

TRINIDAD AND TOBAGO



ADMINISTRATION REPORT

OF THE

MINES DEPARTMENT, 1947

MINES

ADMINISTRATION REPORT OF THE MINES DEPARTMENT 1947

HON. COLONIAL SECRETARY,

I have the honour to submit for the information of His Excellency the Governor, the following report on the Oil and Asphalt Industries of the Colony and on the work of the Mines Department for the year 1947.

The report is set out in the sections, tables, Appendices and Maps as detailed below.

	PAGE
THE OIL INDUSTRY	2
Production of Crude Oil	2
Drilling	3
Refineries	3
Natural Gasoline Recovery Plants	3
Loading facilities	3
Pipelines	3
Tank Storage	3
Leases and Licences	4
Contribution to Revenue of the Colony	4
Local Disbursements	4
Exports	5
Summary	5
THE ASPHALT INDUSTRY	5
THE MINES DEPARTMENT	
Revision of Royalty assessment	6
Returns	7
Inspections	7
Legislation	7
Accidents	7
Staff	8

TABLE I—Statistics

TABLE II—Production Summary

TABLE III—Statement showing Contribution to Revenue of Colony

TABLE IV—Details of Local disbursements

TABLE V—List of Oil and Asphalt Operations

Appendix "A"—Graph showing annual crude oil production

Appendix "B"—Graph showing crude oil production methods

Appendix "C"—Graph showing annual drilling footage

Appendix "D"—Graph showing part of total annual outgoings.

Appendix "E"—Graph showing value of Annual Exports

Appendix "F"—Map of South Trinidad showing Oilfield Areas

The Petroleum Industry

2. The scale of operations in all branches of the Industry throughout 1947 was strictly limited by the general shortage of steel and by the dollar allocations to individual companies which had to be cut during the latter part of the year.

3. Wherever possible purchases of materials were made in the United Kingdom in preference to hard currency countries and it is gratifying to note that the value of the importations from the United Kingdom by the Oil Industry has increased from a C.I.F. value of \$1,438,971 in 1945 to \$6,822,090 in 1947. The importation from foreign currency areas, valued at \$4,758,800 in 1947, represents materials which were either unobtainable from United Kingdom sources or were quoted by U.K. suppliers at such long delivery dates as to be useless for current requirements. In contrast to this hard currency expenditure of the oil industry it should be pointed out that of the Petroleum products exported an appreciable percentage represent direct earnings of foreign currency while the remainder, although sold for sterling, have the effect of reducing the hard currency imports into the sterling area which is short of indigenous oil supplies.

4. In spite of the difficulty in obtaining equipment and supplies, production was very slightly increased over the previous year's figure and drilling was more active.

5. A considerable amount of geological work was done in order to demarcate areas for deeper exploratory drilling. Seismic work was carried out by three field parties, two of whom completed their programmes during the year. Preliminary gravity surveys were commenced on a large scale, the area examined including parts of the Gulf of Paria.

PRODUCTION OF CRUDE OIL

6. The total production of crude oil for the year 1947 was 20,520,554 barrels, an average of 56,220 barrels per day. This represents an increase of 1.42 per cent over last year's figure.

7. Statistics relative to crude oil production are shown under item numbers, 0, 1, and 22-27 inclusive on Table I, items 1 and 25 being reproduced in graph form in Appendix "A". In Table II a detailed monthly breakdown of production methods is given, the annual production contributed the principal producing methods being graphed as a percentage of total production in Appendix "B".

8. Attention should be called to the variation in the average daily production per producing well. This figure increased from 31 barrels per day in 1933 to a maximum of 41 barrels per day in 1940 since when it has declined to 30 barrels per day in 1947. (See Table I, item 25, also Appendix "A".)

9. The steady increase in the average from 1933 to 1940 was due to the rapid increase in drilling after the slump period of 1931-1933 and also to a tendency on the part of some operators to neglect artificial lifting methods with the result that the ratio of the number of flowing wells to those on artificial lift increased abnormally during this period being 1 : 1.84 in the peak production year of 1940. In that year 69 per cent. of the total production was produced by natural flow and over 250 wells were lying idle which had been closed in when the period of natural flow ceased. These wells represented a potential production of over 5,000 barrels per day.

10. The decline in daily average production per well since 1940 is due to two main causes. Firstly, greater attention has been paid to artificial lift wells, the back-log of idle wells having been considerably reduced so that the ratio of the number of flowing wells to those on artificial lift is a more normal one being 1 : 2.00 in 1947. Secondly, for a number of reasons stated below, the daily average production per flowing well has fallen from 79.0 barrels per day in 1940 to 54.2 barrels per day in 1947, a drop of 31 per cent. (The average daily rate for artificial lift wells fell by 11 per cent. in the same period.)

11. The daily average production for flowing wells (item 26 of Table I) fell from 79.0 barrels per day in 1940 to 69.2 barrels per day in 1941 due to deliberate restriction of flowing production to counter temporary lack of off take occasioned by war time conditions. Since 1941 the following four factors have contributed to the further fall in this average :—

1. Smaller number of wells drilled per year since 1942. In December, 1940, 50 per cent. of all flowing wells were less than one year old whereas in December, 1945 only 15 per cent. were less than one year old.
2. Increasing attention to gas oil ratios, resulting in many cases in reduction of average choke sizes and hence in production rate.
3. Increasing attention to bottom hole pressure determinations, necessitating the closing in of flowing wells for periods varying from several days to several months.
4. Increasing number, year by year, of inter-spaced wells as compared to out-steps and successful exploratory wells, the former being drilled into reservoirs whose initial pressure has fallen due to previous drilling.

These four factors have all been operating simultaneously and in view of the importance of number 4 above to the future of the industry, an attempt has been made to apportion the contribution each factor has made.

12. The effect on daily flowing well average in subsequent years produced by the sudden drop, in drilling in 1942, (Factor 1 of the preceding paragraph) was probably just about balanced by the concentration of drilling rigs, during 1942, 1943, and 1944, on the most productive locations only, in order to meet a minimum barrels of oil per ton of steel war time requirement. Factors 2 and 3 of paragraph II represent improvements in operating practice, in that they tend to increase ultimate production.

13. Factor 4 of paragraph II will result in a slow fall in the daily average unless offset by exploratory drilling discovering new reservoirs. Attention should here be directed to item 17 Table I. It will be noted that in 1939 of the 228 wells completed 17 or seven per cent. were dry holes. During the whole of the war period 1940-1945 inclusive, of the 1,060 wells completed, only 41, or less than four per cent. were dry holes. In 1947 however, with the resumption of a more or less normal division of footage between exploitation and exploration, of the 157 wells completed, 16, or over 10 per cent., were dry holes. These dry holes represent a capital investment of over \$3,000,000 for which outlay there will be no return. It must be emphasised that, owing to the small amount of exploration done during the war, an annual expenditure on exploration considerably in excess of \$3,000,000 per annum will have to be faced, and a dry hole percentage in excess of 10 per cent. will probably result, during the next two or three years, if the Colony's proved crude reserve is to be maintained at its present figure of about 250,000,000 barrels.

DRILLING

14. Drilling again showed an increase over the previous year. 162 oil wells were commenced and 157 were completed during the year, the comparable figures for 1946 being 124 and 108 respectively. The total number of oil wells completed in the Colony to the end of 1947 was 4,537 of which 3,037 are on Crown oil-rights and 1,500 are on private lands.

15. The number of feet drilled during 1947 amounted to 644,689, an increase on 111,510 or 20.91 per cent. on the footage for 1946.

16. Statistics relative to drilling will be found in Table I, items 14-21 inclusive; the annual footage, item 18, and the average depth per well, item 21 being shown in graph form in Appendix "C".

17. The reduction in the average depth per well completed in 1947 as compared to the previous three years is due to a successful shallow well programme in the Penal area where a Franck's portable rig was in use.

18. Experiments with oil base mud were commenced and one company completed two wells by this method.

19. The depth of the deepest well completed in the Colony is 11,042, the same as last year. It is expected that this record will shortly be broken when new heavy drilling equipment, at present on order becomes available.

20. The number of oilfield operators in the Colony during the year was 14 as compared to 15 in 1946, one of the operators having assigned his oil interests at Fyzabad to the National Mining Corporation.

REFINERIES

21. Eight permits for the refining of oil were issued during the year under the Oil Mining and Refining Ordinance. Five of these permits were issued in respect of small field topping plants. The total topping capacity of the refineries operating in the Colony is approximately 95,000 barrels per day; in addition there is a cracking capacity of 50,000 barrels per day. Crude run to stills (item 13 of Table I) amounted to 25,281,000 barrels, an increase of 11.3 per cent. on last year's figure.

22. The installation of a vacuum asphalt plant was commenced by the United British Oilfields of Trinidad, Ltd., at their Point Fortin refinery and was nearing completion at the end of the year,

23. Plans were under consideration by Trinidad Leaseholds Limited for increasing their storage capacity and tanker handling facilities in order to facilitate a considerable increase in the importation of foreign crude for refining and re-export which in 1947 amounted 5,896,000 barrels, an increase of 103.8 per cent. over the figure for 1946 (item 8 Table I). Imports are expected to increase during the next few years to an annual total of about 12,000,000 barrels at which figure refinery capacity surplus to that required for processing indigenous crude at its present rate of production will be filled. The existence of this surplus capacity is mainly due to the Air Ministry plant near Pointe-a-Pierre which was installed during the war years and which was purchased by Trinidad Leaseholds Limited after the war. It is hoped that the facilities given to the industry to import foreign crude for processing will result in the establishment of a substantial refining business whose maintenance and future expansion will not be dependent on the results of local exploratory drilling.

NATURAL GASOLENE RECOVERY PLANTS

24. Three plants for the recovery of natural gasoline were in operation during the year. Two of these are charcoal adsorption plants, the other being an oil absorption plant. A little compression gasoline is also made. Production remains steady (item 2 Table I) and is not likely to vary much.

LOADING FACILITIES

25. Four deep water piers equipped for loading tank vessels with crude oil or its products are in use and are situated at Point Fortin, Brighton, Point D'Or and Pointe-a-Pierre respectively. Bunkering facilities are also available in Port-of-Spain Harbour.

PIPELINES

26. No important addition to the crude oil pipe line system was made during the year, the increase in mileage of pipes authorised under the Pipelines Ordinance from 376 in 1947 to 390 last year being of a temporary nature only.

TANK STORAGE

27. The total main storage capacity for crude oil and refined products amounted to 8,342,087 barrels at December 1947, an increase of 5 per cent. over last year. Preparations for the erection of additional storage were being made at the end of the year and a considerable increase may be expected during the next eighteen months in order to facilitate the handling of imported crude and its products.

LEASES AND LICENCES

28. One principal lease was registered and five exploration licences were renewed during the year. The total number of Mining Leases and Exploration Licences over land areas in force at the end of the year amounted to 87, the details of which are as follows :—

	ACREAGE					
	Crown Oil Rights Crown Lands			Crown Oil Rights Alienated Lands		
	A.	R.	P.	A.	R.	P.
82 Mining Leases ...	160,125	3	36	56,809	2	32½
5 Exploration Licences ...	130,379	0	07	—	—	—
<u>87 Total</u>	<u>290,505</u>	<u>0</u>	<u>03</u>	<u>56,809</u>	<u>2</u>	<u>32½</u>

In addition to the above mentioned Crown Oil Rights under Mining Lease, there are, according to details supplied by the Oil Companies, 115,477 acres of privately owned oil rights under lease.

The total acreage of Crown and Private oil rights under oil mining lease or licence on the 31st December, 1947 is therefore 462,792 acres (about 38.8 per cent.) of the total area of Trinidad.

CONTRIBUTION TO THE REVENUE OF THE COLONY

29. Direct contributions to revenue made by the oil industry are shown in detail in Table III. It will be noticed that the four largest sources are Income Tax (item 3), Royalties on Oil (item 7), Harbour Dues (item 13), and Customs (item I).

30. The increase in receipts from Income Tax in 1947 (item 3) is accounted for by the rapid rise in the value of crude oil since January, 1946 with corresponding increase in the incomes of the producing companies, also by virtue of the reciprocal relief arrangement come to with the United Kingdom Government, under the provision of the Income Tax (Amendment) Ordinance, 1947, for the avoidance of double taxation.

31. A considerable further increase under this head may be expected in 1948 since substantial rises occurred in crude prices during 1947 and the income tax has been increased from 40 to 45 per cent. effective from 1st January, 1948.

32. The increased revenue during the year from royalties on oil (item 7—III) is due to the sale of crude oil taken as royalty in kind. This is discussed in detail in paragraphs 43 and 44 below. A considerable increase under this head is expected during 1948, when owing to the revision of royalty rates described in paragraphs 45 to 54 below, a total balance of approximately \$1,220,000 in respect of the years 1946 and 1947 is expected to be collectable. In addition the new royalty rate corresponding to January, 1948 crude prices will be over 27.6 cents per barrel as compared to the previous rate of 8 cents per barrel. The total amount collectable during 1948 from royalties and dead rents is estimated at \$3,800,000 as compared to \$1,040,000 in 1939.

33. Harbour dues on petroleum cargoes (item 13) are showing a steady rise and will continue to do so for several years as the imports of foreign crude increase. Although these dues are not paid by the refining companies, being for ship's account, they are a direct charge on the industry and must be considered as part of the industry's contribution to revenue.

34. The drop in Customs receipts (item I) in 1946 was mainly due to reduced purchases from U.S. sources immediately after the war.

35. The amount collected as excise on local sales of motor spirit (duty 18c. per gallon) and on kerosene (duty 6c. per gallon) is shown as a matter of interest (Table III, item 21). The excise duty is paid by the general public and cannot therefore be considered as part of the industry's direct contribution to revenue. It must be remembered however that although the Oil industry's consumption of petroleum products is excise free the existence of a prosperous oil industry in the Colony stimulates a number of other industries and so increases the overall consumption of petroleum products. Moreover, if there were no local oil industry, petroleum products would have to be imported and, if the excise duty were to remain the same as at present, retail prices would be higher.

LOCAL DISBURSEMENTS

36. The sum expended annually in the Colony by the Oil Industry other than in direct contributions to revenue, is shown by Table IV. It will be noted that while the total number of persons employed by the industry has varied but little in the past ten years (*see* graph, Appendix "D"), the payments to employees, plus payments to contractors (which are largely wages) has more than doubled in the same period.

37. Items 5 and 8 of Table IV plus item 18 of Table III which amount to over \$43,000,000 for 1947 give some indication of the trend of the total outgoings of the industry. It must be appreciated, however, that the above figure does not include contributions to United Kingdom income tax in past years, nor the cost of operating, purchasing and selling organisations, nor various other charges in connection with Administration.

It will be noted that the portion of the total expenditure shown has increased from \$22,000,000 for a production of 19,680,000 barrels in 1939, to \$43,000,900 for a production of \$20,433,000 barrels in 1947, practically a hundred per cent. increase in expenditure per barrel produced.

EXPORT OF PETROLEUM AND ITS PRODUCTS

38. The quantity of petroleum and its products, other than petroleum bitumen, exported during the year (Table I, items 10-12) showed an increase of nearly two and a half million barrels as compared with 1946. The increase was due to the increased importation of foreign crude for processing and re-export. The export of local crude to Canadian Refineries jumped from 263,000 barrels in 1946 to 881,000 barrels in 1947. The rapid rise in Gulf prices during 1947 produced a large jump in the value of petroleum exports, the amounts and values for 1946 and 1947 based on Customs and Excise Department figures being :—

		\$	c.
1946.	20,432,076 barrels valued at	41,520,918	00
	Petroleum bitumen (Company's figures) ...	1,438,926	00
	Total	\$42,959,844	00
1947.	22,926,397 barrels valued at	61,897,237	00
	Petroleum bitumen (Company's figures) ...	1,253,869	00
	Total	\$63,151,106	00

Over 23 per cent. of the above total for 1947 represents the re-export value of blended or refined products of imported crudes. The products of that portion of the crude import not purchased by a local refiner are handed back to the owner who pays in United States currency for the refining service.

39. Petroleum and asphalt and their products continue to form the largest part, namely, 78.80 per cent. of the Colony's export during 1947.

The value of the leading staple products of the Colony exported during 1947 is shown in the following table :—

	Value \$	Percentage of Total
Petroleum and asphalt and their products ...	64,822,420	78.80
Sugar, Molasses and Rum	9,957,334	12.10
Cocoa	3,205,049	3.90
Fruits and Fruit Juices	1,052,740	1.28
Coconuts, Copra and Coconut Oil	789,022	0.96
Bitters	378,925	0.46
Coffee	250,014	0.30
Other Exports not enumerated	1,806,728	2.20
	\$82,262,232	100.00

40. The combined values of petroleum and asphalt together with their products exported annually is shown in Appendix "D" graphed as a percentage of the total annual value of the Colony's exports. This graph most clearly shows the vital importance of the oil and asphalt industries to the overall economy of the Colony. The maintenance of this economy at its present level depends solely on exploratory drilling being successful in discovering new oil reservoirs.

SUMMARY

In 1947 the Oil Industry contributed in direct taxation 16.8 per cent. of the Colony's total revenue. By reason of increased yield from income tax and oil royalties it is expected to contribute an even more impressive percentage of total revenue in 1948, possibly 25 per cent.

An analysis of production shows that the present trend of the daily average production per well is a slow decline and that unless new oil reservoirs are discovered by exploration drilling this trend is likely to continue. In view of the importance of the industry to the overall economy of the Colony the exploration programme must be carefully watched.

As a result of favourable prices the industry is showing considerably increased profits, 45 per cent. of which are collected by the Trinidad Treasury, dividends are limited by consent, and a large proportion of what profit remains is spent on exploration. Future taxation policy should be designed to respond to any sign that the exploration programme may show of inadequacy to maintain reserves.

The Asphalt Industry

41. Production of natural asphalt from the Pitch Lake was somewhat less than last year due to a smaller consumption by the Public Works Department for use on the roads of the Colony.

Plans were under consideration for modernizing the refining plant and additional tankage was under construction at the end of the year.

42. The following Table shows the quantity of natural asphalt produced and the method of disposal:

<i>Production</i>	1945	1946	1947
Removed by Public Works Department free of royalties	34,121	35,263	25,350 tons
Removed by Company (royalty 60c. per ton of dry asphalt content) ...	28,997	58,588	61,996 tons
Total dug from Lake ...	63,118	93,851	87,346 tons

DISPOSAL OF COMPANY'S PRODUCTION

Crude Asphalt	856	585	342 tons
Dried Asphalt	10,914	29,063	32,360 tons
Asphalt cement	9,506	29,843	25,470 tons
	21,276	59,491	58,172 tons

NOTE—Disposal figures do not balance with production since there is a water loss on refining and oil is added to make asphalt cement.

Nearly the whole of the Company's production is exported; the principal markets being Australia and the United Kingdom.

The revenue collected in royalty and export duty in 1947 did not amount to the minimum dead rent of \$115,200 specified under the terms of the Pitch Lake lease. The operating company was accordingly liable for the balance.

The Mines Department

The work of the department was seriously restricted owing to the posts of Government Geologist and 2nd Assistant Petroleum Technologist remaining unfilled. Shortage of staff was aggravated by the absence from the Colony during the entire year of the Acting Inspector of Mines and Petroleum Technologist who was on duty in London in connection with revision of royalty assessment. This threw considerable extra responsibility and work on the remaining staff in Trinidad.

REVISION OF ROYALTY ASSESSMENT ON CRUDE OIL

43. Of the 82 Crown Mining leases in force at the end of the year, 9 were of an old type and the remaining 73 were of a standard type issued under the Land (Oil Mining) Regulations, 1934.

44. The old type leases all contain a provision enabling the Governor at his option to take 10 per cent. of the crude oil produced as royalty in kind; alternatively, the Governor may receive payment in cash of the royalty specified in the lease.

45. During the War period two of these old type leases were paying 1/6 per ton, royalty, three were paying 2/- per ton, two were paying 3/- per ton, and two, by deed of variation, were paying royalty at the current rate specified in Schedule II to the Land (Oil Mining) Regulations, 1934, namely 8c. per barrel.

46. The seven old type leases which were paying royalty on a tonnage basis produced 9,257,900 barrels in 1945, as compared with the 7,589,000 barrels from leases issued under the 1934 Regulations. On the cessation of hostilities and after the removal of war-time price controls, the whole royalty situation was examined. It became apparent that with the rising price of oil products the royalty contributed by these seven old type leases did not represent an adequate percentage of the value of the crude. Accordingly, early in 1946 the Governor gave the lessees notice of intention to exercise his option to take 10 per cent. of the production as royalty in kind. After negotiation, the lessees agreed to buy back the oil taken as royalty in kind, as from 18th July, 1946, at a price of 40/- per ton, equivalent to a royalty of 4/- per ton or 13.7 cents per barrel. This was a fair return at the crude prices then prevailing.

47. In 1939 Government gave notice to lessees under the Land (Oil Mining) Regulations, 1934 (which provide for a royalty of not less than 10 per cent.), that it required a new method of assessment of the royalty. It was agreed to postpone negotiations on this matter until after the war. Negotiations were re-opened in London in January, 1947 and were completed early this year.

48. The Trinidad Government asked for a 10 per cent. royalty on the Field Storage value of the crude, effective as from 1st January, 1946, and suggested that the field storage value should be related to the value of a United States crude comparable in quality to Trinidad average crude and one whose export price at Gulf Ports for world markets was ascertainable.

49. After negotiations protracted by legal and technical difficulties, it was agreed that Trinidad average crude approximated closely to the quality of West Texas sour crude which was to be used as an indicator of price change. It was further agreed to identify the F.O.B. deep water values of these two crudes in order to ascertain the field storage value of Trinidad crude.

50. The F.O.B. value at Gulf Ports of West Texas sour crude was taken as the posted field price of this crude plus 25 United States cents per barrel—the Humble Pipe Line Companies tariff for transporting West Texas crude to seaboard. The corresponding tariff from Fyzabad fields to

F.O.B. Pointe-a-Pierre for Trinidad crude was ascertained by Messrs. Peat, Marwick, Mitchell & Co., Chartered Accountants, who examined the Trinidad transportation cost, on behalf of the Trinidad Government, to be 10.7 United States cents per barrel.

51. The field storage value of Trinidad crude for the purpose of assessing royalty on the production of leases issued under the Land (Oil Mining) Regulations, 1934 as from 1st January, 1946 was thus established as the posted field price of West Texas sour crude *plus* the difference in transportation tariffs from field to F.O.B. deep water terminal (that is $25.0 - 10.7 = 14.3$ U.S. cents per barrel).

52. The wording of an amendment to the Land (Oil Mining) Regulations, 1934, describing the calculation of royalty based on the above valuation of Trinidad crude was under discussion with the Oil Companies at the end of the year.

53. When this amendment to the Land (Oil Mining) Regulations, 1934 is published a balance will be collectable on the two year period commencing 1st January, 1946 representing the difference between the royalty at the new rate and that which has been paid already at the old minimum rate of 8c. per barrel.

54. The new royalty rate varies with the A.P.I. gravity of the oil and for crude of 23.0-23.9 A.P.I. gravity, which is the average A.P.I. gravity of Trinidad crude, the position is as follows:—

<i>Royalty period</i>		<i>Rate in cents per barrel for crude 23.0- 23.9 A.P.I.</i>	<i>Approximate balance collectable</i>
January-June, 1946	11,594,114	\$ 120,000
July-December, 1946	15,080,447	260,000
January-June, 1947	18,214,936	350,000
July-December, 1947	21,185,604	490,000
			1,220,000

By reason of the rapid rise in prices during the last quarter of 1947 it is expected that the royalty rate for the period January-June, 1948 will be not less than 27.6 cents per barrel. The differences between the old and new methods of assessment are briefly as follows:—

55. Under the old method the value of a hypothetical barrel of oil containing 80 per cent. of Bunker "C" grade fuel oil and 20 per cent. of 64 Beaume motor spirit was ascertained from the Gulf export prices of these two products. The producer's realization was assumed to be 60 per cent. of the value of this hypothetical barrel, the refiner getting 40 per cent. The average ascertained value of this barrel over a three year period was fixed to a royalty scale designed to yield about 10 per cent. of the assumed producer's realization. While oil prices remained low this method of assessment was adequate but with rising prices the producers got more than 60 per cent. of the ascertained value of the hypothetical barrel and the royalty yield began to fall below 10 per cent. of the producer's actual realization.

56. The new method of assessment avoids any assumptions as to refining costs, or as to producer's realizations, which in a small closed market such as Trinidad may not always be an equitable basis for royalty assessment. The local crude is now valued, as described in paragraph 51 above, by reference to the open market (West Texas) price of a U.S. crude of comparable quality.

· RETURNS

57. Returns submitted by the Oil Companies under the various Ordinances and Regulations in respect of their operations have been regularly received and after being checked have been filed with the records of the Department.

INSPECTIONS

58. The operations on the various oilfields were inspected by Officers of this Department as frequently as possible, and I have pleasure in recording that the Managers have readily co-operated in ensuring that the provisions of the Ordinances and Regulations were effectively carried out.

LEGISLATION

59. The Petroleum (Amendment) Ordinance, 1947, was published, effective as from 18th January, 1947. Under this Ordinance the amount of petroleum products which can be stored in certain city and Borough areas, under licence issued by the Inspector of Mines, was increased from 12 to 25 tons. This amendment was introduced in order to permit greater storage capacity at approved gasoline filling stations.

ACCIDENTS

60. All fatal and serious accidents which occurred on oilfields and refineries, factories and quarries during the period under review have been investigated, as in the past, by officers of this Department under the Mines, Borings and Quarries Ordinance, Ch. 26. No. 4, and the Prevention of Accidents Ordinance, Ch. 30. No. 3, and, where necessary, recommendations have been made to the employers with the object of reducing the incidence of such accidents to a minimum. During the year 1947 four fatal accidents occurred in the Petroleum Industry as compared with two for the year 1946.

STAFF

61. Mr. W. N. Foster, Acting Inspector of Mines and Petroleum Technologist, was absent from the Colony from 8th January, 1947 on duty when he proceeded to London in connection with revision of royalty assessment methods. During his absence Mr. I. S. Rutherford, Acting Assistant Petroleum Technologist was in charge of the Department.

62. It is with very great regret that I have to record the death of Mr. Nelson Betancourt, I.S.O., F.Inst.Pet., Assistant Inspector of Mines, on the 13th October, 1947. Mr. Betancourt served in this Department for 38 years and retired on the 1st February, 1946, but accepted re-engagement as Head of the Gulf of Paria Boundary Commission, which position he occupied at the time of his death.

63. Mr. R. V. O'Neill, Senior Clerk of this Department, was transferred on promotion to the Department of Works and Hydraulics with effect from 10th October, 1947.

Mr. C. Niles, Senior Clerk, Judiciary, was appointed to replace Mr. O'Neill.

Mr. H. O. Roberts, 1st Class Clerk, was granted 30 days vacation leave from 5th August, 1947.

Miss W. Samlalsingh, 1st Class Clerk, was granted 84 days vacation leave from 1st September, 1947.

I have much pleasure in recording the very able and willing assistance I have received from all members of the Staff.

19th August, 1948

W. N. FOSTER,
*Acting Inspector of Mines and
Petroleum Technologist*

TABLE I—ANNUAL STATISTICS OF PRODUCTION, DRILLING, EXPORTS AND IMPORTS

Item	Unit	1947	+ difference 46/47	1946	1945	1944	1943	1942	1941	1940	1939	
0	PRODUCTION Crude Oil as per previous Administration Report (see footnote)	1,000's Bbls.	20,520	—	20,233	21,093	21,635	21,385	22,069	20,506	22,227	19,742
1	Crude Oil	do.	20,433	+ 1.4	20,142	21,000	21,543	21,286	21,962	20,393	22,128	19,680
2	Natural Gasoline	do.	181	— 3.2	187	182	185	182	197	219	208	159
3	TOTAL CRUDE AND NATURAL GASOLINE	do.	20,614	+ 1.4	20,329	21,182	21,728	21,468	22,159	20,612	22,336	19,839
4	From Crown Oil-rights	do.	15,373	— 1.1	15,541	16,878	17,430	17,089	17,833	15,424	16,717	13,920
5	From Private Oil-rights	do.	5,241	+ 9.5	4,788	4,304	4,298	4,379	4,326	5,188	5,619	5,919
6	IMPORTS (ALL OILS)	do.	5,917	+ 101.7	2,933	3,394	3,188	1,101	1,365	4,048	830	302
7	Imports of Refined Products	do.	21	— 47.5	40	409	840	365	—	—	—	15
8	Imports of Crude Oil for refining	do.	5,896	+ 103.8	2,893	2,119	1,082	—	83	241	399	287
9	Imports of Other Oils for refining and blending	do.	—	—	—	866	1,266	736	1,282*	3,807*	431*	—
10	EXPORTS (ALL OILS)	do.	22,926	+ 12.3	20,432	20,651	19,754	15,860	19,063	15,851	20,173	17,600
11	Exports of Crude Oil	do.	881	+ 234.9	263	—	—	—	—	161	228	217
12	Exports of Refined Products	do.	22,045	+ 9.3	20,169	20,651	19,754	15,860	19,063	15,690	19,945	17,383
13	CRUDE RUN TO STILL	do.	25,281	+ 11.3	22,713	23,170	22,498	21,086	21,914	20,812	22,060	19,415
14	NO. OF WELLS COMMENCED	As stated	162	+ 30.6	124	110	105	127	169	270	283	239
15	NO. OF WELLS COMPLETED	do.	157	+ 45.4	108	100	100	136	163	285	276	228
16	No. of Wells completed as Oil Wells	do.	141	+ 35.6	104	95	96	133	156	275	264	211
17	No. of Wells Completed as Dry holes	do.	16	+ 300.0	4	5	4	3	7	10	12	17
18	FOOTAGE DRILLED (ALL WELLS)	Feet	644,689	+ 20.9	533,209	453,872	456,957	493,731	623,398	935,254	1,021,287‡	830,235‡
19	Footage drilled on Crown Oil-rights	do.	446,798	+ 10.0	406,017	345,071	352,988	389,527	546,233	785,487	824,222‡	581,864‡
20	Footage drilled on Private Oil-rights	do.	197,891	+ 55.6	127,192	108,801	103,969	104,204	77,165	149,767	197,065‡	248,371‡
21	AVERAGE DEPTH OF WELLS COMPLETED IN EACH YEAR	do.	4,155	— 12.9	4,772	4,586	4,535	3,620	3,750	3,276	3,684	3,635
22	NO. OF WELLS PRODUCING (Average during Year)	As stated	1,876	+ 3.1	1,820	1,735	1,637	1,591	1,630	1,516	1,483	1,357
23	No. of Wells producing (Average during year) by Flowing	do.	625	+ 0.2	615	634	642	628	618	561	530	478
24	No. of Wells producing (Average during year) by Artificial Lift	do.	1,251	+ 3.8	1,205	1,101	995	963	1,012	955	953	879
25	AVERAGE DAILY PRODUCTION DURING YEAR PER PRODUCING WELL	Barrels	30.0	— 1.3	30.4	33.3	36.1	36.8	37.1	37.1	41.0	39.9
26	AVERAGE DAILY PRODUCTION DURING YEAR PER FLOWING WELL	do.	54.2	— 1.5	55.0	59.5	63.9	64.8	67.8	69.2	79.0	76.3
27	AVERAGE DAILY PRODUCTION DURING YEAR PER ARTIFICIAL LIFT WELL	do.	17.8	— 0.6	17.9	18.2	18.3	17.5	18.3	18.2	19.7	19.9

The difference between Items 0 and 1 is due to Item 0 including about ½ of total production of Natural Gasoline which was not disposed of as such but blended with crude oil at field storage.

* Include Refined Products.

‡ Figures do not include water well footage as in previous Administration Reports.

Petroleum Office,
San Fernando.

I. S. RUTHERFORD,
Acting Assistant Petroleum Technologist.

TABLE II
ANNUAL PRODUCTION SUMMARY, YEAR ENDING 31ST DECEMBER, 1947

MONTH	Light Fractions returned to Crude	Per Cent.	FLOWING				GAS/AIR LIFT				PUMPING				PLUNGER LIFT			OTHER METHODS				Total No. Producing Wells	Total No. Idle Wells	Total No. Wells Abandoned	No. of Wells Drilling	Total No. of Wells Started	Daily average per producing Well	PRODUCTION: DRY OIL IN BARRELS OF 35 IMPERIAL GALLONS				Total	
			No. of Wells	Production	Per Cent.	Daily Average per Well	No. of Wells	Production	Per Cent.	Daily Average per Well	No. of Wells	Production	Per Cent.	Daily Average per Well	No. of Wells	Production	Per Cent.	Daily Average per Well	No. of Wells	Production	Per Cent.							Daily Average per Well	No. of Wells	Crown	No. of Wells		Private
January ...	6,467	0.4	587	999,179	60.1	54.9	57	55,305	3.3	31.3	864	498,684	30.0	18.6	233	100,831	6.1	14.0	15	1,407	0.1	3.0	1,756	1,298	778	18	3,850	30.5	1,230	1,272,838	526	389,035	1,661,873
February ...	6,046	0.4	617	941,946	60.6	54.5	62	48,204	3.1	27.8	881	465,466	29.9	18.9	227	91,297	5.9	14.4	39	1,539	0.1	1.4	1,826	1,239	784	15	3,864	30.4	1,269	1,194,215	557	360,283	1,554,498
March ...	6,869	0.4	623	1,046,672	60.6	54.2	54	45,661	2.6	27.3	904	528,168	30.5	18.8	223	99,950	5.8	14.5	50	1,759	0.1	1.1	1,854	1,217	788	17	3,876	30.1	1,288	1,288,617	566	440,462	1,729,079
April ...	6,397	0.4	632	1,031,265	60.9	54.4	48	51,457	3.0	24.4	902	504,352	29.8	18.6	221	99,231	5.8	15.0	45	1,490	0.1	1.1	1,848	1,233	790	19	3,890	30.5	1,276	1,223,080	572	471,112	1,694,192
May ...	7,517	0.4	633	1,042,664	59.9	53.1	60	61,948	3.6	33.3	924	521,231	29.9	18.2	218	106,008	6.1	15.7	53	1,842	0.1	1.1	1,888	1,207	792	18	3,905	29.8	1,299	1,278,258	589	462,952	1,741,210
June ...	6,970	0.4	620	1,001,067	59.3	53.8	56	62,324	3.7	37.1	917	508,807	30.2	18.5	227	106,975	6.3	15.7	50	1,834	0.1	1.2	1,870	1,228	798	19	3,915	30.1	1,289	1,258,952	581	429,025	1,687,977
July ...	7,453	0.4	629	1,017,556	58.8	52.2	54	60,101	3.5	35.9	926	534,253	30.8	18.6	222	110,221	6.4	16.0	57	2,181	0.1	1.1	1,888	1,225	802	18	3,933	29.6	1,305	1,286,953	583	444,812	1,731,765
August ...	6,730	0.4	624	1,058,053	60.5	54.8	53	63,654	3.6	41.6	940	526,291	30.0	18.0	223	95,369	5.4	13.8	56	1,606	0.1	0.9	1,896	1,230	806	18	3,950	29.8	1,307	1,308,127	589	443,576	1,751,703
September ...	7,160	0.4	631	1,026,724	60.0	54.3	58	61,462	3.6	35.3	937	508,347	29.7	18.1	223	105,510	6.2	15.8	55	1,894	0.1	1.2	1,904	1,234	810	17	3,965	30.0	1,316	1,278,877	588	432,220	1,711,097
October ...	6,695	0.4	639	1,074,780	60.7	54.2	50	68,488	3.9	44.4	947	521,685	29.4	12.3	226	97,551	5.5	13.9	57	1,897	0.1	1.1	1,919	1,229	814	18	3,980	29.8	1,327	1,333,560	592	437,536	1,771,096
November ...	6,136	0.4	638	1,051,729	61.0	54.9	52	66,642	3.9	43.6	966	505,991	29.4	17.4	226	89,535	5.2	13.2	50	1,244	0.1	0.8	1,932	1,224	820	14	3,990	29.7	1,339	1,297,407	593	423,762	1,721,169
December ...	6,129	0.4	626	1,074,043	60.9	55.3	58	63,467	3.6	35.2	974	525,858	29.7	17.4	223	94,025	5.3	13.6	53	1,373	0.1	0.8	1,934	1,222	829	19	4,004	29.4	1,336	1,330,262	598	434,633	1,764,895
TOTALS ...	80,569	Avge. 0.4	Avge. 625	12,365,678	Avge. 60.2	54.2	Avge. 55	708,613	Avge. 3.5	34.8	Avge. 924	6,149,133	Avge. 30.0	17.8	Avge. 224	1,196,503	Avge. 5.8	14.6	Avge. 48	20,066	Avge. 0.1	1.1	Avge. 1,876					30.0	Avge. 1,298	15,351,146	Avge. 578	5,169,408	20,520,554
DAILY AVERAGES	221			33,879				1,941				16,847				3,278				55										42,058		14,163	56,221

Petroleum Office,
San Fernando.
17th June, 1948.

I. S. RUTHERFORD,
Acting Assistant Petroleum Technologist.

TABLE III—STATEMENT SHOWING CONTRIBUTIONS TO REVENUE OF THE COLONY BY THE OIL INDUSTRY

	1938	1939	1940	1941	1942	1943	1944	1945	1946	1947
1. Customs	\$ 639,670	\$ 580,189	\$ 730,626	\$ 598,563	\$ 565,176	\$ 578,030	\$ 709,372	\$ 636,035	\$ 370,193	\$ 650,525
2. Licences and Internal Revenue not otherwise specified	85,361	71,383	106,841	109,221	110,592	121,974	130,733	120,484	167,062	150,919
3. Taxes on Income... ..	879,707	794,247	1,433,272	1,579,143	1,865,856	2,918,920	2,666,052	3,076,581	2,730,744	3,552,074
4. Re-imburements	14,578	16,444	18,745	17,294	16,581	16,621	19,176	21,839	16,808	23,884
5. Earnings of Government Departments	1,180	2,163	1,568	283	514	491	760	555	1,319	2,079
6. Miscellaneous	17,203	13,256	17,498	29,242	21,881	35,129	15,472	10,351	7,658	13,190
7. Royalty on Oil	881,770	1,042,864	1,218,391	1,323,304	1,183,177	1,498,307	1,351,531	1,428,160	1,287,917	1,976,989
8. Forest—Sale of Timber, &c.	65,604	48,759	50,823	67,622	52,192	31,999	35,629	34,606	43,698	51,880
9. Extraordinary	81	—	—	—	120	—	—	—	—	—
10. Cocoa Subsidy—Special Taxation	57,727	64,974	—	—	—	—	—	—	—	—
11. Emergency Taxation—Oil Impost	—	—	428,758	391,004	436,925	414,348	—	—	—	—
12. Levy on Income	—	—	—	1,103,896	3,526	—	—	—	—	—
SUB-TOTALS	2,642,881	2,634,279	4,006,522	5,220,112	4,256,540	5,615,819	4,928,725	5,328,611	4,625,399	6,421,540
13. Harbour Dues (For Ships' a/c)	—	—	—	—	—	—	169,513	190,480	226,055	367,345
SUB-TOTALS	2,642,881	2,634,279	4,006,522	5,220,112	4,256,540	5,615,819	5,098,238	5,519,091	4,851,454	6,788,885
14. Fees and Payments for Specific Services	11,395	12,106	8,676	10,880	7,606	10,783	8,009	10,331	11,060	16,261
15. Post Office	7,236	7,887	9,861	15,825	18,758	23,520	19,166	19,424	25,405	28,066
16. Rent of Government Property	8,305	4,220	2,441	2,754	1,778	1,489	1,079	2,509	49,999	5,662
17. Government Railway and Telegraph	74,493	61,840	119,467	73,770	47,667	80,080	62,734	77,260	107,499	110,571
18. Wharves and Harbours	101,972	80,754	63,866	74,221	22,018	34,499	28,259	50,533	47,767	127,194
GRAND TOTAL	2,846,282	2,801,086	4,210,833	5,397,022	4,354,367	5,766,190	5,217,485	5,679,148	5,093,184	7,076,639
19. Total Revenue of Colony under the above Eighteen Heads	14,338,662	14,331,566	16,894,077	21,134,915	26,768,239	33,373,031	29,158,819	34,900,299	47,776,085	42,075,147
20. Percentage of total Revenue of Colony contributed by Oil Industry	19.9	19.5	24.9	25.5	16.3	17.3	17.9	16.3	10.7*	16.8
21. Excise collected on Petroleum Products paid by General Public	890,634	963,774	1,048,716	1,299,940	1,468,132	1,212,306	1,255,876	1,491,779	1,762,496	2,135,938

*NOTE: Drop in percentage of total revenue contributed by Oil Industry in 1946 was due to total revenue of Colony being increased by repayment by H.M. Treasury of a loan of \$9,200,000.

TABLE IV—STATEMENT SHOWING THE AMOUNT OF MONEY DISBURSED IN THE COLONY (OTHER THAN CONTRIBUTIONS TO REVENUE) BY THE OIL INDUSTRY

	YEARS									
	1938	1939	1940	1941	1942	1943	1944	1945	1946	1947
1. Payment to Employees*	6,357,405	6,835,576	8,205,922	8,963,560	10,377,356	11,695,979	12,401,298	12,781,464	13,896,842	14,701,680
2. Payments to Contractors*	1,626,627	1,416,052	2,395,281	2,408,097	2,638,996	2,969,415	2,871,227	2,410,418	2,369,675	2,855,917
3. Local purchases of materials	3,030,449	2,808,972	4,337,145	4,239,161	3,946,405	3,095,691	3,955,870	3,813,021	3,494,215	4,005,478
4. Other local expenditure (Rents, Private Royalties, &c.)	2,963,073	2,906,226	3,235,395	2,919,486	3,084,130	2,316,201	2,273,991	2,609,726	2,619,541	3,181,947
5. TOTAL	13,977,554	13,996,806	18,203,743	18,530,304	20,046,887	20,077,286	21,502,386	21,614,629	22,380,273	24,745,022
OVERSEAS PURCHASES OF MATERIALS C.I.F. \$ TRINIDAD CURRENCY										
6. Importations from the United Kingdom	3,870,082	2,506,672	3,553,756	2,472,714	1,583,702	1,303,615	1,019,965	1,438,971	4,425,954	6,822,090
7. Importations from other countries	4,631,661	3,466,893	5,492,537	4,557,249	4,773,440	3,679,393	5,085,790	5,136,245	2,322,331	4,758,800
8. TOTAL	8,501,743	5,973,565	9,046,293	7,029,963	6,357,142	4,983,008	6,105,755	6,575,216	6,748,285	11,580,890

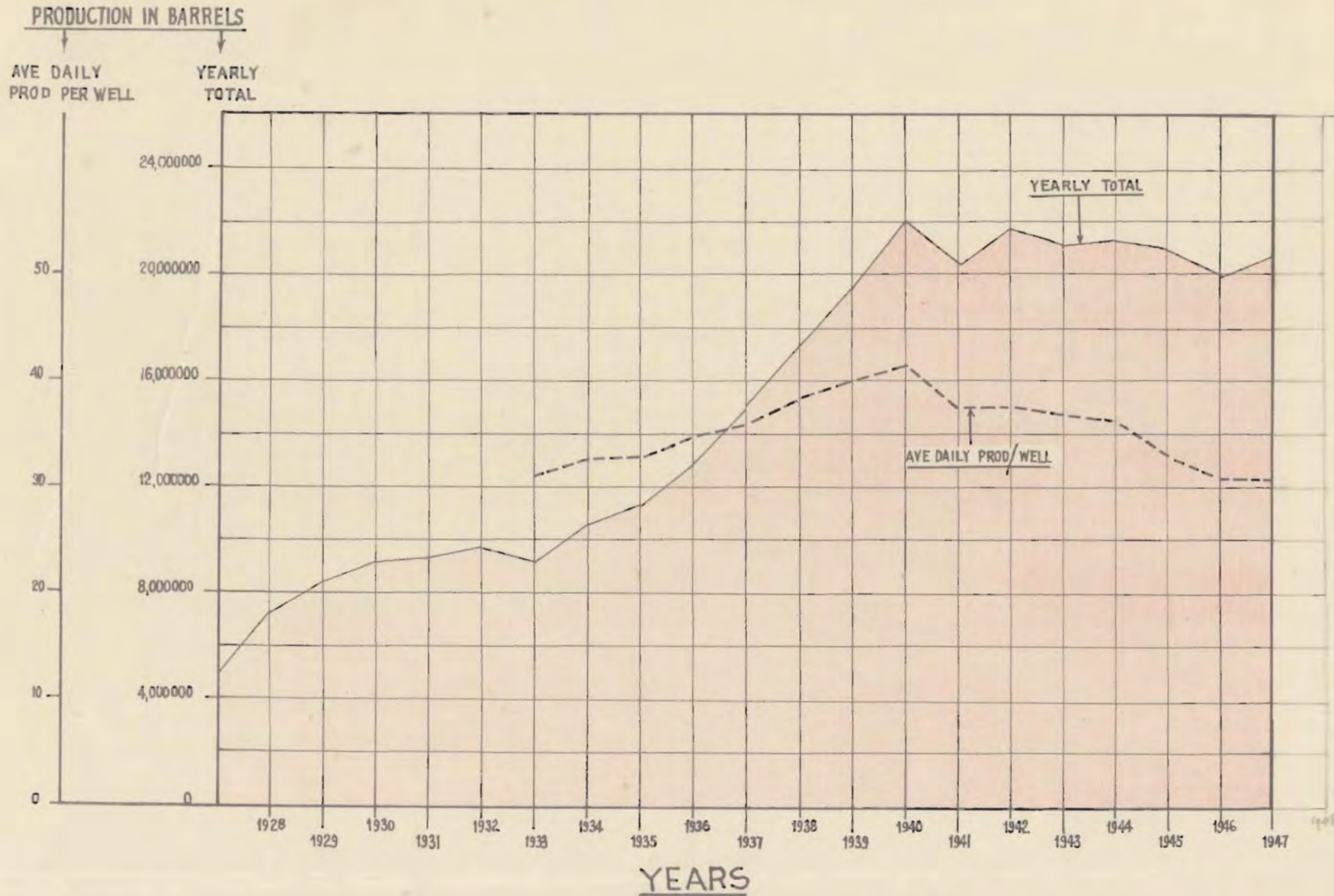
*These amounts include hidden contributions to the direct revenue of the Colony in the form of Customs Duties, Income Tax, Licences, &c.

TABLE V

List of Oil and Asphalt Operations in Trinidad, 1947

No.	Company	Nature of tenure of lands on which operations took place	District in which operations took place	Disposal of Oil
1	Antilles Petroleum Co. (Trinidad) Ltd.	Private Lands	Brighton, Vessigny, Rousillac	Exported
2	Apex (Trinidad) Oilfields, Ltd.	Crown Lands and Crown Oil-rights under Lease, Private Lands	Fyzabad, Siparia	Crude Oil sold to Trinidad Leaseholds, Ltd.
3	Kern Trinidad Oilfields, Ltd.	Private Lands, Crown Lands, and Crown Oil-rights under Lease	Guapo, Ortoire	Crude sold to United British Oilfields of Trinidad Ltd.
4	National Mining Corporation Ltd.	Private Lands, Crown Lands and Crown Oil-rights under Lease	Penal, Fyzabad	Crude sold to Trinidad Leaseholds, Ltd.
5	Partap, Ramesar	Private Lands	Fyzabad	Crude sold to United British Oilfields of Trinidad Ltd.
6	Premier (Trinidad) Oilfields Ltd.	Crown Lands under Lease, Private Lands	Palo Seco, San Francique	Crude sold to Trinidad Leaseholds Ltd.
7	Siparia (Trinidad) Oilfields, Ltd.	Crown Lands and Crown Oil-rights under Lease	Palo Seco, Morne Diablo	Crude sold to Trinidad Leaseholds Ltd.
8	Trinidad Central Oilfields Ltd.	Crown Lands under Lease	Guapo, Barrackpore	Crude sold to Trinidad Leaseholds Ltd.
9	Trinidad Consolidated Oilfields Ltd.	Private Lands and Crown Oil-rights under Lease	Fyzabad	Crude sold to Trinidad Leaseholds Ltd.
10	Trinidad Lake Asphalt Operating Co. Ltd.	Crown Lands under Lease	La Brea	Pitch refined and exported
11	Trinidad Leaseholds Ltd.	Private Lands, Crown Lands and Crown Oil-rights under Lease	Barrackpore, Forest Reserve, Guayaguayare, Quinam, Mayaro	Pumped to Company's Refinery at Pointe-a-Pierre
12	Trinidad Petroleum Development Co., Ltd.	Private Lands, Crown Lands, and Crown Oil-rights under Lease	Coora, Los Bajos, Palo Seco, Quarry, Point Fortin (South)	Crude sold to United British Oilfields of Trinidad Ltd.
13	United British Oilfields of Trinidad Ltd.	Private Lands, Crown Lands and Crown Oil-rights under Lease	Los Bajos, Parrylands, Penal, Point Fortin,	Pumped to Company's Refinery at Point Fortin
14	Zenith (Trinidad) Oilfields Ltd.	Private Lands	Fyzabad	Crude sold to Trinidad Leaseholds, Ltd.

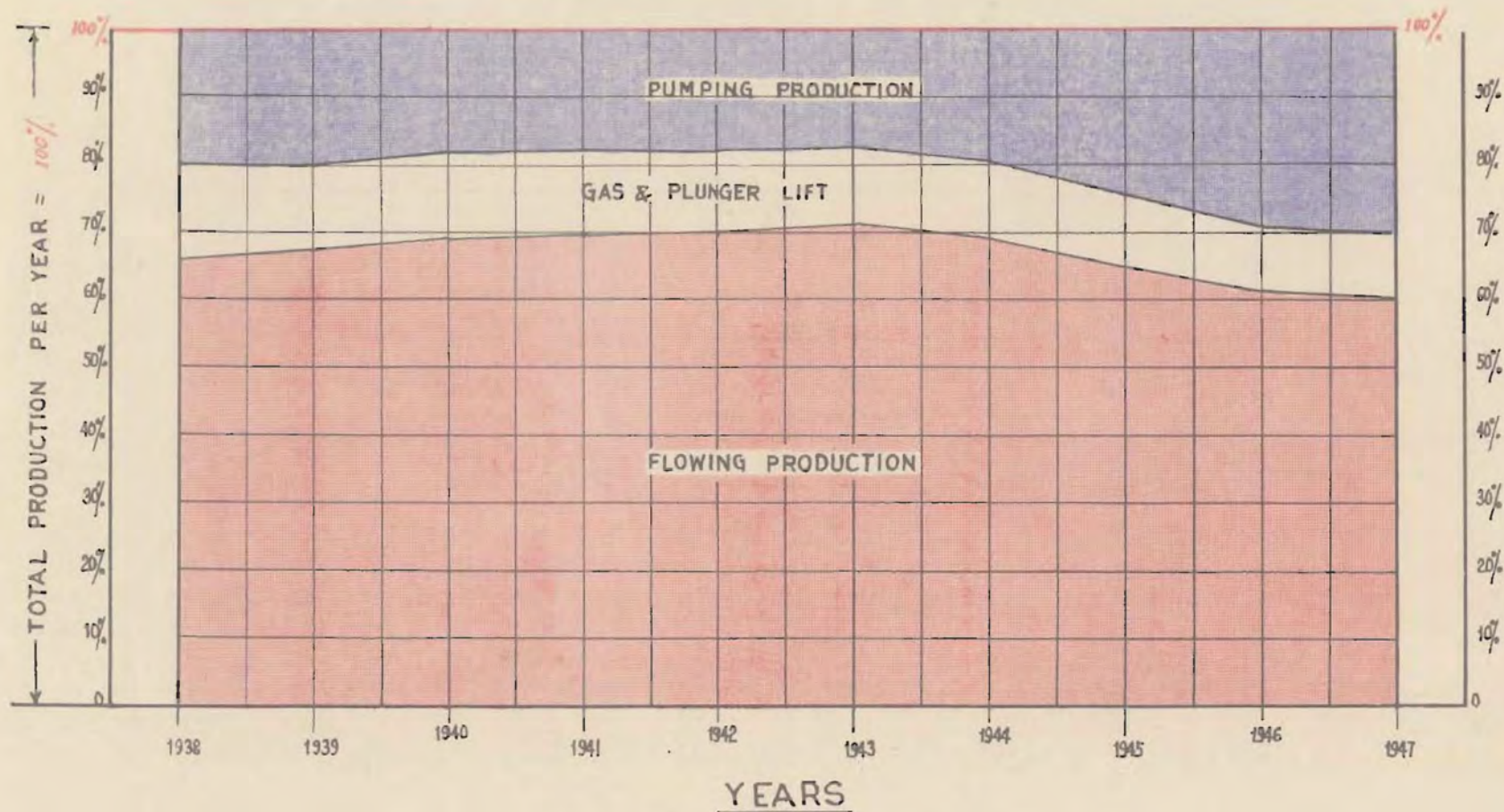
ANNUAL CRUDE OIL PRODUCTION



FOR FIGURES USED IN CONSTRUCTING GRAPH SEE TABLE I ITEMS 1 AND 25.

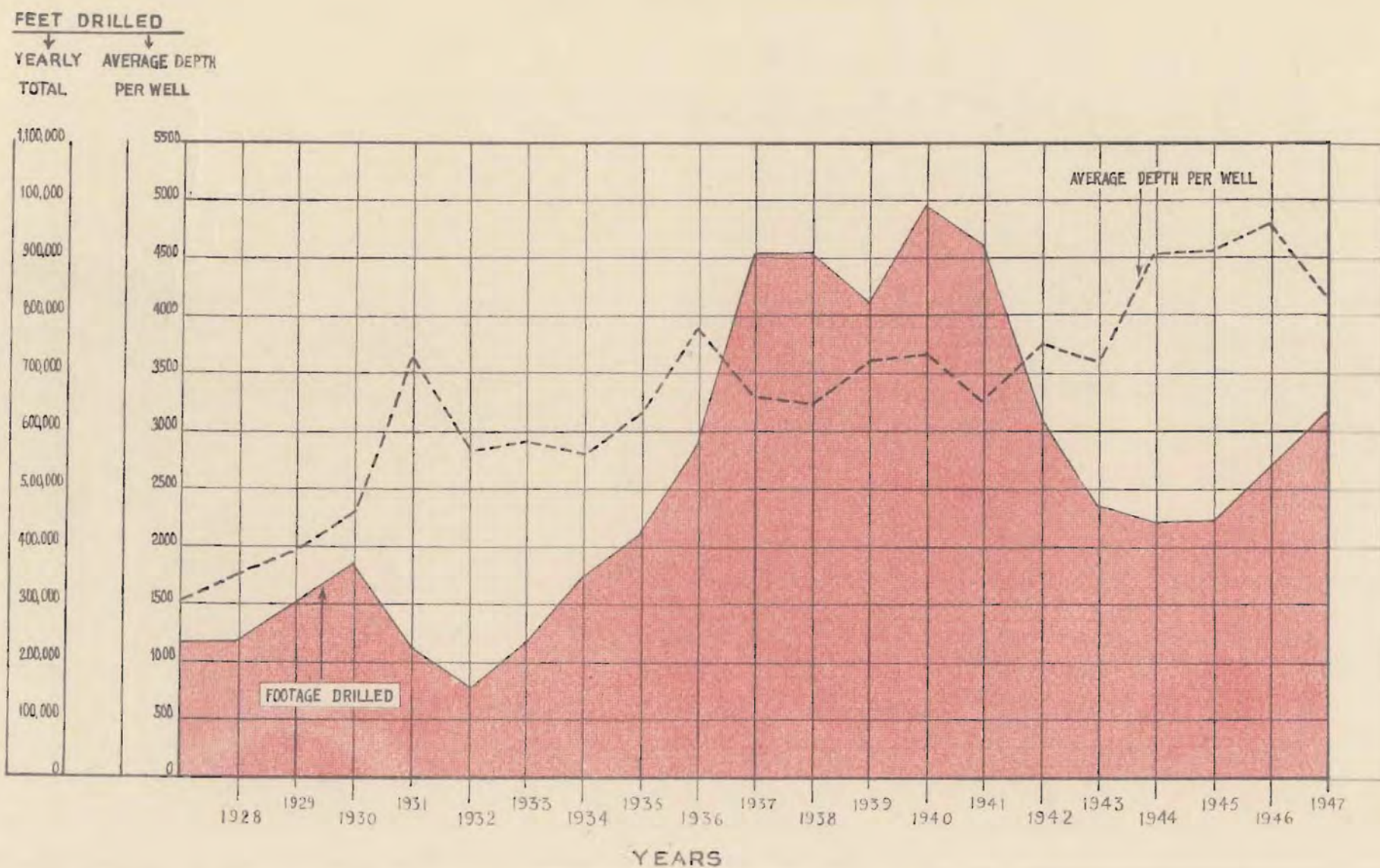
CRUDE OIL PRODUCTION METHODS

YEARLY %ages OF THE PRINCIPAL PRODUCING METHODS USED



SEE TABLE II FOR DETAILED FIGURES FOR 1947.

ANNUAL DRILLING FOOTAGE

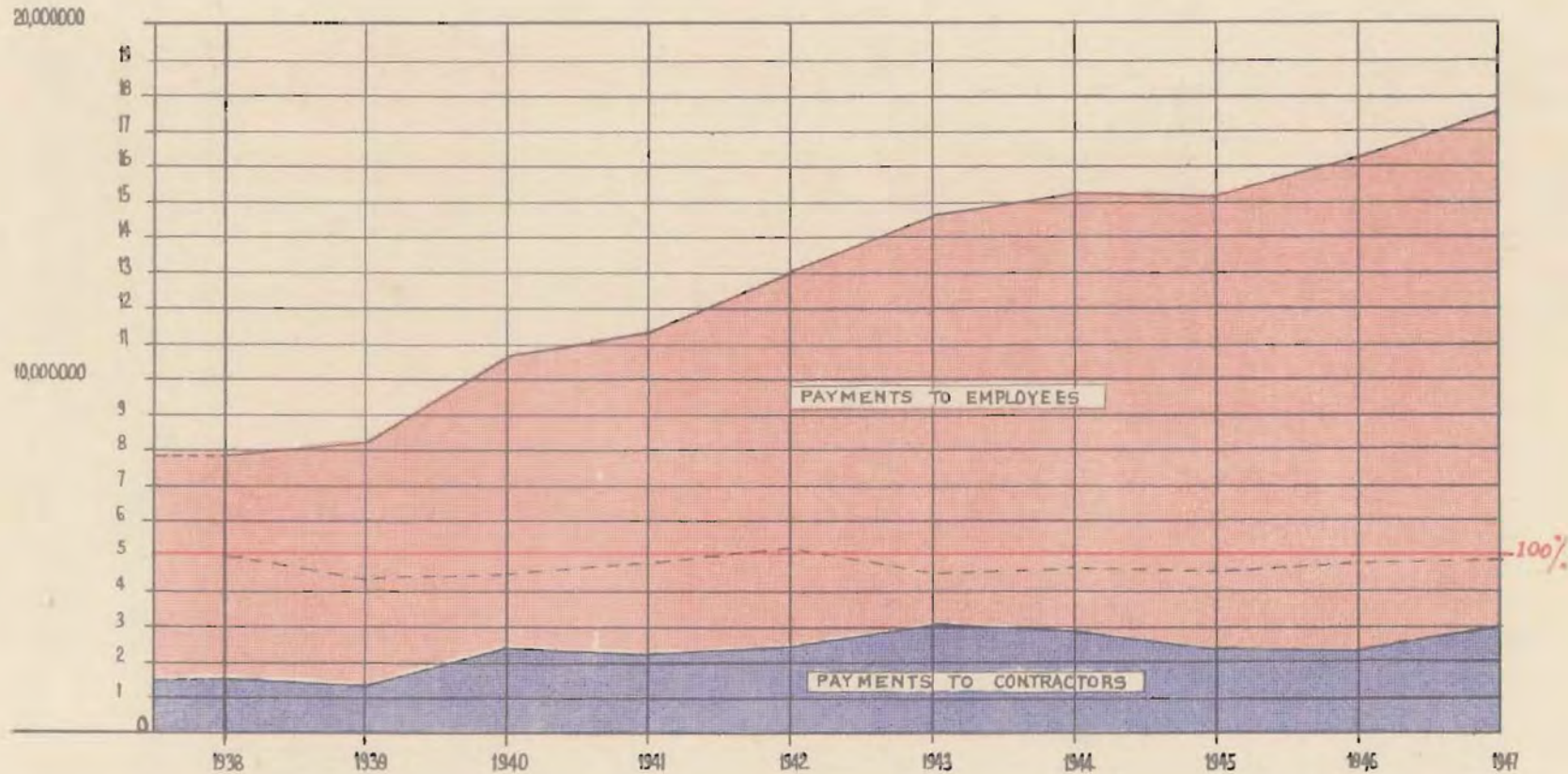


FOR FIGURES USED IN CONSTRUCTING GRAPH SEE TABLE 1 ITEMS 19 AND 25

OIL COMPANIES ANNUAL PAYMENTS TO CONTRACTORS AND EMPLOYEES

TRINIDAD CURRENCY

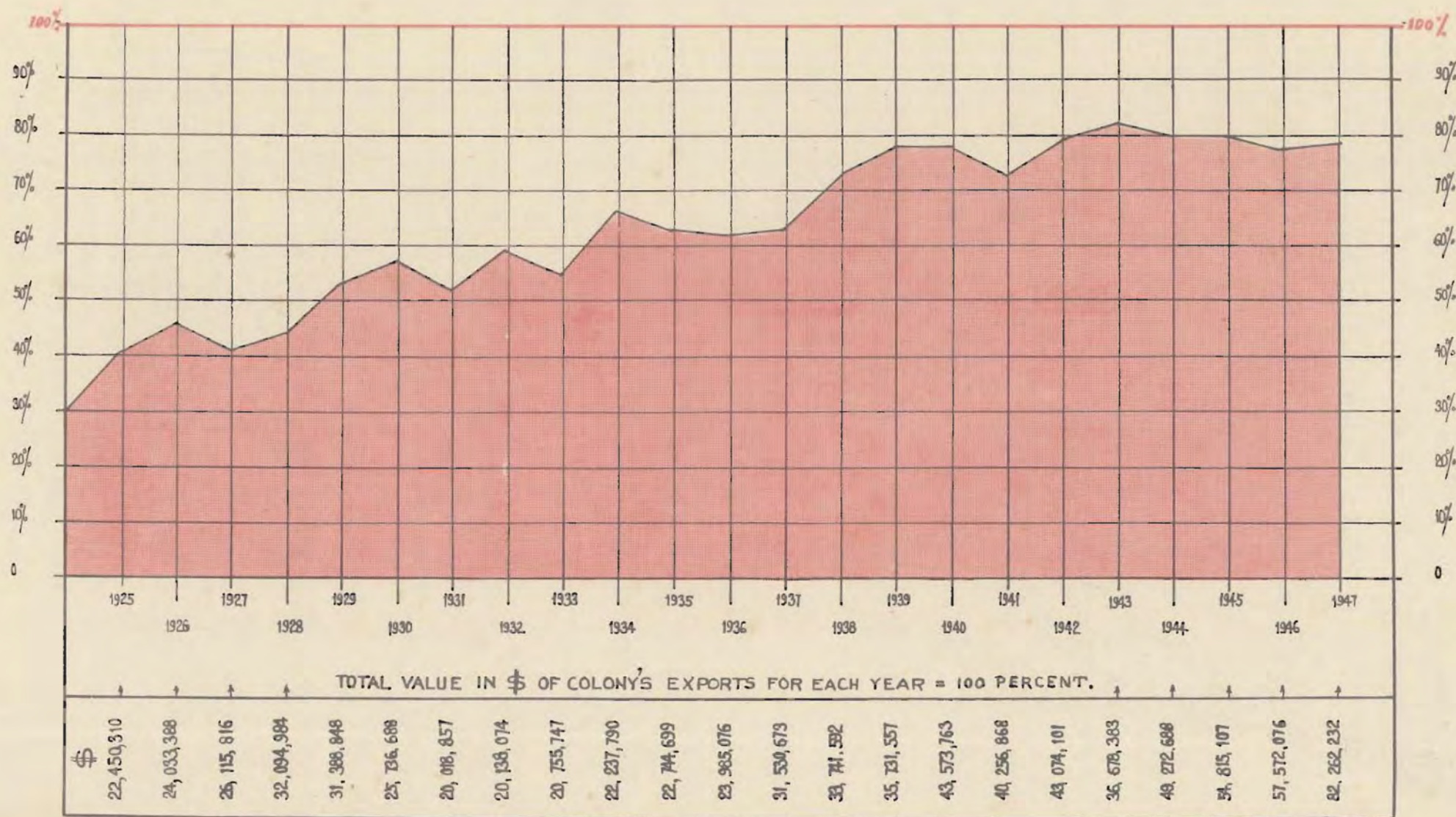
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----- TREND LINE OF TOTAL NO OF EMPLOYEES (INCLUDING CONTRACTOR'S LABOUR.) 1938 FIGURE = 100%

N.B. PAYMENTS TO CONTRACTORS ARE MAINLY ON WAGES ACCOUNT.

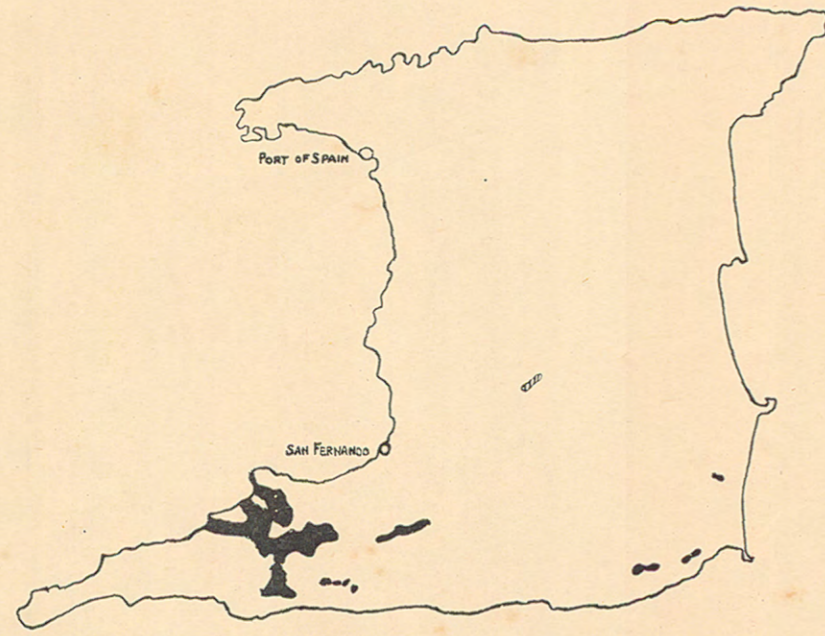
- VALUE OF PETROLEUM AND ASPHALT AND THEIR PRODUCTS EXPORTED
COMPARED TO THE TOTAL VALUE OF COLONY'S EXPORTS



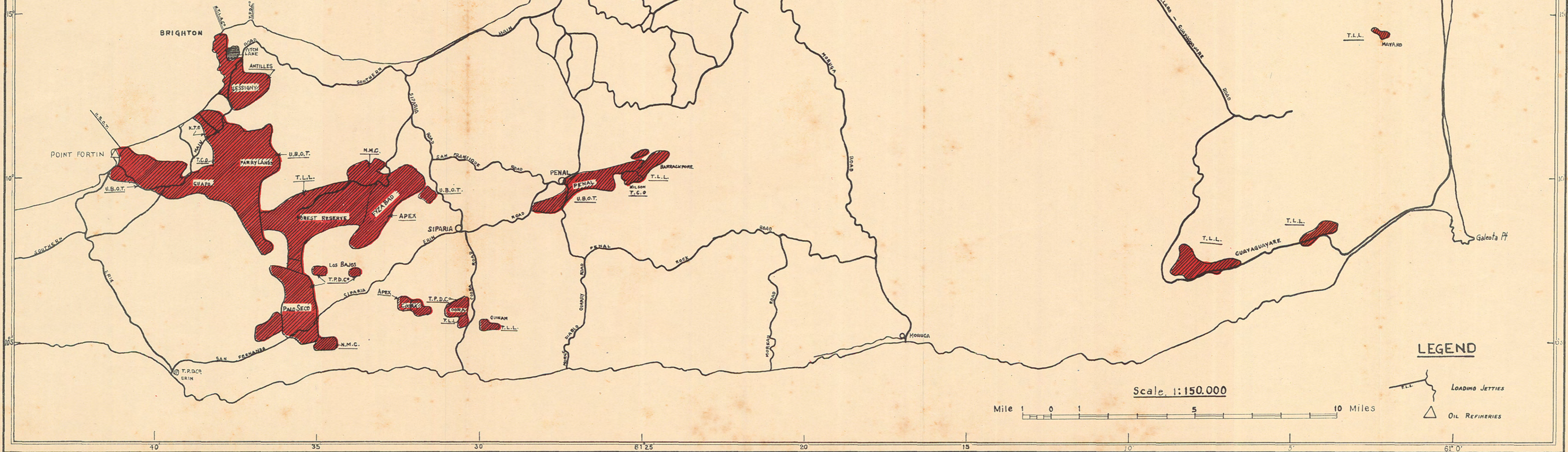
TRINIDAD

- SOUTH TRINIDAD -

SHOWING LOCATION OF OILFIELDS

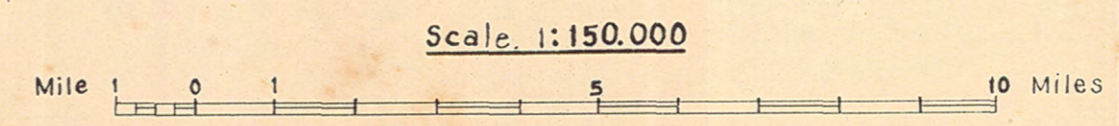


SCALE: 1:1,000,000



LEGEND

- LOADING JETTIES
- OIL REFINERIES



ERRATUM

Page 17, Item 12. "9,776" should read "91,776"