

## Petroleum Developments in South America, Central America, and Caribbean Area in 1971<sup>1</sup>

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**Abstract** This review presents information on 1971 petroleum developments in 27 countries and areas. Ten countries had petroleum production; this totaled 1,689,090,000 bbl (4,627,648 b/d), a decrease of 2.8% from the previous year. The volume decline came mainly in Venezuela, the major producer of the region (76.7% of the total), where production was down 4.3% to 3,549,000 b/d. Production increased moderately in Argentina, Chile, and Brazil, and Bolivia's temporarily disrupted operations made a strong recovery; but downward trends in Peru and Trinidad continued, and Colombia's production was off slightly from a record 1970 level.

Total drilling decreased to 1,887 wells, 91 less than in 1970; but the number of exploration wells was 410, up by 20. Exploration drilling was carried out in 18 countries, but no new countries came into commercial production. Party-months of geologic and geophysical field work were: surface geology, 212 (329 in 1970); seismograph, 671 (659); gravity, 53 (51); and magnetometer, 5.0 (12.6).

Successful exploration drilling continued in eastern Ecuador and in eastern offshore Trinidad; heavy development drilling was done in several of the discovery areas; and first export production from the new major fields will come in 1972. The high level of 1970 exploration drilling effort on the Brazil continental shelf was maintained through 1971. Additional offshore drilling in Argentina and off the east coast of Nicaragua was disappointing; and results of first tests in the northern offshore Trinidad permits, and on the outer shelf of Guyana and of Surinam, have been only moderately encouraging.

The major acreage development of 1971 was the signing of the first service contracts in Peru, followed by several more in early 1972. A further highlight was formal award of the south-central Lake Maracaibo contract areas. Private companies did not acquire significant amounts of new exploration acreage elsewhere in South America during the year.

### INTRODUCTION (Tables 1-4)

Petroleum production in 1971 from 10 countries in the review area was 1,689,090,000 bbl, a decrease of 2.8% from the previous year (Table 1). Venezuela continued to be by far the largest producer (76.7%), though production declined 4.3% from the record 1970 level, to 3,549,000 b/d. Production increased 7.7% in Argentina (Table 2), 3.8% in Brazil, and 3.6% in Chile; Bolivia's production was back to near-normal after a year of disrupted operations; and Ecuador's was up slightly, due entirely to on-site use in development work at the major new fields in the Oriente

which will be going on stream in 1972. Production declined moderately in Colombia, Peru, and Trinidad. A marked increase is to be expected for Trinidad in 1972, however, as promising new fields off the east coast come on production.

The total of wells drilled was 1,887, down 91 from the previous year (Table 4). This was principally due to decreased development effort in Venezuela, which in recent years has typically accounted for about 1/3 of the development wells in South America. Development wells in Trinidad were up significantly, however, to 185 compared with 114 in 1970. The number of exploration wells increased slightly; marked increases in Argentina and Trinidad were largely offset by fewer wells elsewhere, particularly in Bolivia, Brazil, and Peru. No countries were added to the existing ranks of oil-producing nations.

Exploration or acreage activity is reported from 27 countries or areas in Latin America and the Caribbean. There were no petroleum developments in French Guiana, the Netherlands Antilles, or El Salvador.

Party-months of geologic and geophysical field activity are shown in Table 3. Overall, this work was down about 13% from 1970. The large efforts of the state oil companies in Argentina and Brazil continue to dominate these statistics; but work in Colombia (principally in the Llanos area, east of the Andes) and in eastern Ecuador was up substantially in 1971. Eastern Peru will undoubtedly be in the limelight for 1972, with an estimated 14 seismic crews to be in the field by mid-year, and over 20 crews projected by year end.

Further exploration drilling successes in eastern Ecuador and off the east coast of Trinidad were highlights of 1971 developments in Latin America and the Caribbean. Development drilling was completed or well advanced for several of the evidently major fields in these emerging new producing provinces. First drilling (5 wells)

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on the northern offshore Trinidad permits, and 2 outer-shelf wells off Guyana and off Surinam, was only moderately encouraging. Initial tests in the current strong exploration play in the Colombian llanos, and in the south-central Lake Maracaibo contract blocks, resulted in dry holes. Additional exploratory drilling off the east coast of Nicaragua was discouraging; 15 tests have been drilled in this area since 1968, none successful. Results in the Argentine offshore were likewise disappointing. Seven wildcats and 2 attempted extension wells drilled in 1971 (all in the Gulf of San Jorge) were dry, for a total of 32 unsuccessful tests in the Salado, Colorado, and San Jorge basins since 1968; and virtually all of the extensive concession holdings now have been released.

The most ambitious offshore exploration effort in the review area continues to be that in Brazil. Five jack-up rigs were active through the year, and two drill-ships were to go into service by early 1972. Twenty-eight wildcats (plus 8 extension wells) were drilled in 1971, for a total of 55 wildcats (and 27 extensions) since 1968. Two fields, both in the Sergipe basin, are under development.

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owned by Sun Oil, started a seismic survey of its concession during 1971.

**GUATEMALA (Fig. 18; Tables 41-42)**

By R. A. DORSEY, JR., Esso Exploration Inc., Coral Gables, Florida

Petroleum activities continued at a modest pace in 1971. In the southern Petén region, Monsanto Co., through its local subsidiary Monoil Guatemala Inc., did 4 party-months of surface geologic work, shot 30 mi of CDP seismic, and drilled 2 coreholes to unspecified depths (Table 41). Monoil continues as the official Petroleum Contractor for part of the Rights in the general Petén area nominally held by Rudy Weissenberg Martínez. Recursos del Norte Limitad (Basic Resources International Ltd.) is also a partner in this arrangement, and is acting alone as Petroleum Contractor for other Weissenberg Martínez acreage (Table 42).

On the east-central coast, Compañía Centram, S.A., with Westcoast Petroleum Ltd. of Calgary as the operator, shot 180 mi of marine seismic. Centram is a joint enterprise of the International Nickel and Hanna Mining Co.

Esso shot 330 mi of marine seismograph on the Pacific shelf. This company plans to drill a well in early 1972. Esso renounced 65,465 ha. of Right 71 and was granted Right 101 covering 82,231 ha. in the Pacific offshore. This company held 277,772 ha. offshore at the end of 1971.

Texaco-Mobil held 352,285 ha. on the Pacific shelf and had an additional 151,378 ha. under application at year end.

The government announced plans for new procedures under the Petroleum Code in respect to National Reserves. Although not yet final, the new procedures will call for service contracts with government participation. National Reserves totaled approximately 4,600,000 ha. at year end.

**GUYANA (Fig. 19; Table 43)**

By SOBHARAM SINGH, Director of Geological Surveys and Mines, Georgetown

Compared with the previous year, there was much more activity on the oil scene during 1971.

A consortium comprised by Guyana Shell and Continental-Tenneco associated with Texas Pacific Oil Co., Ada Oil Co., Seagrams Ltd., and Deminex drilled a well on the continental shelf at a point near the boundary of their concessions. The well, which was spudded as Berbice-1 on May 25, was abandoned at the end of August. The well was stopped at a depth of 12,500 ft with

one sidetrack at 5,090 ft. Shows of hydrocarbons were encountered at various levels, but no good reservoirs were found.

At year end Continental-Tenneco relinquished their oil prospecting license over the 1,000-sq mi block of the continental shelf which they held, and one of their partners indicated interest in the block. By year end Guyana Shell had completed a further seismic program of 1,300 mi within their concession.

During the year, OXOCO carried out 225 mi of seismic work in their concession. Also, COMORO carried out 200 mi of seismic work in their westernmost concession.

At year end, an aeromagnetic survey of 35,000 sq mi of the country was commenced by Terra Surveys Ltd. under contract. Priority was given to the Takutu sedimentary basin in the south.

**HAITI**

By PETROCONSULTANTS S. A., Geneva, Switzerland

Early in 1972, Wendell Phillips was granted petroleum rights comprising 86,350 sq km covering 6 land areas, islands, the continental shelf, and territorial waters. The concession can be valid for up to 35 years, but must be surrendered after 10 years in the event that no production is established. Wendell Phillips must spend a minimum of \$2.5 million in the first 5 years, and \$6 million in the next two 5-year periods, with the provision that the government would be paid an unspecified royalty in case of production.

No exploratory drilling or other exploration activities have been reported from the country since 1959 when Commonwealth Oil abandoned Cul de Sac-1.

**HONDURAS (Fig. 20; Tables 44-45)**

By D. D. SCHOENEWALD, Mobil Technical Services Inc., Dallas, Texas

During 1971 the Colombia Oil Company drilled Berta-1, to 7,430 ft on Signal/Occidental acreage.

Geophysical activity for the year is shown in Table 44.

Concession status changes during the year were as follows: Signal relinquished 1 block of 1,040 sq km; Shell acquired a concession of 4,160 sq km south and east of the Bahia Islands; Mobil acquired 3 blocks constituting 2,100 sq km south and east of the Bahia Islands; Mobil acquired all of Kewanee's concession interests in 5,878 sq km; Colombia Oil Company acquired an interest in the Signal/Occidental holdings; and Petroleos Hondureños was granted a 1,566-sq km concession onshore.

covering the 2,850,000-acre concession granted to it in October 1969. The concession lies just south of the Pennzoil-Victory concession and is bounded by the common borders with Argentina and Bolivia, lat. 22°N and long. 61°W. Petrolera General S.A. is a wholly owned subsidiary of Phoenix Canada Oil Company and Talent Oil & Gas Company, both of Canada. Galaxy International Oil Management Ltd., of Nassau, and C & K Petroleum Inc., of Houston, are minority financial partners (less than 10%) in this exploration venture.

PERÚ (Fig. 25; Tables 52-56)

By PERCY ROSAS V., Peruvian Gulf Oil Company, Lima

#### Concessions and Contracts

Concession holdings did not change significantly during 1971. Law 17440 cancelled the old concession system and opened the way for the signing of Exploration-Production contracts between Petróleos del Perú (the Government entity) and private oil companies. Tenneco-Union signed a contract for exploration and exploitation of 413,995 ha. in the offshore area near the Ecuadorian border (Fig. 25). Three other contracts were signed for areas in the northern Oriente: Occidental Petroleum (1,166,716 ha.), Union-Tenneco (1,003,120 ha.), and British Petroleum (1,000,027 ha.). At the end of the year, several other companies were negotiating for blocks in this region.

#### Surface Exploration

A total of 93.5 party-months of surface geology, seismograph, gravimeter, and magnetometer work was carried out during the year (Table 53). This was an increase of 311% from the preceding year.

#### Drilling

Twenty-four exploratory tests were drilled in 1971. All except one were drilled in northwest Perú and where located both on land and in the offshore area. Result of this drilling is summarized in Table 54. The 1 exploratory test drilled outside the northwest area was the Petroperu wildcat, Corrientes X-1, in the northern Oriente. This important wildcat was completed as a new-field discovery that will encourage further exploration in this region.

All development drilling was in the northwest coastal zone and offshore area; a total of 110 wells was drilled and results are summarized in Table 55.

#### Production

Total crude oil production in 1971 was

22,588,950 bbl (61,887 b/d)—a decrease of 14% from the 1970 production of 26,269,311 bbl (71,970 b/d). Gas production also declined, from 66,847,354 cu ft in 1970 to 60,944,819 cu ft in 1971.

#### General

As a result of the Exploration-Production contracts signed, it appears that oil exploration will be at a high level during the coming year.

PUERTO RICO (Fig. 26)

By O. D. WEAVER, Weaver Oil and Gas Corporation, Houston, Texas

Four exclusive Oil and Gas Prospecting Permits were in effect at the end of 1971 in, and adjoining, Puerto Rico. Figure 26 shows the approximate outline of the areas covered by these permits.

In early 1971, Ashland Oil conducted 189 line-mi of marine seismic off the south coast of Puerto Rico, on lands held at that time under option from Puerto Rican Petroleum Exploration Company. As a result of the seismic work, Ashland dropped its option on the acreage. On July 14, 1971, the permit area reverted to Puerto Rican Exploration.

Weaver and Associates conducted geologic studies of the Lares Reef complex south of Arecibo on the north-central coastal area. The Weaver Group is composed of Weaver Oil and Gas Corporation, Theo Law and Lloyd H. Smith of Houston, and American Ultramar of New York. The site of a gas blowout near Quebradillas on the north shore was investigated by Weaver geologists and found to be associated with an east-west fault trend.

Weaver relinquished approximately 175,000 acres on the southwest edge of its exclusive permit area and now holds an area of approximately 900,000 acres. A marine seismic program is planned early in 1973.

Sun Oil Company ran 100 mi of marine Vibroseis, centered east and southwest of the Island of Vieques, and appraised magnetic surveys conducted in 1970. Sun has renewed its exploration permit for 1972.

Oceanic Exploration Company was granted a permit on September 28, 1971, totaling 1,559,000 acres. The area is located principally offshore southwest of the main island.

SURINAM (Table 57)

Information furnished by M. TENARLE, ELF, Paris, France

ELF Petroleum Surinam, operator of offshore

acreage held jointly with Shell, drilled the exploration well Galibi Offshore No. 1 on the outer shelf. The concession area, unchanged from last year, is shown in the Review of 1970 (Neff, 1971, Fig. 16).

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Neff, C. H., 1971, Review of 1970 petroleum developments in South America, Central America, and Caribbean area: *Am. Assoc. Petroleum Geologists Bull.*, v. 55, no. 9, p. 1418-1482.

#### TRINIDAD AND TOBAGO (Figs. 27-28; Tables 58-63)

By O. O. FERNANDES, Ministry of Petroleum and Mines, Port-of-Spain

At the end of 1971, Trinidad and Tobago had produced 7% less crude oil than in the previous year. This decline in production which started in 1968 is expected to be reversed in 1972 when large new fields off the east coast will be brought on production.

A record level of drilling activity was achieved and, although the results of development and appraisal drilling in established producing areas were generally poor, exploratory drilling off the east coast discovered substantial reserves of oil and gas.

In the refining sector of the industry, refinery throughput dropped 6% to 145.5 million bbl.

Table 59 summarizes and compares statistics of the petroleum industry in Trinidad and Tobago for the past 3 years. Highlights of the industry during 1971 include the following.

1. The first exploratory well in the north coast marine area of Trinidad and Tobago, KK6-1, was drilled by the Deminex-Agip consortium.

2. Construction of the \$80-million (U.S.) desulphurization plant at Texaco's Pointe-a-Pierre refinery was initiated in February.

3. Technical and economic studies were made on the feasibility of exporting liquefied natural gas.

4. The Government of Trinidad and Tobago entered a joint-venture agreement with Delta Exploration Company Inc. of Houston, Texas, for the purpose of carrying out a seismic survey in the Gulf of Paria and off the East Coast of Trinidad.

5. A government committee held discussions with oil company officials on the determination of reference prices for tax and royalty purposes, the revision of refinery processing fees, and other forms of government oil revenue.

6. A government-appointed committee examined and reported on the problems of the pollution of rivers, inland and coastal waters, and agricultural lands, by oil and other industrial effluents.

7. A consortium comprising Shell Trinidad Ltd., Texaco Trinidad Inc., and Trinidad-Tesoro Petroleum Company, was granted an exploration and production license for an area of approximately 187,400 acres off the east coast (Fig. 27).

8. The Government of Trinidad and Tobago hosted a U.N. seminar on "Mineral resources of the continental shelf," which lasted 2 weeks in April.

#### Geologic and Geophysical Activity

Geophysical activity during 1971 was restricted to the North Coast marine area and part of the East Coast continental slope. An infill seismic survey was carried out by the Amerada Hess Group in their license area and Occidental of Trinidad Inc. carried out some work on the north and east continental slopes. A total of 329 line-mi was shot in 0.47 party-month.

No surface geologic work was conducted during the year.

Plans for a significant future exploratory effort were completed in 1971. The Government of Trinidad and Tobago and Delta Exploration Company signed a joint-venture contract to conduct a survey of open-marine acreage in the marine areas of Trinidad and Tobago. A seismic, gravity, and magnetic survey of approximately 1.75 million acres comprised of approximately 1,200 line-mi will begin early in 1972. The areas to be covered include the north half of the Gulf of Paria and open acreage on the east coast. The survey will include the eastern continental slope to a water depth of 2,000 ft. Interested companies will purchase the data, and, on a date to be announced, will submit confidential bids on a competitive basis for exploration and production licenses.

#### Drilling

The highest level of drilling activity since 1966 was recorded in 1971 when a monthly average of 12.4 rig-months of activity was achieved. This rise in the level of activity was due mainly to Texaco Trinidad Inc. maintaining at least 5 rigs in continuous operation during the year.

In 1971, there were 220 wells drilled and completed, for a cumulative depth of 939,134 ft (Table 63). This represents an increase of 63% in the number of wells drilled and a 41% increase in the resulting total footage. Three new companies, the Deminex-Agip Consortium, Phillips Petroleum Caribbean Ltd., and Santa Fe-Oceanic-Terra Consortium were engaged in drilling activity off the North Coast of Trinidad.

*Exploratory drilling*—There were 35 exploratory wells drilled and completed in 1971 with 22

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TABLE 41. PARTY-MONTHS OF GEOLOGICAL AND GEOPHYSICAL EXPLORATION IN GUATEMALA, 1971

Company	Surf. Geol.	Seis.	Total
Centram	-	0.3*	0.3
Monsanto	4	1.3	5.3
Esso	-	0.8*	0.8
Total	4	2.6	6.6

\* Marine; includes some towed magnetometer

TABLE 42. EXPLORATION RIGHTS AND APPLICATIONS (IN HA.) IN GUATEMALA, DECEMBER 31, 1971

Company	Rights	Applications
Texaco Group	352,285	151,378
Centram	329,234	-
E. Weissenberg Martines	374,648	-
Esso	277,772	-
Others	-	421,891
Total	1,333,740	573,269

TABLE 43. SUMMARY OF WILDCAT DRILLING IN GUYANA, 1971

Well Name	Lat. Long.	Basis for Location	Expl. Class.	Compl. Date	Total Depth (Feet)	Deepest Formation	Result Remarks
GUYANA SHELL LTD.							
Berbice-1	7°51'46"N 57°13'59"W	Seismic	NPW	Aug. 29	12,500	U. Eocene	The well demonstrated that hydrocarbons were formed within the area but good reservoirs were absent

TABLE 44. LINE-MILES OF GEOPHYSICAL EXPLORATION IN HONDURAS, 1971

Company	Seis.	Sea-Grav.	Sea-Mag.
Chevron	317	71	0
LEAE	250	0	0
Mobil	1601	0	464
Signal	0	0	0
Shell*	993	0	0
Union	260	0	0
Totals	3421	71	464

\* Also carried out 0.5 party-months of surface geology.

TABLE 45. PARTY-MONTHS OF GEOPHYSICAL EXPLORATION IN NICARAGUA, 1971

Company	Seis.	Grav.	Air-Mag.	Total
General Crude	-	1.5	0.5	2.0
Mobil-Esso	0.3	-	-	0.3
Western (Signal)	0.3	-	-	0.3
	0.6	1.5	0.5	2.6

TABLE 45. SUMMARY OF WILDCAT DRILLING IN HONDURAS, 1971

Well Name	Lat. Long.	Basis for Location	Lebec Rep. Class.	Compl. Date	Total Depth (Feet)	Deepest Formation	Result Remarks
COLOMBIA OIL COMPANY							
Berta-1	16°13'N 82°04'W	Seismic Anticline	C-3	23 Oct.	7430	Unknown	Dry

TABLE 47. EXPLORATION CONCESSIONS AND APPLICATIONS (IN HA.) IN NICARAGUA, December 31, 1971

Company	Applications (Ha.)	Concessions (Ha.)	Total (Ha.)
Bosco Resources	-	398,800	398,800
Chevron	-	1,715,426	1,715,426
Esso*	-	887,089	887,089
Frank Petroleum**	-	599,812	599,812
General Crude	-	100,000	100,000
Mobil*	-	1,177,352	1,177,352
Oceanic	599,198	504,489	1,104,187
Shell	-	1,200,000	1,200,000
Union	-	388,400	388,400
Western (Signal)***	-	257,653	257,653
TOTALS	599,198	7,429,521	8,028,719

\* Mobil - Operator for Mobil/Esso joint venture.

\*\* Frank Petroleum - Operator for Frank Petroleum/Pyramid joint venture.

\*\*\* Western (Signal) - Jointly held with Occidental.

TABLE 57. WILDCAT DRILLING IN SURINAM, 1971

Well Name	Lat. Long.	Basis for Location	Expl. Class.	Completion Date	Total Depth (Feet)	Deepest Formation	Result Remarks
<b>ELF SURINAM</b>							
Galibi Offshore No. 1	X=54°32'44"W Y=07°14'18"N	Seismic	NPV	16 November (Spud date 7 Sept.)	15,300	Albian	Oil show in Lower Cretaceous

TABLE 58. OIL PRODUCTION IN TRINIDAD AND TOBAGO (IN BBL)

Field	Fig. Area No.	Discovery Year	Total Wells Drilled	Annual Production		Cum. Prod. thru Dec. 1971 (x 1000)
				1970	1971	
<b>SHELL TRINIDAD LTD.</b>						
Balata West & East	9	1932	48	39,126	45,329	1,950
Catskill	9	1950	116	513,355	498,022	19,289
Innis	9	1936	33	104,366	80,896	5,357
Rock Dome	9	1962	3	-	-	16
Penal	8	1936	238	1,115,898	1,111,820	53,662
New Dome	5	1920	31	14,846	14,374	3,020
Point Fortin East	5	1929	131	474,009	937,255	19,392
San Francisco	5	1928	27	20,442	17,926	5,768
Los Bajos	4	1918	29	-	-	546
Erin	4	1963	4	-	-	710
Area IV & Guapo	2	1963	156	169,106	127,787	32,324
Perrylands 1-5	2	1918/1913	343	321,622	267,391	33,115
Point Fortin Cent.	2	1916	94	92,654	79,570	11,649
Point Fortin West	2	1907	204	181,364	108,069	17,392
			1677	3,026,788	3,288,439	204,802
<b>TRINIDAD NORTHERN AREAS LTD.</b>						
F.O.S.-F.T.	2	1954	30	171,001	404,830	2,020
Soldado	1	1955	327	23,823,002	21,543,103	216,482
			357	24,106,003	21,999,933	218,502
<b>TEXACO TRINIDAD INC.</b>						
Guayaguayare	10	1902	643	3,444,116	3,321,284	66,859
Trinity	9	1956	94	395,674	344,454	12,432
Barrackpore	8	1911	296	792,978	745,459	21,695
Oropouche	8	1946	45	62,931	107,840	2,734
M. Diablo/Quinam	6	1926	-	174,895	81,768	7,036
Forest Reserve	5	1913	1813	4,366,508	3,867,508	223,134
Palo Seco	4	1929	-	4,892,881	3,009,901	73,800
Brighton	3	1908	805	2,244,086	1,910,751	63,322
Erin	4	1963	21	610,293	574,363	1,139
			3517	16,153,562	13,763,148	472,151
<b>HELPETCO</b>						
Couva Marine	1	1963	6	-	-	178
<b>PREMIER CONSOLIDATED OILFIELDS</b>						
Bovellius	9	1954	6	-	-	-
Rock Dome	9	1955	11	-	-	189
Siparia	8	1957	5	17,139	13,627	734
San Francisco	5	1929	75	54,465	54,443	2,653
Pyzebad	5	1918	252	67,374	61,092	12,499
Palo Seco	4	1915	83	9,375	9,515	1,560
Icacos	14	1965	13	37,540	31,354	351
Barrackpote	8	1970	3	12,343	19,673	32
			448	198,436	189,704	18,018
<b>TRINIDAD TESORO PETROLEUM CO. LTD.</b>						
Pyzebad	5)	1920)	825	2,056,543)	2,081,180	147,078
Apex Quarry	6)	1938)	-	126,889)	-	-
Guapo	2	1922	446	649,386	588,231	33,382
Moruga East	10	1933	59	45,645	39,945	1,834
Moruga North	9	1956	18	18,980	16,578	832
Moruga West	9	1957	129	180,989	109,659	8,087
Couva/Quarry	6	1936	596	1,294,693	1,250,736	74,140
Palo Seco/Erin(H&K)	4	1924	953	2,696,932	3,361,901	67,664
North Marine	1	1956	15	142,547	69,471	1,098
			3043	7,182,349	7,517,699	334,115
<b>TRINIDAD CANADIAN OILFIELD</b>						
Balata Central	9	1969	4	7,062	-	371
Wilson	8	1936	74	745,327	230,178	18,299
Cruise	2	1913	150	122,722	126,855	25,044
Tabaquite	13	1911	220	4,264	11,785	1,348
<b>Total</b>			<b>450</b>	<b>379,755</b>	<b>388,818</b>	<b>45,062</b>
				51,044,893	47,147,741	1,292,628
					57,078	

Test production from Amoco East Coast field

All production is from the Miocene.

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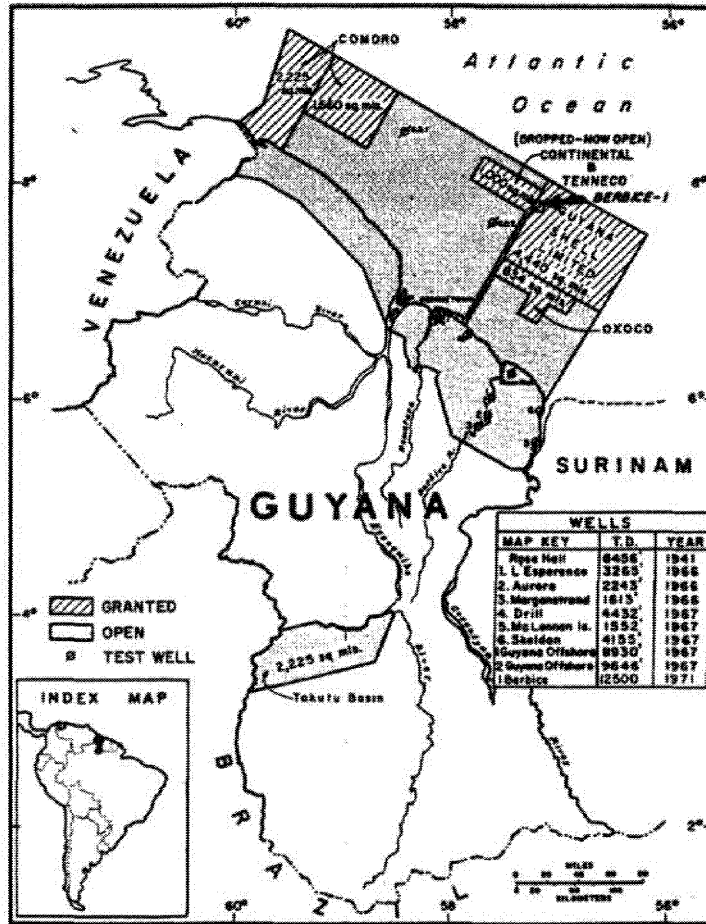


FIG. 19—Guyana, 1971 oil exploration licenses and drilling from current and previous years.

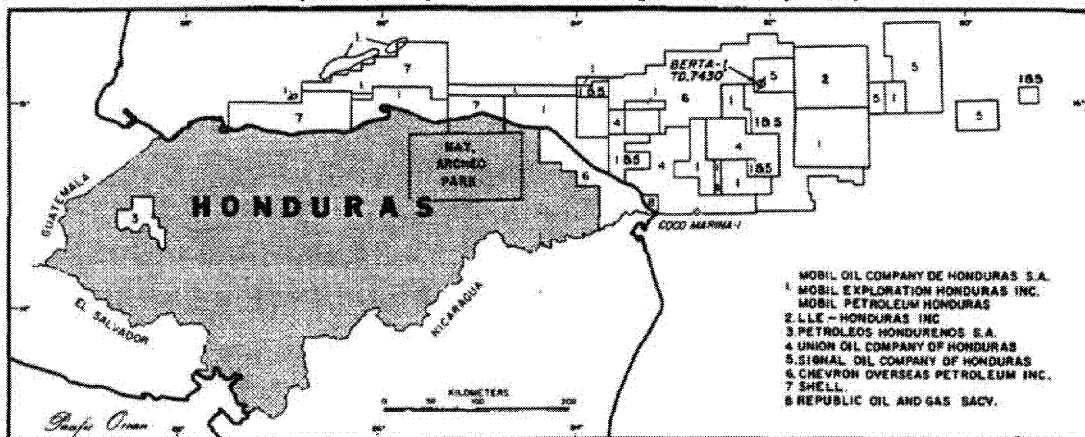


FIG. 20—Honduras, 1971 concession areas and wildcat wells.