

TRINIDAD AND TOBAGO



MINISTRY OF PETROLEUM AND MINES

ANNUAL REPORT

FOR THE YEAR

1977

354:665.5
(729.87)

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FOREWORD-1977

The record level of crude oil production of 83.6 million barrels in 1977 can be attributed to the early encouragement given by Government to Amoco to renew their exploration efforts in 1967 and subsequent oil discoveries of three oilfields off the East Coast of Trinidad.

During the year 1977, the national oil company, Trintoc, has been very successful in arresting the steep production decline from the land areas. In addition, Trintoc has intensified the search for new and deeper petroleum resources by conducting land seismic surveys.

The discovery of oil at 15,000 feet in the exploratory well Ibis 3 in the L-shaped block is very significant in terms of a new petroleum province which has not been explored and developed. These new petroleum developments provide renewed optimism for the future of the oil industry in Trinidad and Tobago.

The Government of Trinidad and Tobago has initiated discussions with the major operating oil companies in the country on the subject of the development and utilization of the substantial reserves of natural gas which have been discovered in the offshore areas of Trinidad. A joint LNG project has been proposed by Government in conjunction with Tenneco and People's Gas Company of Chicago to liquefy and export surplus natural gas.

From the foregoing, in the light of the discovery of significant quantities of natural gas and the arrest of the crude oil decline in the land areas, the future of the oil industry in 1978 seems bright and the Ministry looks forward to the challenge in the control and development of our natural resource in the coming year.

I take this opportunity to extend my sincere wishes to all those persons in the Petroleum Industry who have contributed to successes achieved during the year. I look forward to the support of the entire staff of my Ministry in the efficient management of the petroleum sector at this crucial stage of the transformation of the economy of our young nation.

HCH/hm.

Minister of Petroleum and Mines

SUMMARY AND HIGHLIGHTS OF THE OIL INDUSTRY

Trinidad and Tobago recorded the highest level of crude oil production with a daily average of 229,081 barrels.

Amoco completed its repairs and modification to its Pt. Galeota crude oil processing facilities in June, following the disastrous fire in June, 1976.

Trintoc, the national oil company, the land production level rose above the 9,000 barrels per day mark during December, 1977. This is significant for it represents an almost 50 per cent increase over the production level in August, 1974 when Government acquired the local operations of Shell Trinidad Limited and formed Trintoc.

Oil was discovered at the deepest level below 15,000 feet in the exploration wells IBIS 3, drilled by the South-East Coast Consortium in the reversed L-shaped block.

The Government of Trinidad and Tobago took up its full participation option in the Reversed L-shaped block in May, 1977. This 20 per cent option was assigned to Trintoc bringing their full participation to 50 per cent.

In April, 1977, the National Gas Company commissioned the operations of its 24-inch gas transmission line from Beach Field, Guayaguayare to Picton.

The Tringen Ammonia Plant was commissioned in November, 1977. This plant with a design capacity of 1,200 metric tons per day is a joint venture with W. R. Grace & Company and the Government of Trinidad and Tobago.

Table I summarises and compares overall production and drilling activity for the years 1974, 1975, 1976 and 1977. Figures II and III also vividly illustrate annual drilling and production.

TABLE I

Summary of Statistics for the Trinidad and Tobago Petroleum Industry, 1974-1977

	1974	1975	1976	1977
Annual Crude Oil Production (bbls) ...	68,133,818	78,620,938	77,672,635	83,619,077
Annual Natural Gas Production (Mscf) ...	128,293,247	126,434,192	137,959,327	149,588,976
Average G.O.R. (SCF/bbl) ...	1,883	1,608	1,776	1,789
Annual C.H.P.S. (Natural Gasoline) Production (bbls) ...	68,965	60,991	50,184	61,091
Daily Refinery Capacity (bbls/day) ...	456,000	456,000	456,000	456,000
Annual Refinery throughput (bbls) ...	130,819,840	85,660,318	117,594,982	99,536,480
Total Wells completed during the year (No.) ...	212	189	207	217
Average depth of completed wells (feet) ...	4,509	4,442	4,443	4,250
Total footage drilled during the year (feet) ...	909,980	839,649	919,705	922,295
Oil and Gas Wells completed during the year ...	187	150	153	170
Drilling success-ratio (per cent) ...	88.2	79.4	73.9	78.3
Average Rigs running ...	10.9	14.3	14.7	14.7

GEOLOGICAL AND GEOPHYSICAL ACTIVITY

Geological Surveys

During the year 1977 all of the geological surveys conducted by this Ministry were concerned with exploration in the non-petroleum sector for raw materials mainly for use in the construction and road building industries.

Over three thousand acres of land were explored for sand and gravel in the Valencia Forest Area at the foothills of the Northern Range and in the Matura Forests further East, a survey was also made of twenty acres, for sand suitable for use in the manufacture of glass.

In the valleys of the Northern Range, geological surveys were carried out to delineate the extent of limestone bodies. This material was also needed for use in the construction sector. In the Santa Cruz Valley, 86 acres were surveyed, while in the Blanchisseuse Valley approximately 127 acres were surveyed.

In July, the Ministry of Petroleum and Mines supervised the geological mapping of over ten square miles in the Roxborough-Charlotteville Area in Tobago. This geological mapping was carried out by the final year geology students at the University of the West Indies.

Geophysical Activity

The Ministry of Petroleum and Mines conducted a survey in sub-blocks 4 and 5 of the reverse L-shaped area off the south-east coast of Trinidad. A representative of the government supervised the collection and processing of the data.

The following companies carried out seismic surveys with the necessary approval from the Ministry:

Table II—Geophysical Surveys

<i>Company</i>	<i>Area</i>	<i>Distance</i>
TRINTOC	On land	178 miles
DEMINEX	North Coast Area	627 miles
AMOCO	East Coast (three dimensional, as well as conventional seismic surveys)	1,154 miles
TRINMAR	Gulf of Paria	100 miles
TEXACO	Gulf of Paria, East Coast (Conventional seismics, as well as three dimensional seismic survey, on the East Coast)	1,358 miles

Geophysical maps prepared by the following companies were checked:

DEMINEX	—	Mobil, East Coast Block 4
TEXACO	—	Block 6, off the East Coast of Trinidad
OCCIDENTAL	—	North Coast
TRINIDAD—TESORO	—	On land

DRILLING

In 1977, Trinidad and Tobago experienced an increase in drilling activity with 239 wells started drilling and 217 wells completed, while in 1976, there were 224 started drilling and 207 wells completed. The total drilled depth in 1977 exhibited an incremental increase of 0.6 per cent with the cumulative drilled depth of 925,371 feet. In terms of total rig activity, there was a negligible drop of 0.08 rig months to 176.60 rig months for 1977.

It is significant to note that overall drilling activity on land increased by 35.3 per cent in 1977 with drilled depth of 598,727 feet and the number of rig months of drilling activity showing a rise of 27.1 per cent from 79.07 rig months in 1976 to 100.5 rig months in 1977.

Exploration Drilling

During 1977, Exploration drilling activity declined from 40 well completions in 1976 to 17 well completions in 1977. This significant drop in drilling activity is due to termination of the offshore appraisal well drilling by Trinidad Tesoro. In 1976, this programme accounted for 19 well completions.

Deminex, Texaco and Trinidad Tesoro completed one appraisal well each during 1977. Deminex's well KK 6-2 was a delineation well in the KK-6 while Texaco's Manicou I, was a deep test in an area south of the abandoned South Domil field in Block 1, Gulf of Paria. Both wells were abandoned after testing. Trinidad Tesoro's well PS 986 was a deep test to the Herrera sands which was completed as an oil well in 1977.

Texaco, as operator of the South-East Coast Consortium drilled and completed 4 wells on the Pelican, Oilbird, Kiskadee and Ibis structures. It is significant to note that in the well Ibis 3, oil was discovered at the 15,000 feet level. This is the deepest oil discovery in Trinidad and Tobago.

Amoco drilled 5 exploration wells in 1977 with two wells in Poui field area and one each in South-West Galeota, South-East Queens Beach and offshore Cascadoux areas. Offshore Cascadoux 1 was still drilling at the end of the year.

Trinidad Northern Areas drilled 8 wells in the Soldado field with five wells completed as oil producers, one well suspended, one well abandoned after testing and one well drilling at the end of the year.

Table III is a summary of the exploratory drilling activity for 1977.

TABLE III
Summary of Wildcat Drilling—1977

Operator	Well Name	Map Reference	Basis for Soc.	Lahee Class	Completion Date	Total Depth (feet)	Name for age deepest form	Results/Remarks
Amoco (T'dad) Oil Co.	S.W. Galeota—1	—	S & SG	C 3	21/2/77	13,545	Miocene	Abandoned—dry
	SEQB—1	—	do.	C 3	7/4/77	12,035	do.	do.
	North POUI 1	—	do.	B 3	9/9/77	13,170	do.	Abandoned after testing oil gas
	North-East POUI 1	—	do.	B 1	16/12/77	10,923	do.	do.
	Offshore Cascadoux 1	—	do.	A 3	—	6,037	do.	Drilling
Trinidad Tesoro Petroleum Co. Ltd	P S 986	G16 FF—3	do.	B 2b	7/2/77	7,072	Herrera	Oil Producer
Trinidad Northern Areas	S. 408	F13 HG—17	do.	B 1	26/4/77	7,978	Cruse	do.
	S. 409	F 7 EA—13	do.	C 1	26/4/77	8,729	Nariva	Abandoned after testing
	S. 410	F14 EF—8	do.	B 1	17/7/77	7,700	Cruse	Oil Producer
	S. 411	F13 EK—14	do.	A 2b	—	3,264	do.	Suspended
	S. 413	F 6 IL—17	do.	B 1	10/7/77	4,200	Nariva	Oil Producer
	S. 415	F16 CL—17	do.	B 2C	28/9/77	12,001	Cruse	do.
	S. 419	F 13 GK—3	do.	B 2b	5/11/77	8,371	do.	do.
	S. 423	F13 GJ—8	do.	A 2b	—	11,415	do.	Drilling
Deminex/AGIP Tenneco	KK 6—2	—	do.	B 1	30.1/77	7,894	Miocene	Abandoned after testing gas
T.T.I.	MANICOU 1	—	do.	B 1	30/3/77	14,853	L. Cretaceous	do.
S.E. Coast Consortium	PELICAN 3	—	do.	B 3	15/1/77	17,939	Miocene	do.
	OILBIRD 1	—	do.	B 3	1/5/77	15,000	Pliocene	do.
	KISKADEE 2	—	do.	B 3	16/8/77	16,319	(—)	Abandoned after testing oil & gas
	IBIS 3	—	do.	B 1	21/11/77	16,400	Miocene	do.

Development Drilling

There was an increase in development well activity with 200 well completions and 231,589 metres (759,807 feet) drilled in 1977. This represents an increase of 20 per cent and 18.5 per cent respectively when compared to the 1976's figures.

In the offshore areas, Texaco temporarily abandoned its development drilling on its offshore Pt. Ligoure platform in May, 1977 after completion of ALM-19. Amoco completed 14 wells on Pouï B and Teak E platforms while TNA drilled and completed 11 wells.

In the land areas 9 rigs were utilized to drill 199 wells. Trinidad Tesoro, Trintoc and Texaco drilled 114 space 52 and 33 wells respectively.

Of the 200 development wells completed, 168 were oil producers, 1 gas well, 20 service wells and 13 were abandoned. The success ratio of the development drilling in 1977 (excluding service wells) was 93 per cent.

Table IV is a summary of the development drilling by areas in Trinidad and Tobago in 1977.

TABLE IV
Summary of Development Drilling in Trinidad and Tobago-1977

Area No.	Producers Completed	Dry Holes Completed	Total Completed	Footage drilled (feet)	31.12.77 Rigs active
1	9 (a)	2	11 (a)	58,630 (a)	1
2	35	5	40	164,663	2
3	3	—	3	9,850	—
4	68 (b)	—	68 (b)	216,090 (b)	3
5	35	2	37	97,695	—
6	5	1	6	35,558	1
7	3	—	3	7,600	—
8	11	2	13	57,975	1
9	4 (c)	1	5 (c)	14,318 (c)	—
10	4	—	4	7,981	—
11	10 (d)	—	10 (d)	89,447 (d)	1
12	—	—	—	—	—
TOTAL	187	13	200	759,807	9

(a) Includes 1 Gas well—footage drilled 809

(b) Includes 18 Steam injection wells—footage drilled 23,506.

(c) Includes 2 Water injection wells—footage drilled—4,100

(d) Includes 3 Water injection wells—footage drilled—25,194.

TABLE IVA

Key to Area—numbers on Map (Figure II), on Tables IV and in Text

Area Number	Description
1	Soldado, North Marine, Couva Marine
2	Pt. Ligoure, F.O.S., Area IV and Guapo, Point Fortin West and Central, Parrylands, Cruse
3	Brighton (Land and Marine) Vessigny, Merrimac
4	Palo Seco, Los Bajos, Erin
5	Forest Reserve, Fyzabad, Point Fortin East, New Dome, San Francique
6	Quarry, Coora, Quinam, Morne Diable
7	Oropouche
8	Penal, Barrackpore, Wilson, Siparia
9	Moruga North and West, Rock Dome, Inniss, Trinity, Catshill, Balata, Bovallius
10	Guayaguayare, Moruga East
11	Galeota, Teak, Samaan, Pouï (East Coast)
12	South Marine (South Coast)
13	Tabaquite, Pointe-a-Pierre
14	Icacos
15	North Coast

CRUDE OIL PRODUCTION

Trinidad and Tobago experienced a record high level of crude oil production with a daily average of 36,421 cubic metres (220,081 b.o.p.d.) and a cumulative production of 13,294,346 cubic metres (83,619,077 barrels). The upward production trend began in 1972 when there was a dramatic reversal of the production levels due to the initiation of commercial oil production by Amoco from its offshore oil fields. While the upward trend averaged 12.8 per cent per year, over the last six years there was a 7.6 per cent increase over last year's cumulative production of 12,348,695 cubic metres (77,671,103 barrels).

Offshore crude oil production increased its share of the total oil production by 0.3 per cent to 80.7 per cent. This incremental increase was due primarily to the 15 per cent rise in Amoco's daily production from 18,729 cubic metres (117,800 b.o.p.d.) to 21,540 cubic metres (135,483 b.o.p.d.) in 1977. In June 1977, Amoco completed its repairs and modifications to its Pt. Galeota crude oil processing facilities. Throughout the year, there has been a gradual increase in oil production due to addition of new wells on the Poui B Platform and the increased processing capability of the Pt. Galeota terminal facilities. Amoco's share of the offshore oil production averaged 73.5 per cent.

The other major offshore producing company, Trinidad Northern Areas Limited, registered a 3.5 per cent decrease from 7,619 cubic metres/day (47,923 b.o.p.d.) in 1976 to 7,356 cubic metres per day (46,270 b.o.p.d.) in 1977. The production levels at Trinidad Northern Areas witnessed a significant drop in March 1977 when a combination of the closure to two block stations for alteration and delays in drilling development wells in Platform 20 cause a drop of about 290 cubic metres per day (1,800 b.o.p.d.). The company managed to stabilize the production level at about 7,240 cubic metres/per day (45,540 b.o.p.d.) with the use of continuous drilling activity on Platform 20. Trinidad Northern Area's production represents 25.1 per cent of the offshore crude oil production.

The remaining 1.45 per cent of the offshore crude oil production came from Trinidad Tesoro's Trintes A Platform which averaged 241 cubic metres per day (1,518 b.o.p.d.) and Texaco's offshore Brighton platforms which produced 185 cubic metres per day (1,164 b.o.p.d.).

Crude oil production on land registered a small increase of 1.1 per cent with 6,959 cubic metres per day (43,773 b.o.p.d.) in 1976 and 7,033 cubic metres per day (44,238 b.o.p.d.) in 1977. This rise in the land production level resulted from a significant increase of 17.6 per cent by Trintoc and a small change of 2.3 per cent by Trinidad Tesoro.

Trintoc, the national oil company averaged 1.314 cubic metres per day (8,264 b.o.p.d.) with a cumulative crude oil production of 479,533 cubic metres (3,016,495 barrels). This represents 18.7 per cent of the land production. The intensive drilling efforts by Trintoc contributed significantly to this upward trend in its oil production levels. The average annual increase in the oil production since the change of ownership on August 31, 1974 has been 24 per cent per annum.

Trinidad Tesoro Petroleum Company Limited, the other land based company which registered a production increase, average 2,781 cubic metres per day (17,493 b.o.p.d.) from its land production. This represents a 39.5 per cent of the crude oil production from land-based fields.

The other two land-based companies, Texaco and Premier Consolidated Oilfield experienced a 6.6 per cent and 0.8 per cent drop in production during 1977. Texaco, which produced 2,950 cubic metres per day (18,558 b.o.p.d.) maintained its position as the largest land producer with 41.9 per cent of the production. Premier Consolidated Oilfields Limited, the smallest land producer, had an average production of 54 cubic metres per day (339 b.o.p.d.).

Figure IV illustrates graphically the contribution of new and recompleted wells to the country's total crude oil production.

Table V gives a detailed comparison by fields of production for the years 1976 and 1977.

TABLE V
Oil Production (in Barrels) by Fields, Areas or Districts

Company/Field, Area or District	Dis-covery Year	Total Wells Drilled	Name and/or Age of Producing Formation	Annual Production		Cumulative Production through December, 1977 ('000) bbls.
				1976	1977	
Trinidad and Tobago Oil Company						
Balata East and West	1952	48	Miocene	16,798	21,331	2,216
Catshill	1950	127	do.	315,085	295,738	21,316
Inniss	1956	38	do.	56,687	72,567	5,738
Rock Dome	1962	3	do.	0	0	16
Penal	1936	269	do.	536,781	552,637	57,679
New Dome	1928	31	do.	11,329	19,118	3,080
Point Fortin East	1929	146	do.	473,623	437,089	23,076
San Francique	1929	27	do.	15,577	15,852	5,866
Area IV and Guapo	1963	156	do.	184,979	447,473	33,638
Parrylands 1-5	1913-18	364	do.	285,148	351,249	34,932
Point Fortin Central	1916	151	do.	433,735	550,492	13,306
Point Fortin West	1907	307	do.	235,640	252,949	18,586
Los Bajos	1918	29	do.	—	0	546
Erin	1963	4	do.	—	0	710
Company Total		1,700		2,565,382	3,016,495	220,605
T.T.P.C.L.— (Trinidad-Tesoro Petroleum Co., Ltd.)						
Fyzabad	1920-38	905	Miocene	1,454,149	1,507,245	156,118
Guapo	1922	556	do.	738,890	785,349	38,103
Moruga East	1953	66	do.	45,134	52,299	2,125
Moruga North	1956	23	do.	23,004	20,497	941
Moruga West	1957	129	do.	91,191	98,384	8,657
Cocra/Quarry	1936	613	do.	1,052,424	1,025,100	82,583
Palo Seco/Erin	1926	1,190	do.	2,247,826	2,341,533	85,614
North Marine	1956	15	do.	1,636	0	1,238
Galeota	1972	38	do.	575,256	543,979	2,780
Central Los Bajos	1973	100	do.	489,315	510,079	1,998
Oropouche	1975	2	do.	71,589	51,695	137
Barrackpore	1977	2	do.	—	8,231	8
Company Total		3,639		6,790,414	6,944,391	380,302
Texaco Trinidad Inc.						
Guayaguayare	1902	697	Miocene	1,625,148	1,412,034	78,492
Trinity	1956	95	do.	240,343	229,435	13,807
Barrackpore	1911	326	do.	601,709	664,949	25,287
Oropouche	1944	120	do.	357,742	253,789	5,281
Morne Diable/Quinam	1926	—	do.	52,051	44,709	7,373
Forest Reserve	1913	1,910	do.	3,402,973	2,323,221	239,154
Palo Seco	1929	36	do.	1,398,962	1,234,913	82,769
Brighton	1903	615	do.	662,245	690,646	69,031
Erin	1963	23	do.	76,169	95,797	1,982
Couva Marine	1963	6	do.	25,717	3,607	301
Cruse	1913	150	do.	72,720	74,814	25,521
Wilson	1936	76	do.	157,561	141,134	19,182
Tabaquite	1911	225	do.	28,829	26,452	1,595
Balata Central	1949	6	do.	0	0	371
Company Total		4,285		7,702,169	7,195,500	570,146
Premier Consolidated Oilfields, Ltd.						
Siparia	1957	5	Miocene	9,486	6,876	793
San Francique	1929	75	do.	34,485	37,146	2,900
Fyzabad	1918	253	do.	56,981	57,397	12,842
Palo Seco	1915	83	do.	5,774	5,546	1,607
Barrackpore	1970	3	do.	9,630	9,256	101
Icacos	1955	11	do.	9,141	6,750	433
Defunct Fields	1965	6/13	do.	—	0	323
Company Total		449		125,497	122,971	18,999
Trinidad Northern Areas						
Fos-FT	1954	30	do.	190,299	198,501	3,552
Soldado	1955	438	do.	17,301,827	16,690,015	323,546
Company Total		468		17,492,126	16,888,516	327,098
Amoco Trinidad Oil Company						
Teak	1971	56	Miocene	11,472,459	13,224,192	85,836
Samaan	1971	44	do.	20,411,572	19,517,196	76,118
Poui	1974	21	do.	11,113,016	16,709,816	35,378
Company Total		121		42,997,047	49,451,204	197,332
GRAND TOTAL		10,662		77,672,635	83,619,077	1,714,482

(NOTE: Use whichever geographic unit is the most useful or meaningful in your case. Delete the inappropriate terms.)

REVIEW OF FLUID INJECTION OPERATIONS, 1977

In 1977, fluid injection projects in Trinidad produced 5.4 million barrels of crude oil or 6.5 per cent of the country's total oil production for the year; of this volume, 1.9 million barrels were estimated to be secondary oil. At the year's end, the 32 schemes which were in operation were two less than in 1976. Primarily responsible for this decrease in the number of active schemes was the cessation of natural gas injection operations by Texaco and Trinidad-Tesoro in five project areas. During the year, Trinidad-Tesoro intensified steam injection activity both in Palo Seco and central Los Bajos areas, and Texaco also injected greater quantities of steam and hot water in their two thermal projects at Forest Reserve, resulting in an increase of more than 100 per cent over the equivalent figure for 1976. Amoco Trinidad Oil Co., contributed greatly to the increased water injection figures for this year, when they initiated water injection operations in their Teak and Samaan fields.

Fluid injection operations for the period 1973 to 1977 are summarised in Table VI and Figure IV.

Water Injection

The number of waterflood projects in operation during the year increased to 18 when Amoco's projects came on-stream. The injection rate averaged approximately 72,000 bwpd for all projects as compared with 51,000 bwpd for the previous year, while oil produced by these projects during the period under review averaged 9,077 barrels per day; this was an increase of 66 per cent over the previous year's figures.

A summary of water injection projects by company is presented in Table VII.

Amoco's Teak Field waterflood commenced in April with Teak C-1, the first injector, operating throughout the year with almost no downtime. Four injection wells injected a total volume of 10.9 million barrels of water into four fault blocks in the MM-0/1 Lower Sand. The company also initiated a pilot waterflood project in the MM5B sand in one fault block of the Samaan field, with the objective of determining the applicability of waterflooding to the sands in this field. Due to electrical pump problems, however, only 244,000 barrels of water have been injected in the Samaan pilot flood. At the end of the year, response in the form of pressure improvement in the MM-0/1 sand in the Teak field had been detected.

Texaco operated 11 waterflood projects during 1977 in producing an average of 4,400 bopd, while water injection rates averaged 35,300 bpd for the year. Although water cuts for all of the company's waterflood schemes averaged 66 per cent during the year, this figure attained a value of 78 per cent for one Eastern District project. In the Eastern District oil production from the six water injection projects in operation there averaged 3,150 bpd, while water injection rates averaged 24,000 bpd. In contrast, four Western District waterflood schemes produced an average of 1,100 bopd. with an average injection rate of 8,700 bwpd. Water injection in the Guayaguayare "307" Extension project recommenced in August.

Due to the problems encountered in keeping their polymer flood in operation, Trinidad Tesoro had a 38 per cent decrease in water injection when compared to the 1976 figure. The company operated two cyclic waterflood projects, the Coora/UC/317/II and the Coora/UC/314/I, together with the Fyzabad/UF/169/I polymer flood. Production from these projects amounted to approximately 83,000 barrels of oil for the year. The Fyzabad flood, which was started in August, 1974, was shut down in November. This was as a result of the loss of two injectors in the previous year together with that of two additional injectors this year. Some response to injection was being observed in the producing wells prior to the shut down. The second production cycle of the CO/UC/317 project which started in June last year, continued throughout 1977 when 17,405 barrels of oil were produced; the water cut during the period increased from 11 per cent to 48 per cent. No water was injected in this project during the year. Water injection in the CO/UC/314 project began in June, 1975. Injection continued during the year at an average rate of 808 bwpd. Pressure in the reservoir continued to rise slowly and it was estimated that the sand was near to "fill up" volume at the end of the year. This reservoir was not produced during the year.

Trintoc's Catshill Waterflood Project produced 82,500 barrels of oil, with less than 10 per cent water cut during the year under review. The waterflood pattern was modified from an inverted seven-spot with four injection wells to a peripheral drive with three injection wells. An average of 734 bwpd was injected into the reservoir; this figure is 16 per cent less than that of the previous year.

Trinidad Northern Areas continued water injection in their Main Field 8011 Cruse Reservoir at a rate of 4700 bwpd, that is some 3,000 bwpd less than in 1976. Nevertheless, oil production from this project averaged 973 bwpd or 17 per cent higher than the previous year's production.

A summary of water injection projects operated during the year is presented in Table VIII.

Steam Injection

Thermal recovery operations accounted for 1.9 million barrels of the country's crude oil production for 1977. Of the nine major projects in operation during the year, seven were being operated by Trinidad-Tesoro in their Fyzabad, Palo Seco, Guapo and Central Los Bajos fields, while one steamflood and a hot waterflood project were operated by Texaco in their Forest Reserve field. Steam injection rates for all active thermal projects in the country averaged 11,900 bwpd for the year.

Trinidad-Tesoro intensified steam flooding operations in both the Palo Seco and Central Los Bajos areas. The company's thermal projects produced an average of 3,950 bopd which amounted to 21 per cent of their total oil production. During the year, injection in the Guapo flood had to be terminated due to steam breakout which occurred along fault planes in the reservoir. An increase in oil production was realised, however, from new wells drilled in the reservoir and from "huff and puff" operations. The main activity in the Guapo area was the maintenance of a pilot flood in four patterns and the continuation of "huff and puff" operations. Casing problems were experienced in the thermal operations carried out in the Guapo field. The Northwest Palo Seco Main field steamflood was expanded from 4 patterns to 5 in May, and by the end of the year there were 12 active patterns in operation.

Texaco's thermal projects produced a total of 481,000 barrels of crude, or 30 per cent more oil than in the previous year; steam injection was correspondingly higher by 56 per cent, the company having injected an average of 6,300 bopd in 1977. The Project III Steamflood Extension, Forest Sands Zones 5 and 6, commenced in July with the commissioning of four 50-million BTU/hr. steam generators. There are 16 injectors and 40 producers in this project which realised an increase in production from 800 to 1,200 bopd during the year. The major problem encountered was that of sand production. Response from the Project IV Hot Waterflood Upper Cruse project was limited, due to the poor mechanical condition of the wells. Production from this flood averaged 100 bopd, while the injection rate was 1,050 bwpd.

Steam injection projects are summarized in Table IX.

Natural Gas Injection

Gas injection operations continued to be phased out during 1977 and by the end of the year the number of active operations had decreased from 7 to 2. There was a corresponding decrease in the volume of gas injected from 4,900 mscfd to 560 mscfd.

Natural gas was injected in two of Texaco's waterflood projects: the Forest Reserve UCWE Middle Field project and the Navette "007" project. No oil production was attributed to gas injection in either project, and only 98 mmscf were injected.

Trinidad-Tesoro continued to inject gas in the Fyzabad Field until May. This year no gas was injected in four projects located in the Palo Seco and Quinam areas: PS/UF/543/II; Qu/LM/120/VII; Qu/LM 129 3131/E & F; and Qu/LM/165/I/II. An average of 290 mscfd of gas was injected by the company in 1977.

Gas injection activity is summarised in Table X.

Carbon Dioxide Injection

Three carbon dioxide projects were operated during the year by Texaco Trinidad Inc., the only company carrying out this type of enhanced recovery project in the country. An injection rate of 4,600 mscfd was achieved, which was some 40 per cent greater than the corresponding figure for 1976. Oil produced from the projects amounted to 155,000 barrels. In December no carbon dioxide was injected, due to the shut down of the Braun Plant at Federation Chemicals Limited which supplies the gas.

Carbon dioxide injection figures for 1977 are summarised in Table X.

TABLE VI
Summary of Fluid Injection Operations in Trinidad and Tobago : 1973-1977

Year	NUMBER OF PROJECTS IN OPERATION AT END OF YEAR				INJECTION VOLUMES			CRUDE OIL PRODUCTION					
	Gas	Water	Steam	Carbon Dioxide	Natural Gas (mmscf)	Water and other Fluids (Bbl)	Steam (Bbl)	Oil produced by wells under project influence (bbl)					Oil expressed as a percentage of Country's total production
								Gas Injection Projects	Water Injection Projects	Thermal Recovery Projects	Carbon Dioxide Projects	All Projects	
1973	13	18	6	1	6,573	19,063,428	2,248,606	811,100	2,088,992	1,593,344	304,003	4,797,439	7.9
1974	9	13	6	2	4,986	21,347,585	1,867,416	603,930	1,803,749	1,720,680	184,805	4,313,164	6.3
1975	8	16	6	2	1,443	13,758,293	1,530,743	352,920	1,992,222	1,395,432	146,105	3,386,679	4.9
1976	7	16	8	3	1,796*	18,536,272	2,076,772	414,364	2,001,986	1,223,092	203,842	3,843,284	5.0
1977	2	18	9	3	204 1,686**	26,455,049	4,353,607	61,710	3,313,246	1,923,299	154,575	5,452,830	6.5

*1,189 mmscf of CO₂ injected in Forest Reserve projects.

**CO₂ injected in Forest Reserve projects.

TABLE VII
Fluid Injection Operations, 1977

Company	Number of Active Projects	Water Injected (bbl)	Oil Produced (bbl)	Water Produced (bbl)	Gas Produced (mscf)	Water Cut Per cent
T.T.I. ...	11	12,889,935	1,597,678	3,077,435	3,061,849	66
T.T.P.C.L.	3	413,848	82,791	54,338	65,732	40
T.T.O.C. ...	1	267,797	82,500	5,041	20,645	6
T.N.A. ...	1	1,709,609	355,175	494,714	614,114	58
A.T.O.C. ...	2	11,173,860	1,195,102	28,029	2,341,218	2
TOTAL	18	26,455,049	3,313,246	3,659,557	6,103,558	52

Steam Injection

Company	Number of Active Projects	Steam Injected (bbl)	Oil Produced (bbl)	Water Produced (bbl)	Gas Produced (mscf)	Water Cut Per cent
T.T.I. ...	2	2,312,096	481,024	854,595	80,117	64
T.T.P.C.L.	7	2,040,701	1,442,275	547,340	55,976	28
TOTAL	9	4,353,607	1,923,299	1,401,935	136,093	42

Natural Gas Injection

Company	Number of Active Projects	Gas Injected (mscf)	Oil Produced (bbl)	Water Produced (bbl)	Gas Produced (mscf)	GOR (scf/bbl)
T.T.I. ...	—	97,960	—	—	—	—
T.T.P.C.L.	2	105,750	61,710	1,512	1,030,636	16,701
TOTAL	2	203,710	61,710	1,512	1,030,636	16,701

Carbon Dioxide Injection

Company	Number of Active Projects	Co ₂ Injected (mscf)	Oil Produced (bbl)	Water Produced (bbl)	Gas Produced (mscf)	G.O.R. (Scf/bbl)
T.T.I. ...	3	1,686,421	154,575	65,450	576,190	3,728
TOTAL	3	1,686,421	154,575	65,450	576,190	3,728

TABLE VIII
Water Injection Summary by Projections, 1977

Company	Field	Project	Water Injected (bbl)	Oil Produced (bbl)	Water Produced (bbl)	Gas Produced (mscf)	Water-Cut Per cent
T.T.I. ...	Forest Reserve	UCRA*	924,086	—	—	—	—
		UCWE— (Middle Field)	983,559	68,311	73,715	251,621	52
		Uc "645"	974,781	102,659	266,564	169,701	72
		Bernstein UM Cruse	569,647	33,347	26,294	44,339	44
		Forest Sds. Zone 4	—	50,825	23,035	14,504	31
	Guayaguayare	Navette "007"	206,596	235,675	186,118	1,261,994	44
		Navette "410"	3,435,087	352,671	1,036,653	428,064	75
		"307" Waterflood	2,603,478	227,084	368,349	268,671	62
		"307" Ext.	97,919	27,973	19,299	32,513	41
		"410" Ext.	1,355,458	77,532	273,717	92,058	78
	Trinity	Shallow Herrera	1,094,750	229,435	576,465	264,285	72
	Palo Seco	L.F. "234" Sands	644,574	192,166	227,226	234,099	54
T.T.I. ...	All Fields	All Projects	12,889,935	1,597,678	3,077,435	3,061,849	66
T.T.P.C.L.	Coora	CO/UC/317/II	—	17,405	17,043	15,393	49
		CO/UC/314/I	295,078	—	—	—	—
	Fyzabad	FM/UF/169/I	118,770	65,386	37,295	50,339	36
T.T.P.C.L.	All Fields	All Projects	413,848	82,791	54,338	65,732	40
T.T.O.C.	Catshill	CO.30 Sands	267,797	82,500	5,041	20,645	6
T.N.A. ...	Soldado Main	Cruse	1,709,609	355,175	494,714	614,114	58
A.T.O.C.	Teak	MM-0/1(L) F.B. IIa/IIb	10,929,491	903,431	27,426	1,051,495	3
	Samaan	MM-5B FB.K/L	244,369	291,671	603	1,289,723	2
A.T.O.C. ...	All Fields	All Projects	11,173,860	1,195,102	28,029	2,341,218	2
All Companies	All Fields	All Projects	26,455,049	3,313,246	3,659,557	6,103,558	52

*CO₂ Injection Project—Production attributed to CO₂ injection.

TABLE IX
Steam Injection Summary by Projects— Year, 1977

Company	Field	Project	Steam Injection (bbl)	Oil Production (bbl)	Water Production (bbl)	Gas Production (mscf)	Water-cut Per cent
T.T.I. ...	Forest Reserve	Forest Sands Zones 5 and 6	1,929,646	444,191	755,169	56,493	63
		Upper Cruse	383,260	36,833	99,426	23,624	73
T.T.I. ...	All Fields	All Projects	2,312,906	481,024	854,595	80,117	64
T.T.P.C.L.	Fyzabad	Pilot	15,993	244,126	42,174	276	15
	Palo Seco	Main Project UF/LMLE	444,253	201,987	130,818	1,425	39
		Other than Main	694,771	168,975	144,760	764	46
	Guapo	Experimental Gen. 3	269,148	229,073	23,613	42,477	9
		Other than Gen. 3	258,227	200,470	72,381	7,438	27
	Central Los Bajos	Main Project UF/LMLE	159,917	178,211	70,690	648	28
	Other than Main	198,392	219,383	62,904	2,948	22	
T.T.P.C.L.	All Fields	All Projects	2,040,701	1,442,275	547,340	55,976	28
All Companies	All Fields	All Projects	4,353,607	1,923,299	1,401,935	136,093	42

TABLE X

Natural Gas Injection Summary by Areas, 1977

Company	Field	Gas Injected (mscf)	Oil Produced (bbl)	Gas Produced (mscf)	G.O.R. (Scf/bbl)
T.T.I.	... Forest Reserve	52,486	—	—	—
T.T.I.	... Guayaguayare	45,474	—	—	—
T.T.I.	... All Fields	97,960*	—	—	—
T.T.P.C.L.	... Fyzabad	105,750	61,710	1,030,636	16,701
All Companies	... All Fields	203,710	61,710	1,030,636	16,701

*Natural gas was injected in two T.T.I. water injection projects.

—F/R U.C.W.E. Middle Field and Navette "007". In both projects no production was attributable to the gas injected.

Carbon Dioxide Injection, 1977

Company	Field	Projects	FLUID INJECTED		Oil Produced (bbl)	Water Produced (bbl)	Gas Produced (mscf)	G.O.R.	Water Cut-%
			CO ₂	Water					
T.T.I. ...	Forest Reserve	UCRA	1,381,919	924,086	112,004	59,812	496,244	4,431	35
		Forest Sands	75,120	—	6,791	2,489	6,506	958	—
		Forest Sands: Zone 5	229,382	—	35,780	3,149	73,440	2,053	—
T.T.I.	All	All	1,686,421	924,086	154,575	65,450	576,190	3,728	30

NATURAL GAS PRODUCTION AND UTILIZATION

Natural Gas production also rose during 1977, increasing by 8.4 per cent over 1976 to an average total of 409.8 mmscfd during the year. Amoco Trinidad produced almost 68 per cent of this total and with Trinmar accounted for 85 per cent of total gas production. However, whereas Trinmar was able to usefully allocate almost 75 per cent of the gas produced, the repairs at Amoco's Point Galeota facilities was only completed by September, 1977, and as a consequence, considerable under-utilization of natural gas resulted in the first half of the year. By October, utilization for the country had increased to 65.7 per cent from an initial figure of 45.5 per cent in January.

Over-all natural gas utilization rose from the 1976 level of 50.1 per cent to 55.4 per cent in 1977 and is expected to show a significantly greater increase in 1978 as three noteworthy events took place during 1977. As previously mentioned, the fire damage at Point Galeota was completely repaired during the third quarter. During the year, the first phase expansion of the East Coast pipeline system was completed with the addition of two segments of 24-inch pipeline, the first inland 30 miles from Beach Field to Picton, and the second offshore from Teak via Poui to Point Galeota. The third event was the commissioning of the Trinidad Nitrogen Company Limited Ammonia Plant in November, with an anticipated daily gas usage of 40 mmscfd.

The overall increase of 33.8 mmscfd in gas utilization during 1977 when compared to 1976 was affected by the establishment of Tringen, and increases in the refineries as well as the producing fields. The first noticeable direct effect of the land incentive allowance appeared, as gas used in the fields jumped 51 per cent from 1975's level of 16.4 million scf per day to 24.8 million scf per day during 1977. This is attributable in the main to gas being used as fuel for steam generation in the expanded steam projects on land. Gas injection continued to fall and average less than 1 million cubic feet per day for 1977, while gas used for gas lift rose from 5.2 per cent to 6.9 per cent as many of the offshore producers were converted to this form of artificial lift.

The trend of gas production over the past five years is given in Table XI.

TABLE XI
Annual Statistics for Natural Gas Production and Utilization, 1973-1977

	1973		1974		1975		1976		1977	
	Millions of S.C.F.	%	Millions of S.C.F.	%	Millions of S.C.F.	%	Millions of S.C.F.	%	Millions of S.C.F.	%
Production	119,979	100.0	123,293	100.0	126,434	100.0	137,959	100.0	149,589	100.0
G.O.R. (s.c.f./bbl.)	1,978	—	1,883	—	—	—	1,776	—	1,789	—
(a) Used as Fuel:										
In Fields	8,223	6.9	7,645	6.0	6,000	4.7	7,128	5.2	9,064	6.0
In Refineries	22,506	18.7	20,034	15.6	15,763	12.5	18,541	13.4	19,350	12.9
In other Industries	23,970	20.0	23,029	17.9	29,855	19.7	27,276	19.8	34,554	23.1
Sub-Total	54,699	45.6	50,708	39.5	46,618	36.8	52,945	38.4	62,968	42.0
(b) Other Complete Utilization:										
Used as process gas	9,624	8.0	8,071	6.3	6,844	5.4	7,169	5.2	7,708	5.1
Injected into formation	6,381	5.3	5,705	4.4	2,018	1.6	1,699	1.2	333	0.2
Converted into C.H.P.S.	61	0.1	49	0.1	60	0.1	50	0.1	62	0.1
Sub-Total	16,066	13.4	13,825	10.8	8,922	7.1	8,918	6.5	8,103	5.4
(d) Vented;										
After use of Pneumatic Energy	6,439	5.4	6,635	5.2	6,684	5.4	7,200	5.2	10,349	6.9
Without Use	42,775	35.6	57,125	44.5	64,010	50.6	68,896	49.9	68,169	45.6
Sub-Total	49,214	41.0	63,760	49.7	70,894	56.1	76,096	55.1	78,518	52.5

REFINING AND PETROCHEMICAL MANUFACTURE, 1977

The decline in refining activities in Trinidad and Tobago, evident for some years, continued in 1977. Average refinery throughput in 1977 was 272,679 barrels per day, a decline of 15.1 per cent from the daily average level for 1976.

The continuing decline resulted from the steady erosion of available markets in the principal market area, the United States of America. Competitive advantages enjoyed by the United States refineries (including the Virgin Islands) in addition to poor product demand and high crude oil costs have depressed refinery throughput.

The problem, however, is not unique to Trinidad and Tobago but a general pattern affecting Caribbean, West European and all export oriented refineries.

Below lists daily average throughputs for the principal refineries, Texaco and Trintoc.

Average Daily Throughput, Barrels Per Day

Year	Trintoc	Texaco
1970	69,870	354,368
1971	67,427	331,297
1972	67,381	326,777
1973	66,492	321,648
1974	56,613	301,759
1975	46,782	187,866
1976	54,994	266,274
1977	55,124	217,555

Trintoc, with a refinery capacity of 100,000 b.o.p.d. has still not been able to obtain a greater share of external markets since the takeover in 1974.

The volume of crude oil refined in 1977 in Trinidad and Tobago was 99,536,480 barrels or a daily average of 272,679 barrels. This represents a decline of 15.1 per cent from the 1976 volume.

Trintoc, the National Oil Company, totalled 20,120,119 barrels in 1977 or a daily average throughput of 55,124 barrels, an increase of 0.03 per cent from the previous year.

Texaco, however, totalled 79,407,441 barrels in 1977 for a daily average of 217,555 barrels. This represents a decline of 18.5 per cent from 1976 level.

The production and exports of major petrochemical intermediates and the variations from the 1976 levels are presented below.

Petrochemical Intermediate	1977		Percentage change from 1976	
	Production	Export	Production	Export
Normal Paraffin	575,835	644,893*	+4.2	+36.7
Di-isobutylene	13,617	9,129	+36.7	+0.15
Nonene	35,639	33,486	+4.04	-29.8
Tetramer	27,113	23,070	+37.9	-33.6
Benzene	68,169	51,953	-46.5	-57.2
Toluene	158,934	165,842*	-49.7	-41.3
Xylene	21,961	29,810*	-60.7	-23.6
Cyclohexane	33,999	17,002	+29.1	-44.8
Naphthenic Oil Residue	2,586	1,948	-14.8	+13.9

*Excess of exports over production made up from stocks.

The data for the production and export of the sole petrochemical intermediate produced at the Trintoc refinery was:-

Petrochemical Intermediate	1977		Percentage change from 1976	
	Production	Export	Production	Export
Naphthenic Oil Residue	7,790	9,002*	-27.3	-41.4

*Excess of export and production made up from stocks.

The main refinery products were:-

	Million Barrel	Difference from
	1977	previous year
		(per cent)
Fuel Oils	56.3	-17.0
Gasolines	18.7	-4.9
Gas/Diesel Oil	10.7	-12.3
Aviation Turbine Fuel	2.5	-41.8
Kerosene	5.8	-14.7
Lubes/greases	1.0	+11.1
Petrochemicals	1.0	-16.6

Crude feedstock to the Texaco and Trintoc refineries excluding indigenous crude, originated from the following sources:-

Company	Country	Amount (bbls)	Per cent
TEXACO	Saudi Arabia	35,685,033	53.90
	Iran	12,135,267	18.33
	Indonesia	13,586,556	20.52
	West Africa	650,755	0.98
	Angola	2,877,404	4.35
	Iraq	140,837	0.21
	Venezuela	3,750	0.01
	United Arab Emirates	177,497	0.27
	Sub Total	65,257,099	98.57
	TRINTOC	Venezuela	571,686
Ecuador		375,076	0.57
Sub Total		946,762	1.43
TOTAL	66,203,861	100.00	

Petrochemicals:

The production of petrochemical intermediate from the Texaco refinery amounted to 937,353 barrels in 1977 as compared to 1,142,203 barrels in 1976, a decline of 18 per cent. Aromatics (benzene, toluene, xylene) production declined sharply in 1977 because of process plant problems between January to June, 1977 and frequent power outages in the of 1977.

Crude Oil Balance, 1977

Availability	Million bbls	Disposal	Million bbls
Stock at 1st January	5.3	Exports	50.9
Production 83.6		Delivered to Refinery	99.5
Less Loss 0.3	83.3		
Imports	65.8	Stocks at 31st December	4.0
	154.4		154.4

Refined Products Balance

Availability	Million bbls	Disposal	Million bbls
Stocks at 1st January	8.8	Shipments	87.7
Imports	1.6	Bunkers	2.2
Crude delivered 99.5		Local Consumption	6.7
Refinery Gas and Loss 3.9			
	95.6		
Products obtained	95.6	Stock at 31st December	9.4
	106.0		106.0

Petrol Filling Stations—Sales and Marketing Position, 1977

There were 218 filling stations in operation in Trinidad and Tobago during 1977 and of these 10 were located in Tobago. The stations were all serviced by the Trinidad and Tobago National Petroleum Marketing Company Limited in accordance with Government's decision to acquire all the service stations operating in the country.

The distribution and sales of these petrol filling stations were as follows:—

	<i>Trinidad</i>	<i>Tobago</i>	<i>Total</i>
Number of Stations	208	10	218
Volume Mogas (I.G.)	69,494,800	2,243,946	71,738,746
Average per Station (I.G.)	334,109	224,395	329,077
Per cent of Total Sales	96.9	3.1	100.0

Consumption increased by 11.6 per cent from 64.28 million imperial gallons in 1976 to 71.74 million I.G. in 1977. The average growth rate of increase in consumption for the period 1973—1977 was 8.1 per cent.

The following table shows the total consumption of gasoline over the period 1973—1977.

<i>Year</i>	<i>Total Consumption of Mogas I.G.</i>
1973	52,546,106
1974	56,017,495
1975	58,981,220
1976	64,279,672
1977	71,738,746

The volume of exciseable products amounted to 3,320,575 barrels. The exciseable sale of gasoline amounted to 2,110,200 barrels and increase of 8.9 per cent compared to 1976. The exciseable duty on all products amounted to \$13,535,617. The excise tax on gasoline being 16 cents for premium and 10 cents for regular.

Sales of bottled propane showed an increase of 31.4 per cent over 1976 figure amounting to 56,546,670 lb. on which excise duty at 2 cents per lb. was paid.

Details of petroleum exciseable products are listed hereunder:

<i>Premium Gas</i> <i>bbls</i>	<i>Regular Gas</i> <i>bbls</i>	<i>Gas/Diesel</i> <i>bbls</i>	<i>Propane</i> <i>lb.</i>
1,655,520	454,680	1,210,375	56,546,670

Nitrogenous Fertilizers:

Ammonia production totalled 240,061 short tons, corresponding to an average production of 657 short tons/day. This represented a 10 per cent increase in production. This is due primarily to the start up in May, 1977 of the Trinidad Nitrogen Company Limited Ammonia Plant with a rated capacity of 1,200 short tons/day. Production of Ammonia Sulphate and urea decreased by 19 per cent and 1.2 per cent to 64,923 and 73,381 short tons respectively.

A total of 21,015 mmcf of natural gas was utilized, an increase of 36.5 per cent over last year's figure, of this amount 9,945 mmcf was used for feedstock for ammonia and nitrogenous fertilizer and hydrogen with 11,070 mmcf being consumed as fuel.

ACCIDENT REPORT, 1977

In the petroleum industry the number of accidents reported for the year 1977 numbered 783. This figure represents a decrease of 8.3 per cent over the figure for 1976. Of the total number of accidents reported, 388 or 49.6 per cent were refinery accidents and as such does not fall under the jurisdiction of the Ministry of Petroleum and Mines.

Accidents which occurred during drilling and producing operations numbered 395 or 50.4 per cent, representing a decrease of 26.4 per cent over last year's figure of 537.

Accidents were classified as serious and minor depending on the extent of the injuries sustained. Serious accidents comprised 10.7 per cent, representing an increase of .2 per cent over last year's 10.5 per cent and consisted mainly of fractured limbs, amputation of fingers, severe head, back and eye injuries, crush injuries and first-degree burns. Minor accidents included typical accidents such as cuts and bruises to the body, squeezed limbs and fingers, sprains, strained muscles, superficial burns and minor injuries caused by falls.

Of the total number of accidents reported eight (8) were fatal representing an increase of 33.3 per cent over last year's figure of six (6). Six of the fatalities occurred in Trintoc's Point Fortin field, while the other two occurred in Amoco's Teak field.

The first fatal accident for the year occurred in January when an employee of Venwell Services fell to his death from the mast of a drilling rig at Trintoc's well FE 173. At the time the workman was freeing the geograph wireline which was fouled on the mast.

In the following month four men were burnt to death in a fire which occurred at Trintoc's well FC 230. The men, all employed by Santana Services, were, at the time, engaged in workover operations on the well.

The other fatal accident in this field occurred when a mechanic helper died from head injuries he received while changing a tyre on a workover rig. The tube on the replacement tyre blew out throwing the workman against the flange of a BOP which was located nearby.

The first fatal offshore accident for the year took place in Amoco's Teak A platform. An employee of Petroleum Offshore Services was struck on the forehead by the lifting head of a Christmas tree which was being raised at the time.

The other offshore fatality occurred on this platform when an employee of Petroleum Offshore Services was found in a mud tank. This worker was last seen alive mixing chemical additives in the mud tank on the platform.

Several fires occurred in the oilfields during the year resulting in injuries and destruction to equipment.

During fishing operations at Texaco's Palo Seco Well PS 367, the well blew out and resulted in a fire which destroyed the winch and other ancillary equipment. Another fire occurred at Trinidad Tesoro's Industry Park, Palo Seco when a leaking gas line which supplied gas to domestic units at the pavilion ignited causing injuries to several persons in the vicinity.

Offshore, a fire on Amoco's Samaan "A" platform resulted in injuries to four persons when the engine on one of the pumps backfired while it was being tuned up. The malfunctioning of an automatic valve on the gas line caused a build up of gas which ignited when the engine backfired.

Towards the end of the year, a Trinidad Tesoro's well blew out in the Coora Field. Over 10,000 barrels of oil escaped from the well causing pollution to the surrounding area. At the time, work was being conducted to convert this well, which was closed in since 1964, to water injection. After three (3) days of uncontrolled blowing, the well bridged itself. Most of the oil was recovered from streams which were dammed by the company's anti-pollution team.

A Summary of accident statistics is given in Table XII.

TABLE XII
Accident Statistics, 1977

Company	Field	Total	Fatalities	Serious				Non-Serious			
				D	P	E	O	D	P	E	O
Texaco	Guayaguayare ...	12	—	—	1	—	—	2	9	—	—
	Barrackpore ...	7	—	1	—	—	—	3	3	—	—
	Forest Reserve	59	—	2	5	—	—	23	27	2	—
	Brighton ...	18	—	—	—	—	1	—	—	7	10
	Cruse ...	1	—	—	—	—	—	—	1	—	—
	Wilson ...	1	—	—	—	—	—	—	—	1	—
	Point-a-Pierre*	388*	—	—	—	—	—	—	—	—	—
	98										
Amoco	All ...	157	2	14	5	1	—	108	23	4	—
Tesoro	All ...	40	—	—	6	—	—	2	32	—	—
Trinmar	All ...	39	—	—	—	—	—	21	10	6	2
Trintoc	All ...	38	6	1	3	—	—	22	6	—	—
S.E.C. Consortium	— ...	22	—	2	—	—	—	20	0	—	—
Deminex	— ...	1	—	—	—	—	—	—	—	—	1
		395	8	20	20	1	1	201	111	20	13

D.=Drilling P.=Production E.=Engineering O.=Others

*Refinery accidents under the jurisdiction of the Inspectorate Division (not included in totals.)

ROYALTY ASSESSMENT, 1977

Appendix VIII presents a summary of crude oil assessed for Crown Royalty by Company showing averaged price per barrel and analyses for the half-yearly periods ended 30th June and 31st December, 1977.

Net royalty production increased from 45,373,799 barrels and 40,911,338 barrels in the first and second half of 1976 to 46,006,040 barrels and 47,069,250 barrels respectively in 1977. The reason for this is the continuing upward trend of Amoco's crude oil production.

Prices of petroleum products continued rising. Total royalty on crude for the year was therefore, 266,028,875 as compared with 223,563,233 for 1976 and \$182,693,761 for 1975 (see Appendix IX—average price in TT currency per barrel).

Appendix IX presents a summary of royalty assessed for Crude Oil, Natural Gasolene and Natural Gas produced, and Minimum Rents on Crown Oil Mining Leases/Licences for the half-yearly periods 1975, 1976 and 1977.

Total royalty in 1977 of \$269,782,849 is higher than 1976 and 1975 respectively at \$226,363,710 and \$184,278,578. Greater production in 1977 is therefore mainly responsible for this increase as well as the higher rate of royalty of 12½ per cent applicable to Amoco Trinidad Oil Company and Trinidad and Tobago Petroleum Company Limited Galeota Field.

LEASES AND LICENCES

Total acreage under Licence decreased from 4,489,714 acres at the end of 1976 to 3,744,021 acres at the end of 1977.

During the year a total of 745,690 acres were surrendered by the following Licences. Deminex/Agip/Tennaco—257,397 acres; Oceanic/Santa Fe Terra—160,640 acres; Occidental—147,841 acres; South-East Coast Consortium—90,357 acres and Diminex/Mobil—89,455 acres.

The following is an outline of the situation as at 31st. December, 1977

State Petroleum Oilrights	Acres	Roods	Perches
Public Petroleum Rights	222,142	3	33
Private Petroleum Rights (Encroachments)	50,247	1	17
Exploration and Production Licences (Public Petroleum Rights)	2,859,307	0	00
Marine Licences	506,375	0	00
Total Crown Oilrights	3,638,072	1	10
<i>Private Petroleum Oilrights</i>			
Private Leases	105,949	2	09
Total acreage of all Lands under Licence	3,744,021	3	19

A detailed survey of State and Private Petroleum Oilrights is set out on a Company basis in Table XIII.

TABLE XIII
Oil Rights under Lease and Licence as at 31st December, 1977

COMPANY	STATE															OIL RIGHTS			TOTAL											
	LAND LEASES						SUBMARINE LICENCES									Land			State and Private											
	Public Petroleum Oil Rights			Private Petroleum Oil Rights			Total			High Seas			Territorial Waters			Exploration Licences			Total											
	A	R	P	A	R	P	A	R	P	A	R	P	A	R	P	A	R	P	A	R	P	A	R	P	A	R	P	A	R	P
Trinidad Northern Areas Limited (T.N.A.)	32	3	33	—	—	—	—	—	—	83,434	0	00	100,213	0	00	—	—	—	183,647	—	—	—	—	—	183,679	3	33			
Texaco Trinidad Inc. (T.T.I.)	127,482	3	35	33,495	3	32	160,978	3	27	372,241	0	00	15,344	0	00	365,079	0	00	752,664	0	00	84,658	1	28	998,301	1	15			
Trinidad and Tobago Oil Company (Trintoc)	60,734	3	18	5,239	2	24	65,974	2	02	—	—	—	—	—	—	—	—	—	—	—	—	938	0	08	66,912	2	10			
Premier Consolidated Oilfields Limited (P.C.O.L.)	10,718	2	09	2,640	1	13	13,358	3	22	—	—	—	—	—	—	—	—	—	—	—	—	5,99	0	14	18,957	3	36			
Trinidad Canadian Oils (T.C.O.)	6,996	2	31	—	—	—	6,996	2	31	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	6,996	2	31			
State of Timothy Roodal	—	—	—	9	2	12	9	2	12	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	9	2	12			
Trinidad Tesoro Petroleum (T.T.P.C.L.)	16,176	3	27	8,861	3	16	25,038	3	03	50,700	0	00	42,831	0	00	78,929	0	00	172,460	0	00	14,753	3	39	212,252	3	02			
AMOCO Trinidad Oil Co.	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	892,395	0	00	892,395	0	00	—	—	—	892,395	0	00			
Texaco/Tennaco	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	259,891	0	00	259,891	0	00	—	—	—	259,891	0	00			
Texaco/G.O.T.T.	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	373,142	0	00	373,142	0	00	—	—	—	373,142	0	00			
Consortium T.T.I./Trintoc T.P.C.L.	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	91,305	0	00	19,305	0	00	—	—	—	91,305	0	00			
Deminex-Agip and Tenneco	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	260,370	0	00	260,370	0	00	—	—	—	260,370	0	00			
Deminex/Mobil	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	213,969	0	00	213,969	0	00	—	—	—	213,969	0	00			
Occidental	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	165,839	0	00	165,839	0	00	—	—	—	165,839	0	00			
TOTAL	222,142	3	33	50,247	1	17	272,390	1	10	506,375	0	00	158,388	0	00	2,700,919	0	00	3,365,682	0	00	105,949	2	09	3,744,021	3	19			

REVENUE SUBSIDY AND PRODUCTION LEVY, 1977

Revenue

Revenue was received by the Ministry as follows:

	1976	1977
	\$	\$
Petroleum Operating Licences	39,287	36,000
Exploration and Production Licences	9,882	3,380
Pipeline Licences	1,200	—
Transfer Fee	100	—
Oil Impost	2,524,564	3,221,673
Seismographic Surveys	5,000	42,245
Sale of Reports and Maps	560	180
Royalty on Crude Oil and Natural Gas	225,427,145	263,147,580
Concessions—Premia on Oil	—	2,400,000
	<u>228,007,738</u>	<u>268,851,058</u>

The increase in royalty from \$225.43 million to \$263.15 million is due partly to higher prices of products during the year, as well as a significant increase in production of crude oil by the Amoco Trinidad Oil Company. There were small decreases in production by Texaco Trinidad Inc., Trinmar and Premier Consolidated Oilfields Limited, while Trinidad Tesoro Petroleum Company Limited and Trinidad and Tobago Oil Company Limited produced slightly more crude oil in 1977 than in 1976.

Production Levy and Subsidy

The Production Levy and Subsidy for 1977 was \$87.27 million compared with \$68.3 million in 1976. Higher prices of products were mainly responsible for the increase of \$19.97 million, but subsidy on Liquid Petroleum Gas increased by approximately \$3.4 million. During the year too, there was a significant rise in the vehicle population.

Petroleum Development fund long Term Projects

24" Natural Gas Transmission Pipeline from Beachfield to Picton

The pipeline was completed and commissioned by the Minister of Petroleum and Mines on 12th April, 1977. The Project Manager, Amoco Trinidad Oil Company issued a certificate of completion of work to Harbert Construction Corporation with the acceptance date as June 11, 1977. A period of one year from this date for maintenance purposes will elapse before retention monies of \$1.434 million are paid to Harbert Construction Corporation.

An *ex-gratia* payment of \$627,688 was awarded by Cabinet to Harbert Construction Corporation for additional costs incurred due to lengthy delay in awarding the contract to the corporation for construction of the 24-inch Natural Gas Transmission Pipeline.

The total cost of the pipeline is \$32,942,440.38. Inventory taken by the Project Manager revealed surplus materials to the value of \$2,008,101.60.

STAFF

The year 1977 was one of considerable activity and involvement in international affairs for the Ministry. There were several new additions of staff.

Additional Staff

The Ministry recruited a number of staff during 1977 as part of its general expansion programme.

They are as follows:—

MR. PRAKASH SEETAHAL	B.Sc. in Chemical Engineering, University of the West Indies, St. Augustine. with effect from 12th September, 1977 as Petroleum Engineer I.
MR. NAGIB ALI	B.Sc. in Chemical Engineering, University of Alberta, Edmonton, Canada, with effect from 23rd September, 1977 as Petroleum Engineer I.

- MR. HAYDEN TONEY ... Economist II, M.Sc Degree in Petroleum Economics at the Pennsylvania State University U.S.A. with effect from 14th July, 1977.
- MR. GEORGE CHIN ... B.Sc Degree in Chemical Engineering, University of the West Indies with effect from 29th August, 1977 as Chemical Engineer I.
- MR. LESLIE THOMPSON ... B.Sc in Petroleum Engineering, University of Tulsa, Oklahoma, with effect from 1st July, 1977 as Petroleum Engineer I.

In addition four (4) Petroleum Inspectors and three (3) Petroleum Engineering Assistants were appointed to the Development Section, San Fernando.

The Geological Section of the Ministry also had additions of staff.

Mr. Kirton Rodriguez, a graduate of the University of the West Indies, Mona, Jamaica with a B.Sc. degree in Geology was appointed as Geologist I with effect from 2nd September, 1977.

Mr. Chanan Mootilal, graduate from the University of the West Indies, Mona, Jamaica with a B.Sc degree in Geology was appointed as Geologist I with effect from 1st September, 1977. Two Geological Assistants were also recruited to this section in November, 1977.

Training

Mr. Horace Williams, Petroleum Inspector II attended a course designed primarily for public officers who are directly responsible for the supervision of subordinate staff either in the office or in the field. The course was held at the Naparima Bowl, San Fernando from 7th-11th February, 1977.

Mr. Carlton Brathwaite, Administrative Officer V attended a one-day seminar in Human Resource Development on March 16, 1977 at the Kapok Hotel.

Mr. Trevor Boopsingh, Petroleum Engineer II attended a Seminar on Financial Aspects of Mineral Resources Development held in New York over the period 7th-18th February, 1977 which was organised by Morgan Guarantee Trust Company. The course was intended for those with management responsibility in the financial area of national oil companies and other Government entities in oil producing countries.

Mr. Syping Lee, Geologist I attended the Sixth Annual short course in Applied Geophysics for Geologist at the University of Houston, Texas from 16th-27th May, 1977. Attendance at this course was a result of greater emphasis being placed on Geophysical methods in exploration for hydrocarbons in Trinidad.

Mrs. Kamla Bhoelai, Senior State Council, in the Ministry attended a short course in Oil and Gas Law and Taxation which was held in the University of Texas, U.S.A. from 5th June, 1977.

Mr. George Chin, Chemical Engineer I attended a series of programmes namely a conference held in September 16 and 17, a follow-up 2-day Appreciation Seminar for upper level management and a National Course with project activities held from October 16, 1977 to January 30, 1978. The training was done by the Trinidad and Tobago Government in co-operation with the Inter-American Programme on Project Formulation and Evaluation of the Organization of American States.

Mr. Carlisle de Bourg attended an eight-week seminar on Advanced Drilling Technology held at the University of the West Indies, St. Augustine from July 4-August 26, 1977.

Three Petroleum Engineers of the Development Section attended a one-day seminar on Controlled Directional Drilling held at Texaco Conference Room on 2nd November, 1977.

Mrs. Magdaline Kurpiel, Temporary Geologist III, Ministry of Petroleum and Mines, proceeded to Houston, Texas for the period of two weeks with effect from November 1, 1977 for the purpose of supervising the processing of the geophysical data that was obtained from the seismic survey conducted by Geophysical Services Inc. during September, 1977. Mrs. Kurpiel, a qualified Geophysicist in the Ministry, was assigned to supervise the work carried out.

VISITS: Colombia

Mr. Rupert Mends, Petroleum Engineer III formed part of a Trinidad and Tobago Trade Mission, headed by the Honourable Minister of Industry and Commerce that visited Colombia from 22nd-26th August, 1977 with a view to exploring possibilities for the development of trade with Colombia.

A Colombia Economic and Financial Mission visited Trinidad and Tobago during 17th–19th November, 1977. The visit was a follow-up to the visit of a Trinidad and Tobago Trade Mission to Colombia 22nd–26th August, 1977.

Brazil

The Trinidad and Tobago delegation visited Brazil with a view to exploring in depth the development of Trade with Brazil and possible co-operation in other areas such as science and technology aimed at further increasing commercial and economic relations between the two countries.

Dr. Akin Young Hoon was part of the Trinidad and Tobago delegation that visited Brazil 15th to 18th August, 1977 headed by the Trinidad and Tobago Ambassador to Brazil. This visit was a follow-up to a delegation which held trade talks with Brazil from 27th to 29th July, 1977.

As a result of these talks two officials from Brazil visited Trinidad and Tobago namely the Brazilian Minister of Mines and Energy from 1st to 4th September, 1977 and the Foreign Minister of Brazil 2nd to 4th October, 1977.

Against the background of these visits, a Trinidad and Tobago delegation headed by the Honourable Minister of Petroleum and Mines, Mr. Errol Mahabir and including Mr. George Legall, Permanent Secretary and Mr. John Scott, Geologist III of the same Ministry visited Brazil during the period October 22 to 31, 1977 with Miss E. Maule, Executive Secretary in the Ministry as Secretary to the Delegation.

The delegation dealt with areas of co-operation between Trinidad and Tobago and Brazil, those areas of co-operation were embodied in Joint Communiqués.

Conferences

Mr. Kenrick Haynes, Geologist II and Mr. Syping Lee, Geologist I in the Ministry of Petroleum and Mines represented Trinidad and Tobago at the Eighth Caribbean Geological Conference held in Curacao, Netherlands Antilles from July 9 to 24, 1977.

The Conference is held triannually for the purpose of holding discussions on Geological and Geophysical matters related to the Caribbean area, in particular and, in general, examining technological advancements in those two fields.

United Nations Conference

Mr. Rodney Appleton, Senior Economist and Mr. J. P. Scott, Geologist III represented Trinidad and Tobago at the Sixth Session of the Third United Nations Conference on the Law of the Sea held in New York from May 23 to July 17, 1977.

Offshore Technology Conference

Mr. Hugh Hinds, Chief Petroleum Engineer and Mr. Frank Look Kin, Acting Development Engineer represented Trinidad and Tobago at the 9th Annual Offshore Technology Conference held in Houston, Texas on the 2nd to 5th May, 1977.

The trend in the country's offshore exploratory effort is towards deeper water depth areas. The development of offshore fields in those areas will have to be done by sub-sea completions. At the Conference, Ministry personnel could obtain first-hand knowledge from persons currently engaged in such activities as well as have the opportunity to see and discuss the actual equipment involved.

World Energy Conference

The Republic of Trinidad and Tobago was represented at the Tenth World Energy Conference held in Istanbul, Turkey from September 19 to 23, 1977. The Minister of Petroleum and Mines, Honourable Errol Mahabir and Mr. Frank Look Kin, Acting Development Engineer formed part of the delegation.

Liquefied Natural Gas

Three Chemical Engineers together with three (3) Petroleum Engineers of the Ministry all attended a Liquefied Natural Gas (LNG) School in Houston, Texas 9th to 13th May, 1977. The school was taught by lecturing from the Institute of Gas Technology.

The courses at the LNG school covered subjects in the current technology of LNG production storage, transport, safety, economics, equipment/selection, plant design, construction and operation. Those subjects would be beneficial to Engineers in the Petroleum Industry whose responsibilities would require the knowledge of both the engineering concepts and practice of LNG technology.

Mr. Basharat Ali and Dr. Akin Young Hoon visited Chicago to review with Amoco, the Kellogg Study relating to Joint Venture Fertiliser Project during the period 20th to 25th September, 1977.

The Republic of Trinidad and Tobago was represented at the American Institute of Chemical Engineers (AIChE) Meeting held in December, Colorado, from August 29, to September 1, 1977 by Dr. Akin Young Hoon, Chemical Engineer II, Ministry of Petroleum and Mines, The meeting dealt with safety operations of ammonia plants.

Oil Spill

Mr. Hugh Hinds and Mr. Rupert Mends attended an Oil Conference from 8th to 11th March, 1977, in New Orleans, U.S.A. The Oil Spill Conference is an annual conference attended by oil industry, environmental interest, research and Government organizations with a view to tackling the many problems posed by oil pollution.

Mr. Hugh Hinds also attended another Oil Spill Control Course in Texas, U.S.A. from 26th to 30th September, 1977.

UNESCO

Trinidad and Tobago was represented at the Tenth Session of the Assembly of the Inter-Governmental Oceanographic Commission (UNESCO, Paris) 27th October to 10th November, 1977 by Mr. J. P. Scott, Geologist III in the Ministry of Petroleum and Mines.

APPENDIX I

Annual Statistics of Production, Drilling, Refining - Exports and Imports 1967 - 1977

ITEM	UNIT	PERCENTAGE DIFFERENCE 1977 - 1976	1977	1976	1975	1974	1973	1972	1971	1970	1969	1968	1967
1. Crude Oil	'000 bbls.	+ 7.6	83,619	77,673	78,621	68,136	60,670	51,211	47,148	51,847	57,418	66,984	64,995
2. Coasting Head Gasoline (C.H.P.S.)	'000 bbls.	+ 22.8	61	50	61	69	79	137	141	168	158	164	192
3. Total Crude Oil and Natural Gasoline (1 + 2)	'000 bbls.	+ 7.6	83,680	77,723	78,682	68,205	60,749	51,348	47,289	51,215	57,668	67,068	65,187
4. Crude Oil Production - Crown Oil Rights	'000 bbls.	+ 7.9	80,612	74,784	76,818	65,878	57,736	48,246	43,929	47,594	54,814	63,345	60,961
5. Crude Oil Production - Private Oil Rights	'000 bbls.	+ 1.3	3,007	2,969	2,603	3,058	2,934	2,965	3,219	3,452	3,405	3,559	4,034
6. Total Imports	'000 bbls.	- 22.8	67,441	87,459	58,796	95,636	103,977	107,662	107,567	175,448	105,418	93,388	84,146
7. Imports of Refined Products	'000 bbls.	- 32.8	1,681	2,583	268	46	21	76	75	69	43	49	43
8. Imports of Crude Oil for Refining	'000 bbls.	- 22.4	65,760	84,784	58,144	95,472	103,624	107,188	106,867	113,275	103,762	91,447	80,437
9. Imports of Other Oils for Refining and Blending	'000 bbls.			172	392	110	332	835	625	2,181	1,613	1,884	3,666
10. Total Exports	'000 bbls.	- 4.8	140,753	147,896	138,714	153,297	155,998	149,992	146,663	154,974	147,878	142,876	141,779
11. Exports of Crude Oil	'000 bbls.	+ 14.7	98,936	44,488	48,289	193,878	23,614	14,885	6,988	8,669	6,139	6,983	5,881
12. Exports of Refined Products	'000 bbls.	- 13.2	89,817	103,408	91,487	121,427	132,384	136,822	139,665	146,305	141,648	135,893	135,978
13. Reus to Still	'000 bbls.	- 15.3	98,536	117,595	85,648	138,819	141,687	144,276	145,547	154,868	154,877	151,282	138,925
14. Number of Wells Started	As stated	+ 4.9	235	289	182	219	205	191	248	148	127	176	213
15. Total Number of Wells Completed	As stated	+ 4.8	217	297	188	212	212	195	228	135	138	176	221
16. Number of Drilling Wells Completed as Oil Wells	As stated	+ 11.1	178	153	188	187	181	166	175	187	99	151	197
17. Number of Drilling Wells Abandoned, & c	As stated	- 12.9	47	54	24	25	31	38	45	28	31	25	24
18. Total Footage Drilled (All Wells)	Foot	+ 8.3	922,295	919,785	839,648	989,988	955,185	841,742	939,259	662,977	688,671	942,686	928,218
19. Footage Drilled on Crown Oil Rights	Foot	+ 8.3	882,823	879,132	772,279	766,787	874,867	768,768	743,784	566,878	677,974	928,915	888,839
20. Footage Drilled on Private Oil Rights	Foot	- 8.7	48,272	48,873	67,378	143,193	88,318	88,973	195,475	96,099	12,697	13,771	47,371
21. Average Depth of Completed Drilling Wells (15)	Foot	- 5.5	4,196	4,443	4,442	4,589	4,586	4,294	4,269	4,911	5,313	5,356	4,328
22. Total Number of Wells Producing (Average during year)	As stated	+ 5.8	3,148	2,997	2,777	2,981	2,894	2,932	3,035	3,123	3,257	3,381	3,427
23. Number of Wells Produced by Flowing (Average during year)	As stated	- 2.2	428	438	438	486	506	626	559	626	788	795	891
24. Number of Wells Produced Artificial Lift (Average during year)	As stated	+ 6.2	2,720	2,558	2,339	2,483	2,388	2,487	2,476	2,487	2,548	2,586	2,536
25. Average Daily Production per Producing Well	Barrel	+ 2.5	72.8	71.8	77.6	62.6	57.4	47.7	42.6	44.8	48.3	54.1	52.8
26. Average Daily Production Flowing Well	Barrel	+ 2.1	335.7	328.5	358.7	248.8	284.4	146.8	114.4	119.9	125.2	137.3	117.6
27. Average Daily Production per Artificial Lift Well	Barrel	+ 23.1	31.4	25.5	24.9	28.8	26.3	26.1	26.4	26.8	26.9	28.5	28.9
28. Total Value of Domestic Exports	\$'000	- 2.6	5,188,987	5,331,567	3,839,878	3,834,181	1,852,476	1,858,823	1,888,948	944,131	934,658	918,636	755,188
29. Total Value of Petroleum Products (Item 28)	\$'000	- 3.4	4,787,288	4,988,888	1,925,785	2,532,881	831,486	838,993	884,831	668,439	644,676	725,438	593,653
30. Total Value of Lube Asphalt Products	\$'000	- 31.8	3,851	4,426	4,248	4,657	3,876	3,299	3,561	2,764	3,289	3,289	3,268
31. Total Natural Gas Produced	MBCF	+ 8.4	148,589	137,959	126,434	128,293	119,979	184,338	189,814	121,868	137,588	151,445	148,338
32. Used as Fuel	MBCF	+ 18.9	62,868	52,931	46,618	58,588	54,788	57,131	55,866	56,488	58,348	56,418	53,846
33. Replaced in Formation	MBCF	+ 88.4	333	1,689	2,817	5,786	6,381	9,238	12,112	19,818	24,728	21,324	22,625
34. Losses, Not Collected	MBCF	+ 3.1	78,518	76,885	78,898	63,788	48,213	28,816	32,793	35,356	43,464	62,916	54,355

* revised data.

APPENDIX II

MONTHLY ANALYSIS OF DRILLING AND WORKOVER WELLS, 1977
TRINIDAD & TOBAGO

MONTH	RIG/ MONTH	NEW WELLS STARTED	DRILLING WELLS COMPLETED										TOTAL	AGGREGATE DEPTH	AVERAGE DEPTH	CLOSED IN		MONTHLY FOOTAGE DRILLED			AVERAGE FOOTAGE DRILLED		OLD WELLS	
			OIL & GAS PRODUCERS		INJECTION & OBSERVATION WELLS		APPLY TEST WELLS		ABANDONED DRY HOLES		TECHNICAL CURVES					NO.	AGGREGATE DEPTH	CORON	PRIVATE	TOTAL	/DAY	/RIG /DAY	RECOMPLETED	ABANDONED
			NO.	AGGREGATE DEPTH	NO.	AGGREGATE DEPTH	NO.	AGGREGATE DEPTH	NO.	AGGREGATE DEPTH	NO.	AGGREGATE DEPTH												
JANUARY	13.19	16	10	39938	1	1130	2	25833	-	-	1	2750	14	68657	4875	-	-	56802	4275	61177	1974	150	13	2
FEBRUARY	13.81	16	12	57542	3	3946	-	-	1	13545	-	-	16	79033	4680	-	-	69316	-	69316	2476	179	5	-
MARCH	15.44	16	14	47434	-	-	2	21103	-	-	-	-	16	68537	4284	-	-	72831	-	72831	2348	152	10	-
APRIL	14.64	22	9	42571	1	7960	1	8788	2	13035	-	-	13	72295	5561	-	-	71117	3876	74993	2500	171	21	-
MAY	15.80	21	15	39945	1	7788	2	24008	-	-	-	-	48	71713	3884	-	-	91074	6062	97136	3133	198	16	1
JUNE	16.42	16	7	32838	3	3980	-	-	-	-	-	-	10	36818	3682	-	-	66656	5925	72582	2420	147	13	-
JULY	15.16	19	18	68675	1	1515	-	-	-	-	-	-	18	71188	3747	-	-	78141	5155	75297	2429	168	18	-
AUGUST	15.24	21	12	51404	1	9466	2	21318	2	9580	-	-	17	91879	5485	-	-	85828	3330	89258	2879	189	17	-
SEPTEMBER	14.64	24	17	65843	3	4388	1	13178	4	18044	1	771	26	98228	3817	-	-	75791	2988	78781	2626	179	21	-
OCTOBER	14.71	21	21	68391	7	9518	-	-	-	-	-	-	28	77881	2782	-	-	71128	3928	75056	2422	165	18	-
NOVEMBER	14.33	19	24	98141	2	2835	1	16488	-	-	-	-	27	118376	4384	-	-	74483	47	74530	2484	173	13	-
DECEMBER	13.22	24	11	41388	-	-	1	18873	1	5585	-	-	13	57916	4488	-	-	79738	4688	84426	2723	286	13	-
TOTAL 1977	176.68	235	178	656188	23	52418	12	141527	18	56899	2	3521	217	918537	4186	-	-	888888	48272	925371	2535	172	178	3
TOTAL 1976	176.68	224	144	588662	12	17274	7	87288	35	159978	8	47888	287	857152	4888	-	-	876887	42788	919665	2513	171	206	5
INCREASE 1977 - 1976	- .00	11	25	188526	11	35135	5	54277	-25	-180079	-6	-43667	18	43385	7	-	-	8182	-2435	7666	22	1	-28	-3

APPENDIX IIA

LAND AND MARINE FOOTAGE DRILLED - 1977

	January	February	March	April	May	June	July	August	September	October	November	December	Total
LAND	48,854	42,784	43,178	46,210	62,604	98,238	95,787	53,991	56,575	51,461	48,457	54,885	686,518
MARINE	21,123	26,532	29,653	28,783	34,442	22,354	98,510	35,258	22,286	23,689	25,873	27,237	315,781
TOTAL	61,177	69,316	72,831	74,993	97,136	72,592	75,297	89,250	78,781	75,070	74,530	81,322	922,295
Daily Av. Footage	1973.5	2475.6	2348.3	2488.8	3133.4	2419.8	2428.9	2879.8	2626.8	2421.6	2484.3	2623.2	2526.8
Daily Av. Ft/Rig	148.6	179.3	152.1	178.7	188.3	147.4	168.2	188.9	179.4	164.6	175.8	188.4	-
Marine % of Total	34.5	38.3	48.7	38.4	35.4	38.8	25.9	38.5	28.1	31.4	33.6	33.4	34.2

APPENDIX III

ANALYSIS OF MONTHLY PRODUCTION FOR THE YEAR ENDED 31st DECEMBER, 1977

MONTH	FLOWING				GAS/AIR LIFT				PUMPING				PLUNGER LIFT				OTHER METHODS				SALT WATER				No of Wells produced	No of idle wells	No of Wells abandoned	No of wells North-End	Total no of wells started producing	Daily Av. per producing well	Total oil production	BREAKDOWN OF TOTAL PRODUCTION						Average B.O.P.O.	Crown COPS	Private COPS	TOTAL						
	No of Wells	Quantity bbls	% of Total oil	Daily Av. per well bbls	No of wells	Quantity bbls	% of Total Oil	Daily Av. per well bbls	No of wells	Quantity bbls	% of Total Oil	Daily Av. per well bbls	No of wells	Quantity bbls	% of Total	Daily Av. per well bbls	No of wells	Quantity bbls	% of Total Oil	Daily Av. per well bbls	No of wells	Quantity bbls	% of Total	Daily Av. per well bbls								No of wells	Quantity bbls	% of Total	Daily Av. per well bbls	No of wells	Quantity bbls					% of Total	Daily Av. per well bbls	CROWN		PRIVATE	
																																												Daily Av. per well	No of wells	Quantity produced bbls	Daily Av. per well
JANUARY	416	4,419,771	62.8	342.7	716	1,403,088	21.0	66.8	1,942	1,137,838	16.2	10.9	1	82	-	2.6	3	39	-	1.3	1,506	1,741,416	19.2	37.3	3,078	7,743	3	15	10,839	73.8	7,046,810	89.2	2,453	6,785,493	13.2	625	255,317	227,123	5,484	36	5,518						
FEBRUARY	407	3,946,352	62.2	346.3	726	1,365,526	21.5	67.2	1,923	1,033,488	16.3	19.2	2	193	-	3.4	3	14	-	0.2	1,493	1,595,100	20.1	38.2	3,061	7,770	1	14	10,854	74.0	6,346,583	89.1	2,453	6,117,094	13.4	608	228,489	226,628	4,859	54	4,909						
MARCH	401	4,404,173	63.0	354.3	707	1,410,215	20.1	64.3	1,970	1,178,893	16.9	19.3	2	194	-	3.1	3	18	-	0.2	1,538	1,836,558	20.8	38.5	3,083	7,771	2	14	10,870	73.2	6,993,593	89.1	2,437	6,732,463	13.0	646	261,130	225,680	4,838	54	4,893						
APRIL	411	4,395,406	64.2	356.5	692	1,308,760	19.1	63.0	1,969	1,138,382	16.7	19.3	1	240	-	8.0	4	53	-	0.4	1,508	1,740,844	20.3	38.5	3,077	7,808	3	13	10,893	74.1	6,842,761	90.1	2,439	6,591,990	13.1	638	250,771	228,092	4,803	47	4,750						
MAY	424	4,674,374	64.5	355.6	690	1,378,962	19.0	64.5	1,983	1,199,593	16.5	19.5	2	309	-	5.0	4	28	-	0.2	1,586	1,874,123	20.5	38.1	3,103	7,794	2	15	10,914	75.4	7,253,266	90.8	2,481	6,981,715	14.1	622	271,551	233,976	3,810	42	3,860						
JUNE	414	4,519,109	65.0	363.9	695	1,295,556	18.7	62.1	2,029	1,132,268	16.3	18.6	3	168	-	1.9	5	55	-	0.4	1,626	1,854,383	21.1	38.0	3,146	7,771	-	13	10,930	73.6	6,947,156	89.7	2,487	6,691,471	12.9	659	255,685	231,572	4,650	99	4,755						
Production Total 1st Jan-30th June	410	26,359,185	63.6	355.2	704	8,242,107	19.9	64.7	1,970	6,820,484	16.5	19.1	2	1,186	-	3.3	4	207	-	0.3	1,544	10,642,424	25.7	38.1	3,098	-	-	10,938	74.1	48,423,169	89.8	2,464	39,900,226	13.2	636	1,522,943	728,857	27,753	132	28,085							
JULY	435	4,615,636	64.5	342.3	703	1,379,600	19.3	63.3	2,003	1,162,217	16.2	18.0	1	168	-	5.4	4	26	-	0.2	1,640	1,943,083	21.4	38.2	3,226	7,709	-	14	10,940	71.6	7,157,647	87.0	2,561	6,903,876	12.3	665	253,771	230,892	5,521	117	5,638						
AUGUST	406	4,504,731	63.0	357.9	693	1,500,075	21.8	69.8	2,084	1,158,751	16.0	17.8	-	-	-	-	4	72	-	0.6	1,658	2,123,208	22.9	41.3	3,187	7,764	4	18	10,970	72.4	7,155,629	87.7	2,543	6,912,618	12.2	644	243,011	230,827	5,310	112	5,422						
SEPTEMBER	419	4,022,276	59.4	320.8	676	1,615,378	23.9	79.7	2,045	1,132,582	16.7	18.5	1	31	-	1.8	4	51	-	0.4	1,586	1,977,181	22.6	41.6	3,145	7,838	6	13	10,994	71.7	6,778,318	87.2	2,494	6,526,188	12.5	651	244,130	225,677	5,764	121	5,887						
OCTOBER	458	4,180,434	60.6	294.4	704	1,598,564	23.2	73.2	2,061	1,119,411	16.2	17.5	3	172	-	1.8	3	21	-	0.2	1,632	1,987,748	22.4	38.3	3,229	7,771	-	14	11,015	68.9	6,898,582	82.9	2,589	6,651,807	12.4	648	246,785	222,535	5,787	120	5,877						
NOVEMBER	483	4,246,862	61.3	293.1	685	1,568,764	22.5	75.8	2,058	1,117,586	16.2	18.2	-	-	-	-	3	37	-	0.4	1,629	2,028,303	22.6	41.3	3,221	7,808	1	10	11,037	71.7	6,925,169	86.2	2,582	6,677,728	12.9	639	247,441	230,839	5,558	117	5,676						
DECEMBER	484	4,520,421	62.0	301.3	680	1,629,725	22.4	77.3	2,061	1,138,373	15.6	17.8	-	-	-	-	4	34	-	0.3	1,582	2,841,682	21.9	41.4	3,229	7,828	2	11	11,062	72.8	7,288,553	88.8	2,588	7,038,367	12.4	648	248,186	235,115	4,461	95	4,556						
PRODUCTION TOTAL 1st July-31st Dec	447	26,090,360	61.8	317.2	690	9,284,096	22.0	73.1	2,064	6,828,848	16.2	18.8	1	371	-	-	4	241	-	0.3	1,622	12,093,126	22.3	40.5	3,206	-	-	11,062	71.5	42,196,988	86.5	2,557	40,711,584	12.4	648	1,484,324	229,326	32,324	682	33,006							
YEARS PRODUCTION TOTAL	428	52,449,545	62.7	335.7	697	18,526,283	21.8	68.9	2,017	13,641,324	16.3	18.5	2	1,557	-	-	4	448	-	0.3	1,583	22,735,550	21.4	39.3	3,148	-	-	11,062	72.8	83,619,877	88.1	2,586	80,611,818	12.8	642	3,807,267	229,893	68,877	1,814	61,091							
DAILY AVERAGES	-	143,697	-	-	-	48,817	-	-	-	37,373	-	-	-	4	-	-	-	1	-	-	62,289	-	-	-	-	-	-	-	228,893	-	-	228,854	-	-	8,239	-	165	3	168								
AVERAGES DURING YEAR	428	-	-	335.7	697	-	-	68.9	2,017	-	-	18.5	2	-	-	-	4	-	-	0.3	1,583	-	-	39.3	3,148	-	-	-	72.8	-	-	88.1	2,586	-	12.8	642	-	-	-	-	-						

APPENDIX III A

ANALYSIS OF PRODUCTION BY OPERATIONS COMPANY - 1977

COMPANY	FLOWING				GAS LIFTING				PUMPING				SALT WATER				Total Oil Production bbl.	Coys production as a % of Total production	Crude Production bbl.	% of Total	Private Production bbl.	% of Total		
	Average No. of Wells	Quantity (Barrels)	% of Total	Daily Average per well	Average No. of Wells	Quantity (Barrels)	% of Total	Daily Average per well	Average No. of wells	Quantity (barrels)	% of Total	Daily Average per well	Average No. of wells	Quantity (Barrels)	% of Total Liquids	Daily Average per well							Average No. of wells producing	Daily Average per producing well
Trinidad Tere Petroleum Company Limited	74	732,552	10.5	27.1	179	1,037,910	14.9	15.9	888	5,173,929	74.5	14.9	606	1,630,860	19.1	7.4	1,203	15.8	6,944,391	8.3	5,272,509	75.9	1,671,882	24.1
Tereco Trinidad Inc.	87	844,752	11.7	26.6	306	2,479,757	34.5	17.6	684	3,070,991	93.8	17.6	486	6,393,551	47.8	35.3	1,077	18.3	7,195,000	8.6	6,336,864	88.1	859,436	11.9
Premier Consolidated Oilfields Limited	4	6,933	5.6	4.7	-	-	-	-	87	116,838	94.4	3.7	35	62,185	33.6	59.5	91	3.7	122,971	0.1	26,488	21.5	96,583	78.5
Tricentral Limited	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Trinidad Northern Area Limited	111	9,117,648	54.8	225.8	188	5,288,362	38.8	142.5	47	2,578,385	19.2	148.8	235	5,037,515	23.8	88.7	288	178.3	16,888,516	28.3	16,888,516	100.0	-	-
Amoco Trinidad Oil Company	67	10,771,389	82.4	1667.2	18	8,679,815	17.6	1321.1	-	-	-	-	42	8,488,938	14.7	563.7	85	1383.9	48,451,284	58.1	48,451,284	100.0	-	-
Shell Trinidad Limited	85	976,270	32.4	31.5	16	129,916	4.3	22.2	389	1,918,388	63.3	16.7	188	1,114,585	27.8	18.1	434	18.8	3,976,485	3.6	2,636,968	87.4	379,526	12.6
TOTAL	428	52,448,545	62.7	335.7	689	17,527,760	21.8	68.7	2,821	13,641,772	16.3	18.5	1,583	22,736,545	27.2	38.3	3,148	72.8	83,619,877	100.0	80,611,819	96.4	3,007,267	3.6
TOTAL 1976	434	52,646,413	67.8	331.4	708	11,548,835	14.8	44.6	1,855	13,476,387	17.4	19.8	1,478	18,427,488	19.2	34.1	2,997	70.8	77,672,635	100.0	74,686,434	96.2	2,976,201	3.8

NATURAL GASOLINE C.H.P.S. PRODUCTION

	From Oil	From Gas	TOTAL
	bbl.	bbl.	bbl.
Trinidad Tere Petroleum Company Limited	68,877	1,014	61,091
Total 1976	11,482	1,324	92,816

APPENDIX IIIB
DAILY AVERAGE PRODUCTION BY MONTHS FOR ALL COMPANIES - 1977
(ALL QUANTITIES IN BARRELS)

COMPANY	JANUARY	FEBRUARY	MARCH	APRIL	MAY	JUNE	JULY	AUGUST	SEPTEMBER	OCTOBER	NOVEMBER	DECEMBER	TOTAL CRUDE	TOTAL B.O.P.D.
T.T.P.C.L.	567,685	512,914	612,379	588,940	595,868	962,977	576,326	584,926	578,814	599,983	585,564	586,814	6,944,391	
B.O.P.D.	18,318	18,318	19,754	19,631	19,221	18,766	18,591	18,869	19,000	19,354	19,519	18,938		19,826
TRINTOC	242,730	227,156	252,844	243,278	265,783	243,589	254,495	252,832	250,878	248,699	259,514	282,697	3,016,495	
B.O.P.D.	7,830	8,113	8,156	8,109	8,574	8,119	8,210	8,156	8,363	7,764	8,650	9,119		8,264
T.T.I.	648,853	584,321	627,777	591,179	638,216	591,668	684,865	589,186	579,866	571,892	571,752	684,733	7,195,508	
B.O.P.D.	28,931	28,868	28,251	19,786	28,329	19,722	19,512	19,086	19,382	18,448	19,858	19,588		19,714
P.C.O.L.	18,739	9,251	18,324	9,961	11,288	18,468	18,781	18,101	18,328	18,151	9,558	18,117	122,971	
B.O.P.D.	346	338	333	332	362	349	348	326	344	327	318	326		337
T.N.A.	1,549,639	1,378,478	1,488,978	1,385,404	1,412,393	1,358,542	1,412,633	1,402,845	1,392,733	1,427,369	1,338,215	1,358,095	16,888,516	
B.O.P.D.	49,988	49,231	47,773	46,188	45,561	45,285	45,569	45,227	46,424	46,844	44,687	43,552		46,278
AMOCO	4,821,164	3,633,471	4,889,291	4,823,998	4,337,886	4,179,928	4,298,547	4,316,539	3,967,299	4,848,488	4,168,574	4,454,897	49,451,284	
B.O.P.D.	129,715	129,767	129,332	134,133	139,929	139,331	138,663	139,243	132,243	138,597	138,656	143,681		135,483
TOTAL 1977	7,848,818	6,345,583	6,993,593	6,842,761	7,253,266	6,947,156	7,157,647	7,155,629	6,778,318	6,898,592	6,925,169	7,288,553	83,619,877	
B.O.P.D.	227,123	226,628	225,688	228,892	233,976	231,572	238,892	238,827	225,677	222,535	238,839	235,115		229,893
TOTAL 1976	6,762,846	6,372,386	7,886,996	6,612,212	7,845,825	6,834,422	5,154,198	5,675,288	6,248,895	6,465,854	6,529,318	6,974,963	77,672,635	
B.O.P.D.	218,131	219,735	226,832	228,487	227,259	227,814	166,264	183,867	208,238	208,388	217,644	224,999		212,228

Appendix III C
Marine offshore & Land Production - 1977
 (All Quantities in Barrels)

Type of well	January		February		March		April		May		June		Sub-Totals		July		August		September		October		November		December		Sub-Totals		Grand Total			
	Wells	Production	Wells	Production	Wells	Production	Wells	Production	Wells	Production	Wells	Production	January-June		Wells	Production	Wells	Production	Wells	Production	Wells	Production	Wells	Production	Wells	Production	July - December		Av. No of Wells	Production		
													Av. no of Wells	Production													Av. No of Wells	Production				
Marine																																
T.N.A. Soldado	246	1,531,465	246	1,365,843	246	1,465,339	241	1,366,673	241	1,392,879	242	1,341,844	243	8,462,443	242	1,386,543	246	1,388,174	238	1,378,382	251	1,412,897	251	1,324,178	248	1,327,286	248	8,227,572	246	16,698,815		
TEXACO A.B.R.	56	34,138	56	28,548	54	27,968	47	26,723	46	25,283	44	25,428	58	168,888	58	32,448	48	38,941	53	41,382	68	44,736	65	36,172	67	38,882	58	224,343	54	382,343		
A.L.N.	1	7,546	1	9,262	2	6,737	1	3,726	1	7	-	-	1	27,278	-	-	-	-	-	-	-	-	2	2,337	2	2,268	1	4,587	1	31,875		
TEXACO Coava Marine	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	1,815	1	2,392	-	-	-	-	-	-	-	-	-	3,687	1	3,687		
TESORO North Marine	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
TESORO Galeota	15	52,847	15	46,318	15	53,528	15	58,876	15	48,813	15	47,146	15	258,312	15	46,753	15	43,862	15	46,725	15	46,334	15	38,751	14	23,442	15	245,867	15	543,978		
AMOCO	78	4,824,164	77	3,633,471	79	4,888,291	85	4,823,888	87	4,337,886	84	4,178,928	82	24,286,658	87	4,298,547	98	4,316,538	88	3,967,282	88	4,848,488	92	4,168,574	98	4,464,897	98	4,464,897	98	25,246,547	86	48,451,797
Sub Total	396	5,646,362	394	5,882,634	385	5,962,855	389	5,471,388	388	5,886,788	385	5,983,546	381	33,162,283	385	5,775,258	481	5,781,388	488	5,433,881	414	5,862,485	425	5,562,884	436	5,846,687	413	33,988,733	482	67,113,816		
Deviated from shore																																
T.N.A. F.O.S.	14	18,174	18	13,427	11	16,638	14	18,731	14	19,314	13	17,488	13	182,983	13	16,888	11	13,871	11	14,151	12	14,472	11	14,845	14	82,889	12	95,518	12	198,581		
TEXACO A.S.	28	13,173	28	18,932	38	12,153	23	15,532	24	14,187	25	13,131	26	79,878	27	12,987	27	13,813	29	11,712	37	12,954	36	13,988	36	13,655	32	79,878	29	158,157		
TEXACO A.L.S.	1	63	-	-	-	-	-	-	2	288	2	768	1	1,121	2	637	2	614	2	568	1	63	1	57	1	63	2	2,883	1	3,124		
TESORO Guape N. Wells 1181/53	5	897	4	634	5	1,888	4	688	4	837	5	784	4	4,752	5	924	5	786	5	983	5	781	5	781	5	882	5	4,757	5	9,589		
Sub Total	48	32,387	42	24,993	46	28,792	41	34,947	44	34,788	45	32,181	44	187,834	47	38,638	45	29,884	47	27,825	55	28,288	53	28,841	56	37,489	51	181,357	47	369,291		
Marine & Deviated	444	5,678,688	436	5,907,627	441	5,991,647	438	5,506,131	433	5,848,386	438	5,625,647	435	33,350,217	442	5,885,986	446	5,818,382	485	5,488,986	468	5,888,746	478	5,598,845	482	5,883,296	464	34,132,898	448	67,482,387		
Land	2634	1,362,151	2625	1,237,966	2642	1,481,946	2647	1,336,638	2678	1,412,788	2716	1,321,589	2655	8,872,952	2784	1,351,741	2741	1,346,237	2681	1,388,412	2768	1,317,847	2743	1,334,324	2714	1,485,257	2738	8,063,818	2687	16,136,778		
TOTAL Production	3078	7,040,839	3061	6,345,593	3083	6,988,593	3077	6,842,761	3183	7,253,266	3146	6,947,185	3088	41,423,168	3226	7,187,647	3887	7,158,628	3146	6,778,318	3228	6,988,382	3221	6,925,168	3286	7,888,983	3283	42,195,988	3146	83,619,877		

APPENDIX IV
PRODUCTION AND DISPOSAL OF NATURAL GAS - 1977
 (ALL FIGURES OF GAS PRODUCTION IN MSCF)

M = 1,000 STANDARD CUBIC FEET.

	CRUDE OIL PRODUCTION BBLs.	AVERAGE GOR CU. FT./BBLs.	NATURAL GAS PRODUCTION	NATURAL GAS DISPOSAL								PIPELINE LOSSES AND UNACCOUNTED FOR	NOT COLLECTED	NATURAL GAS RECOVERY			USED FOR THE MANUFACTURE OF PETROCHEMICAL	
				SALES TO OTHER COMPANIES	REPLACED IN FORMATION	CONVERTED INTO CNGs	USED AS FUEL		VENTED TO ATMOSPHERE		NATURAL GAS TREATED			AVERAGE PLANT RECOVERY 16/MCF	NATURAL GASOLINE PRODUCED BBLs.	INTER OIL COMPANY SALES		
							IN FIELDS	IN REFINERIES	AFTER UTILIZATION	WITHOUT UTILIZATION	TOTAL							
JANUARY	7,040,810	1,791	12,070,050	2,050,091	75,273	5,709	552,315	1,420,596	830,450	5,024,544	6,654,954	222,407	820,413	445,601	433	5,510	1,840,344	547,910
FEBRUARY	6,345,503	1,744	11,065,130	2,440,503	50,154	5,060	519,400	1,449,005	665,600	5,009,229	5,754,917	150,371	671,720	300,594	442	4,909	1,645,033	400,390
MARCH	6,993,593	1,729	12,091,272	2,323,009	53,655	5,043	505,635	1,534,016	664,225	6,073,235	6,737,460	131,046	720,660	302,511	447	4,093	1,600,521	326,231
APRIL	6,042,761	1,746	11,940,050	2,056,444	22,809	4,355	509,100	1,519,575	503,400	5,592,229	6,175,727	155,665	626,023	292,774	496	4,150	1,773,306	403,601
MAY	7,253,263	1,816	13,160,906	3,319,511	10,733	4,050	636,104	1,709,136	667,419	5,930,130	6,605,549	125,304	750,519	392,640	344	3,060	2,109,974	761,415
JUNE	6,947,156	1,841	12,790,201	3,292,307	23,360	4,900	617,667	1,446,455	736,377	5,004,903	6,621,360	130,519	653,537	412,945	403	4,755	1,020,323	002,553
HALF YEAR TOTAL	41,423,169		73,676,213	17,091,545	244,072	29,205	3,500,301	9,006,703	4,147,657	34,402,350	30,500,007	923,392	4,250,020	2,315,145	424	20,005	10,797,501	3,330,196
JULY	7,157,647	1,026	13,067,704	3,776,400	26,000	5,915	937,690	1,615,104	046,574	4,900,633	5,035,207	144,769	726,513	475,305	415	5,630	2,200,447	002,359
AUGUST	7,155,629	1,741	12,460,575	3,730,972	27,700	5,600	1,024,336	1,001,210	937,054	3,979,599	4,917,453	140,660	723,539	443,710	427	5,422	2,433,394	079,700
SEPTEMBER	6,770,310	1,003	12,204,492	4,279,650	20,367	5,972	059,146	1,746,262	1,062,607	3,316,339	4,370,946	122,165	791,975	446,526	462	5,007	2,340,834	1,152,260
OCTOBER	6,090,592	1,014	12,510,732	4,595,370	14,502	5,910	001,013	1,723,129	1,002,560	3,562,712	4,645,201	234,039	490,600	444,676	450	5,027	2,301,603	1,253,272
NOVEMBER	6,925,169	1,061	12,007,050	4,762,066	-	5,757	962,101	1,405,006	1,140,927	3,747,425	4,097,352	137,664	636,054	429,007	462	5,676	2,050,053	1,499,063
DECEMBER	7,200,553	1,754	12,701,329	4,022,795	-	3,942	970,000	1,012,412	1,122,360	4,031,311	5,153,600	94,917	714,500	320,019	426	3,909	2,209,429	947,642
HALF YEAR TOTAL	42,195,900		75,912,602	25,177,200	90,577	33,104	5,564,162	10,263,203	6,201,000	23,626,010	20,027,010	074,223	4,004,164	2,550,642	442	32,359	13,631,760	6,615,104
YEAR TOTAL	83,619,077	1,709	149,500,095	42,260,706	332,640	62,460	9,064,463	10,340,906	10,340,557	50,020,360	60,377,925	1,797,615	8,334,992	4,074,707	434	60,444	24,429,341	9,946,300
PERCENT DISPOSAL FOR YEAR	-	-	-	28.26	0.22	0.04	6.06	12.04	6.92	30.79	46.71	1.20	5.57	-	-	-	-	-

APPENDIX V
 DESTINATION OF EXPORTS OF CRUDE AND REFINED PRODUCTS FROM TRINIDAD AND TOBAGO - 1977
 (ALL QUANTITIES IN BBL.)

COUNTRY	TOTALS	% OF TOTAL EXPORTS	CRUDE PETROLEUM EXPORTS	L.P.G.	AVIATION TURBINE FUEL	AVIATION GASOLINE	MOTOR GASOLINE	KEROSENE	GAS AND DIESEL OILS	FUEL OILS	LUBES AND GREASES	ASPHALTIC PRODUCTS	OTHER REFINED PRODUCTS	PETRO CHEMICALS
NORTH AMERICA:														
CANADA	705,276	0.822	1,121,653	-	-	-	-	-	22,230	362,596	320,441	-	-	-
U.S.A.	56,254,293	65.537	49,874,442	-	201,530	19,874	9,524,762	3,703,909	1,579,830	40,811,843	799,843	-	-	252,894
TOTAL N.A.	56,959,569	66.359	50,996,095		201,530	19,874	9,524,762	3,703,909	1,602,060	41,174,439	1,120,284			252,894
CENTRAL AMERICA:														
CANAL ZONE	21,412	0.025	-	-	-	10,212	-	-	-	-	-	-	-	3,200
GUATEMALA	635,377	0.740	-	-	-	90,710	88,062	25,123	125,243	295,623	-	-	-	10,608
HONDURAS	1,473,964	1.717	-	-	-	13,614	879,894	33,340	463,215	61,222	-	-	-	22,679
MEXICO	156,004	0.182	-	-	-	-	-	-	156,004	-	-	-	-	-
REP. OF PANAMA	329,670	0.384	-	46,567	-	-	103,640	44,896	126,666	-	-	-	-	7,900
OTHER C.A. (1)	153,884	0.179	-	-	-	42,431	5,512	720	45,439	-	-	-	-	25,243
TOTAL C.A.	2,770,379	3.227		46,567		166,957	1,077,117	204,087	916,567	356,845				69,620
SOUTH AMERICA:														
FRENCH GUIANA	465,937	0.543	-	6,227	15,400	3,700	123,552	6,916	309,684	-	-	1,000	-	-
GUYANA	2,130,362	2.481	-	21,747	70,667	17,004	407,664	109,881	1,064,368	430,611	-	7,430	-	-
SURINAME	4,603,249	5.363	-	-	99,551	8,471	390,885	43,066	1,660,890	2,394,028	-	11,645	-	713
OTHER S.A. (2)	19,070	0.022	-	-	-	-	-	-	-	-	-	-	-	10,071
TOTAL S.A.	7,226,626	8.419		27,974	185,618	28,575	922,091	159,863	3,034,942	2,824,639		20,075		10,784
WEST INDIAN ISLANDS:														
BRITISH (3)	3,617,955	4.215	-	62,670	463,806	26,020	517,922	552,755	1,179,404	747,229	3,904	12,974	52,301	-
FRENCH (4)	684,365	0.797	-	1,843	43,103	-	264,462	102,160	131,442	31,309	-	15,210	14,676	-
NETHERLANDS (5)	1,060,199	1.236	-	-	191,574	-	685,633	-	222,992	-	-	-	-	-
PUERTO RICO	2,957,124	3.445	-	-	-	-	2,079,008	879,521	-	-	-	-	-	-
VIRGIN ISLANDS	103,419	0.121	-	476	-	-	57,136	1,156	44,651	-	-	-	-	-
OTHER W.I. ISLANDS (6)	256,859	0.299	-	-	-	32,681	-	-	-	224,168	-	-	-	-
TOTAL W.I. ISLANDS	8,672,921	10.112		64,989	687,763	58,711	3,602,756	1,615,592	1,578,560	1,002,796	3,904	28,184	66,977	
EUROPE:														
ITALY	515,140	0.600	-	-	-	-	-	-	151,060	-	-	-	-	364,080
NETHERLANDS	2,550,877	2.981	-	-	340,062	-	1,449,663	-	245,653	174,689	-	-	-	339,010
NORWAY	53,040	0.062	-	-	-	-	-	-	-	-	-	-	-	-
SWEDEN	235,527	0.274	-	-	-	-	-	-	-	-	-	-	-	-
UNITED KINGDOM	963,095	1.122	-	-	-	-	-	-	236,527	-	-	-	-	-
WEST GERMANY	324,119	0.378	-	-	406,904	-	79,704	-	456,560	-	-	-	-	20,430
TOTAL EUROPE	4,649,792	5.417			746,966		1,669,667		1,272,372	174,689				723,520
OTHERS:														
AFRICA (7)	1,779,052	2.073	-	-	-	-	400,000	161,702	771,320	333,931	96,851	-	11,170	-
CANARY ISLANDS	1,110,622	1.284	-	-	-	-	-	-	1,026,739	83,883	-	-	-	-
HAWAII	771,029	0.939	-	-	-	-	-	377,029	-	-	-	-	-	-
JAPAN	9,072	0.011	-	-	-	-	-	-	-	-	-	-	-	9,002
NEW ZEALAND	93,727	0.109	-	-	93,727	-	-	-	-	-	-	-	-	-
PHILIPPINES	8,932	0.010	-	-	-	-	-	-	-	-	-	-	-	-
HIGH SEAS*	1,620	0.002	-	-	(279)	-	(624)	(329)	3,070	-	-	-	-	8,432
TOTAL OTHERS	3,379,997	3.938			93,727		403,756	538,402	1,801,137	417,814	96,851		20,170	9,002
TOTAL CARGOES	83,666,225	97.472	50,996,095	139,530	11,921,631	272,136	17,299,345	6,121,933	10,205,596	46,951,212	620,167	48,259	167,493	985,424
FOREIGN BUNKERS	2,160,870	2.520			210,125		1,300	52,251	1,343,309	1,543,733				
TOTAL EXPORTS	85,827,095	100.000	50,996,095	139,530	2,170,396	273,463	17,251,596	6,121,946	10,548,905	47,494,945	620,167	48,259	167,493	985,424

* COUNTRIES NOT DETAILED

(1) OTHER CENTRAL AMERICA - COSTA RICA (80,653), NICARIGUA (30,700), EL SALVADOR (34,531)

(3) BRITISH - ANTIGUA, ANGUILLA, BARBADOS, BEQUIA, CARRIACOU, DOMINICA, GRAND CAYMAN, GRENADA, JAMAICA,

MONSERMAT, NEVIS, ST. LUCIA, ST. KITTS, ST. VINCENT.

(5) NETHERLANDS - ARUBA, CURACAO, SABA, ST. EUSTACIUS.

(7) AFRICA - GAMBIA, IVORY COAST, LIBERIA, NIGERIA, REP. OF BENIN, REP. OF CAMEROON, REP. OF GUINEA, REP. OF SENEGAL, SIERRA LEON.

(2) OTHER SOUTH AMERICA - COLOMBIA (19,070)

(4) FRENCH - GUADELOUPE, MARTINIQUE, ST. BARTHS, ST. MARTIN.

(6) OTHER WEST INDIAN ISLANDS - DOMINICAN REPUBLIC (256,859)

APPENDIX VI
MOVEMENT OF REFINED PRODUCTS - 1977
(QUANTITIES IN BARRELS)

PRODUCTS	Opening Inventory	Production	Imports	Other Receipts	Total	Purchases etc. from other Petroleum Markets	Sales etc. from Other Petroleum Markets		Local Consumption			Exports		Other Disbursement	Closing Inventory	Total
							Own Use	Retails Etc.	Local Bunkers	Total	Cargoes	Foreign Bunkers				
Liquid Petroleum Gas	19,190	464,896	-	6,009	490,095	307,546	301,396	733	303,103	-	303,836	161,506	-	9,756	21,145	496,245
Aviation Gasolines	13,320	367,398	-	-	380,718	60,032	63,059	-	26,137	16,276	42,413	311,332	1,308	(560)	23,198	377,691
Aviation Turbine Fuels	225,738	2,493,360	-	-	2,719,098	932,896	998,665	-	52,710	305,063	357,773	1,999,310	218,725	(184)	77,706	2,653,329
Motor Gasolines	1,490,777	17,597,058	186,564	12,440	19,286,839	2,313,529	1,680,511	13,062	2,507,122	-	2,520,184	15,471,836	52,251	4,884	1,861,542	19,909,857
Kerosine	576,366	5,812,583	-	50,507	6,440,056	272,531	205,661	1,533	265,180	-	266,713	5,824,648	13	1,378	314,174	6,506,926
White Spirit	4,741	16,902	-	-	21,643	12,890	6,666	2,386	18,796	-	21,182	2,917	-	195	3,573	27,867
Gas Oil	587,482	10,293,648	49,896	15,466	10,946,492	1,090,878	1,181,383	69,802	964,433	168,370	1,202,605	8,763,355	87,783	(1,527)	811,771	10,863,987
Marine Diesel	51,331	478,552	-	5,502	535,355	409,312	508,663	120	69,385	2,138	71,643	21,841	255,575	3,603	77,342	436,004
Fuel Oils	2,624,508	56,115,202	1,379,608	1,061,408	61,180,728	3,617,300	3,805,605	1,227,610	275,806	69,941	1,673,357	53,096,304	1,543,733	58,650	4,620,379	60,992,423
Lubes & Greases	90,430	924,224	54,344	19,836	1,088,834	68,399	83,773	10,787	67,748	258	78,713	866,846	10,430	3,059	114,412	1,073,460
Asphalt Products	17,160	202,950	183	13	220,306	148,662	71,864	407	227,350	-	227,757	48,904	-	365	20,078	297,104
Unfinished Oils	2,968,238	(889,889)	-	-	2,078,349	-	-	2,139	-	-	2,139	-	-	-	2,076,210	2,078,349
Petrochemicals	211,275	937,206	10,230	-	1,158,711	7,435	6,940	1,119	7,973	-	9,092	986,317	-	(1)	163,798	1,159,206
Other Finished Products	1,288	55	733	742	2,818	649	716	332	717	-	1,048	11	-	80	1,611	2,751
TOTAL	8,882,445	98,814,115	1,681,559	1,171,923	106,550,042	9,250,059	8,924,902	1,429,950	4,786,460	562,046	6,778,486	87,650,329	2,169,818	79,658	10,186,938	106,875,199

APPENDIX VII

MOVEMENT OF CRUDE AND C.H.P.S. YEAR ENDED 31ST DECEMBER, 1977
(ALL QUANTITIES IN BBLs)

MONTH MONTH	PRODUCTION	IMPORTS	DECREASE IN INVENTORIES	TOTAL	PURCHASES AND EXCHANGES FROM OTHER COMPANIES	SALES AND EXCHANGES TO OTHER COMPANIES	OWN USE	TO REFINERY	EXPORTS	GAIN AND LOSSES	TOTAL
JANUARY	7,053,723	6,393,850	880,663	14,328,236	2,576,554	2,576,554	989	10,243,420	3,914,061	169,766	14,328,236
FEBRUARY	6,354,185	7,920,528	(535,306)	13,739,407	2,965,282	2,348,167 ¹⁾	1,040	10,059,642	3,766,357	(87,632)	13,739,407
MARCH	6,998,489	6,434,804	(290,542)	13,142,751	2,496,166	2,496,166	1,180	8,921,352	4,109,751	110,468	13,142,751
APRIL	6,846,891	5,524,217	(1,247,480)	11,123,628	2,385,776	2,385,776	948	7,573,586	3,481,665	67,529	11,123,628
MAY	7,257,126	5,111,648	1,837,962	14,206,736	2,439,122	2,439,122	1,121	8,664,432	5,459,106	82,077	14,206,736
JUNE	6,951,911	4,396,185	(1,261,169)	10,086,927	2,146,161	2,146,161	722	5,875,191	4,232,219	(21,255)	10,086,927
JULY	7,163,285	3,654,251	845,731	11,663,267	2,405,425	2,405,425	1,361	7,397,732	4,146,878	117,296	11,663,267
AUGUST	7,162,886	6,085,790	(132,536)	13,116,140	2,322,690	2,322,690	1,297	8,600,617	4,503,768	10,458	13,116,140
SEPTEMBER	6,791,376	6,575,453	(727,766)	12,639,063	2,443,963	2,443,963	1,053	8,291,273	4,294,761	51,976	12,639,063
OCTOBER	6,904,184	5,040,674	(254,216)	11,690,642	2,407,960	2,407,943 ²⁾	637	7,852,977	3,762,001	75,027	11,690,642
NOVEMBER	6,931,080	4,133,297	365,255	11,429,632	1,866,924	1,866,924	2,016	7,423,751	3,943,869	59,996	11,429,632
DECEMBER	7,293,109	4,933,172	1,807,157	14,033,438	2,347,662	2,347,662	1,264	8,632,508	5,321,659	78,007	14,033,438

1) 17,115 barrels of TTPCL stock held at Amoco.

2) 17 barrels TTPCL stock held at Amoco.

APPENDIX VIII

Summary of Crude Oil Assessed for Crown Royalty with Prices and Analyses - 1977
(For half yearly assessment periods ending 30th June and 31st December)
1 barrel = 34.9726 l.s.

Company	Net Royalty Production barrels	Royalty		Sub Division of (Royalty) Crude into Products as per RLE Analysis											Crude Oil Weighted Average Gravity A.P.I.	
		10% Assessed bbls	Value \$	Average Price \$/bbl	Light Fractions			GAS - OIL					Fuel Oil			
					Quantity	Percentage	Tetra Ethyl lead To blend to 70/72 Oct Gas RTA	53-57 B bbls	48-52 B bbls	43-47 U.I. bbls	No 2 Fuel bbls	Total Gas Oil bbls	Percentage	Quantity bbls		%
Trinidad Tesoro Petroleum Co. Ltd	2,319,206	231,929	5,713,843.92	24.64	20,006	8.66	339,173.67	232	23	6,429	51,723	58,407	25.18	153,436	66.16	22.0
Tesoro Galoeta	298,912	37,364	1,008,704.83	29.14	4,849	12.98	-				18,541	18,541	49.62	13,974	37.40	-
Premier Consolidated Oil Fields Ltd.	13,076	1,308	33,962.61	25.97	135	10.32	17,364.46		179		293	472	36.09	701	53.59	26.0
Estate of Timothy Roodal	297	30	724.70	24.16	1	3.33	-				9	9	30.00	20	66.67	19.8
Trintec	1,281,457	128,146	3,153,946.56	24.61	16,820	13.13	3,755,535.87	11,106		11,633	2,678	25,417	19.83	85,909	67.84	25.0
Trinidad Northern Areas	8,565,426	856,843	20,746,825.69	24.22	114,255	13.34	30,935,179.68		115,184		-	115,184	13.45	627,184	73.21	24.7
Texaco Trinidad Inc	3,195,781	319,578	8,252,068.50	25.82	42,218	13.21	5,814,186.61	16,844	28,114		55,160	99,318	31.08	178,042	55.71	24.0
Ameco Trinidad Oil Co.	24,205,659	3,825,706	93,700,447.50	38.99	365,493	12.88	22,588,865.46		2,296,882			2,296,882	75.89	364,131	12.03	29.0
Total Averages January - June	39,879,885	4,688,684	132,768,722.51	26.89	563,857	12.25	67,842,384.89	27,382	2,439,582	18,862	128,404	2,613,430	56.81	1,423,317	38.94	-
Trinidad Tesoro Petroleum Co. Ltd.	2,484,289	248,429	6,003,531.74	24.96	21,527	8.95	483,151.83	37	177	6,997	51,785	58,916	24.51	159,987	66.54	22.0
Tesoro Galoeta	246,867	32,633	856,468.87	27.96	4,117	13.44	-				14,995	14,995	48.95	11,521	37.61	-
Premier Consolidated Oil Fields Ltd.	12,863	1,286	33,829.18	25.88	94	7.31	6,438.2		175		265	440	34.21	752	58.48	26.0
Estate of Timothy Roodal	239	24	593.23	24.82	1	4.16	-				7	7	29.17	16	66.67	19.8
Trinidad & Tobago Oil Co.	1,352,988	135,290	3,363,397.71	24.86	17,815	13.17	4,684,547.89	8,887		12,383	2,867	25,857	18.52	92,418	68.31	25.0
Trinidad Northern Areas	8,323,888	832,389	20,388,385.82	24.46	117,874	14.87	39,374,388.88		109,482			109,482	13.15	605,753	72.78	24.7
Texaco Trinidad Inc.	3,112,599	311,268	8,032,388.76	25.80	48,853	13.86	5,688,313.78	15,302	25,579		58,948	91,821	29.50	178,785	57.44	24.0
Ameco Trinidad Oil Co.	25,245,554	3,155,684	94,611,363.55	29.98	388,348	12.31	24,421,386.78		2,376,878			2,376,878	75.29	381,268	12.48	29.0
Total & Averages July-December	48,686,681	4,786,925	133,268,151.78	28.31	589,629	12.53	74,622,431.32	25,226	2,511,481	19,380	128,779	2,636,796	56.87	1,448,508	38.68	-
Years Totals & Averages	88,576,486	9,387,529	266,028,874.29	28.98	1,153,486	12.39	142,464,736.21	52,608	4,951,073	37,362	248,183	5,250,226	56.84	2,863,817	38.77	-

APPENDIX IX
ROYALTY ASSESSMENT

The Royalty assessed on the crude oil, natural gasolene and natural gas produced on Crown oil Mining Leases for each half yearly period during 1975, 1976 and 1977 is shown in the following Table:-

of Revenue	Assessment for half yearly Periods ending					
	31-12-77	30-6-77	31-12-76	30-6-76	31-12-75	30-6-75
	£	£	£	£	£	£
Royalty on Natural Gas	504,139	333,968	357,383	392,663	377,575	388,466
Royalty on Natural Gasolene	106,862	51,669	88,271	81,913	98,783	66,796
Minimum Rent not offset by Royalty on Crude Oil	1,317,899	1,439,337	1,193,199	695,138	729,689	691,238
Royalty on Crude Oil	133,268,152	132,768,723	106,048,587	117,522,726	104,589,214	79,184,547
Half yearly Total	135,189,152	134,593,697	107,671,269	118,692,430	105,337,686	79,248,981
Yearly Total	269,782,848		226,363,718		204,278,578	

The Volume upon which the above assessments were made are as follows:

Substances assessed

For Royalty		31-12-77	30-6-77	31-12-76	30-6-76	31-12-75	30-6-75
Natural Gas	NOF	33,689,381	22,264,588	23,828,228	26,176,846	25,767,648	29,363,788
Natural Gasolene	16	1,888,341	524,181	816,716	795,662	1,062,798	536,387
Crude Oil Net	669	47,863,258	46,886,848	48,911,338	46,373,799	39,181,384	36,882,873
Crude Oil Average Royalty Value	TT	28.31	26.89	25.92	25.88	23.21	18.94

The data used to evaluate crude oil for Crown Royalty Assessment for each of the last six half-yearly periods together with the Royalty rates on kerosene and Petroleum Spirit for each of these periods are shown in the following Table.

Average Price in T.T. Currency per barrel of 34.8726 lb for half year ended.

Product	31-12-77	30-6-77	31-12-76	30-6-76	31-12-75	30-6-75
Bunker C, Grade Fuel	24,189,583	23,877,831	21,332,388	21,511,342	28,761,128	19,828,868
No. 2 Fuel	33,629,313	34,595,520	31,863,948	30,263,191	29,697,388	21,988,631
43-47 Oil Gas Oil	33,738,682	34,682,819	38,347,851	38,842,438	29,841,642	22,144,768
48-52 Oil Gas Oil	33,865,874	34,888,491	31,472,488	30,685,351	29,894,418	22,324,738
53-57 Oil Gas Oil	34,118,019	35,861,436	31,732,529	32,235,351	38,766,127	22,365,852
78-72 Oct W Loaded Motor Gas	34,638,343	36,801,424	36,129,859	34,742,632	32,325,385	23,868,382
Average Middle Rate for eight Draft on NY T.T. Currency for U.S. \$1.00	2,489.88	2,489.88	2,489.88	2,476.883	2,389.624	2,043.865
Value of Toluene Ethyl Lead in T.T. cents per gallon	-0.1095358	-0.0999786	-0.1085626	-0.1071183	-0.0922148	-0.0833821
Royalty in T.T. cents per Gallon on Natural Gasolene (G.R.P.S.)	8.898592	10.318388	9.829646	9.951929	9.283581	6.897837

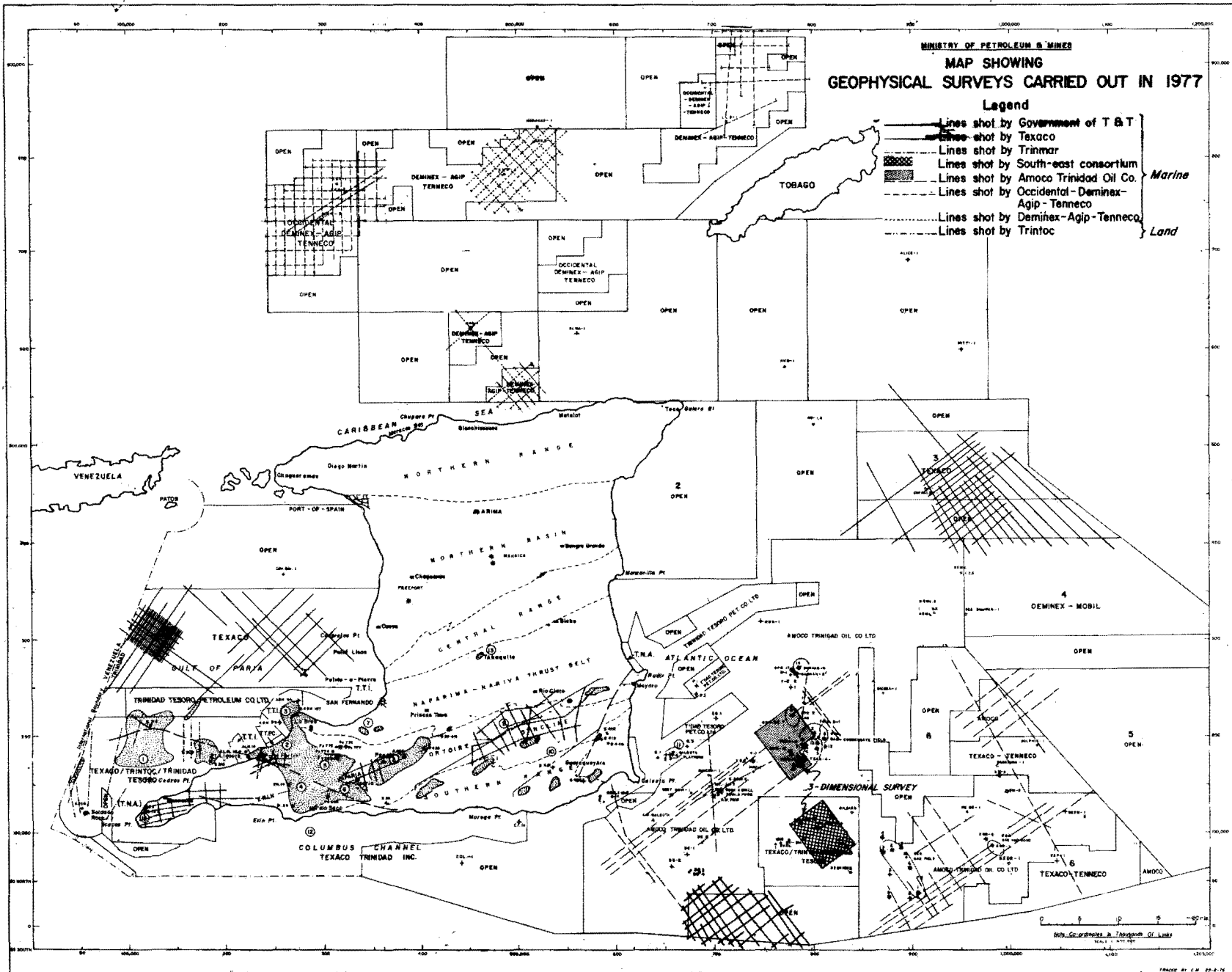
The half yearly of products to which the above prices for 1977 were applied respectively in calculating royalty on crude oil will be found in Appendix VIII

APPENDIX I

The following table shows for the years 1975, 1976 and 1977 the quantity of Asphalt extracted from the Pitch Lake and the quantities of derived products which were exported and consumed locally.

NATURAL ASPHALT		T O N S		
		1975	1976	1977
Extracted by the Ministry of Works for Local Use		31,631	25,451	21,429
Extracted by the Trinidad Lake Asphalt Co.		47,812	39,146	22,167
TOTAL		79,443	64,597	43,596
Derived Products Manufactured by the Company:-				
Exported	Crude Asphalt	-	-	0
	Briefed Asphalt	36,251	27,457	15,162
	Cement Asphalt	832	600	195
	TOTAL	37,083	28,137	15,357
Local Sales	Crude Asphalt	80	104	195
	Briefed Asphalt	210	204	301
	Cement Asphalt	33	400	147
	TOTAL	331	716	528

Note: The above tabulation 1 Long Ton = 2,240 lbs.



MINISTRY OF PETROLEUM & MINES
AREAS UNDER OIL EXPLORATION IN TRINIDAD & TOBAGO
 (ONLY FIELDS AND IMPORTANT WELLS DRILLED)

FIG 11

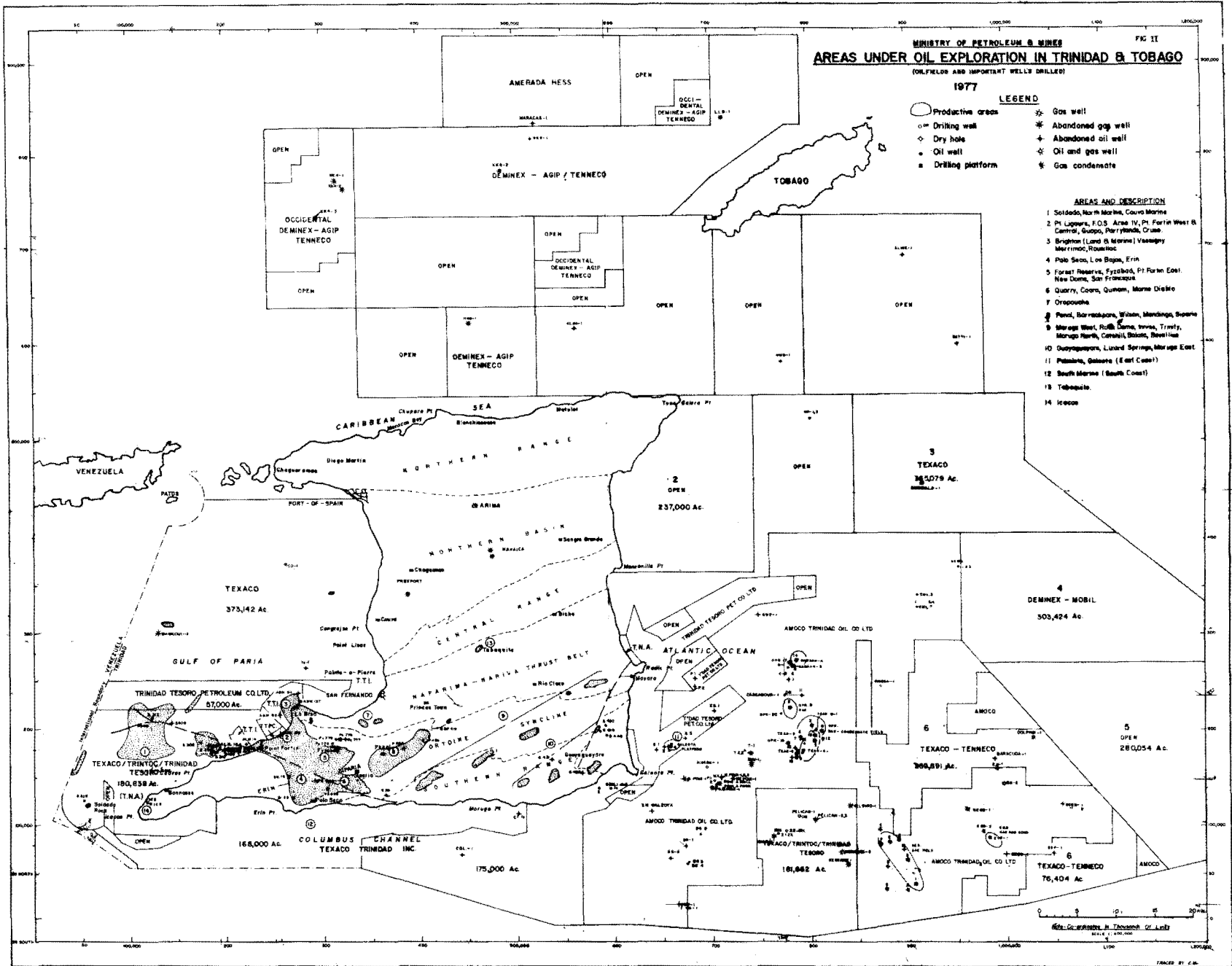
1977

LEGEND

- Productive areas
- ◊ Drilling well
- ◇ Dry hole
- Oil well
- Drilling platform
- ⊗ Gas well
- ⊕ Abandoned gas well
- ⊖ Abandoned oil well
- ⊗ Oil and gas well
- ⊕ Gas condensate

AREAS AND DESCRIPTION

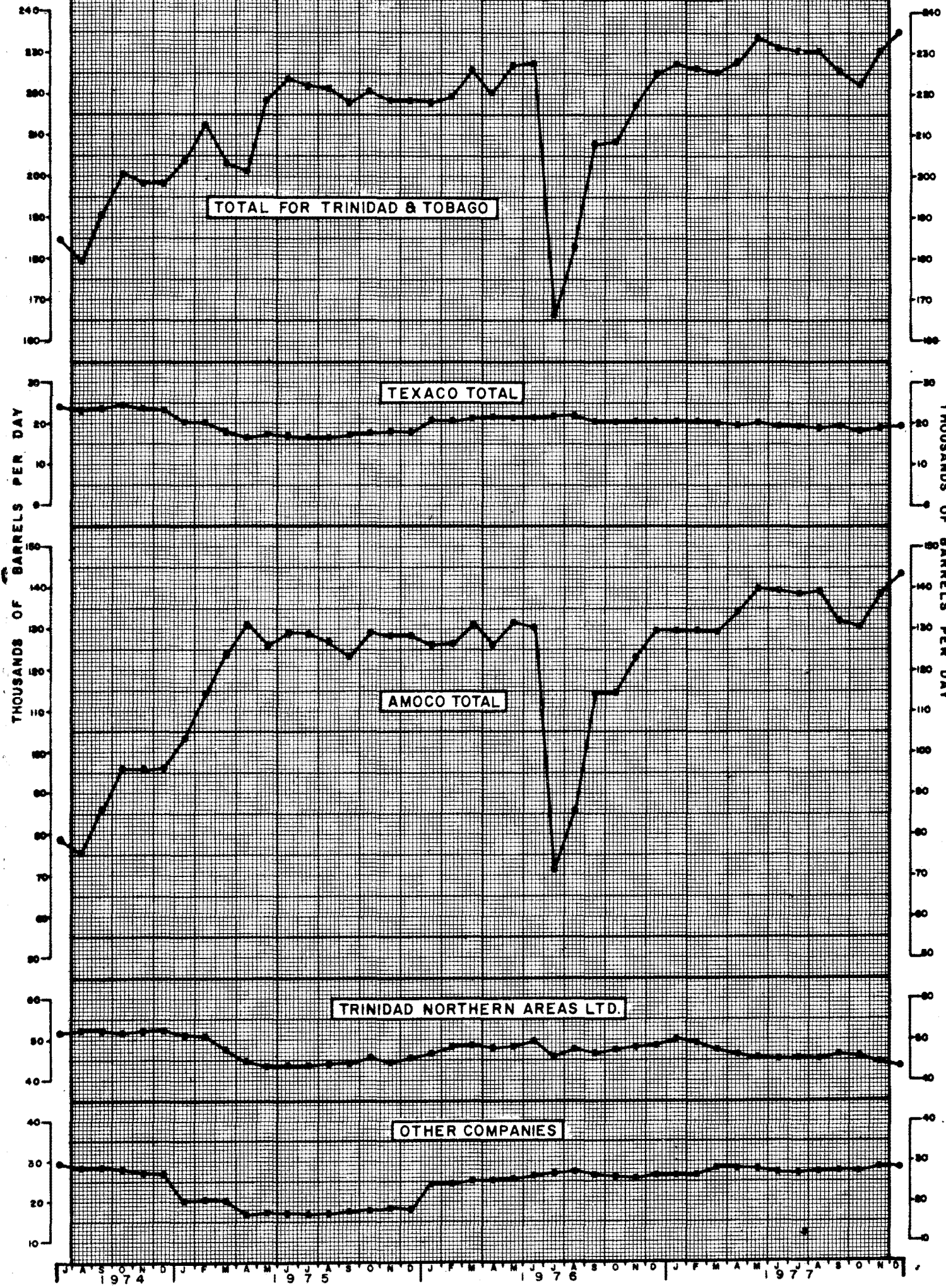
- 1 Saldado, San Mateo, Cueva Morne
- 2 Pt Liguera, F.O.S. Area IV, Pt Fortin West B Canal, Guapo, Parrylands, Cruise
- 3 Brighton (Land B. Morona) Vasegny Morrimo, Rosillos
- 4 Pale Saco, L. on Bago, Erin
- 5 Forest Reserve, Fysshok, Pt Fortin East, New Dome, San Francisco
- 6 Quarry, Coora, Quomom, Morne Diabla
- 7 Orapoveha
- 8 Panel, Barroblanco, Winton, Mandinga, Supero
- 9 Moraga West, Rio Ch., Santa Ines, Tredy, Moraga North, Corozil, Bolato, Newlines
- 10 Quayagayara, Luvard Springs, Moraga East
- 11 Palumbo, Galena (East Coast)
- 12 South Morne (South Coast)
- 13 Tobacuco
- 14 Icooca



Scale: 1:100,000
 Date: 1977

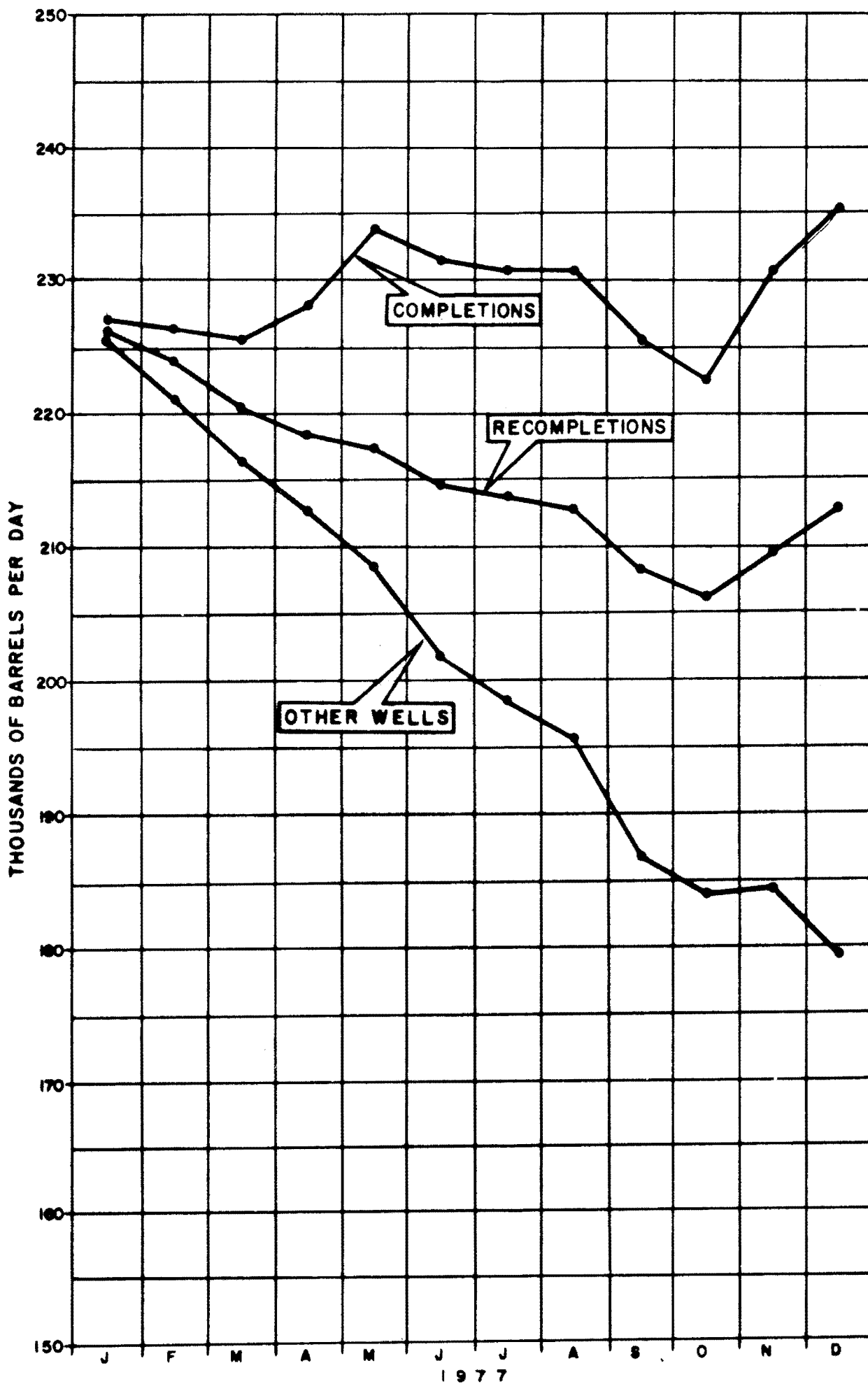
TRINIDAD & TOBAGO

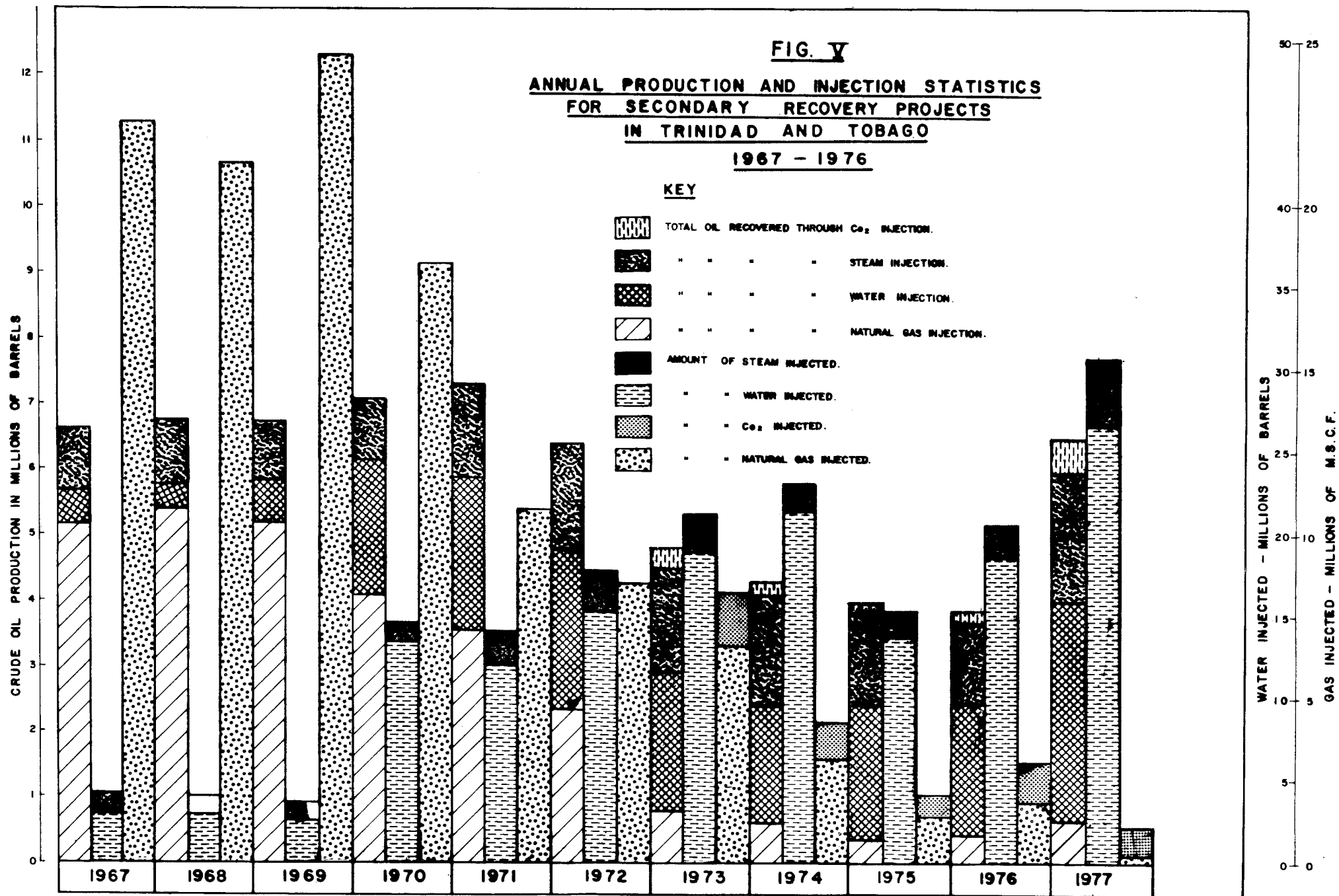
MINISTRY OF PETROLEUM AND MINES
CRUDE OIL PRODUCTION RATE BY MONTHS
 JULY 1974-DECEMBER 1977
 (BARRELS PER DAY)

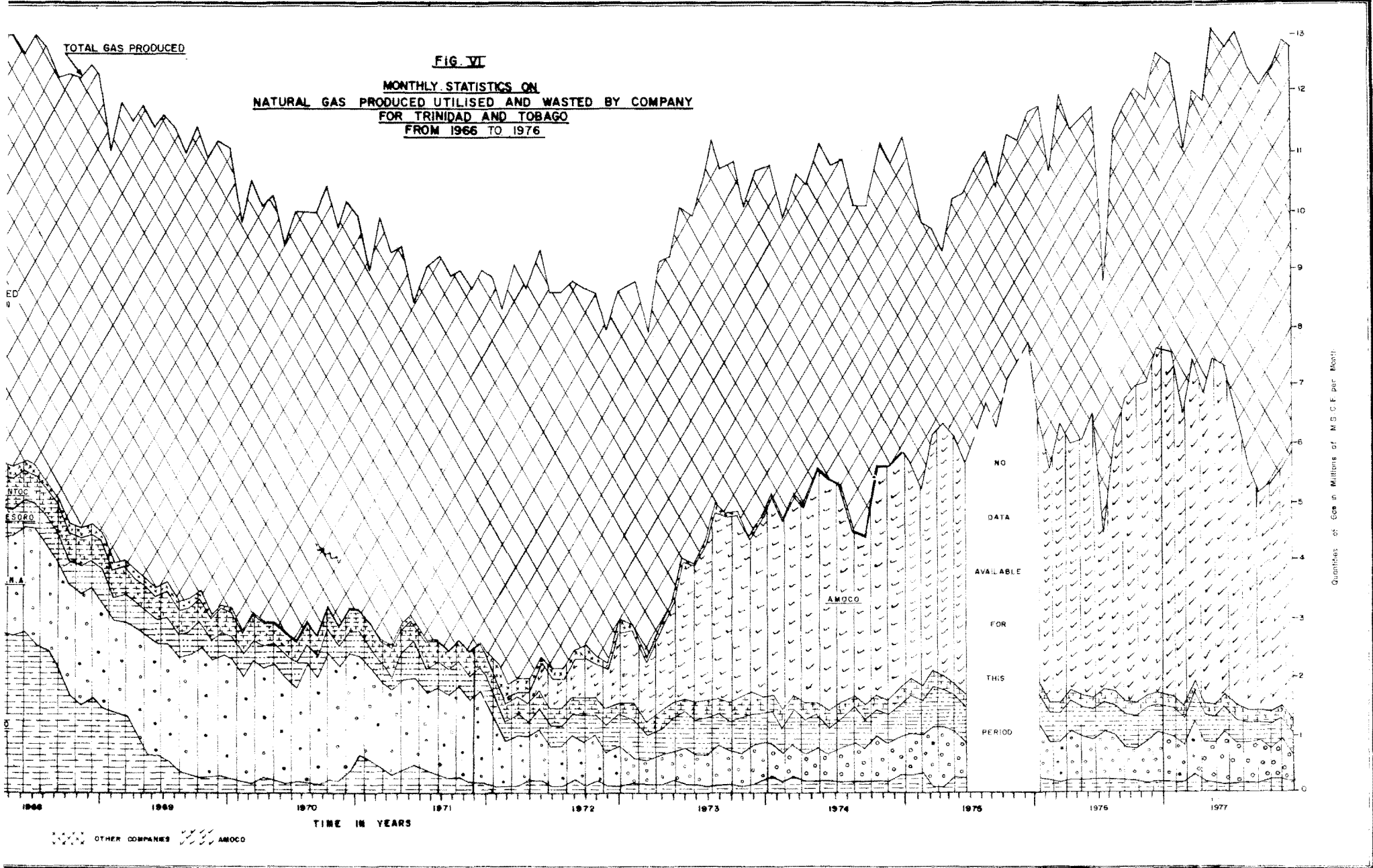


MINISTRY OF PETROLEUM AND MINES
 TRINIDAD AND TOBAGO CRUDE OIL PRODUCTION, 1977

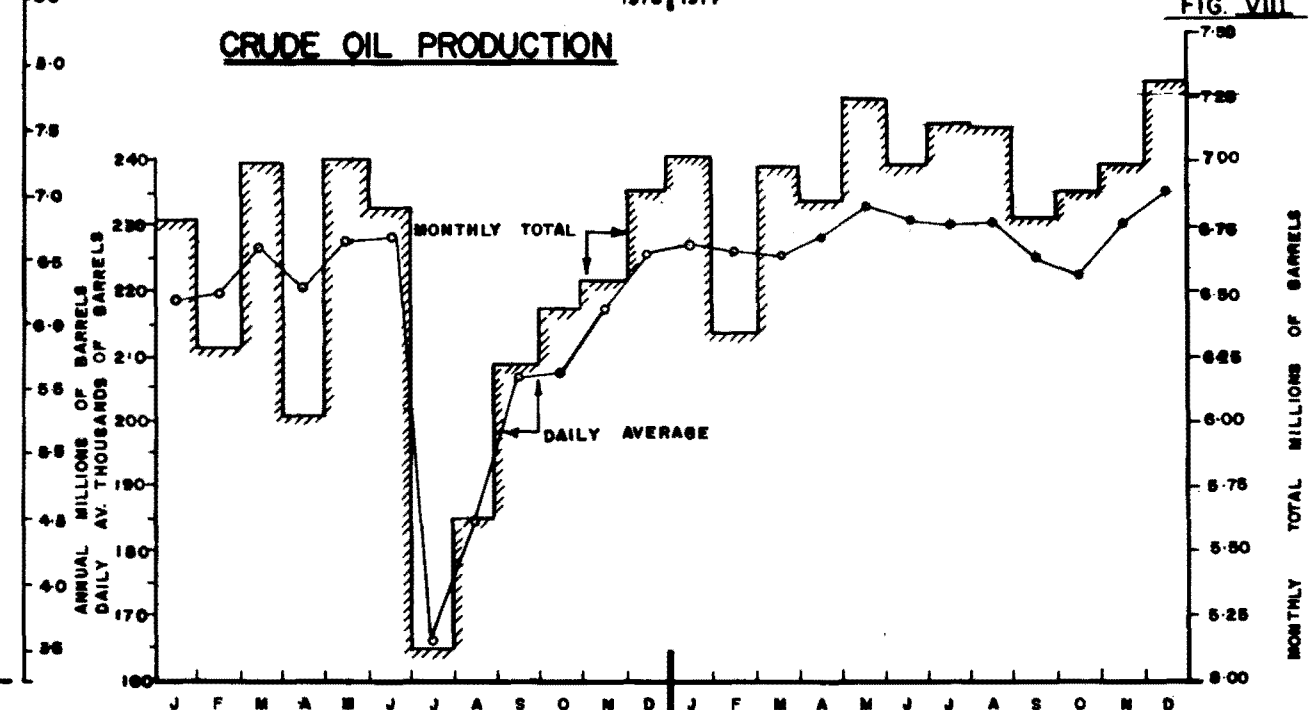
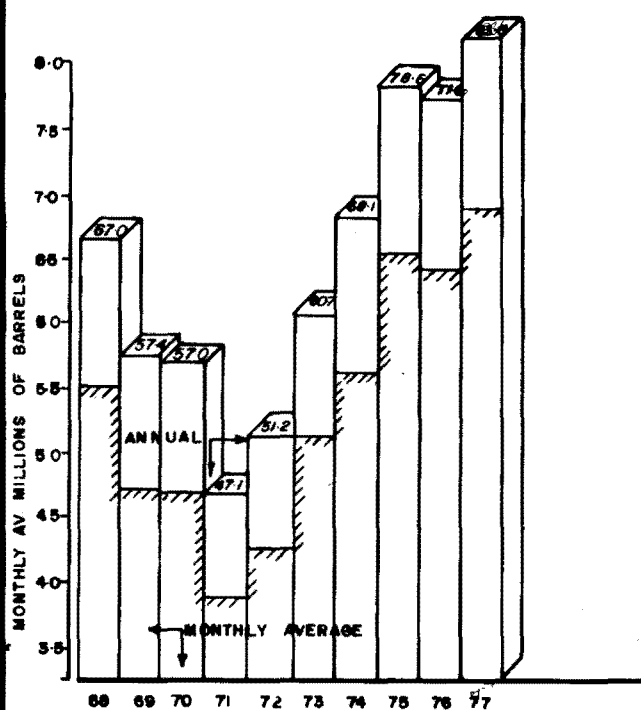
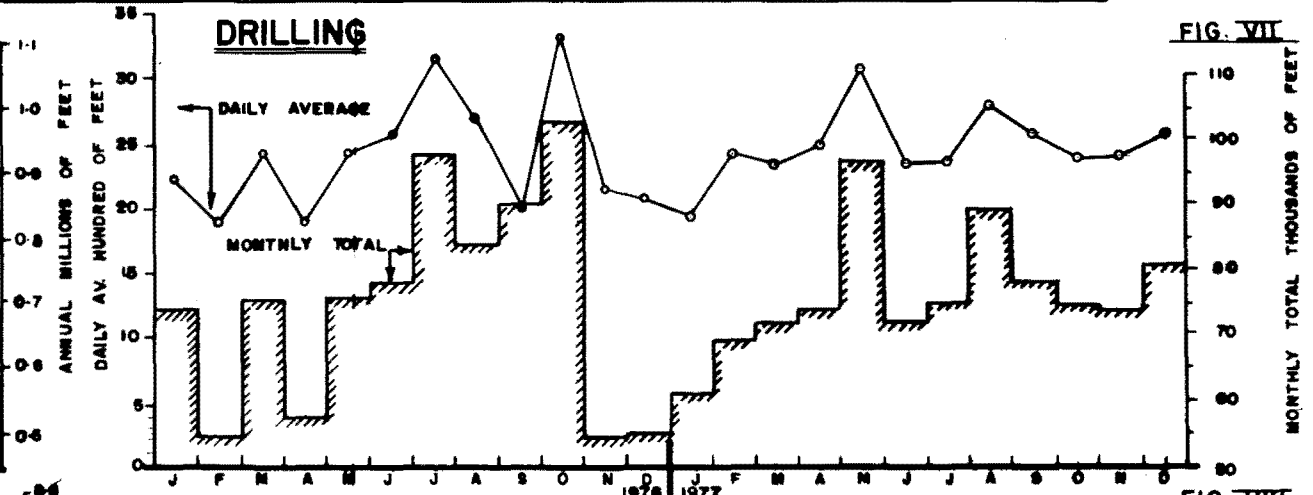
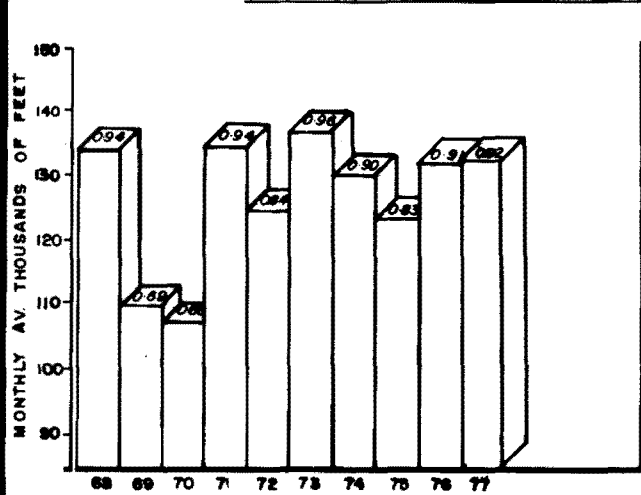
DAILY AVERAGE BY MONTHS
 COMPLETIONS, RECOMPLETIONS AND OTHER WELLS



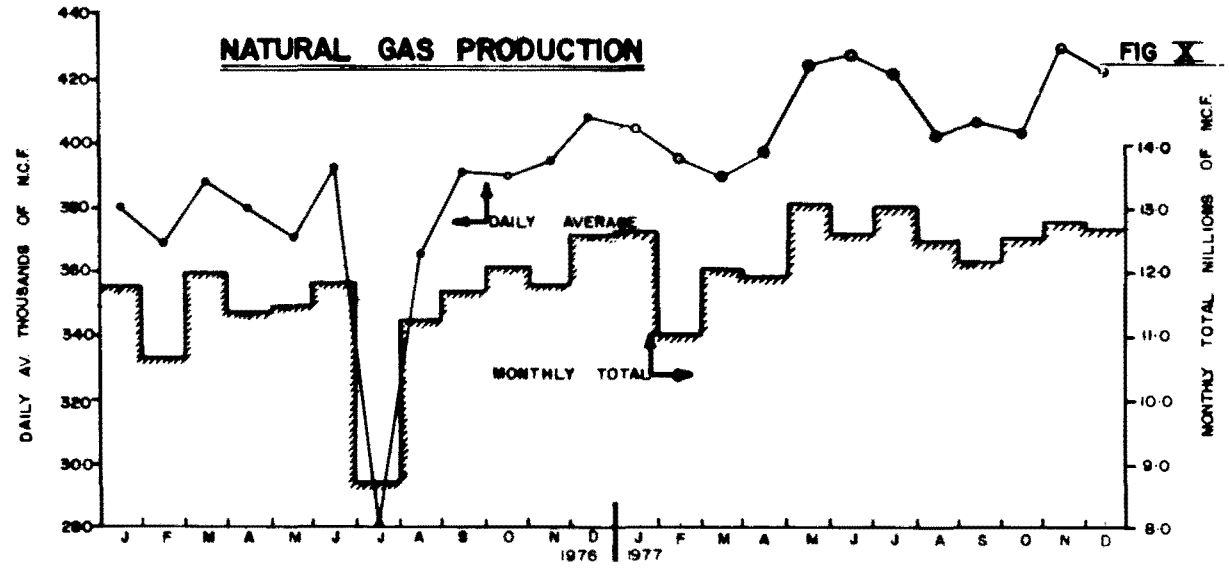
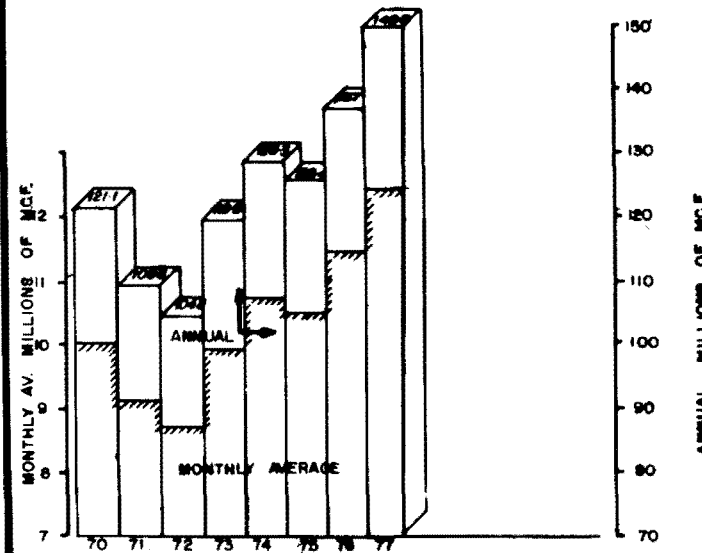
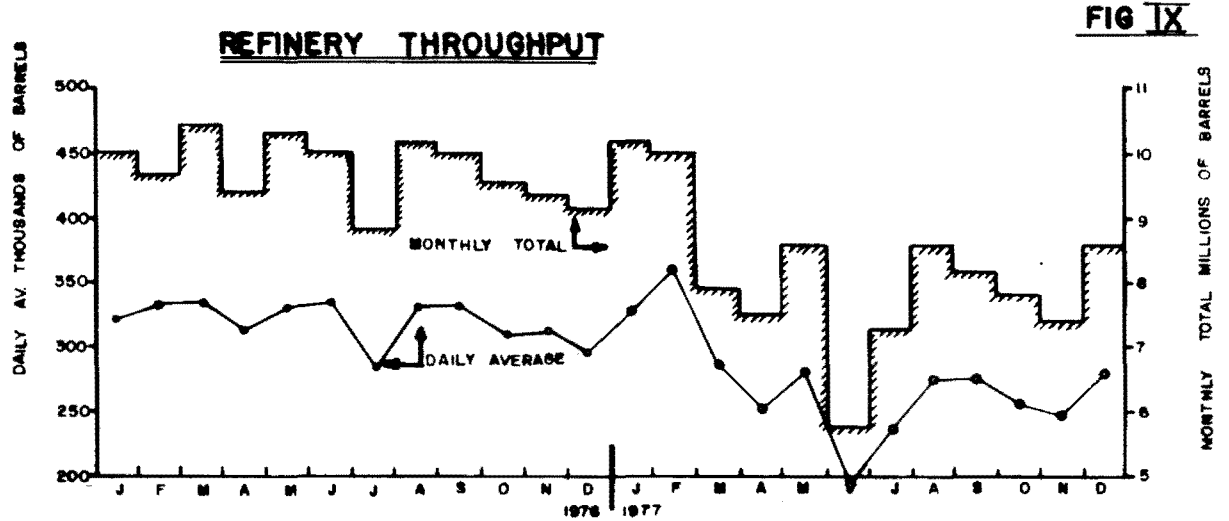
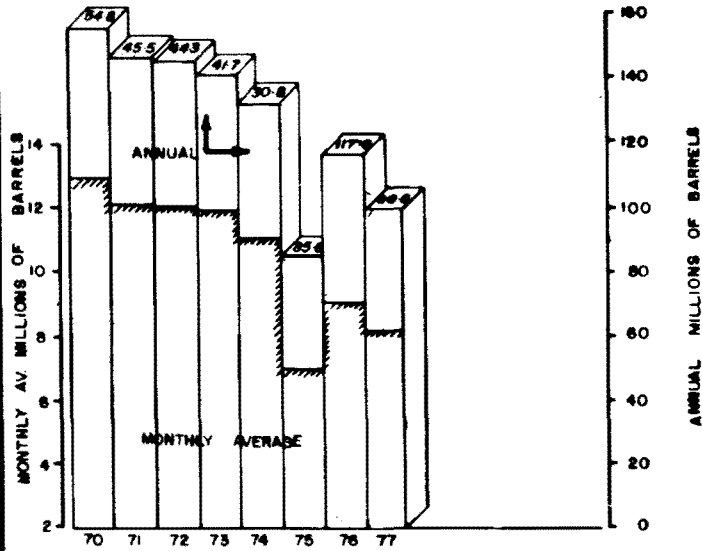




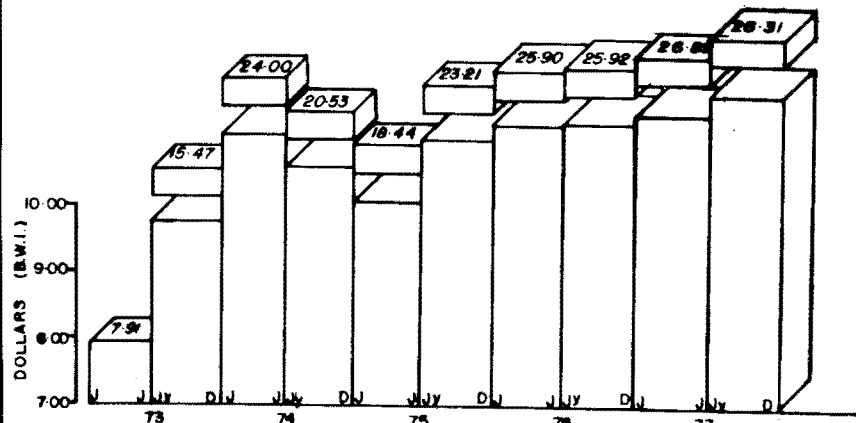
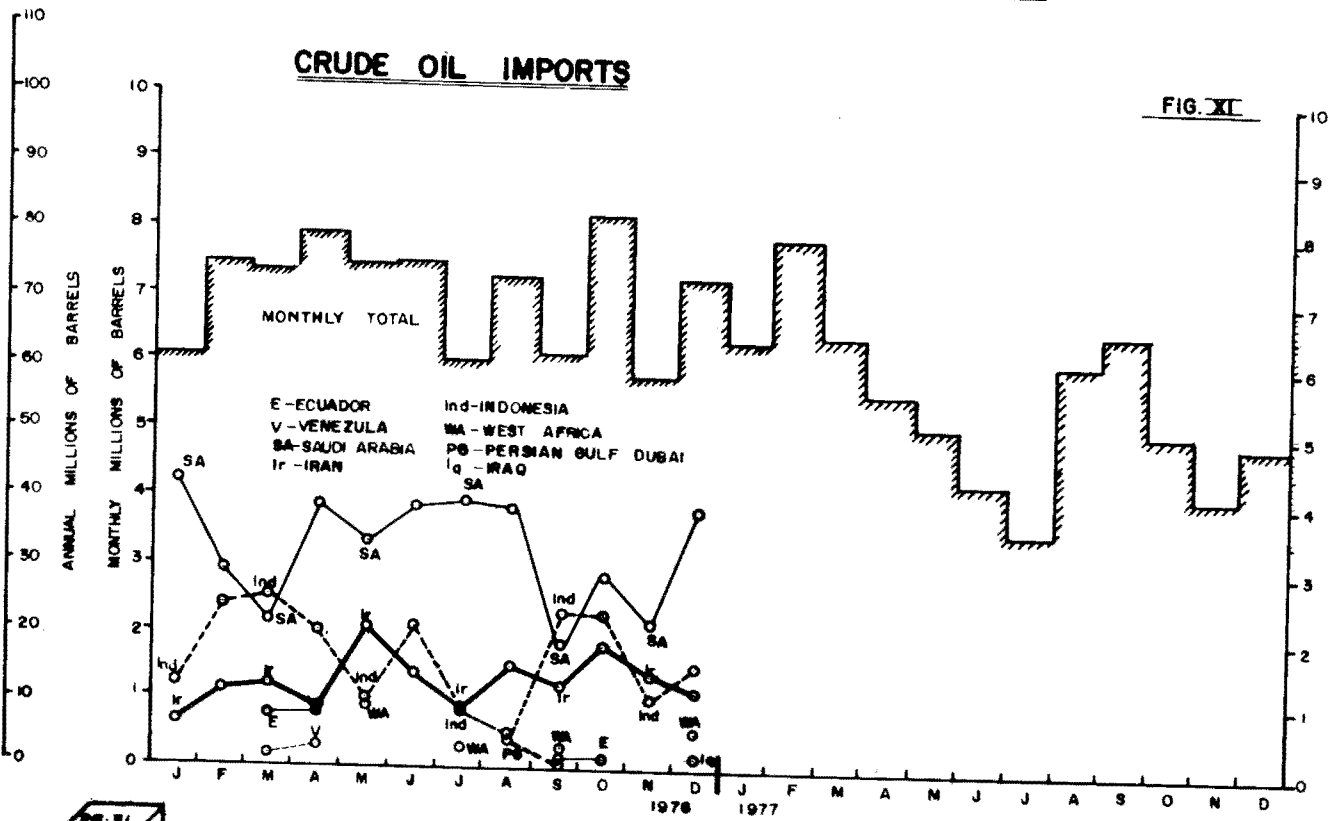
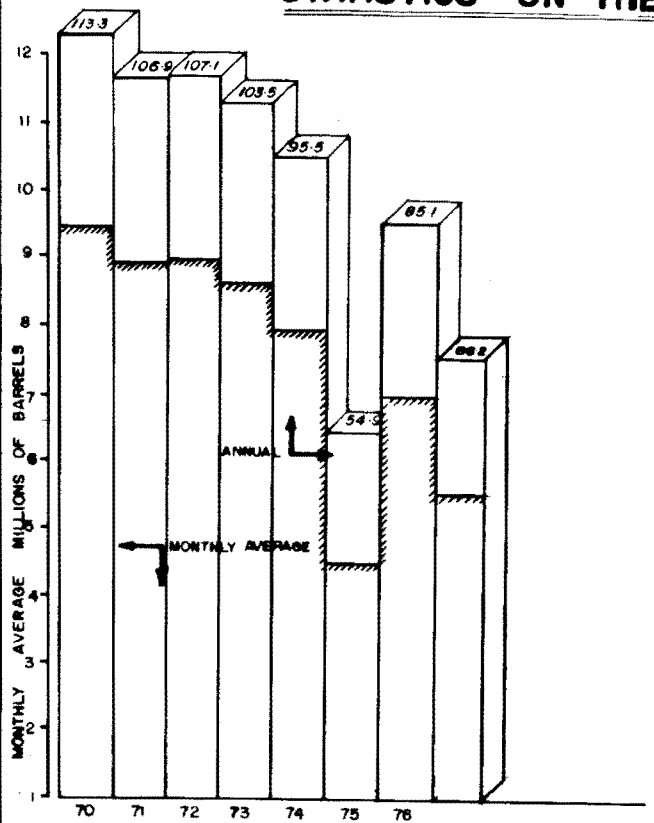
STATISTICS ON THE PETROLEUM INDUSTRY OF TRINIDAD & TOBAGO



STATISTICS ON THE PETROLEUM INDUSTRY OF TRINIDAD AND TOBAGO



STATISTICS ON THE PETROLEUM INDUSTRY OF TRINIDAD AND TOBAGO



AVERAGE VALUE* (For Royalty Evaluation) OF A BARREL OF CRUDE OIL

* AS DETERMINED BY THE METHOD OUTLINED IN THE LAND (OIL MINING) AMENDMENT REGULATIONS, 1953.

GOVERNMENT PRINTERY, TRINIDAD, TRINIDAD AND TOBAGO—1982