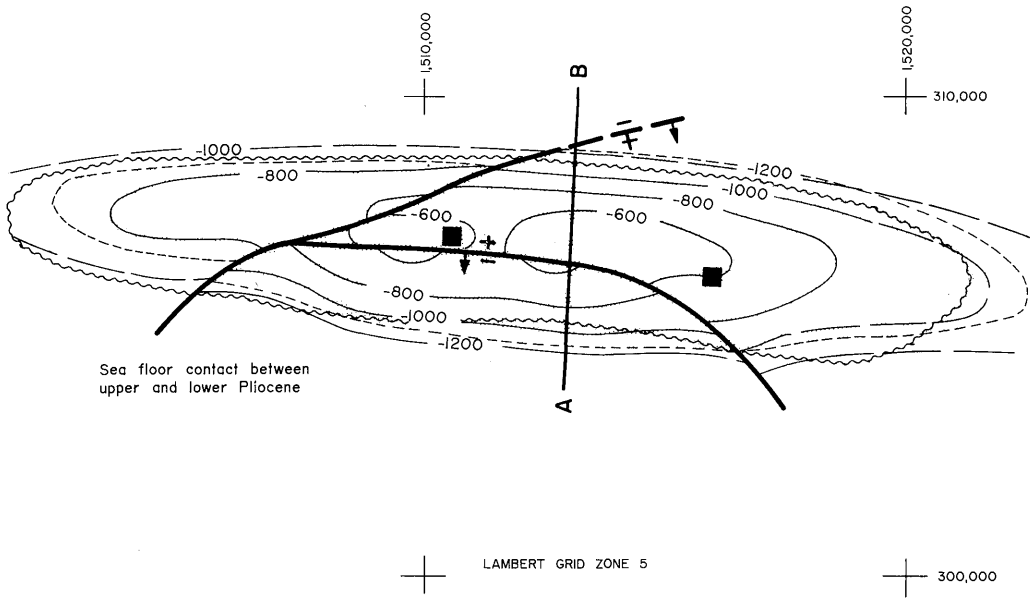
Selected References:

DATE: February 1990

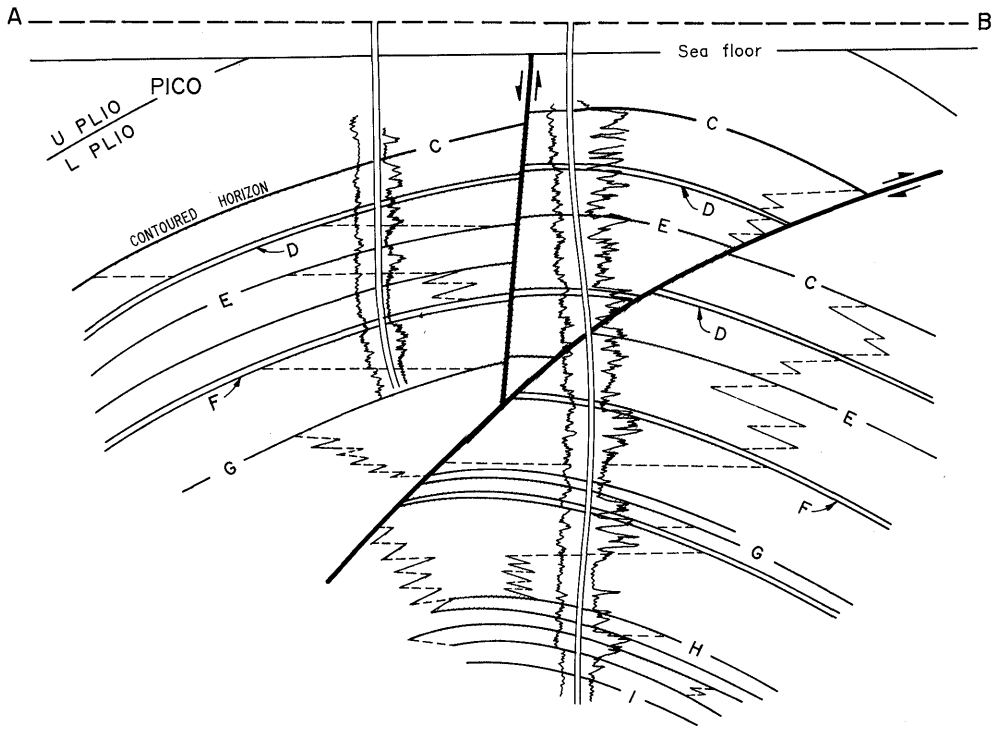
CALIFORNIA DIVISION OF OIL AND GAS

DOS CUADRAS OFFSHORE OIL FIELD
FEDERAL OCS





CONTOURS ON C ELECTRIC LOG MARKER



After U S G S Prof. Paper 679

COUNTY: SANTA BARBARA

DOS CUADRAS OFFSHORE OIL FIELD
FEDERAL OCS

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	Union Oil Co. of Calif. A-20	Same as present	X-1,513 Y-307		3,673	Repetto	
Deepest well	Union Oil Co. of Calif. No. 1	"	X-1,515 Y-317		13,292		Monterey Miocene

POOL DATA

ITEM	REPETTO	MONTEREY				FIELD OR AREA DATA
Discovery date	March 1969	July 1972				
Initial production rates						
Oil (bbl/day)	1,710	155				
Gas (Mcf/day)	485	265				
Flow pressure (psi)						
Bean size (in.)						
Initial reservoir pressure (psi)						
Reservoir temperature (°F)						
Initial oil content (STB/ac.-ft.)						
Initial gas content (MSCF/ac.-ft.)						
Formation	Pico	Monterey				
Geologic age	e Pliocene	Miocene				
Average depth (ft.)	2,300	9,500				
Average net thickness (ft.)	745	46				
Maximum productive area (acres)						
RESERVOIR ROCK PROPERTIES						
Porosity (%)	20-30***	-				
S_{oi} (%)	50-80	-				
S_{wi} (%)	20-30	-				
S_{gi} (%)	0	-				
Permeability to air (md)	0.5-540.0	-				
RESERVOIR FLUID PROPERTIES						
Oil:						
Oil gravity (°API)	18-32	34				
Sulfur content (% by wt.)						
Initial solution GOR (SCF/STB)	240	-				
Initial oil FVF (RB/STB)	1.14-1.17	-				
Bubble point press. (psia)	1,385	-				
Viscosity (cp) @ °F	6.6 @ 124	-				
Gas:						
Specific gravity (air = 1.0)	0.8	-				
Heating value (Btu/cu. ft.)						
Water:						
Salinity, NaCl (ppm)	15,900	-				
T.D.S. (ppm)						
R_w (ohm/m) (77°F)						
ENHANCED RECOVERY PROJECTS						
Enhanced recovery projects	waterflood					
Date started	1971					
Date discontinued	active					
	polymer flood					
	1986					
	active					
Peak oil production (bbl)						27,752,972
Year						1971
Peak gas production, net (Mcf)						15,486,876
Year						1971

Base of fresh water (ft.):

Remarks: The field is produced from Unocal's Platforms A, B, C, and Hillhouse.

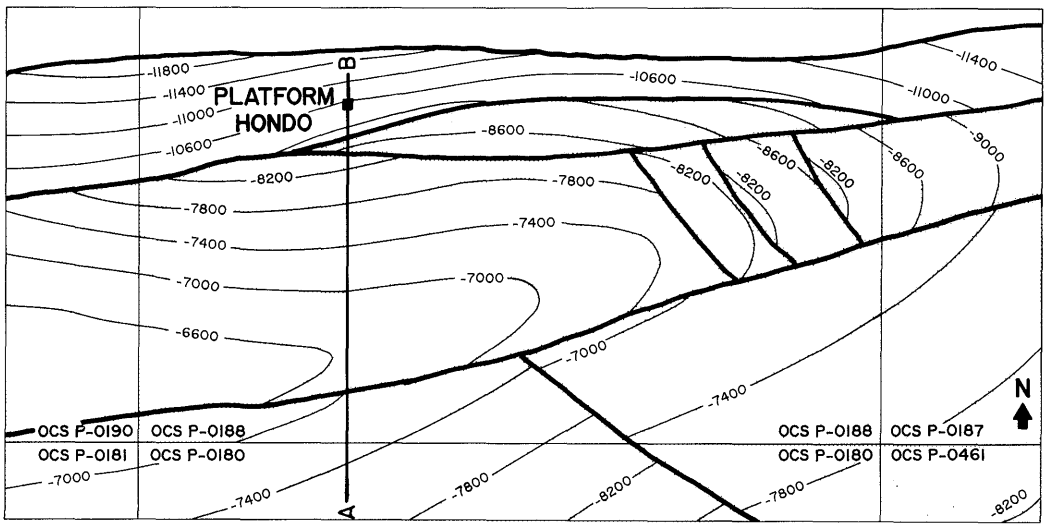
Selected References: McColloh, J.H., 1969, Geologic Characteristics of the Dos Cuadras Offshore Field: U.S. Geol. Survey Prof. Paper 679-C.
Adams, M.V., 1973, Report on Water Injectivity Test, Lease OCS-P 0241, Well No. B-49-I, Dos Cuadras Field, Santa Barbara Channel, Offshore Calif., U.S. Geol. Survey Cir. 687.

DATE: March 1991

***Representative value for area, formation, and depth

CALIFORNIA DIVISION OF OIL AND GAS

HONDO OFFSHORE OIL FIELD
FEDERAL OCS



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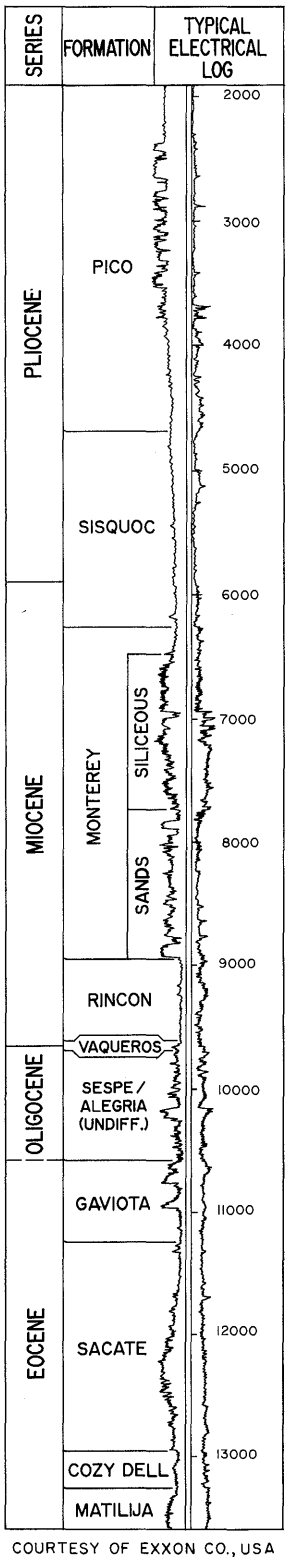
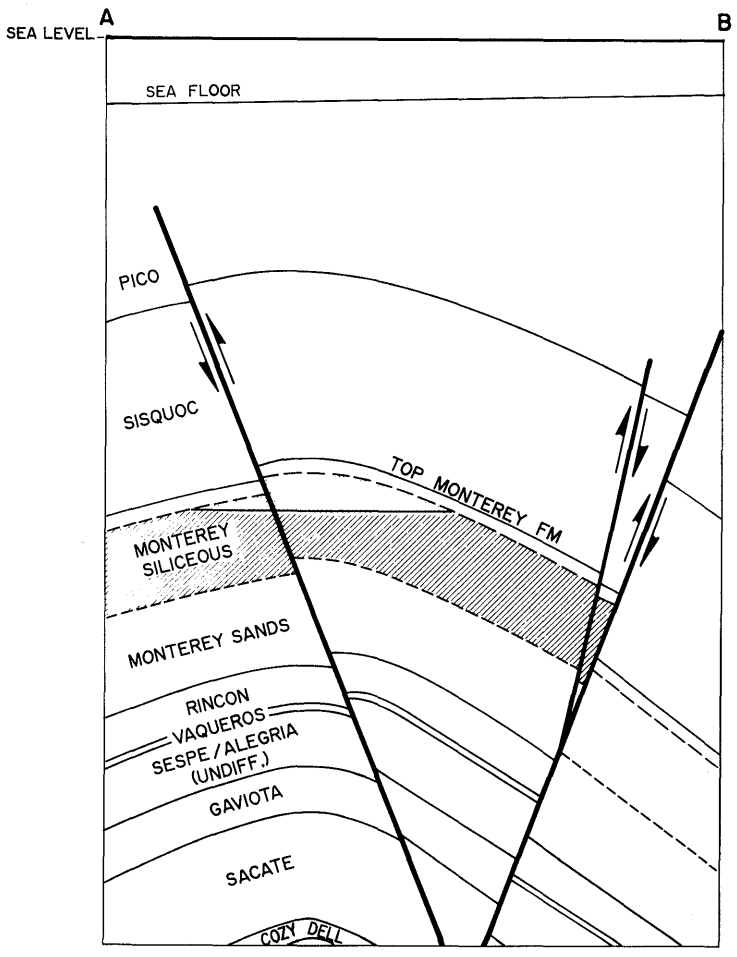


COURTESY OF EXXON CO., USA

HONDO "A" CROSS SECTION



COUNTY: SANTA BARBARA

HONDO OFFSHORE OIL FIELD
FEDERAL OCS

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	Exxon Corp. OCS P-0188 190 #1	Exxon Corp. OCS P-10188190 #1	-	-	13,621	Monterey	
Deepest well	Exxon Corp. OCS P-0188 H-37	Same as present	-	-	17,900		Monterey Miocene

POOL DATA

ITEM	MONTEREY					FIELD OR AREA DATA
Discovery date	July 1968					
Initial production rates						
Oil (bbl/day)	7,400					
Gas (Mcf/day)	3,100					
Flow pressure (psi)	230					
Bean size (in.)						
Initial reservoir pressure (psi)						
Reservoir temperature (°F)	210					
Initial oil content (STB/ac.-ft.)						
Initial gas content (MSCF/ac.-ft.)						
Formation						
Geologic age	Miocene					
Average depth (ft.)	8,200 vss[a/]					
Average net thickness (ft.)	1,250					
Maximum productive area (acres)	3,600					
RESERVOIR ROCK PROPERTIES						
Porosity (%)						
So_i (%)						
Sw_i (%)						
Sg_i (%)						
Permeability to air (md)						
RESERVOIR FLUID PROPERTIES						
Oil:						
Oil gravity (°API)	13-20					
Sulfur content (% by wt.)						
Initial solution GOR (SCF/STB)	420					
Initial oil FVF (RB/STB)						
Bubble point press. (psia)						
Viscosity (cp) @ °F						
Gas:						
Specific gravity (air = 1.0)						
Heating value (Btu/cu. ft.)						
Water:						
Salinity, NaCl (ppm)	20,000					
T.D.S. (ppm)						
R_w (ohm/m) (77°F)						
ENHANCED RECOVERY PROJECTS						
Enhanced recovery projects						
Date started						
Date discontinued						
Peak oil production (bbl)	13,485,000					
Year	1982					
Peak gas production, net (Mcf)	23,400,000					
Year	1989					

Base of fresh water (ft.):

Remarks: The field is produced from Exxon's Platform Hondo.

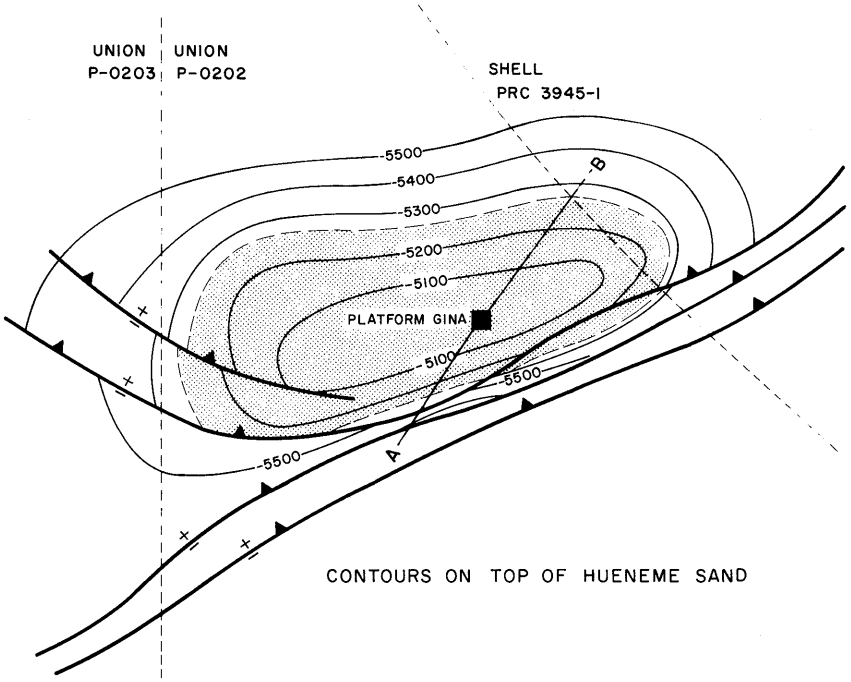
a/ vertical sub-sea level

Selected References:

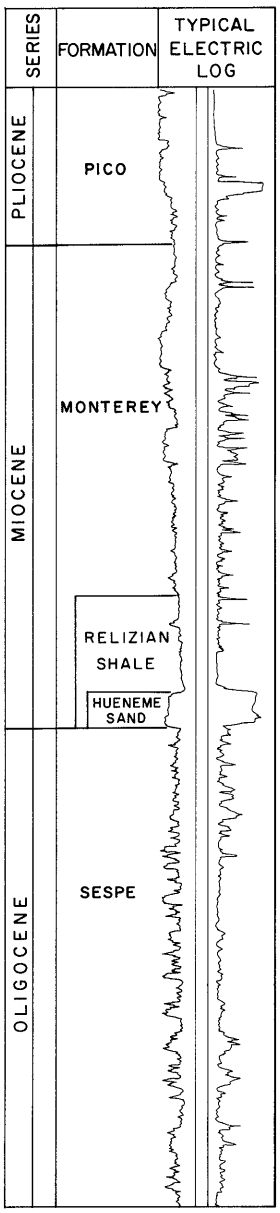
DATE: January 1991

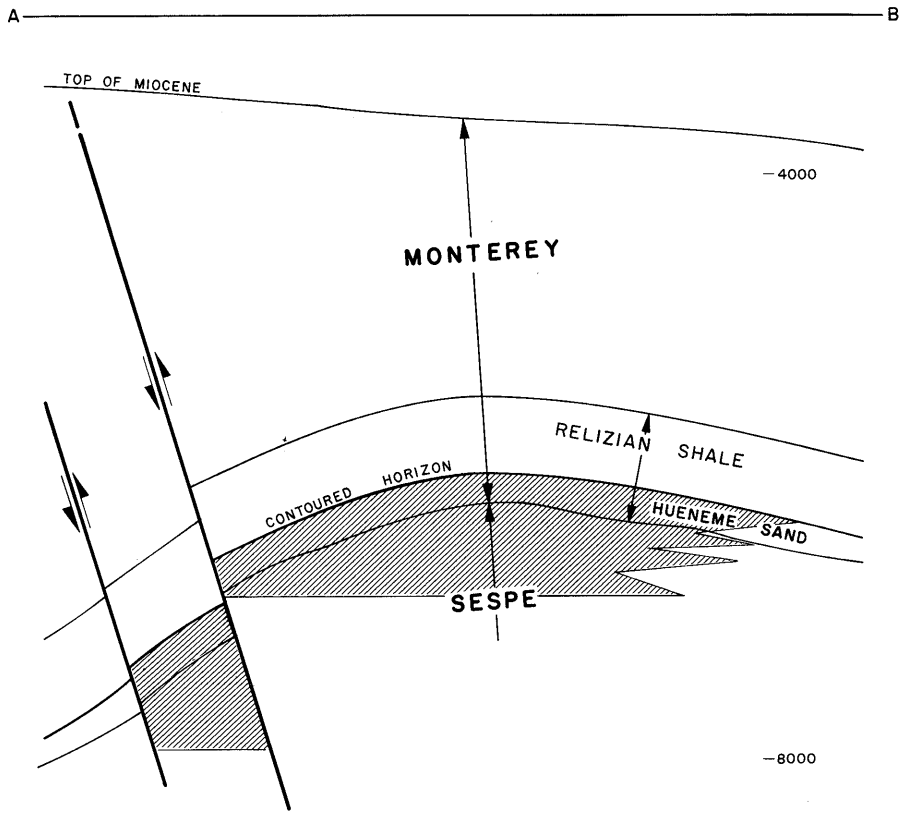
CALIFORNIA DIVISION OF OIL AND GAS

HUENEME OFFSHORE OIL FIELD
FEDERAL OCS



CONTOURS ON TOP OF HUENEME SAND





MODIFIED FROM PACIFIC SECTION AAPG

COUNTY: VENTURA

HUENEME OFFSHORE OIL FIELD
FEDERAL OCS

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. OCS P-0202 No. 1	Same as present			8,452	Hueneme and Sespe	Miocene and Oligocene
Deepest well	Confidential	"					

POOL DATA

ITEM	HUENEME	SESPE				FIELD OR AREA DATA
Discovery date	July 1969	July 1969				
Initial production rates						
Oil (bbl/day)	1,036	46				
Gas (Mcf/day)	223	7				
Flow pressure (psi)						
Bean size (in.)						
Initial reservoir pressure (psi)	2,370	2,540				
Reservoir temperature (°F)						
Initial oil content (STB/ac.-ft.)						
Initial gas content (MSCF/ac.-ft.)						
Formation		Sespe				
Geologic age	Miocene	Oligocene				
Average depth (ft.)	5,160	5,520				
Average net thickness (ft.)	105	25				
Maximum productive area (acres)	220	346				
RESERVOIR ROCK PROPERTIES						
Porosity (%)	32.4	30.2				
S_{oi} (%)	33.1	16.7				
S_{wi} (%)	32.1	52.0				
S_{gi} (%)	34.8	31.3				
Permeability to air (md)	2,200	256				
RESERVOIR FLUID PROPERTIES						
Oil:						
Oil gravity (°API)	15.4	14.1				
Sulfur content (% by wt.)						
Initial solution GOR (SCF/STB)	87	152				
Initial oil FVF (RB/STB)						
Bubble point press. (psia)						
Viscosity (cp) @ °F						
Gas:						
Specific gravity (air = 1.0)						
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	waterflood					
Date started	1982					
Date discontinued	active					
Peak oil production (bbl)						1,575,184
Year						1983
Peak gas production, net (Mcf)						394,350
Year						1983

Base of fresh water (ft.):

Remarks: The field is produced from Unocal's Platform Gina.

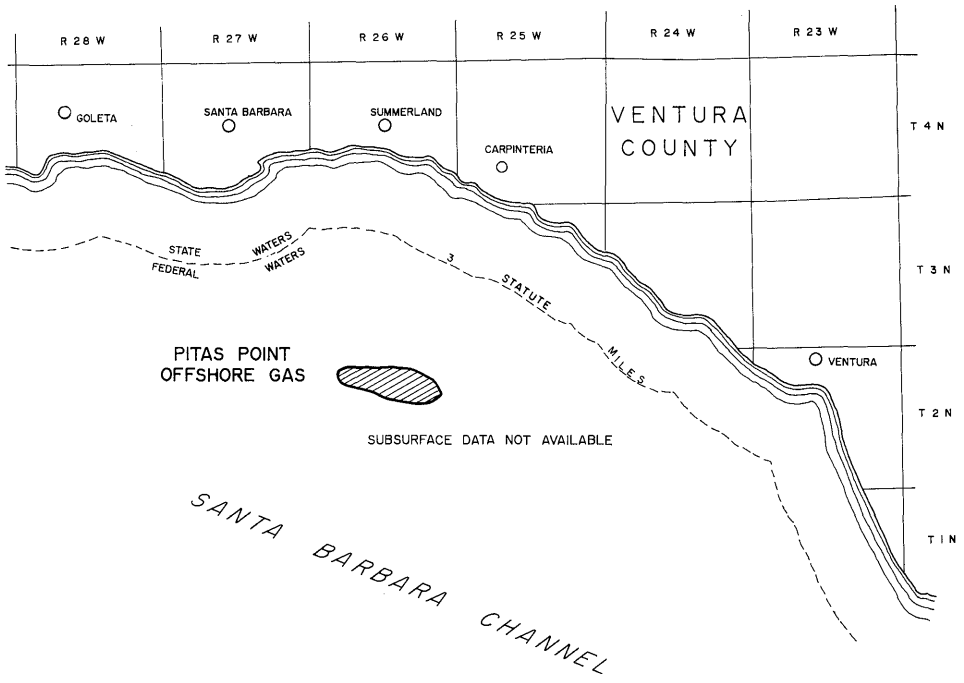
Selected References:

DATE: July 1991

CALIFORNIA DIVISION OF OIL AND GAS

PITAS POINT OFFSHORE GAS FIELD

FEDERAL OCS



COUNTY: SANTA BARBARA

PITAS POINT OFFSHORE GAS FIELD
FEDERAL OCS

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. OCS P-0234 No. 4	Same as present			9,500	Pico	
Deepest well	Texaco Inc. OCS P-0234 No. 3	"			18,318		Miocene

POOL DATA

ITEM	MIDDLE PICO	LOWER PICO	REPETTO			FIELD OR AREA DATA
Discovery date	November 1977	1978	1978			
Initial production rates						
Oil (bbl/day)						
Gas (Mcf/day)						
Flow pressure (psi)						
Bean size (in.)						
Initial reservoir pressure (psi)	2,800	5,350	5,750			
Reservoir temperature (°F)	155	211	229			
Initial oil content (STB/ac.-ft.)						
Initial gas content (MSCF/ac.-ft.)						
Formation						
Geologic age	Pliocene	Pliocene	Pliocene			
Average depth (ft.)	5,000-7,500	10,000-10,500	10,700-11,500			
Average net thickness (ft.)						
Maximum productive area (acres)	300	-	-			
RESERVOIR ROCK PROPERTIES						
Porosity (%)	20	14-17	14-17			
Soi (%)						
Swi (%)	40-60	40-60	40-60			
Sgi (%)	1-20	1-20	1-20			
Permeability to air (md)						
RESERVOIR FLUID PROPERTIES						
Oil:						
Oil gravity (°API)	35	35	35			
Sulfur content (% by wt.)						
Initial solution GOR (SCF/STB)						
Initial oil FVF (RB/STB)						
Bubble point press. (psia)						
Viscosity (cp) @ °F						
Gas:						
Specific gravity (air = 1.0)	0.56	0.56	0.56			
Heating value (Btu/cu. ft.)	1,004	1,004	1,004			
Water:						
Salinity, NaCl (ppm)						
T.D.S. (ppm)						
R_w (ohm/m) (77°F)						
ENHANCED RECOVERY PROJECTS						
Enhanced recovery projects						
Date started						
Date discontinued						
Peak oil production (bbl)						33,700
Year						1985
Peak gas production, net (Mcf)						29,898,809
Year						1985

Base of fresh water (ft.):

Remarks: The field is produced from Texaco's Platform Habitat.

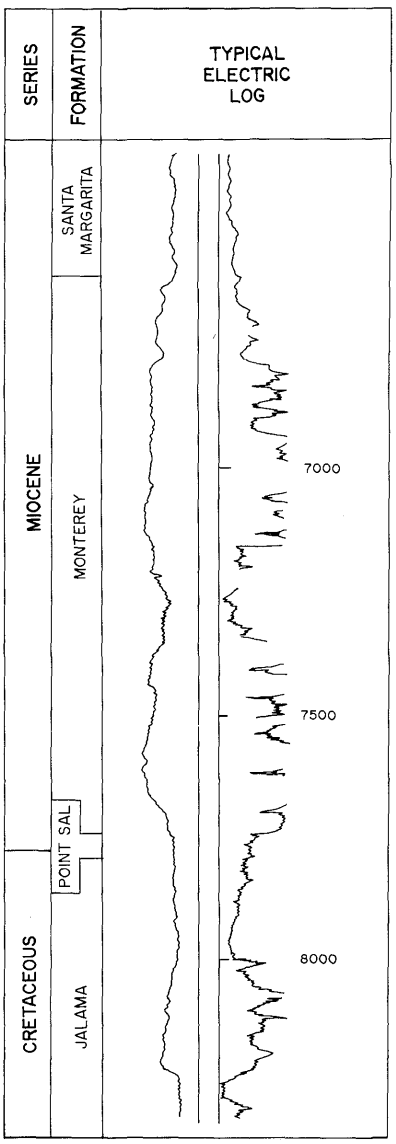
Selected References:

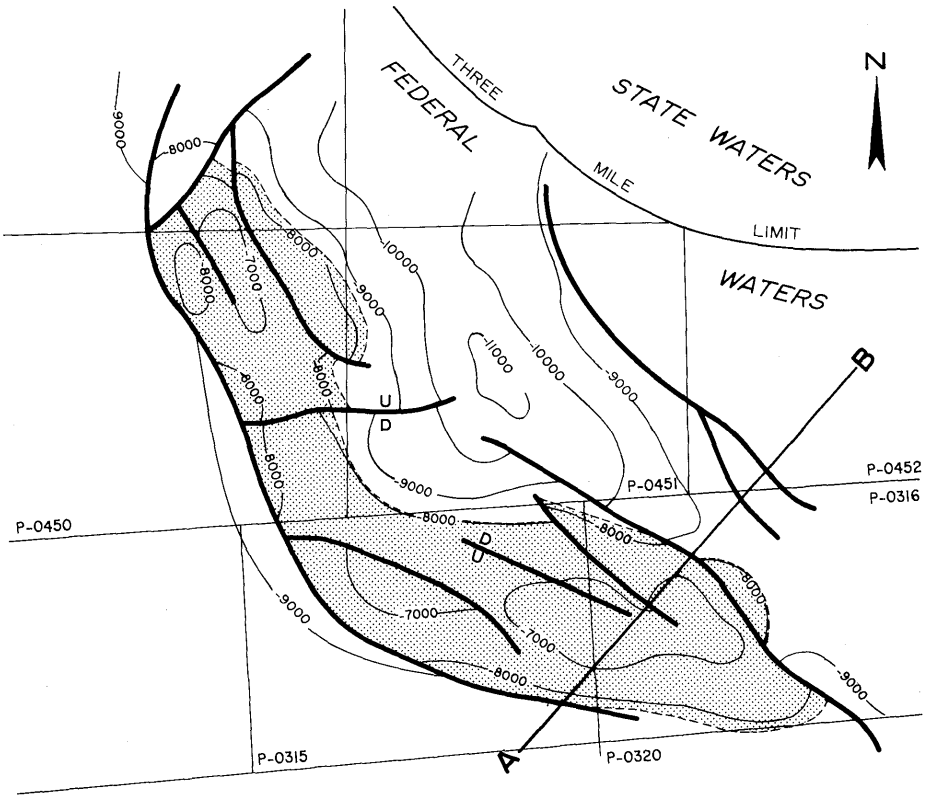
DATE: March 1991

CALIFORNIA DIVISION OF OIL AND GAS

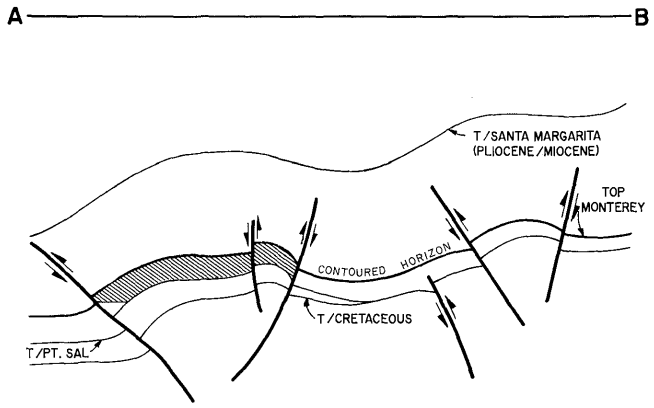
POINT ARGUELLO OFFSHORE OIL FIELD

FEDERAL OCS





CONTOURS ON TOP OF MONTEREY ELECTRIC-LOG MARKER



ADAPTED FROM AAPG BULLETIN V. 69, No. 4 (1985)

COUNTY: SANTA BARBARA

POINT ARGUELLO OFFSHORE OIL FIELD
FEDERAL OCS

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. P-0316-1	Same as present			9,621	Monterey	
Deepest well	Chevron U.S.A. Inc. P-0316-2	"			11,116		Monterey Miocene

POOL DATA

ITEM	MONTEREY					FIELD OR AREA DATA
Discovery date	1980					
Initial production rates						
Oil (bbl/day)	6,580					
Gas (Mcf/day)	1,680					
Flow pressure (psi)						
Bean size (in.)	32/64-56/64					
Initial reservoir pressure (psi)	3,420					
Reservoir temperature (°F)	245					
Initial oil content (STB/ac.-ft.)						
Initial gas content (MSCF/ac.-ft.)						
Formation	Monterey					
Geologic age	Miocene					
Average depth (ft.)	7,900					
Average net thickness (ft.)	1,000					
Maximum productive area (acres)						
RESERVOIR ROCK PROPERTIES						
Porosity (%)	10-20					
S_{oi} (%)						
S_{wi} (%)	21-79					
S_{gi} (%)						
Permeability to air (md)						
RESERVOIR FLUID PROPERTIES						
Oil:						
Oil gravity (°API)	20					
Sulfur content (% by wt.)	0.8 - 5.0					
Initial solution GOR (SCF/STB)	400					
Initial oil FVF (RB/STB)						
Bubble point press. (psia)	2,450					
Viscosity (cp) @ °F	3.7 @ 245					
Gas:						
Specific gravity (air = 1.0)						
Heating value (Btu/cu. ft.)	1,183					
Water:						
Salinity, NaCl (ppm)						
T.D.S. (ppm)						
R_w (ohm/m) (77°F)						
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: Commercial production has not begun.

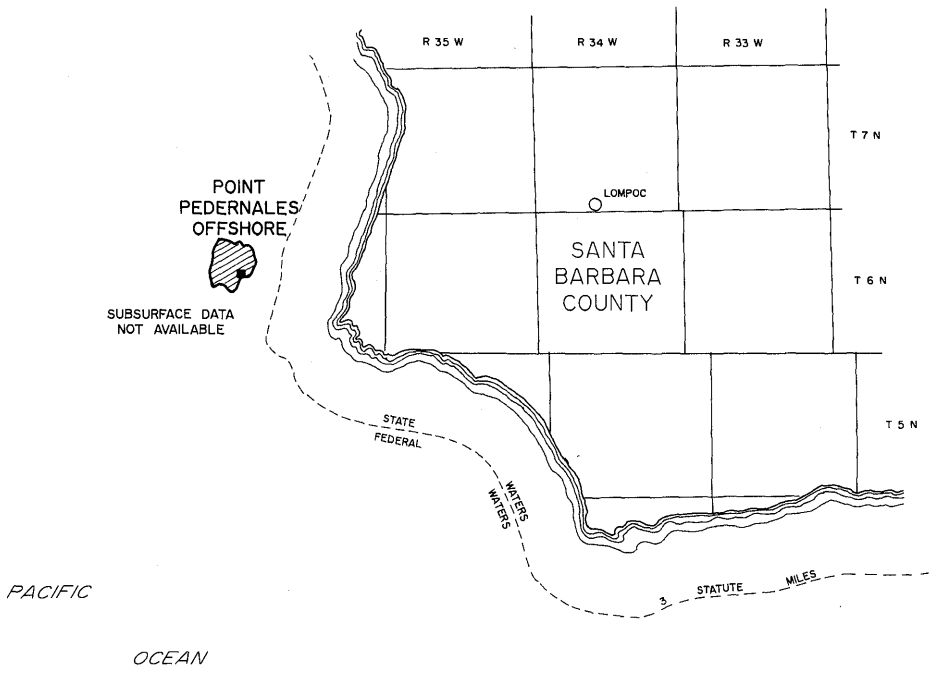
Selected References: Crain, W.E., W.E. Mero, and D. Patterson, 1985, Geology of the Point Arguello Discovery: AAPG Bulletin Volume 69, No. 4, p. 537-545.
Van Bloemen Waanders, B.G., and B.L. Litvak, 1989, Simulation of a Naturally Fractured Reservoir, Point Arguello Field, Offshore Calif. SPE Paper 18745.

DATE: March 1991

CALIFORNIA DIVISION OF OIL AND GAS

POINT PEDERNALES OFFSHORE OIL FIELD

FEDERAL OCS



COUNTY: **SANTA BARBARA**

POINT PEDERNALES OFFSHORE OIL FIELD
FEDERAL OCS

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	Union Oil Co. of Calif. OCS P-0441 #1	Same as present			Conf.	Monterey	Miocene
Deepest well	Confidential	"					

POOL DATA

ITEM	MONTEREY					FIELD OR AREA DATA
Discovery date	November 1982					
Initial production rates						
Oil (bbl/day)	-					
Gas (Mcf/day)	-					
Flow pressure (psi)	-					
Bean size (in.)	-					
Initial reservoir pressure (psi)	-					
Reservoir temperature (°F)	-					
Initial oil content (STB/ac.-ft.)	-					
Initial gas content (MSCF/ac.-ft.)	-					
Formation	-					
Geologic age	-					
Average depth (ft.)	6,600					
Average net thickness (ft.)	-					
Maximum productive area (acres)	-					
RESERVOIR ROCK PROPERTIES						
Porosity (%)	-					
So_i (%)	-					
Sw_i (%)	-					
Sg_i (%)	-					
Permeability to air (md)	-					
RESERVOIR FLUID PROPERTIES						
Oil:						
Oil gravity (°API)	14-18					
Sulfur content (% by wt.)	-					
Initial solution GOR (SCF/STB)	-					
Initial oil FVF (RB/STB)	-					
Bubble point press. (psia)	-					
Viscosity (cp) @ °F	-					
Gas:						
Specific gravity (air = 1.0)	0.773					
Heating value (Btu/cu. ft.)	1,292					
Water:						
Salinity, NaCl (ppm)	-					
T.D.S. (ppm)	-					
R_w (ohm/m) (77°F)	-					
ENHANCED RECOVERY PROJECTS						
Enhanced recovery projects						
Date started						
Date discontinued						
Peak oil production (bbl)	7,283,393					
Year	1989					
Peak gas production, net (Mcf)	1,531,069					
Year	1989					

Base of fresh water (ft.):

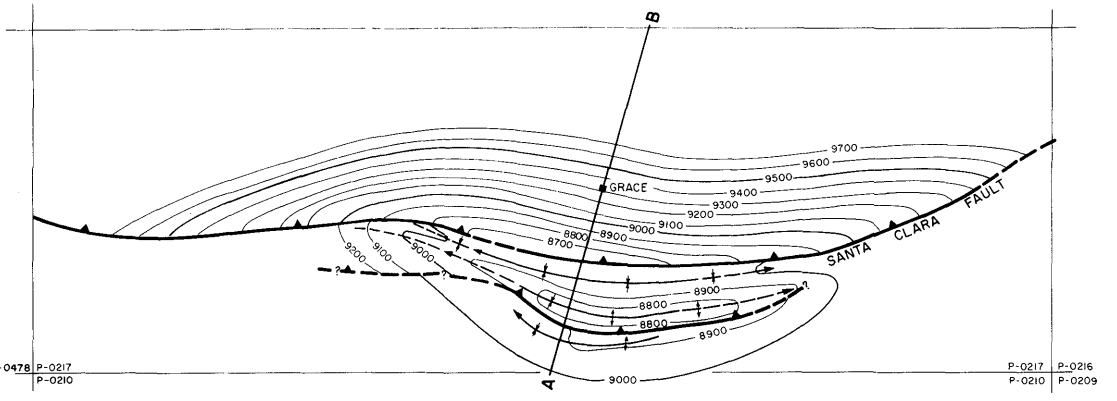
Remarks: Field Produced From Union Platform "Irene".

Selected References:

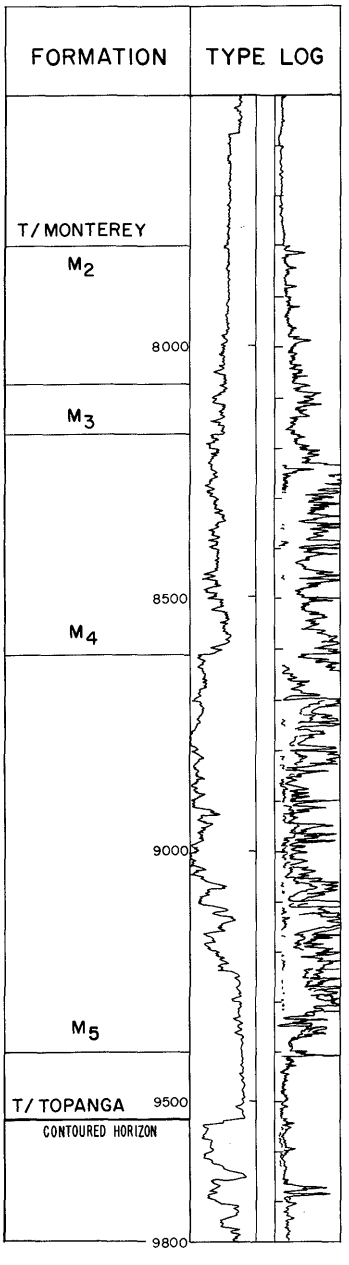
DATE: March 1991

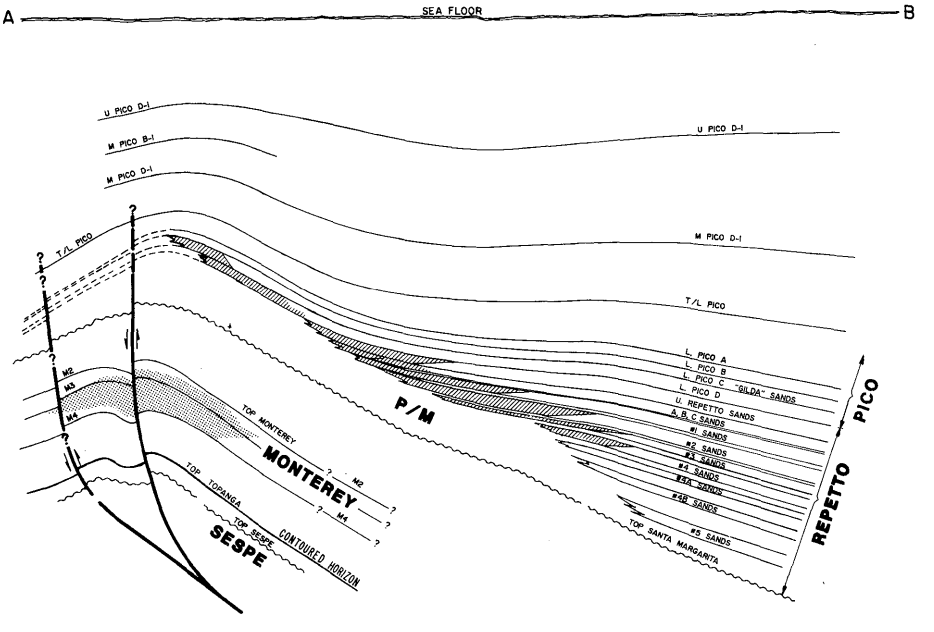
CALIFORNIA DIVISION OF OIL AND GAS

SANTA CLARA OFFSHORE OIL FIELD
FEDERAL OCS



STRUCTURE CONTOURS ON TOP L. TOPANGA FM.





COUNTY: VENTURA

SANTA CLARA OFFSHORE OIL FIELD
FEDERAL OCS

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. OCS-P-217 #1	Same as present	48N 62W	MD	9,990	Monterey	
Deepest well	Chevron U.S.A. Inc. OCS-P-217 A-7	Same as present	48N 62W	MD	10,107		Sespe Oligocene

POOL DATA

ITEM	MONTEREY	PICO				FIELD OR AREA DATA
Discovery date	1975	1983				
Initial production rates						
Oil (bbl/day)	736	-				
Gas (Mcf/day)	2,045	3,000				
Flow pressure (psi)						
Bean size (in.)						
Initial reservoir pressure (psi)	3,600	1,420				
Reservoir temperature (°F)	188	101				
Initial oil content (STB/ac.-ft.)						
Initial gas content (MSCF/ac.-ft.)						
Formation	Monterey	Pico				
Geologic age	Miocene	Pliocene				
Average depth (ft.)	7,900	4,400				
Average net thickness (ft.)						
Maximum productive area (acres)						
RESERVOIR ROCK PROPERTIES						
Porosity (%)	28	30				
So_i (%)						
Sw_i (%)						
Sg_i (%)						
Permeability to air (md)	10-577	50				
RESERVOIR FLUID PROPERTIES						
Oil:						
Oil gravity (°API)	28	-				
Sulfur content (% by wt.)						
Initial solution GOR (SCF/STB)	826	-				
Initial oil FVF (RB/STB)						
Bubble point press. (psia)						
Viscosity (cp) @ °F						
Gas:						
Specific gravity (air = 1.0)						
Heating value (Btu/cu. ft.)						
Water:						
Salinity, NaCl (ppm)	9,000	-				
T.D.S. (ppm)	26,000	-				
R_w (ohm/m) (77°F)						
ENHANCED RECOVERY PROJECTS						
Enhanced recovery projects						
Date started						
Date discontinued						
Peak oil production (bbl)	1,029,072	-				
Year	1983	-				
Peak gas production, net (Mcf)	2,330,114	2,830,000				
Year	1981	1983				

Base of fresh water (ft.):

Remarks:

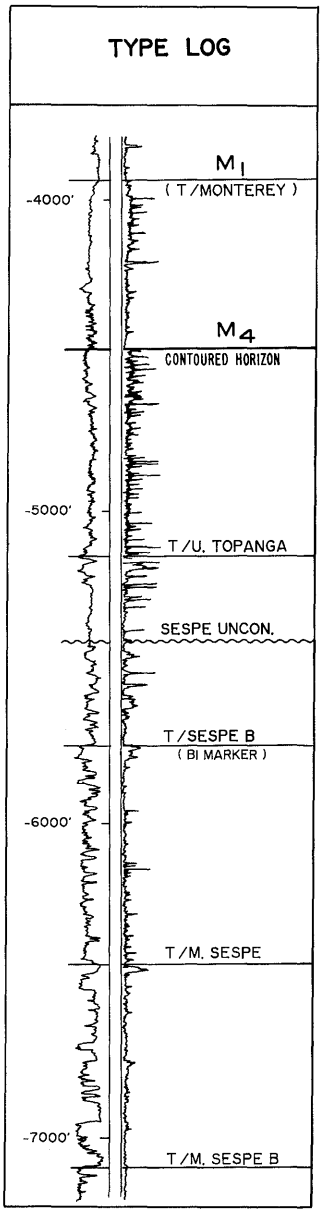
Selected References:

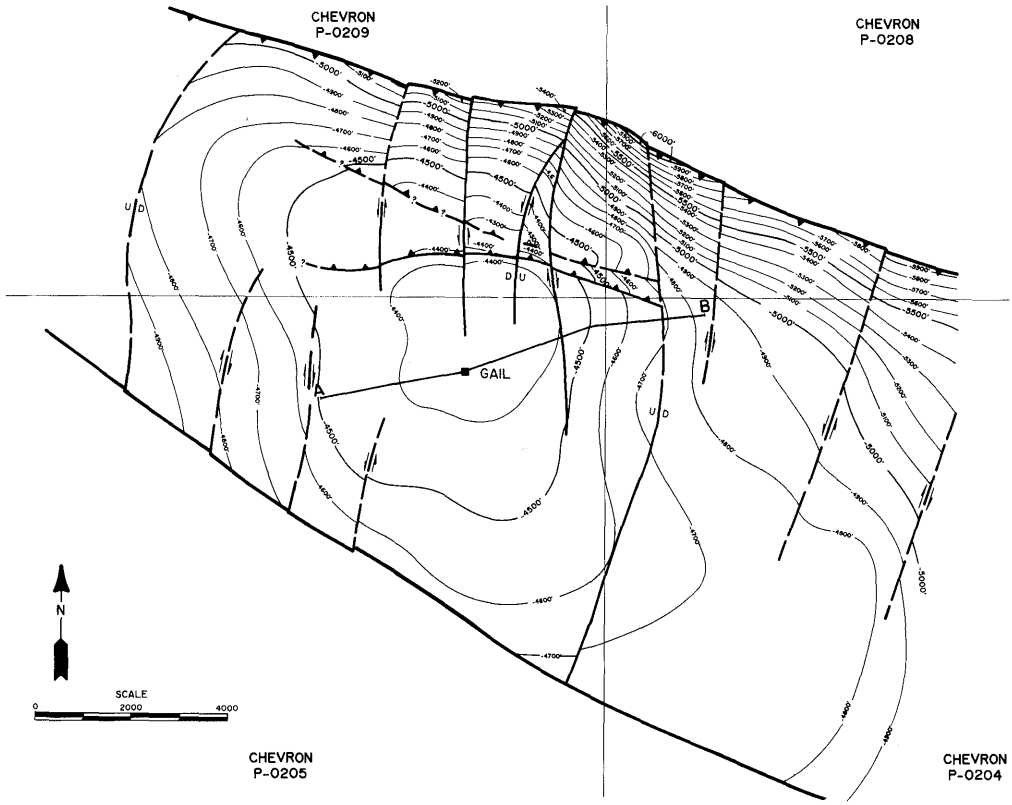
DATE: January 1991

CALIFORNIA DIVISION OF OIL AND GAS

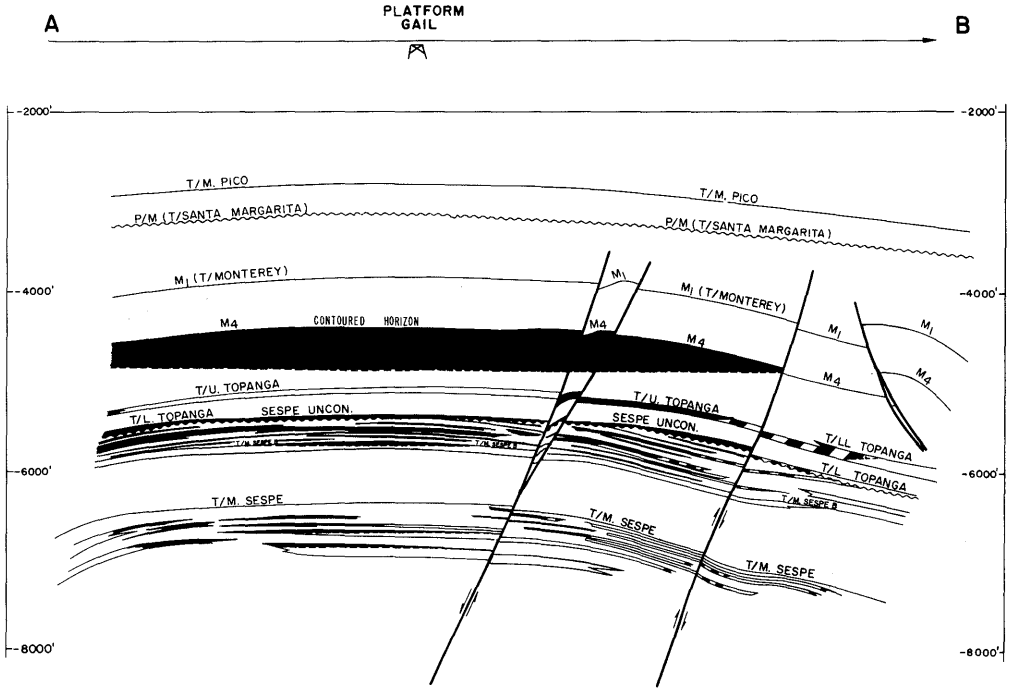
SOCKEYE OFFSHORE OIL FIELD

FEDERAL OCS





CONTOURS ON M4 ELECTRIC LOG MARKER



STRUCTURE SECTION A - B

COUNTY: VENTURA

SOCKEYE OFFSHORE OIL FIELD
FEDERAL OCS

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. OCS-P-205 #1	Humble Oil Company OCS-P-205 #1	OCS-P-205 X= 728,472 Y=1,046,798		12,771	Monterey u & m Sespe	Miocene & Oligocene
Deepest well	Same as above	"	"		"	"	"

POOL DATA

ITEM	MONTEREY	U. TOPANGA	L. TOPANGA	U. SESPE	M. SESPE	FIELD OR AREA DATA
Discovery date	1970	1970	1970	1970	1970	
Initial production rates						
Oil (bbl/day)	1,500-2,000	-	-	1,500-2,000	-	
Gas (Mcf/day)	400	-	-	1,000	6,300	
Flow pressure (psi)						
Bean size (in.)						
Initial reservoir pressure (psi)	2,157	2,326	2,595	2,595	3,179	
Reservoir temperature (°F)	150	150	167	167	180	
Initial oil content (STB/ac.-ft.)						
Initial gas content (MSCF/ac.-ft.)						
Formation	Monterey	Topanga	Topanga	Sespe	Sespe	
Geologic age	Miocene	Miocene	Miocene	Oligocene	Oligocene	
Average depth (ft.)	4,880 vss[a/]	5,200 vss[a/]	5,600 vss[a/]	5,600 vss[a/]	6,700 vss[a/]	
Average net thickness (ft.)						
Maximum productive area (acres)						
RESERVOIR ROCK PROPERTIES						
Porosity (%)	28	30	25	25	24	
S_{oi} (%)						
S_{wi} (%)						
S_{gi} (%)						
Permeability to air (md)	83.5	1,000.0	177.0-511.0	177.0-511.0	13.7	
RESERVOIR FLUID PROPERTIES						
Oil:						
Oil gravity (°API)	16	18	29	29	-	
Sulfur content (% by wt.)						
Initial solution GOR (SCF/STB)	260	300	460	460	-	
Initial oil FVF (RB/STB)						
Bubble point press. (psia)						
Viscosity (cp) @ °F						
Gas:						
Specific gravity (air = 1.0)						
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						
Date started						
Date discontinued						
Peak oil production (bbl)						
Year						
Peak gas production, net (Mcf)						
Year						

Base of fresh water (ft.):

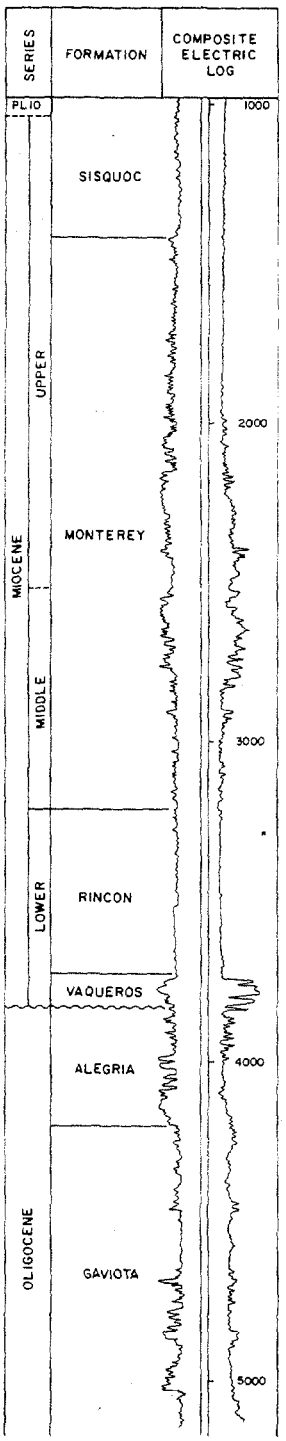
Remarks: a/ vertical sub-sea level

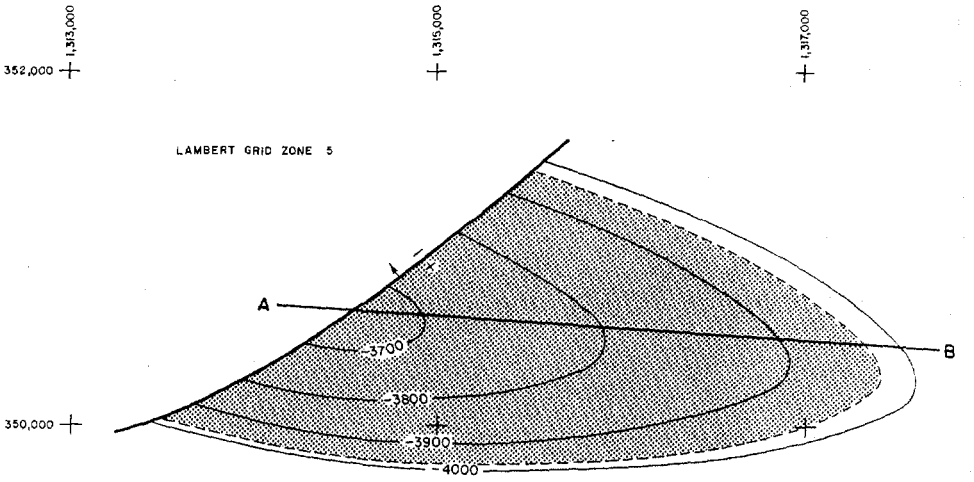
Selected References: Sankur, V., L.S. Weber, and L.O. Masoner, 1990, Development of Sockeye Field in Offshore California: A Case History: SPE Paper 20047.

DATE: January 1991

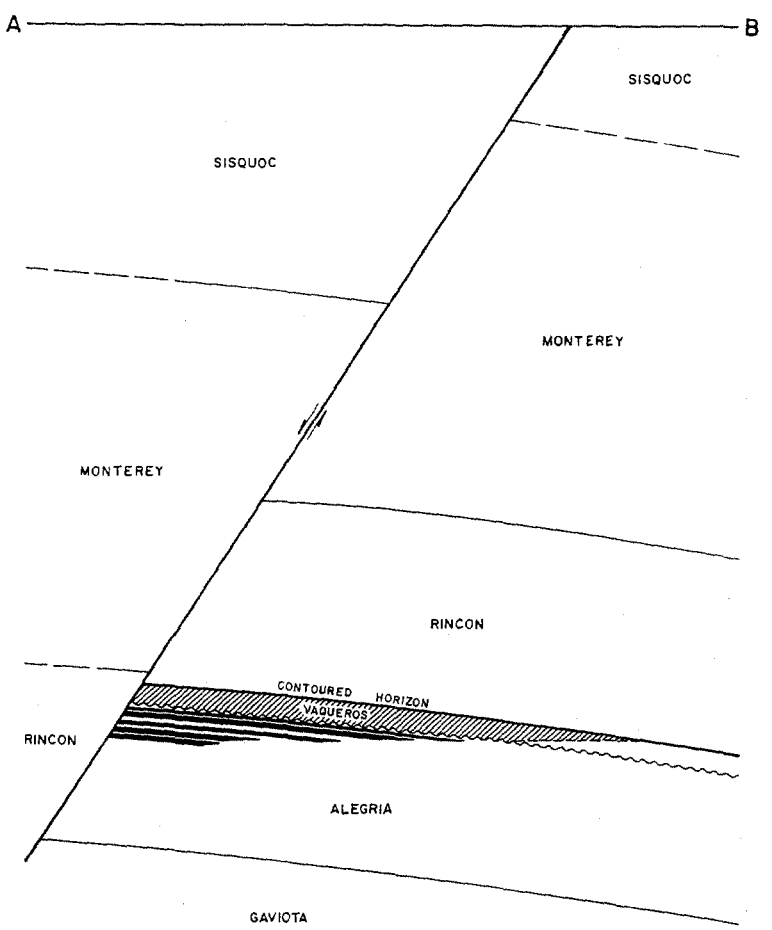
CALIFORNIA DIVISION OF OIL AND GAS

ALEGRIA OFFSHORE OIL FIELD





CONTOURS ON TOP OF VAQUEROS



COUNTY: SANTA BARBARA

ALEGRIA OFFSHORE 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	ARCO Oil & Gas Co. "State 2793" 1	Richfield Oil Corp. "State 2793" 1	7 4N 32W	SB	4,350 a/	Vaqueros-Alegria	
Deepest well	Same as above	"	"	"	6,010 b/		Gaviota Oligocene

POOL DATA

ITEM	VAQUEROS	ALEGRIA c/				FIELD OR AREA DATA
Discovery date	March 1962	March 1962				
Initial production rates						
Oil (bbl/day)	114	d/				
Gas (Mcf/day)	1,775	-				
Flow pressure (psi)	1,400	-				
Bean size (in.)	12/64	-				
Initial reservoir pressure (psi)	1,840	-				
Reservoir temperature (°F)	129	-				
Initial oil content (STB/ac.-ft.)						
Initial gas content (MSCF/ac.-ft.)						
Formation	Vaqueros	Alegria				
Geologic age	early Miocene	Oligocene				
Average depth (ft.)	3,800	3,950				
Average net thickness (ft.)	100	140				
Maximum productive area (acres)						20
RESERVOIR ROCK PROPERTIES						
Porosity (%)	20-30***	-				
S_{oi} (%)	60-70***	-				
S_{wi} (%)	20-30***	-				
S_{gi} (%)	10***	-				
Permeability to air (md)						
RESERVOIR FLUID PROPERTIES						
Oil:						
Oil gravity (°API)	39-45**	39-45**				
Sulfur content (% by wt.)						
Initial solution GOR (SCF/STB)	-	4,400				
Initial oil FVF (RB/STB)	1.20	1.20				
Bubble point press. (psia)						
Viscosity (cp) @ °F						
Gas:						
Specific gravity (air = 1.0)						
Heating value (Btu/cu. ft.)	1,133	-				
Water:						
Salinity, NaCl (ppm)	19,345	29,960				
T.D.S. (ppm)	21,400	-				
R_w (ohm/m) (77°F)	0.32	0.22				
ENHANCED RECOVERY PROJECTS						
Enhanced recovery projects						
Date started						
Date discontinued						
Peak oil production (bbl)						77,033
Year						1970
Peak gas production, net (Mcf)						602,679
Year						1964

Base of fresh water (ft.): None

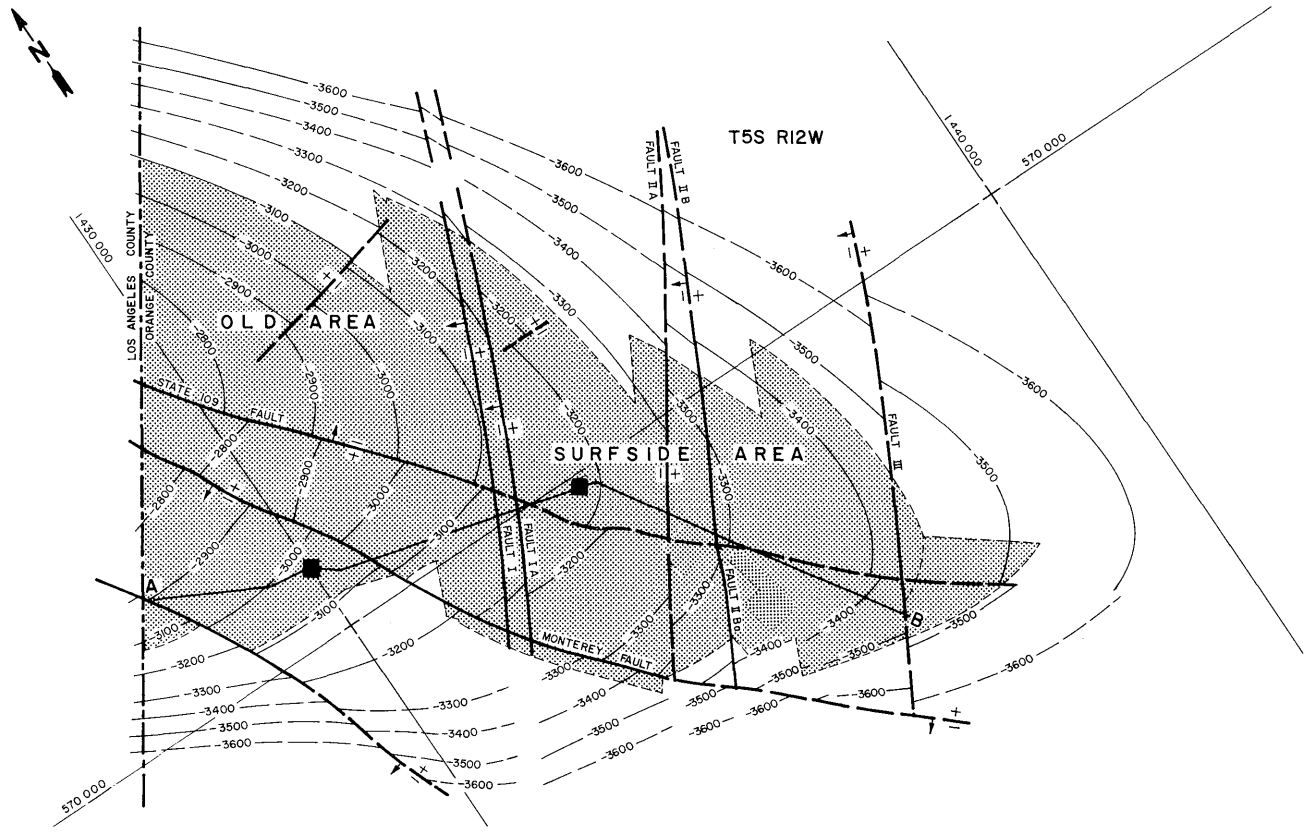
Remarks:
a/ Directional well; true vertical depth of present hole is 4,212 feet. Commercial production was established after redrilling the deepest well.
b/ Directional well; true vertical depth of original hole is 5,957 feet.
c/ This pool is abandoned. Early production was not broken down by pools.
d/ Commingled with production from the Vaqueros zone.

Selected References:
Barton, C.L., 1962, Operations in District No. 3: Calif. Div. of Oil and Gas, Summary of Operations -- Calif. Oil Fields, Vol. 48, No. 2.
Yerkes, R.F., H.C. Wagner, K.A. Yenne, 1969, Petroleum Development in the Region of the Santa Barbara Channel: U.S. Geol. Survey Prof. Paper 679B, p. 19.

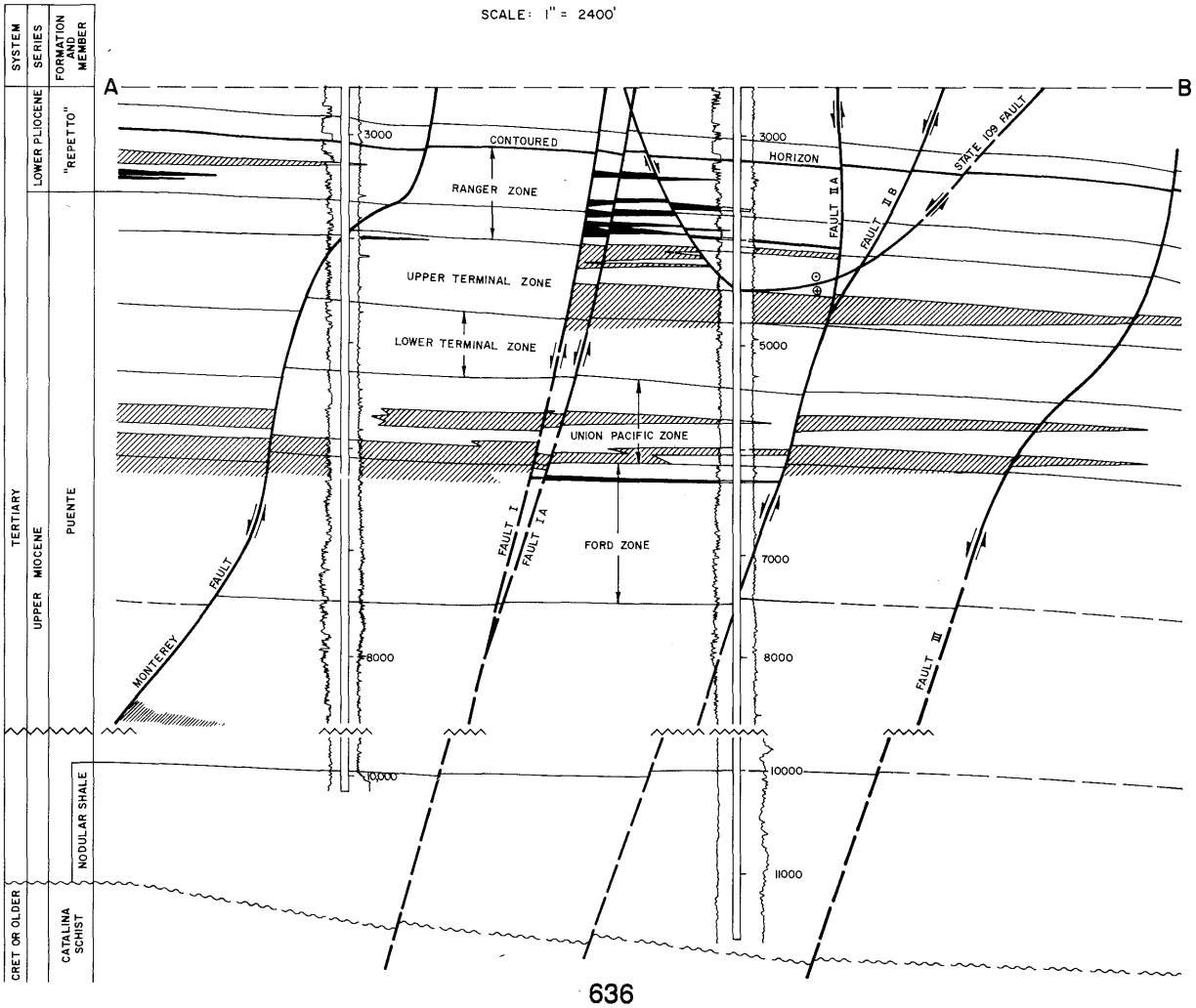
DATE: August 1987 **Estimated value *** Representative values for area, formation, and depth

CALIFORNIA DIVISION OF OIL AND GAS

BELMONT OFFSHORE OIL FIELD



CONTOURS ON TOP OF RANGER ZONE
SCALE: 1" = 2400'



COUNTY: ORANGE

BELMONT OFFSHORE 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	Exxon Corp. "State PRC 186" 1	Gilco Inc. "State" 1	11 5S 12W	SB	8,050 a/	Upper	
Deepest well	Exxon Corp. "State PRC 186" 210	Marine Exploration Co. "State" 2	11 5S 12W	SB	12,131 b/		Puente late Miocene

POOL DATA

ITEM	UPPER					FIELD OR AREA DATA
Discovery date	July 1947					
Initial production rates						
Oil (bbl/day)	5					
Gas (Mcf/day)	2,000					
Flow pressure (psi)						
Bean size (in.)						
Initial reservoir pressure (psi)	975-1,300					
Reservoir temperature (°F)	152					
Initial oil content (STB/ac.-ft.)						
Initial gas content (MSCF/ac.-ft.)						
Formation	"Repetto"-Puente					
Geologic age	e Plio./l Miocene					
Average depth (ft.)	2,950					
Average net thickness (ft.)	100					
Maximum productive area (acres)						760
RESERVOIR ROCK PROPERTIES						
Porosity (%)	30-33					
S_{oi} (%)	60-70**					
S_{wi} (%)	30**					
S_{gi} (%)	0-10**					
Permeability to air (md)	976					
RESERVOIR FLUID PROPERTIES						
Oil:						
Oil gravity (°API)	16-27					
Sulfur content (% by wt.)						
Initial solution GOR (SCF/STB)	93-168					
Initial oil FVF (RB/STB)	1.105-1.114					
Bubble point press. (psia)	1,300					
Viscosity (cp) @ °F	9.4 @ 140					
Gas:						
Specific gravity (air = 1.0)	0.54-0.56					
Heating value (Btu/cu. ft.)	1,000-1,009					
Water:						
Salinity, NaCl (ppm)	30,400-34,236					
T.D.S. (ppm)	32,100					
R_w (ohm/m) (77°F)	0.200-0.222					
ENHANCED RECOVERY PROJECTS						
Enhanced recovery projects	waterflood					
Date started	1959					
Date discontinued	1979					
Peak oil production (bbl)	4,295,682					
Year	1968					
Peak gas production, net (Mcf)						
Year						

Base of fresh water (ft.): See Areas

Remarks: a/ Directional well, true vertical depth is 3,406 feet.
b/ Directional well, true vertical depth is 5,772 feet.

Selected References:

DATE: January 1989 **Estimated value

CALIFORNIA DIVISION OF OIL AND GAS

COUNTY: ORANGE

BELMONT OFFSHORE OIL FIELD
(OLD 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	Exxon Corp. "State PRC" 1	Gilco Inc. "State" 1	11 5S 12W	SB	8,050 a/	Upper	
Deepest well	Exxon Corp. "State PRC 186" 210	Marine Exploration Co. "State" 2	11 5S 12W	SB	12,131 b/		Puente late Miocene

POOL DATA

ITEM	UPPER	INTERMEDIATE	LOWER			FIELD OR AREA DATA
Discovery date	July 1947	September 1961	November 1948			
Initial production rates						
Oil (bbl/day)	5	412	41			
Gas (Mcf/day)	2,000	-	-			
Flow pressure (psi)						
Bean size (in.)						
Initial reservoir pressure (psi)	975-1,300	1,650	2,580			
Reservoir temperature (°F)	152	160	215			
Initial oil content (STB/ac.-ft.)						
Initial gas content (MSCF/ac.-ft.)						
Formation	"Repetto"-Puente	Puente	Puente			
Geologic age	e Plio./l Miocene	late Miocene	late Miocene			
Average depth (ft.)	2,950	4,000	5,500			
Average net thickness (ft.)	100	25	250			
Maximum productive area (acres)						335
RESERVOIR ROCK PROPERTIES						
Porosity (%)	30.0-33.0	33.8	19.6			
So_i (%)	60-70**	67**	55**			
Sw_i (%)	30**	38**	45**			
Sg_i (%)	0-10**	0**	0**			
Permeability to air (md)	976	237	179			
RESERVOIR FLUID PROPERTIES						
Oil:						
Oil gravity (°API)	16-27	23-29	23-29			
Sulfur content (% by wt.)	-	-	0.90			
Initial solution GOR (SCF/STB)	93-168	250	423			
Initial oil FVF (RB/STB)	1.105-1.114	1.169	1.299			
Bubble point press. (psia)	1,300	-	2,580			
Viscosity (cp) @ °F	9.4 @ 140	-	1.3 @ 215			
Gas:						
Specific gravity (air = 1.0)	0.54-0.56	0.63	-			
Heating value (Btu/cu. ft.)	1,000-1,009	1,000	-			
Water:						
Salinity, NaCl (ppm)	30,400-34,236	31,700	27,000			
T.D.S. (ppm)	32,100	33,400	29,400			
R_w (ohm/m) (77°F)	0.200-0.222	0.220	0.250			
ENHANCED RECOVERY PROJECTS						
Enhanced recovery projects	waterflood		waterflood			
Date started	1959		1976			
Date discontinued	active		1979			
Peak oil production (bbl)						1,052,099
Year						1966
Peak gas production, net (Mcf)						601,275
Year						1975

Base of fresh water (ft.): 1,900

Remarks: Under the classification shown in Div. of Oil and Gas published production statistics, the Upper, Intermediate and Lower zones correspond to the Ranger, Upper Terminal and Union Pacific-Ford zones, respectively.
All but two wells drilled from Monterey Island. Dry gas was produced from two wells completed in the Upper Ranger zone; cumulative production was 3,645,417 Mcf when wells were shut in during 1970.
a/ Directionally drilled from onshore drillsite, true vertical depth is 3,406 feet.
b/ Directionally drilled from onshore drillsite, true vertical depth is 5,772 feet.

Selected References: Frame, R.G., 1960, California Offshore Petroleum Development: Calif. Div. of Oil and Gas, Summary of Operations -- Calif. Oil Fields, Vol. 46, No. 2.

DATE: January 1989 **Estimated value

CALIFORNIA DIVISION OF OIL AND GAS

COUNTY: **ORANGE**

BELMONT OFFSHORE OIL FIELD
SURFSIDE 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. "State 3095" 318	Standard Oil Co. of Calif. "Surfside 3095" 318	22 2S 12W	SB	4,920 d/	Upper Terminal	
Deepest well	Chevron U.S.A. Inc. "State 3095" 317	Standard Oil Co. of Calif. "Surfside 3095" 317	22 2S 12W	SB	11,695 c/		Puente late Miocene

POOL DATA

ITEM	RANGER a/	UPPER TERMINAL b/	LOWER TERMINAL b/	UNION PACIFIC	FORD	FIELD OR AREA DATA
Discovery date	November 1965	September 1965	December 1965	October 1965	October 1965	
Initial production rates						
Oil (bbl/day)	248	516	464	50	50	
Gas (Mcf/day)	85	181	168	-	-	
Flow pressure (psi)						
Bean size (in.)						
Initial reservoir pressure (psi)	1,300-1,400	1,350-1,500	1,800	1,750-1,800	1,750-1,800	
Reservoir temperature (°F)	150	140	-	-	-	
Initial oil content (STB/ac.-ft.)						
Initial gas content (MSCF/ac.-ft.)						
Formation	"Repetto"-Puente	Puente	Puente	Puente	Puente	
Geologic age	e Plio./l Miocene	late Miocene	late Miocene	late Miocene	late Miocene	
Average depth (ft.)	3,700	4,000	4,800	5,400	6,100	
Average net thickness (ft.)	105	150	85	200	75	
Maximum productive area (acres)						425
RESERVOIR ROCK PROPERTIES						
Porosity (%)	35	31	31**	25	25	
S_{oi} (%)	71**	67**	61**	58**	53**	
S_{wi} (%)	29**	33**	39**	42**	47**	
S_{gi} (%)	0**	0**	0**	0**	0**	
Permeability to air (md)	1,638**	735**	500**	140**	80**	
RESERVOIR FLUID PROPERTIES						
Oil:						
Oil gravity (°API)	21-30	23-29	23-29	25-28	25-28	
Sulfur content (% by wt.)	0.02	-	-	0.23	0.16	
Initial solution GOR (SCF/STB)	-	1.25	-	-	-	
Initial oil FVF (RB/STB)						
Bubble point press. (psia)						
Viscosity (cp) @ °F						
Gas:						
Specific gravity (air = 1.0)	1.025	1.025	1.025	1.023	1.024	
Heating value (Btu/cu. ft.)						
Water:						
Salinity, NaCl (ppm)	30,130	30,130	30,300	24,200	24,000-28,000	
T.D.S. (ppm)	22,300-30,300	30,500	31,200	27,650	28,100-30,500	
R_w (ohm/m) (77°F)	0.21	0.23	0.21	0.27	0.24-0.25	
ENHANCED RECOVERY PROJECTS						
Enhanced recovery projects	waterflood	waterflood	waterflood	waterflood	waterflood	
Date started	1967	1967	1967	1972	1972	
Date discontinued	1979	1979	1979	1979	1979	
Peak oil production (bbl)						3,615,984
Year						1968
Peak gas production, net (Mcf)						412,000
Year						1976

Base of fresh water (ft.): 2,100

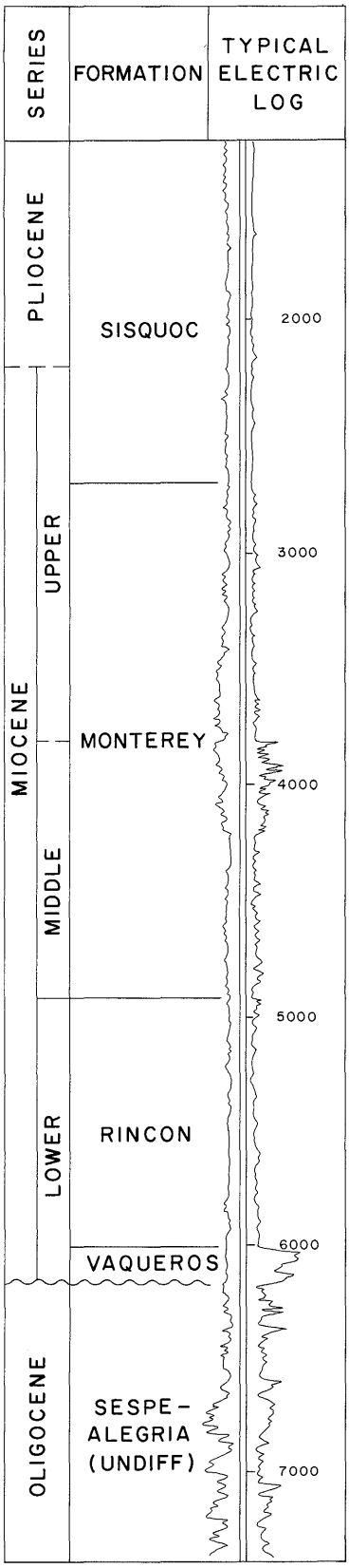
Remarks: All completed wells drilled from Island Esther (now Platform Esther).
a/ Production from Ranger and Upper Terminal commingled.
b/ Production from Upper and Lower Terminal commingled.
c/ Directional well, true vertical depth is 11,647 feet.
d/ Directional well, true vertical depth is 4,814 feet.

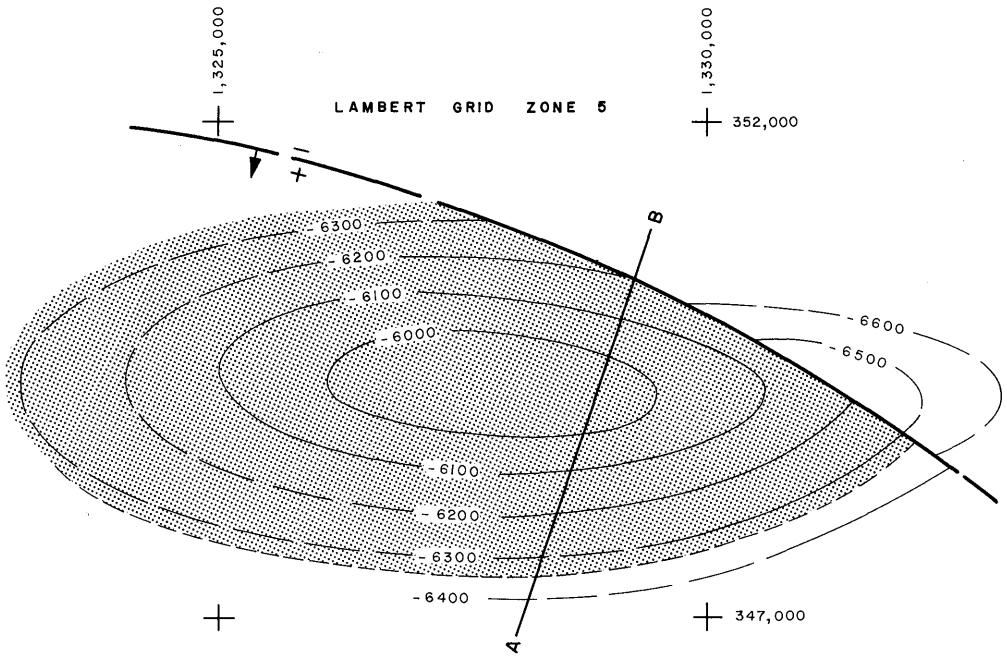
Selected References:

DATE: January 1989 **Estimated value

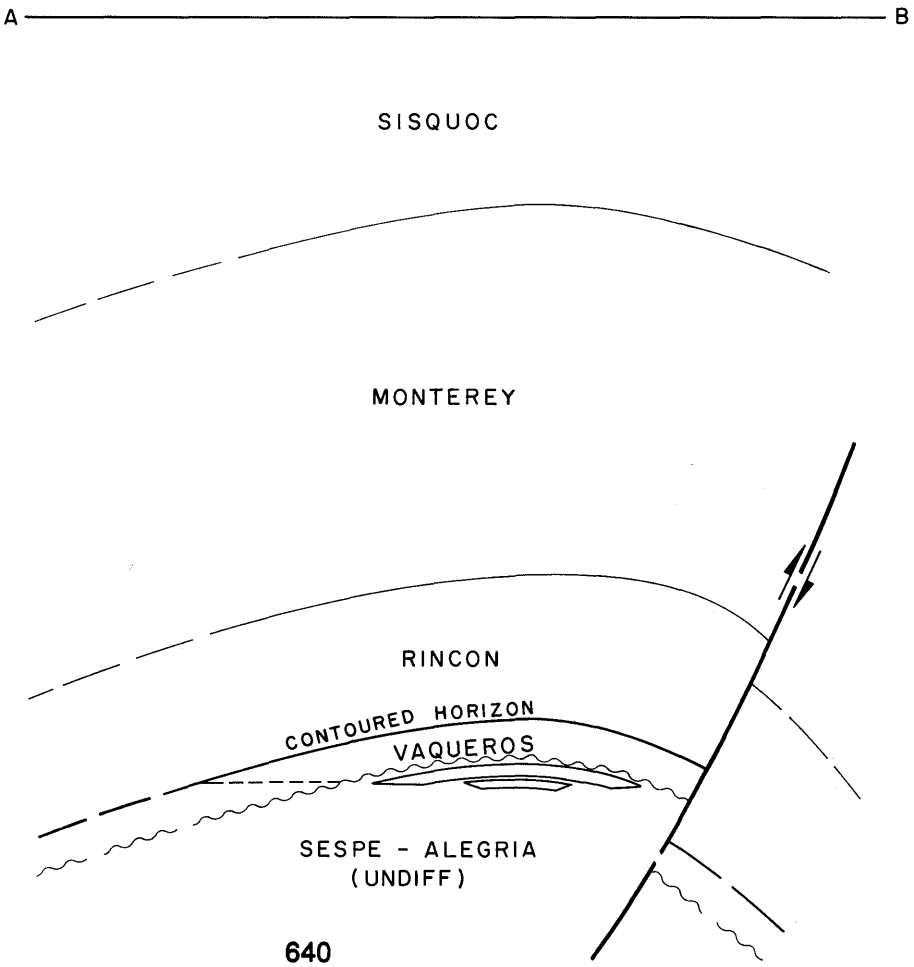
CALIFORNIA DIVISION OF OIL AND GAS

CALIENTE OFFSHORE GAS FIELD





CONTOURS ON TOP OF VAQUEROS



COUNTY: SANTA BARBARA

CALIENTE OFFSHORE GAS 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	Chevron U.S.A. Inc. "SSGS 2199" 401A	Standard Oil Co. of Calif. "SSGS 2199" 401A	10 4N 32W	SB	7,070	Vaqueros	
Deepest well	Chevron U.S.A. Inc. "SSGS 2199" 101	Standard Oil Co. of Calif. "Standard-Humble Gaviota State" 101	10 4N 32W	SB	7,912		Gaviota Oligocene

POOL DATA

ITEM	VAQUEROS	SESPE-ALEGRIA				FIELD OR AREA DATA
Discovery date	May 1962	October 1962a/				
Initial production rates						
Oil (bbl/day)						
Gas (Mcf/day)	2,700	3,000				
Flow pressure (psi)	1,625	1,895				
Bean size (in.)	40/64	36/64				
Initial reservoir pressure (psi)	2,975	2,840				
Reservoir temperature (°F)	220	220				
Initial oil content (STB/ac.-ft.)	854	854				
Initial gas content (MSCF/ac.-ft.)						
Formation	Vaqueros	Sespe-Alegria				
Geologic age	early Miocene	Oligocene				
Average depth (ft.)	6,000-6,200	6,400				
Average net thickness (ft.)	200	75				
Maximum productive area (acres)						140
RESERVOIR ROCK PROPERTIES						
Porosity (%)	16	16				
S_{oi} (%)						
S_{wi} (%)	30	30				
S_{gi} (%)	70	70				
Permeability to air (md)	307	307				
RESERVOIR FLUID PROPERTIES						
Oil:						
Oil gravity (°API)						
Sulfur content (% by wt.)						
Initial solution GOR (SCF/STB)						
Initial oil FVF (RB/STB)						
Bubble point press. (psia)						
Viscosity (cp) @ °F						
Gas:						
Specific gravity (air = 1.0)						
Heating value (Btu/cu. ft.)	1,160	1,160				
Water:						
Salinity, NaCl (ppm)	20,544	20,544				
T.D.S. (ppm)						
R_w (ohm/m) (77°F)						
ENHANCED RECOVERY PROJECTS						
Enhanced recovery projects						
Date started						
Date discontinued						
Peak oil production (bbl)						4,284,901
Year						1967
Peak gas production, net (Mcf)						
Year						

Base of fresh water (ft.): None

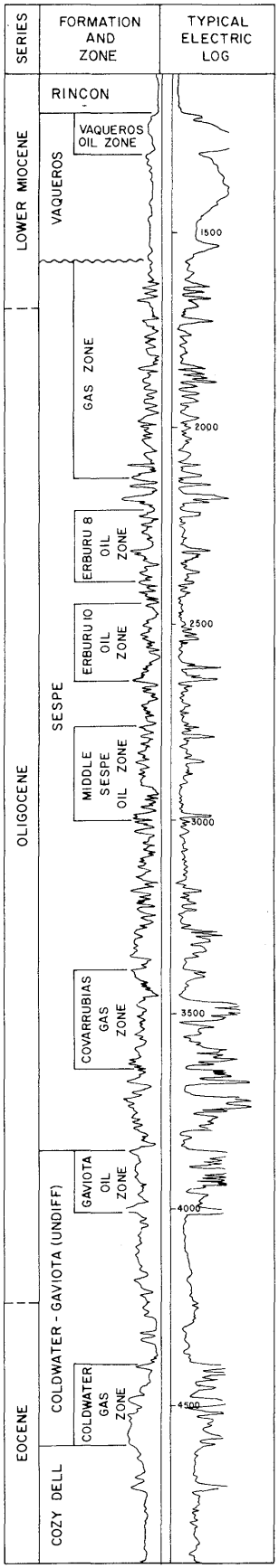
Remarks: a/ Commingled with production from Vaqueros zone.

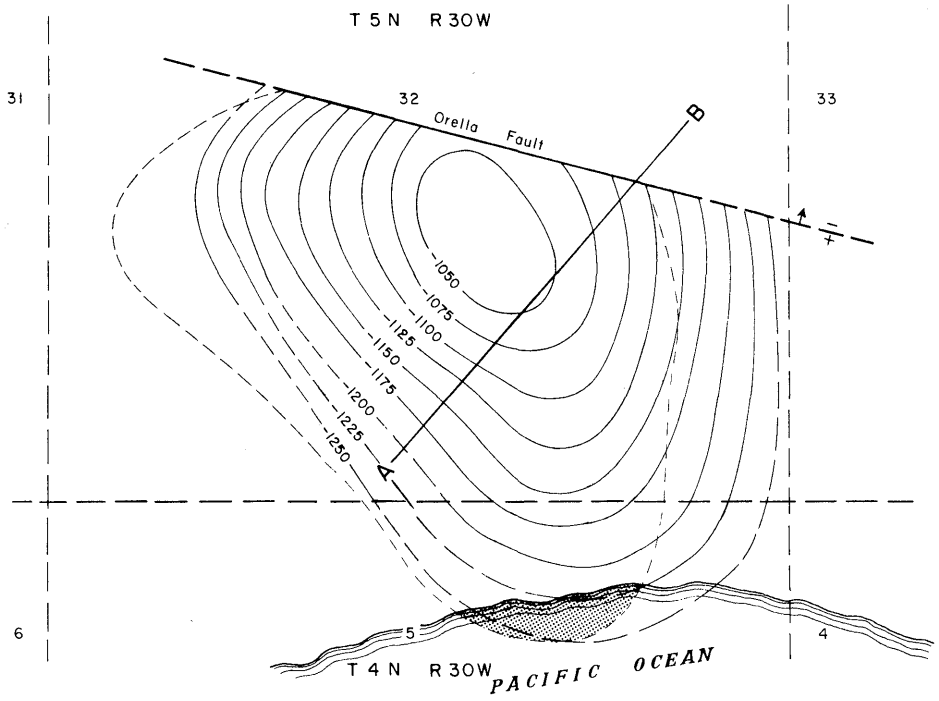
Selected References:

DATE: January 1989

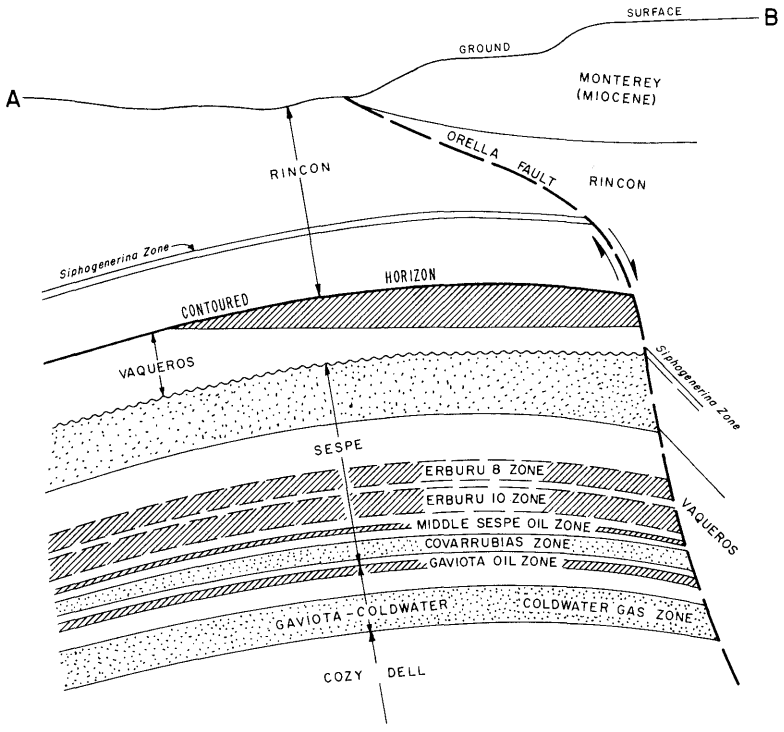
CALIFORNIA DIVISION OF OIL AND GAS

CAPITAN OIL FIELD
Offshore Area
(Abandoned)





CONTOURS ON TOP OF VAQUEROS
SCALE: 1" = 1360'



COUNTY: SANTA BARBARA

CAPITAN OIL FIELD
OFFSHORE 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	H.J. Montgomery 170-1	Oakburn Drilling Co. 170-1	5 4N 30W	SB	1,302	Vaqueros	
Deepest well	Mobil Oil Corp. "State 2991" 2B	Socony Mobil Oil Co. Inc. "State 2991" 2	4 4N 30W	SB	6,761		Sespe Oligocene

POOL DATA

ITEM	VAQUEROS	ERBURU 8	ERBURU 10			FIELD OR AREA DATA
Discovery date	February 1930	September 1932	September 1932			
Initial production rates						
Oil (bbl/day)	75	39	a/			
Gas (Mcf/day)						
Flow pressure (psi)						
Bean size (in.)						
Initial reservoir pressure (psi)						
Reservoir temperature (°F)						
Initial oil content (STB/ac.-ft.)						
Initial gas content (MSCF/ac.-ft.)						
Formation	Vaqueros	Sespe	Sespe			
Geologic age	early Miocene	Oligocene	Oligocene			
Average depth (ft.)	1,250	-	-			
Average net thickness (ft.)	100	-	-			
Maximum productive area (acres)						20
RESERVOIR ROCK PROPERTIES						
Porosity (%)	24***	20-30***	20-30***			
So_i (%)	60-80***	60-70***	60-70***			
Sw_i (%)	20-40***	30-40***	30-40***			
Sg_i (%)						
Permeability to air (md)	900***	100-200***	100-200***			
RESERVOIR FLUID PROPERTIES						
Oil:						
Oil gravity (°API)	16	43	43			
Sulfur content (% by wt.)						
Initial solution GOR (SCF/STB)						
Initial oil FVF (RB/STB)						
Bubble point press. (psia)						
Viscosity (cp) @ °F						
Gas:						
Specific gravity (air = 1.0)						
Heating value (Btu/cu. ft.)						
Water:						
Salinity, NaCl (ppm)	20,544	15,000-17,000	15,000-17,000			
T.D.S. (ppm)						
R_w (ohm/m) (77°F)						
ENHANCED RECOVERY PROJECTS						
Enhanced recovery projects						
Date started						
Date discontinued						
Peak oil production (bbl)						5,826
Year						1934
Peak gas production, net (Mcf)						
Year						

Base of fresh water (ft.): 150

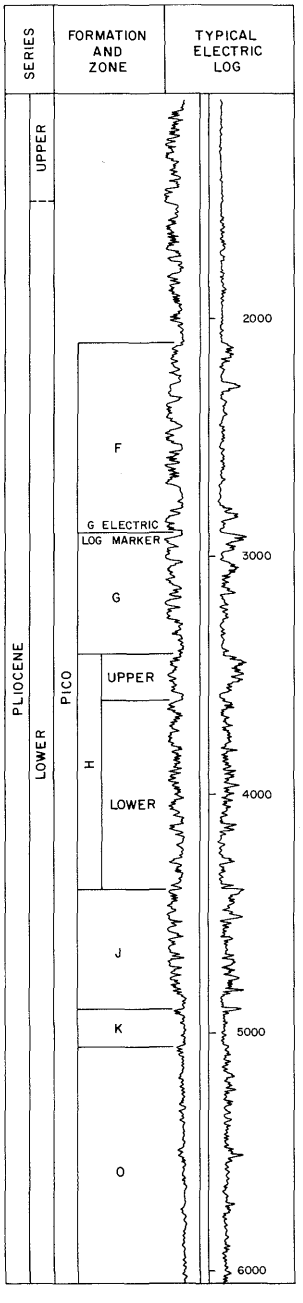
Remarks: The area was abandoned in 1963. Cumulative production is 71,074 bbl of oil and 33,141 Mcf of gas.
a/ Commingled with production from Erburu 8 zone.

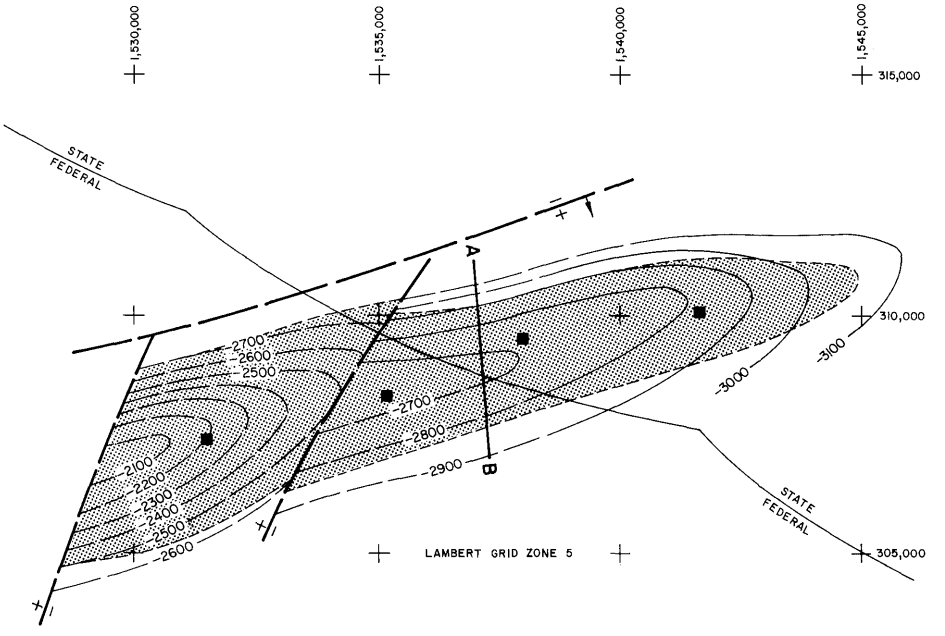
Selected References: Yerkes, R.F., H.C. Wagner, and K.A. Yenne, 1969, Petroleum Development in the Region of the Santa Barbara Channel: U.S. Geol. Survey Prof. Paper 679B, p. 19.

DATE: January 1989 ***Representative values for area, formation, and depth

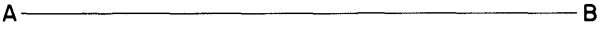
CALIFORNIA DIVISION OF OIL AND GAS

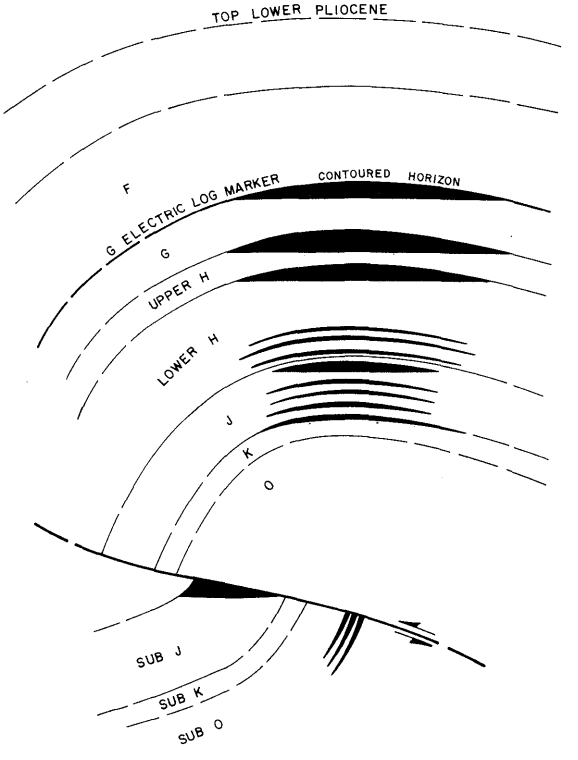
CARPINTERIA OFFSHORE OIL FIELD





CONTOURS ON G ELECTRIC LOG MARKER





COUNTY: SANTA BARBARA

CARPINTERIA OFFSHORE 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	Chevron U.S.A. Inc. "Sacs 3150" 1	Standard Oil Co. of Calif. "Sacs 3150" 1	17 3N 25W	SB	5,935	Pico	
Deepest well	Chevron U.S.A. Inc. "Sacs 3150" 9	Standard Oil Co. of Calif. "Sacs 3150" 9	17 3N 25W	SB	14,552		Sespe Oligocene

POOL DATA

ITEM	PICO	SUBTHRUST PICO				FIELD OR AREA DATA
Discovery date	1964	February 1967				
Initial production rates						
Oil (bbl/day)	213	62				
Gas (Mcf/day)	85	156				
Flow pressure (psi)						
Bean size (in.)						
Initial reservoir pressure (psi)	1,425	2,865				
Reservoir temperature (°F)	124	160				
Initial oil content (STB/ac.-ft.)	1,360	670				
Initial gas content (MSCF/ac.-ft.)	-	960				
Formation	Pico	Pico				
Geologic age	early Pliocene	early Pliocene				
Average depth (ft.)	3,800	6,000				
Average net thickness (ft.)	920	350				
Maximum productive area (acres)						340
RESERVOIR ROCK PROPERTIES						
Porosity (%)	21.6-30.7	20.0-22.0				
Soi (%)	80-69	50				
Swi (%)	20-31	50				
Sgi (%)	0	0				
Permeability to air (md)	540	200-500				
RESERVOIR FLUID PROPERTIES						
Oil:						
Oil gravity (°API)	26.2	27.0				
Sulfur content (% by wt.)						
Initial solution GOR (SCF/STB)	242	-				
Initial oil FVF (RB/STB)	1.14	1.27				
Bubble point press. (psia)	1,385	-				
Viscosity (cp) @ °F	6.6 @ 124	-				
Gas:						
Specific gravity (air = 1.0)	0.8	-				
Heating value (Btu/cu. ft.)						
Water:						
Salinity, NaCl (ppm)	15,900	15,900				
T.D.S. (ppm)						
R_w (ohm/m) (77°F)						
ENHANCED RECOVERY PROJECTS						
Enhanced recovery projects						
Date started						
Date discontinued						
Peak oil production (bbl)						10,475,173
Year						1969
Peak gas production, net (Mcf)						7,470,095
Year						1969

Base of fresh water (ft.): None

Remarks: Field straddles the state-federal boundary. Wells were drilled from state Platforms Heidi and Hope and federal Platforms Hogan and Houchin. First production from federal leases was in 1968.

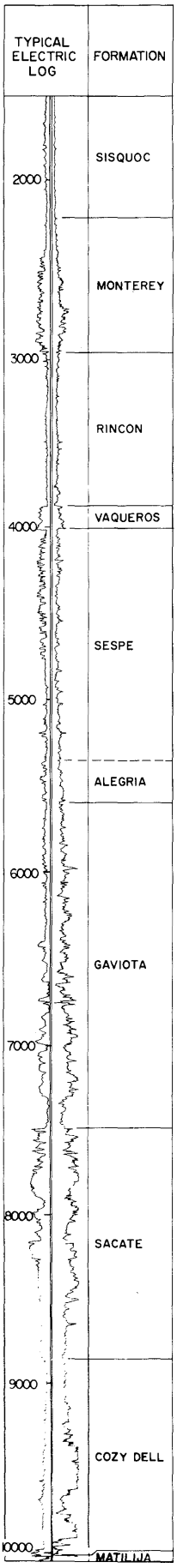
Selected References:

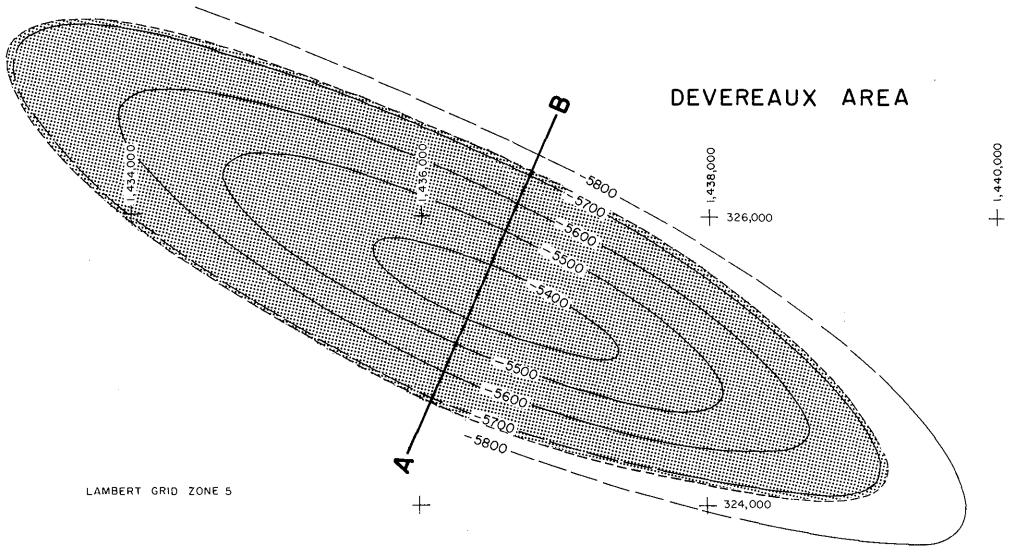
DATE: May 1983 *Average value

CALIFORNIA DIVISION OF OIL AND GAS

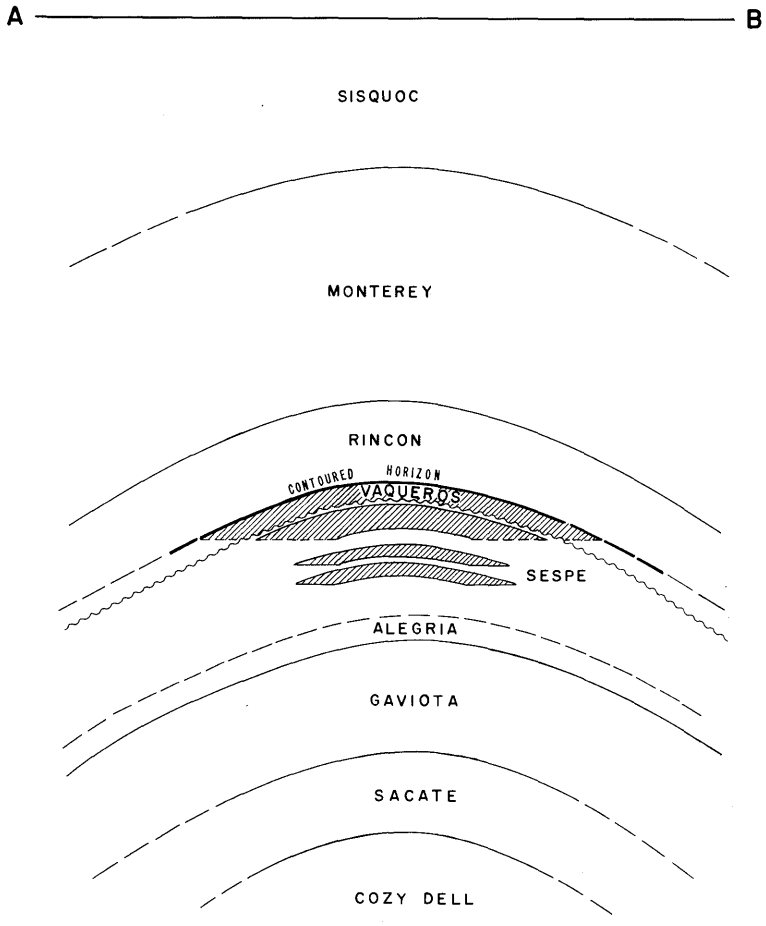
COAL OIL POINT OFFSHORE OIL FIELD

(Abandoned)





CONTOURS ON TOP OF VAQUEROS



COUNTY: SANTA BARBARA

COAL OIL POINT OFFSHORE OIL FIELD (ABD)

(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 Producing Inc. "Honolulu-Signal-Macco State" 309-1	Honolulu Oil Corp. "Honolulu-Signal-Macco State" 309-1	19 4N 28W	SB	4,404 a/	Vaqueros	
Deepest well	Texaco Producing Inc. "Honolulu-Signal-Macco State" 309-2	Honolulu Oil Corp. "Honolulu-Signal-Macco State" 309-2	19 4N 28W	SB	10,055 b/		Matilija(?) Eocene

POOL DATA

ITEM	VAQUEROS					FIELD OR AREA DATA
Discovery date	September 1947					
Initial production rates						
Oil (bbl/day)	12					
Gas (Mcf/day)						
Flow pressure (psi)						
Bean size (in.)						
Initial reservoir pressure (psi)	900					
Reservoir temperature (°F)	90					
Initial oil content (STB/ac.-ft.)						
Initial gas content (MSCF/ac.-ft.)						
Formation	Vaqueros					
Geologic age	early Miocene					
Average depth (ft.)	3,130 c/					
Average net thickness (ft.)	10					
Maximum productive area (acres)	20					140
RESERVOIR ROCK PROPERTIES						
Porosity (%)	20-30***					
So_i (%)	40-50***					
Sw_i (%)	50-60***					
Sg_i (%)						
Permeability to air (md)	80-100***					
RESERVOIR FLUID PROPERTIES						
Oil:						
Oil gravity (°API)	30					
Sulfur content (% by wt.)						
Initial solution GOR (SCF/STB)						
Initial oil FVF (RB/STB)						
Bubble point press. (psia)						
Viscosity (cp) @ °F						
Gas:						
Specific gravity (air = 1.0)						
Heating value (Btu/cu. ft.)						
Water:						
Salinity, NaCl (ppm)	18,147					
T.D.S. (ppm)						
R_w (ohm/m) (77°F)	0.34					
ENHANCED RECOVERY PROJECTS						
Enhanced recovery projects						
Date started						
Date discontinued						
Peak oil production (bbl)	474					232,136
Year	1947					1966
Peak gas production, net (Mcf)						634,406
Year						1965

Base of fresh water (ft.): None

Remarks: The field was abandoned in 1984. Cumulative production is 1,307,279 bbl of oil and 3,269,672 Mcf of gas.
a/ Directional well; true vertical depth is 3,357 feet.
b/ Directional well; true vertical depth is 9,270 feet.
c/ Approximate true vertical depth.

Selected References: Yerkes, R.F., H.C. Wagner and K.A. Yenne, 1969, Petroleum Development in the Region of the Santa Barbara Channel: U.S. Geol. Survey Prof. Paper 679B, p. 19.

DATE: January 1989 ***Representative value for area, formation, and depth

CALIFORNIA DIVISION OF OIL AND GAS

COUNTY: SANTA BARBARA

COAL OIL POINT OFFSHORE OIL FIELD (ABD) DEVEREAUX 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	ARCO Oil and Gas Co. "R-H-S State 308" 3	Richfield Oil Corp. "Richfield-Honolulu-Signal State 308" 3	36 4N 29W	SB	6,105	Vaqueros-Sespe	
Deepest well	ARCO Oil and Gas Co. "R-H-S State 308" 4	Richfield Oil Corp. "State 308" 4	1 3N 29W	SB	8,795		Cozy Dell Eocene

POOL DATA

ITEM	MONTEREY[b]	VAQUEROS	SESPE			FIELD OR AREA DATA
Discovery date	June 1982	July 1961	July 1961			
Initial production rates						
Oil (bbl/day)	4,138	70	a/			
Gas (Mcf/day)	-	1,000	a/			
Flow pressure (psi)	confidential	confidential	confidential			
Bean size (in.)	"	"	"			
Initial reservoir pressure (psi)	"	"	"			
Reservoir temperature (°F)	"	"	"			
Initial oil content (STB/ac.-ft.)	"	"	"			
Initial gas content (MSCF/ac.-ft.)	"	"	"			
Formation	Monterey	Vaqueros	Sespe			
Geologic age	Miocene	early Miocene	Oligocene			
Average depth (ft.)	-	5,450	5,600			
Average net thickness (ft.)	-	50	350			
Maximum productive area (acres)						100
RESERVOIR ROCK PROPERTIES						
Porosity (%)	confidential	confidential	confidential			
So_i (%)						
Sw_i (%)						
Sg_i (%)						
Permeability to air (md)						
RESERVOIR FLUID PROPERTIES						
Oil:						
Oil gravity (°API)	confidential	29-30	29-30			
Sulfur content (% by wt.)						
Initial solution GOR (SCF/STB)						
Initial oil FVF (RB/STB)						
Bubble point press. (psia)						
Viscosity (cp) @ °F						
Gas:						
Specific gravity (air = 1.0)						
Heating value (Btu/cu. ft.)						
Water:						
Salinity, NaCl (ppm)		17,289	17,289			
T.D.S. (ppm)						
R_w (ohm/m) (77°F)						
ENHANCED RECOVERY PROJECTS						
Enhanced recovery projects						
Date started						
Date discontinued						
Peak oil production (bbl)						232,136
Year						1966
Peak gas production, net (Mcf)						634,406
Year						1965

Base of fresh water (ft.): None

Remarks: Wells were completed on the sea floor. The area was unitized in 1964 and abandoned in 1984. Cumulative production is 1,306,000 bbl of oil and 3,252,000 Mcf of gas.
a/ Commingled with production from the Vaqueros zone.
b/ Discovery well was drilled and abandoned as an expendable hole.

Selected References:
Barton, C.L., 1961, Operations in District No. 3: Calif. Div. of Oil and Gas, Summary of Operations--Calif. Oil Fields, Vol. 47, No. 2, p. 125.
Dainty, N.D., and D. Woltz, 1983, Oil and Gas Developments in West Coast Area in 1982: AAPG Bull. 67, No. 10, p. 1661.

DATE: January 1989

CALIFORNIA DIVISION OF OIL AND GAS

COUNTY: SANTA BARBARA

COAL OIL POINT OFFSHORE OIL FIELD
(ABD)
OLD 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	Texaco Producing Inc. "Honolulu-Signal-Macco State" 309-1	Honolulu Oil Corp. "Honolulu-Signal-Macco State" 309-1	19 4N 28W	SB	4,404 a/	Vaqueros	
Deepest well	Texaco Producing Inc. "Honolulu-Signal-Macco State" 309-2	Honolulu Oil Corp. "Honolulu-Signal-Macco State" 309-2	19 4N 28W	SB	10,055 b/		Matilija(?) Eocene

POOL DATA

ITEM	VAQUEROS	MATILIJA(?)				FIELD OR AREA DATA
Discovery date	September 1947	August 1948				
Initial production rates						
Oil (bbl/day)	12	89				
Gas (Mcf/day)	-	840				
Flow pressure (psi)	-	1,750				
Bean size (in.)	-	11/64				
Initial reservoir pressure (psi)	900	-				
Reservoir temperature (°F)	90	222				
Initial oil content (STB/ac.-ft.)						
Initial gas content (MSCF/ac.-ft.)						
Formation	Vaqueros	Matilija(?)				
Geologic age	early Miocene	Eocene				
Average depth (ft.)	3,130 c/	9,245 c/				
Average net thickness (ft.)	10	25				
Maximum productive area (acres)	20	20				40
RESERVOIR ROCK PROPERTIES						
Porosity (%)	20-30***	15***				
So_i (%)	40-50***	60***				
Sw_i (%)	50-60***	40***				
Sg_i (%)						
Permeability to air (md)	80-100***	-				
RESERVOIR FLUID PROPERTIES						
Oil:						
Oil gravity (°API)	30	32				
Sulfur content (% by wt.)						
Initial solution GOR (SCF/STB)						
Initial oil FVF (RB/STB)						
Bubble point press. (psia)						
Viscosity (cp) @ °F						
Gas:						
Specific gravity (air = 1.0)						
Heating value (Btu/cu. ft.)						
Water:						
Salinity, NaCl (ppm)	18,147	17,634				
T.D.S. (ppm)						
R_w (ohm/m) (77°F)	0.34	0.38				
ENHANCED RECOVERY PROJECTS						
Enhanced recovery projects						
Date started						
Date discontinued						
Peak oil production (bbl)	474	620				805
Year	1947	1948				1948
Peak gas production, net (Mcf)		17,672				17,672
Year		1948				1948

Base of fresh water (ft.): None

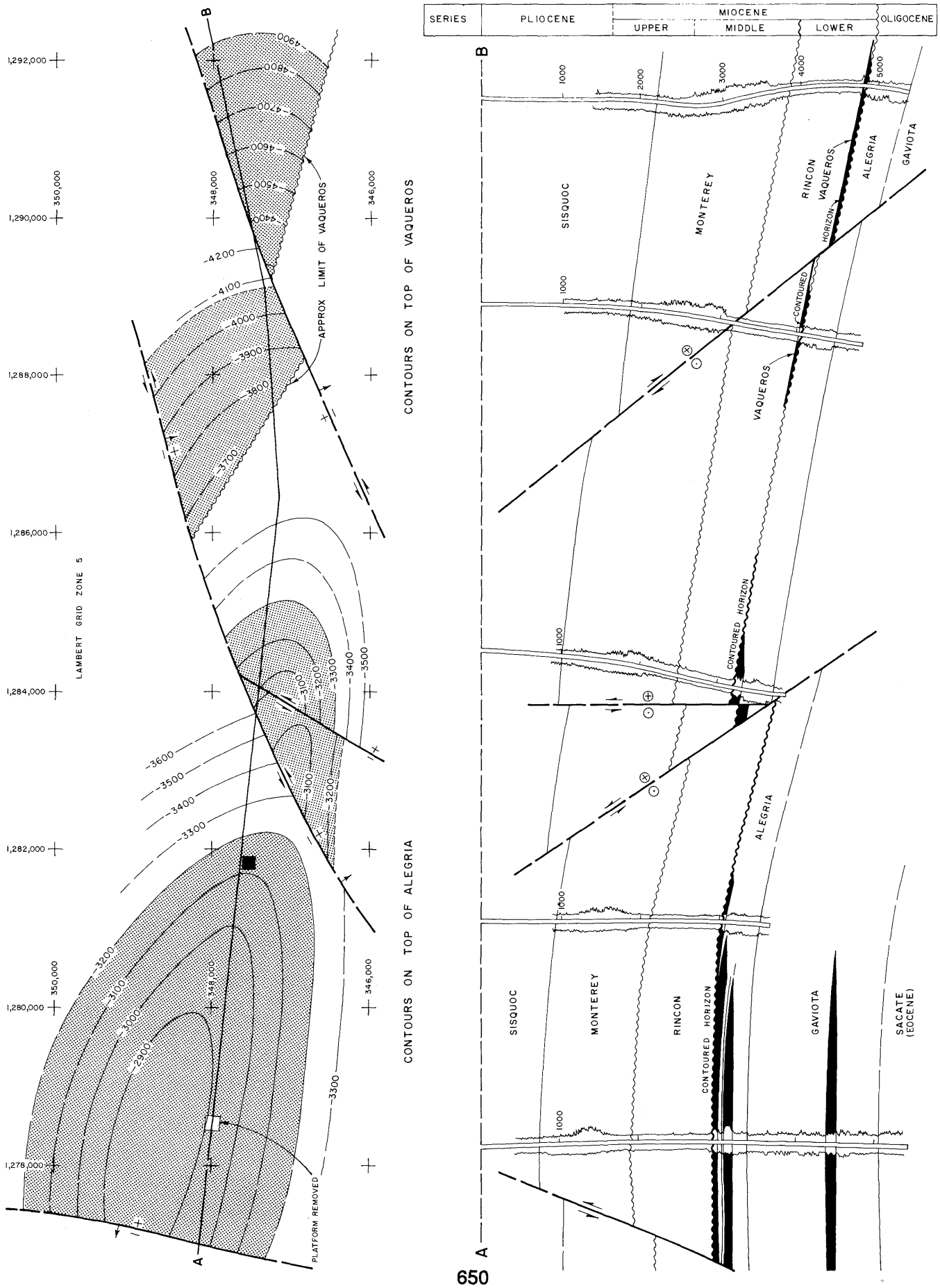
Remarks: The area was abandoned in 1966. Cumulative production is 1,279 bbl of oil and 17,672 Mcf of gas.
a/ Directional well; true vertical depth is 3,357 feet.
b/ Directional well; true vertical depth is 9,270 feet.
c/ Approximate true vertical depth.

Selected References:

DATE: January 1989 ***Representative value for area, formation, and depth

CALIFORNIA DIVISION OF OIL AND GAS

CONCEPTION OFFSHORE OIL FIELD
(Abandoned)



COUNTY: SANTA BARBARA

CONCEPTION OFFSHORE OIL FIELD (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	Phillips Petroleum Co. "State 2207" 4	Same as present	13 4N 34W	SB	6,897	Gaviota	
Deepest well	Phillips Petroleum Co. "State 2207" 36	Same as present	14 4N 34W	SB	10,707 a/		Alegria Oligocene

POOL DATA

ITEM	VAQUEROS	ALEGRIA	GAVIOTA			FIELD OR AREA DATA
Discovery date	July 1961	June 1961	April 1961			
Initial production rates						
Oil (bbl/day)	1,338	1,435	312			
Gas (Mcf/day)	582	695	b/			
Flow pressure (psi)	520	650	-			
Bean size (in.)	22/64	-	16/64			
Initial reservoir pressure (psi)	2,070	1,500-1,550	2,080			
Reservoir temperature (°F)	160	128-150	160			
Initial oil content (STB/ac.-ft.)	1,605	1,493-1,632	490			
Initial gas content (MSCF/ac.-ft.)						
Formation	Vaqueros	Alegria	Gaviota			
Geologic age	early Miocene	Oligocene	Oligocene			
Average depth (ft.)	4,600	3,000	4,400			
Average net thickness (ft.)	30	250-300	100			
Maximum productive area (acres)						330
RESERVOIR ROCK PROPERTIES						
Porosity (%)	31	23-30	16			
So_i (%)	80	77-80	49			
Sw_i (%)	20	20-23	51			
Sg_i (%)						
Permeability to air (md)	-	430-1,200	30			
RESERVOIR FLUID PROPERTIES						
Oil:						
Oil gravity (°API)	32-42	32-42	32-42			
Sulfur content (% by wt.)	-	0.13	-			
Initial solution GOR (SCF/STB)	427	155-445	440			
Initial oil FVF (RB/STB)	1.20	1.12-1.25	1.25			
Bubble point press. (psia)	2,000	1,580	1,550			
Viscosity (cp) @ °F	0.83 @ 160	1.60 @ 128	0.90 @ 160			
Gas:						
Specific gravity (air = 1.0)						
Heating value (Btu/cu. ft.)						
Water:						
Salinity, NaCl (ppm)						20,544
T.D.S. (ppm)						
R_w (ohm/m) (77°F)						
ENHANCED RECOVERY PROJECTS						
Enhanced recovery projects						
Date started						
Date discontinued						
Peak oil production (bbl)						5,001,722
Year						1964
Peak gas production, net (Mcf)						3,340,163
Year						1964

Base of fresh water (ft.): None

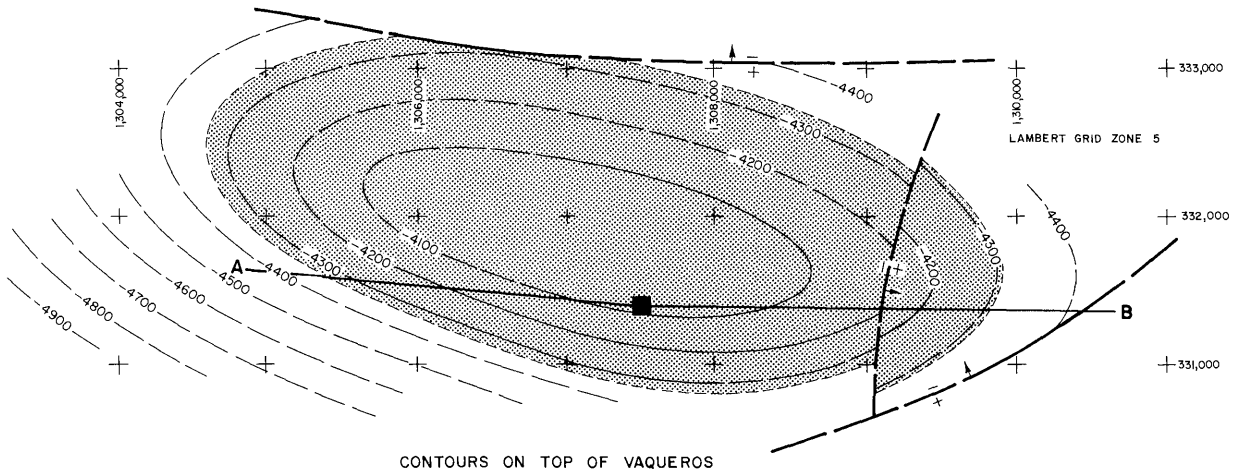
Remarks: The western portion of the field was developed by wells drilled from Platform Harry. The eastern portion of the field was developed by subsea-completed wells with production facilities on Platform Herman.
The field was abandoned in 1988. Cumulative production is 20,933,349 bbl of oil and 12,325,906 Mcf of gas.
a/ Directional well; true vertical depth is 9,116 feet.
b/ Not recorded.

Selected References: Yerkes, R.F., H.C. Wagner and K.A. Yenne, 1969, Petroleum Development in the Region of the Santa Barbara Channel: U.S. Geol. Survey Prof. Paper 679B, p. 19.

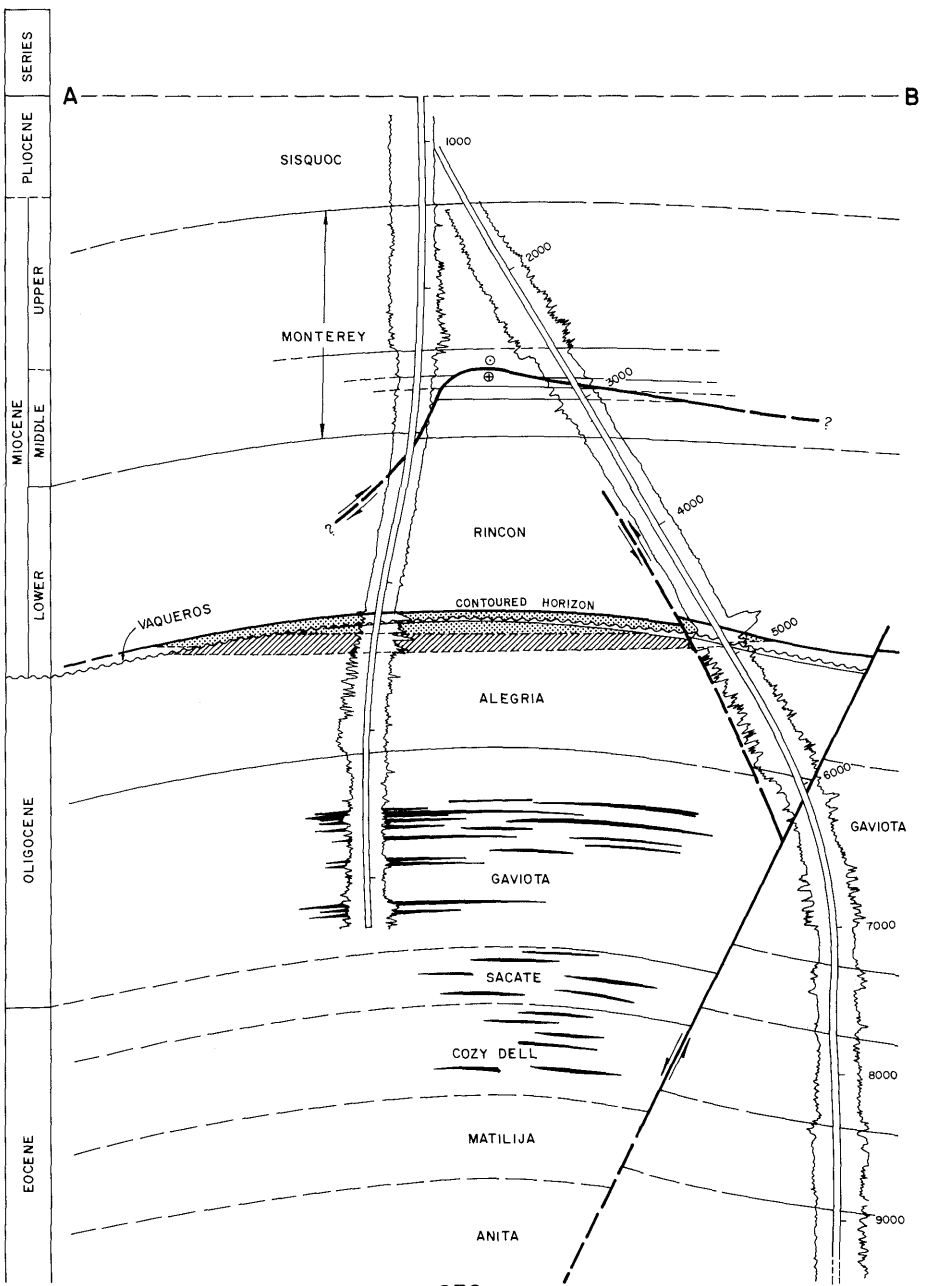
DATE: January 1989

CALIFORNIA DIVISION OF OIL AND GAS

CUARTA OFFSHORE OIL FIELD
(Abandoned)



CONTOURS ON TOP OF VAQUEROS



COUNTY: SANTA BARBARA

CUARTA OFFSHORE OIL FIELD (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. "Anita" 1	Texaco Inc. "Texaco-Monterey PRC 2206.1" 1	12 4N 33W	SB	7,513 a/	Vaqueros	
Deepest well	Texaco Inc. "Anita" 5	Texaco Inc. "Texaco-Monterey PRC 2206.1" 5	11 4N 33W	SB	9,476 b/		Anita Eocene

POOL DATA

ITEM	VAQUEROS GAS	ALEGRIA	GAVIOTA	SACATE	COZY DELL	FIELD OR AREA DATA
Discovery date	January 1959	April 1959	March 1961	November 1961	November 1961	
Initial production rates						
Oil (bbl/day)	-	6,750	57	83	c/	
Gas (Mcf/day)	2,120	12,480	825	445	-	
Flow pressure (psi)	1,250	-	-	1,850	-	
Bean size (in.)	20/64	1/8	-	14/64	-	
Initial reservoir pressure (psi)	2,018	2,000	2,385	2,949	3,264	
Reservoir temperature (°F)	138	140	161	187	192	
Initial oil content (STB/ac.-ft.)	-	1,163	430	1,261	959	
Initial gas content (MSCF/ac.-ft.)	500	-	-	-	-	
Formation	Vaqueros	Alegria	Gaviota	Sacate	Cozy Dell	
Geologic age	early Miocene	Oligocene	Oligocene	Eocene	Eocene	
Average depth (ft.)	4,020	4,080	5,300	6,500	6,900	
Average net thickness (ft.)	50-70	150	250	150	150	
Maximum productive area (acres)						120
RESERVOIR ROCK PROPERTIES						
Porosity (%)	22.7	26.9	16.0	25.0	19.0	
S_{oi} (%)	-	68	44	80	80	
S_{wi} (%)	36	32	56	20	20	
S_{gi} (%)	64	-	-	0	0	
Permeability to air (md)	75	748	9	-	-	
RESERVOIR FLUID PROPERTIES						
Oil:						
Oil gravity (°API)	-	28-38	32-55	28-36	33-36	
Sulfur content (% by wt.)						
Initial solution GOR (SCF/STB)	-	500	440	480	-	
Initial oil FVF (RB/STB)	-	1.22	1.26	1.23	1.23	
Bubble point press. (psia)	-	1,850	1,550	1,550	1,550	
Viscosity (cp) @ °F	-	1.20 @ 140	0.75 @ 161	0.70 @ 187	0.70 @ 192	
Gas:						
Specific gravity (air = 1.0)	0.61	-	-	-	-	
Heating value (Btu/cu. ft.)	1,090	-	-	-	-	
Water:						
Salinity, NaCl (ppm)	22,253	22,253	17,974	19,500	56,482	
T.D.S. (ppm)						
R_w (ohm/m) (77°F)	0.29	0.29	0.35	0.32	0.12	
ENHANCED RECOVERY PROJECTS						
Enhanced recovery projects						
Date started						
Date discontinued						
Peak oil production (bbl)						189,067
Year						1962
Peak gas production, net (Mcf)						4,612,243
Year						1963

Base of fresh water (ft.): None

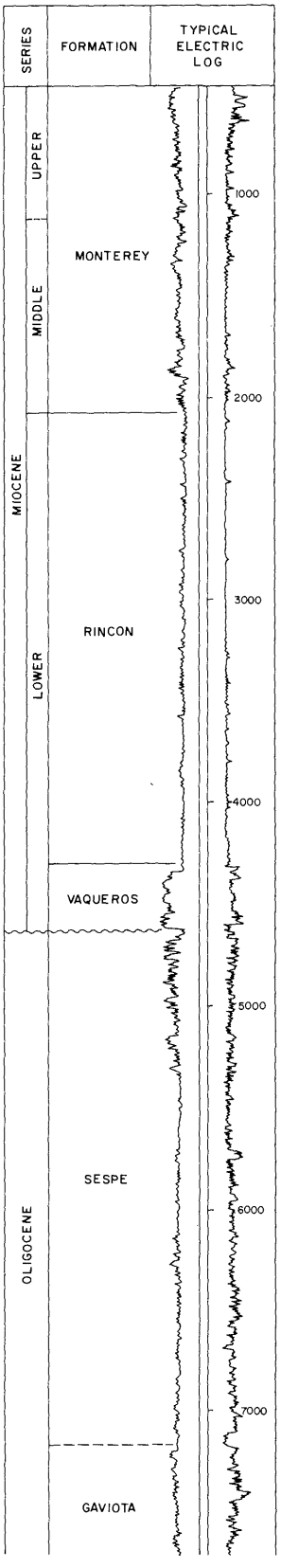
Remarks: The field was abandoned in March 1985. Nine wells were completed with a cumulative production of 613,974 bbl of oil and 18,714,699 Mcf of gas.
a/ Directional well; true vertical depth is 7,222 feet.
b/ Directional well; true vertical depth is 8,777 feet.
c/ Commingled with production from the Sacate zone.

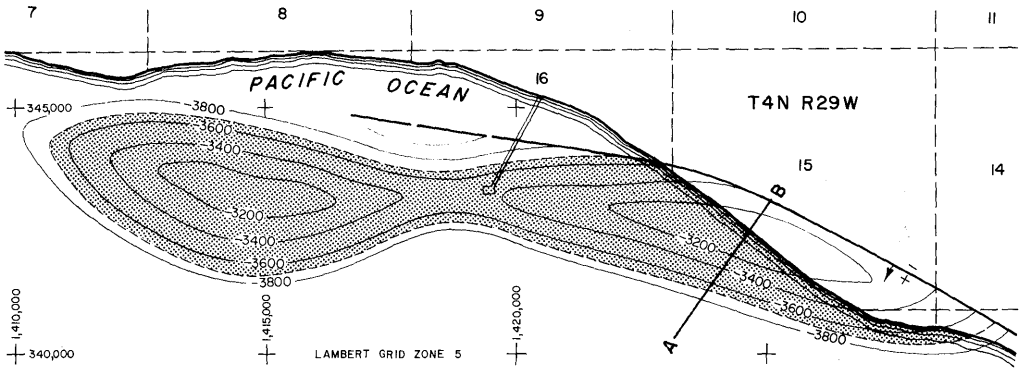
Selected References: Cordova, S., 1972, Cuarta Offshore Oil Field: Calif. Div. of Oil and Gas, Summary of Operations--Calif. Oil Fields, Vol. 58, No. 1.
Yerkes, R.F., H.C. Wagner, and K.A. Yenne, 1969, Petroleum Development in the Region of the Santa Barbara Channel: U.S. Geol. Survey Prof. Paper 679B, p. 20.

DATE: January 1989

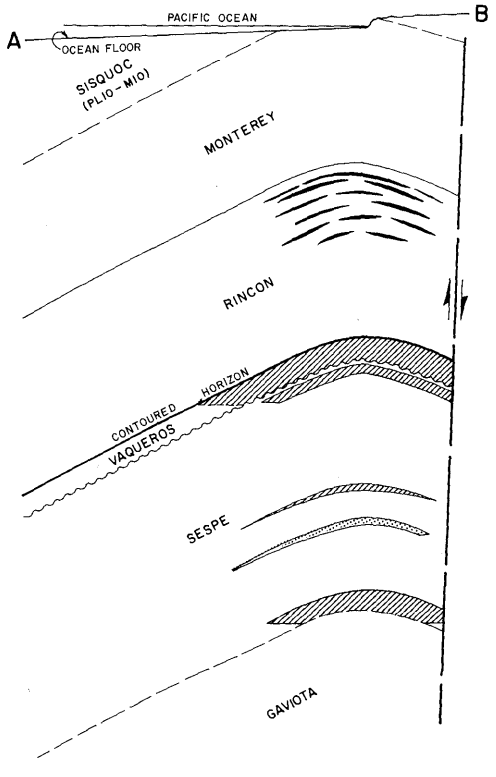
CALIFORNIA DIVISION OF OIL AND GAS

ELWOOD OIL FIELD
Offshore Area





CONTOURS ON TOP OF VAQUEROS



COUNTY: SANTA BARBARA

ELWOOD OIL FIELD
OFFSHORE 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	Oryx Energy Co. 94-1	Barnsdall Oil Co. of Calif. "Tideland Permit" 94-1	22 4N 29W	SB	3,512	Vaqueros	
Deepest well	ARCO Oil and Gas Co. "State 208" 29X	Signal Oil and Gas Co. "State" 208-29X	17 4N 29W	SB	9,986 a/		Cozy Dell Eocene

POOL DATA

ITEM	RINCON	VAQUEROS	UPPER SESPE	BELL 14	SESPE GAS	FIELD OR AREA DATA
Discovery date	April 1938	November 1929	May 1935	August 1934	May 1936	
Initial production rates						
Oil (bbl/day)	132	2,557	1,059	584	-	
Gas (Mcf/day)	-	-	727	-	1,010	
Flow pressure (psi)	-	90	-	600	-	
Bean size (in.)	-	56/64	40/64	40/64	64/64	
Initial reservoir pressure (psi)	-	1,560	-	-	-	
Reservoir temperature (°F)	-	120-155	-	-	-	
Initial oil content (STB/ac.-ft.)						
Initial gas content (MSCF/ac.-ft.)						
Formation	Rincon	Vaqueros	Sespe	Sespe	Sespe	
Geologic age	early Miocene	early Miocene	Oligocene	Oligocene	Oligocene	
Average depth (ft.)	2,100	3,400	3,700	4,500	5,200	
Average net thickness (ft.)	900	320	100	60	100	
Maximum productive area (acres)						610
RESERVOIR ROCK PROPERTIES						
Porosity (%)	26.0	21.3-24.0	20.0-30.0***	20.0-30.0***	16.0***	
So_i (%)	60	66	60-70***	60-70***	-	
Sw_i (%)	40	34	30-40***	30-40***	30***	
Sg_i (%)	-	-	-	-	70***	
Permeability to air (md)	fractured shale	514-900	85-200***	85-200***	514-900	
RESERVOIR FLUID PROPERTIES						
Oil:						
Oil gravity (°API)	26	38	36	42	-	
Sulfur content (% by wt.)						
Initial solution GOR (SCF/STB)	-	264	-	-	-	
Initial oil FVF (RB/STB)	-	1.19	-	-	-	
Bubble point press. (psia)						
Viscosity (cp) @ °F						
Gas:						
Specific gravity (air = 1.0)						
Heating value (Btu/cu. ft.)	-	-	-	-	1,100	
Water:						
Salinity, NaCl (ppm)	34,240	20,544	17,120	17,120	17,120	
T.D.S. (ppm)						
R_w (ohm/m) (77°F)						
ENHANCED RECOVERY PROJECTS						
Enhanced recovery projects		gas injection				
Date started		1947				
Date discontinued		1969				
Peak oil production (bbl)						b/
Year						
Peak gas production, net (Mcf)						
Year						

Base of fresh water (ft.): None

Remarks: a/ Directional well; true vertical depth of original hole is 9,280 feet.
b/ Early production was not broken down by areas.

Selected References: Frame, R.G., 1960, California Offshore Petroleum Developments: Calif. Div. of Oil and Gas, Summary of Operations--California Oil Fields, Vol. 46, No. 2.

DATE: January 1989 ***Representative values for area, formation, and depth

CALIFORNIA DIVISION OF OIL AND GAS

COUNTY: SANTA BARBARA

ELWOOD OIL FIELD OFFSHORE 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	LOWER SESPE					FIELD OR AREA DATA
Discovery date	May 1936					
Initial production rates						
Oil (bbl/day)	36					
Gas (Mcf/day)	c/					
Flow pressure (psi)	60					
Bean size (in.)	64/64					
Initial reservoir pressure (psi)						
Reservoir temperature (°F)						
Initial oil content (STB/ac.-ft.)						
Initial gas content (MSCF/ac.-ft.)						
Formation	Sespe					
Geologic age	Oligocene					
Average depth (ft.)	5,620					
Average net thickness (ft.)	250					
Maximum productive area (acres)						
RESERVOIR ROCK PROPERTIES						
Porosity (%)	20-30***					
So_i (%)	60-70***					
Sw_i (%)	30-40***					
Sg_i (%)						
Permeability to air (md)	85-200***					
RESERVOIR FLUID PROPERTIES						
Oil:						
Oil gravity (°API)	34					
Sulfur content (% by wt.)						
Initial solution GOR (SCF/STB)						
Initial oil FVF (RB/STB)						
Bubble point press. (psia)						
Viscosity (cp) @ °F						
Gas:						
Specific gravity (air = 1.0)						
Heating value (Btu/cu. ft.)						
Water:						
Salinity, NaCl (ppm)	17,120					
T.D.S. (ppm)						
R_w (ohm/m) (77°F)						
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.): None

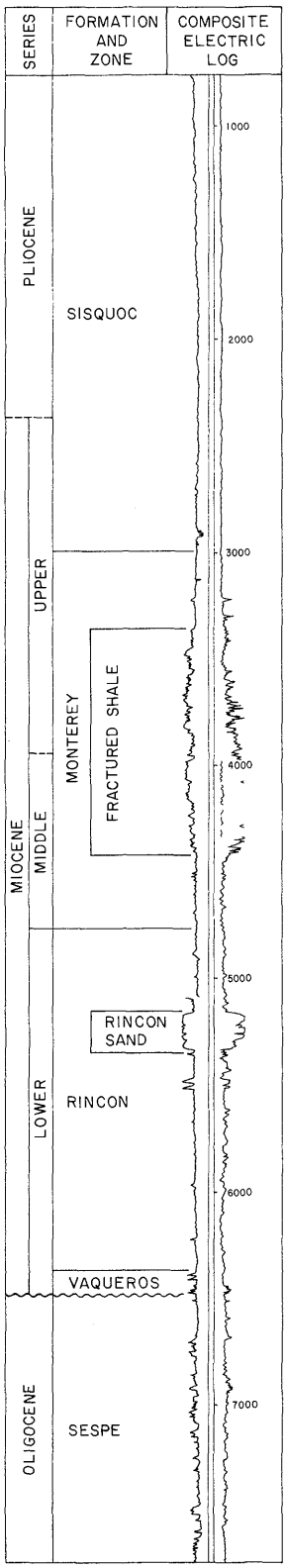
Remarks: c/ Commingled with production from the Sespe Gas zone.

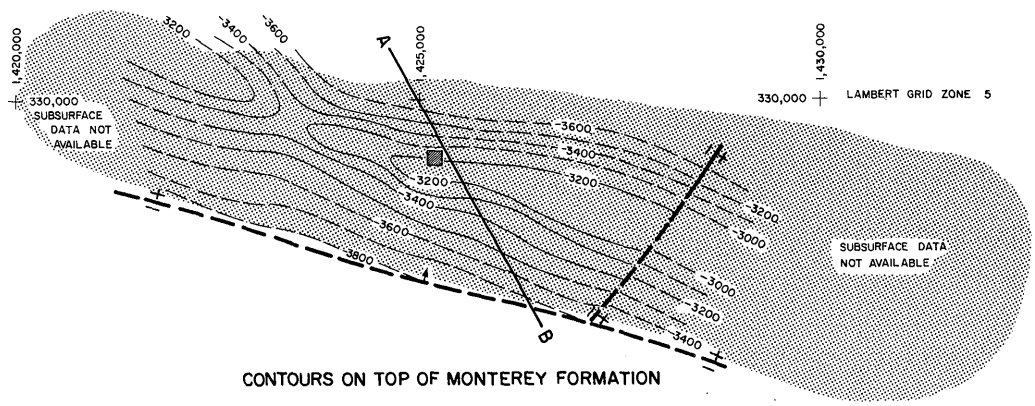
Selected References:

DATE: January 1989 ***Representative values for area, formation, and depth

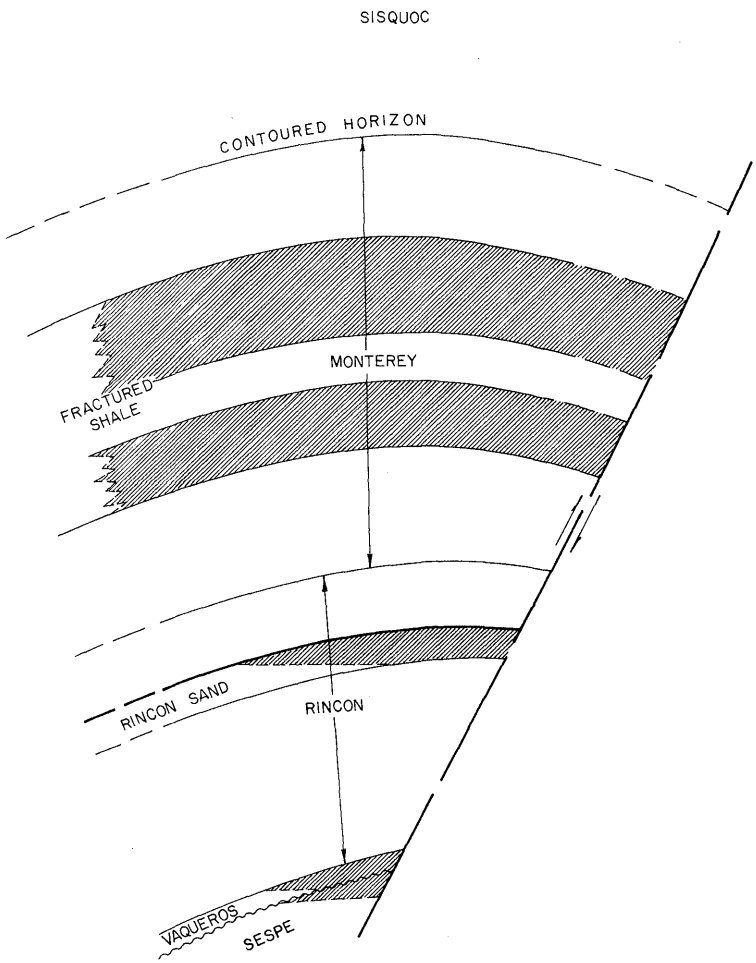
CALIFORNIA DIVISION OF OIL AND GAS

SOUTH ELWOOD OFFSHORE OIL FIELD





CONTOURS ON TOP OF MONTEREY FORMATION



COUNTY: SANTA BARBARA

ELWOOD, SOUTH, OFFSHORE 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	ARCO Oil and Gas Co. "State 3242" 1	Richfield Oil Corp. "State 3242" 1	34 4N 29W	SB	6,490 a/	Rincon	
Deepest well	ARCO Oil and Gas Co. "Ames 3242" 19	Same as present	34 4N 29W	SB	b/		Confidential

POOL DATA

ITEM	SISQUOC	MONTEREY	RINCON	VAQUEROS c/	SESPE c/	FIELD OR AREA DATA
Discovery date	July 1969	May 1969	July 1965	January 1967	January 1967	
Initial production rates						
Oil (bbl/day)	15	112	1,010	145	d/	
Gas (Mcf/day)	-	10-15	273	36	-	
Flow pressure (psi)	-	-	400-425	150	-	
Bean size (in.)	-	64/64	28/64	64/64	64/64	
Initial reservoir pressure (psi)	615	1,600	2,205	3,650	3,650	
Reservoir temperature (°F)	99	150	190	208	208	
Initial oil content (STB/ac.-ft.)	-	100-150	1,402	-	-	
Initial gas content (MSCF/ac.-ft.)						
Formation	Sisquoc	Monterey	Rincon	Vaqueros	Sespe	
Geologic age	Pliocene	Miocene	early Miocene	early Miocene	Oligocene	
Average depth (ft.)	1,350	3,350	5,000	5,900	6,000	
Average net thickness (ft.)	10	500	150	60	150	
Maximum productive area (acres)						600
RESERVOIR ROCK PROPERTIES						
Porosity (%)	-	fractured shale	29	24***	24***	
So_i (%)	-	-	59	60***	70***	
Sw_i (%)	-	-	21	30***	30***	
Sg_i (%)	-	-	20	10***	-	
Permeability to air (md)	-	-	587	80-200***	80-200***	
RESERVOIR FLUID PROPERTIES						
Oil:						
Oil gravity (°API)	25-34	25-34	32-34	33	33	
Sulfur content (% by wt.)	-	2.02	0.20	-	-	
Initial solution GOR (SCF/STB)	-	500	346-1,000	3,947-4,800	3,947-4,800	
Initial oil FVF (RB/STB)	-	-	1.248	-	-	
Bubble point press. (psia)	-	-	2,205	-	-	
Viscosity (cp) @ °F	-	55 @ 100	40 @ 100	-	-	
Gas:						
Specific gravity (air = 1.0)	-	0.97	0.68	-	-	
Heating value (Btu/cu. ft.)	-	1,136-1,289	1,206	-	-	
Water:						
Salinity, NaCl (ppm)	-	44,340	20,530	21,400	21,400	
T.D.S. (ppm)	-	-	21,803	-	-	
R_w (ohm/m) (77°F)	-	-	0.31	-	-	
ENHANCED RECOVERY PROJECTS						
Enhanced recovery projects		gas injection	waterflood			
Date started		1973	1971			
Date discontinued		1981	1977			
			gas injection			
			1981			
			active			
Peak oil production (bbl)		3,444,789	1,883,893	123,485	d/	3,460,338
Year		1984	1968	1967		1984
Peak gas production, net (Mcf)		2,948,055	1,411,155	236,253	d/	2,956,696
Year		1984	1967	1967		1984

Base of fresh water (ft.): None

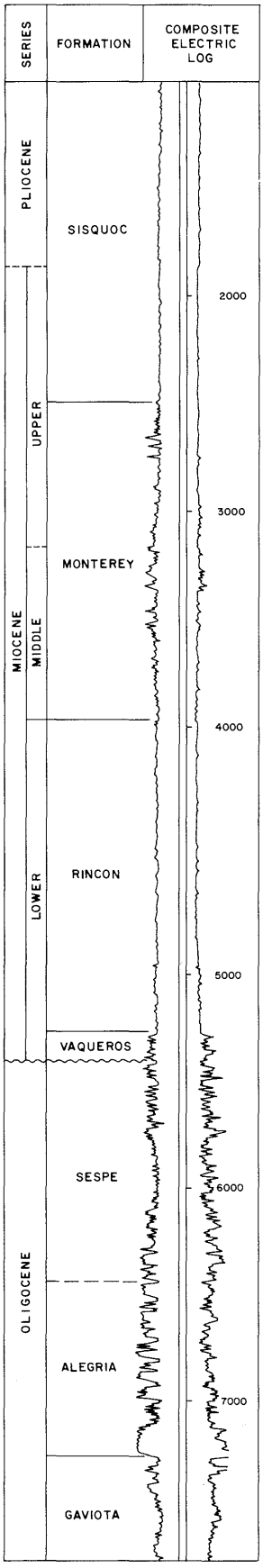
Remarks:
a/ Directional well; true vertical depth is 6,472 feet.
b/ Directional well; however, measured and true vertical depth are confidential.
c/ Pool has been abandoned.
d/ Commingled with production from the Vaqueros zone.

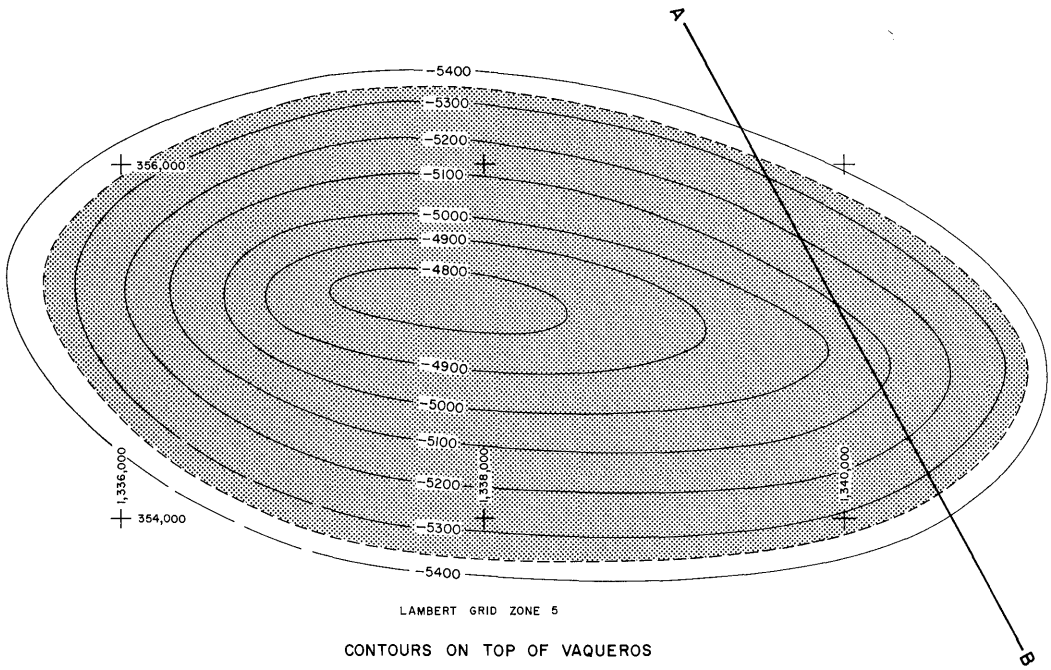
Selected References:
Belfield, W.C., and others, 1983, South Elwood Oil Field, Santa Barbara Channel, California, a Monterey Formation Fractured Reservoir in Petroleum Generation and Occurrence in the Miocene Monterey Formation, California Pacific Section SEPM.
Yerkes, R.F., H.C. Wagner and K.A. Yenne, 1969, Petroleum Development in the Region of the Santa Barbara Channel: U.S. Geol. Survey Prof. Paper 679B, p. 19.

DATE: August 1987 ***Representative values for area, formation, and depth

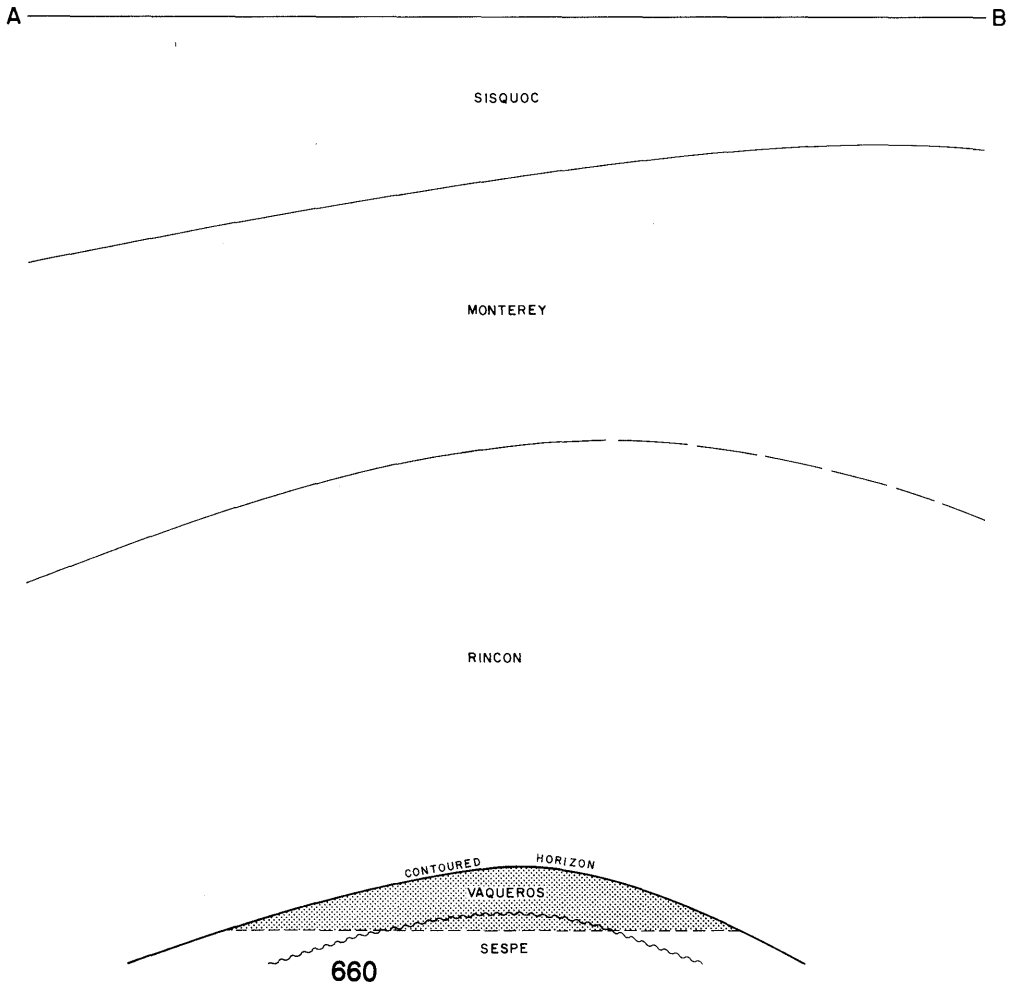
CALIFORNIA DIVISION OF OIL AND GAS

GAVIOTA OFFSHORE GAS FIELD





CONTOURS ON TOP OF VAQUEROS



COUNTY: SANTA BARBARA

GAVIOTA OFFSHORE GAS 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	Chevron U.S.A. Inc. "SGS 2199" 1	Standard Oil Co. of Calif. "Standard-Humble Gaviota State" 1	2 4N 32W	SB	7,751 a/	Vaqueros-Sespe	
Deepest well	Chevron U.S.A. Inc. "SGS 2199" 2A	Standard Oil Co. of Calif. "Standard-Humble Gaviota State" 2A	3 4N 32W	SB	8,567 b/		Gaviota Oligocene

POOL DATA

ITEM	VAQUEROS-SESPE					FIELD OR AREA DATA
Discovery date	July 1960					
Initial production rates						
Oil (bbl/day)	269					
Gas (Mcf/day)	5,598					
Flow pressure (psi)						
Bean size (in.)	28/64					
Initial reservoir pressure (psi)	2,400					
Reservoir temperature (°F)	195					
Initial oil content (STB/ac.-ft.)						
Initial gas content (MSCF/ac.-ft.)	740					
Formation	Vaqueros-Sespe					
Geologic age	Mio-Oligocene					
Average depth (ft.)	5,100					
Average net thickness (ft.)	450					
Maximum productive area (acres)	470					
RESERVOIR ROCK PROPERTIES						
Porosity (%)	22.7					
So_i (%)						
Sw_i (%)	28					
Sg_i (%)	72					
Permeability to air (md)	268					
RESERVOIR FLUID PROPERTIES						
Oil:						
Oil gravity (°API)	62					
Sulfur content (% by wt.)						
Initial solution GOR (SCF/STB)						
Initial oil FVF (RB/STB)						
Bubble point press. (psia)						
Viscosity (cp) @ °F						
Gas:						
Specific gravity (air = 1.0)	0.67					
Heating value (Btu/cu. ft.)	1,190					
Water:						
Salinity, NaCl (ppm)	20,544-32,000					
T.D.S. (ppm)						
R_w (ohm/m) (77°F)						
ENHANCED RECOVERY PROJECTS						
Enhanced recovery projects						
Date started						
Date discontinued						
Peak oil production (bbl)						
Year						
Peak gas production, net (Mcf)	8,994,473					
Year	1964					

Base of fresh water (ft.): None

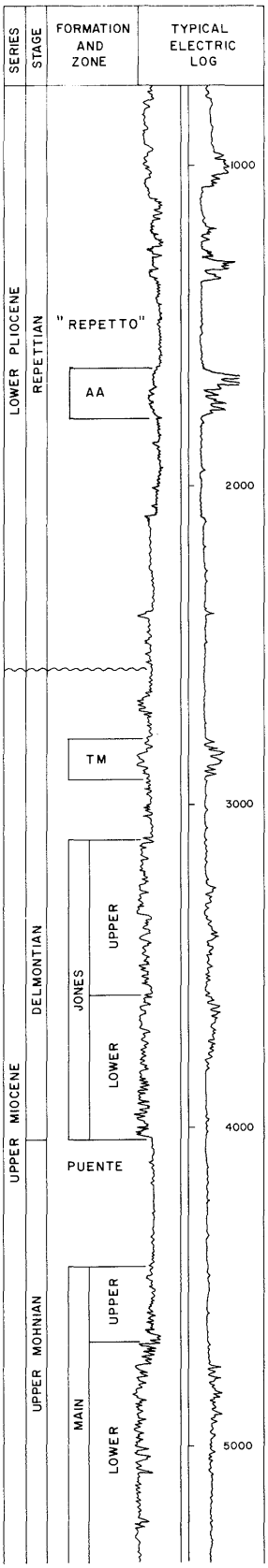
Remarks: a/ Directional well; true vertical depth is 7,238 feet; drilled from a jack-up barge. The well tested for 4,000 Mcf of gas and 445 bbl of condensate per day in November 1958 and was subsequently suspended. Pool data are from the first producing well, "SGS 2199" 4.
b/ Directional well; true vertical depth is 7,726 feet.

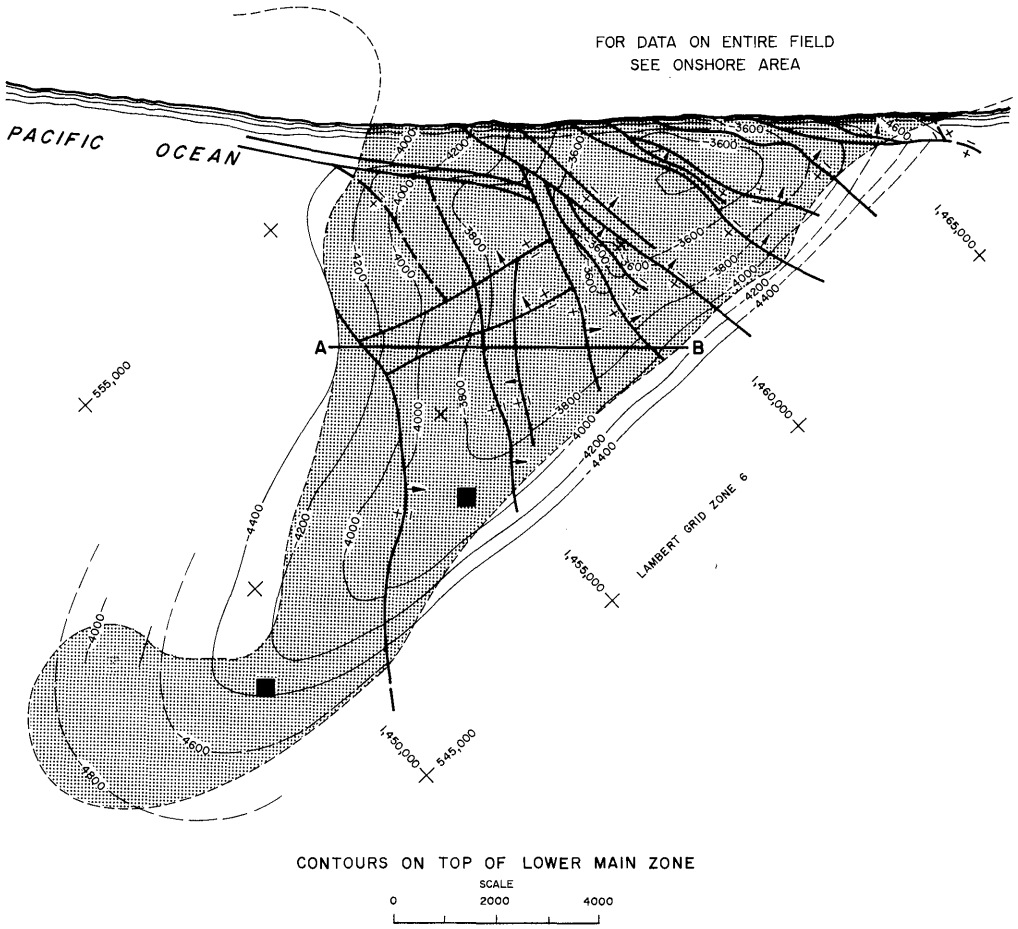
Selected References: Giallonardo, T., and A. Koller, 1978, Gaviota Offshore Gas Field: California Division of Oil and Gas Publication TR21, p. 1-8.
Yerkes, R.F., H.C. Wagner and K.A. Yenne, 1969, Petroleum Development in the Region of the Santa Barbara Channel: U.S. Geol. Survey Prof. Paper 679B, p. 19.

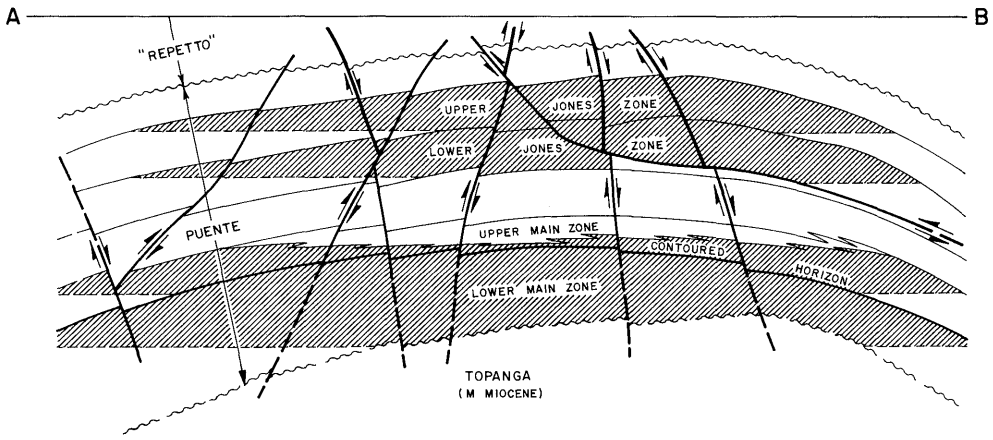
DATE: January 1989

CALIFORNIA DIVISION OF OIL AND GAS

HUNTINGTON BEACH OIL FIELD
Offshore Area







COUNTY: ORANGE

HUNTINGTON BEACH OIL FIELD
OFFSHORE 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	Shell Western Expl. & Prod. Inc. "State 91 M2U" 1331	The Superior Oil Co. "Babbitt" 1	10 6S 11W	SB	4,475	Upper Main	
Deepest well	Shell Western Expl. & Prod. Inc. "State PRC 426" 4143	Signal Oil and Gas Co. "State 426" 143	33 5S 11W	SB	12,236		Puente late Miocene

POOL DATA

ITEM	AA	TM	UPPER JONES			FIELD OR AREA DATA
Discovery date	May 1964	April 1964	November 1933			
Initial production rates						
Oil (bbl/day)	65	68	828			
Gas (Mcf/day)						
Flow pressure (psi)						
Bean size (in.)						
Initial reservoir pressure (psi)	640	1,000	1,100			
Reservoir temperature (°F)	105	128	132			
Initial oil content (STB/ac.-ft.)						
Initial gas content (MSCF/ac.-ft.)						
Formation	"Repetto"	Puente	Puente			
Geologic age	early Pliocene	late Miocene	late Miocene			
Average depth (ft.)	1,510	2,200	2,400			
Average net thickness (ft.)	90	125	190			
Maximum productive area (acres)						195
RESERVOIR ROCK PROPERTIES						
Porosity (%)	34	32	25			
So_i (%)	80	46	65			
Sw_i (%)	20	54	35			
Sg_i (%)	-	-	-			
Permeability to air (md)	1,000	1,000	300			
RESERVOIR FLUID PROPERTIES						
Oil:						
Oil gravity (°API)	14.8	11.0-14.0	17.0-18.0			
Sulfur content (% by wt.)						
Initial solution GOR (SCF/STB)						
Initial oil FVF (RB/STB)						
Bubble point press. (psia)						
Viscosity (cp) @ °F	-	-	42			
Gas:						
Specific gravity (air = 1.0)						
Heating value (Btu/cu. ft.)						
Water:						
Salinity, NaCl (ppm)	-	-	28,471			
T.D.S. (ppm)						
R_w (ohm/m) (77°F)						
ENHANCED RECOVERY PROJECTS						
Enhanced recovery projects		steamflood	waterflood			
Date started		1981	1967			
Date discontinued		active	active			
Peak oil production (bbl)						
Year						
Peak gas production, net (Mcf)						
Year						

Base of fresh water (ft.): 500

Remarks: The Jones and Main zones were discovered from townlot drillsites by trespass wells. Wells were directionally drilled from onshore, and from Platforms Eva and Emmy.

Selected References:

Frame, R.C., 1960, California Offshore Petroleum Development: Calif. Div. of Oil and Gas, Summary of Operations -- Calif. Oil Fields, Vol. 46, No. 2.

Murray-Aaron, E.R., 1947, Tidelands Pools of Huntington Beach Oil Field: Calif. Div. of Oil and Gas, Summary of Operations -- Calif. Oil Fields, Vol. 33, No. 1.

DATE: August 1983

CALIFORNIA DIVISION OF OIL AND GAS

COUNTY: ORANGE

HUNTINGTON BEACH OIL FIELD
OFFSHORE 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	LOWER JONES	UPPER MAIN	LOWER MAIN			FIELD OR AREA DATA
Discovery date	November 1933	May 1930	May 1930			
Initial production rates						
Oil (bbl/day)	828	346	346			
Gas (Mcf/day)	-	-	0			
Flow pressure (psi)						
Bean size (in.)						
Initial reservoir pressure (psi)	1,275	-	1,800			
Reservoir temperature (°F)	142	170	165			
Initial oil content (STB/ac.-ft.)	-	-	1,150			
Initial gas content (MSCF/ac.-ft.)	-	-	120			
Formation	Puente	Puente	Puente			
Geologic age	late Miocene	late Miocene	late Miocene			
Average depth (ft.)	2,850	3,600	3,800			
Average net thickness (ft.)	120	250	450			
Maximum productive area (acres)	195	211	-			2,365
RESERVOIR ROCK PROPERTIES						
Porosity (%)	28	21-24	23-24			
S_{oi} (%)	57	70	71			
S_{wi} (%)	43	30	29			
S_{gi} (%)						
Permeability to air (md)	400-900	90-168	170-725			
RESERVOIR FLUID PROPERTIES						
Oil:						
Oil gravity (°API)	14-19	22	22			
Sulfur content (% by wt.)						
Initial solution GOR (SCF/STB)	124	-	30			
Initial oil FVF (RB/STB)	1.07	-	1.16			
Bubble point press. (psia)	-	-	2,000			
Viscosity (cp) @ °F	37 @ 135	40 @ 135	50 @ 135			
Gas:						
Specific gravity (air = 1.0)						
Heating value (Btu/cu. ft.)						
Water:						
Salinity, NaCl (ppm)	29,668	27,360	24,453			
T.D.S. (ppm)						
R_w (ohm/m) (77°F)						
ENHANCED RECOVERY PROJECTS						
Enhanced recovery projects	waterflood	waterflood	waterflood			
Date started	1959	1971	1960			
Date discontinued	active	active	active waterflooda/ 1978 active			
Peak oil production (bbl)						16,692,650
Year						1972
Peak gas production, net (Mcf)						2,586,341
Year						1972

Base of fresh water (ft.):

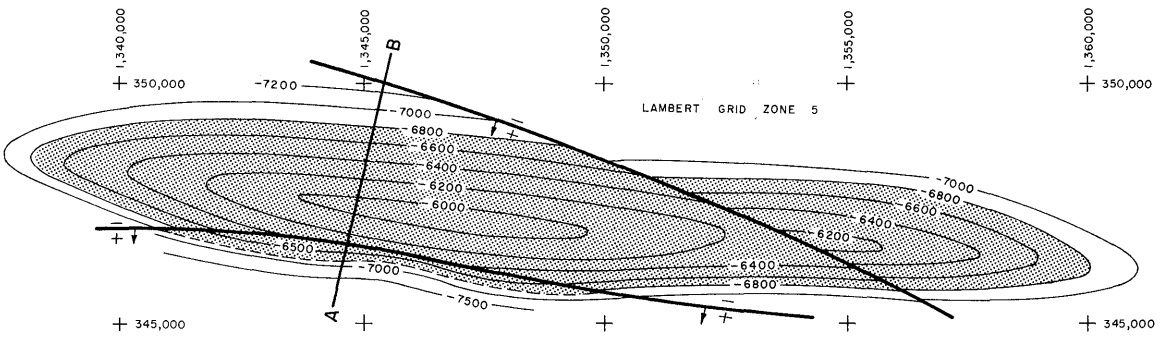
Remarks: a/ Caustic waterflood.

Selected References:

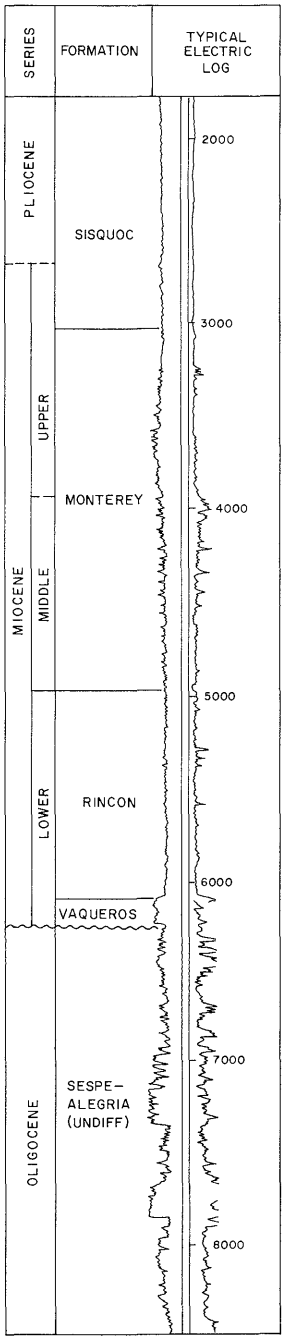
DATE: August 1983

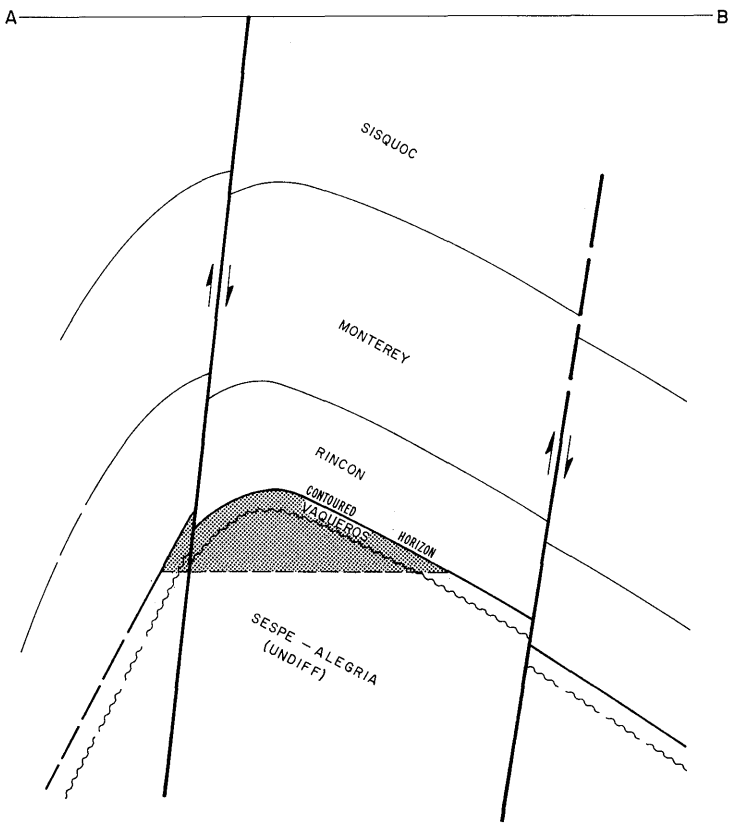
CALIFORNIA DIVISION OF OIL AND GAS

MOLINO OFFSHORE GAS FIELD



CONTOURS ON TOP OF VAQUEROS





COUNTY: SANTA BARBARA

MOLINO OFFSHORE GAS 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	Shell Western Expl. & Prod. Inc. "SSMS 2920" 1	Shell Oil Co. "C.H." 8-502	8 4N 31W	SB	8,479 a/	Vaqueros Sespe-Alegria	
Deepest well	Shell Western Expl. & Prod. Inc. "SSMS 2920" 8	Shell California Production Inc. "SSMS 2920" 8	18 4N 31W	SB	12,589 b/		Matilija Eocene

POOL DATA

ITEM	VAQUEROS	SESPE ALEGRIA	MATILIJA			FIELD OR AREA DATA
Discovery date	October 1962	October 1962	October 1983			
Initial production rates						
Oil (bbl/day)						
Gas (Mcf/day)	7,400	4,490 c/	22,900			
Flow pressure (psi)	70	35	-			
Bean size (in.)	32/64	32/64	5/8			
Initial reservoir pressure (psi)	3,130	3,130	-			
Reservoir temperature (°F)	190-212	190-212	-			
Initial oil content (STB/ac.-ft.)						
Initial gas content (MSCF/ac.-ft.)	954	802	-			
Formation	Vaqueros	Sespe-Alegria	Matilija			
Geologic age	early Miocene	Oligocene	Eocene			
Average depth (ft.)	6,200	6,400	10,500			
Average net thickness (ft.)	140	250	800			
Maximum productive area (acres)						1,160
RESERVOIR ROCK PROPERTIES						
Porosity (%)	18-22	24	12			
So_i (%)						
Sw_i (%)	25	40	30			
Sg_i (%)	75	60	70			
Permeability to air (md)	10-200	10-100	1,500			
RESERVOIR FLUID PROPERTIES						
Oil:						
Oil gravity (°API)						
Sulfur content (% by wt.)						
Initial solution GOR (SCF/STB)						
Initial oil FVF (RB/STB)						
Bubble point press. (psia)						
Viscosity (cp) @ °F						
Gas:						
Specific gravity (air = 1.0)	0.610-0.650	0.610-0.650	0.609-0.650			
Heating value (Btu/cu. ft.)	1,071-1,137	1,071-1,137	1,093-1,100			
Water:						
Salinity, NaCl (ppm)	16,349	16,349	-			
T.D.S. (ppm)						
R_w (ohm/m) (77°F)						
ENHANCED RECOVERY PROJECTS						
Enhanced recovery projects						
Date started						
Date discontinued						
Peak oil production (bbl)						30,576,437
Year						1967
Peak gas production, net (Mcf)						
Year						

Base of fresh water (ft.): None

Remarks: a/ Direction well; true vertical depth is 8,423 feet.
b/ Direction well; true vertical depth is about 12,200 feet.
c/ Commingled with production from Vaqueros zone.

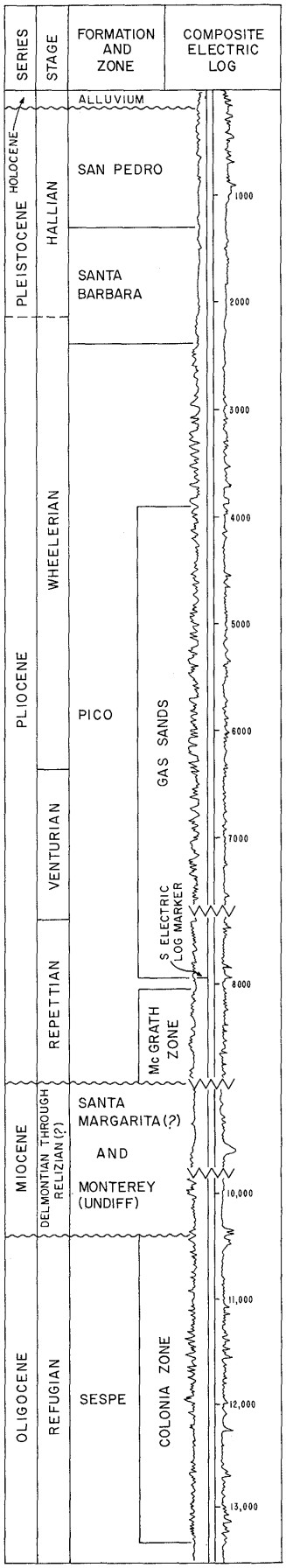
Selected References: Yerkes, R.F., H.C. Wagner and K.A. Yenne, 1969, Petroleum Development in the Region of the Santa Barbara Channel: U.S. Geol. Survey Prof. Paper 679B, p. 19.

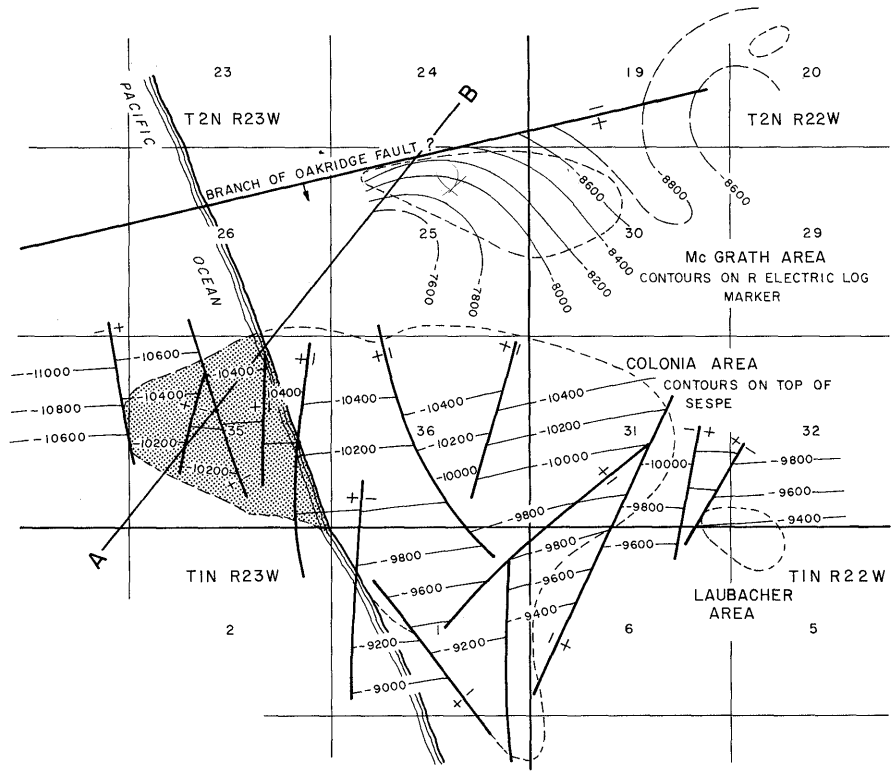
DATE: January 1990

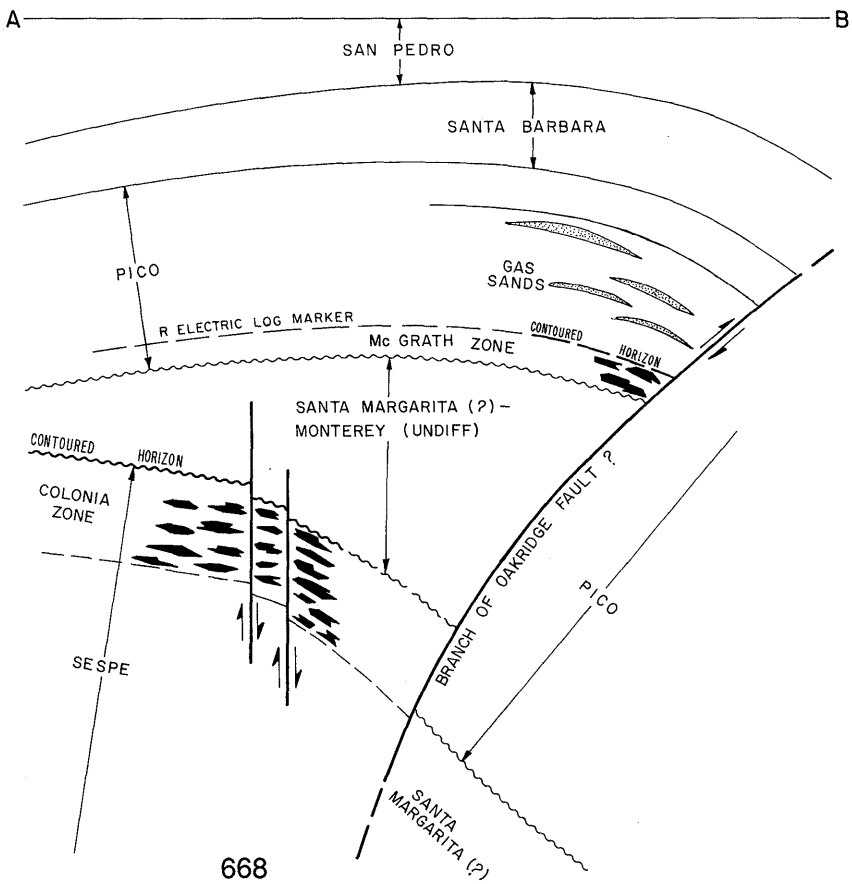
CALIFORNIA DIVISION OF OIL AND GAS

WEST MONTALVO OIL FIELD

Offshore Area







COUNTY: VENTURA

MONTALVO, WEST, OIL FIELD OFFSHORE 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. "State" C-1A	Standard Oil Co. of Calif. "State" C-1A	35 2N 23W	SB	13,600	Colonia	
Deepest well	Chevron U.S.A. Inc. "State" B-6	Standard Oil Co. of Calif. "State" B-6	26 2N 23W	SB	14,850		Sespe Oligocene

POOL DATA

ITEM	COLONIA					FIELD OR AREA DATA
Discovery date	June 1953					
Initial production rates						
Oil (bbl/day)	304					
Gas (Mcf/day)	85					
Flow pressure (psi)						
Bean size (in.)						
Initial reservoir pressure (psi)						
Reservoir temperature (°F)						
Initial oil content (STB/ac.-ft.)						
Initial gas content (MSCF/ac.-ft.)						
Formation	Sespe					
Geologic age	Oligocene					
Average depth (ft.)	11,500					
Average net thickness (ft.)	2,500					
Maximum productive area (acres)	200					
RESERVOIR ROCK PROPERTIES						
Porosity (%)						
So_i (%)						
Sw_i (%)						
Sg_i (%)						
Permeability to air (md)						
RESERVOIR FLUID PROPERTIES						
Oil:						
Oil gravity (°API)	13-32					
Sulfur content (% by wt.)						
Initial solution GOR (SCF/STB)						
Initial oil FVF (RB/STB)						
Bubble point press. (psia)						
Viscosity (cp) @ °F						
Gas:						
Specific gravity (air = 1.0)						
Heating value (Btu/cu. ft.)						
Water:						
Salinity, NaCl (ppm)	21,400					
T.D.S. (ppm)						
R_w (ohm/m) (77°F)						
ENHANCED RECOVERY PROJECTS						
Enhanced recovery projects						
Date started						
Date discontinued						
Peak oil production (bbl)	608,693					
Year	1958					
Peak gas production, net (Mcf)	413,241					
Year	1959					

Base of fresh water (ft.): 1,100 - 1,600

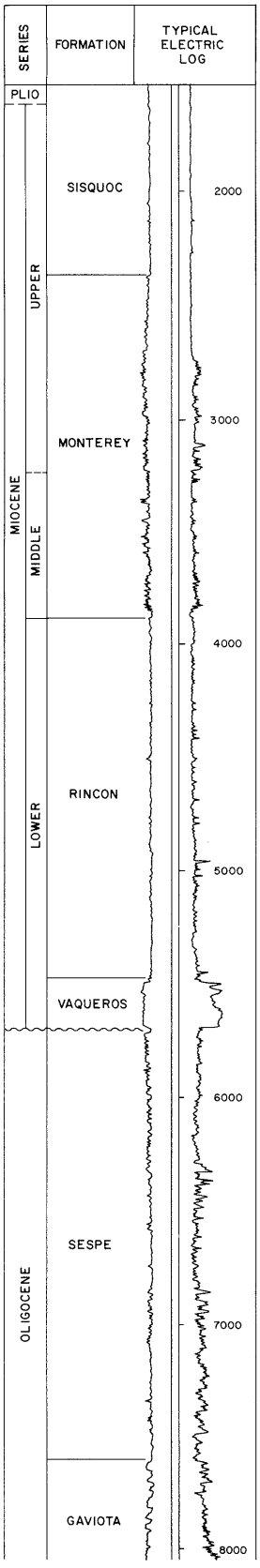
Remarks: Wells directionally drilled from onshore site.

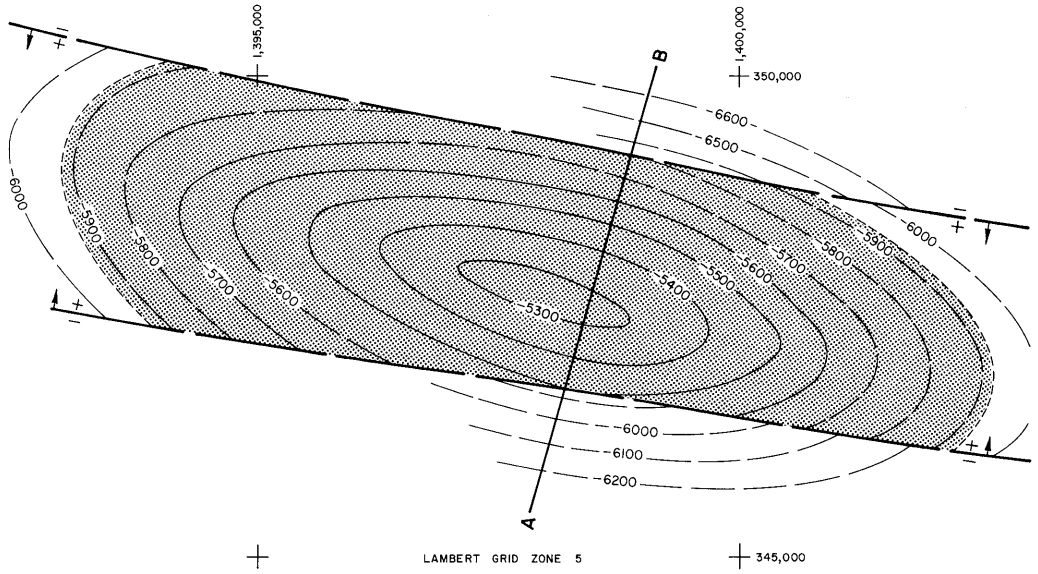
Selected References:

DATE: May 1983

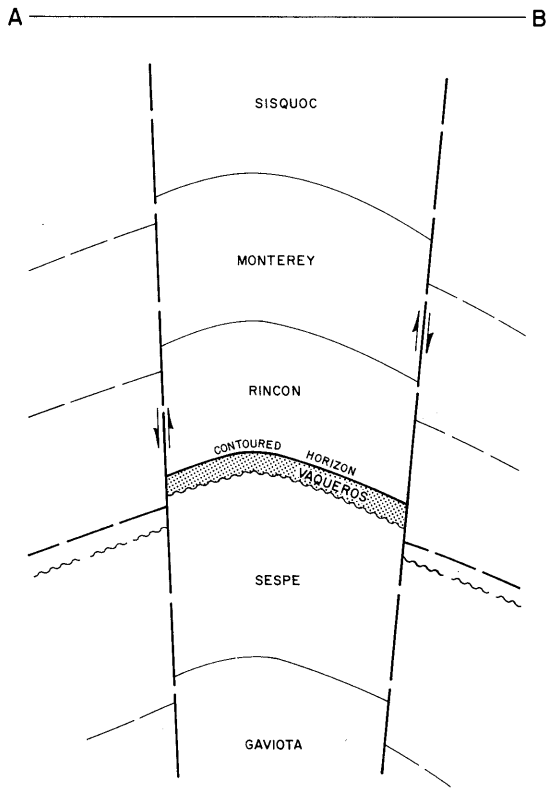
CALIFORNIA DIVISION OF OIL AND GAS

NAPLES OFFSHORE GAS FIELD
(Abandoned)





CONTOURS ON TOP OF VAQUEROS



COUNTY: SANTA BARBARA

NAPLES OFFSHORE GAS FIELD (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	Phillips Petroleum Co. "State 2205" 5	Phillips Petroleum Co. "Phillips Pet. Co.-Pauley et al State 2205" 5	2 4N 30W	SB	8,871 a/	Vaqueros	
Deepest well	Phillips Petroleum Co. "State 2205" 3	Phillips Petroleum Co. "Phillips Pet. Co.-Pauley et al State 2205 E.T." 3	11 4N 30W	SB	8,101		Gaviota Oligocene

POOL DATA

ITEM	VAQUEROS					FIELD OR AREA DATA
Discovery date	September 1960					
Initial production rates						
Oil (bbl/day)						
Gas (Mcf/day)	5,150					
Flow pressure (psi)	1,285					
Bean size (in.)	19/64					
Initial reservoir pressure (psi)	2,715					
Reservoir temperature (°F)						
Initial oil content (STB/ac.-ft.)						
Initial gas content (MSCF/ac.-ft.)	1,358					
Formation	Vaqueros					
Geologic age	early Miocene					
Average depth (ft.)	5,700					
Average net thickness (ft.)	200					
Maximum productive area (acres)	450					
RESERVOIR ROCK PROPERTIES						
Porosity (%)	32+					
So_i (%)						
Sw_i (%)	9-18+					
Sg_i (%)	82-91+					
Permeability to air (md)						
RESERVOIR FLUID PROPERTIES						
Oil:						
Oil gravity (°API)						
Sulfur content (% by wt.)						
Initial solution GOR (SCF/STB)						
Initial oil FVF (RB/STB)						
Bubble point press. (psia)						
Viscosity (cp) @ °F						
Gas:						
Specific gravity (air = 1.0)	1,158					
Heating value (Btu/cu. ft.)						
Water:						
Salinity, NaCl (ppm)	14,000+					
T.D.S. (ppm)						
R_w (ohm/m) (77°F)	0.42+					
ENHANCED RECOVERY PROJECTS						
Enhanced recovery projects						
Date started						
Date discontinued						
Peak oil production (bbl)						
Year						
Peak gas production, net (Mcf)	7,628,456					
Year	1963					

Base of fresh water (ft.): None

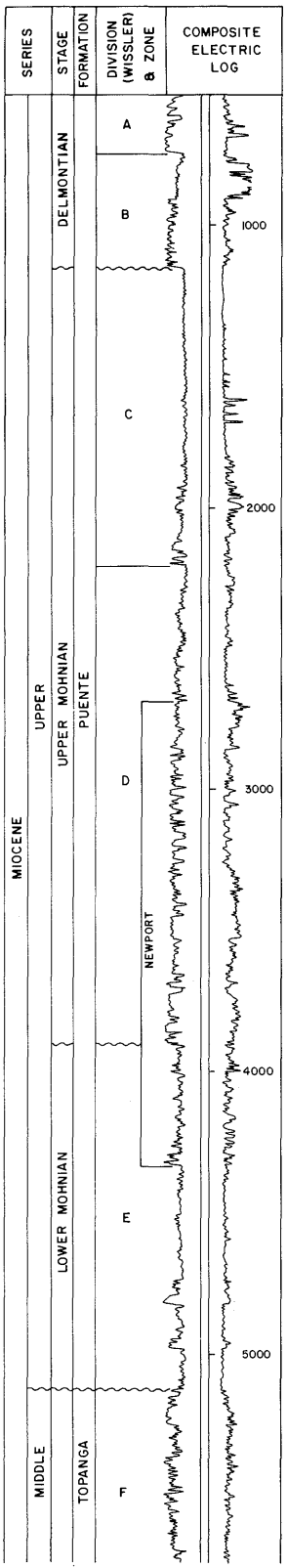
Remarks: The first well to penetrate the gas zone was Phillips Petroleum Co. "State 2205" 3, which was drilled as an expendable test hole from a drilling barge. Producing wells were directionally drilled from onshore locations. The field was abandoned in 1968. Cumulative production is 555,962 bbl of condensate and 20,814,928 Mcf of gas.
a/ Directional well; true vertical depth is 5,963 feet.

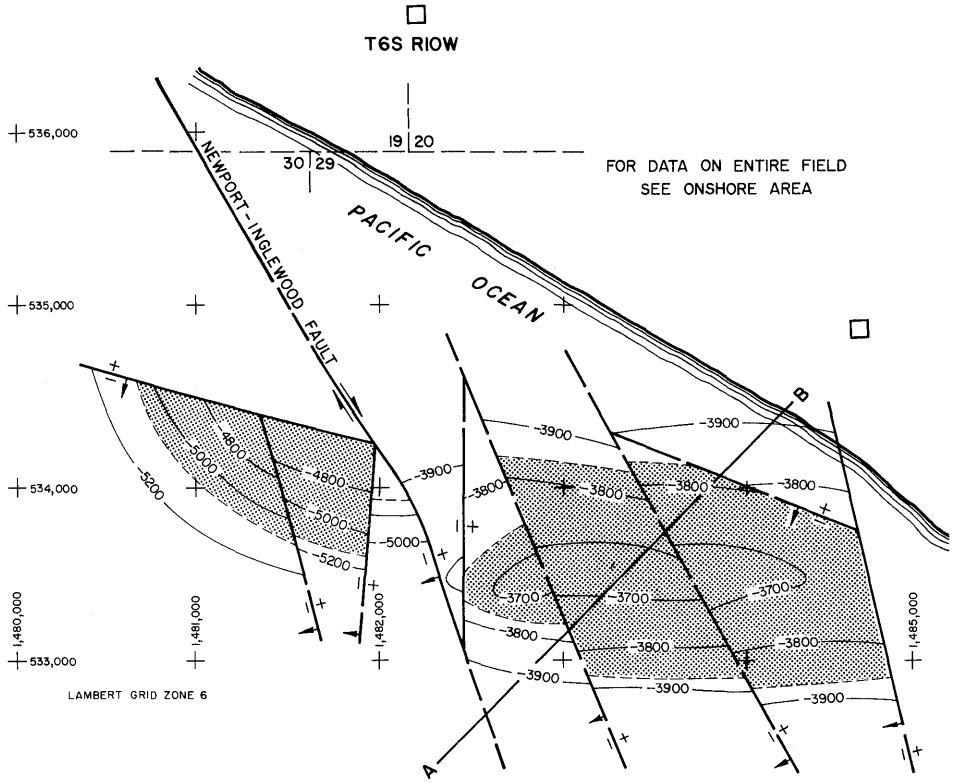
Selected References: Yerkes, R.F., H.C. Wagner and K.A. Yenne, 1969, Petroleum Development in the Region of the Santa Barbara Channel: U.S. Geol. Survey Prof. Paper 679B, p. 19.

DATE: January 1989 +Log derived value

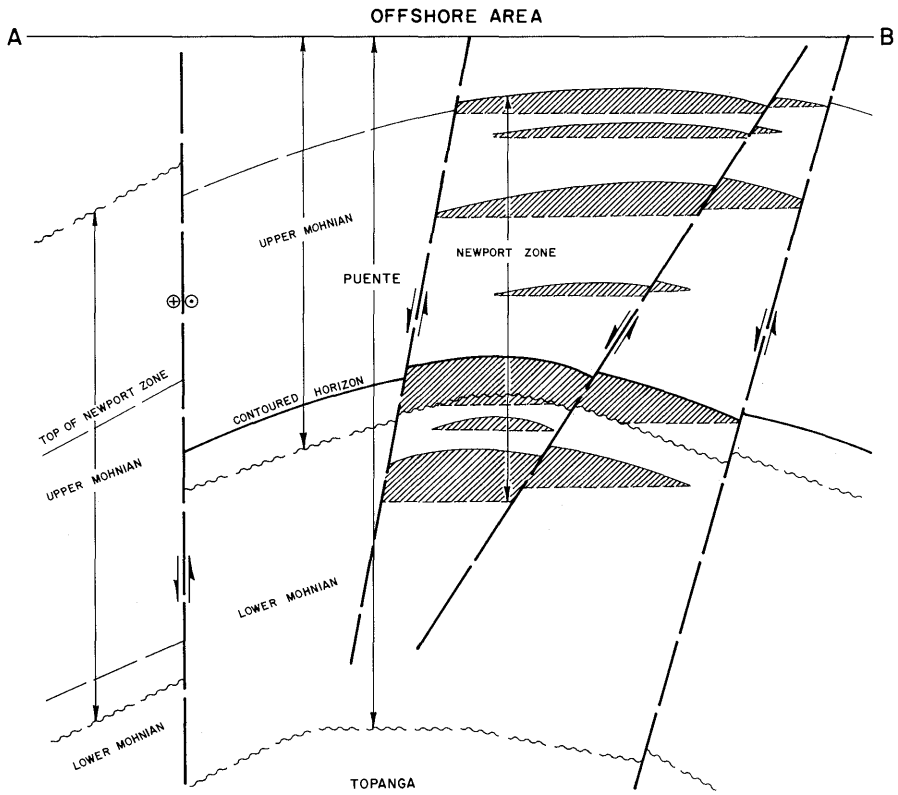
CALIFORNIA DIVISION OF OIL AND GAS

WEST NEWPORT OIL FIELD
Offshore Area





CONTOURS ON TOP OF BASAL SAND OF UPPER MOHNIAN



COUNTY: ORANGE

WEST NEWPORT OIL FIELD OFFSHORE 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	City of Newport Beach "Newport Beach" 1	Monterey Oil Co. "Newport Beach" 1	29 6S 10W	SB	7,125	Newport	
Deepest well	Exxon Corp. "State 1549" 1	Monterey Oil Co. "State 1549" 1	19 6S 10W	SB	8,711		Topanga middle Miocene

POOL DATA

ITEM	NEWPORT					FIELD OR AREA DATA
Discovery date	December 1953					
Initial production rates						
Oil (bbl/day)	69					
Gas (Mcf/day)						
Flow pressure (psi)						
Bean size (in.)						
Initial reservoir pressure (psi)						
Reservoir temperature (°F)	140					
Initial oil content (STB/ac.-ft.)						
Initial gas content (MSCF/ac.-ft.)						
Formation	Puente					
Geologic age	late Miocene					
Average depth (ft.)	3,750					
Average net thickness (ft.)	470					
Maximum productive area (acres)						80
RESERVOIR ROCK PROPERTIES						
Porosity (%)						
So_i (%)						
Sw_i (%)						
Sg_i (%)						
Permeability to air (md)						
RESERVOIR FLUID PROPERTIES						
Oil:						
Oil gravity (°API)	19					
Sulfur content (% by wt.)						
Initial solution GOR (SCF/STB)						
Initial oil FVF (RB/STB)						
Bubble point press. (psia)						
Viscosity (cp) @ °F						
Gas:						
Specific gravity (air = 1.0)						
Heating value (Btu/cu. ft.)						
Water:						
Salinity, NaCl (ppm)	17,289-32,524					
T.D.S. (ppm)						
R_w (ohm/m) (77°F)						
ENHANCED RECOVERY PROJECTS						
Enhanced recovery projects						
Date started						
Date discontinued						
Peak oil production (bbl)						352,539
Year						1957
Peak gas production, net (Mcf)						
Year						

Base of fresh water (ft.): None

Remarks: All producing wells were drilled from two onshore drillsites.

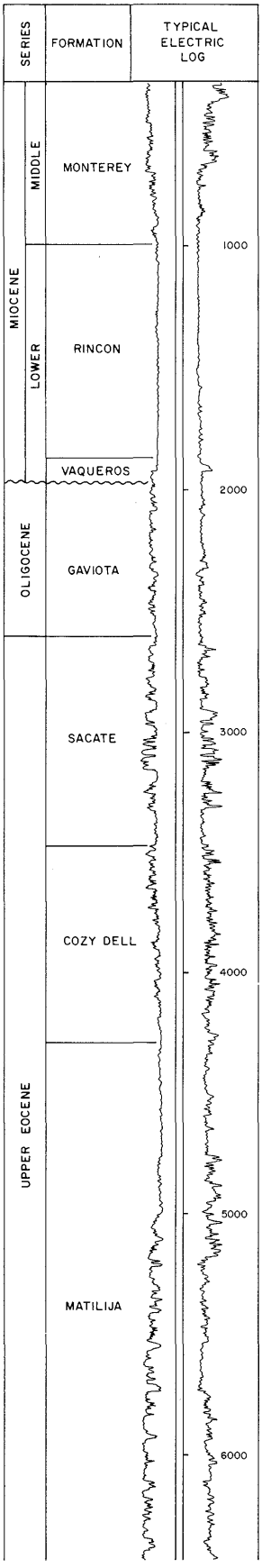
Selected References: Hunter, A. L., and D. R. Allen, 1956, Recent Developments in the West Newport Oil Field: Calif. Div. of Oil and Gas, Summary of Operations -- Calif. Oil Fields, Vol. 42, No. 2.

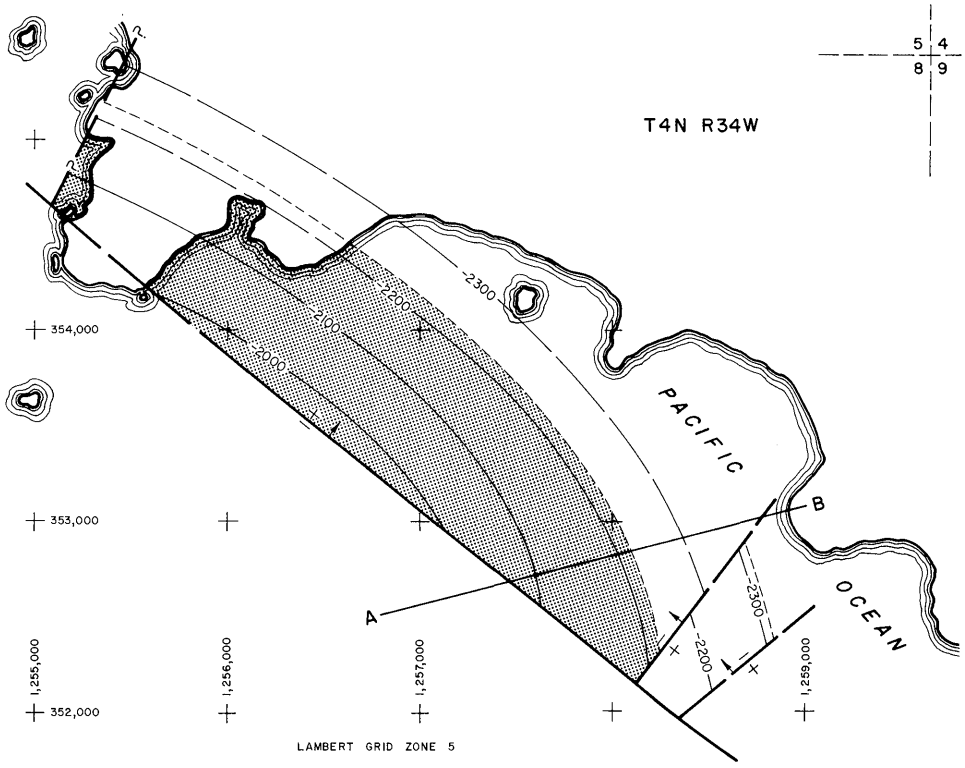
DATE: January 1991

CALIFORNIA DIVISION OF OIL AND GAS

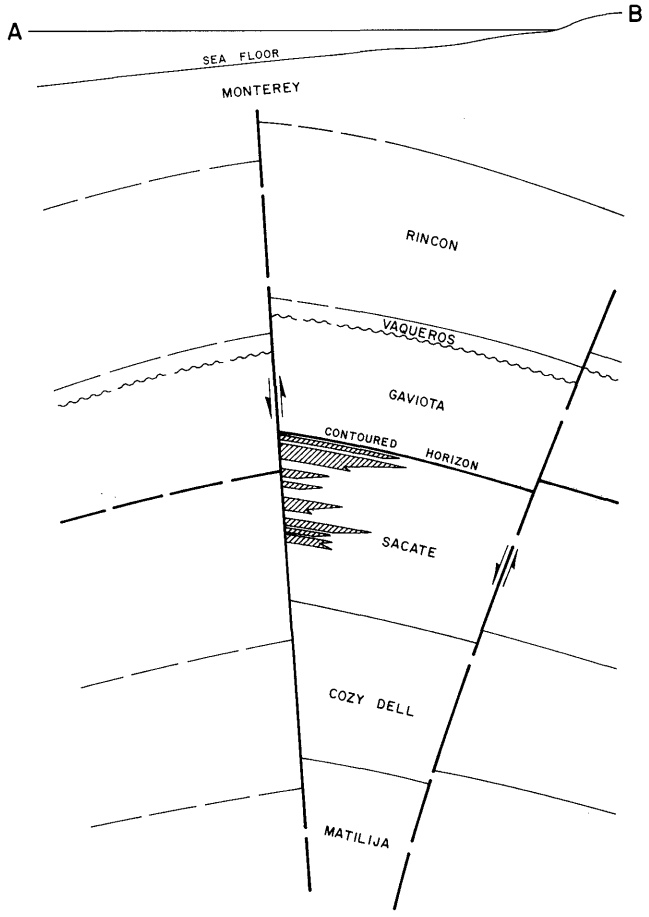
POINT CONCEPTION OIL FIELD

Offshore area





CONTOURS ON TOP OF SACATE



COUNTY: SANTA BARBARA

POINT CONCEPTION OIL FIELD OFFSHORE 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	Union Oil Co. of Calif. "State 2879" 10-6	Same as present	8 4N 34W	SB	7,491 a/	Sacate	
Deepest well	Union Oil Co. of Calif. "State 2879" 5-6	Same as present	16 4N 34W	SB	8,780 b/		Matilija Eocene

POOL DATA

ITEM	SACATE					FIELD OR AREA DATA
Discovery date	February 1965					
Initial production rates						
Oil (bbl/day)	169					
Gas (Mcf/day)	60					
Flow pressure (psi)	40					
Bean size (in.)	1					
Initial reservoir pressure (psi)	890-1,470					
Reservoir temperature (°F)	110					
Initial oil content (STB/ac.-ft.)						
Initial gas content (MSCF/ac.-ft.)						
Formation	Sacate					
Geologic age	Eocene					
Average depth (ft.)	2,800					
Average net thickness (ft.)	500					
Maximum productive area (acres)	60					
RESERVOIR ROCK PROPERTIES						
Porosity (%)	25-29					
So_i (%)	22-38					
Sw_i (%)	62-78					
Sg_i (%)						
Permeability to air (md)	210					
RESERVOIR FLUID PROPERTIES						
Oil:						
Oil gravity (°API)	30-33					
Sulfur content (% by wt.)						
Initial solution GOR (SCF/STB)	375					
Initial oil FVF (RB/STB)	1.10					
Bubble point press. (psia)						
Viscosity (cp) @ °F						
Gas:						
Specific gravity (air = 1.0)						
Heating value (Btu/cu. ft.)						
Water:						
Salinity, NaCl (ppm)	16,743					
T.D.S. (ppm)	18,340					
R_w (ohm/m) (77°F)	0.29-0.40					
ENHANCED RECOVERY PROJECTS						
Enhanced recovery projects						
Date started						
Date discontinued						
Peak oil production (bbl)	153,617					
Year	1970					
Peak gas production, net (Mcf)	60,527					
Year	1972					

Base of fresh water (ft.): None

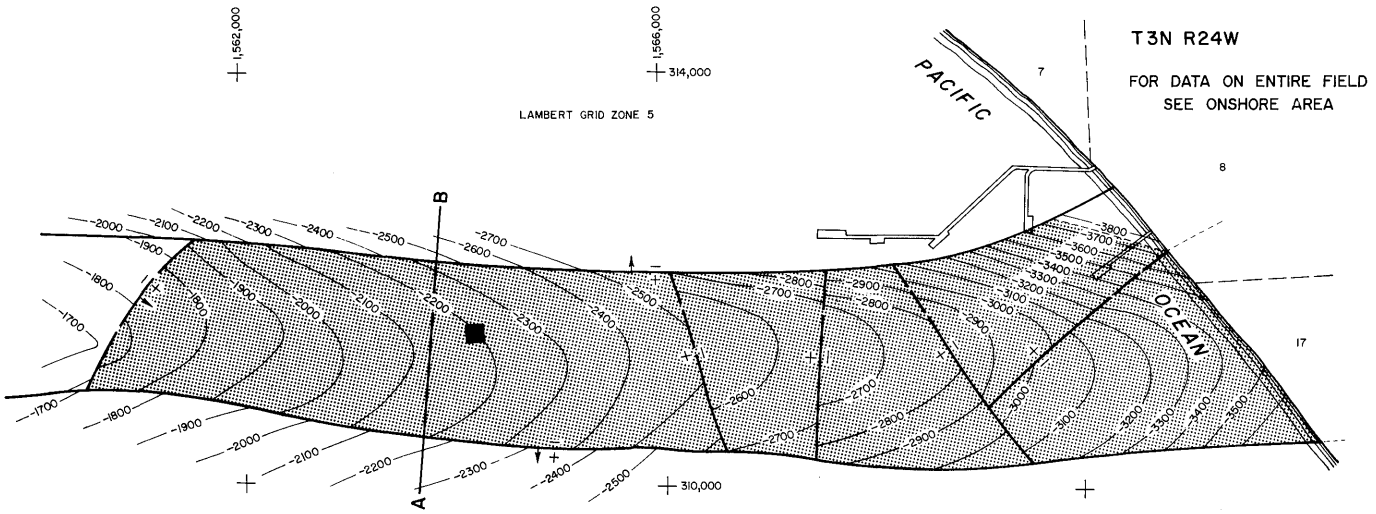
Remarks: Completed wells are directionally drilled from onshore locations. This area was originally included in Conception Offshore field.
a/ Directional well; true vertical depth is 7,104 feet.
b/ Directional well; true vertical depth is 8,202 feet.

Selected References: Barton, C.L., 1965, Operations in District No. 3: Calif. Div. of Oil and Gas--Summary of Operations, Vol. 51, No. 2.

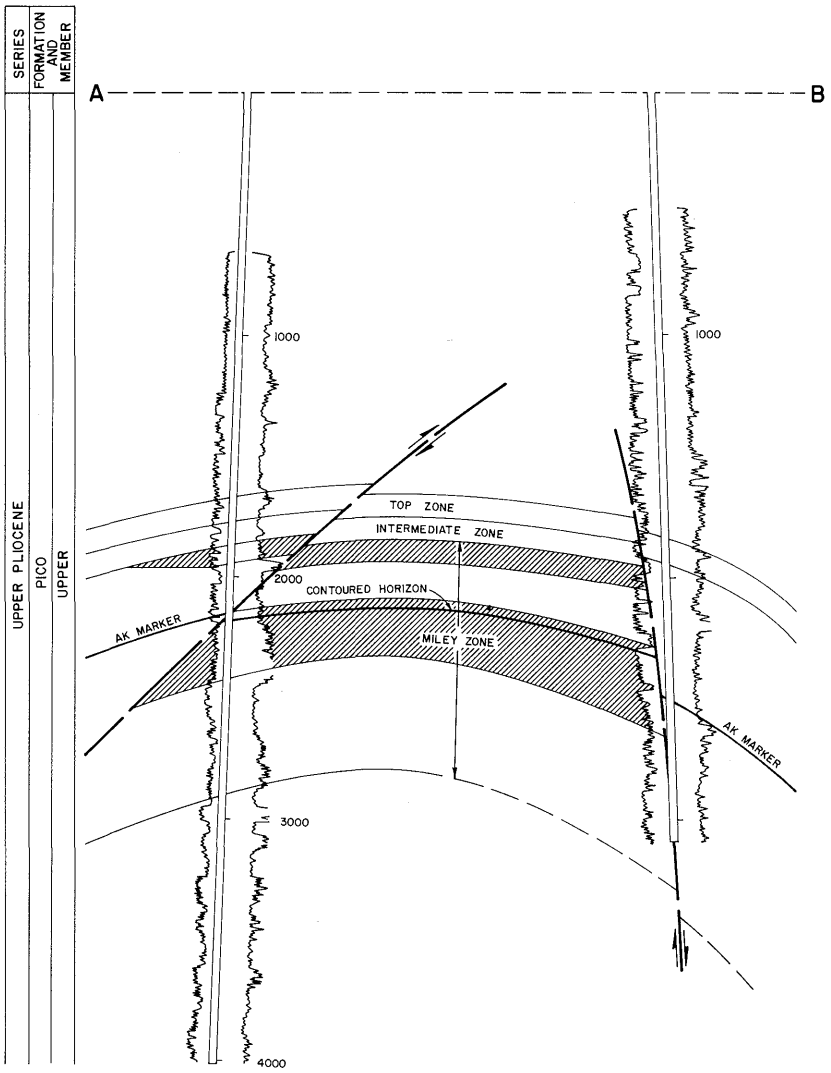
DATE: January 1989

CALIFORNIA DIVISION OF OIL AND GAS

RINCON OIL FIELD
Offshore Area



CONTOURS ON AK MARKER (TOP OF THIRD MILEY SAND)



COUNTY: VENTURA

RINCON OIL FIELD OFFSHORE 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	ARCO Oil & Gas Co. "Hobson State" 1	Chanslor-Canfield Midway Oil Co. "State" 1	17 3N 24W	SB	4,281	Miley	
Deepest well	Chevron U.S.A. Inc. "State 3184" 3	Standard Oil Co. of Calif. "State 3184" 3	22 3N 24W	SB	17,590		Santa Margarita late Miocene

POOL DATA

ITEM	MILEY					FIELD OR AREA DATA
Discovery date	March 1928					
Initial production rates						
Oil (bbl/day)	608					
Gas (Mcf/day)	0					
Flow pressure (psi)						
Bean size (in.)						
Initial reservoir pressure (psi)	2,000 @ 4,400**					
Reservoir temperature (°F)	123 @ 4,000					
Initial oil content (STB/ac.-ft.)	1,255					
Initial gas content (MSCF/ac.-ft.)	74**					
Formation	Pico					
Geologic age	Pliocene					
Average depth (ft.)	2,615 @ 4,500					
Average net thickness (ft.)	380					
Maximum productive area (acres)	550					
RESERVOIR ROCK PROPERTIES						
Porosity (%)	22-28					
So_i (%)	64**					
Sw_i (%)	26					
Sg_i (%)	10**					
Permeability to air (md)	40-100					
RESERVOIR FLUID PROPERTIES						
Oil:						
Oil gravity (°API)	32					
Sulfur content (% by wt.)	0.2					
Initial solution GOR (SCF/STB)	705					
Initial oil FVF (RB/STB)	1.20					
Bubble point press. (psia)	1,633					
Viscosity (cp) @ °F	12 @ 80					
Gas:						
Specific gravity (air = 1.0)	0.635					
Heating value (Btu/cu. ft.)						
Water:						
Salinity, NaCl (ppm)	9,100					
T.D.S. (ppm)	21,900					
R_w (ohm/m) (77°F)	0.43 @ 80					
ENHANCED RECOVERY PROJECTS						
Enhanced recovery projects	waterflood					
Date started	1965					
Date discontinued	active					
Peak oil production (bbl)	1,271,457					
Year	1960					
Peak gas production, net (Mcf)	310,398					
Year	1973					

Base of fresh water (ft.): None

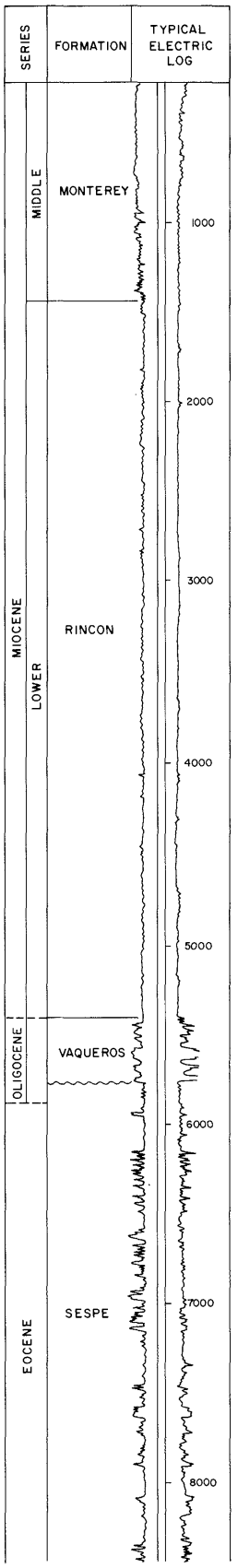
Remarks: Wells were originally drilled from piers. Later wells were directionally drilled from onshore areas and from an artificial island.

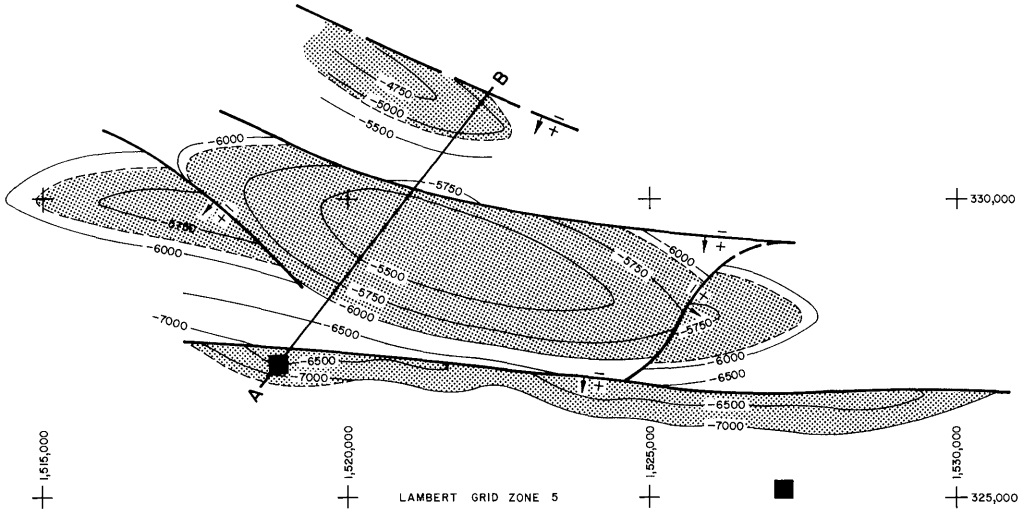
Selected References: Frame, R.C., 1960, California Offshore Petroleum Development: Calif. Div. of Oil and Gas, Summary of Operations -- Calif. Oil Fields, Vol. 46, No. 2.

DATE: May 1983 ** Estimated value

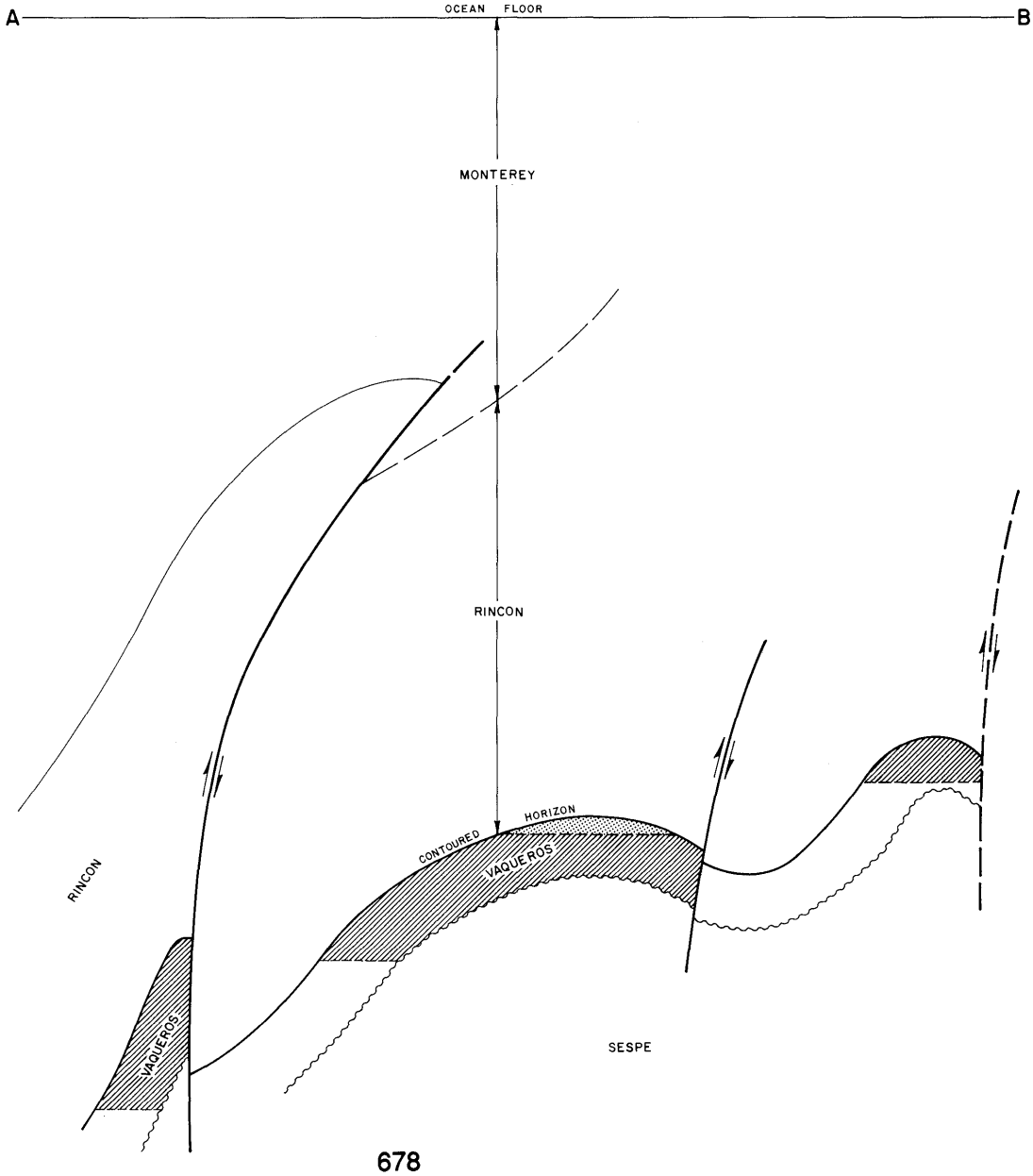
CALIFORNIA DIVISION OF OIL AND GAS

SUMMERLAND OFFSHORE OIL FIELD





CONTOURS ON TOP OF VAQUEROS



COUNTY: **SANTA BARBARA**

SUMMERLAND OFFSHORE 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	Chevron U.S.A. Inc. "SHSS 1824" 1A	Standard Oil Co. of Calif. "Standard-Humble Summerland State" 1	35 4N 26W	SB	7,768	Vaqueros	
Deepest well	Chevron U.S.A. Inc. "SHSS 1824" 26	Standard Oil Co. of Calif. "Standard-Humble Summerland State" 24	35 4N 26W	SB	12,133		Sespe Oligocene

POOL DATA

ITEM	VAQUEROS					FIELD OR AREA DATA
Discovery date	May 1957					
Initial production rates						
Oil (bbl/day)	720					
Gas (Mcf/day)	513					
Flow pressure (psi)						
Bean size (in.)						
Initial reservoir pressure (psi)	2,675 @ 6,000					
Reservoir temperature (°F)	175					
Initial oil content (STB/ac.-ft.)	721					
Initial gas content (MSCF/ac.-ft.)	6,300					
Formation	Vaqueros					
Geologic age	early Miocene					
Average depth (ft.)	7,000					
Average net thickness (ft.)	196					
Maximum productive area (acres)						830
RESERVOIR ROCK PROPERTIES						
Porosity (%)	19.5-20.8					
S_{oi} (%)	63					
S_{wi} (%)	37					
S_{gi} (%)						
Permeability to air (md)	156					
RESERVOIR FLUID PROPERTIES						
Oil:						
Oil gravity (°API)	35					
Sulfur content (% by wt.)	0.54					
Initial solution GOR (SCF/STB)	665					
Initial oil FVF (RB/STB)	1.41					
Bubble point press. (psia)	2,675					
Viscosity (cp) @ °F	0.64 @ 175					
Gas:						
Specific gravity (air = 1.0)	0.7					
Heating value (Btu/cu. ft.)						
Water:						
Salinity, NaCl (ppm)	22,230					
T.D.S. (ppm)						
R_w (ohm/m) (77°F)						
ENHANCED RECOVERY PROJECTS						
Enhanced recovery projects						
Date started						
Date discontinued						
Peak oil production (bbl)	3,792,551					
Year	1964					
Peak gas production, net (Mcf)	9,453,070					
Year	1967					

Base of fresh water (ft.): None

Remarks: Two producing wells were completed on the ocean floor; all others are on either Platform Hazel or Hilda. Hazel was the first platform installed in California waters that was constructed in a shipyard and towed to the site.

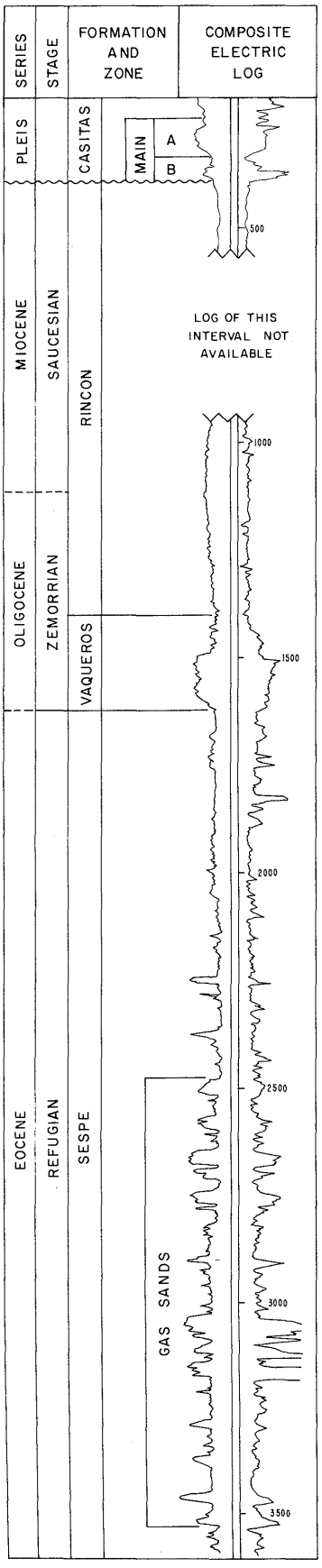
Selected References:

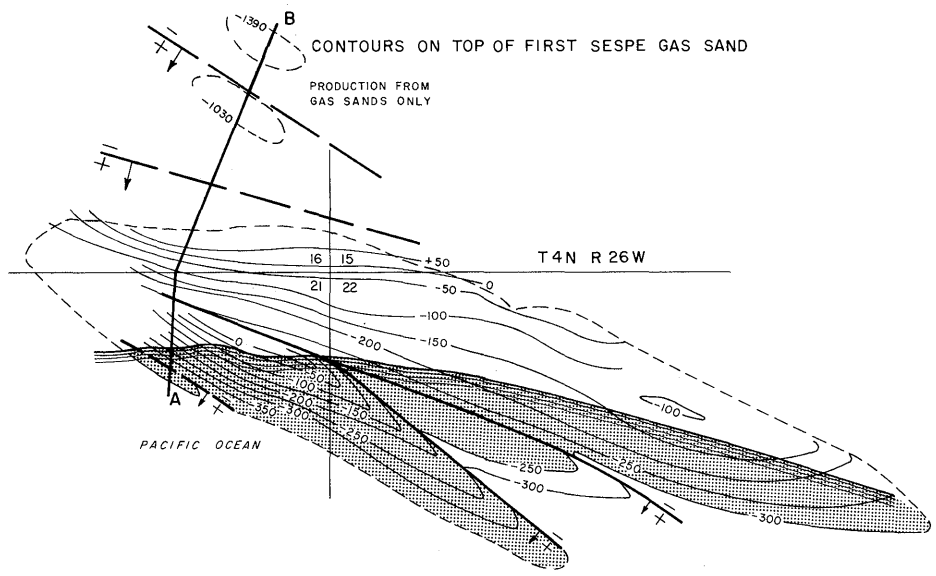
DATE: May 1983

CALIFORNIA DIVISION OF OIL AND GAS

SUMMERLAND OIL FIELD

Offshore Area

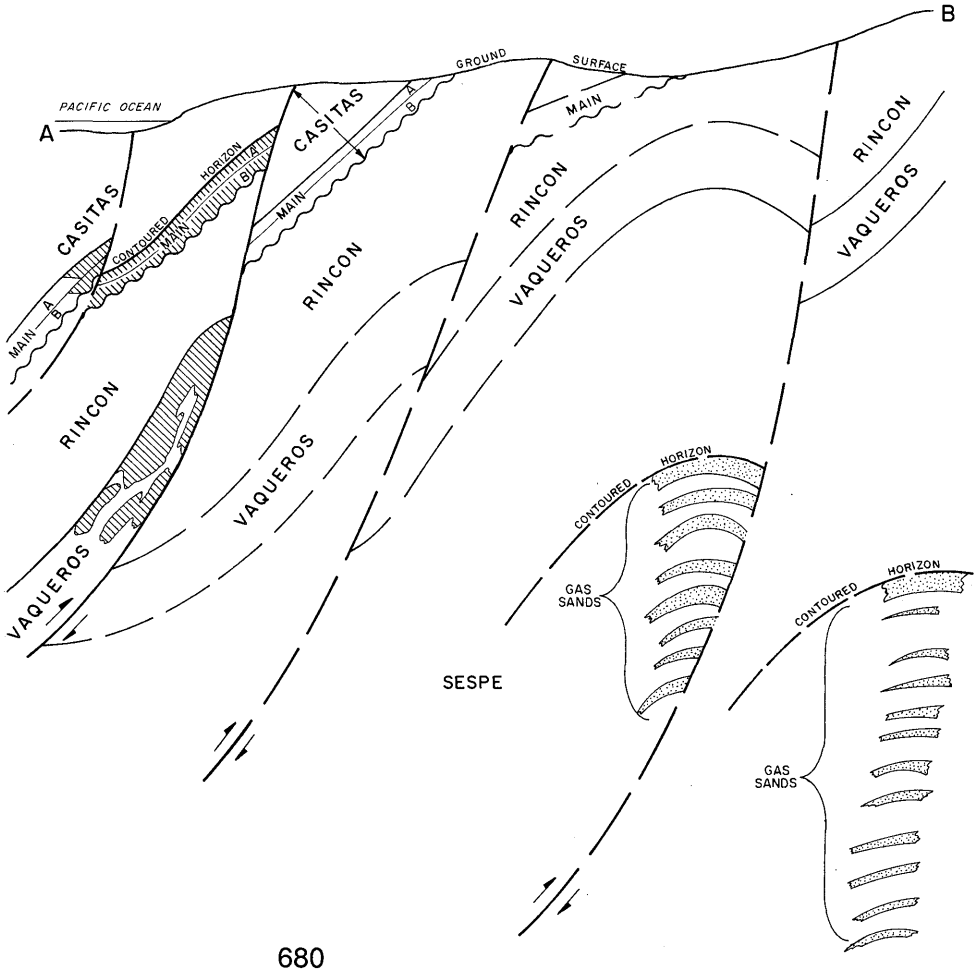




CONTOURS ON TOP OF MAIN (A) SAND

SCALE: 1" = 600'

MAP AND CROSS SECTION BASED UPON DATA BY R. ARNOLD, AND MODIFIED BY THE DIVISION OF OIL AND GAS.



COUNTY: SANTA BARBARA

SUMMERLAND OIL FIELD OFFSHORE 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	H.L. Williams, Well No. unknown	unknown	SB	unk.	Main	
Deepest well	Texaco Producing Inc. "Seaside-State" 1	Tidewater Oil Co. "Seaside-State" 1	22 4N 26W	SB	6,191		Sespe Oligocene

POOL DATA

ITEM	MAIN	VAQUEROS				FIELD OR AREA DATA
Discovery date	1896	December 1929				
Initial production rates						
Oil (bbl/day)	-	68				
Gas (Mcf/day)						
Flow pressure (psi)						
Bean size (in.)						
Initial reservoir pressure (psi)						
Reservoir temperature (°F)						
Initial oil content (STB/ac.-ft.)						
Initial gas content (MSCF/ac.-ft.)						
Formation	Casitas	Vaqueros				
Geologic age	Pleistocene	early Miocene				
Average depth (ft.)	220	1,400				
Average net thickness (ft.)	100	300				
Maximum productive area (acres)						360
RESERVOIR ROCK PROPERTIES						
Porosity (%)						
So_i (%)						
Sw_i (%)						
Sg_i (%)						
Permeability to air (md)						
RESERVOIR FLUID PROPERTIES						
Oil:						
Oil gravity (°API)	7	16				
Sulfur content (% by wt.)	-	0.54				
Initial solution GOR (SCF/STB)						
Initial oil FVF (RB/STB)						
Bubble point press. (psia)						
Viscosity (cp) @ °F						
Gas:						
Specific gravity (air = 1.0)						
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						
Date started						
Date discontinued						
Peak oil production (bbl)						
Year						
Peak gas production, net (Mcf)						
Year						

Base of fresh water (ft.): None

Remarks: This is the first offshore oil field developed in California and possibly in the world. The last production from this field was in 1940.

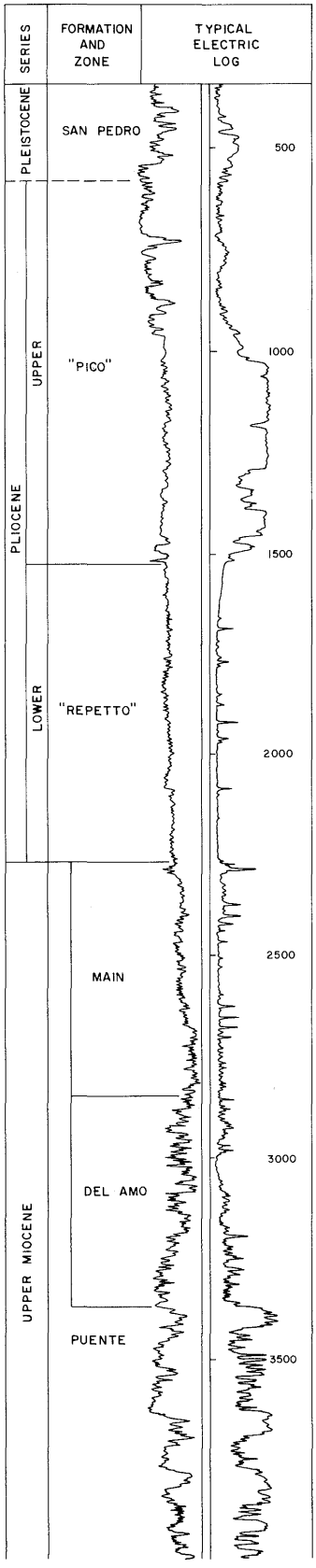
Selected References:

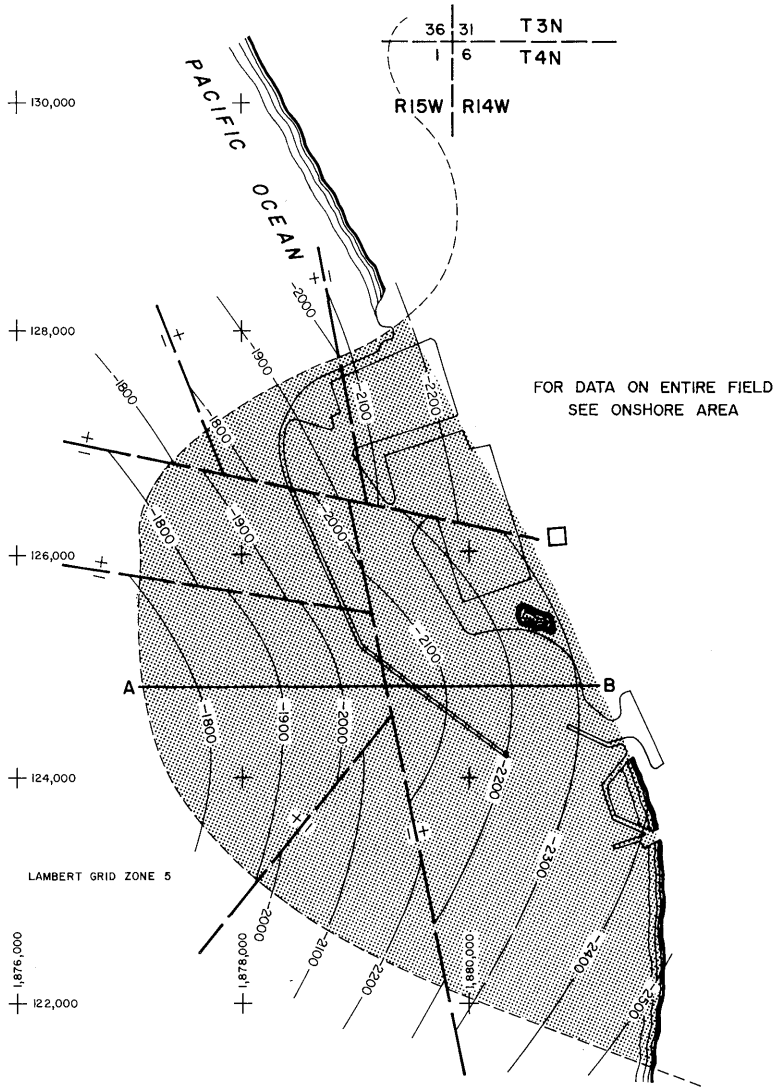
Arnold, Ralph, 1907, Geology & Resources of the Summerland District, Santa Barbara County, California: U.S. Geol. Survey Bull. 321.
Dibblee, T.W., Jr., 1966, Geology of the Central Santa Ynez Mountains, Santa Barbara County, Calif: Calif. Div. of Mines and Geology Bull. 186, p. 88.

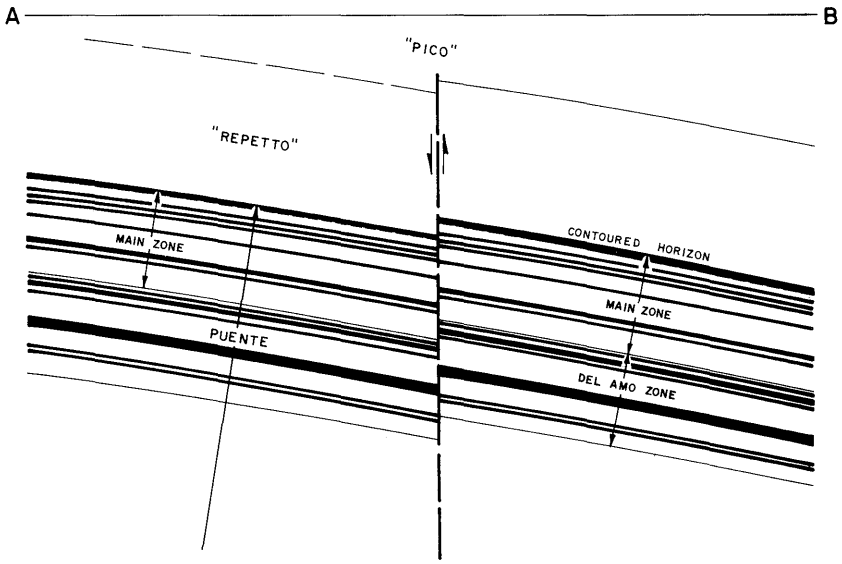
DATE: May 1991

CALIFORNIA DIVISION OF OIL AND GAS

TORRANCE OIL FIELD
Offshore Area







COUNTY: ORANGE

TORRANCE OIL FIELD OFFSHORE 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	American Pacific International, Inc. "City of Redondo Beach" 1	Signal Oil and Gas Co. "City of Redondo Beach" 1	6 4S 14W	SB	4,036	Del Amo	
Deepest well	American Pacific International, Inc. "City of Redondo Beach" S-12	McCulloch Oil Corp., Inc. "City of Redondo Beach" S-12	6 4S 14W	SB	8,313		Puente late Miocene

POOL DATA

ITEM	MAIN	DEL AMO				FIELD OR AREA DATA
Discovery date	May 1956	April 1956				
Initial production rates						
Oil (bbl/day)	194	162				
Gas (Mcf/day)	19	29				
Flow pressure (psi)						
Bean size (in.)						
Initial reservoir pressure (psi)	1,200	1,400				
Reservoir temperature (°F)	135	145				
Initial oil content (STB/ac.-ft.)	204	200				
Initial gas content (MSCF/ac.-ft.)	42	42				
Formation	Puente	Puente				
Geologic age	late Miocene	late Miocene				
Average depth (ft.)	2,100	2,600				
Average net thickness (ft.)	65	70				
Maximum productive area (acres)						690
RESERVOIR ROCK PROPERTIES						
Porosity (%)	17	20				
S_{oi} (%)	96	96				
S_{wi} (%)	4	4				
S_{gi} (%)	0	0				
Permeability to air (md)						
RESERVOIR FLUID PROPERTIES						
Oil:						
Oil gravity (°API)	14-28	26-30				
Sulfur content (% by wt.)	2.43	2.43				
Initial solution GOR (SCF/STB)						
Initial oil FVF (RB/STB)						
Bubble point press. (psia)						
Viscosity (cp) @ °F	120	120				
Gas:						
Specific gravity (air = 1.0)	0.79	0.79				
Heating value (Btu/cu. ft.)	900	900				
Water:						
Salinity, NaCl (ppm)	27,388	29,956				
T.D.S. (ppm)	34,600	34,000				
R_w (ohm/m) (77°F)	1.75	2.52				
ENHANCED RECOVERY PROJECTS						
Enhanced recovery projects						
Date started						
Date discontinued						
Peak oil production (bbl)						857,170
Year						1958
Peak gas production, net (Mcf)						
Year						

Base of fresh water (ft.): None

Remarks: All completed wells were drilled from one onshore drillsite.

Selected References:

Crowder, R.E., 1956, Torrance Oil Field: Calif. Div. of Oil and Gas, Summary of Operations -- Calif. Oil Fields, Vol. 42, No. 2.

Crowder, R.E., 1964, Del Amo Zone of Torrance Oil Field: Calif. Div. of Oil and Gas, Summary of Operations -- Calif. Oil Fields, Vol. 51, No. 1.

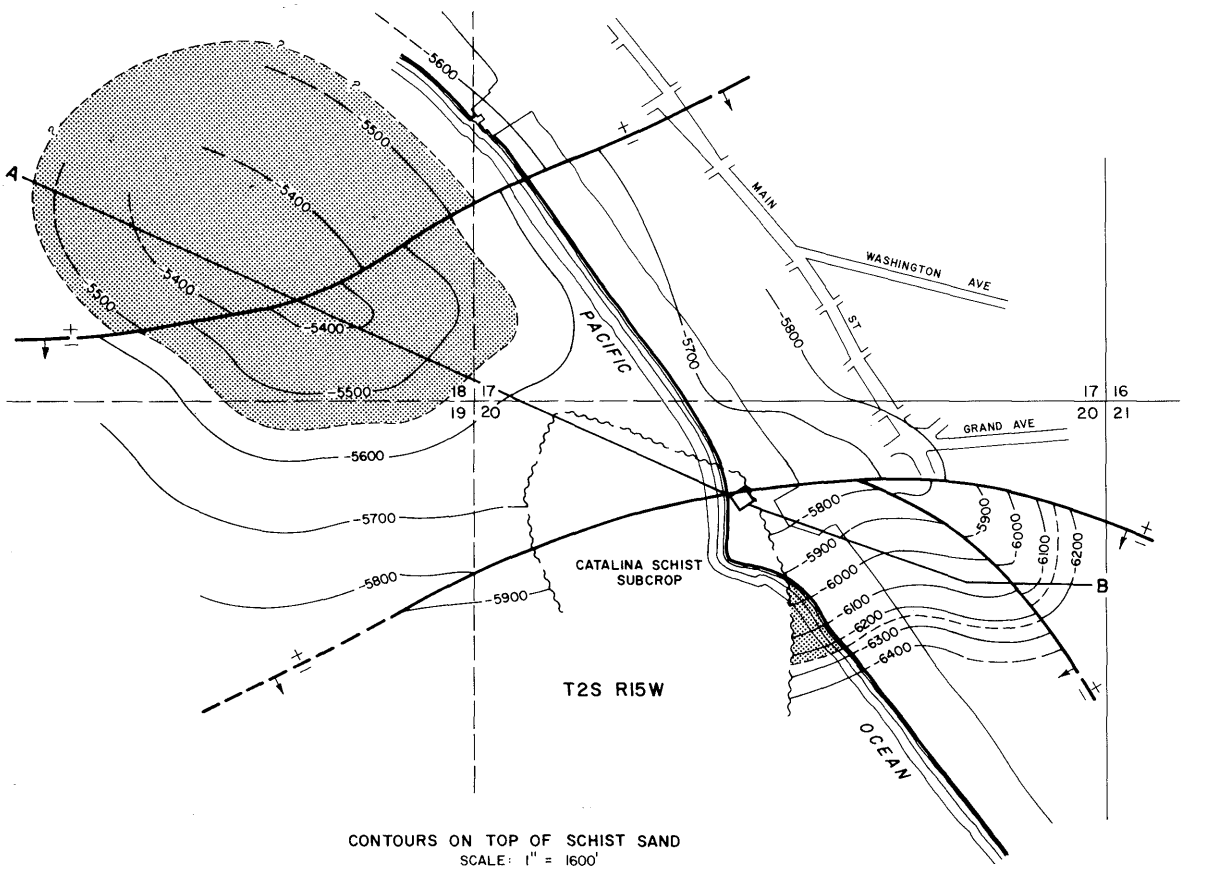
Frame, R.G., 1960, Calif. Offshore Petroleum Development: Calif. Div. of Oil and Gas, Summary of Operations -- Calif. Oil Fields, Vol. 46, No. 2.

DATE: May 1983

CALIFORNIA DIVISION OF OIL AND GAS

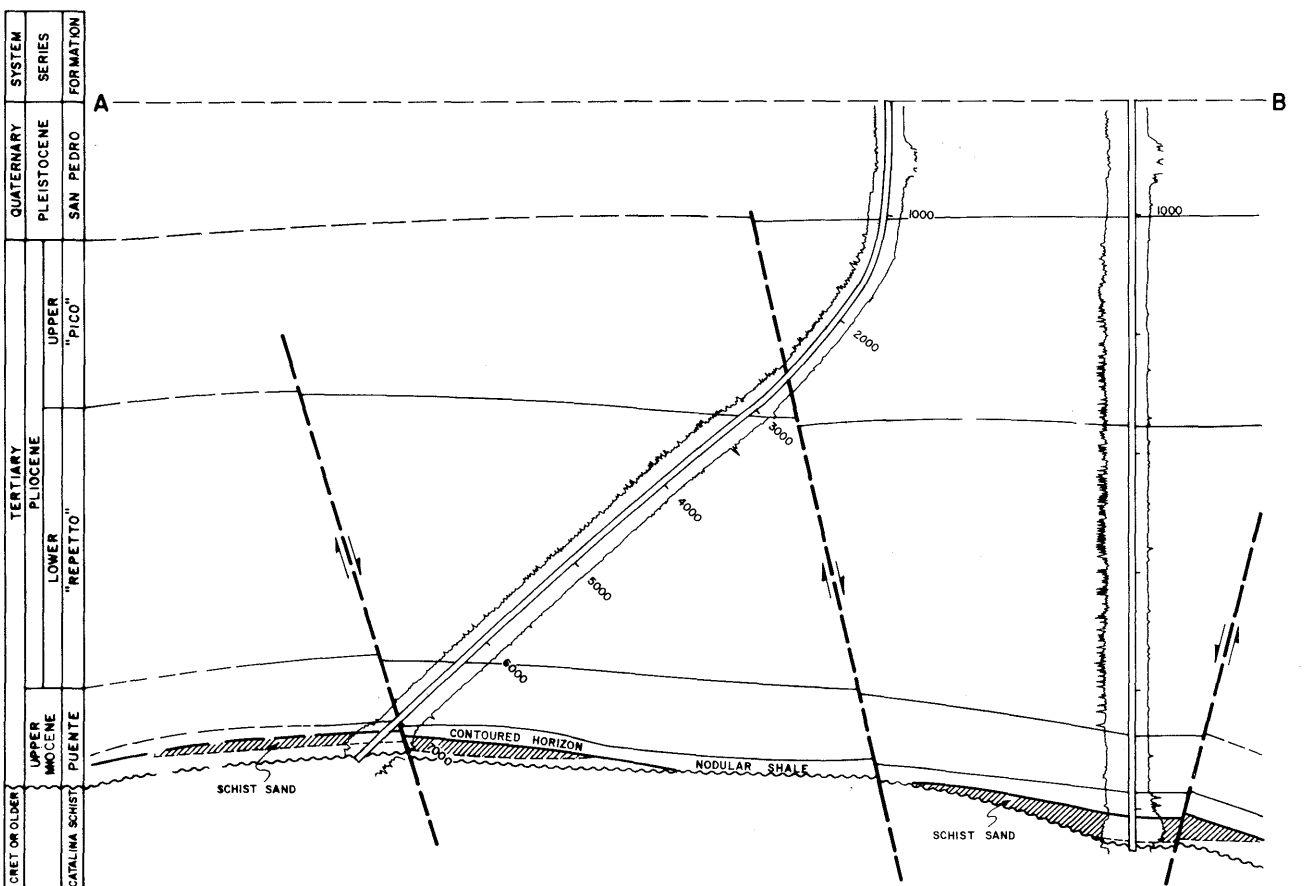
VENICE BEACH OIL FIELD

Offshore Area



CONTOURS ON TOP OF SCHIST SAND

SCALE: 1" = 1600'



COUNTY: LOS ANGELES

VENICE BEACH OIL FIELD OFFSHORE 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	Damson Oil Corp. "L. A. City 135" 3	Socony Mobil Oil Co., Inc. "L. A. City 135" 3	20 2S 15W	SB	7,045	Schist Sand	
Deepest well	Damson Oil Corp. "L. A. City 135" 9	Socony Mobil Oil Co., Inc. "L. A. City 135" 9	20 2S 15W	SB	7,522		Catalina Schist Cret. or older

POOL DATA

ITEM	SCHIST SAND					FIELD OR AREA DATA
Discovery date	August 1966					
Initial production rates						
Oil (bbl/day)	355					
Gas (Mcf/day)	280					
Flow pressure (psi)						
Bean size (in.)	8/64					
Initial reservoir pressure (psi)						
Reservoir temperature (°F)	235					
Initial oil content (STB/ac.-ft.)						
Initial gas content (MSCF/ac.-ft.)						
Formation	Puente					
Geologic age	late Miocene					
Average depth (ft.)	5,450					
Average net thickness (ft.)	80					
Maximum productive area (acres)						80
RESERVOIR ROCK PROPERTIES						
Porosity (%)						
So_i (%)						
Sw_i (%)						
Sg_i (%)						
Permeability to air (md)						
RESERVOIR FLUID PROPERTIES						
Oil:						
Oil gravity (°API)	22					
Sulfur content (% by wt.)						
Initial solution GOR (SCF/STB)						
Initial oil FVF (RB/STB)						
Bubble point press. (psia)						
Viscosity (cp) @ °F						
Gas:						
Specific gravity (air = 1.0)						
Heating value (Btu/cu. ft.)						
Water:						
Salinity, NaCl (ppm)	9,415					
T.D.S. (ppm)						
R_w (ohm/m) (77°F)						
ENHANCED RECOVERY PROJECTS						
Enhanced recovery projects						
Date started						
Date discontinued						
Peak oil production (bbl)						455,162
Year						1968
Peak gas production, net (Mcf)						
Year						

Base of fresh water (ft.): 600-700

Remarks: All wells were directionally drilled from an onshore drillsite.

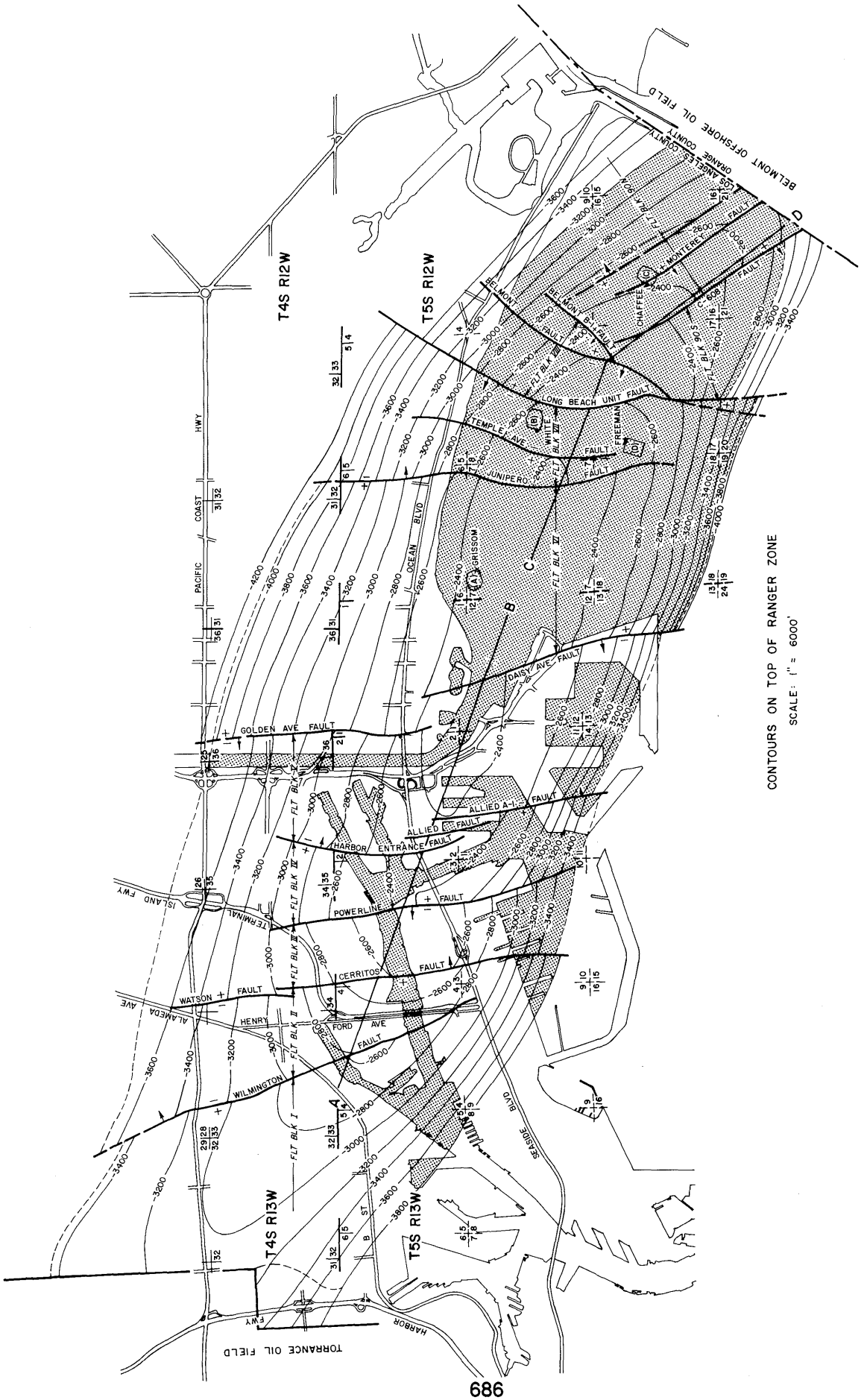
Selected References:

DATE: January 1991

CALIFORNIA DIVISION OF OIL AND GAS

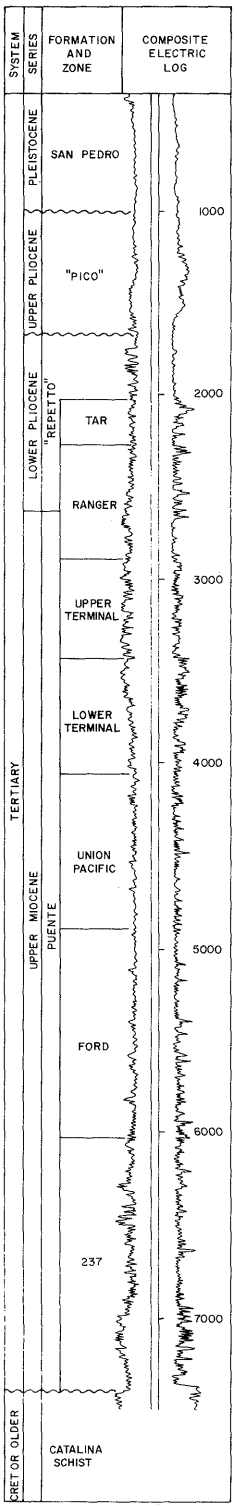
WILMINGTON OIL FIELD

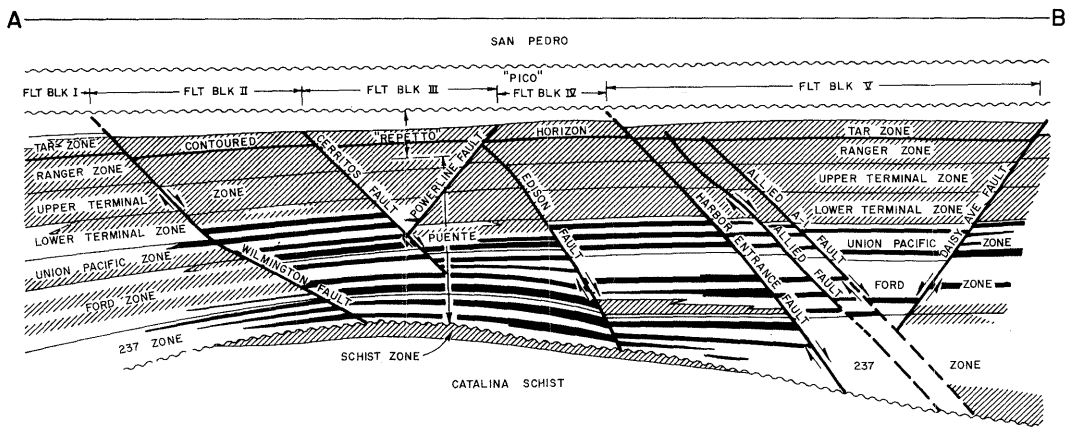
Offshore Area

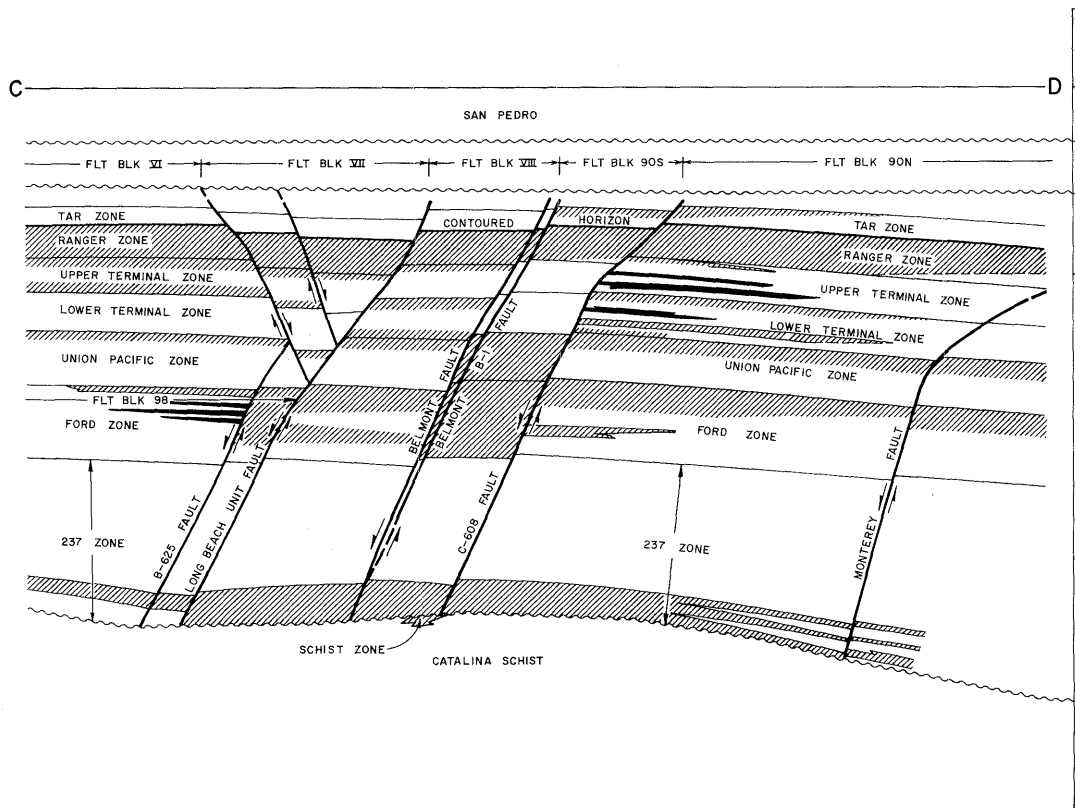


WILMINGTON OIL FIELD

Offshore Area







COUNTY: LOS ANGELES

WILMINGTON OIL FIELD OFFSHORE 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	Long Beach Oil Development Co. "X" 6	Same as present	2 5S 13W	SB	3,840	Ranger	
Deepest well	Thums Long Beach Co. C-520 I	Same as present	16 5S 12W	SB	12,383		late Miocene

POOL DATA

ITEM	TAR	RANGER	UPPER TERMINAL	LOWER TERMINAL	UNION PACIFIC	FIELD OR AREA DATA
Discovery date	March 1943	May 1939	May 1939	May 1939	March 1947	
Initial production rates						
Oil (bbl/day)	91	287a/	a/	a/	1,290	
Gas (Mcf/day)	103	482a/	a/	a/	390	
Flow pressure (psi)						
Bean size (in.)						
Initial reservoir pressure (psi)	1,040	1,265	1,436	1,670	1,877	
Reservoir temperature (°F)	122	141	151	167	184	
Initial oil content (STB/ac.-ft.)	1,558	1,620	1,572	1,230	1,279	
Initial gas content (MSCF/ac.-ft.)	175	227	245	265	350	
Formation	"Repetto"	"Repetto"-Puente	Puente	Puente	Puente	
Geologic age	early Pliocene	e Plio./l Miocene	late Miocene	late Miocene	late Miocene	
Average depth (ft.)	2,100	2,500	3,000	3,600	5,300	
Average net thickness (ft.)	120	150	300	366	125	
Maximum productive area (acres)						
RESERVOIR ROCK PROPERTIES						
Porosity (%)	35	32	33	27	27	
So_i (%)	64	72	67	61	54	
Sw_i (%)	31	25	30	36	46	
Sg_i (%)	5	3	3	3	0	
Permeability to air (md)	1,000	1,270	900	465	75	
RESERVOIR FLUID PROPERTIES						
Oil:						
Oil gravity (°API)	12-15	12-25	14-25	25-30	25-32	
Sulfur content (% by wt.)	1.65	-	-	-	-	
Initial solution GOR (SCF/STB)	100	140	156	215	322	
Initial oil FVF (RB/STB)	1.053	1.075	1.078	1.086	1.202	
Bubble point press. (psia)	1,060	1,320	1,462	1,682	-	
Viscosity (cp) @ °F	1,379 @ 100	-	-	-	-	
Gas:						
Specific gravity (air = 1.0)	0.65	0.65	0.63	0.71	0.72	
Heating value (Btu/cu. ft.)	1,030	-	-	-	-	
Water:						
Salinity, NaCl (ppm)	12,900	-	-	29,500	30,980	
T.D.S. (ppm)	20,900	-	-	30,400	32,625	
R_w (ohm/m) (77°F)	0.270	-	-	0.180	0.191	
ENHANCED RECOVERY PROJECTS						
Enhanced recovery projects	waterflood	waterflood	waterflood	waterflood	waterflood	
Date started	1958	1958	1958	1956	1959	
Date discontinued	active	active	active	active	active	
	steamflood		polymer flood			
	1981		1979			
	active		1981			
	CO_2-WAG flood					
	1982					
	1989					
Peak oil production (bbl)						
Year						
Peak gas production, net (Mcf)						
Year						

Base of fresh water (ft.): 1,600

Remarks: a/ Production from Ranger, Upper Terminal, and Lower Terminal commingled.

Selected References:

DATE: May 1983

CALIFORNIA DIVISION OF OIL AND GAS

COUNTY: LOS ANGELES

WILMINGTON OIL FIELD OFFSHORE 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	FORD	237	SCHIST			FIELD OR AREA DATA
Discovery date	June 1945	June 1945	June 1945			
Initial production rates						
Oil (bbl/day)	385[b/]	[b/]	[b/]			
Gas (Mcf/day)	225[b/]	[b/]	[b/]			
Flow pressure (psi)						
Bean size (in.)						
Initial reservoir pressure (psi)	2,300	3,960	3,960			
Reservoir temperature (°F)	216	309	309			
Initial oil content (STB/ac.-ft.)	729	-	-			
Initial gas content (MSCF/ac.-ft.)	345	-	-			
Formation	Puente	Puente	Catalina Schist			
Geologic age	late Miocene	late Miocene	Cret. or older			
Average depth (ft.)	6,500	8,000	8,500			
Average net thickness (ft.)	300	200	15			
Maximum productive area (acres)						6,025
RESERVOIR ROCK PROPERTIES						
Porosity (%)	23	10	10			
S_{oi} (%)	53	-	-			
S_{wi} (%)	47	-	-			
S_{gi} (%)						
Permeability to air (md)	75	5	5			
RESERVOIR FLUID PROPERTIES						
Oil:						
Oil gravity (°API)	28-32	28-32	28-32			
Sulfur content (% by wt.)						
Initial solution GOR (SCF/STB)	463	850	850			
Initial oil FVF (RB/STB)	1.289	1.54	1.54			
Bubble point press. (psia)	2,508	3,740	3,740			
Viscosity (cp) @ °F	105 @ 228	-	-			
Gas:						
Specific gravity (air = 1.0)	0.83	-	-			
Heating value (Btu/cu. ft.)						
Water:						
Salinity, NaCl (ppm)	28,760	-	-			
T.D.S. (ppm)	31,279	-	-			
R_w (ohm/m) (77°F)	0.25	-	-			
ENHANCED RECOVERY PROJECTS						
Enhanced recovery projects	waterflood	waterflood				
Date started	1959	1960				
Date discontinued	1982	1972				
Peak oil production (bbl)						64,775,754
Year						1969
Peak gas production, net (Mcf)						
Year						

Base of fresh water (ft.):

Remarks: [b/] Production from Ford, 237, and Schist commingled.

Selected References:

DATE: May 1983

CALIFORNIA DIVISION OF OIL AND GAS

Ferrel, Mimi

From: Jeff Schwartz [redacted]
Sent: Monday, October 18, 2021 1:48 PM
To: Vera, Albert; Eriksson, Goran; Fisch, Alex; McMorrin, Yasmine; Lee, Daniel; Public Comment at Culver City; City Council - external public facing; Clerk, City
Subject: Public Comment for City Council Item PH-1

Dear Mayor, Vice Mayor, and Council Members,
I expect your vote on this item will be a formality. I hope it will be unanimous. Four of you campaigned on closing the oil field and voted for this item on its previous appearance.
I am writing to share this article, which just appeared as a collaboration of Capital & Main, Grist, and LA Taco: https://www.lataco.com/oilfields-los-angeles/
It's focused on environmental racism, but also documents the health impacts of drilling near homes.
I encourage you to close this deal and shut down the oil field once and for all.
In my opinion, this is far too generous to Sentinel: we should be suing them for damages rather than buying them out, but it's the deal at hand and we need to stop extracting and burning fossil fuels immediately.
Thank you for continuing to move this forward and keeping Culver City a climate leader.

Ferrel, Mimi

From: Liz Jones <ljones@biologicaldiversity.org>
Sent: Monday, October 18, 2021 1:55 PM
To: Public Comment at Culver City; Clerk, City
Cc: Maya Golden-Krasner
Subject: File No. 22-361, Reintroduction of an Ordinance Approving Zoning Code Amendment P2021-0036-ZCA
Attachments: 21 10 18 CBD File No 22-361 IOF Ordinance Comments with Enclosures.pdf

To the City Clerk's Office:

Please see the attached written comments related to File No. 22-361 - Reintroduction of an Ordinance Approving Zoning Code Amendment P2021-0036-ZCA.

Please contact me with any questions.

Best,

Liz Jones
Staff Attorney, Climate Law Institute
Center for Biological Diversity
660 S. Figueroa St., Suite 1000, Los Angeles, CA 90017
cell: (310) 612-1018; office: (213) 785-5400
she/her/hers

CENTER for BIOLOGICAL DIVERSITY Because life is good.

October 18, 2021

City Clerk
City of Culver City
9770 Culver Boulevard
Culver City, CA 90232
City.clerk@culvercity.org
via email

Re: File No. 22-361, Reintroduction of an Ordinance Approving Zoning Code Amendment P2021-0036-ZCA, Amending Culver City Municipal Code Title 17: Zoning Code, Section 17.610.010.D – Nonconforming Oil Use, to Terminate Nonconforming Oil and Gas Uses by November 24, 2026

The Center for Biological Diversity ("Center") submits these comments in support of the reintroduction of the ordinance to phase out nonconforming oil and gas uses by November 24, 2026.

Over the past few years, the Center has submitted several letters in support of Culver City's actions to phase out drilling in the Inglewood Oil Field in order to protect residents' health and reduce greenhouse gas emissions. I am attaching those letters to ensure they are included in the record associated with this agenda item. We also signed on to a June 15, 2021 letter of support for the City-Initiated Zoning Code Amendment to Chapter 17.610, Section 17.610.010.D, to terminate and phase out over a five-year period the closure and removal of nonconforming oil and gas activities within Culver City, and a representative of our organization spoke in favor of the proposed ordinance at the June 17, 2021 meeting.

We continue to support the ordinance and thank the City Council for demonstrating leadership in addressing Culver City's dangerous oil and gas projects. We were concerned, however, to see the change in the ordinance that allows Sentinel Peak Resources to continue to operate "injection wells that are permitted and demonstrated to be active and necessary by CalGEM" after the five-year phase-out period. This change apparently leaves it to CalGEM's discretion to determine when injection wells are "necessary." The ordinance would align better with City Council's health and safety goals if it clarified that such injection wells are "necessary" only to protect health and safety – such as by preventing subsidence or groundwater contamination in Culver City, but that "necessary" does not mean needed to support additional oil and gas extraction in the adjoining portion of the Inglewood Oil Field in unincorporated Los Angeles County. Please consider amending the ordinance to make this clarification.

Do not hesitate to contact me with any questions.

Sincerely,

Liz Jones

Staff Attorney
Center for Biological Diversity
ljones@biologicaldiversity.org
(213) 785-5402

Enclosures:

1. June 20, 2018 letter re: Update on the Specific Plan for the Inglewood Oil Field
2. August 12, 2020 letter re: File No. 21-158, Amortization Study for Culver City Portion of the Inglewood Oil Field
3. August 28, 2020 letter re: File No. 21-158, Amortization Study for Culver City Portion of the Inglewood Oil Field
4. October 26, 2020 letter re: A-4. 21-389, Resolution Declaring Intent to Evaluate Phase Out Period for the Inglewood Oil Field

Enclosure 1:

June 20, 2018 letter re: Update on the Specific Plan for the Inglewood Oil Field

June 20, 2018

City Clerk
City of Culver City
9770 Culver Boulevard
Culver City, CA 90232
City.clerk@culvercity.org
via email

Re: Update on the Specific Plan for the Inglewood Oil Field

The Center for Biological Diversity ("Center") submits these comments in support of the City Council Oil Drilling Subcommittee's ("Subcommittee) recommendation for the Inglewood Oil Field, as explained in the City Staff Report on June 15, 2018. These comments supplement comments the Center previously submitted on March 14, 2018, which are hereby incorporated by reference.[1]

The Center urges the City Council to adopt the Subcommittee's recommendation. Specifically, the Center recommends that the City Council:

- End all well stimulation, enhanced oil recovery, and wastewater injection;
- Stop issuing permits for new wells or infrastructure, unless required for safety or repair;
- Begin an amortization study and create a plan to phase out all existing operations, starting with wells closest to homes and schools, and restore the site to a beneficial use for the community with appropriate remediation; and
- Meaningfully include the public in the creation of the amortization study as well as the phase-out plan, including conducting proper government-to-government consultation with all Tongva nations about protecting their cultural and natural cultural resources.

These measures are necessary to protect public health and to set a precedent that helps put us on a path to meeting the climate goals set out in the Paris Climate agreement. In addition, case law supports phasing out existing drilling through amortization. The Subcommittee's recommendation is, therefore, the best way forward for the residents of Culver City.

I. PERMITTING OIL WELLS AND INFRASTRUCTURE HINDERS THE STATE'S CLIMATE GOALS

As detailed in the Center's March 14, 2018 comments, oil drilling near homes and schools increases numerous health and safety risks, especially for residents who live, good to school, play, or work within 2500 feet of the operations. In addition—also as detailed in the Center's earlier comments—approving new wells will only hinder achievement of the state's climate

[1] The letter is attached for ease, but without references. The letter and all references were submitted to the City on March 14, 2018.

goals. Immediate and aggressive greenhouse gas emissions reductions are necessary to keep warming well below 2°C rise above pre-industrial levels—the temperature rise beyond which the most catastrophic effects of climate change are projected to occur.

The emission reduction potential in California alone is staggering. In February 2018, the Stockholm Environment Institute released a study concluding that restricting California oil production by 100 million barrels/year would likely decrease global GHG emissions by 8 to 24 million tons CO_2/year.[2] Overall emission benefits may be even greater if one factors in the upstream GHG emissions associated with producing, transporting, and processing that oil.[3]

Similarly, an Oil Change Institute report released in May 2018 found that halting new oil well permits and phasing out wells within 2,500 feet of sensitive areas—a distance within which public health studies suggest the greatest exposure to toxic air pollution occurs—could keep 660 million barrels of oil in the ground from 2019 through 2030.[4] This oil, if extracted and burned, would release more than 425 million metric tons of carbon pollution over the same time period.[5] As a point of comparison, Governor Brown set a goal to reduce oil use in cars and trucks by 50 percent by 2030, which save about 430 million barrels of oil over the next 12 years.[6] So, if California does not limit production, it could add more oil supply to the market than its demand-side measures reduces.[7]

Further, both of these studies found that reducing production in California would *not* result in an equal import of oil from other states or countries. Rather, reducing production locally results in a net reduction of overall oil produced. The Stockholm Environment Institute, for instance, confirmed that every barrel of California oil left in the ground will result in a net decrease of about half a barrel of oil consumption globally.[8]

The urgent need to prevent the worst impacts of climate change means that California cannot afford to invest in new fossil fuel extraction and infrastructure that locks in carbon intensive oil production for years into the future. As a result, we urge Culver City to immediately stop issuing permits for new wells and infrastructure.

II. THE CITY HAS BROAD AUTHORITY TO REGULATE OIL AND GAS DRILLING

As explained in the Center's March 14, 2018 Comments, cases have upheld local governments' broad authority to regulate oil and gas drilling generally. Some of the cases are summarized in chronological order below.

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[2] Peter Erickson & Michael Lazarus, Stockholm Envtl. Institute, *How limiting oil production could help California meet its climate goals* at p. 3 (Feb. 27, 2018), *available at* https://www.sei.org/wp-content/uploads/2018/03/sei-2018-db-california-oil2.pdf ("SEI Report").
[3] *Id.*
[4] Oil Change International, "The Sky's Limit California: Why the Paris Climate Goals Demand that California Lead in a Managed Decline of Oil Extraction, at p. 8 (May 2018), *available at* http://priceofoil.org/content/uploads/2018/05/Skys_Limit_California_Oil_Production_R2.pdf.
[5] *Id.*
[6] *Id.*
[7] *Id.*
[8] SEI Report.

Pacific Palisades Ass'n v. City of Huntington Beach (1925) 196 Cal. 211

The California Supreme Court considered an emergency city ordinance that prohibited a landowner from "erecting derricks, installing machinery, and drilling oil wells" within a business and residence district. Id. at 214. The Huntington Beach ordinance effectively blocked the landowner from executing a lease for the development of proven oil land, amidst nearby lands with producing wells. Id. at 215. Nonetheless, the Supreme Court concluded that the city "has the unquestioned right to regulate the business of operating oil wells within its city limits, and to prohibit their operation within delineated areas and districts, if reason appears for so doing." Id. at 217.

Marblehead Land Co. v. Los Angeles, 47 F.2d 528 (9th Cir. 1931)

The City of Los Angeles repealed an ordinance that had excluded a strip of the plaintiff's land from a residential district in which oil production was prohibited. The land had already been leased for drilling purposes with a considerable sum of money spent on preliminary work. The federal court held that the city's police powers permitted the city to protect inhabitants from fire and noxious gas hazards, and stated "there can be no question of the inherent right of the city to control or prohibit such production, provided it is done reasonably and not arbitrarily. In that event the loss must fall upon the owner whether it prevents him from erecting structures or establishing industries which he desires to erect or establish, or whether it prevents him from developing the inherent potentialities of his land." Marblehead, 47 F.2d at 531-32. The court further noted: "a mere change of policy or of legislation, however unfortunate the result may be to appellants, does not justify the courts in declaring void an ordinance exercising legitimate police power." Id. at 534.

Beverly Oil Co. v City of Los Angeles (1953) 40 Cal.2d 552

In the 1920s, the City of Los Angeles annexed land on the west side and passed a series of zoning ordinances that prohibited drilling and deepening of wells in the annexed area but permitted operations of existing wells and support structures (derricks, pumping units, well casings, pipes, storage tanks) in those areas as nonconforming uses. Uses that did not have association buildings or support structures were to be amortized out over 5 years, but the Supreme Court did not address this portion of the ordinance because the City—at the time—interpreted its ordinance as allowing the plaintiff's drilling to continue.

In affirming the City's right to prohibit new wells or re-drill old wells, however, the Court reiterated its earlier-stated rule that "the city had 'the unquestioned right to regulate the business of operating oil wells within its city limits, and to prohibit their operation within the delineated areas and districts, if reason appears for so doing.'" Beverly Oil Co., 40 Cal.2d at 558, quoting Pacific Palisades Ass'n v. City of Huntington Beach (1925) 196 Cal. 211, 217. The Supreme Court concluded that local zoning ordinances prohibiting oil production are valid because:

> It is to be remembered that we are dealing with one of the most essential powers of government, one that is the least limitable. It may, indeed, seem harsh in its exercise, usually is on some individual, but the imperative necessity for its existence precludes any limitation upon it when not exerted arbitrarily. A vested interest cannot be asserted against it because of conditions once obtaining. To so hold would preclude development and fix a city forever in its primitive conditions.

> There must be progress, and if in its march private interests are in the way, they must yield to the good of the community.

Id. at 557 (quoting Hadacheck v. Sebastian, 239 U.S. 394 (1915) (upholding a City of Los Angeles zoning ordinance that retroactively required the removal of a brickmaking industry (internal citations omitted)). The Supreme Court concluded that it is "well settled that the enactment of an ordinance which limits the owner's property interest in oil bearing lands located within the city is not of itself an unreasonable means of accomplishing a legitimate objective within the police power of the city." Beverly Oil, at 558.

Friel v. County of Los Angeles (1959) 172 Cal.App.2d 142

Los Angeles County zoned certain areas for residential uses and denied plaintiffs' applications for exceptions or variances for the purpose of drilling for oil. Plaintiffs complained that their neighbors in different zones, who were permitted to drill, were drilling the oil underlying plaintiffs' land. The court upheld the ordinance, stating: "There is no question that the county has the right to regulate the drilling and operation of oil wells within its lands and to prohibit their drilling and operation within particular districts if reasonably necessary for the protection of the public health, safety and general welfare." Friel, 172 Cal.App.2d at 157.

Hermosa Beach Stop Oil Coalition v. City of Hermosa Beach (2001) 86 Cal.App.4th 534

After an oil company entered into a lease agreement with a city for oil and gas exploration and production on city-owned property, the city's voters enacted an initiative reinstating a total ban on oil drilling within the city. The Court of Appeals found that the company had not obtained vested rights to drill because, despite the existing lease, it had not yet received its required permits. Hermosa Beach, 86 Cal.App.4th at 552-553 ("'Courts have yet to extend the vested rights or estoppel theory to instances where a developer lacks a building permit or the functional equivalent, regardless of the property owner's detrimental reliance on local government actions and regardless of how many other land use and other preliminary approvals have been granted.... California courts apply this rule most strictly ....' [citation]"). The Court further found that the ban was not an unconstitutional impairment of the existing lease, noting that the oil company knew of the risk of increased regulation, and that "Proposition E was adopted with general findings that reinstituting the total ban on oil drilling and production in a densely populated urban area is necessary to preserve the environment, as well as to protect the public health, safety and welfare of people and property within Hermosa Beach. It is, therefore, presumptively a justifiable exercise of the City's police power." Id. at 555.

III. COURTS HAVE UPHELD AMORTIZATION PERIODS FOR PHASING OUT MANY DIFFERENT TYPES OF USES

Property owners claiming a vested right must demonstrate that they have: (1) acquired all discretionary permits necessary for the prohibited activity, and (2) completed substantial work in good faith reliance on those permits prior to the effective date of the ordinance. Avco Community Developers, Inc. v. South Coast Regional Commission (1976) 17 Cal. 3d 785, 791 (1976). Vested rights need not be allowed to continue indefinitely; they may be terminated pursuant to a regulation's reasonable phase-out or "amortization" period. Metromedia, Inc. v.

San Diego (1980) 26 Cal. 3d 848, 882. The cases below are some that support amortization periods to phase out existing uses.

Livingston Rock and Gravel Co. v. County of Los Angeles (1954) 43 Cal.2d 121

Los Angeles County re-zoned an area from industrial to light manufacturing, but allowed nonconforming uses to continue operating for 20 years unless the time period was revoked or shortened by the planning commission. The planning commission could revoke (shorten) the 20 years if: (1) it would not impair any person's constitutional rights, or (2) after a public hearing, the planning commission found that the continued use was detrimental to public health or safety or a nuisance. The planning commission revoked the company's right to operate a cement mixing plant, effective one year later, and the board of supervisors added to the basic zoning ordinance a section expressly confirming the expiration date fixed by the commission. Livingston Rock, 43 Cal.2d at 124-125. The Supreme Court recognized the legitimacy of amortization periods, noting that "zoning legislation looks to the future in regulating district development and the eventual liquidation of nonconforming uses within a prescribed period commensurate with the investment involved." Id. at 127. The Court thus upheld the right of the County to shorten the phase-out period, noting that the original 20-year phase-out period was an *exception* to the rezoning restrictions. The Court found that revocation of *exceptions*—in particular where the revocation was based on whether the shortened amortization period violated a person's constitutional rights—were constitutionally valid as a whole and within a local government's policy power authority. Id. at 127-128.

City of Los Angeles v. Gage (1954) 127 Cal.App.2d 442

The City of Los Angeles passed a zoning ordinance requiring discontinuance of nonconforming commercial and industrial uses of residential buildings in residential zones. A wholesale and retail plumbing business challenged the five-year amortization period, but the California Court of Appeal upheld it. The court stated that zoning ordinances are valid exercises of local police powers, which are constitutional under the due process doctrine provided they are exercised for a proper purpose (health, safety, welfare) and are not arbitrary or unreasonable when applied in a particular case. Gage, 127 Cal.App.2d at at 453. The court noted:

> The distinction between an ordinance restricting future uses and one requiring the termination of present uses within a reasonable period of time is merely one of degree, and constitutionality depends on the relative importance to be given to the public gain and to the private loss….
> Use of a reasonable amortization scheme provides an equitable means of reconciliation of the conflicting interests in satisfaction of due process requirements. As a method of eliminating existing nonconforming uses it allows the owner of the nonconforming use, by affording an opportunity to make new plans, at least partially to offset any loss he might suffer.

Id. at 460. Under the facts of this case (applying several fact-dependent factors), the court found that the amortization period was reasonable as applied to the plumbing business. Id. at 461.

National Advertising Co. v. County of Monterey (1970) 1 Cal.3d 875
In 1955, Monterey County adopted a comprehensive zoning ordinance which banned billboards in many areas. An appellate court decision upheld a five-year amortization for billboards in the rezoned areas. In 1965, the county created a new zone within which billboards would need to be removed within one year. The Supreme Court upheld the one-year amortization period despite the company's continual investments in the signs for maintenance and even rebuilding the structures: "Although essential maintenance repairs may be said to prolong to a degree the useful life of any structure, and are permitted to those that are nonconforming [citation], the repairs cannot be relied upon to defeat zoning legislation which looks to the future and the eventual liquidation of nonconforming uses. [citations.]" National Advertising Co., 1 Cal.3d at 880.

People v. Gates (1974) 41 Cal.App.3d 590, 603-605
Applying multiple fact-dependent factors, the California Court of Appeals upheld as reasonable an 18-month amortization period granted by the County for an automobile wrecking yard.

United Bus. Com. v. City of San Diego (1979) 91 Cal.App.3d 156, 180-182
Provides a survey of cases in which courts have upheld amortization periods for nonconforming signs of two years and eight months, three years, five years, and seven years.

Castner v. City of Oakland (1982) 129 Cal.App.3d 94
Based on the facts, the Court of Appeals upheld as reasonable a one-year amortization period (with an extra two years' grace period for operations obligated by a lease they could not break) for an adult bookstore subject to a newly adopted ordinance banning adult entertainment activities within 1,000 feet of a residential zone.

Finally, with respect to any potential argument that phasing out and amortizing fossil fuel production in the Culver City portion of the IOF would result in an unconstitutional taking, as explained in the Center's March 14, 2018 Comments (p. 28), a court would be unlikely to find that a taking has occurred. First, the Culver City is a small portion of the productive capacity of the field. Second, any amortization period combined with an individual appeals process would mitigate financial losses. When weighed against the significant public health and environmental benefit, such a regulation is clearly a reasonable exercise of the City's police powers.

The Center encourages the City Council to adopt the Subcommittee's recommendation. Please do not hesitate to contact me with any questions.

Sincerely,

Maya Golden-Krasner
Senior Attorney | Climate Law Institute
Center for Biological Diversity
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(213) 785-5402

Enclosure 2:

August 12, 2020 letter re: File No. 21-158, Amortization Study for Culver City Portion of the Inglewood Oil Field

CENTER for BIOLOGICAL DIVERSITY Because life is good.

August 12, 2020

City Clerk
City of Culver City
9770 Culver Boulevard
Culver City, CA 90232
City.clerk@culvercity.org

via email

Re: File No. 21-158, Amortization Study for Culver City Portion of the Inglewood Oil Field

The Center for Biological Diversity ("Center") submits these comments in support of the City Council Oil Drilling Subcommittee's ("Subcommittee) recommendation for the Inglewood Oil Field ("IOF") to direct staff to develop a framework that identifies an appropriate period to phase out oil and gas activity, and to authorize the Oil Drilling Subcommittee to continue its work with staff on this framework.

Oil drilling near homes and schools increases numerous health and safety risks, especially for residents who live, go to school, play, or work within 2500 feet of the operations. In addition, approving new wells will only hinder achievement of the state's climate goals. Immediate and aggressive greenhouse gas emissions reductions are necessary to keep warming well below 2°C rise above pre-industrial levels—the temperature rise beyond which the most catastrophic effects of climate change are projected to occur.

The emission reduction potential of phasing out oil drilling in California alone is staggering. In February 2018, the Stockholm Environment Institute released a study concluding that restricting California oil production by 100 million barrels/year would likely decrease global GHG emissions by 8 to 24 million tons CO_2/year.[1] Overall emission benefits may be even greater if one factors in the upstream GHG emissions associated with producing, transporting, and processing that oil.[2]

Similarly, an Oil Change Institute report released in May 2018 found that halting new oil well permits and phasing out wells within 2,500 feet of sensitive areas—a distance within which public health studies suggest the greatest exposure to toxic air pollution occurs—could keep 660 million barrels of oil in the ground from 2019 through 2030.[3] This oil, if extracted and burned,

[1] Peter Erickson & Michael Lazarus, Stockholm Envtl. Institute, *How limiting oil production could help California meet its climate goals* at p. 3 (Feb. 27, 2018), *available at* https://www.sei.org/wp-content/uploads/2018/03/sei-2018-db-california-oil2.pdf ("SEI Report").
[2] *Ibid.*
[3] Oil Change International, "The Sky's Limit California: Why the Paris Climate Goals Demand that California Lead in a Managed Decline of Oil Extraction, at p. 8 (May 2018), *available at* http://priceofoil.org/content/uploads/2018/05/Skys_Limit_California_Oil_Production_R2.pdf.

would release more than 425 million metric tons of carbon pollution over the same time period.[4] Both of these studies found that reducing production in California would *not* result in an equal import of oil from other states or countries. Rather, reducing production locally results in a net reduction of overall oil produced. The Stockholm Environment Institute, for instance, confirmed that every barrel of California oil left in the ground will result in a net decrease of about half a barrel of oil consumption globally.[5]

The urgent need to prevent the worst impacts of climate change means that California cannot afford to continue investing in fossil fuel extraction and infrastructure that locks in carbon intensive oil production for years into the future. Thus, the Center fully supports phasing out oil drilling in the Culver City portion of the IOF.

In particular, we urge the City Council to:

- Move forward with phasing out oil production and remediation starting in January 2021;
- Ensure that the operator, not taxpayers, covers the full costs for remediation, and that workers hired for remediation are local and unionized;
- Create a process for community-led determination of the long-term transition vision for the site, including informed consent of the local Indigenous community.

Courts have upheld amortization periods for phasing out many different types of uses.

Furthermore, amortization of existing wells is a legally appropriate way of ending oil drilling here. In *Livingston Rock and Gravel Co. v. County of Los Angeles* (1954) 43 Cal.2d 121, Los Angeles County re-zoned an area from industrial to light manufacturing with a 20-year amortization period, and after a public hearing, revoked the company's right to operate a cement mixing plant, effective one year later. In upholding the right of the County to shorten the phase-out period, the Supreme Court recognized the legitimacy of amortization periods, noting that "zoning legislation looks to the future in regulating district development and the eventual liquidation of nonconforming uses within a prescribed period commensurate with the investment involved." *Id*. at 127.

In *City of Los Angeles v. Gage* (1954) 127 Cal.App.2d 442, the City of Los Angeles passed a zoning ordinance requiring discontinuance of nonconforming commercial and industrial uses of residential buildings in residential zones. A wholesale and retail plumbing business challenged the five-year amortization period, but the California Court of Appeal upheld it. The court stated that:

> Use of a reasonable amortization scheme provides an equitable means of reconciliation of the conflicting interests in satisfaction of due process requirements. As a method of eliminating existing nonconforming uses it allows the owner of the nonconforming use, by affording an opportunity to make new plans, at least partially to offset any loss he might suffer.

Id. at 460. After considering several fact-dependent factors, the court found that the amortization period was reasonable as applied to the plumbing business. *Id.* at 461.

[4] *Ibid.*
[5] SEI Report.

Furthermore, with respect to any potential argument that phasing out and amortizing fossil fuel production in the Culver City portion of the IOF would result in an unconstitutional taking, a court would be unlikely to find that a taking has occurred. First, the Culver City is a small portion of the productive capacity of the field. Second, any amortization period combined with an individual appeals process would mitigate financial losses. When weighed against the significant public health and environmental benefit, such a regulation is clearly a reasonable exercise of the City's police powers.

The Baker & O'Brien Amortization Study supports phasing out wells in the Culver City portion of the IOF starting in January 2021.

The study by Baker & O'Brien used two different methods to determine the time required for the amortization of capital investment ("ACI") by Sentinel Peak Resources, LLC: modeling the time for ACI for Sentinel's investment when it acquired Freeport McMoRan's portfolio of California oil and gas production properties, and modeling the time for ACI based on the original costs to drill and complete the wells and infrastructure made by other operators in the IOF between 1925 and 2016. The analysis demonstrates that the time for ACI for Sentinel's capital investment is within four to five years of Sentinel's acquisition date, thus by January 2021. In addition, even if particular wells fall short of the five-year ACI mark, the study confirms that high returns from performing wells offset low returns from marginal wells. The Center therefore urges the City Council and staff to develop a plan that begins to phase out wells starting in January 2021.

A just transition of the oil field to clean energy can help spur jobs and economic recovery.

A global survey of more than 200 of the world's most senior economists and economic officials found that investment in clean energy infrastructure, clean research and development spending, connectivity infrastructure investment, and other incentive spending have both climate benefits and the greatest stimulus effect ("economic multiplier") over time.[6] Green spaces and natural infrastructure investment and building upgrades for energy were both ranked as having high climate benefits though a lower economic multiplier.

Repurposing this portion of the IOF for clean energy, green spaces, natural infrastructure would do more to create jobs and stimulate Culver City's economy than maintaining the status quo. To that end, the City should look into: ensuring that Sentinel pays for plugging and abandoning the wells as well as remediation, rather than taxpayers; and including a project labor agreement for work done at the site to ensure that the workers receive a living wage, are properly trained, are unionized, and where possible, local.

For these reasons, the Center encourages the City Council to adopt the Subcommittee's recommendations as the best outcome for Culver City's residents. Please do not hesitate to contact me with any questions.

[6] Hepburn, Cameron et al., Oxford Smith School of Enterprise and the Environment, Working Paper No. 20-02 (May 4, 2020), forthcoming in the Oxford Review of Economic Policy 36(S1), https://www.smithschool.ox.ac.uk/publications/wpapers/workingpaper20-02.pdf.

Sincerely,

Maya Golden-Krasner
Senior Attorney | Climate Law Institute
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Enclosure 3:

August 28, 2020 letter re: File No. 21-158, Amortization Study for Culver City Portion of the Inglewood Oil Field

August 28, 2020

City Council for the City of Culver City
City of Culver City – City Hall
9770 Culver Boulevard
Culver City, CA 90232
city.council@culvercity.org

via email

Re: File No. 21-158, Amortization Study for Culver City Portion of the Inglewood Oil Field

To the Honorable City Council Members:

On behalf of the Center for Biological Diversity and the National Resources Defense Council, we thank the City Council for demonstrating continued leadership in addressing Culver City's dangerous oil and gas projects. We submit these comments in response to the August 13, 2020 letter sent to Culver City Council by Alston & Bird on behalf of Sentinel Peak Resources California LLC ("Sentinel"), which contains misinformation and erroneous characterization of local government authority.

Sentinel claims in its letter that amortization does not apply to vested rights in the oil and gas context because "extraction of minerals" is protected under the diminishing asset doctrine identified in *Hansen Brothers Enterprises v. Board of Supervisors*, 12 Cal. 4th 533 (1996).[1] According to Sentinel, this doctrine distinguishes the "extensive" rights that belong to companies that extract minerals from the rights of billboard owners whose investments may be amortized.[2] The report Sentinel commissioned from Robert Lang and attached to its letter goes further, stating that the *Hansen* case means amortization cannot apply to ***any*** "extractive industries," and that the oil and gas industry has a right to unfettered expansion of "development and exploration" operations.[3] These assertions misrepresent the diminishing asset doctrine, which has no application to Sentinel's operations in Culver City.

[1] Letter from Nikki Carlsen, Counsel to Sentinel Peak Resources LLC, to Culver City Council 1 (Aug. 13, 2020).
[2] Letter from Nikki Carlsen, Counsel to Sentinel Peak Resources LLC, to Heather Baker, Assistant City Attorney for Culver City 1-2 (June 3, 2020).
[3] Robert Lang, *Review of the Baker & O'Brien Report* 8 (Aug. 13, 2020).

I. The Diminishing Asset Doctrine Identified in the *Hansen* Case is Limited to Quarrying and Gravel Mining.

Hansen dealt only with the applicability of the diminishing asset doctrine ***to quarrying and gravel mining***, finding that the scope of a vested right to mine rock and gravel can extend to an entire parcel such that abandonment of a nonconforming use is determined by looking at overall operations on the parcel. *Hansen Bros. Enters.*, 12 Cal. 4th at 540, 542. In outlining the diminishing asset doctrine, the *Hansen* court cited exclusively to quarrying and gravel mining cases, *id.* at 554-558,[4] and noted the distinctive nature of quarrying and gravel mining activities:

> [Q]uarrying involves a unique use of land. As opposed to other nonconforming uses in which the land is merely incidental to the activities conducted upon it . . . quarrying contemplates the excavation and sale of the corpus of the land itself as a resource. Depending on customer needs, the land will be gradually excavated in order to supply the various grades of sand and gravel demanded. Thus as a matter of practicality as well as economic necessity, a quarry operator will not excavate his entire parcel of land at once, but will leave areas in reserve, virtually untouched until they are actually needed.
>
> It is because of the unique realities of gravel mining that . . . quarrying constitutes the use of land as a 'diminishing asset.' . . . [Q]uarrying, as a nonconforming use, cannot be limited to the land actually excavated at the time of enactment of the restrictive ordinance because to do so would, in effect, deprive the landowner of his use of the property as a quarry.

id. at 554.

In fact, the *Hansen* court recognized that "[i]n general, the state has the same power to prohibit the extraction or removal of ***natural products from the land*** as it does to prohibit other uses." *Id.* at 553 (emphasis added) (citing *Beverly Oil Co. v. City of Los Angeles*, 40 Cal.2d 552, 558 (1953)). The court in *Beverly Oil* affirmed that a city has "the unquestioned right to regulate the business of operating oil wells within its city limits, and to prohibit their operation within the delineated areas and districts, if reason appears for so doing." 40 Cal.2d at 558. ***Quarrying and gravel mining*** uses were specifically distinguished from other natural resource uses by the *Hansen* court. Those uses are exempted from the general rule barring expansion of existing nonconforming uses because quarrying land is "one use" land: quarrying operations fundamentally depend on excavation of all portions of the land where that use existed or was

[4] *Stephan & Sons v. Municipality of Anchorage*, 685 P.2d 98 (Alaska 1984) (gravel pit); *McCaslin v. City of Monterey Park*, 329 P.2d 522 (Cal. Ct. App. 1958) (decomposed granite quarry and sand and gravel pit); *County of Du Page v. Elmhurst-Chicago Stone Co*., 165 N.E.2d 310 (Ill. 1960) (quarry); *Hawkins v. Talbot*, 80 N.W.2d 863, 865 (Minn. 1957) (gravel pit); *Town of Wolfeboro v. Smith*, 556 A.2d 755 (N.H. 1989) (gravel pit); *Flanagan v. Town of Hollis*, 293 A.2d 328, 329 (N.H. 1972) (gravel excavation); *Moore v. Bridgewater Tp*., 173 A.2d 430, 437 (N.J. Super. 1961) (quarry); *Struyk v. Samuel Braen's Sons*, 85 A.2d 279, 281 (N.J. Super. 1951) (quarry); *Syracuse Aggregate Corp. v. Weise*, 414 N.E.2d 651 (N.Y. 1980) (quarry); *Dolomite Products Company v. Kipers*, 279 N.Y.S.2d 192 (N.Y. App. Div. 1965) (quarry); *R. K. Kibblehouse v. Marlborough*, 630 A.2d 937, 944 (Pa. Commw. Ct. 1993) (quarry); *Gibbons & Reed Company v. North Salt Lake City*, 431 P.2d 559, 562-563 (Utah 1967) (gravel mine); *Smart v. Dane County Bd. of Adjustments*, 501 N.W.2d 782, 785 (Wis. 1993) (quarry).

clearly contemplated when zoning regulations changed. *Id.* at 553. For these reasons, the diminishing asset doctrine is limited to quarrying and gravel mining.

As the City Council is no doubt aware, Culver City has prevailed on this very legal issue before. In *Plains Exploration & Production Co. v. City of Culver City* (L.A. Super. Ct. No. BS122799, March 26, 2010), the Court rejected an oil company's argument that it had a vested right to expand its existing nonconforming use and drill new wells under the diminishing asset doctrine outlined in *Hansen*. The Court pointed out that oil and gas drilling are not mining under California law. *Id.* at 10-11. In addition, oil and gas are generally migratory rather than fixed features of a parcel—they can be extracted from one location on a property without expanding use to the entire parcel. *Id.* at 11-12. Owners can also use oil and gas-producing land for purposes other than extraction. *Id*. The diminishing asset doctrine is of highly questionable application outside of the quarrying and gravel mining context and of absolutely no application to oil and gas operations.

II. Even If the Diminishing Asset Doctrine Applied to Oil and Gas Operations—Which It Does Not—Amortization Could Still Be Used to Phase Out Drilling Rights.

Vested rights are not perpetual rights; they may be lawfully discontinued through amortization. *City of Los Angeles v. Gage*, 127 Cal. App. 2d 442, 459 (1954). This is true even when those rights relate to mining diminishing assets, which, again, is not the case with oil and gas vested rights. Sentinel's statement that "[n]o case has held that the amortization applies to eliminate a diminishing asset use" is false.[5] In fact, the *Hansen* court expressly acknowledged that a vested nonconforming use may be limited to the period adequate for amortization of the owners' investment. *Hansen*, 12 Cal. 4th at 552. Other states that recognize the diminishing asset doctrine have also noted its compatibility with amortization. *See Stephan & Sons v. Municipality of Anchorage*, 685 P.2d 98, 102 (Alaska 1984) (by "providing for the amortization of a mineral resource nonconforming use," Alaska law "contemplates that those uses may continue to some degree" under the diminishing asset doctrine); *City of Univ. Place v. McGuire*, 30 P.3d 453, 459 (Wash. 2001) (adopting the "doctrine of diminishing asset to determine the lawful scope of the nonconforming use in mining operations" and noting that any "potential damage to zoning schemes" caused by this adoption "may be ameliorated through reasonable amortization periods"). Even if the diminishing asset doctrine applied to oil and gas operations, amortization of the investment for those assets would be possible. And Sentinel has not demonstrated that the amortization period would be longer if its oil and gas drilling rights were subject to the doctrine.

California courts have long recognized amortization periods as a legal means to balance the competing interests of a landowner's property rights and a local agency's need to implement zoning changes that benefit public health and welfare. *Gage*, 127 Cal. App. 2d at 460. As noted in the Center for Biological Diversity's earlier comments, amortization's application is not confined to billboards. On the contrary, courts have approved the use of phase out periods in a wide variety of contexts.[6]

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[5] Letter from Nikki Carlsen, Counsel to Sentinel Peak Resources LLC, to Culver City Council 1 (Aug. 13, 2020).
[6] *See, e.g.*, *Livingston Rock & Gravel Co. v. County of Los Angeles*, 43 Cal. 2d 121 (1954) (cement mixing plant); *People v. Gates*, 41 Cal. App. 3d 590, 603 (1974) (wrecking yard); *Castner v. City of Oakland*, 129 Cal. App. 3d 94, 96-97 (1982) (adult bookstore).

Moreover, local governments have always had authority to exercise their broad police powers to abate nuisances and protect the public from harm. Cal. Const. Art. XI, sec. 7; *Richeson v. Helal*, 158 Cal. App. 4th 268, 277 (2007). In Culver City, the air, water, noise, and light pollution caused by oil and gas activities have been allowed to endanger nearby residents for far too long.

We commend the Culver City Council for directing staff to develop a framework and timeline to phase out wells in the City. Sentinel's manufactured arguments should not slow down this process. Please do not hesitate to contact us with any questions. We look forward to working together on this critical issue.

Sincerely,

/s/ Liz Jones

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cc: Carol Schwab, City Attorney, city.attorney@culvercity.org
Heather Baker, Assistant City Attorney, heather.baker@culvercity.org

Enclosure 4:

October 26, 2020 letter re: A-4. 21-389, Resolution Declaring Intent to Evaluate Phase Out Period for the Inglewood Oil Field

October 26, 2020

City Council for the City of Culver City
City of Culver City – City Hall
9770 Culver Boulevard
Culver City, CA 90232
city.clerk@culvercity.org
public.comment@culvercity.org
via email

Re: A-4. 21-389, Resolution Declaring Intent to Evaluate Phase Out Period for the Inglewood Oil Field

To the Honorable City Council Members:

The Center for Biological Diversity ("Center") submits these comments in support of the City Council Oil Drilling Subcommittee's ("Subcommittee") recommendation to adopt a resolution "declaring the City Council's intent to evaluate the establishment of an approximate five-year phase-out period for the amortization and removal of nonconforming oil and gas activities within the City," and to direct the Subcommittee and staff to develop and refine an Amortization Program. We thank the City Council for demonstrating continued leadership in addressing Culver City's dangerous oil and gas projects.

Oil drilling poses numerous health and safety risks, especially for residents who live, go to school, play, or work within 2,500 feet of operations. Research has found that people living near drilling sites have a higher risk for developing cancer, higher hospitalization rates, higher rates of preterm births and low birth rates, and more upper respiratory problems and rashes. Many Californians living near active oil and gas wells suffer from terrible symptoms such as nosebleeds, headaches, and worsened asthma. In addition, drilling hinders our state's ability to achieve climate goals. Immediate and aggressive greenhouse gas emissions reductions are necessary to keep global warming well below 2°C rise above pre-industrial levels—the temperature rise beyond which the most catastrophic effects of climate change are projected to occur.

In order to protect the safety and wellbeing of Culver City residents, the Council must act quickly to transition away from fossil fuels to a clean and sustainable economy. By repurposing the Inglewood Oil Field for clean energy, green spaces, and natural infrastructure, Culver City can create jobs and help spur economic recovery.

California courts have long recognized amortization periods as a legal means to balance the competing interests of a landowner's property rights and a local agency's need to implement zoning changes that benefit public health and welfare. As explained in the Center for Biological

Diversity's earlier comments,[1] Courts have approved the use of phase out periods in a wide variety of contexts.[2] Sentinel Peak Resources, LLC's arguments that oil drilling is specially protected under California law have also been rejected by the Los Angeles Superior Court.[3] Finally, local governments have always had authority to exercise their broad police powers to abate nuisances and protect the public from harm.[4] In Culver City, the air, water, noise, and light pollution caused by oil and gas activities have been allowed to endanger nearby residents for far too long.

The study commissioned by Baker & O'Brien found that Sentinel Peak Resources, LLC achieved amortization of its capital investment *within four to five years* of purchasing the wells in the Inglewood Oil Field: that is, by January 2021. In addition, even if particular wells fall short of the five-year amortization mark, the study confirms that high returns from performing wells offset low returns from marginal wells. While we are disappointed that City Council and staff have not committed to phasing out drilling and fully remediating the site of oil and gas activities sooner than five years after the effective date of the proposed Amortization Program, the five year timeframe proposed in the resolution is clearly sufficient given the findings of the Baker & O'Brien study. We urge City Council to adopt the Subcommittee's recommendation.

Further, the Subcommittee and staff should work to prepare the Amortization Program as quickly as possible. City Council should also at a future date consider adopting a more specific timeline for the end of drilling at the site and for remediation. For the health and safety of City residents and in order to ensure legacy spills and other drilling activity impacts are fully cleaned-up, Sentinel Peak Resources, LLC must not be allowed to wait until the end of the five-year period to stop drilling and begin remediation. Drilling can and should be phased out starting in January 2021.

Please do not hesitate to contact me with any questions. We look forward to working together on this critical issue.

Sincerely,

Liz Jones, Staff Attorney
Center for Biological Diversity
660 S. Figueroa St., Suite 1000
Los Angeles, CA 90017
ljones@biologicaldiversity.org
(213) 785-5400

[1] The Center for Biological Diversity submitted letters on March 14, 2018; June 20, 2018; August 12, 2020; August 28, 2020. We are happy to further discuss the information contained in any of these letters.
[2] *See, e.g.*, *Livingston Rock & Gravel Co. v. County of Los Angeles*, 43 Cal. 2d 121 (1954) (cement mixing plant); *Castner v. City of Oakland*, 129 Cal. App. 3d 94, 96-97 (1982) (adult bookstore); *People v. Gates*, 41 Cal. App. 3d 590, 603 (1974) (wrecking yard); *City of Los Angeles v. Gage*, 127 Cal. App. 2d 442 (1954) (commercial and industrial uses of residential buildings in residential zones).
[3] *Plains Expl. & Prod. Co. v. City of Culver City* at 10-12 (L.A. Super. Ct. No. BS122799, March 26, 2010).
[4] Cal. Const. Art. XI, sec. 7; *Richeson v. Helal*, 158 Cal. App. 4th 268, 277 (2007).

Ferrel, Mimi

From: Leah Pressman [redacted]
Sent: Monday, October 18, 2021 2:03 PM
To: Public Comment at Culver City; Fisch, Alex; Vera, Albert; Yasmine-Imani McMorrin; Lee, Daniel; Eriksson, Goran
Subject: Public Comment for City Council Item PH-1

Dear Mayor, Vice Mayor, and Council Members,

I expect your vote on this item will be unanimous. I write and echo much of what Jeff Schwartz has said in his email to you because I agree and I am running out of time to submit a very original comment.

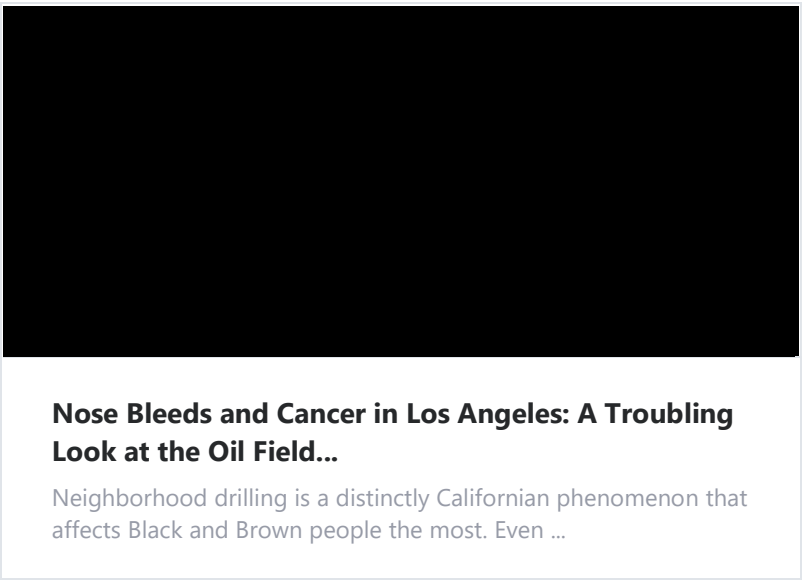
Four of you campaigned on closing the oil field and voted for this item on its previous appearance. This was a BIG deal. My deep and heartfelt thanks to those of you who
chose to lead on tis.

Culver City's leadership was followed by Los Angeles City and Los Angeles County also acting to close down the oil field.

As Pete Buttigieg pointed out yesterday, if we do not act and act boldly and decisively to mitigate climate change, it will result in more death and more economic devastation.

Capital & Main, Grist, and LA Taco just collaborated the article referenced below:

Nose Bleeds and Cancer in Los Angeles: A Troubling Look at the Oil Fields in Our Backyards



Nose Bleeds and Cancer in Los Angeles: A Troubling Look at the Oil Field...

Neighborhood drilling is a distinctly Californian phenomenon that affects Black and Brown people the most. Even ...

It's focused on environmental racism, but also documents the health impacts of drilling near homes.
I encourage you to close this deal and shut down the oil field once and for all.

Thank you for continuing to move this forward and keeping Culver City a climate leader.

Ferrel, Mimi

From: McGuire, Julie <JMcGuire@manatt.com>
Sent: Monday, October 18, 2021 2:22 PM
To: Public Comment at Culver City
Cc: Waggener, Sigrid; Moyer, Craig
Subject: Comments on Proposed Zoning Code Amendment P2021-036-ZCA, City Council October 18, 2021 Hearing
Attachments: Letter to Clerk_ City of Culver City - October 18_ 2021.pdf

Please see attached comments of the California Independent Petroleum Association on Zoning Code Amendment P2021-0036-ZCA.

Thank you.

Julie McGuire
Legal Secretary

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October 18, 2021

VIA E-MAIL [PUBLIC.COMMENT@CULVERCITY.ORG]

City of Culver City
City Council for the City of Culver City
9770 Culver Blvd.
Culver City, CA 90232

Re: Comments on Proposed Zoning Code Amendment P2021-0036-ZCA, City Council October 18, 2021 Hearing

Dear Mayor, Vice Mayor and Honorable Council Members:

This firm represents the California Independent Petroleum Association (CIPA). On CIPA's behalf, we submit the below comments on the City of Culver City's (City) reintroduction of its proposed Zoning Code Amendment, Ordinance P2021-0036-ZCA entitled, "Nonconforming Oil Use, to Terminate Nonconforming Oil and Gas Uses by November 24, 2026" (Ordinance). We ask that these comments be made part of the record of proceedings regarding the Ordinance.

1. The Ordinance Conflicts with State Law; It Is Therefore Preempted.

We urge the City to suspend all proceedings concerning the Ordinance in light of last week's decision in the matter of *Chevron U.S.A., Inc. v. County of Monterey*, No. H045791, 2021 Cal. App. LEXIS 844, at *4 2021 WL 4743024 (Ct. App. Oct. 12, 2021) (*Chevron*). In *Chevron,* the Court of Appeal affirmed the authority of the State to regulate the manner in which oil drilling operations could proceed. Nevertheless, the City's proposed Ordinance would prohibit most oil and gas activity, including the drilling and redrilling, or deepening of existing wells and to prohibit the erection of any derrick, structure, or equipment related to oil and gas operations, all of which conflict with the State's laws and regulations. [Proposed Zoning Code Amendment, section D.] This is contrary to the holding in *Chevron*, and moving forward with the Ordinance will likely result in the Ordinance being challenged on *Chevron* grounds.

2. Application of An Amortization Program is Improper Here.

The amortization concept is based on the premise that a property owner must be given an opportunity to recoup its investment and be made whole. The application of the concept to oil fields does not achieve that purpose. The utility of an oil field depends on its productivity, which requires ongoing infrastructure investment. Amortization does not fully account for such

investments and therefore does not facilitate actual recovery on oil field infrastructure investments. Instead, the application of an amortization program in the context of oil field operations amounts to a taking of property without just compensation.

3. Even if Amortization Could Be Applied Here, the City's Application Is Flawed

As discussed in the October 18, 2021 letter of Sentinel Peak Resources California, LLC submitted in connection with the proposed Ordinance, the City's amortization program relies on fundamentally flawed and legally improper assumptions. By way of example, the program assumes that all capital investments in oilfields within the City were made decades ago and returns on those investments have already been garnered. Not so. As explained above, the nature of oil and gas operations requires constant, ongoing capital investment. Such investments have yet to be recouped.

4. The City's Reliance on Categorical Exemptions Is Improper

The City purports to comply with the environmental disclosure, evaluation and mitigation mandates of the California Environmental Quality Act (CEQA) in its adoption of the Ordinance by relying on three categorical exemptions.[1] Such reliance is improper. In deeming the Ordinance exempt from CEQA, the City failed to consider the significant, foreseeable impact the Ordinance would have on mineral resources. The City must undertake a legally adequate evaluation of the impacts to this CEQA resource class prior to adoption of the Ordinance. The City must also consider the increases in greenhouse gas (GHG) emissions that will result from Ordinance adoption. Reducing oil and gas production in California will result in an immediate, foreseeable increase in the importation of foreign oil. Importation of foreign oil results in increased GHG emissions from tanker ships carrying the oil and the oil itself, which is not climate compliant.[2]

For the reasons stated herein, CIPA strongly opposes the City to discontinue its processing of the proposed Ordinance and decline to adopt the Ordinance.

Sincerely,

Sigrid R. Waggener

[1] These exemptions are Existing Facilities (Class 1), Minor Alterations to Land (Class 4), and Actions by Regulatory Agencies for the Protection of the Environment (Class 8).
[2] By contrast, oil produced in California is climate compliant—meaning that oil produced in State is produced in compliance with some of the most rigorous GHG reductio programs in the world.

Ferrel, Mimi

From: [redacted]
Sent: Monday, October 18, 2021 3:01 PM
To: Public Comment at Culver City
Attachments: Culver City 10-18-2021 (CFT).pdf

LIZ K. GOSNELL
CONE FEE TRUST
[redacted]

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October 18, 2021

VIA E-MAIL

The City of Culver City City Council Mayor
Alex Fisch alex.fisch@culvercity.org
Vice Mayor Daniel Lee daniel.lee@culvercity.org
Council Member Goran Eriksson goran.eriksson@culvercity.org
Council Member Yasmine-Imani McMorrin yasmine-imani.mcmorrin@culvercity.org
Council Member Albert Vera albert.vera@culvercity.org

Re: Cone Fee Trust And Vickers Group's Objections To Reintroduction of and ordinance approving zoning code ordinance code amendment P2021-0036-ZCA, amending Culver City municipal code Title 17: Zoning code, section 17.610.010.D - nonconforming oil use to terminate nonconforming oil and gas uses by 11/24/2026 and (2) direction to the subcommittee and City Staff as deemed appropriate

Dear Mayor, Vice Mayor and Council Members,

On behalf of the Cone Fee Trust, an owner within the Inglewood Oil Field (IOF) and stakeholder in these proceedings, CFT provides preliminary comments as follows. Attorney Charles Moore representing the Vickers Group, the major landowner in the Culver City portion of the Inglewood Oil Field, joins in the comments expressed herein.

For transparency's sake, the City Council for the City of Culver City should report to their residence and taxpayers all funds spent in the last decade plus years in the City's relentless efforts to close the oil field. The City Council must also advise the same group of the related extensive cost of future litigation going forward should the City Council choose to proceed with this erroneous proposed zoning and inherently flawed "Amortization Study" as a pretext for the unlawful taking of private property.

Further, the proposed zoning is squarely at odds with myriad facts and principles:

- The total ban on the future use of the existing 100-year-old oil field without adequate compensation is an improper taking of the landowners' property interests.

- This proposed action is not a question of banning or regulating future oil and gas activities in the City. This local regulation is about the uncompensated taking of the existing oil production activities.

- The threatened City action to compel termination of the oil field in five years is a conclusory announcement untethered to law or fact. No owner consents to such activity. No owner subscribes to the wholly flawed and socialist "amortization" rubric. The existing use is established under law and not subject to government seizure through these surreptitious means.

- If adopted, the City will be immediately challenged in Court in order to derive adequate compensation for the proposed taking.

Additionally, the City relies on a purported general exception in state law with no real application to the landowners or the energy or future uses of the property. Amortization is not a mere accounting principal simply borrowed to replace the land use principles of zoning. Amortization does not end the discussion of the landowners' interest or the true cost of eliminating this single source of energy or uses of future private property.

The City and its out of town consultant ignore future uses and any analysis of future uses. Therefore, the City did only half a study, at best, and the study, as it is, presents zero basis for any action by the City now or hereafter that attempts to restrict or take private property.

If any councilperson is in favor of transparency, accountability, fiscal responsibility, and the interests of all of its citizens, the Amortization Study and any action thereon should be recommended to be rejected and abandoned and the limited resources utilized for essential services for the citizens.

Should you wish to discuss, please feel free to contact me.

Very truly yours,

Patrick C. McGarrigle of
MCGARRIGLE, KENNEY & ZAMPIELLO, APC
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