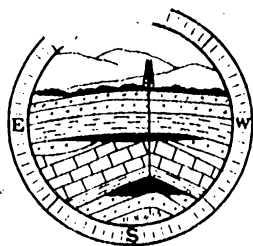


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FIELD *TRIP* ROUTES

**OIL FIELDS  
GEOLOGY**



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**JOINT ANNUAL MEETING  
LOS ANGELES, CALIFORNIA  
MARCH, 1952**

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# PLACERITA OIL FIELD

By

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## ACKNOWLEDGMENT

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## LOCATION AND HISTORY

The Placerita oil field is situated in Township 4 N., Range 15 W., S.B.B. & M., about two miles northeast of Newhall, in Los Angeles County, California. It is the most important of a series of fields extending around the west end of the San Gabriel Mountains, the first of which was discovered in 1889. The Placerita Canyon area was discovered in the Equity Oil Company "Daisy" No. 1 in 1920<sup>1</sup>, but because of the heavy oil only four producers were drilled before re-discovery in the Nelson-Phillips Oil Company "Kraft" No. 1, completed on April 20, 1948, flowing 70 barrels per day of 16.4° gravity oil from a sand between 585 and 718 feet.

Development of the southern or low-gravity part of the field followed on an average 2-acre spacing until the Somavia and Yant "Juanita" No. 1 came in as an outpost well in February, 1949, and opened the northern or higher-gravity area producing 340 barrels per day of 22.8° gravity oil from 100 feet of sand below 1737 feet.

The practice of unrestricted production in this area, with initials as high as 3120 barrels per day, combined with a ruling in the California Superior Court which declared the State Spacing Act unconstitutional and opened 80 acres of highly subdivided land for indiscriminate development, caused the most sensational townlot boom the oil industry has known since the early 1920's. Approximately 140 wells were drilled on about 60 acres and the production reached a peak of 28,950 barrels per day, or 522 barrels per day per well, during September, 1949. The effect of this on initial production rates and decline in individual wells is shown on the chart illustrating development and production of the

higher gravity town lot pool.

During the past year Tevis F. Morrow purchased and consolidated the three largest undeveloped holdings and drilled 46 wells, mostly in the heavy gravity area. This completed the development of the field except for a few undrilled locations of fee land held by major companies.

To the end of November, 1951, the higher-gravity northern pool had produced 11,611, 670 barrels. During that month it produced 178,128 barrels from 182 wells, with 25 wells shut in.

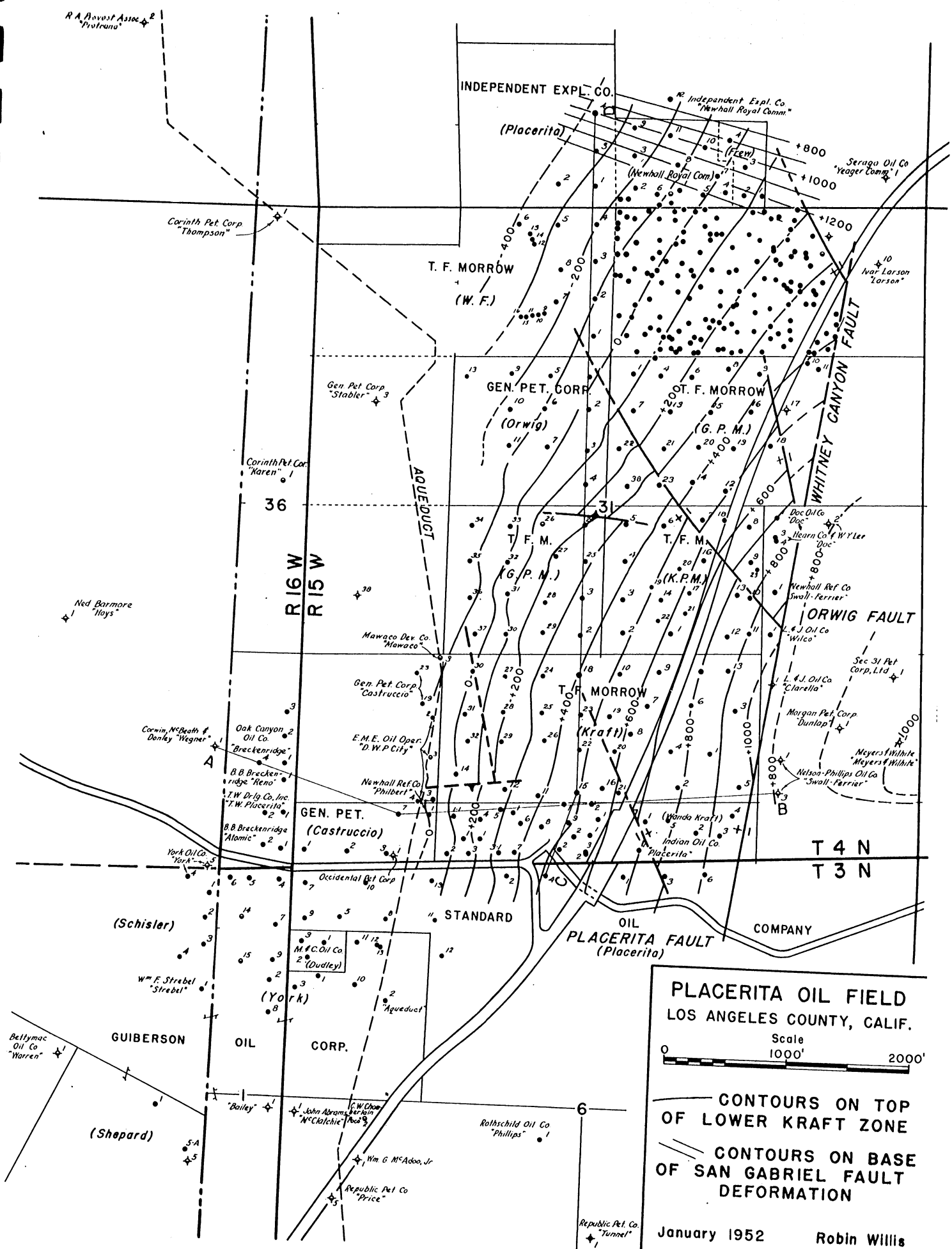
The lower-gravity area had produced 2,973, 313 barrels up to the end of November, 1951, and yielded 145, 659 barrels during that month from 168 wells, with three shut in.

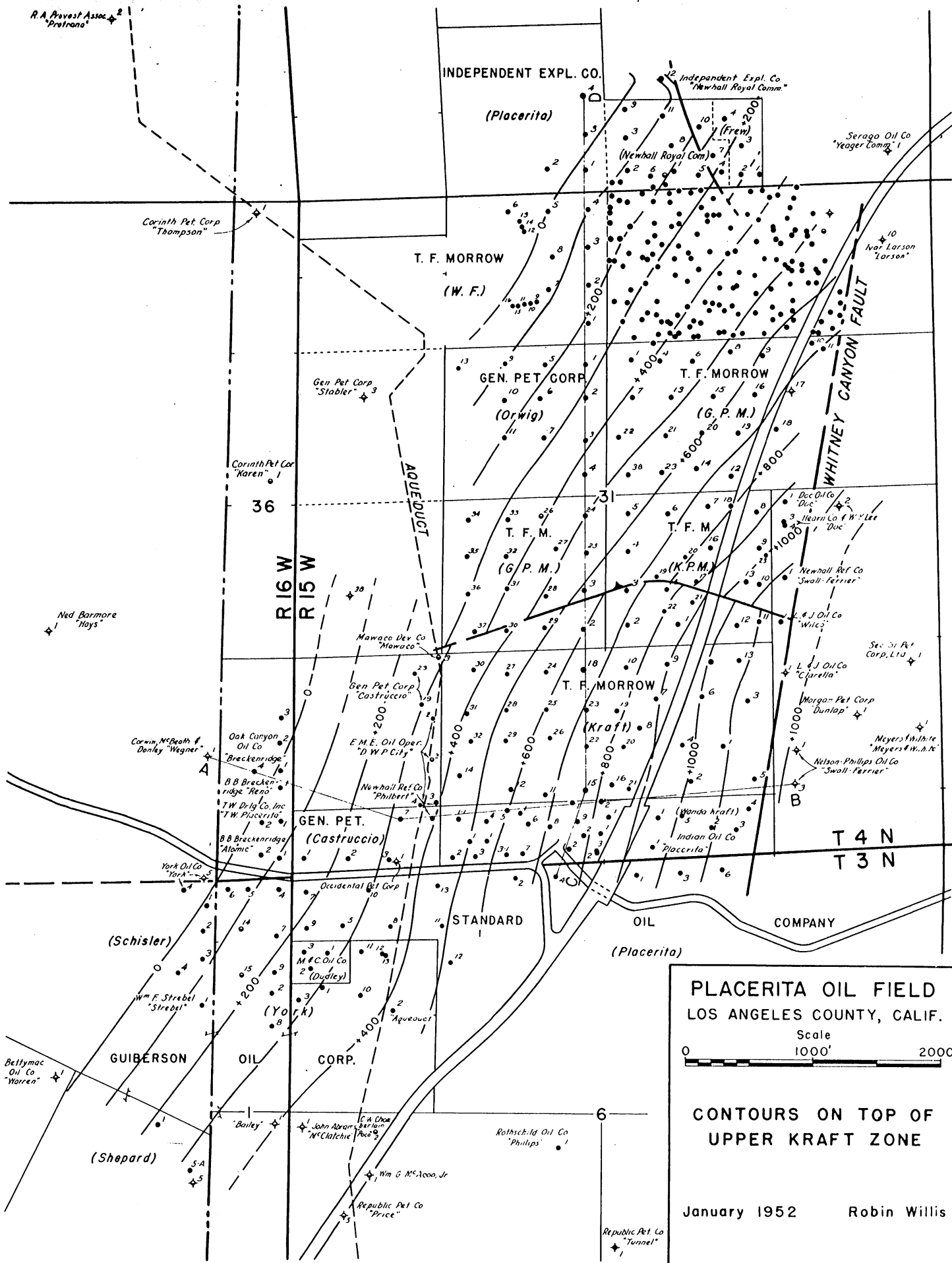
## STRATIGRAPHY

The surface formations of the Placerita area have been ably described by Oakshott<sup>2</sup>. In the subsurface, the following divisions have been recognized. The correlations are the writer's, based on paleontological information furnished by Messrs. Holman and Jones, and subsurface and surface tracing of the beds.

STRATIGRAPHIC TABLE

		THICKNESS IN FEET	FIELD NAME
Pleistocene:	Continental	1800	
Saugus formation	sands, gravel and thin shales	plus	
	..... unconformity .....		
(	Sunshine Ranch	220	Upper Kraft
(	member (?)		shale
(	Upper Pico	150-)	
Pliocene: (	conglomerate	250 )	Upper Kraft
Pico for- (..... unconformity .....	(		zone
mation (	(Upper sand and	50-)	
(	conglomerate	200 )	
(Repetto	(Shale	10-100 )	Lower Kraft
( equivalent (	(Basal member,	300-	shale
(	( sand and silt		Lower Kraft
	..... unconformity .....		zone
Miocene:	Interfingering	1500	
Modelo formation	marine and continental beds	plus	
	.....unconformity?.....		
Eocene:	Shale, hard	2000	
Las Lajas for- mation (?)	sand and conglomerate	plus	
	..... unconformity .....		
Pre-Eocene:			
Basement complex			

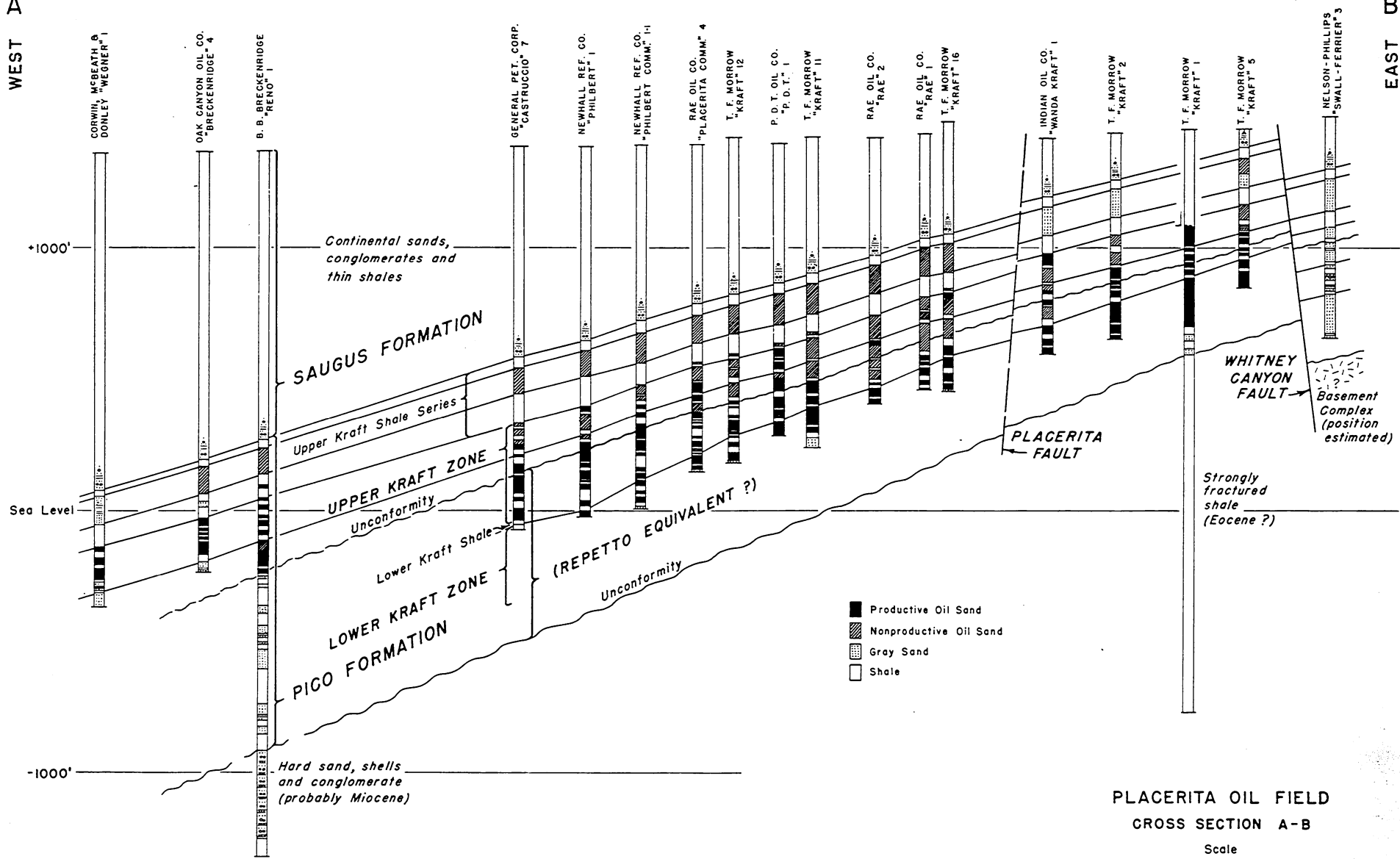




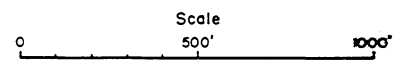
WEST A

EAST B

35



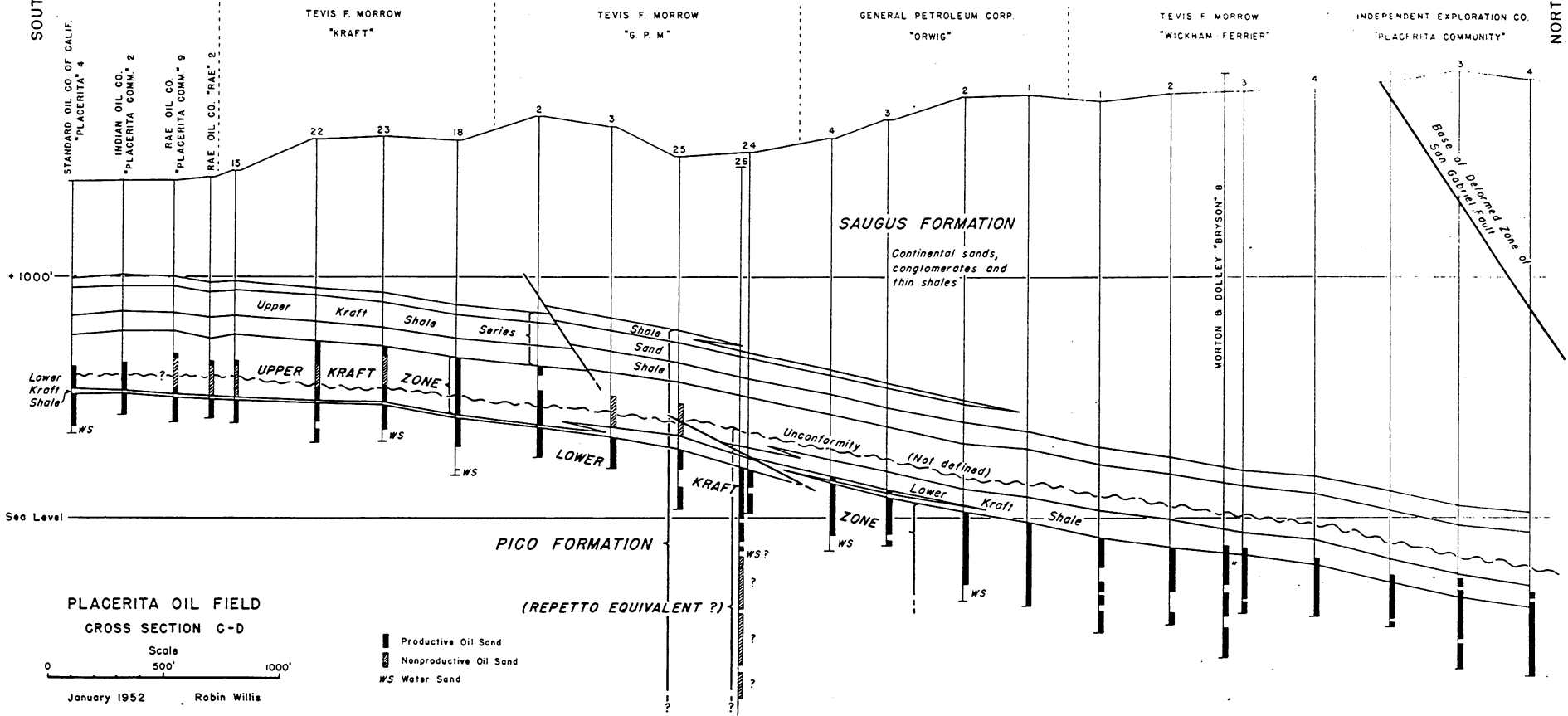
PLACERITA OIL FIELD  
CROSS SECTION A-B



January 1952 Robin Willis

SOUTH C

NORTH D

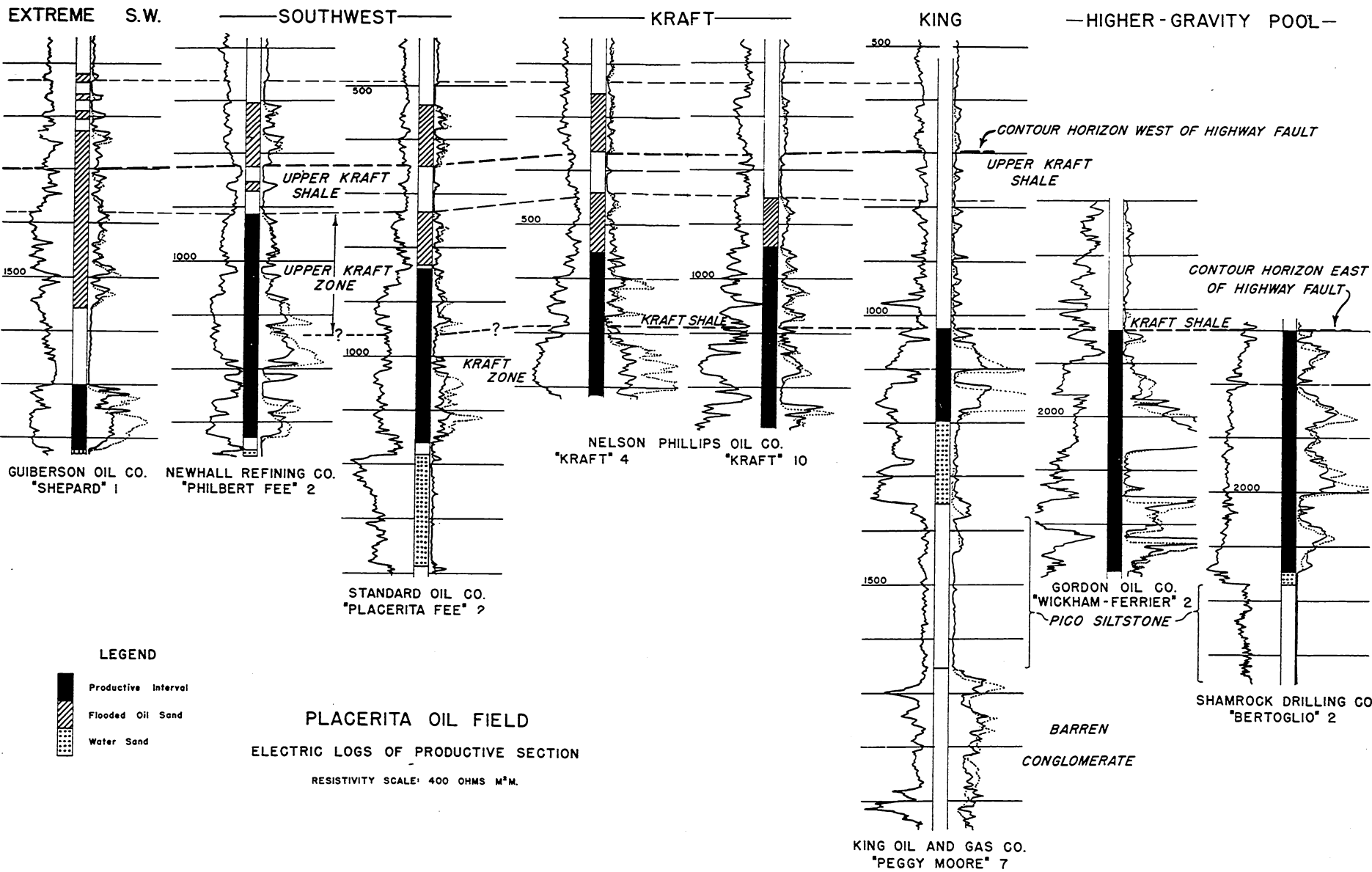


PLAGERITA OIL FIELD  
CROSS SECTION C-D

Scale  
500' 1000'

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- Productive Oil Sand
- ▨ Nonproductive Oil Sand
- WS Water Sand



## BASEMENT COMPLEX.

The basement of pre-Cretaceous metamorphics and intrusives is found directly under the Pliocene in all wells drilled through the latter east of the Whitney Canyon fault. It has not been reached west of the fault near the Placerita field.

## EOCENE.

Intensely crushed greenish-blue clay shale was encountered in Nelson-Phillips "Kraft" No. 1 at 820 feet, and the well was still in this formation at 2200 feet. Holman classifies this shale as Eocene, tentatively of the Las Lajas formation. The Rothschild Oil Co. "Phillips" No. 2 drilled over 2000 feet of Eocene sediments including some hard sands and conglomerates, all barren. Both of these wells are just west of the Whitney Canyon fault and indicate the large pre-Pliocene displacement on it.

## MIOCENE.

Northeast of the San Gabriel fault the true pink and green bentonitic lake-bed shales, sands and conglomerates of the Mint Canyon formation are exposed. South of this fault Miocene beds of similar character have been encountered in many wells, and referred to as "Mint Canyon." Recent drilling has shown these to be interfingered with marine shale carrying an upper Miocene fauna, and they appear to be merely the continental equivalent of the Modelo formation at the end of the Ventura basin. These beds have produced commercially in the Tunnel area two miles south of Placerita. They have probably been encountered in wells in the western part of the Placerita field, but are not commercially productive there.

## PLIOCENE: PICO FORMATION.

**BASAL MEMBER.** This is a series of sands and silts, with some conglomerates, varying from 200 to 1000 feet thick. The upper part constitutes the Lower Kraft oil zone.

This member carries a Pico fauna (Holman, personal communication) but is thought, on the basis of continuity and position directly above the unconformity at the base of the Pliocene, to correlate with the basal Repetto conglomerate of the Weldon Canyon area.

**LOWER KRAFT SHALE.** This persistent shale or siltstone is only 10 feet thick in the southeast part of the field. It thickens northward at the expense of the beds above it to 100 feet. It also thickens southward, and the writer correlates it with the 300 feet of shale in the Tunnel area which carries a Repetto fauna (Jones, personal communication) and can be traced into the Repetto shale to the northwest.

In the northern part of the field this shale marks the top of the productive section.

**UPPER REPETTO SAND AND CONGLOMERATE.** The upper part of the Repetto shale on the outcrop in the Elsmere area grades northward into sand and conglomerate, below the middle Pliocene unconformity. In the field these beds form the lower part of the Upper Kraft zone.

**UPPER PICO CONGLOMERATE.** On the outcrop south of the field this conglomerate is easily recognized. It is highly ferruginous and forms prominent cliffs. It overlaps the older Pliocene beds eastward to the basement complex, as shown on the Geologic Map of the Elsmere Canyon Area. In the field it forms the upper part of the Upper Kraft zone. The unconformity cannot be traced in logs but it is indicated by the difference in structure above and below it as may be noted from the contour maps of the Upper and Lower Kraft Zones.

**UPPER KRAFT SHALE SERIES.** This series consists of an upper and lower shale with about 100 feet of sand and conglomerate between. The lower shale can be traced throughout the field, but grades southward into sand. The upper thins northward and is not present in the northern part. The intermediate sand shows oil saturation in the southern area, but is not commercially productive. This unit appears to correlate with the beds tentatively designated as Sunshine Ranch by Oakeshott.

## PLEISTOCENE: SAUGUS FORMATION

Overlying the Upper Kraft shale are the continental beds of the Saugus formation. These are barren throughout the field. Regionally they are unconformable with the Pliocene but there is no angular discordance in the field.

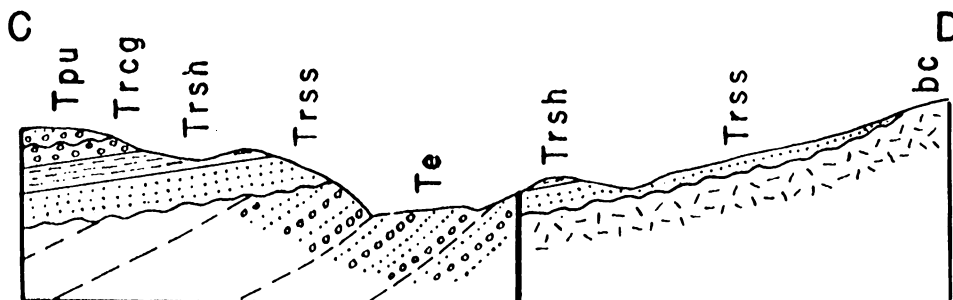
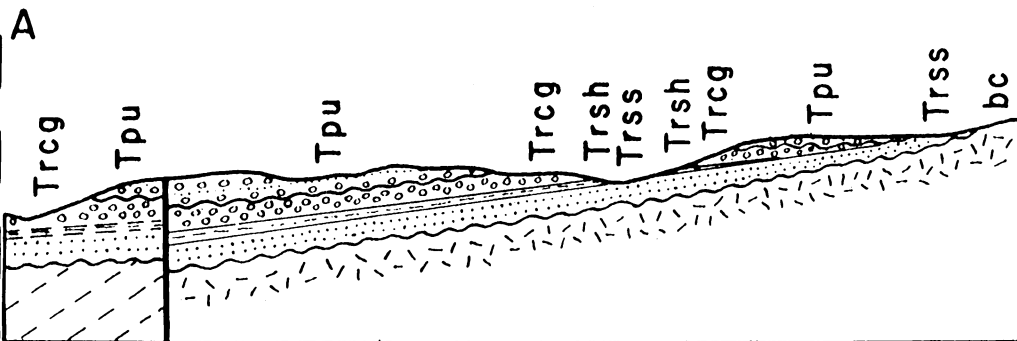
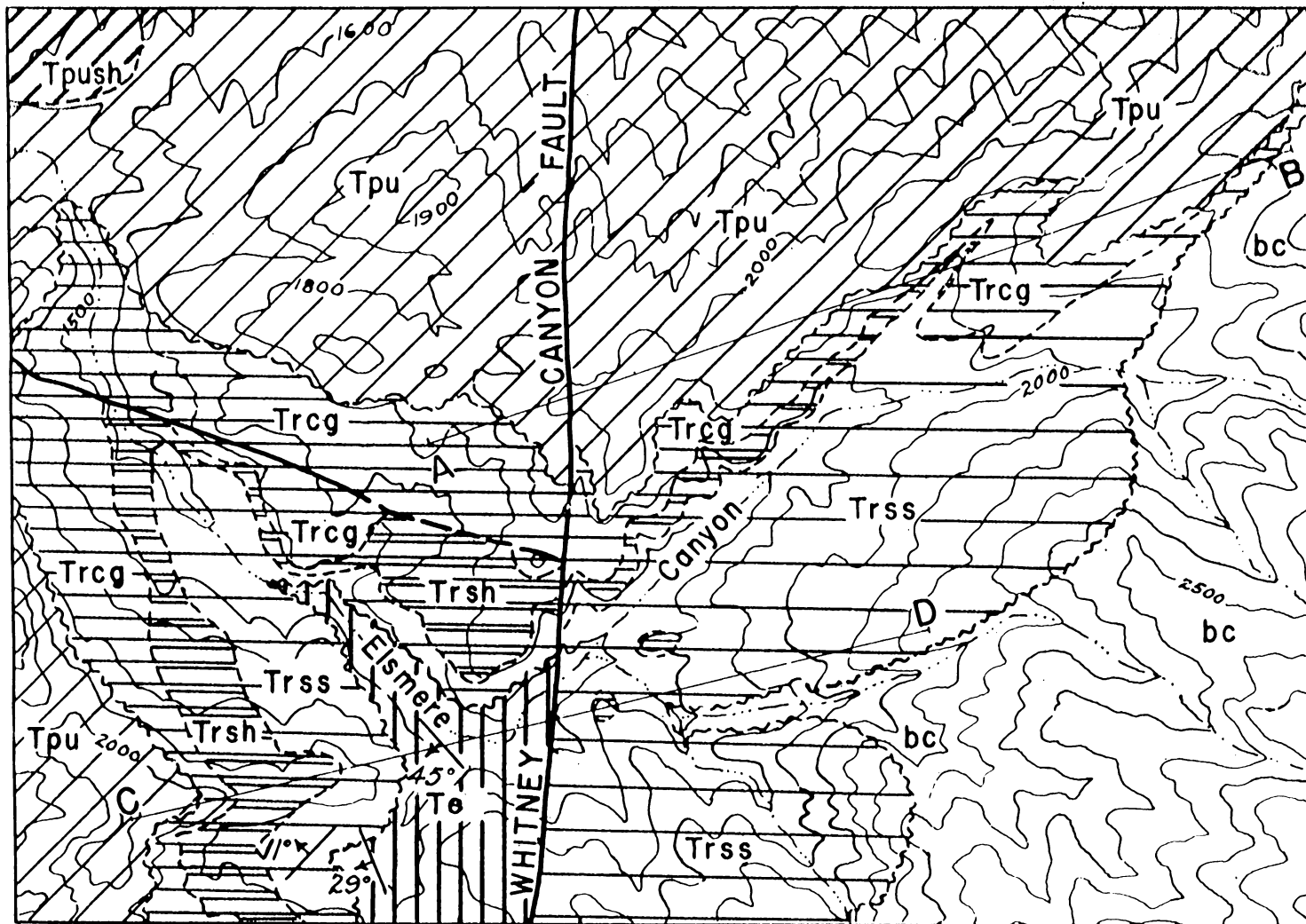
The stratigraphic relationships of the Placerita field are duplicated and exposed in Elsmere Canyon east of the hills which comprise the old Elsmere productive area about two miles south of the Placerita field and are illustrated on the Geologic map of the Elsmere Canyon Area.

## PRODUCING ZONES

### LOWER KRAFT ZONE.

This zone lies at the top of the basal member of the Pliocene. It is barren in the southwest part of the field. It thickens eastward to 200 feet along the eastern margin, and northward to 480 feet at the west side of the northern townlot area. In the center of the field the T. F. Morrow "G.P.M." No. 26 apparently logged 950 feet of oil-saturated section, though the lower part did not produce, and there are intermediate waters in this area. The differences in thickness of saturation appear to be related both to lenticularity and to minor faults and flexures. The details are obscure.





Elsmere Canyon Area, Section 7, Township 3-N., Range 15-W., S.B.B.&M., Los Angeles County, California. Surface Geology illustrating formations and structure of Placerita Oil Field.

The basal Repetto is oil-saturated. The Pico conglomerate is locally oil saturated. There are live seeps along both faults and at the base of the Repetto. Note overlap of Upper Pico and absence of Eocene east of Whitney Canyon fault.

<b>PLIOCENE:</b>		
Tpush	Upper Pico Shale	Upper Kraft Shale
Tpu	Upper Pico Conglomerate	Upper Kraft Zone
Trcg	Upper Repetto Conglomerate	
Trsh	Repetto Shale	Lower Kraft Shale
Trss	Basal Repetto Sandstone	Lower Kraft Zone

**EOCENE:**  
Te Las Lajas formation

**PRE-EOCENE:**  
bc Basement Complex



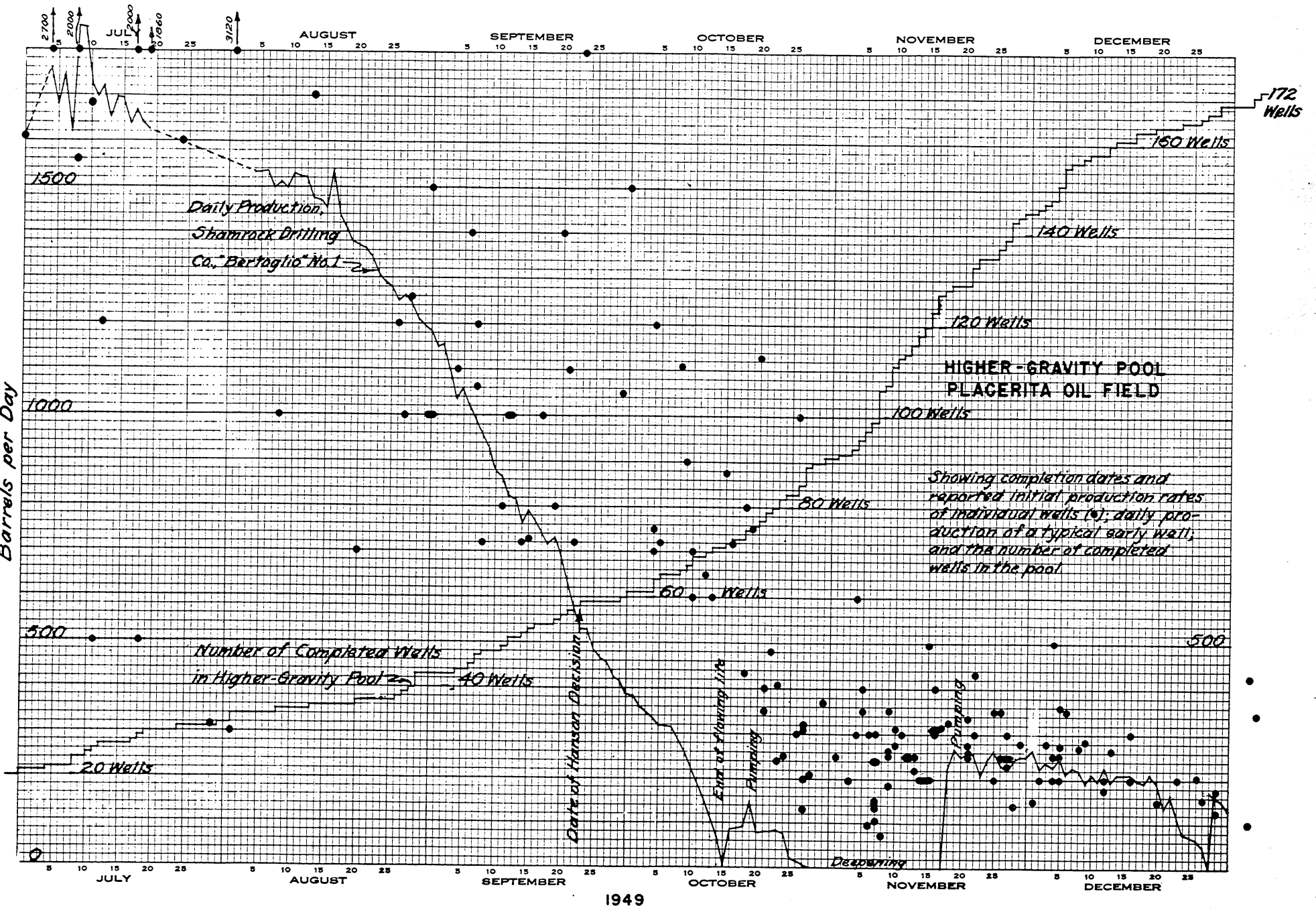


Chart illustrating early development and production of the higher-gravity town lot pool of the Placerita oil field.

This zone yields 20° to 25° oil northeast of the Orwig fault, 16° oil east of the Placerita fault, and 12° oil elsewhere.

#### UPPER KRAFT ZONE.

This zone produces only in the southern part of the field. Accumulation appears to be governed more by lenticularity than by faulting. To the east only the lower half is productive. Westward it extends progressively upward until the entire zone is good. At the west edge of the field it is terminated by a definite bottom-water interface. The zone yields oil of 10° to 12° gravity.

#### STRUCTURE

The Placerita field is a monoclinical accumulation controlled on the north and east by faults. The southern limits of the field do not appear to be closed but the productive sands appear to pass into an area where fresh water, either from the outcrop or from old wells in the Whitney Canyon and Elsmere Canyon areas, has flooded them and rendered it impossible to produce the highly viscous low-gravity oil. It may be that this viscosity has retained the gas pressure, beyond the area penetrated by fresh water, and prevented depletion of the low-gravity portion of the field. The high-gravity area in the northern part of the field is separated from the rest of the field by the northwest trending normal Orwig fault. It is an isolated reservoir without an effective water drive.

#### FAULTS.

The largest fault in the area is the San Gabriel fault which bounds the field on the northeast. This is a major shear which divides two geologic provinces of different history and stratigraphy, and it probably has a very large displacement, possibly measured in

miles. It dips to the north in this locality and several wells have been drilled northeast of its outcrop and passed through the fault to find production below.

The Whitney Canyon fault bounds the field on the east. As noted, this fault had a large pre-Pliocene displacement, down on the west. The post-Pliocene displacement varies from 20 to 150 feet and is down on the east.

The Orwig fault trends northwest through the center of the field and, as already indicated, forms a gravity barrier between the lighter oil area to the north and the heavy oil area to the south. It is a normal fault and the displacement is so slight and the beds involved so lenticular that it can be recognized in only one or two wells.

There are other minor faults in the field, of which two reverse and two normal faults are shown on the contour maps. The former have no economic significance. The Placerita fault forms a local barrier between 16° gravity oil on the east and heavier oil on the west.

There appear also to be sharp monoclinical flexures in the lower Pliocene. Three of these are shown on the contour map of the lower Kraft zone. Though they might be interpreted as faults, the logs of wells near them show no duplication or cutout but merely a local thickening of the beds below the middle Pico unconformity, reflecting a deformation which took place in this interval. Some of the minor faults are also probably confined to the lower Pliocene beds.

#### REFERENCES

1. Report of Calif. State Oil and Gas Supervisor, Vol. 20, No. 2, p 48, 1934.
2. Oakshott, Gordon B. Geology of the Placerita Oil Field, Los Angeles County, California. Calif. Jour. of Mines and Geology, Vol. 46 No. 1, pp 50-63, 1950.

### PLACERITA TO PIRU

#### ROAD LOG

By

EDWARD L. WINTERER  
*U. S. Geological Survey*

#### Mileage

- |      |  |       |  |
|------|--|-------|--|
| 32.6 | Intersection, U.S. Highway 6 and Placerita Canyon Rd. Turn left down Placerita Canyon Rd. About 1-1/2 miles upstream gold was first discovered in California in 1842. A few miles farther upstream a small amount of oil is produced from fractured metamorphic rocks. | 36.2  | Intersection (three-way). Turn right on Tenth Street.  |
| 32.9 | Hills on either side of the valley are developed on the Saugus formation, with a capping of late Quaternary terrace deposits.  | 36.4. | Fork in road. Bear to the right and continue on Lyons Ave. Early in 1949 town-lot drilling activity was begun in the area immediately south (left) of the road, but tight sands and water problems halted activity.  |
| 36.0 | Intersection, Placerita Canyon Rd. and San Fernando Rd. Turn left.   | 36.7  | At 11 o'clock, in the distance, are the Santa Susana Mountains, the higher, grass-covered portions of which are developed on upper Miocene shale (Modolo formation). The shale is overlain by 1500-4000 feet of con- |