

NO-16379

2

ARMED SERVICES PETROLEUM BOARD

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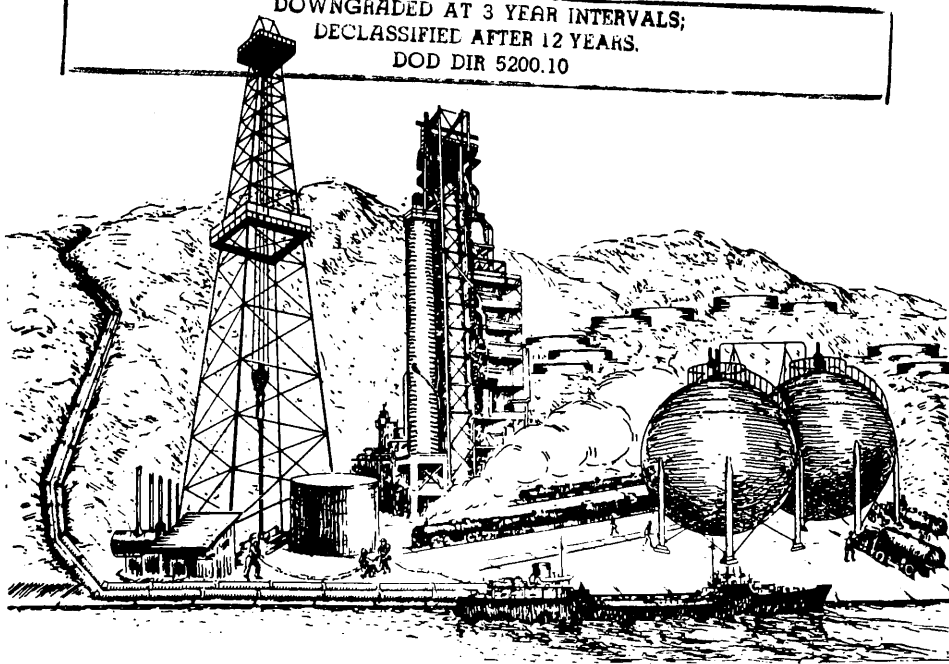
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PETROLEUM SITUATION

FAR EAST

December 1948

DOWNGRADED AT 3 YEAR INTERVALS;
DECLASSIFIED AFTER 12 YEARS.
DOD DIR 5200.10



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NATIONAL MILITARY ESTABLISHMENT
Armed Services Petroleum Board
Building T-4
Washington 25, D. C.

16379

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NCP-16379

ASPB Serial: 911-4

3 February 1949

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Subject: Petroleum Situation, Far East. Amendment to Paragraph 3, page 6 of the report

1. The enclosure (s) is for inclusion in the subject report in the place of paragraph 3, page 6 which should be deleted entirely.

J. M. Boyd

J. M. BOYD
Captain, USN
Executive Officer

C 16379

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(3) Existing East Indies bulk storage totals approximately 8,850,000 barrels and approximately 9,000,000 barrels of additional bulk storage is proposed.

SUMATRA

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	No. Tanks	Bbls. Crude	No. Tanks	White	No. Tanks	Black
Pangkalan Brandan	-	-	-	-	-	-
Pladjoe	20	920,000	63	1,920,000	41	1,420,000
Palembang	4	336,000	21	858,500	12	392,400
Tandjoeng Oeban	-	-	10	763,000	8	389,000
		1,256,000		3,541,500		2,211,400

Proposed Additional Storage

Pangkalan Brandan	9	590,000	20	470,000	21	350,000
Pangkalan Soesoe	2	130,000	17	450,000	13	355,000
Palembang	4	320,000	3	240,000	-	-
Tandjoeng Oeban	2	160,000	1	80,000	2	160,000
		1,200,000		1,240,000		865,000

JAVA

Tjapoe	3	53,000	2	3,500	3	10,300
--------	---	--------	---	-------	---	--------

BORNEO

Balikpapan	5	260,000	6	183,000	8	224,000
Tarakan	9	230,000	-	-	-	-
Lutong	34	409,400	-	-	3	11,500
Seria	6	240,000	-	-	-	-
		1,139,400		183,000		235,500

Proposed Additional Storage

Balikpapan	18	1,300,000	47	1,850,000	51	2,150,000
Lutong	3	228,000	9	233,800	18	653,000
Seria	2	120,000	-	-	-	-
		1,648,000		2,083,800		2,203,000

NEW GUINEA

195,000



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091-Far East Study
(ASPB Serial 911-7)

EXEMPTED FROM AUTOMATIC DOWNGRADING AND DECLASSIFICATION
EXEMPTION AUTHORITY: 25 CFR 172.16
DOB DATE: 5/20/10

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FROM: Armed Services Petroleum Board
TO: Distribution List
SUBJECT: Petroleum Situation, Far East

1. Subject enclosure is forwarded herewith for information.

J. E. Boyd
J. E. BOYD
Captain, USN
Executive Officer

Distribution List

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REPORT ON THE
PETROLEUM SITUATION OF THE FAR EAST
BY
ARMED SERVICES PETROLEUM BOARD

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1. PURPOSE

To ascertain the availability of petroleum and petroleum facilities in the countries of the Far East.

2. SUMMARY

(a) Proven Reserves

(1) Chinese proven reserves, including Korea and Formosa are reported to be about 30,000,000 barrels.

(2) Japanese proven reserves are reported to be 13,000,000 barrels. There were seventy-two producing fields in 1932 but only fifteen are now considered of much importance.

(3) The East Indies, including Burma, has combined proven reserves of about 1,050,000,000 barrels.

(4) The Philippine Islands presently have no proven reserves. The Far East Oil Company is exploring the Islands and there is inconclusive indication that oil does exist in commercial quantity.

(b) Crude Production

(1) Chinese crude production, including Korea and Formosa averaged about 1500 barrels per day during the year 1947. Sinkiang province is China's principal petroleum producing area. There are thirteen fields in this area, namely Sochi, Sha-wan, T'a-Chang'eng, Sui-lai, Ti-hua, Wu-su, K'u-ch'e, Wen-su, Shu-na, Ch'ing-Shui-ho, Chin-Shui-ho, Tou-San-Tzu, Hui-hui-pao and Ku-yeh - Yuan-hsing-kung. The most important of these are the Tu-Shan-Tze field near Wu-su (44N-85E) and Yumen field near Yumen (39N-97E). The Tu-Shan-tze field was operated by the Russians from 1939 until their withdrawal in 1943. All wells were cemented in at that time but late reports indicate the Chinese have

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succeeded in re-opening six wells. The opening of the Yumen field was a significant wartime development.

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There are three potential producing areas in China known as Gobi Desert Basin, Huangshui Basin and the Lungtuan Basin. All of the Chinese production is located in remote areas where little or no transportation is available.

Seventy percent of Chinese production is required by the Chinese Army.

Manchuria shale reserves located at FUSHUN and estimated at 2,300,000,000 barrels are considered to be a second potential source of petroleum.

(2) Japanese production for the year 1947 was reported to average 3560 barrels per day. This is a decrease of about 4.5% compared with 1946 production. Efforts were made in 1937 toward the extensive development of synthetics but the lack of technical knowledge and Japanese inability to manufacture the necessary equipment or import it, caused the plan to fail.

(3) Sumatra has produced the greatest share of East Indies crude. The southern fields consisting of 500 wells produced about 45,000 barrels per day prior to World War II. These fields were destroyed in the early days of the war and did not get back in production until about July 1947. By 1949 these fields are expected to be producing about 52,000 barrels per day. The fields of North and Central Sumatra are still held by the Indonesian Republic and efforts of the prewar owners to re-enter have been denied. Unsettled political conditions in Java have so hampered efforts at reconstruction that present production is only 1,000 barrels per day. On 31 October 1948 political strife was reported to have caused the burning of the Tjepoe fields and refinery. The extent of the damage

[REDACTED]

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[REDACTED] UNCLASSIFIED

has not been reported. Production in Ceram was [REDACTED] has not yet been attempted. New Guinea is the center of a push for new sources of crude oil in the East Indies. The Netherlands New Guinea Petroleum Company is reported to be spending \$15,000,000.00 for exploration and exploitation. The Klamono, Mogoi and Wasian fields are known to be productive but the lack of storage facilities and pipelines will hold up production at least until the middle of 1949. The oil fields of Borneo, Miri, Seria, Tarakan and Balikpapan had exceeded 50,000 barrels per day by the end of 1947.

(4) The Philippine Islands have no production of petroleum.

(c) Refining Capacity

(1) Authoritative reports indicate only one refinery in operation in China at the end of 1947. This plant is located near Yumen (39N-97E) in northern Kansu province and is reported to have a capacity of about 1400 barrels per day. Estimates raise refining capacity to 8000 barrels per day by 31 December 1948 as a result of new construction now under way at the two refineries located at Takao, Formosa. These plants were built by the Japanese to refine East Indies crude. They had a thermal capacity of 14,000 barrels per day and catalytic cracking capacity of 2000 barrels per day. As a result of wartime equipment removals the capacity has been very limited since World War II. The China Petroleum Corporation has assumed responsibility for rehabilitation and operation of these plants.

(2) The Japanese are reported to have refining capacity of 27,000 barrels per day average as of 31 December 1947. The actual throughput was only 3,585 barrels per day, averaged for the first five months of 1947. Japanese refining losses are very high, averaging 23% of input.

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The Reparations Committee report recommends that Japanese refining capacity be limited to 40,000 barrels per day.

(3) Refining capacity of the East Indies at the end of the year 1947 totalled about 89,500 barrels per day. Sumatra has three refineries, Soengei Gerong, Pladjoe and Pangkalan Brandan. The first two are in southern Sumatra and the latter in the north. Northern area facilities are still held by the Indonesian Republic and all efforts at re-entry by the owners have been denied. The Soengei Gerong plant started post-war operation in October 1947 and by July 1948 had exceeded 46,000 barrels per day. Restoration of Java refineries has been held up by political strife. The three plants Tjepoe, Kapoean and Wonokromo have been operating on a limited scale but the total output has not exceeded 1,000 barrels per day. In October 1948 it was reported that the Tjepoe refinery had been set afire. The extent of the damage is not known. There is presently no refining in New Guinea. Borneo has two refineries, Lutong in north Borneo and Balikpapan in the southeast. Lutong is being modernized and restored and is scheduled to be on stream by mid 1949. Balikpapan is presently a skimming plant of 7,000 barrels per day capacity. Ceram has no refineries. The combined refinery capacity of all countries from India to Japan has never been sufficient to supply the needs of the Far East.

(d) Domestic Consumption

(1) China's domestic consumption for the year 1946 was about 24,000 barrels per day. Post war consumption has increased materially but authentic data is not presently available. The extent of Chinese domestic consumption in the future will depend on the outcome of the present chaotic political and economic situation.

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(2) Japanese domestic consumption averaged 15,469 barrels per day for the year ending 1 July 1947. In 1938 Japanese domestic consumption averaged 79,452 barrels per day. The Control Law of 1934 was invoked in 1938 to create a quota system and establish rationing.

(3) East Indies domestic consumption for the year 1947 is reported to be 9,627 barrels per day. Domestic consumption of this area is low because of the lack of industry and other heavy consumers and its geographical location.

(4) Domestic consumption in the Philippine Islands for the year 1948 is estimated to be about 18,000 barrels per day. Motor gasoline, fuel oil, diesel oil, and kerosene, in order, are the principal products consumed.

(5) The average per capita consumption of petroleum products in the Far East is 4 gallons per year which is the equivalent to the average per capita consumption of petroleum products in the United States every 48 hours.

(e) Imports

(1) Petroleum products imported by China averaged about 39,000 barrels per day for the year 1947. Major products in order of volume were fuel oil, gasoline, kerosene and lubricating oils.

(2) Japanese imports for the year ending 1 July 1947 averaged 13,109 barrels per day. Navy Special, gasoline, diesel oil and lubricating oils head the list.

(3) East Indies imports for the first 10 months of 1947 were about 1,685,808 barrels.

(4) Philippine Islands imports are estimated to have averaged about 18,000 barrels per day for the year 1947. Estimates of 1948 are only slightly higher [REDACTED]

(f) Exports

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(1) There were no Chinese exports of petroleum products reported for the year 1947.

(2) There were no Japanese exports reported for the year 1947.

(3) East Indies exports, for the year 1947 were 8,851,000 barrels, or 24,250 barrels per day.

(4) Figures are not available to determine the amount of Philippine exports but it is known that some kerosene and lubricating oils are exported to China.

(g) Storage

(1) Bulk storage along the China coast totals 5,373,000 barrels and is widely scattered. The three principal storage points are Shanghai 60% or 3,553,000 barrels, Hong Kong 811,600 barrels and Tientsin 483,000 barrels.

(2) The Japanese "Strike" report of February 1948 indicated there was 7,293,000 barrels of above ground and 11,381,650 barrels of underground storage in Japan. Principal military storage points and quantities in order are Yokahama 387,410 barrels, Kainan 824,000 barrels, Sasebo 705,300 barrels, Kawasaki 502,000 barrels, Fukuoka 209,320 barrels and Kobe 180,800 barrels. The military is now occupying about 6,400,000 barrels and commercial storage approximates 2,000,000 barrels, leaving about 10,000,000 barrels of storage available for increased operational or strategic purposes.

(3) In the East Indies, there is approximately 760,000 barrels of storage as follows: 110,000 barrels at Hollandia, 20,000 barrels at Noesi Podido, 36,900 barrels Balikpapan, 347,000 barrels Batavia and Soerabaja has 246,000 barrels under construction and scheduled for completion in late 1948.

See attached change on front cover

~~TOP SECRET~~

(4) The Philippine Islands have 659,812 barrels of military storage and 1,990,400 barrels of commercial storage. Luzon Island has 659,812 barrels of military storage and 1,034,000 barrels of commercial storage. Cebu Island has 676,900 barrels of commercial storage. Panay has 246,700 barrels of commercial storage.

(h) Terminals

(1) Three Chinese ports are capable of accommodating fully loaded T-2 tankers. Shanghai has 32' of water and lines and connections for all products, Amoy has 32' of water and lines and connections for all products and Hong Kong has 31' of water and lines and connections for all products. Five other ports, Chinkiang, Foochow, Hankow (summer only) Tsingtao and Swatow have varying water depths (20' to 30') and some discharge facilities. Tientsin has insufficient water to accommodate vessels of over 14' draft because of a sand bar in the harbor entrance and vessels must use lighterage from the outer anchorage to the terminal.

(2) Japan has three ports capable of accommodating fully loaded T-2 tankers. Sasebo Naval Base has water depth of 33' and 36' with cranes, warehouses and railroad spurs at each pier. Shimotsu has 35' of water and two 10" discharge lines. Nagasaki has 34' of water and floating discharge lines. Yokahama has only 29' of water at the berth but discharge is made to lighters. Tsurumi (Tokio Bay) has 29' of water and discharge is made to lighters. Qonai and Itozaki have 30'6" of water but no information is available about discharge facilities. Yokosuka can accommodate fully loaded T-2 tankers but the water depth and method of discharge is not presently known.

(3) In the East Indies, Belawan Island, Sumatra and Lutong, British Borneo can accommodate fully loaded T-2 tankers. Each port has lines and connections for all products.

[REDACTED]

(4) In the Philippine Islands there are three ports which can take fully loaded T-2 tankers. Manila has 35' of water, but discharge is made by lighterage. Cebu has 31' of water, three 8" lines and one 6" line. Iloilo, Poro and Tacloban each have 30' of water and several 4", 6" and 8" lines. Davao has 26' of water and two 8" lines. The draft of the Bataan terminal at Quitang Point is presently unknown but the port is equipped with three 8" and one 6" lines.

(i) Transportation

(1) Railroads

(a) Chinese railroads are reported to have 13,349 miles of 4'8½" (standard gauge) track, 2,798 locomotives, 32,564 freight cars and 5,165 passenger cars. There are also 749 miles of meter gauge track with 205 locomotives, 2,209 freight cars and 221 passenger cars.

Japan has a total of 24,760 miles of railway trackage. There are 20,225 miles of 3'6" gauge owned by the Government and 3,208 miles of 3'6" gauge owned by private interests. There are also 821 miles of 4'8½" (standard gauge) and 506 miles of 2'6" gauge owned by private interests. Japan has the following equipment; 6,438 steam locomotives, 519 electric locomotives, 113,987 freight cars and 12,316 passenger cars. There is no breakdown of the inventories by gauge or ownership.

Sumatra has 565 miles of 3'6" gauge trackage, 101 locomotives, 2,186 freight cars and 242 passenger cars. There are also 318 miles of 2'6" gauge trackage, 39 locomotives, 1,032 freight cars and 155 passenger cars.

Java has 3,018 miles of 3'6" gauge trackage, 972 locomotives, 20,220 freight cars and 3,000 passenger cars. There are also 162 miles of 4'8½" (standard gauge) trackage, 57 locomotives, 1,758 freight cars and 138 passenger cars.

[REDACTED]
Ceram has no railroads.

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Dutch Borneo has no railroads. The principal transportation of this area is by coastal steamers and inland waterways.

British Borneo has 116 miles of meter gauge trackage, 12 locomotives, 149 freight cars and 34 passenger cars.

(b) Of the Philippine Islands only Luzon, Panay and Cebu Islands have railroads. The line on Luzon has 538 miles of 3'6" gauge trackage 77 locomotives, 1,838 freight cars, 39 express, mail and caboose cars, 75 freight cars converted to passenger use and 67 passenger cars. Panay and Cebu Islands combined have 131 miles of 3'6" gauge trackage. There is no information on the equipment at these two points.

(2) Highways

(a) China has 79,000 miles of highways but the condition is very poor. There are very few motor vehicles in China. Present roads can be considered as satisfactory only for continued animal cart traffic. The percentage of concrete or asphalt roads is unknown.

(b) Japan is reported to have 568,750 miles of highways. It is estimated that less than one half of one percent are concrete or asphalt and the balance is little more than trails.

(c) The East Indies are reported to have 43,700 miles of highway of which 17% is concrete or asphalt.

Java has 16,850 miles of which 31% is concrete or asphalt.

Sumatra has 15,800 miles of highway of which 10% is concrete or asphalt.

Ceram, because of its development and topography has no significant highways. [REDACTED]

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[REDACTED]
Dutch Borneo is reported to have 2,250 miles of road, most of which is considered to be trails.

British Borneo is reported to have 771 miles of highways with 9% concrete and asphalt. About 176 miles are improved earth surface.

New Guinea is reported to have 669 miles of road but the largest percentage are believed to be little better than trails.

(d) The Philippine Islands are reported to have 14,907 miles of highway, 13% of which are concrete or asphalt.

(3) Pipelines.

- (a) China is reported to have no pipelines.
- (b) Japan has no pipelines according to the latest reports.
- (c) Sumatra

(1) There was an extensive network of gathering lines running throughout northern Sumatra. The lines vary in diameter from 3" to 7 $\frac{1}{4}$ " and from 4 to 47 miles long. However, there is no information available regarding their condition. (Appendix I)


Southern Sumatra has many gathering lines varying in diameter from 2 $\frac{1}{2}$ " to 8" and from 5 miles to 165 miles in length. (Appendix J)

(2) Java. There is a network of gathering lines throughout Java varying in size from 3" to 4" in diameter. The main pipeline runs a distance of 93 miles from the Tjepoe refinery to Bondaran, the loading point, on Madoera Strait. (Appendix K)

(3) Ceram. There are no pipelines.

(4) Borneo. There are numerous gathering lines from 4" to 9" in diameter and varying from 2 miles in length to 36 miles. (Appendix L)

(5) New Guinea. There is no pipeline in Borneo.

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struction from the Klamona field to Sele Straits. There are also pipelines at a deep water port due east of Makmak Island. There are also pipelines under construction from the Mogoi and Wasian fields to a point in MacCluer Bay on the south coast of the Vogelkop. These lines are scheduled for completion in 1949 and 1950, respectively.

(4) The Philippine Islands have no pipelines.

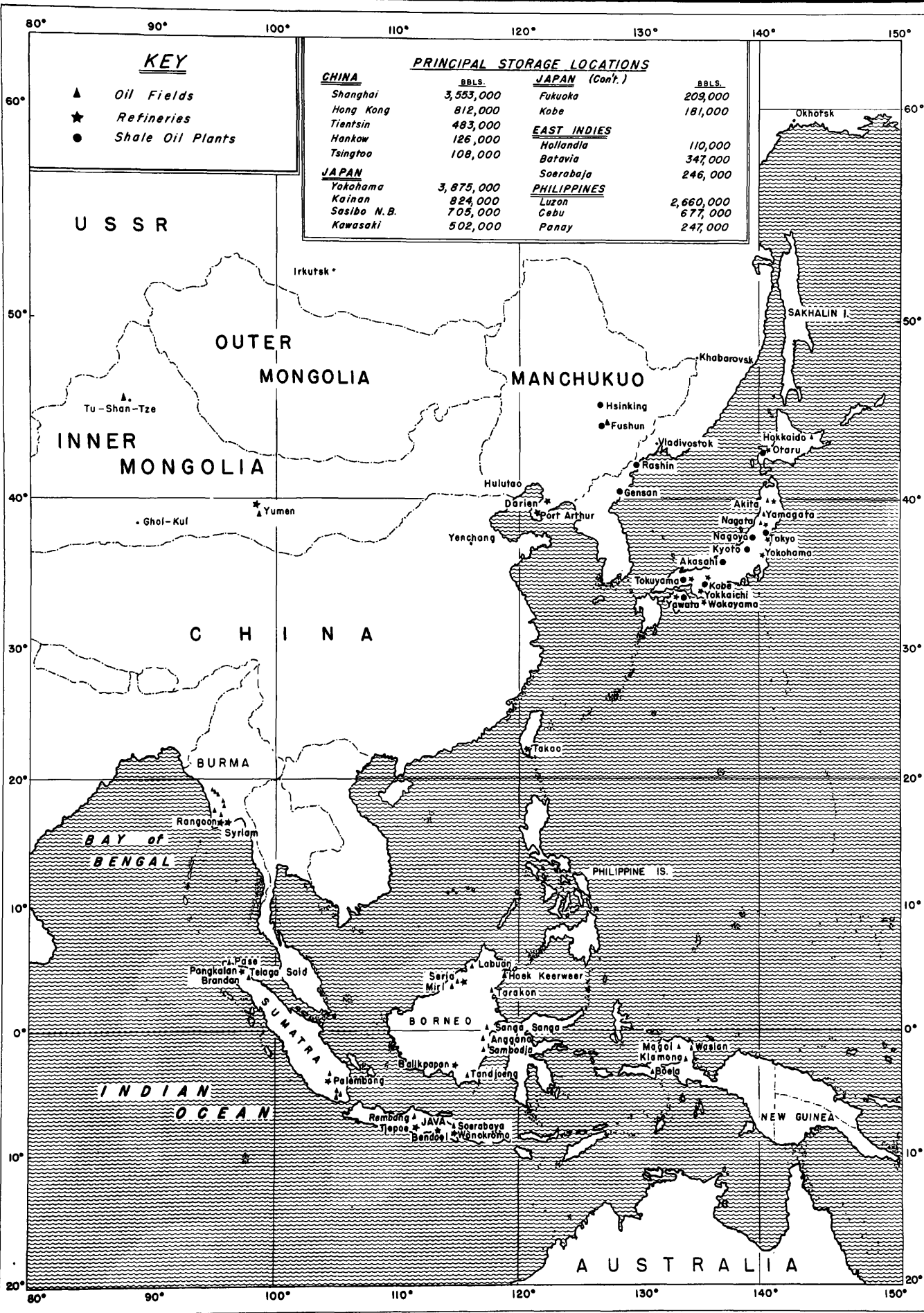
CONCLUSIONS

(a) As potential allies, all countries of the Far East, except Java, Sumatra, Borneo and New Guinea, would be petroleum liabilities to the United States.

(b) Terminal facilities and water depth are insufficient at most ports for the expeditious handling of T-2 or larger tankers.

(c) Railroad facilities, highways and pipelines are inadequate for the support of large scale military operations.

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KEY

- ▲ Oil Fields
- ★ Refineries
- Shale Oil Plants

PRINCIPAL STORAGE LOCATIONS

<u>CHINA</u>	<u>BBLs.</u>	<u>JAPAN (Cont.)</u>	<u>BBLs.</u>
Shanghai	3,553,000	Fukuoka	209,000
Hong Kong	812,000	Kobe	181,000
Tientsin	483,000		
Hankow	126,000	<u>EAST INDIES</u>	
Tsingto	108,000	Hollandia	110,000
		Batavia	347,000
<u>JAPAN</u>		Saerabaja	246,000
Yokohama	3,875,000	<u>PHILIPPINES</u>	
Kainan	824,000	Luzon	2,660,000
Sasibo N.B.	705,000	Cebu	677,000
Kawasaki	502,000	Panay	247,000

U S S R

OUTER MONGOLIA

MANCHUKUO

INNER MONGOLIA

C H I N A

BURMA

INDIAN OCEAN

PHILIPPINE IS.

BORNEO

SUNATRA

JAVA

A U S T R A L I A

NEW GUINEA

Okhotsk

SAKHALIN I.

Tu-Shan-Tze

Ghol-Kul

Yumen

Irkutsk

Khabarovsk

Hsinking

Fushun

Hulutao

Dorien

Yenchang

Rashin

Gensan

Vladivostok

Hokkaido

Otaru

Akita

Nagata

Nagoya

Kyoto

Yokohama

Akasahi

Tokuyama

Kobe

Yokkaichi

Yawata

Wakayama

Yamagata

Tokyo

Takao

Rangoon

Syriam

BAY OF BENGAL

Pangkalen

Brandan

Fuse

Telaga

Said

Serjo

Miri

Labuan

Hoek

Keerweer

Tarakan

Sanga

Sanga

Anggona

Sambaja

Balkpapan

Tandjoeng

Palembang

Rembang

Tjepoa

Bendoe

Saerabaya

Wanakra

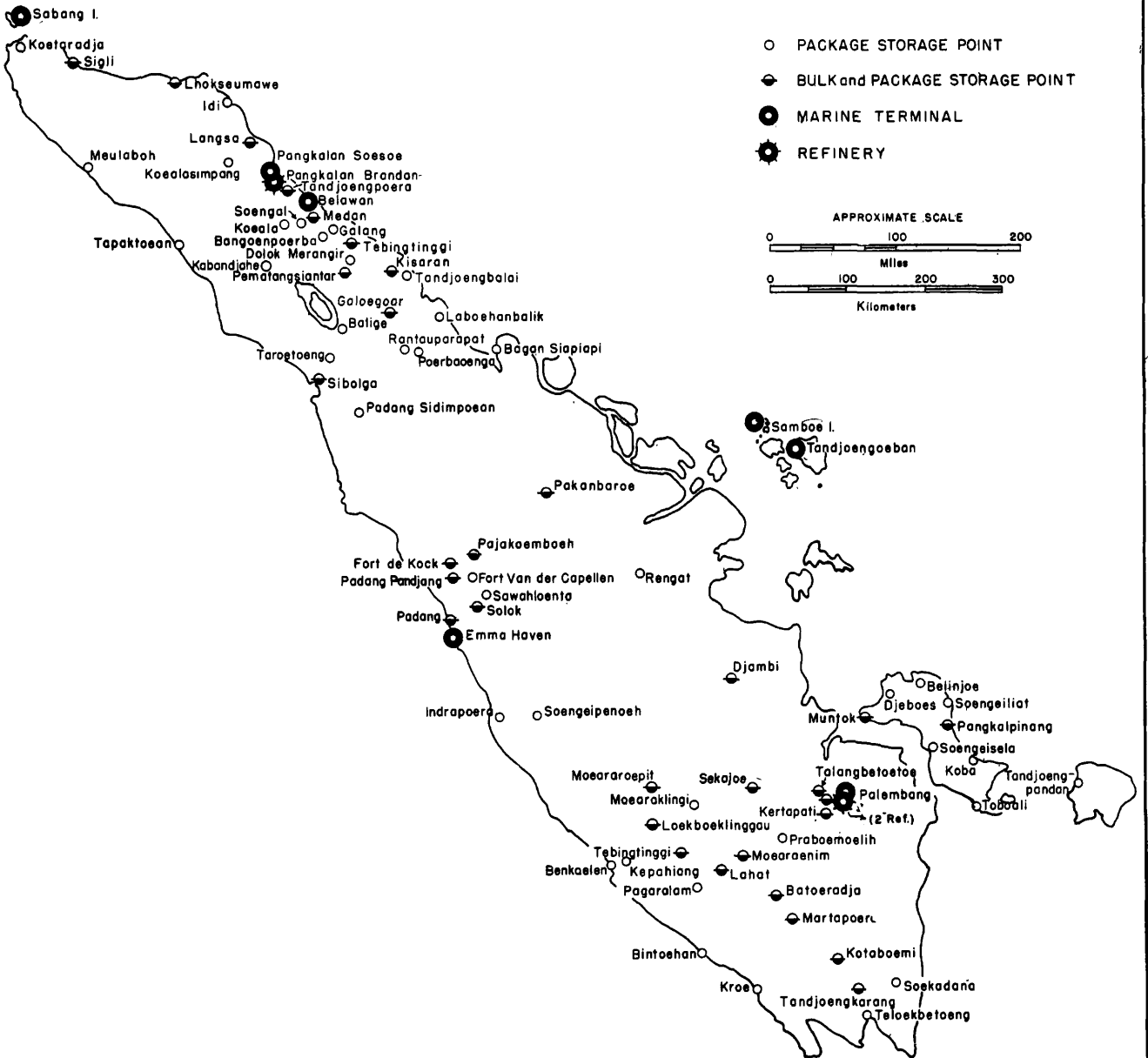
Magol

Wasian

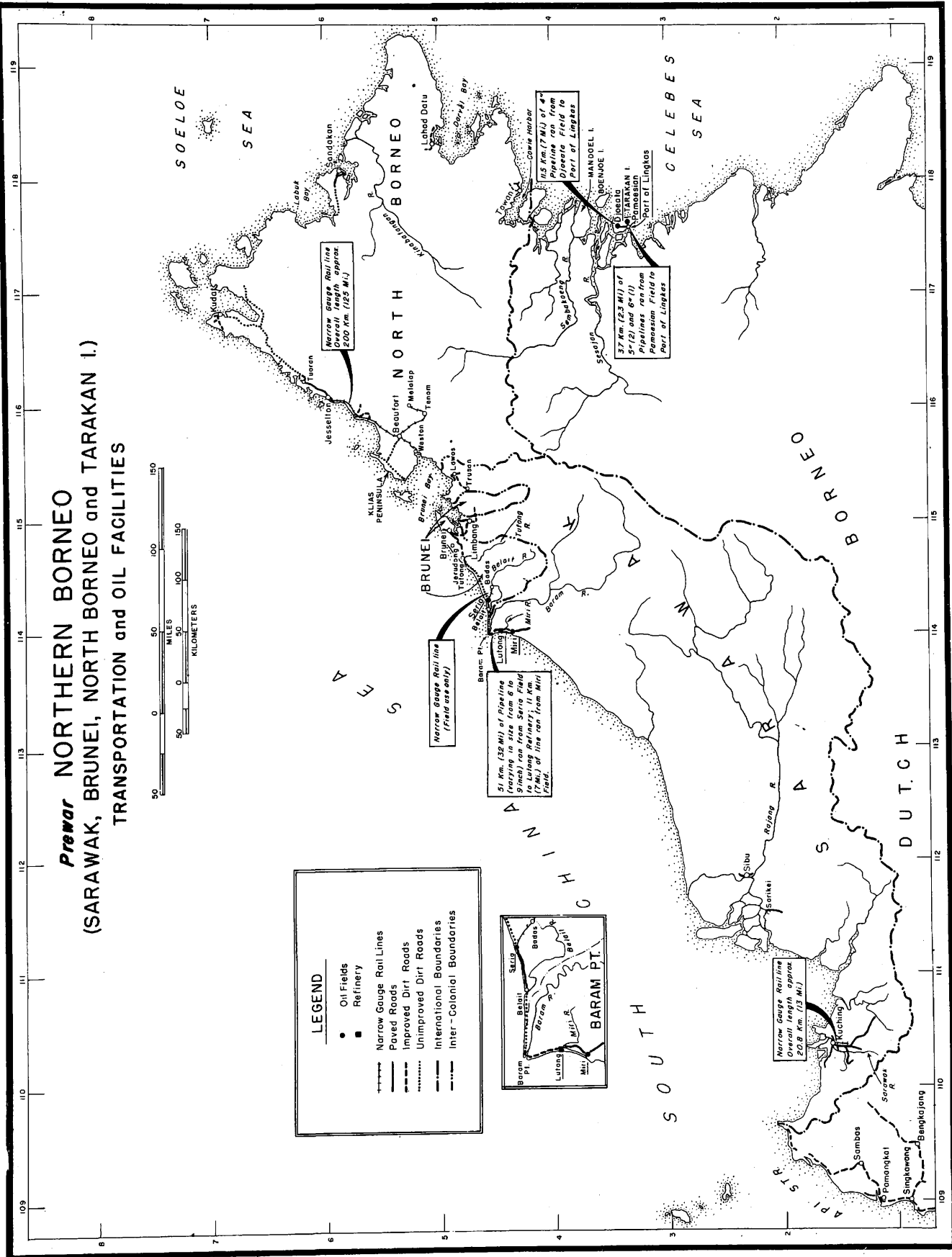
Klamanga

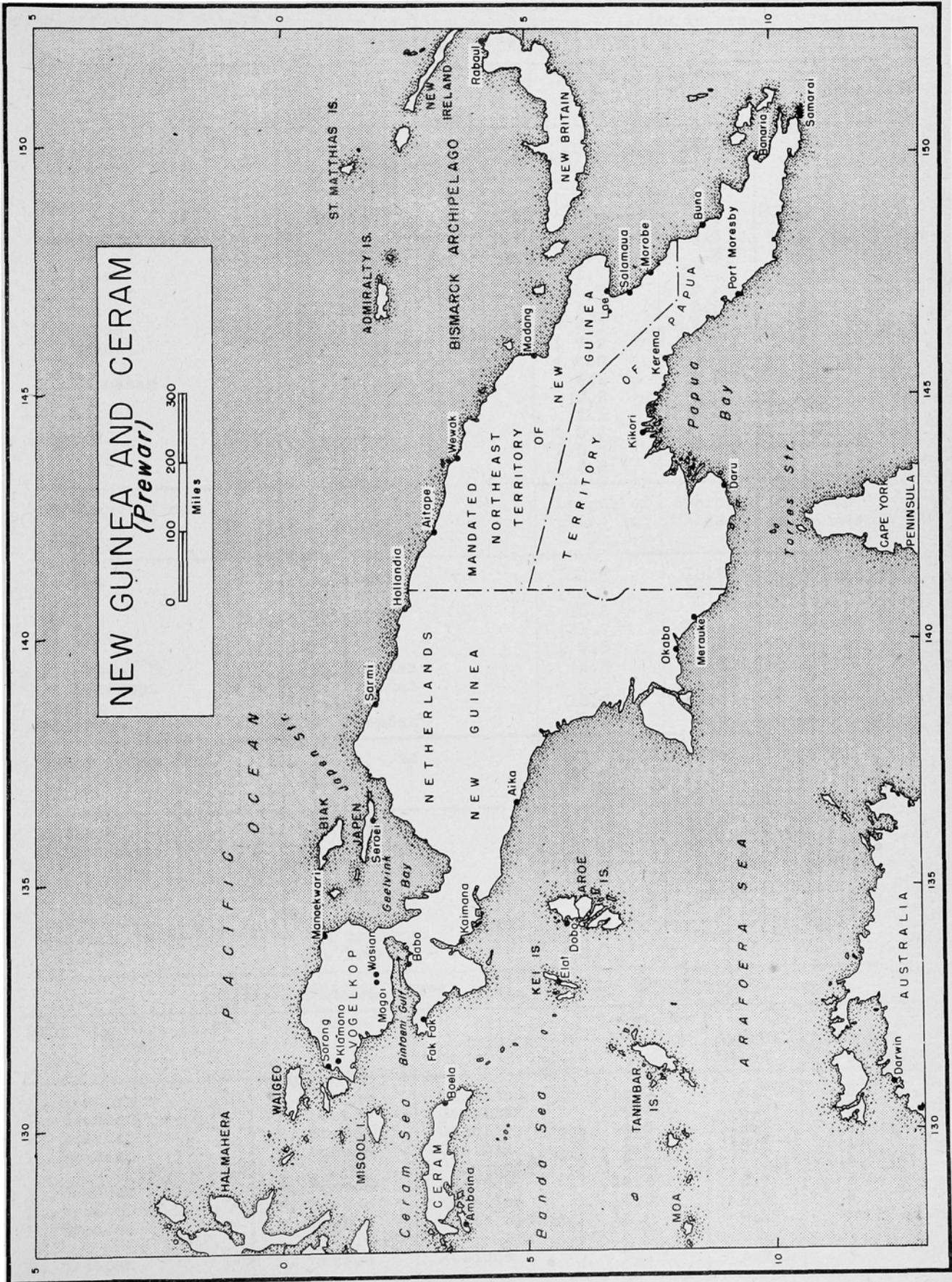
Bela

Prewar **SUMATRA** REFINERIES, MARINE TERMINALS, AND STORAGE FACILITIES

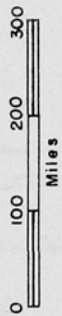


Prewar Northern Borneo
(SARAWAK, BRUNEI, NORTH BORNEO and TARAKAN I.)
TRANSPORTATION and OIL FACILITIES





NEW GUINEA AND CERAM
(Prewar)



APPENDIX I

Pipe lines. - A system of pipe lines served the different oil fields Pangkalanbrandan the refinery, and Pangkalansoesoe the marine terminal or ship-ping-off point. Detail of main pipe line connections existing in prewar days follows

Northern Sumatra, Prewar Main Pipe Line

Oil Lines from	to	Length of Line in Km.	Approx. Miles	Diameter in Inches
Djoeloerajeu	Perlak	32.8	22	3
Perlak	S. Lipoet	75.3	47	5
Rantau	S. Lipoet	15.5	9.6	6
Rantau	S. Lipoet	(14.7	9.1	4
		(0.8	.5	6
Serangdjaja	S. Lipoet	(16.5	10.3	6
		(0.8	.5	4
S. Lipoet	P. Batoe	41.7	27	5
S. Lipoet	P. Batoe	41.7	27	6
P. Batoe	P. Brandan	6.2	3.85	6
P. Batoe	P. Brandan	6.1	3.8	5
P. Brandan	P. Soesoe	(7.2	4.5	6
		(6.0	3.7	4
P. Taboehan	P. Brandan	6.2	3.85	3
Darat	T. Said	7.8	4.85	4
T. Said	P. Brandan	9.1	5.7	3
Post II	S. Sidoer	(0.6	.37	7½
		(0.7	.45	6
		(0.2	.14	5
Gas Lines from	to	Length of Line in Km.	Approx. Miles	Diameter in Inches
Perlak	S. Lipoet	(30.2	18.8	5
		(45.1	28.	4
Rantau	S. Lipoet	15.6	9.7	6
S. Lipoet	P. Batoe	(31.9	19.8	5
		(9.8	6.2	6
P. Batoe	P. Brandan	6.2	3.85	6
P. Taboehan	P. Brandan	6.2	3.85	4
Gebang	Pelawie	12.2	7.6	4
Pelawie	P. Brandan	3.1	1.9	3
Water Lines from	to	Length of Line in Km.	Approx. Miles	Diameter in Inches
Serangdjaja	S. Lipoet	16.4	10.2	6
P. Brandan	P. Soesoe	(7.8	4.85	5
		(6.1	3.8	4
Gebang	Pelawie	12.2	7.6	3
P. Taboehan	P. Brandan	6.2	3.85	3
Pelawie	P. Brandan	3.1	1.9	24
Pelawie	P. Brandan	3.1	1.9	24
Pelawie	P. Brandan	3.1	1.9	24

Northern Sumatra, Prewar Main Pipe Line (Continued)

Products Pipe Lines from	to	Product	Length of Line in Km.	Approx. Miles	Diameter in Inches
P. Brandan	P. Soesoe	Gasoline	14.0	8.7	5
P. Brandan	P. Soesoe	Gasoline	14.0	8.7	6
P. Brandan	P. Soesoe	Gasoline	14.0	8.7	6
P. Brandan	P. Soesoe	Gas Oil	(13.4	(8.3	(4
			(0.5	(.31	(5
P. Brandan	P. Soesoe	Residue	14.0	8.7	5
P. Brandan	P. Soesoe	Kerosine	14.0	8.7	4
P. Brandan	P. Soesoe	White Spirit	14.0	8.7	4
P. Brandan	P. Soesoe	Residue	3.1	1.9	2

A P P E N D I X J

MAIN PREWAR CRUDE PIPE LINES, SOUTHERN SUMATRA

<u>Oil Lines from</u>	<u>To</u>	<u>Length of line in Km.</u>	<u>Approx. Miles</u>	<u>Diameter in inches</u>
<u>BPM</u>				
Kenaliassam	Tempino	22.5	14.0	4"
Betoeng	Badjoebang	12.5	7.6	4"
Badjoebang	Tempino	27.5	17.0	4"
Tempino	Pladjoe	265	165.0	8"
Kloeang	Pladjoe	135	84.0	6"
Kloeang	Mangoendjaja	54	33.5	4 & 3"
Mangoendjaja	Babat	20	12.4	4"
Mangoendjaja spur		8.5	5.3	3"
Babat	Soebanboeroeng	25	15.5	4"
Babat	Sumpal	46	28.5	2½"
Sumpal	Selara Ladangpait	16	10.0	3"
Pladjoe (loop)	Pladjoe	107	65.5	6"
Pladjoe	Lembok	74	46.0	4"
Pladjoe	Lembok	74	46.0	6"
Lembok	Limau	36	22.4	4"
Lembok	Limau	36	22.4	6"
Limau	Soebandjerigi	32	19.8	4"
Soebandjerigi	Tandjongloentar	36	22.4	6"
Kampong Minjak	Pladjoe (a)	160	100.0	4"
<u>NKPM</u>				
Benakat	Djirak	8	5.3	6"
Djirak	Talangakar	12	7.5	8"
Talangakar	Soengaigerong	131	82.	8"
Talangakar	Soengaigerong	131	82.	6"
Pendopo	Soengaigerong	136	84.	8"

From Pladjoe BPM also had an 8" gasoline line running to Lembok 73 km., (5 miles) to Limau 40 km. (2 miles) and on to Tandjongloentar there was another 44 km. (3 miles) of 6" line.

(a) Gasoline line.

APPENDIX K

PREWAR PIPE LINES JAVA

The following table gives the available data on pipe lines between the oil fields and the refineries, between the refineries and the installations and between the installations and the shipping-off points.

Data on Pipe Lines

Place	No.	Size In In.	Capacity(a) Bbls./day of 24 hrs.	Distance In Miles	Product
Kroeka Field to Wonokromo Refinery	(1 (1	3 & 4 3	3,000 ?	1/2 1/2	Crude Gas
Lidah Field to Wonokromo Refinery	1	3	3,000	5-1/2	Crude
Wonokromo to Bandaran Installation	1	5	7,000	10	Gas Oil
Bandaran to BPM bunkering installation	2	10	55,000	2	Fuel and Diesel
Bandaran to Passar Toerie installation	1	5)	25,000	5	Diesel
Bandaran to Passar Toerie installation	1	8)			
Bandaran to Shipping-off jetty	1	6	10,000	2	Crude
Bandaran to Shipping-off jetty	1	4	4,500	2	Gasoline
Tjepoe refinery to Bandaran	1	8	13,000	93	Crude
Kawengan field to Tjepoe	1	6	18,500	10	Crude
Nglobo field to Tjepoe	1	4	6,000	13	Crude
Ledok field to Tjepoe	1	4	?	7	Gas
Ledok field to Tjepoe	1	4	6,000	7	Crude
Semanggi field to Nglobo	(1 (1	3 2 & 4	3,000 ?	6 6	Crude Gas
Loesi field to Kapoean refinery	1	2	1,000	10	Crude
Petak field to Loesi/Kapoean Line	1	2	1,250	4	Crude
Tremboel field to Loesi/Kapoean Line	1	3	2,500	16	Crude
Gliron field to Tremboel Line	1	2	1,250	2	Crude

(a) Estimated

APPENDIX L

PREWAR PIPE LINES BORNEO

The table which follows gives the available data on pipe lines from the oil fields to the refineries and terminals, as they existed at the time of the evacuation.

Data on Pipe Lines

Field	No. of Lines	Size In In.	Capacity(a) Bbls/24 hr. Day	Distance In Miles	Product
Miri Field to Lutong Refinery	2 1	6 6	15,000 ?	4 7	Crude Gas
Seria Field to Lutong "	2 looped	6 - 9	30,000 Light) 22,000 Heavy)	32	Crude
Djoeata Field to Lingkas Terminal	1	4	?	7	Crude
Pamoeasian Field to Lingkas Terminal	(2 (1	5) 5 & 6)	30,000	2 2	Crude Crude
Anggana-Moeara-Louise fields to Sambodja field	(1 (1 (1	5) 6) 8)	30,000	34 34 36	Crude Crude Gas
Sambodja field to Balikpapan Refinery	(2 (1 (1 (1	5) 8) 5) 6)	48,000 ? ?	34	Crude Crude Gas Gas

(a) Estimated.

[REDACTED]

APPENDIX M

BASIS OF STUDY

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CHINA


China's proven reserves are estimated at 30,000,000 barrels, an amount which constitutes only .04% of the total proven crude oil reserves of the world. There is some indication that China's potentialities may be much higher. A recent survey estimated her reserves at 1,600,000,000 barrels, but this figure can be taken as little more than an intelligent guess. Even if such reserves did exist, the inaccessibility and undeveloped state of China's oil-bearing regions definitely limit the possibilities of commercial oil exploitation during the near future.

Manchurian shale oil reserves, estimated at 2,300,000,000 barrels, provides China with another potential source of petroleum. Although oil shale cannot be worked on a competitive basis with crude oil, the Japanese under the pressure of a war economy managed to exploit successfully the oil shale deposits at Fushun (42N-124E). Since Fushun shale is extracted simultaneously with coal, it is possible that China will continue to exploit these shale reserves on a commercial scale.

China's present production of crude petroleum averages 1500 B/D. Prior to World War II Chinese production was even less significant. Small amounts of crude were obtained for local consumption from oil seeps in northern Sinkiang Province, and from salt wells in Szechwan Province. The Standard Oil Company was for a time interested in the oil fields at Yench'ang in northern Shensi Province, but gave up exploratory work in 1916 because of the unpromising nature of the area. The Chinese Government carried on similar experimental work which was also unsuccessful. It is estimated that in 1935 China's total crude production was only about 3,000 barrels. [REDACTED]

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 A significant wartime development was the opening of the Tu-Shan-Tze oil field in northern Kansu Province. Exploration has been in progress since 1939 and about 30 wells have been drilled. Production has run as high as 3000 B/D of 33 gravity oil, with a cumulative production of about 3 million barrels.

The Russians in 1939 began development work at the Tu-Shan-Tze fields in Sinkiang, and by 1942 these fields were yielding about 150,000 barrels annually. They withdrew in 1943, dismantling the refinery and capping up the producing wells. An American observer declared that by the end of August, 1944, the Chinese had succeeded in uncapping six of the wells and were producing crude oil at the rate of 125,000 barrels annually. The remoteness of these fields, however, limits their usefulness in supplying China's petroleum needs.

Other petroleum developments in China during this period were of little significance. Szechwan oil production in 1943 was reported at 450 barrels a year, and the Shensi fields experienced a similarly low rate of productivity.

In Manchuria, the Japanese-subsidized shale oil industry at Fushun produced over 400,000 barrels in 1935 and obtained a peak production of 1,300,000 barrels in 1943. Although this output was large in comparison with Chinese production during the war, it was not on the scale originally projected by the Japanese.

In July, 1947, a joint exploration program was undertaken by the Chinese Petroleum Corporation (Chinese Government) and several American and British companies. This survey is reported to have found a large oil field in Sinkiang Province.

In June, 1946, responsibility for China's domestic petroleum was assumed by the above-mentioned China Petroleum Corporation, a government

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monopoly operating under the National Resources Commission. Due to unsettled political conditions, postwar output has been unsatisfactory. Daily production during 1946 averaged 2,100 barrels but declined to 1500 B/D in 1947. Most of this production came from Kansu, but lack of adequate transportation facilities rendered difficult the movement of this oil to areas where critical petroleum shortages existed.

It is estimated that with adequate production equipment and distribution facilities China's annual petroleum production could be increased to 5 million barrels within five years. This estimate does not take into account yields from future petroleum explorations. Some American petroleum experts believe that annual output from the Yumen fields in Kansu alone could be increased to over 3,500,000 barrels. Such an increase would require heavy investment in additional drilling, refining, and storage equipment and in the development of adequate distribution facilities.

Any considerable increase in Chinese petroleum production would seem to depend primarily on a restoration of political stability, for which current prospects are anything but encouraging. This condition is particularly applicable to the shale oil distillation plants at Fushun in Manchuria, whose utilization depends first of all on the restoration of the Nationalist Government's authority in that area, and secondarily on the increase of Fushun coal production. All of this production is requisitioned by the Military in Mukden. Despite the high cost of producing oil from shale the Chinese appear to be determined to operate these facilities on a significant scale. Since the shale is a by-product of coal, the raw material cost would be virtually nil, and the cost of the shale oil might therefore not be too high for the Chinese.

As of December 31, 1947 there was no refinery capacity in operation in China according to official reports. World Petroleum reports a

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During the war with Japan, the normal supply and distribution facilities of China's petroleum market were destroyed or altered. The war brought about a drastic reduction in the petroleum consumption of both free and occupied China. Increased consumption after V-J day was made possible by a gradual increase in imports. The following table gives a breakdown of 1946 consumption. These figures are only rough approximations based on imports plus domestic production.

DOMESTIC CONSUMPTION 1946

<u>Product</u>	<u>Total Consumption (Bbls.)</u>	<u>Daily Average (B/D)</u>
Gasoline	3,600,000	9,870
Kerosene	1,800,000	4,930
Fuel Oil	2,900,000	7,950
Lube Oil	400,000	1,096
Other	<u>100,000</u>	<u>274</u>
Total	8,800,000	24,120

Although China's consumption of all petroleum products in 1946 approximated the prewar level, requirements were substantially different from the prewar pattern. Gasoline and lubricating oils for military vehicles had prior claims on limited supplies; the prevailing shortage of coal forced power plants and other industrial facilities to convert to fuel oil; and the disruption of transport prevented an adequate distribution of kerosene to the interior. Judging by the considerable increase in imports for 1947, domestic consumption must have far exceeded that for 1946. This increase was most striking in the case of fuel oil, the 1947 imports of which increased three-fold over 1946.

The magnitude of China's petroleum requirements over the next few years depends largely on the outcome of the present chaotic political and economic conditions. An early restoration of political stability would no doubt presage a considerable increase in civilian consumption. Other important determinants of future requirements include the rate of progress

of China's industrialization; the fuel oil needs for shipping; the rehabilitation of distribution facilities; and the number of motor vehicles in operation. Given the return of political stability and an increase in domestic petroleum requirements, China would still need sufficient foreign exchange to obtain needed imports of petroleum products. The present shortage of foreign exchange, if not overcome, will seriously curtail these needed imports.

Total storage capacity at Chinese coastal ports is estimated at 5,373,000 barrels. Over 60% of total storage capacity, is situated at Shanghai. The table below itemizes storage in the coastal ports of China by locality:

<u>Location</u>	<u>Amount of Storage In Barrels</u>
Kwanghsi	68,000
Canton	52,900
Hong Kong	811,000
Shanghai	3,553,000
Nanking	45,200
Kangwan	8,000
Lungwha Airport	2,000
Tientsin	483,500
Hankow	126,000
Tsingtao	108,000
Keelung	74,000
Yuling Harbor	40,800
TOTAL	5,373,000

Just as in the case of storage capacity Shanghai takes the lead in marine terminals. Shanghai, Hong Kong, and Amoy are the only ports which can accommodate fully loaded T-2 tankers. The following somewhat sketchy information gives a picture of the terminal situation at the various ports:

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<u>Location</u>	<u>Number of Berths</u>	<u>Size Tanker Accommodated</u>	<u>Number and Size of Connections</u>
Hong Kong	5	(Draft 31' (Any Length	Connections and Lines for all products unknown.
Swatow	2	(Draft 20'6"	
Amoy	2	(Draft 32' Any length	Connections and Lines for all Products
Foochow	Floating Lines	(Draft 20'	
Shanghai	8	(Draft 32'	Connections and Lines for all Products
Chingkiang	2	(Draft 29'	
Hankow	3	(Draft 30' (Summer only)	
Tsingtao	1	Draft 21'	
Tientsin	Discharge to Barges		

China's most developed means of transportation is her inland waterways. The Yangtze and its tributaries and the Sikiang and other rivers of South-east China bear an enormous amount of junk traffic, and the use of powered vessels is increasing all the time. The Grand Canal from the Pei River to the Yangtze has carried heavy traffic for centuries. In both central and South China the great bulk of inland trade is carried on the waterways.

Chinese roads are very poor. There are very few motor vehicles in the country and the present roads are satisfactory only for animal carts, etc.,.

There are 12,960 miles of railroad in China. The principal north and south lines are from Peking via Hankow to Canton and from Peking via Tientsin and Nanking to Shanghai. An important east and west line runs from Haichow through Suchow to Poochi in Shensi province. Shorter lines bearing heavy traffic include a line from Shanghai to Ningpo via Hangchow and from Kowloon to Canton. Tank car figures, if any are not available

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There are no pipelines in China's coastal area.

An analysis of the various factors in the Chinese petroleum situation as discussed above leads to the conclusion that China should be regarded as a petroleum liability in regard to any strategic operation undertaken within the foreseeable future. Due to the lack of developed petroleum resources and to the almost complete absence of refining capacity, any military operations in China would involve the importation of all finished petroleum products needed for the armed forces as well as most of the requirements for the civilian population. Storage facilities at Chinese coastal ports appear to be adequate. Transportation facilities in the interior are so poor as to present considerable obstacles to the effective movement of petroleum products.

From a long-range point of view effective measures should be undertaken to reduce the extent of the petroleum liability of China. Encouragement should be given to the Chinese Government to undertake an extensive roadbuilding program, China might also be assisted in the undertaking of a long-term program of exploration and exploitation of her oil resources, as well as the reconstruction of war-damaged refineries. However, high amounts of capital would be required for such enterprises, and it is doubtful if the Chinese Government would be able to embark on these ventures on its own. Any significant increase in the exploitation of Kansu petroleum reserves would require the drilling of new wells, additional refining capacity, and possibly the construction of a pipeline. Estimates by American experts of the amount of capital required for the necessary equipment for this project range from 40 to 100 million U.S. dollars. The logical source of this capital would be foreign investors, but incentive for such investment would depend (among other things) not only on a stable political situation in China, but also upon the adoption of the Chinese Government of a petroleum policy favorable to outside in-

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vestors. However, the trend, like that in many of the countries with mineral resources, seems to be in the direction of reserving the production and distribution of petroleum to the Chinese themselves, including as much as possible, any new foreign investment. This is evidenced by the formation by the Government of the Chinese Petroleum Corporation. Its funds are government-subscribed, and its charter places an absolute ban on foreign capital. Functions of this government monopoly are the exploration, production, refining, distribution, and marketing of petroleum products in China, and its properties include the Takao refineries, other Japanese-built facilities, the Kansu reserves, and various petroleum distribution and storage facilities.

Despite the formation of this government corporation, it cannot be operated without capital, and it would therefore appear that the Chinese may yet welcome new foreign investment in their petroleum industry. There have been negotiations for a joint Sino-foreign petroleum enterprise, and this appears to be the most practical solution that is compatible with the Chinese objective of preventing foreign economic domination. If, however, the Government is determined to exclude all foreign capital, investment in Chinese petroleum industry might be financed by a loan from the International Bank for Reconstruction and Development or through a long-term credit extended by the U. S. Export-Import Bank.

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Japanese proven crude reserves as of January 1, 1948, were estimated at 13 million barrels. The petroliferous belt commences on the west coast of the Island of Hokkaido, continues along the west coast of northern Honshu and reappears in southeastern Honshu. There are numerous individual fields of which many have no important production and others have been abandoned. The Japanese Government reported in 1932 that there were 72 oil fields in operation, of which only 15 were classed as important, and four as semi-important. The main oil fields are in the prefectures of Akita and Niigata along the western coast of the Island of Honshu, in an area underlain by Tertiary strata that have been sharply folded, faulted, and intruded by igneous masses. The formations of the different oil fields are similar in geological character. Nearly all the fields are located on anticlines, although a few are in faulted monoclines. Oil and gas seepages, and salt springs abound. Most of the production has come from very shallow depths. Many wells have produced from depths of less than 200 feet, and probably over half of the wells drilled prior to 1930 are less than 1000 feet deep. In recent years production is reported from wells reaching depths between 6500 and 8500 feet.

During the years between 1875 and 1941 annual production of crude petroleum in Japan never exceeded 3 million barrels. Production has rarely exceeded ten per cent of consumption, and in 1941 amounted to 2,300,000 barrels. By providing subsidies equal to two-thirds of the cost of drilling new wells and promoting additional prospecting and deeper zone drilling, the Government sought to increase indigenous crude production. However, production during the war decreased, rather than increased. This was probably due to the fact that in 1942 the Japanese transferred most of their oil drilling and production technicians ~~CONFIDENTIAL~~

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well as considerable equipment, to the East Indies in order to explore and operate the oil fields in that area.

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Japanese crude oil production following V-J Day was little more than half that of 1941, averaging 3,673 B/D in 1946. Figures for the first five months of 1947 indicate an average production of 3,560 B/D, a decrease of approximately $4\frac{1}{2}\%$ over 1946.

Commencing in 1937, the Japanese Government made serious efforts to boost synthetic oil production. The Seven-Year Plan called for completion by 1943 of 10 hydrogenation plants, 11 Fischer-Tropsch plants, and 66 low temperature carbonization plants, these facilities to produce 6,371,000 barrels of gasoline and 7,675,000 barrels of heavy oil. For a number of reasons, among them lack of technical knowledge of the processes involved, and the inability to fabricate or import the necessary equipment, the Seven-Year Plan was about 10% realized. By the end of 1944, four hydrogenation plants, four Fischer-Tropsch plants, and 8 low-temperature carbonization plants had been completed. However, only one hydrogenation plant and two Fischer-Tropsch plants achieved production on a regular scale. Japan's actual synthetic production reached a maximum of 1,501,000 barrels of total products in 1942, when emphasis was shifted to expansion of production in the East Indies. Production thereafter fell off steadily until the restoration of high priority for synthetic production in February, 1944, brought a slight revival.

B. Refining

The manufacture of refined oil in Japan, from both domestic and imported crude oils, increased from a total output of 2,803,000 barrels in 1925 to 8,715,000 barrels in 1935. All of the gas oil, solar oil, and neutral or light oils consumed in Japan in 1935 were supplied from domestic production as well as about 50% of the gasoline, 50% of the kero-

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design or theory. Most of the important plants were heavily bombed and some of them were so heavily wrecked as to be incapable of ever being repaired. Whole units within a plant, however, often escaped any damage whatsoever or were only from 10% to 30% damaged. It has been estimated that after some repairs are effected, approximately 40% of Japanese pre-war capacity will remain in operable condition.

Postwar refining operations were limited by the SCAP Directive of November, 1946, which ordered the Pacific Coast refineries to cease their operations. Refining capacity was thus confined with minor exceptions to the crude oil producing areas.

For the first five months of 1947 Japanese refinery output averaged 3,258 B/D. Diesel oil, fuel oil, gasoline, and kerosene, in that order, led the list of refined products. It would appear that refinery operations were very inefficient. In processing 639,170 barrels, 146,804 barrels were consumed and lost, equivalent to approximately 23%. This compares with a loss of approximately 21% for 1946. The following is a list of products refined during this period with the quantities for each product:

Refinery Output for 5-month Period, January-May 1947

<u>Product</u>	<u>Output for Period (Bbls.)</u>	<u>Daily Average (B/D)</u>
Gasoline	71,324	472
Kerosene	59,280	392
Gas Oil	20,527	136
Diesel Oil	125,950	832
Fuel Oil	3,295	22
Lube Oil	84,606	560
Wax	484	3.2
Asphalt	28,200	187
Pitch/Coke	132	.87
Grease	1,025	7
Other	8,730	58
Semi-refined products	<u>88,813</u>	<u>588</u>
	493,366	3,258.07

Refining capacity as of December 31, 1947, was reported to be 27,000 b/d. Throughput was nowhere near that figure due to the lack of imported crude. The Reparations Committee has recommended that Japanese

refining capacity be limited to 40,000 B/D. This ceiling applies to

in line with the potential capacity that will exist when repairs to the not-too-heavily damaged refineries are completed.

Peacetime consumption of petroleum products in Japan increased annually from 1929 to 1938 when the quota system initiated by the Control Law of 1934, and rationing, was utilized to reduce consumption. During the period of expansion civilian consumption increased from 11,300,000 barrels to 29,000,000 barrels. Through rationing and other restrictive measures consumption decreased to roughly half of this quantity by the end of 1941. Contrast this with domestic consumption for the period 1 July 1946 to 1 July 1947 which totaled only 5,649,256 barrels, equivalent to an average of 15,469 B/D. The following is a product breakdown of consumption during this period:

Domestic Consumption for the Period 1 July 1946 to 1 July 1947

<u>Product</u>	<u>Total Consumption (Bbls.)</u>	<u>Daily Average (B/D)</u>
Gasoline	1,178,990	3,221
Kerosene	269,325	737
Gas Oil	553,834	1,515
Diesel Oil	2,882,707	7,900
Fuel Oil	109,200	300
Lube Oil	608,500	1,668
Greases	46,700	128
TOTAL	5,649,256	15,469

Under normal conditions prior to the war, not more than 10% of the liquid petroleum products used in Japan and its colonies were produced in Japan. During the decade preceding the war there was a gradual increase in imported crudes and a decrease in the imports of refined products until just before the war Japan's own refineries were turning out more than 50% of the liquid products consumed. Crude was imported from various countries but upwards of 80% came from the United States.

Sakhalin was the source of two million barrels. Imports of heavy crude from the Dutch East Indies ranged from 600,000 to 900,000 barrels per



Matsukata		275,000
Kainan	824,000	
<u>Kyushu</u>		
Sasebo	705,300	42,500
Fukuoka	209,320	65,600
Ashiya AB	6,550	
Konoya	5,988	21,000
Nagasaki		168,000
Itazuke	3,840	
<u>Hokkaido</u>		
Otaru	<u>81,730</u>	<u>53,000</u>
Total	6,487,702	2,045,000
GRAND TOTAL		8,532,702

Since the present surface storage capacity falls well within the ten million barrel capacity recommended by the Reparations Committee, it seems unlikely that any of these surface tanks will be removed for reparations purposes.

It is concluded that the seven million barrel storage capacity of Japan is more than ample to support the present rate of domestic and military consumption. Based on estimates that the Japanese domestic economy cannot consume more than 13 million barrels of petroleum products annually in the foreseeable future, this seven million barrel capacity would also be adequate to support more than six months domestic petroleum requirements. If both surface and underground storage are combined, it would appear that storage capacity would be sufficient to support both domestic and strategic needs in the event of military operations in Japan.

The following terminal information is not complete, but is the best available from present sources:



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<u>Location</u>	<u>Number of Berths</u>	<u>Size Tanker Accommodated</u>	<u>Number and Size of Connections</u>	<u>Type of Lines</u>
Shimotsu	1	35' Draft	2	2 - 10" Lines
Yokohama	None	29' Draft	1	Lighter discharge
Yokosuka	Unknown	T-2	Unknown	Unknown
Nagasaki	None	34' Draft (505' Length)	Unknown	Floating lines
Kudamatusu	1	30' Draft	Unknown	Unknown
Itozaki	2	30'6" Draft	Unknown	Unknown
<u>Honshu</u>	Floating line	30'6" Draft (any length)	Unknown	1 Gasoline - 8" 1 Kerosene - 8" 1 Fuel Oil - 10" 1 Diesel Oil - 8"
Onagawa	Floating line	30' Draft (Any length)	Unknown	1 Black Oil - 6"
<u>Tokyo Bay</u> Tsurumi	1	29' Draft (Any Length)	Unknown	1 Gasoline - 8" 1 Kerosene - 8" 1 Diesel Oil - 8" 1 Fuel Oil - 10" 2 Lube Oil - 4", 8"
Kobe	Floating line	28' Draft (any length)	1-6"	
Nagoya	Floating line	25' Draft (500' length)	1-8"	
Osaka	Discharge to barges			
Taketoyo	Floating line	18' Draft (any length)	1-6"	Gasoline and Kerosene
Hikoshima	Floating line	29' Draft 490' length)	Unknown	--
Itozaki	1	30'6" Draft (600' length)	2-6", 8"	1 Gasoline - 6" 1 Kerosene - 6" 1 Fuel & Diesel - 8"
<u>Kyushu</u>				
Nagasaki	Floating line	No Restrictions	1-6"	
Saitozaki	Floating line	19' Draft	2-6", 8"	1 Gasoline and Kerosene - 6" 1 Black Oil - 8"

The Japanese have a complete distribution system for petroleum products. Since over 80 percent of normal consumption is imported, the greatest movement of petroleum products is from ocean terminals to sub-terminals and bulk plants by means of coastal tankers, railway tank cars and highway tank trucks. There are 11,229 miles of 3'6" rail connecting

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all important points in Japan. Before the war there were 7,600 tank cars with a capacity of 14,534 tons. However, there are no up-to-date figures available. When the war began the Japanese were going in more and more for motor tank trucks. At that time they had about 75 tank trucks, varying in capacity from 700 to 1,000 gallons each. The highway system in Japan is fair, having 5,000 miles of concrete and asphalt roads, 100,000 miles of gravel roads, and 450,000 miles of dirt roads. There are no distributional pipelines in Japan.

NETHERLANDS EAST INDIES

The oil fields of Sumatra occur in three areas--southern, central and northern. The northern fields were first developed over 50 years ago, but the southern territory, developed eleven years later, has long since surpassed the northern in production. Proven reserves in the south are ten fold those of the north. Production in the south in 1940 was 32,946,000 barrels, compared to 7,567,000 barrels in the northern area. The central fields are in the early stages of development; the Cal-Tex Co. has been doing some exploration in the area; but there has been no commercial production. However, a recent report based on estimates of a number of geologists and engineers makes a conservative estimate of reserves in the Doeri, Minas, and Sabanga fields of Central Sumatra at 250,000,000 barrels. The Bataafsche Petroleum Maatschappij (BPM), an operating company formed by Royal Dutch Shell in 1892 was the first organization to exploit Sumatran oil. The Standard Oil Company of New Jersey (as a result of a merger of marketing organizations with Socony Vacuum, the combined organization is now known as (Standard Vacuum) entered the field in 1912, forming the company known as Nederlandsche Koloniale Petroleum Maatschappij (NKPM). Until 1930 BPM operation accounted for about 95% of the total oil produced in Sumatra,

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but subsequently NKPM greatly increased its share in the aggregate production.

When the Japanese invaded Sumatra, the Dutch military were able to destroy the refinery effectively, but only part of the wells in the four fields could be completely junked. As a result the Japs were able to restore production in substantial quantities. Best estimates are that enemy production from NKPM fields in four years of operation totaled 28 million barrels. In 1943 a peak production of 12,284,000 barrels was reached, equal to about 75% of NKPM prewar production.

Due to unsettled political conditions, it was not possible for the oil companies to regain control of their fields for some time. A large part of Sumatra is still occupied by Indonesian Nationalists, but the fields of South Sumatra are in the hands of their prewar operators.

BPM (Shell) reoccupied a number of fields in this area in July, 1947. Reconstruction was started at once. One of the fields, Djimar, produced 7,000 B/D in August and had reached 10,300 B/D by September, 1947.

NKPM (Standard Vacuum) was not able to resume production in Sumatra until October, 1947. By early 1948 100 wells had been restored to satisfactory mechanical condition, and work-over crews were going over the field as rapidly as possible. Present production is 20,000 B/D, and the NKPM schedule contemplates a production of 35,000 B/D by April, 1948 and a prewar level of 45,000 B/D by fall of 1948. NKPM has also begun drilling a new development wells in a small way, and later in the year plans to run eight or ten rigs.

The oil fields of Java fall into two main groups, the Rembang group in Mid-Java and the Socabaja group in East Java. The Rembang group is located south of the city of Rembang which is on the north coast of central Java. Originally there were 26 separate fields in the Rembang

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but there is thought to be a considerable reserve in the fields now producing, particularly at Kawengan.

Unsettled political conditions have delayed the rehabilitation of Javanese oil fields. BPM has been unable to enter its main fields in Java. The Lidah and Kroeka fields near Surabaya have been restored, although installations at Lidah were removed by the Indonesians during their occupation of the area. In the Kroeka fields 70 old wells have been put back into production and three new wells drilled. Production has now reached 1,170 B/D.

Borneo ranked second among the islands of the East Indies as a pre-war petroleum producer, being outranked only by Sumatra. 20 million barrels were produced from its wells in 1940. This total was contributed by four groups on fields on the island as shown below:

Production of Crude Oil in 1940 - Borneo Fields

<u>Field</u>	<u>Barrels</u>	<u>% of Total</u>
Miri (Sarawak)	996,292	5
Seria (Brunei)	6,193,344	31
Tarakan Fields (Dutch Borneo)	5,365,659	27
Southeast Borneo Fields (Dutch Borneo)	<u>7,232,160</u>	<u>37</u>
Total	19,787,455	100

The Miri fields has been on the decline for some years and is approaching exhaustion. The Seria field is the most important because of its plentiful yield, its important reserves, its accessibility and the fact that a good part of the crude can be used as a fuel oil under boilers without refining. The Tarakan fields are also of major importance for the same reasons as for Seria, except that all of the crude from this source can be used as fuel oil without refining and merely requires settling and chemical treatment to extract the water which is produced with the crude. There are some difficulties, however, in extracting the oil from the fields, which render them of somewhat less value than Seria.

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In southeastern Borneo there are two oil fields which have been found in commercial quantities. The Samarinda-Sambodja-Balikpapan fields on the east coast and the Tandoeng fields farther south in the interior.

The Tankjoeng fields had never been brought into commercial production before the Jap invasion. Some of the Sumarinda fields and the Balikpapan fields were either entirely or virtually exhausted and only the Anggana, Moeara and Louise fields in the Sumarinda group and the Sambodja field were of importance.

Both British and Dutch Borneo were reoccupied much earlier than other parts of Indonesia at the close of the war, and rehabilitation was begun in some fields even before V-J Day. Production in British Borneo is now 49,000 B/D or nearly three times the prewar rate. In Dutch Borneo the oil fields were in a badly damaged condition at the end of the war, but wells are being redrilled and production is averaging about 13,000 barrels daily compared with about 36,000 B/D prewar.

The Boela field, situated on the northeastern tip of Ceram, is the only known oil field on the island and has a rated potential production of 650,000 barrels a year, or 1,800 B/D. There is no refinery at Boela and it was the pre-war practice to carry the crude to Balikpapan for refining. The Boela field was developed by two Royal Dutch-Shell subsidiaries and reach a peak production of 750,000 barrels in 1939.

No restoration has been attempted in the Ceram fields, but this is not surprising in view of its minor importance as a prewar producer.

Up until the Jap occupation, oil had been found in commercial quantities only in three fields - Klamono, Wesian and Mogoi - all in the Vogelkop Peninsula of northwestern New Guinea. There had been no production except to prove the discoveries. Some 21 wells had been drilled up to the time of the evacuation and 9 were good producers. These wells were capped during the war.

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Proved reserves of New Guinea are stated to be 50,000,000 Bbl.

Ambitious plans for the development of these reserves have been made since the war. The Netherlands New Guinea Petroleum Company, which is 40% owned by Standard Vacuum, 40% by Shell and 20% by Cal-Tex, plans to spend about 15 million dollars in 1948 in the exploration and exploitation of the three New Guinea fields this year. There will be no production delivered to a shipping point until a pipeline from Klamono to Sele Straits is completed some time in 1949.

In British New Guinea, which comprises the eastern half of the island, no oil has been found in commercial quantities in either Papua or the Mandated Territory in spite of intensive geological work in certain areas. Australasia Petroleum Company (Standard Vacuum 40%, Anglo-Iranian 40%, and Oil Search Lt. 20%) have resumed extensive explorations in Papua. A wildcat well is being drilled at Kariava, but there have been no oil shows to date.

OIL REFINERIES OF THE NETHERLANDS EAST INDIES

<u>Plant Location</u>	<u>Owner</u>	<u>Prewar Crude Capacity</u>	<u>*</u>	<u>Present Capacity</u>	<u>Type Plant</u>	<u>Cracking Capacity</u>
Sumatra:						
					(Prewar)	
Pladjoe	BPM	50,000		30,000	Comp.	25,000
Soengei Gerong	NKPM	45,000		21,000	Comp.	25,000
Pangkalan Brandan	BPM	27,000		14,000	S	-
Java:						
Tjepoe	BPM	10,000		(1)	SCW	3,000
Wonokromo	BPM	3,000		1,250	A	-
Kapoean	NKPM	500		Shut down	S	-
Borneo:						
Balikpapan (Dutch B.)	BPM	58,000		7,500	Comp.	6,000
Lutong, Sarawak (British B.)	Sarawak Oilfields, Ltd.	20,000		10,000(2)	S	-
TOTAL		213,500		83,750		

(*) Capacities are in barrels per day. Key to type of plant: S-Skimming; A-Asphalt; C-Cracking; W-Wax; Com-Complete.

(1) Tjepoe Refinery now being operated by Indonesian Republic.

(2) A new refinery to replace the Lutong Plant is being built on Muara Island in Brunei Bay.

PHILIPPINE ISLANDS

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The Philippine Islands have no established petroleum reserves.

Numerous oil seepages have been found in various locations but wildcat drilling over a fifty year period has produced no significant show of oil.

Exploration has been resumed by the Far East Oil Company since the end of World War II. These continued activities are on Cebu Island.

Estimated domestic consumption for the calendar year 1948 is about 18,000 barrels per day.

Imports into the Philippine Islands, exclusive of military imports, total about 18,000 barrels per day or just enough to meet domestic requirements. Nearly all diesel oil and residual fuels are imported from the Persian Gulf and Netherlands East Indies. Gasoline, kerosene and lubricating oils are imported from the United States, Persian Gulf and Netherlands East Indies.

Storage facilities of the Philippine Islands totals 2,650,212 barrels of which 1,990,400 is commercial and 659,812 barrels is military. It is located as follows:

<u>Luzon Island</u>	<u>Military</u>	<u>Commercial</u>
Clark Field	16,000	
Dau POLD	15,000	
Subic Bay	80,000	
Batangas QM	42,000	
Bataan Terminal	410,000	
Cavite NAS	16,812	
Manila		965,000
Poro		69,000
South Manila	80,000	
<u>Mindanao</u>		32,800

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Cebu

676,900

Panay

Iloilo

24,300

Panducan

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659,812

1,990,400

GRAND TOTAL

2,650,212 Barrels

Philippine terminals are generally in poor condition as a result of war damage. Discharge lines are, in many locations, badly in need of replacement largely because of the lack of preventive maintenance.

Rail transportation, while limited, is rapidly being restored.

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