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THE PETROLEUM INDUSTRY IN ECONOMIC REGION V OF THE USSR

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FOREWORD

This report is a condensation of a detailed analysis of the production, refining, distribution, and consumption of crude oil, natural gas, and petroleum products in Economic Region V of the USSR.

Although the report contains only the data and information essential to a clear concept of the economic importance of the petroleum industry in Region V and in the USSR, the full results of the detailed study are available (see Methodology, Appendix C).

This report is one of a series of regional analyses of the Soviet petroleum industry in the postwar period.

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THE PETROLEUM INDUSTRY IN ECONOMIC REGION V OF THE USSR*

Summary

Economic Region V, Transcaucasus, is the most important single area in the USSR for the production of crude oil and petroleum products. In 1954, production of crude oil in Region V was about 35 percent of total production in the USSR. Within Region V the Baku fields in Azerbaydzhan SSR are the major producers. Of the total 1954 production of crude oil in Region V of 17.1 million metric tons,** the Baku fields produced about 17 million tons. Of the remainder, the Georgian SSR produced from 65,000 to 70,000 tons.

The most important postwar development in the petroleum industry in Region V is the large increase in the production of the offshore fields in the Baku area. Offshore production in 1954 is estimated at about 8 million tons of crude oil and natural gas, a marked increase over the reported 1945 production of about 2 million tons.*** The trend is a clear indication that the future of the Baku area in the production of crude oil depends largely on the offshore operations.

The production of natural gas in Region V is limited almost entirely to Azerbaydzhan SSR, and because of the practice of permitting natural gas to be wasted in the field, production thus far has not been significant.

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* The estimates and conclusions contained in this report represent the best judgment of ORR as of 1 May 1955.

** Throughout this report, tonnages are given in metric tons.

*** This figure probably does not include natural gas.

In 1954 the refineries of Region V produced about 14.5 million tons of products, an increase of approximately 28 percent over 1948. The Baku refineries, in addition to producing more than 50 percent of the Soviet requirement for lubricating oil, are the principal sources of jet fuel in the USSR and produce a full range of petroleum products -- from high-octane aviation gasoline (B 100/130) to bitumen. The total installed capacity of all refineries in Region V includes nearly 19 million tons of primary distillation capacity and over 3 million tons of thermal and catalytic cracking capacity.

Consumption of petroleum products in Economic Region V is small in comparison with the availability of petroleum products. Consumption within Region V increased from about 2.7 million tons in 1948 to about 4.8 million tons in 1954, and the total availability of products produced within Region V increased from about 11.3 million tons in 1948 to about 14.5 million tons in 1954.

The large surplus of petroleum products in Region V is distributed by rail and by water from the two refining centers at Baku and Batumi to other areas of the USSR and to the other countries of the Sino-Soviet Bloc. In 1954 the additional shipment of about 630,000 tons of petroleum products from Batumi to countries outside the Sino-Soviet Bloc was a significant development in the distribution of the surplus available in Region V. A major portion of these shipments probably originated in Baku.

One pipeline connects Baku and Batumi and is used to transport charge stock to the Batumi refineries. Construction of another pipeline, a 12-inch line, which probably will transport petroleum products from Baku to Batumi, is planned. This pipeline will increase the capabilities of Region V to distribute its surplus petroleum products.

In 1954, Region V had an exportable surplus of crude oil of between 1.5 million and 2 million tons. Virtually all of the surplus of crude oil is believed to have been distributed to the refineries at Groznyy and Gury'ev.

The production of crude oil and petroleum products in Economic Region V is not expected to increase significantly over the 1954 level. The large surplus of petroleum products in Region V is an important factor in the petroleum economy of the USSR. Although consumption within the region may continue to increase somewhat, Region V may be expected to maintain for many years a very important position as a surplus petroleum area.

I. Introduction. 1/*

Economic Region V of the USSR, commonly known as the Transcaucasus,** includes Azerbaydzhan SSR, the Georgian SSR, and the Armenian SSR. Petroleum is the most important single industrial asset in the Transcaucasus. The industry is centered in Baku, the capital of Azerbaydzhan, which is located on Il'ich Bay on the south side of the Apsheron Peninsula. A large percentage of the oilfields are on the Apsheron Peninsula and in the Caspian Sea along the coast of the Peninsula. There is also oil along the Caspian north of the Apsheron Peninsula, south of Baku in the Kura River Valley, in western Azerbaydzhan in the vicinity of Kirovabad, and in Georgia. The largest Soviet refinery complex is located in Baku, which is the principal source in the USSR for lubricating oils. There are also 16 oil machinery plants in Baku.

The Transcaucasus has long been the most important oil-producing area in the USSR and still supplies approximately 35 percent of the total crude oil produced in the USSR. There is a good harbor at Baku, and large amounts of both crude oil and finished products are shipped out on the Caspian Sea to other areas of the USSR. From Batumi, a major oil port on the Black Sea, petroleum products are shipped not only to western areas of the USSR but also to other countries.

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* For serially numbered source references, see Appendix E.

** See CIA Map No. 12048.1, 9-51 (First Revision, 7-52), USSR: Economic Regions.

II. Production.

A. Azerbaydzhan SSR.

1. Crude Oil.

The postwar recovery of the Azerbaydzhan oilfields has not been so rapid as had been anticipated by the Soviet planners, and the postwar production has not even approached the high production levels of the years immediately before World War II. The gradual increase in the production of the Baku fields since 1945 has been almost entirely the result of the discovery and development of a few highly productive new oil deposits rather than any significant increase in the output of the old fields. 2/

The measures taken to increase the production in the old fields -- the resumption of drilling, the installation of new equipment, the introduction of secondary methods of production, and the like -- have been only partially successful. 3/ In some fields, such as some of the Leninneft' fields, these measures have notably increased production, but in others they have served only to halt the decline or have had no appreciable effects.

During the postwar period the prospecting organizations have succeeded in opening a few new and important areas for exploitation. The new offshore fields under the trusts,* Artemneft' and Gyurgyanneft', and the fields of Buzovnyneft' in the northeastern part of the Apsheron Peninsula have been by far the largest factors in the increase in production since 1945. 4/ Two other new production trusts, Kirovabadneft' 5/ and Kobystanneft', 6/ which also have been discovered and developed in the postwar period, have had little effect on the total production of Azerbaydzhan.

The estimates of the total production of crude oil in Azerbaydzhan are given in Table 1.**

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* For a description of the trusts, see Appendix A.

** P. 8, below.

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The total production in Azerbaydzhan for 1945 is estimated to have ranged between 11,223,000 and 11,383,000 tons. Therefore, the frequently repeated statement in the Soviet press that the 1950 plan goal of 17 million tons represented 150 percent of the 1945 production, 7/ or a computed total of 11,333,000 tons, appears to approximate the actual production of crude oil in 1945. The estimated total production in Azerbaydzhan in 1946 ranges from 11,692,000 to 11,852,000 tons, which also closely approximates the published report of an increase of 3.8 percent over 1945 production, 8/ a computed total of 11,764,000 tons. There is additional support for the latter figure in the fact that in 1946 Azneft' fulfilled its annual plan 102 percent 9/ and produced 230,000 tons above plan, 10/ indicating a production that year of 11,730,000 tons. Therefore, because the estimates derived from the data on total Baku production for 1945 and 1946 published by the Soviet press are within less than 1 percent of the total of the production estimates for the individual trusts, the former are believed to be fairly reliable and have been used as the base for the percentage increases through 1950.*

Although the data for the individual trusts for the years after 1946 were insufficient to permit a total production estimate by that method, there is some substantiating evidence for the 1947 estimate as derived from the percentage increase figures. In June 1947 the Buzovnyneft' Trust was reported to be producing 10 percent of the total Baku production. 11/ The production of Buzovnyneft' in 1947 was estimated at 1.2 million tons, about 9 percent of the estimated total Baku production of 13.2 million tons derived from the percentage increase figures.

The poor production results in 1948, when the plan was fulfilled only 93.3 percent, 12/ brought about a drastic revision in the plan for the remaining 2 years of the Fourth Five Year Plan. 13/ Instead of the 1950 goal of a 50-percent increase over 1945 -- a 1950 total of 17 million tons, as set in the original plan 14/ -- a far more reasonable goal was set, and the revised

* See Table 1, p. 8, below.

1950 plan, which was reported fulfilled, 15/ represented only a 28-percent increase over 1945. 16/ No plan goals for the current Five Year Plan have been published by the Soviet press. It is believed that planning is now being done more on a year-to-year basis 17/ and that the goals set are more realistic. Long-range planning does not appear to be emphasized in the Soviet press.

The estimates of Baku production for the years 1950-54 have been made by an analysis of the production of each trust during those years and by estimating rates of increase or decrease. The production increase for each year after 1951 can be attributed almost entirely to the increase in offshore production.

The fact that the increase in 1951 was greater than the increases during preceding years was reflected in the last published report on production percentage increase. In the first quarter of 1951 there was a 6-percent increase over the first quarter of 1950, 18/ whereas the 1950 production had been only 3 percent over 1949. 19/ This upswing in the rate of production increase is believed to have continued until 1953. In the second half of 1953 the Baku production fell off, 20/ with the result that the 1953 plan for production of petroleum was fulfilled by only 99.4 percent. 21/

During 1954 the trend observed during the latter half of 1953 apparently continued. The decline in production in the older Baku fields has continued at an even more rapid rate than previously, and the offshore production is believed to be leveling off, with the result that the total 1954 production probably was at about the 1953 level.

The outlook for the future development of the Azerbaydzhan oilfields will depend, to a large extent, on the effort and capital the USSR decides to invest there. In 1953 the cost of producing 1 ton of oil was 3 times as great as in 1946. 22/ Because of the complicated techniques, the deeper drilling, and the extensive construction that will be required to find and develop new deposits, it appears that the capital required to maintain the production at even its present level will continue to increase. It is believed, therefore, that Soviet policy

will be to maintain Baku production at a level sufficient to supply the refinery complexes and distribution systems that are dependent on Baku crude oil. Estimated production of crude oil in Azerbaydzhan, 1937-54, is shown in Table 1.*

The most important development in the petroleum industry in the postwar period in Azerbaydzhan is the success in exploiting the oil deposits under the Caspian Sea. 23/ From only 5 offshore fields in 1945, 24/ producing an estimated 1.9 million tons of oil, the offshore development has expanded to include at least 10 fields with an estimated combined production of about 7 million tons in 1953 (see Table 2**). The emphasis on offshore development was reflected in the formation in December 1949 of the Azmorneft' Association. 25/ This association included the Artem Oil Trust with both its island and offshore fields; the Bukhta Il'ich Oil Field, which had previously been under the jurisdiction of the Stalin Oil Trust; the newly formed Gyurgyan Oil Trust; and the Exploratory and Exploitational Offshore Oil Drilling Trusts. 26/ Although the Azmorneft' Association was liquidated in early 1953 and its trusts returned to the Azneft' Association, 27/ it is apparent that the offshore development has continued to increase rapidly, and the prospects for the future development of other offshore areas along the coast are more promising than the prospects in any other part of Azerbaydzhan.

The estimated annual production of crude oil from the offshore areas of Azerbaydzhan, 1945-54, is given in Table 2.** The estimates include the production from the Artem Oil Trust's three island fields, as they were included in Azmorneft's percentage increase figures. Their production, however, is believed to represent only a very small percentage (from a maximum of 7 percent in 1945 to less than 3 percent in 1953) of the total offshore production.***

* Table 1 follows on p. 8.

** Table 2 follows on p. 12.

*** See Table 2, note b.

Table 1

Estimated Production of Crude Oil
in Azerbaydzhan SSR
1937-54

Thousand Metric Tons

Year	Production	Percent of Total Soviet Production	Cumulative Production
1937	21,380 a/	75.01	419,100 b/
1938	22,119 c/	73.28	441,219
1939	21,561 d/	70.88	462,780
1940	22,189 e/	72.37	484,969
1941	24,834 f/	77.85	509,803
1942	17,917 g/	81.07	527,720
1943	11,000 h/	65.87	538,720
1944	11,000 h/	61.80	549,720
1945	11,333 i/	58.42	561,053
1946	11,764 j/	54.21	572,817
1947	13,223 k/	50.86	586,040
1948	13,804 l/	46.95	599,844
1949	14,218 m/	42.32	614,062
1950	14,575 n/	38.76	628,637
1951	15,400 o/	37.05	644,052
1952	16,200 o/	35.65	660,307
1953	17,000 p/	34.47	677,403
1954	17,000 p/	N.A.	694,403

a. 28/
b. 29/
c. 30/
d. Production dropped 558,000 tons in 1939. 31/
e. The increase in 1940 was 628,000 tons. 32/
f. Oil and gas output in 1941 was three and one half times the output of 1913. 33/ The 1913 production was 7,680,000 tons. 34/ Oil and gas production in 1941 was, therefore, 26,880,000 tons. The gas

Table 1

Estimated Production of Crude Oil
in Azerbaydzhan SSR
1937-54
(Continued)

production is estimated to be 8.24 percent of the crude oil production (the 1938 gas-oil ratio 35/). The crude oil production is, therefore, estimated to be 24,833,702 tons. Substantiating evidence is the statement in a Soviet publication that in 1941 oil output was almost 25 million tons. 36/

g. By interpolation.

h. Estimated. "The drop in oil production at Baku was brought to a halt in 1944." 37/

i. The Fourth Five Year Plan envisaged the production of 17 million tons in 1950, or 1.5 times the 1945 production. 38/ This indicates a production of 11,333,000 tons in 1945.

j. In 1946, production of crude oil increased 3.8 percent over 1945. 39/ The 1946 production is therefore 11,764,000 tons, an increase of 431,000 tons. The Soviet press reported an increase of 500,000 tons in 1946. 40/

k. Production in 1947 increased 12.4 percent over 1946. 41/

l. Production up 21.9 percent over 1945. 42/ 121.9 percent of 11,333,000 tons is 13,815,000 tons. Production up 4.3 percent over 1947. 43/ 104.3 percent of 13,223,000 tons is 13,792,000 tons. The average of the two figures is 13,804,000 tons.

m. Production up 3 percent over 1948. 44/ 103 percent of 13,804,000 tons is 14,218,000 tons.

n. Production increased 28 percent in the course of the Fourth Five Year Plan. 45/ 128 percent of 11,333,000 tons is 14,506,240 tons. Production

Table 1

Estimated Production of Crude Oil
in Azerbaydzhan SSR
1937-54
(Continued)

increased 3 percent over 1949. 46/ 103 percent of 14,218,000 tons is 14,644,540 tons. The average of the two figures is 14,575,390 tons.

o. By interpolation.

p. Estimates based on an analysis of the production of the individual trusts and estimates of the rates of increase or decrease (see Methodology, Appendix C).

The offshore areas now under exploitation include Artem Island and the sea around it, particularly to the north; Zhiloy Island; Neftyannye Kamni; the Bukhta Il'ich; and Nargin Island. 47/ Exploitation has recently begun on the Banka Darvina, far to the north of Artem Island. 48/ There may also now be some production along the Buzovny coast and at Mardakyan, where extensive prospecting was begun soon after the war. 49/ It is believed that there is some production also from Peschanyy Island, which is in actuality a continuation of the Zykh structure on the mainland. 50/

Prospecting has been done on many other islands and in the open sea from Cape Kegna-Bil'gya in the north to the mouth of the Kura River in the south. 51/ Geologically, this whole area appears very promising for future exploitation. Although there are many factors which make offshore drilling less attractive than drilling on land, such as the frequency of storms on the sea and the considerably greater outlay of capital required for offshore construction, the richness of these deposits seems to warrant the huge outlay of capital and effort involved. 52/ Furthermore, the relatively uncomplicated geologic structures in the offshore area virtually insure that when they have been adequately studied, almost

every well drilled will produce oil. The new prospecting areas and the producing fields in the western part of the Apsheron Peninsula, on the other hand, are on geologic structures so complicated that even on some of the old fields virtually every well drilled is an exploratory well, and the incidence of dry holes is far higher, with a resulting smaller return in production. It seems probable, therefore, that the future development of the oilfields of Azerbaydzhan will continue to be predominantly in the offshore area, the only important limiting factor being the depth of the sea. 53/

2. Natural Gas.

The estimates of natural gas production in Baku are based on the commercial consumption of gas rather than on the quantity of gas actually available in the fields. Large quantities of gas which could not be processed or consumed immediately have customarily been allowed to escape into the atmosphere. 54/ Only within the last few years has this practice become less common.

The latest consumption figures available are those for 1949, when about 998,000 tons of natural gas were produced in Azerbaydzhan.* There is no evidence to indicate that either the Georgian SSR or the Armenian SSR produces natural gas in commercial quantities.

The chief consumers of natural gas in Azerbaydzhan are the carbon black plants; the First Gasoline Plant, subordinate to Azgaz, Bakgaz (Gaku Gas Trust), which supplies the city of Baku; Azenergo (Azerbaydzhan Power System); and the crude oil trusts and refineries. Less than 2.5 percent of the gas goes to other consumers. 55/

3. Production Problems and Techniques.

At the end of World War II the productive efficiency of the old Baku fields was at a very low level. Before the war it

* See Methodology, Appendix C.

Table 2

Estimated Production of Crude Oil
from the Offshore Oilfields of Azerbaydzhan SSR
1945-54

Year	Production (Thousand Metric Tons)	Percent of Total Baku Production
1945	1,900 a/	16.77
1946	1,900 b/	16.54
1947	2,100 c/	16.17
1948	2,300 d/	16.89
1949	2,700 e/	18.91
1950	3,500 f/	23.99
1951	4,700 g/ h/	
1952	5,900 h/ i/	
1953	7,200 h/ j/	
1954	8,000 - 8,500 k/	

a. Estimated.

b. The two offshore fields of Stalinneft' and Artemneft' were producing 5,000 tons per day. 56/ Of this total, Artem's Field No. 4 is estimated to have produced approximately 850 tons per day, about 310,000 tons for the year. 57/ Bukhta Il'ich is estimated to have produced 4,150 tons per day, about 1,515,000 tons for the year. The remaining fields of Artemneft' produced about 121,000 tons for the year. The total of Bukhta Il'ich production (1,515,000) and Artem production (431,000) is 1,946,000 tons.

c. By interpolation.

d. Production in 1950 was 50 percent over 1948. 58/

e. Production in 1950 was 30 percent over 1949. 59/

f. Offshore production increased 84 percent over 1945. 60/

Table 2

Estimated Production of Crude Oil
from the Offshore Oilfields of Azerbaydzhan SSR
1945-54
(Continued)

g. Offshore production increased 34.1 percent over 1950. 61/
h. These estimates are believed to include the production of natural gas as well as crude oil.
i. Offshore production during the first 9 months of 1952 was 125.2 percent of the first 9 months of 1951. 62/
j. During 1953, production at offshore fields grew by 23 percent. 63/
k. This estimate is based on the belief that the rate of increase in 1954 was not so great as it had been in preceding years. The history of the development of the older Baku oilfields shows a rapid increase in production during the first 5 to 8 years of development, and thereafter a sharp decline sets in. It is believed that in the offshore oilfields developed earliest this decline is already beginning and that most of the 1954 increase came from new wells in the Gyurgyanneft' fields.

had been common practice to rely strongly on the newly drilled, highly productive flowing wells for most of the Baku crude oil production. The operation of the older wells was inefficient, and many of them were permitted to go out of operation entirely. During the war, when no new drilling could be done and pumps, pumping jacks, repair equipment, and other new devices for the technological improvement of the old wells were unavailable, the rapid decline in Baku production was inevitable. Consequently, the efforts in the postwar period have been devoted not only to new drilling, by which production could be increased rapidly from flowing wells, but also to the repair and technological improvement of the old wells. 64/

By far the most important effort to increase the production of the old Baku fields has been the introduction on a large scale of secondary recovery methods. 65/ Because of inefficient methods of exploitation in the early years, the natural reservoir pressure was largely depleted and production declined, although considerable oil still remained in the deposits, estimated at as much as 50 percent of the original total. 66/

The results of the use of secondary recovery methods have not yet become apparent (usually several years are required for increases in production to be noted after secondary recovery methods have been instituted). There is evidence that in some fields the poor absorptiveness of the rocks may hinder the success of the experiment. 67/ It is believed, however -- in view of successes already noted in some fields where secondary recovery methods have been employed for several years 68/ -- that considerable oil will be recovered in this way, but not in quantities sufficient to increase the total production of the old Baku fields.

4. Prospecting Trusts.

Geophysical surveying, exploratory drilling, and the preparation of new areas for commercial exploitation are the duties of several prospecting trusts. The Azneftegeofizika (Azerbaydzhan Oil Geophysics Trust) 69/ conducts all the geophysical aspects of oil prospecting, such as gravimetric and seismographic exploration, electric well logging, core sampling, and so forth. The Geological Prospecting Trust 70/ is believed to be in charge of the preliminary shallow drilling operations in all prospecting areas. This trust usually employs light mobile rigs for "Krelius" drilling, as this type of drilling is generally called. 71/ When most of the preliminary prospecting work has been completed, other prospecting trusts do the final deep drilling and preparation of the new areas for exploitation.

The exploratory operations in the postwar period have been the least successful of all drilling activities. 72/ Plans for prospecting drilling have been consistently underfulfilled, with the

result that very few new deposits have been turned over for exploitation. This failure to discover new deposits on the mainland has been the primary reason for the failure to increase the production there significantly during the last few years. 73/

B. Georgian SSR.

1. Crude Oil.

The annual production of crude oil in the Georgian SSR is relatively insignificant as to quantity. The discoveries made prior to World War II, which seemed so promising as to cause the planners to set 110,000 tons as the goal for 1950, 74/ did not develop into the highly productive fields anticipated. By 1950, production had reached only 40,000 tons (see Table 3), and production since 1950, while it has been increasing more rapidly, is still believed to be no more than 70,000 tons per year at the present time. The Georgia Oil Trust fulfilled its 1952 plan, 75/ and in 1953 it fulfilled the annual plan as early as 28 October. 76/ It has continued to overfulfill the plan in 1954, with the production of 22 percent more oil in the first quarter of 1954 than in the corresponding period of 1953. 77/ The production of the Georgian SSR in 1954 is therefore estimated at between 65,000 and 70,000 tons.

The production of crude oil in the Georgian SSR is conducted by the Gruzneft', Georgia Oil Trust. 78/ This trust was founded in 1930 and conducts all production and oil prospecting activities in Georgia. 79/ It also owns and operates the small refinery at Lilo, which operates entirely on Georgian crude oil. 80/ Estimated production of crude oil in the Georgian SSR, 1945-54, is shown in Table 3.*

2. Prospecting Localities.

In the Georgian SSR there are many prospecting localities where traces of oil have been noted, 81/ but prospecting has

* Table 3 follows on p. 16.

Table 3

Estimated Production of Crude Oil
in the Georgian SSR
1945-54

Year	Amount (Thousand Metric Tons a/)	Percent of USSR Total
1945	35 b/	1.80
1946	29 c/	1.34
1947	30 d/	1.15
1948	30 e/	1.02
1949	32 f/	0.95
1950	40 g/	1.06
1951	42 h/	1.01
1952	50 i/	1.10
1953	60 i/	1.21
1954	65 to 70 i/	N.A.

a. Rounded to the nearest thousand.
b. 82/
c. Production reported as 83.9 percent of 1945 production. 83/
d. Production reported as 2.6 percent over 1946 production. 84/
e. Production reported as 0.05 percent over 1947 production. 85/ "Daily production for 121 days in 1948, , indicates a possible production of 32,604 tons in that year. 86/
f. Production reported as 7 percent over 1948. 87/
g. Production reported as 24 percent over 1949. 88/
h. Production reported as 5 percent over 1950. 89/
i. Estimated.

lagged badly in both the prewar and the postwar period. 90/ Several areas where prospecting has been done since the war are Mlashis-Kheva and Iori, near Mirzaani and Tsiteli-Tskharo 91/; Kavtis-Khev, near Tbilisi 92/; and Gromy, in South Osetia. 93/ Some small amounts of oil may be produced from some of these areas, but no discoveries of any importance have been reported.

III. Refining.*

A. Facilities.

The largest single refining complex in the USSR is located in Region V, at Baku in Azerbaydzhan SSR. A smaller refinery is located at Batumi in the Georgian SSR, and a small crude oil topping plant is also located in the Georgian SSR at Lilo, near Tbilisi. The present installed refining facilities at these three sites include nearly 19 million tons of primary distillation capacity**; over 3 million tons of thermal and catalytic cracking capacity; and several specialty installations which produce such products as alkylbenzol, aviation alkylate, toluene, and benzene. These facilities are capable of producing about 14 million tons of products per year. More than 12 million tons of products can be produced at Baku alone.

Estimated throughput capacities of primary oil-processing units in Region V are shown in Table 4.***

The facilities located at Baku consist of 9 refineries, an acid plant, and 3 natural gasoline plants,**** and they include some of the oldest as well as the most modern facilities in the USSR.

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* For documentation of the data given in this section, see Appendix B and Methodology, Appendix C.

** Primary distillation capacity includes facilities used to distill mazut for lubricating oil stocks as well as facilities used to distill crude oil.

*** Table 4 follows on p. 18.

**** See Appendix B.

Estimated Throughput Capacities of Primary Oil Processing Units in Region V [a]

Metric Tons per Year [b]

	Baku	Batumi	Lilo	Total
Crude distillation units				
Shell still			(60,000) [c]	60,000
Pipe still (atmospheric)	13,300,000	2,000,000		15,300,000
Total	13,300,000	2,000,000	60,000	15,360,000
Mazut distillation units (lube stock)				
Shell still	1,100,000			1,100,000
Pipe still (vacuum)	2,190,000	260,000		2,450,000
Total	3,290,000	260,000		3,550,000
Total primary distillation capacity	16,590,000	2,260,000	60,000	18,910,000
Pyrolytic cracking units	(500,000) [c]			500,000
Visbreaking unit [d] (light cracking)	(90,000 - 100,000) [c]			95,000
Thermal cracking units	1,980,000 [e]	720,000		2,700,000
Catalytic cracking unit	(400,000) [c]			400,000
Alkylation (benzene) units	(60,000) [c]			60,000
Maximum total petroleum product capacity [f]	12,200,000	1,800,000	55,000	14,055,000

a. Operable 1 January 1955.
b. Based on an operating year of 330 days.
c. Figures in parentheses are only rough estimates based on a minimum of information.

Table 4

Estimated Throughput Capacities of Primary Oil Processing Units
in Region V
(Continued)

d. Tentatively identified as a visbreaking unit.
e. Assuming thermal cracking capacity at NBNZ of 600,000 tons.
f. This is based on the total crude oil distillation capacity installed at each refinery and does not include supplementary semifinished products imported by the refineries as charge stocks, or any petroleum or nonpetroleum base additives or components of products supplied from other regions.

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The two largest refineries, Stalin and Andreyev, have about 13.5 million tons of primary distillation capacity. Other important facilities at Baku include the new Thermofor catalytic cracking unit, nearly 2 million tons of thermal cracking capacity, 2 benzene alkylation units, 3 pyrolysis plants, and a new unit tentatively identified as a visbreaking (light cracking) unit. Auxiliary facilities include 2 plants which produce lubricating oil additives, 1 plant which produces diesel fuel additive, and a deasphalting plant. Presently under construction at Baku are a propane dewaxing plant, two vacuum distillation units, and hot caustic washing facilities for treating jet fuel.

The Batumi refinery has about 2.3 million tons of primary distillation capacity, about 720,000 tons of thermal cracking capacity, and a lubricating oil treating plant.

The refinery at Lilo is believed to consist of about 60,000 tons of crude oil distillation capacity and acid-treating facilities.

B. Product Output.

In 1954 the refineries in Region V are estimated to have processed about 15.1 million tons of crude oil and to have produced approximately 14.5 million tons of products, an increase of 28 percent over the estimated production of 11.3 million tons in 1948. Operations of the oil refineries at Baku and Batumi in 1948 and 1954 are shown in Table 5.* The small refinery at Lilo produced an estimated total of 22,000 tons of distillate and residual fuels in 1948 and about 50,000 tons in 1954. The total output was consumed within Georgia, and no estimates can be made of output by product.

The refineries in Region V produce a full line of petroleum products, from aviation gasoline B-100/130 to bitumen. The Batumi refinery produces aviation gasoline grade B-70 and its ethylated counterpart, grade B-89. Most of the aviation gasolines produced at Baku use straight-run gasoline as base stock. They are produced

* Table 5 follows on p. 21.

Table 5

Operations of Oil Refineries at Baku and Batumi
1948 and 1954

Thousand Metric Tons

	1948			1954		
	Baku [a]	Batumi [b]	Total	Baku [c]	Batumi [c]	Total
Crude rum to stills	10,961	1,089	12,050	13,082	2,000 [d]	15,082
Total product yield [e]	10,285	1,042	11,327	12,385	2,088	14,473
Aviation gasoline	360	65	425	900	100	1,000
Motor gasoline	200	100	300	600	150	750
Jet fuel	250		250	700	15	715
Ligroin and kerosine	2,895	335	3,230	2,300	500	2,800
Diesel fuel	900	130	1,030	1,900	250	2,150
Gas oil	550		550	400		400
Mixed oils	1,250		1,250	800		800
Fuel oil	2,275	210	2,485	2,900	700	3,600
Lubricating oils	1,400	140	1,540	1,600	250	1,850
Solid lubricants (grease)	35		35	45		45
Bitumen and coke	100	60	160	150	120	270
Other products	70	2	72	90	3	93

a. 94/
b. 95/
c. The 1954 estimates are arbitrary extensions of information for the 1948-50 period contained in sources 96/ and 97/ The estimates include conservative increases or decreases consistent with trends observed in scattered information available in the intervening years.
d. The Batumi refinery receives straight-run mazut from Baku as charge stock for its thermal cracking units.
e. Product yields include purchased components not produced from the crude oil run to stills, so that product yield does not represent products recovered from crude oil charged to the refineries. Components are believed to amount to from 2 to 3 percent of the total product yield.

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at the Andreyev and Stalin refineries and range from grade B-70 to grade B-95/130. The New Baku Refinery produces catalytically cracked aviation gasolines, grade B-100/130 and grade B-95/130.

Region V is the principal source of jet fuel in the USSR. Most of the jet fuel is produced at Baku and is believed to be produced at the Andreyev refinery. The Baku refineries are also the most important producers of lubricating oil in the USSR and are the only known producers of turbine oil. The refineries Andreyev, Stalin, and Dzhaparidze produce a full range of standard lubricating oils and greases. The total estimated production of about 1.6 million tons probably is more than 50 percent of total Soviet production.

C. Experimental Development.

The Azerbaydzhan Scientific Research Institute has done significant work at Baku in investigating new refining techniques and developing additives for improving the quality of petroleum products. Experimental plants for the investigation of catalytic cracking, hydrogenation, and hydroforming processes have been constructed in the postwar period. It is believed that the catalytic unit began investigation of a fluid catalytic cracking process in the first half of 1953. An experimental lubricating oil plant also is in existence and is used to develop special oils and lubricating oil additives. The experimental units at Baku are important as an indicator of the degree of technological advance which Soviet engineers have attained and also as an indicator of the possible future direction of refining operations, not only in Baku, but in the whole of the USSR.

IV. Distribution.

The principal distribution centers for petroleum in Region V are Baku, on the Caspian Sea, and Batumi, on the Black Sea. These two centers, both the sites of petroleum refineries, supply most of the requirements of the Transcaucasus Republics and, in addition, ship petroleum products to all other areas of the USSR, to the European Satellites, to Communist China and the Asiatic

Satellites, and to many non-Bloc countries. The production of the small refinery near Tbilisi is distributed for local consumption within the republic of Georgia.

A. From Baku.

The largest concentration of petroleum production and refining activity in the USSR is located in the vicinity of Baku. Consequently, the volume of petroleum shipping from this area is extremely large. Shipments consist of crude oil, semifinished (partially refined) petroleum products, and finished petroleum products and are distributed by rail and sea.

Rail shipments of finished petroleum products consist primarily of bulk shipments made in tank cars and a small quantity of packaged products shipped in freight cars and include the full range of products produced by the refineries. 98/ In 1948, total rail shipments of crude oil and petroleum products amounted to about 1.7 million tons, including about 1.5 million tons of finished products 99/ and about 200,000 tons of semifinished products and crude oil. 100/ Rail shipments in 1954 amounted to about 4.1 million tons, 101/ approximately 240 percent of the 1948 figure, and included about 3 million tons of finished products and 1.1 million tons semifinished products and crude oil. 102/ Shipments by freight car, included in the totals for finished products, amounted to about 54,000 tons in 1948 103/ and are believed to have increased to at least 70,000 tons by 1954. 104/ In 1948, more than 50 percent of the rail shipments went to destinations within Region V, 105/ and it is believed that Region V is still the principal recipient of rail shipments. Rail shipments to areas outside Region V include those for Communist China, the Asiatic Satellites, the European Satellites, and Finland and consist primarily of lubricating oils and greases and aviation fuels. 106/ In addition, some products -- primarily distillate and residual fuels -- are shipped by rail to Batumi for transshipment by water to other ports in the USSR and to other countries. 107/ Rail shipments of semifinished products and crude oil from Baku include shipments of straight-run mazut and transformer distillate to Batumi 108/ and Siazan crude oil to the Groznyy refineries. 109/

Estimated sea shipments of crude oil and petroleum products from Baku, by port of destination, 1948, are shown in Table 6.*

* Table 6 follows on p. 24.

Table 6

Estimated Sea Shipments of Crude Oil and Petroleum Products from Baku by Port of Destination 110/
1948

Million Metric Tons

	Makhachkala	Astrakhan'	Krasnovodsk	Gur'yev	Total
Products	1.3	3.6	1.3		6.2
Crude oil	1.0	0.2		0.4	1.6
Mixed oils	0.8	0.1			0.9
Gas oil				0.3	0.3
Total	3.1	3.9	1.3	0.7	9.0

Astrakhan' received over 50 percent of the finished products for transshipment to supply other areas. Approximately 45 percent of the total received at Astrakhan' consisted of tractor kerosine. 111/ Makhachkala received products for transshipment by rail and pipeline and charge stock for the Groznyy refineries. 112/ Krasnovodsk received finished products primarily for transshipment eastward, and Gur'yev received only charge stock for the refinery located there. 113/ Since 1948, information is not available to permit quantitative estimates, but it is believed that the pattern of sea shipments has remained the same and that the level of shipments probably has not increased more than 5 percent. 114/ Any increase that has occurred probably has been a result of increased availability of finished products.

Before World War II, Baku and Batumi were connected by two pipelines: one, an 8-inch line completed in 1906, had an annual capacity of 900,000 tons, and the other was a 10-inch line completed around 1930. 115/ There is considerable evidence that since the war only one pipeline, the old 8-inch line, has been in use and that it transports charge stock to the Batumi refinery. 116/ It is possible that during the war the 10-inch line may have been dismantled for

relocation. 117/ In 1948 the pipeline carried about 750,000 tons of mixed oils. 118/ Since that time it is believed that the pipeline has been switched to transporting crude oil from the Baku fields and from the Kazan-Bulag field. 119/ It is assumed that in 1954 the pipeline operated at or near its capacity.

Construction of a new 12-inch pipeline from Baku to Batumi was being planned in 1951 and 1952, 120/ and actual work on the line probably has begun. 121/ It is not known whether this line will be used to transport crude oil or petroleum products, but in view of the large surplus of petroleum products at Baku, it probably will be used to transport petroleum products.

B. From Batumi.

Petroleum products are distributed from Batumi by rail and sea to areas within Region V, to other areas in the USSR, and to other countries.

Rail shipments in 1948 amounted to about 400,000 tons, of which nearly 75 percent is estimated to have been shipped to destinations in Georgia. 122/ Limited information since 1948 123/ suggests that rail shipments in 1954 probably amounted to between 600,000 and 700,000 tons. Most of the rail shipments probably went to Georgia.

Sea shipments of petroleum from Batumi go to Odessa and other Soviet ports on the Black Sea, to the Soviet Far East, and to consumers outside the USSR. 124/ Total shipment by water in 1948 is estimated to have amounted to about 650,000 tons. 125/ Nearly 80 percent of this total was shipped to Odessa, and only a very small amount (less than 5 percent) is believed to have been shipped for export. Since 1948, available information on total sea shipments from Batumi is very limited. It is known, however, that one particular category of these shipments, the shipments for export, has increased significantly. In 1953, exports amounted to about 265,000 tons, including about 250,000 tons shipped to non-Bloc countries. 126/ Export shipments in 1954 increased even more significantly and are estimated to have amounted to about 650,000 tons,

of which about 630,000 tons were exported to non-Bloc countries. 127/ Shipments from Batumi to the Soviet Far East amounted to about 80,000 tons. 128/ Total sea shipments in 1954 probably amounted to about 1.9 million tons.

V. Consumption.

Practically all of the petroleum products consumed within Region V are supplied by the refineries located within the region at Baku, Batumi, and Lilo. Products from Baku are consumed in all three of the Republics, products from Batumi supply Armenia and Georgia, and the small output from Lilo is consumed entirely within Georgia.

A. Armenian SSR.

Distribution in the Armenian SSR is carried out by the oil sales directorate at Yerevan and its subordinate bases. 129/ Armenia has no indigenous source of petroleum supply and is therefore dependent upon rail shipments from Baku and Batumi. Civil consumption in 1948 is estimated to have amounted to about 100,000 tons, 130/ of which about 15 percent was supplied from Batumi and about 85 percent from Baku. 131/ The products consumed were principally motor gasoline, heating mazut and kerosine, and a small quantity of miscellaneous lubricating oils. 132/ Since 1948, consumption has increased, and the relative importance of Batumi as a source of supply has also increased slightly. 133/ Consumption in 1954 probably amounted to between 175,000 and 225,000 tons of petroleum products.

B. Georgian SSR.

Two oil sales directorates are located in the Georgian SSR, at Tbilisi and Batumi. 134/ The directorate at Batumi is subordinate to the one at Tbilisi. 135/ Petroleum requirements for the republic are met by the three refineries located in Region V plus smaller shipments from refineries outside the region. 136/ Consumption

in the republic in 1948 is estimated to have been between 400,000 and 500,000 tons.* More than 70 percent of the estimated total, including all of the heating mazut requirement, was supplied from Batumi. Principal products consumed were mazut, motor gasoline, kerosine, and diesel fuel. 140/ A large part of the mazut probably is released at Batumi to the Merchant Fleet, the largest single consumer. 141/ Consumption in the Georgian SSR is believed to have increased to about 1.2 million tons by 1954. The available supply included about 300,000 tons of products from sources outside of Region V, 142/ including fairly sizable quantities of heating mazut, which was also supplied from both Baku and Batumi. 143/

C. Azerbaydzhan SSR.

The major portion of the products consumed within Azerbaydzhan SSR is supplied by the refineries at Baku. A small quantity of special products is supplied from other areas, 144/ and recently heating mazut has also been supplied from other areas to consumers within the republic. 145/ Products are distributed by rail and by local release through the oil sales directorate at Baku and its subordinate bases. Civil consumption within the republic is estimated to have amounted to about 1.9 million tons in 1948. This included approximately 1.2 million tons of products released locally at Baku 146/ and about 700,000 tons shipped by rail. 147/ The limited available information since 1948 shows a considerable increase in consumption. 148/ Total consumption in 1954 is believed to have increased to about 3.2 million tons. It is believed that at least 300,000 tons of this total were heating mazut supplied from refineries outside Region V. 149/ Consumption of mazut in 1948 accounted for at least 50 percent of the total 150/ and probably still represents a significant part of the total consumption. 151/

* This figure is derived as the sum of the estimated rail shipments from Baku and Batumi, 137/ barge shipments from Batumi, 138/ local release at Batumi, 139/ and the production of the Lilo refinery.

VI. Supply Balance.

In 1954, the production of crude oil in Region V was about 17 million tons. The refineries at Baku consumed about 13.8 million tons, and about 900,000 tons were shipped by pipeline to Batumi. In addition, rail shipments of crude oil to Batumi refineries probably amounted to about 400,000 tons. The small production of crude oil of the Georgian SSR was consumed entirely within the region. The total consumption of locally produced crude oil in 1954, therefore, amounted to about 15.2 million tons, 89 percent of the total production. Shipments out of Region V by rail and sea from Baku totaled about 1.8 million tons and went primarily to supply the refineries at Groznyy and Gur'yev. Although Baku ships excess crude oil out of the area, some crude oil is imported by way of the Black Sea for the Batumi refinery. 152/ These imports probably do not exceed 750,000 tons per year. Difficulties in transporting crude oil from Baku to Batumi probably account for the simultaneous import and export of crude oil from the region.

The refineries of Region V supply all of the requirements of the region except for heating mazut and small quantities of special products. In the past few years, consumption of heating mazut has increased while production has decreased, and fairly large quantities of this product have been imported -- in particular from Kuybyshev and Makhachkala. In view of the large production capacity of the refineries, this suggests that the quality of the crude oil in Region V makes it advantageous to limit the production of heating mazut in favor of other, more valuable products.

After internal requirements are met, Region V has a surplus of petroleum products amounting to about 10 million tons. Most of this surplus is produced by the Baku refineries. Baku ships products by rail to all areas of the USSR, to Sino-Soviet Bloc countries, to Finland, and to Batumi for transshipment by water. The shipments consist primarily of lubricating oils and special products. Rail shipments from Batumi out of Region V are negligible. Sea shipments from Baku to the Caspian ports of Astrakhan, Makhachkala, and Krasnovodsk represent a large part of the available output. These

shipments can be transshipped to supply the area along the Volga River, Soviet Central Asia, Siberia, the Far East, and the western part of the USSR. Sea shipments from Baku include most of the products produced by the refineries. Sea shipments from Batumi include products from Baku and go primarily to Odessa, to the Soviet Far East, and for export to non-Bloc countries.

VII. Capabilities, Vulnerabilities, and Intentions.

A. Capabilities.

The future development of the production of crude oil in Region V will depend upon the amount of effort and capital invested. Production could be increased but only with a large expenditure of capital. It seems probable that production will be maintained at approximately the present level, which is sufficient to supply the refineries that are dependent upon Azerbaydzhan crude oil. The greatest emphasis will be placed upon the development of the offshore oil deposits, where the return on the capital invested is greater than it is on the mainland.

During the past 5 years the refineries of Region V have stressed the improvement of the quality of petroleum products rather than an increase in quantity. No further major refinery construction in the region is anticipated. The Azerbaydzhan Scientific Research Institute of the Oil Refining Industry has constructed in Baku pilot, or experimental, plants for the investigation of catalytic cracking, hydrogenation, and hydroforming processes and an experimental lubricating oil plant. It is believed that this experimental development will be an important indicator of the future direction of refining operations.

The significant increase in the export from Batumi of petroleum products to countries outside the Soviet Bloc which developed in 1953 and 1954 probably will continue as long as the USSR exerts a concerted effort to participate in world trade. The major share of the Region's surplus of petroleum products will continue to contribute to the supply of the requirements of the Soviet Bloc, and the region

unquestionably will remain a dominant factor in the petroleum economy of the USSR.

B. Vulnerabilities.

The greatest weakness of the petroleum industry in Region V is its extremely vulnerable location, bordering on Turkey and Iran. The great concentration of refining facilities and producing fields in and around Baku add to the locational vulnerability.

C. Intentions.

The maximum output of the highest octane grade of aviation gasoline, B-100/130, at Baku has not been attained -- possibly because of the small peacetime demand for it. In the event of a wartime emergency, however, the output of high-octane aviation gasolines and jet fuel could be greatly increased at the expense of other products, particularly motor gasoline, lamp kerosine, and tractor fuel. Such a shift in product emphasis might be a clear indicator of military intentions.

APPENDIX A

PRODUCTION TRUSTS IN REGION V*

1. Azerbaydzhan SSR.

a. Azizbekovneft'.

The Azizbekovneft' trust has five oilfields 153/ and has been producing crude oil since 1932. 154/ In 1936 it was the second largest producer in Azerbaydzhan. 155/ Production has declined since that time, 156/ and in 1954 the trust probably produced less than 1 million tons. The trust is also an important producer of natural gas, which it supplies to the carbon black plant in Bina. 157/

b. Artemneft'.

The Artemneft' trust is composed of 6 fields, 3 on Artem Island and 3 offshore fields. 158/ It has been a consistently good producer during the postwar period, 159/ and the observed general increase in production has been primarily from the offshore fields. 160/ Production from this trust amounted to about 780,000 tons in 1949. 161/ Production has continued to increase and by 1954 may have amounted to about 2 million tons.

c. Gyurgyanneft'.

The Gyurgyanneft' trust was established in 1949 162/ and consists of three fields located at Neftyannye Kamni and Zhiloy Island in the Caspian Sea. 163/ The production of this trust has increased rapidly, 164/ and it appears that it is now the largest producing trust in Azerbaydzhan. Its production may exceed 3 million tons per year.

* Production estimates for individual fields include natural gas production. Additional information on the geology, operations, and prospects of the individual trusts and fields in Region V is available in detail in CIA files and is the basis for the information presented here.

d. Buzovnyneft'.

The Buzovnyneft' trust, which now has 6 fields, 165/ was originally formed in 1945 from 2 fields which had formerly belonged to Leninneft' and Azizbekovneft'. 166/ Production increased rapidly at first but began to level off around 1948. 167/ Since that time only a small increase is believed to have occurred, principally in the last 2 years, 168/ and production probably has not greatly exceeded 1.5 million tons. Most of the past difficulties of the trust seem to have resulted from technological problems. 169/

e. Kaganovichneft'.*

The Kaganovichneft' trust seems to have experienced a decline in production in the postwar period. 170/ Total production from nine fields 171/ in 1945 is estimated to have been about 1.3 million tons. 172/ The trust now has only six fields, 173/ and its production is believed to be less than 1 million tons. The declining trend is expected to continue because the trust has very few prospecting areas where new deposits may be discovered.

f. Ordzhonikidzeneft'.

The production of crude oil of the Ordzhonikidzeneft' trust declined slightly in 1946, 174/ and the decline probably continued until 1950. A small increase has been noted since that time, 175/ and production has probably risen to about 1.8 million tons, approximately the 1946 level. The trust consists of 9 fields, 176/ 8 of which are the old Surakhany fields. 177/ No substantial increase in the production of this trust is expected.

g. Leninneft'.

The Balakhany-Sabunchi-Romany fields, which form the Leninneft' trust, are both the oldest and -- until 1953 -- the largest

* In December 1954 it was reported that this trust had been merged with the Ordzhonikidzeneft' trust.

producing fields in the USSR. The trust has 14 fields, 178/ and includes some wells which are as much as 50 or 60 years old. 179/ Recovery in the postwar period was good until 1953, 180/ when the trust failed to fulfill its plan. 181/ The present level of production is believed to be slightly less than 3 million tons, but unless valuable new oil deposits are discovered, a gradual decline in production will probably occur. The trust has also produced fairly significant quantities of natural gas. 182/

h. Stalinneft'.

Production of the Stalinneft' trust is from the old Bibi-Eybat and Bukhta Il'ich oilfields. 183/ The trust consists of 9 fields, 8 of which are located on land on the old Bibi-Eybat field. 184/ The ninth field is the "enlarged" Bukhta Il'ich field including the offshore area which has been extended far out to sea. 185/ The major portion of the present production, which is probably about 2.8 million tons, is believed to come from the offshore area, although the introduction of secondary recovery methods has resulted in some increase in production at the old fields. 186/

i. Kirovneft'.

Production of the Kirovneft' trust lagged in the immediate postwar period 187/ but since 1949 is believed to have increased slowly and steadily until it probably now exceeds 1 million tons annually. The steady increase is believed to result from the development of promising areas discovered just before World War II. 188/ The trust has six fields. 189/

j. Molotovneft'.

The Molotovneft' trust has seven oil fields 190/ including the areas of the former Kergezneft' trust, which was liquidated in 1952. 191/ The record of the trust in the postwar period has been poor, 192/ and the annual production is believed to be less than 1 million tons. It has been, however, a good producer of natural

gas, 193/ most of which is consumed at the .rbon black plant at Karadag 194/ and the furnace black plant at ›vaya Puta. 195/ The production of this trust is not expected to increase.

k. Kirovabadneft'.

The Kirovabadneft' trust was formed in 1947 196/ and includes the production of the Kazan-Bulag deposit 197/ and possibly the Naftalan deposits. 198/ Production has never exceeded 300,000 tons and in 1954 was probably insignificant.* The Kazan-Bulag and Naftalan deposits are connected to the Baku-Batumi pipeline. 199/

l. Neftechalaneft'.

The Neftechalaneft' trust operates in the lower valley of the Kura River. In the postwar period the trust has expanded from 1 field immediately after the war 200/ to 3 fields in 1954. 201/ Its production is still small, probably less than 200,000 tons, but developments in the next few years should determine the future importance of this area. The planned construction 202/ of a 12-inch gas pipeline in 1950 from Neftechala to Baku indicates the discovery of large gas reserves which will be exploited upon completion of the pipeline.

m. Siazanneft'.

The Siazanneft' trust, consisting of only one field, 203/ was formed in 1940, 204/ and production during 1954 was about 90,000 tons.

n. Kobystanneft'.**

Production in the Kobystanneft' trust began in 1951 205/ and is believed to be quite small. The trust consists of only one field. 206/

* In December 1954, this trust was not mentioned among existing trusts.

** In December 1954 it was reported that this trust had been merged with the Molotovneft' trust.

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2. Georgian SSR.

a. Gruzneft'.

The Gruzneft' trust was formed in 1930 and conducts all producing and prospecting activities in Georgia. 207/ The trust operates in three fields. 208/ Its total production probably is about 65,000 to 70,000 tons.

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APPENDIX B

PETROLEUM REFINERIES IN REGION V

1. Baku.

a. Refinery imeni Stalin, No. 432. 209/

Refinery imeni Stalin is the largest refinery in Baku and is located in Belyy Gorod, adjacent to the Andreyev refinery. 210/ It has an estimated 5 million tons of crude oil distillation capacity 211/ and 2.6 million tons of mazut distillation capacity. 212/ Other facilities include a lubricating oil contact treating plant (MOZ), 213/ a gasoline-ligroine treating plant, 214/ a Max Miller furfural lubricating oil treating plant, 215/ three additive plants, 216/ and a propane deasphalting plant. 217/ The refinery is the largest producer of lubricating oils in the USSR. 218/ It also produces gasolines, 219/ kerosine, 220/ and diesel fuel. 221/ It is believed that most of the light product blending -- particularly as regards the quality grades of aviation gasoline -- is carried out at the Stalin refinery.

b. Refinery imeni Andreyev, No. 430. 222/

The Andreyev refinery is the oldest refinery in Baku 223/ and is located in Chernyy Gorod. 224/ It has about 5.4 million tons of crude oil distillation capacity 225/ and about 0.5 million tons of mazut distillation capacity. 226/ Other facilities include acid and caustic treating plants, 227/ a soap naphtha plant, 228/ and a plant to produce acid contact demulsifier. 229/ The refinery produces principally distillate and residual fuels, including aviation gasoline base stock, aviation gasoline B-70, jet fuel, ligroine, kerosine, diesel fuel, and various mazuts. 230/ It also produces some lubricating oils. 231/ It is believed that the Andreyev refinery is the only refinery at Baku producing jet fuel. Facilities for hot caustic washing of the jet fuel fractions are under construction at the refinery. 232/ The maximum jet fuel production of the refinery probably is about 1 million tons.

c. New Baku Refinery, NBNZ. 233/

Construction of the Baku Refinery, NBNZ, began in 1948 in the northeastern suburbs of Baku near Kishly. 234/ The refinery was in operation by mid-1953 235/ and includes a thermal cracking plant completed in 1950 236/ and a catalytic cracking plant completed in early 1953. 237/ It is believed to have a catalytic cracking capacity of about 400,000 tons per year 238/ and a thermal cracking capacity of about 600,000 tons per year. 239/ Other facilities are believed to include a catalyst plant, 240/ a gas recovery plant, 241/ a thermal reforming plant, 242/ and a thermal depropanizing plant. 243/ This refinery is the only source of aviation gasoline grade 100/130 244/ in Region V and has also produced catalytically cracked aviation gasoline grade 95/130. 245/ Other products probably include motor naphtha (to be used in blends of motor gasoline), cracked ligroines and kerosines, and fuel oil. The catalyst plant is believed to be capable of producing about 3,000 tons of pellet-type catalyst per year, 246/ and in 1952 and early 1953 it made catalyst for the cracking unit at Krasnovodsk. 247/

d. Baku Cracking Plant imeni Vano Sturua, No. 229. 248/

The prewar Vickers and Winkler-Koch units of this plant were completely reconstructed and modernized during World War II, 249/ with a resultant increase in throughput capacity of about 30 percent. 250/ The present thermal cracking throughput capacity of these reconstructed facilities is believed to be about 1.4 million tons per year. A new unit constructed in 1948-50 and known as the "Spets" unit 251/ is believed to be a thermal visbreaker 252/ with a probable annual throughput capacity of about 90,000 to 100,000 tons. The plant also has a catalyst factory 253/ which has produced "powder" catalyst. 254/ The refinery produces cracked motor gasoline, cracked ligroine and kerosine, diesel fuel, coke, and asphalt. 255/ It also treats and prepares the coke benzol charge for the benzene alkylation plants. 256/

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e. Refinery No. 435.

Refinery No. 435 is primarily a distillation plant and has the most modern distillation equipment in Baku. 257/ Facilities include 2 atmospheric distillation units 258/ with an estimated capacity of about 2.9 million tons per year, 259/ a gasoline-stabilizing and gas-fractionating plant, 260/ and 12 desalting-dehydrating (ELOU) units. 261/ The refinery probably produces the usual straight-run products such as gasoline, ligroine, kerosine, and mazut or gas-oil.

f. Refinery imeni Dzhaparidze, No. 377. 262/

Refinery No. 377 has a distillation capacity of about 200,000 tons of mazut per year. 263/ Other facilities include a propane de-waxing plant, 264/ a wax-processing plant, 265/ a petrolatum oxygenation plant, 266/ and an acid recovery unit. 267/ The principal product of the refinery is a brightstock base stock. 268/ It also produces miscellaneous lubricating oils. 269/

g. Baku Solid Lubricants (Grease) Plant No. 405. 270/

Plant No. 405 is primarily a bulk grease plant producing solid lubricants from petroleum or vegetable oils. Its output includes products such as solidol, 271/ gun and rifle greases, 272/ shoe grease, 273/ petrolatum, 274/ and cable insulation grease. 275/

h. Benzene Alkylation Plant No. 10. 276/

Plant No. 10 consists of 2 units, 1 using sulfuric acid as a catalyst 277/ and 1 using aluminum chloride. 278/ The two units probably can produce a maximum of 90,000 tons of alkylbenzol per year. 279/ They operate on benzene from the Budennyy refinery and coke benzol from the chemicals industry. 280/

i. Refinery imeni Budenny, No. 412. 281/

Refinery No. 412 consists of two reconstructed pyrolysis plants 282/ and a new pyrolysis plant constructed during 1950-51. 283/ The throughput capacity of the three plants probably does not exceed

500,000 tons of kerosine distillate charge per year. 284/ The refinery produces pyrobenzol (a mixture of aromatics used as a component in aviation and motor gasolines), 285/ toluene, 286/ benzene, 287/ and green oil. 288/ The gas from the pyrolysis units, Pirogaz, is a source of olefins for the benzene alkylation units and is also burned to produce carbon black. 289/

j. Sulfuric Acid Plant imeni Frunze.

The original Frunze plant completed in 1929 290/ has been reconstructed. It contains Lurgi, Frischer, and ChemCo equipment and is believed to be capable of producing about 50,000 to 60,000 tons of sulfuric acid per year. 291/

k. Natural Gasoline Plants, Nos. 2, 3, and 4. 292/

2. Georgian SSR.

a. Refinery imeni Stalin, No. 429 (Batumi). 293/

Refinery No. 429 has an estimated 2 million tons of crude oil distillation capacity, 294/ about 260,000 tons of mazut distillation capacity, 295/ and a thermal cracking capacity of about 720,000 tons per year. 296/ It produces aviation gasoline grades B-70 and B-89, jet fuel, motor gasoline, tractor kerosine, diesel fuel, engine fuel, fuel oil, asphalt, and some of the basic lubricating oils. 297/

b. Lilo Refinery.

The Lilo Refinery, a small crude oil distillation plant, is located in Tbilisi. 298/ Its maximum throughput capacity probably does not exceed 60,000 tons of crude oil per year. 299/

APPENDIX C

METHODOLOGY

The major quantitative estimates contained in this report are based on detailed studies which, because of the bulk of the data involved, it would be impracticable to publish as parts of the report. Those studies have been compiled in fully documented appendixes which are available in the files of the responsible branch of ORR..

The estimates of production of petroleum in Economic Region V are derived from studies of the individual production trusts in the Transcaucasus. Estimates of the production of petroleum products are based on studies of the individual refineries in the region. Quantitative estimates of distribution and consumption are based on all available data on shipments of petroleum and petroleum products from Baku and Batumi by sea, rail, and pipeline and on the activities of the various Oil Sales Directorates.

In addition to the data on production trusts, refineries, and shipments, the appendixes on file contain information on prospecting trusts, industry organization, classification of crude oils, and the kinds of petroleum products produced by the refineries.

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APPENDIX D

GAPS IN INTELLIGENCE

The principal gap in intelligence on the petroleum industry in Economic Region V of the USSR is the general lack of information since 1950. Although there has been some valuable information regarding refinery construction since that time, there have been virtually no reports of crude oil production. Other specific gaps, where information is almost entirely lacking, include crude oil imports into the region, a breakdown of shipments of crude oil and semifinished products by rail and pipeline, and information regarding the ultimate consumers of the petroleum products.

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APPENDIX E

SOURCE REFERENCES
