

REPORT OF THE COMMITTEE ON PETROLEUM STORAGE CAPACITY
NATIONAL PETROLEUM COUNCIL

October 15, 1948

Members of the
National Petroleum Council

Gentlemen:

Your Committee on Petroleum Storage Capacity, appointed by Chairman Hallanan shortly after the April Council meeting, held its first session in Chicago on May 20th. In planning its approach to the survey requested, the group had before it the communication of April 5, 1948 from Max W. Ball, Director of the Oil & Gas Division, Department of the Interior, to Mr. Hallanan which said in part:

"Important information with respect to primary and secondary storage capacity for crude oil and products and minimum working level stock of crude oil and products is either inadequate or lacking. So is information as to stocks of crude oil and products not available for use, such as tank bottoms and pipeline fills.

"Authoritative information on these subjects would be of value to the Government in interpreting stock figures and in other ways.*****

"I therefore request the Council to establish a committee or committees to study, for both crude oil and products, storage capacity, minimum working level stocks, and non-available stocks, and to submit such reports and recommendations with respect thereto as may be deemed appropriate."

and also the recommendation of the Agenda Committee "that a Committee of the Council should be appointed to study, for both crude oil and products, storage capacity, stock levels and non-available stocks and to report the results to the Council. Such committee should not attempt to study or to suggest minimum working level stocks."

With these instructions in mind the committee drew up the necessary questionnaires. It was the committee's opinion that in order to gain the maximum usefulness and understanding of the figures to be returned, it would be necessary to ask each company to analyse its unavailables as a part of some previously reported information. It was therefore decided to ask for such analysis of the March 31, 1948 inventories reported to the Bureau of Mines. These represented not only the most up-to-date inventory figures available when the questionnaires were sent out, but also gave an opportunity for analysis of unavailables and tankage at the close of the 1947-1948 winter refining season and the beginning of the 1948 summer season.

A total of 323 questionnaires was distributed, 66 to companies in the Pacific Coast Territory and 257 in the area East of California. 54 returns were received from the Pacific Coast and 196 from companies in the rest of the country. Based on inventories in comparison with those previously reported to the Bureau of Mines, the crude oil section represents 98 per cent of refinery, pipe line, tank farm and in transit crude; the clean products group 97 per cent, and the residual fuel oil portion almost 99 per cent of all the inventories of those products reported as of March 31st last. These extremely large returns are very gratifying to your committee and it takes this opportunity to thank the industry for such a fine response.

While a few relatively small refiners did not return questionnaires, it is nevertheless believed that the majority of those not returned went to producers who carry only lease stocks, an item for

which no analysis was requested, it being the opinion of the committee that such inventories in practically all circumstances represented required working inventories on leases.

The significant facts brought out by the survey on Crude Oil are:

(a) that 65 per cent, or about two-thirds of total crude oil inventories represent unavailable stocks. California was the high individual district with 68 per cent and District IV the lowest with 53 per cent.

(b) that total tankage for the storage of crude oil at refineries, tank farms, etc. for the country as a whole totaled 416,727,000 barrels, including reservoir storage in California of 2,527,000, as against the 177,480,000 barrels actually contained in these facilities on March 31, 1948.

(c) that more than 30,579,000 barrels of crude oil are required to fill tank farm and main trunk pipe lines and 5,165,000 as fill for crude oil tankers, barges, tank cars and trucks.

(d) that about 100,000,000 barrels of crude are required to assure continuous operation of pipe lines and refineries, and the handling and blending of the various grades of crude oil.

Consolidated crude oil comparisons by the general supply and demand districts of the country appear in Table #1 which follows:

TABLE #1 - ANALYSIS OF ACTUAL AND UNAVAILABLE CRUDE OIL INVENTORIES AND TANKAGE

MARCH 31, 1948 - Barrels 42 Gallons

<u>District</u>	<u>Actual</u>	<u>Questionnaires</u>		<u>Unavailable</u>		<u>Tankage March 31, 1948</u>	
	<u>B. of M.</u>	<u>Returned</u>		<u>in Column 2</u>		<u>Capacity</u>	<u>Amount</u>
	<u>Mar. 31, 1948</u>	<u>Total</u>	<u>Percent</u>	<u>Total</u>	<u>Percent</u>	<u>Reported</u>	<u>in Tanks</u>
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
<u>Inventories at Refineries, in Pipe Line and Tank Farm and In Transit Thereto</u>							
I	18,086,000	17,603,499	97.3	11,134,153	63.2	26,863,840	13,056,950
II	63,913,000	62,451,360	97.7	38,374,754	61.4	120,618,711	47,572,566
III	103,393,000	100,197,744	96.9	61,896,253	61.8	191,124,450	86,613,528
IV	6,723,000	6,598,214	98.1	3,520,174	53.4	18,524,886	5,650,189
V	<u>26,055,000</u>	<u>26,373,060</u>	<u>101.2</u>	<u>17,999,871</u>	<u>68.3</u>	<u>*59,595,355</u>	<u>24,586,476</u>
TOTAL U.S.	218,170,000	213,223,877	97.7	132,925,205	62.3	416,727,242	177,479,709
<u>Producers' Lease Stocks - No Analysis Requested - Considered Operating Stocks</u> (Shown as reported by U. S. Bureau of Mines)							
TOTAL U.S.	15,994,000	15,994,000	100.0	15,994,000	100.0	Not Available	15,994,000
<u>Total All Crude Oil Stocks - B. of M.</u>							
UNITED STATES	234,164,000	229,217,877	97.9	148,919,205	65.0	Not Available	193,473,709

*Includes 2,527,000 barrels of reservoir storage.

Companies responding to the questionnaire had about 150,000,000 barrels of Clean Product inventories, including Gasoline, Kerosine, and Distillate Fuel Oils on March 31, 1948. Of that total 75,000,000 or about one-half were reported as necessary for continuous operation and therefore unavailable for consumption. About 11,500,000 barrels of these products alone are required as pipe line, tanker, barge, tank car and tank truck fill with another 6,500,000 necessary as pipe line operating reserves. The East Coast refining district's 61 per cent unavailable is the highest individual. Overall district requirement in comparison with the national average. California is next highest with 56 per cent, the other areas ranging between Rocky Mountain's 29 to Oklahoma-Kansas with 49 per cent.

Clean Product tankage reported to the survey totaled 319,759,000 barrels in comparison with the 138,629,000 barrels of these products actually contained in this storage.

Consolidated Clean Product totals follow in Table #2 by Bureau of Mines refining districts:

TABLE #2 - ANALYSIS OF ACTUAL AND UNAVAILABLE CLEAN PRODUCT INVENTORIES AND TANKAGE
MARCH 31, 1948 - INCLUDES GASOLINE, KEROSENE AND DISTILLATE FUEL OILS
(Barrels 42 Gallons)

<u>B.of M.</u> <u>Refining</u> <u>Districts</u>	<u>Actual</u>	<u>Questionnaires</u>		<u>Unavailable</u>		<u>Tankage March 31, 1948</u>	
	<u>B.of M.</u> <u>Mar. 31, 1948</u>	<u>Returned</u>		<u>in Column 2</u>		<u>Capacity</u>	<u>Amount</u>
	(1)	<u>Total</u>	<u>Percent</u>	<u>Total</u>	<u>Percent</u>	<u>Reported</u>	<u>In Tanks</u>
		(2)	(3)	(4)	(5)	(6)	(7)
<u>Includes Inventories at Refineries, Terminals, Pipe Lines and In Transit Thereto</u>							
East Coast ..	35,240,000	33,307,942	94.5	20,289,272	60.9	74,364,297	28,229,378
Appalachian:							
District I	2,840,000	2,247,770	79.1	954,021	42.4	5,059,590	1,977,802
District II	1,418,000	1,342,620	94.7	544,465	40.6	3,148,417	1,239,825
Ind. Ill. Ky.	27,057,000	26,373,287	97.5	12,482,711	47.3	60,275,173	24,422,675
Okla. Kans.							
Mo.	12,851,000	12,689,570	98.7	6,165,357	48.6	24,500,981	11,215,606
Texas Inland	4,963,000	4,510,610	90.9	2,049,145	45.4	7,386,800	4,348,196
Texas Gulf	24,855,000	24,239,471	97.5	10,328,707	42.6	54,285,122	23,992,216
La. Gulf	8,184,000	8,278,478	101.2	3,398,814	41.1	16,673,659	7,840,250
No. La. - Ark.	2,924,000	3,465,446	118.5	1,452,178	41.9	5,684,680	2,897,494
New Mexico	113,000	66,550	58.9	21,042	31.6	196,790	66,550
Other Rocky							
Mt.	4,218,000	4,126,261	97.8	1,201,445	29.1	7,668,813	4,014,706
California	<u>29,964,000</u>	<u>29,255,477</u>	<u>97.6</u>	<u>16,345,974</u>	<u>55.9</u>	<u>60,514,713</u>	<u>28,383,891</u>
TOTAL U.S.	154,627,000	149,903,482	96.9	75,233,131	50.2	319,759,035	138,628,589

The reporting companies indicated that they required 50 per cent of their 41,297,000 barrel inventory, or about 20,803,000 barrels, in order to keep their facilities operating. Tankage for storing residual fuel oil as of March 31st last totaled 123,380,000 barrels, including 41,574,000 of reservoir storage space in California. About 40,000,000 barrels of residual fuel oil was actually contained in the storage indicated on March 31st.

Individual district requirements for unavailable ranged from 22 per cent in Louisiana Gulf to 63 per cent in the District II portion of the Appalachian refining district as is shown in Table #3 which consolidates the residual fuel oil returns.

More complete details and analysis of unavailable inventories by districts for the Crude Oil, Clean Product and Residual groups are attached.

TABLE #3 - ANALYSIS OF ACTUAL AND UNAVAILABLE RESIDUAL FUEL OIL

INVENTORIES; AND TANKAGE

MARCH 31, 1948 - Barrels 42 Gallons

<u>B.of M. Refining Districts</u>	<u>Actual</u>	<u>Questionnaires</u>		<u>Unavailable</u>		<u>Tankage March 31, 1948</u>	
	<u>B.of M. Mar. 31, 1948</u>	<u>Returned</u>		<u>in Column 2</u>		<u>Capacity</u>	<u>Amount</u>
	<u>(1)</u>	<u>Total</u>	<u>Percent</u>	<u>Total</u>	<u>Percent</u>	<u>Reported</u>	<u>in Tank</u>
		<u>(2)</u>	<u>(3)</u>	<u>(4)</u>	<u>(5)</u>	<u>(6)</u>	<u>(7)</u>
<u>Includes Inventories at Refineries, Terminals, Pipe Lines and In Transit Thereto</u>							
East Coast	7,608,000	7,797,758	102.5	4,351,040	55.8	14,574,415	7,020,052
Appalachian:							
District I	264,000	224,553	85.1	71,748	32.0	455,262	224,553
District II	136,000	106,838	78.6	66,887	62.6	383,392	106,838
Ind. Ill. Ky.	3,071,000	3,087,912	100.6	1,240,350	40.2	8,813,629	3,060,658
Okla. Kans. Mo.	1,405,000	1,584,705	112.8	519,806	32.8	4,034,104	1,583,305
Texas Inland	801,000	772,268	96.4	314,304	40.7	1,705,097	771,531
Texas Gulf	5,067,000	4,330,879	85.5	1,808,302	41.8	10,715,527	4,287,019
La. Gulf	1,609,000	1,593,397	99.0	349,219	21.9	3,725,643	1,583,247
Mo. La. - Ark.	122,000	114,984	94.2	34,448	30.0	430,782	114,984
New Mexico	25,000	15,714	62.9	4,934	31.4	62,050	15,714
Other Rocky Mt.	704,000	656,511	93.3	203,719	31.0	1,888,562	656,511
East of California	20,812,000	20,285,519	97.5	8,964,757	44.2	46,788,463	19,424,412
California	21,133,000	21,011,872	99.4	11,837,782	56.3	*76,591,516	20,515,372
TOTAL U.S.	41,945,000	41,297,391	98.5	20,802,539	50.4	123,379,979	39,939,784

* Includes 41,573,510 barrels of reservoir storage.

One of the most interesting findings of this study is the very large petroleum storage capacity required in the United States to maintain normal flexibility of operations, over and above that actually occupied by current inventories. On March 31, 1948, there was an average of 100 barrels of storage capacity for every 41 barrels of petroleum inventories. To those outside the petroleum industry this relationship may appear unusually large but to the petroleum industry this simply confirms operating experience indicating a relatively high capacity is needed compared to inventories in order to operate efficiently. This does not mean, of course, that there was room to store an additional 59 barrels for every 41 barrels then on hand and still continue to operate the industry normally.

In no sense is the difference between these inventory and capacity figures an indication of usable storage space. In this connection it should be realized that Kerosine, Distillate Fuel Oils and Residual stocks were at their seasonal low on March 31 and that Crude Oil stocks were at undesirably low levels in several districts. Seasonal accumulations of burning oils from March 31 to September 30 normally amount to approximately 82,000,000 barrels and this year about 87,000,000 barrels were added. It is also a fact that field and refinery tank farm as well as terminal and other distribution facilities must be completely flexible if shipments to refining and consumer points are to be carried on efficiently and on schedule.

Also the large number of different grades and specifications of products carried is another reason that would tend to make the relationship of tankage capacity to actual stock appear to be on the high side. Long term operating experience also indicates that anything higher than a 70 per cent product-tankage relationship will begin to develop difficulties, while in other installations even a considerably smaller relationship causes operating problems.

The storage capacity indicated in this report includes 44,100,000 barrels of reservoir storage in California, and while only a small part of this is occupied, its usefulness is limited to the storage of heavy crude oil or viscous residual fuels.

These points are made here not only for the interest they may contain but also to point out that the only true measurement of availability of surplus storage space would be through direct contact with operating companies.

SECONDARY STORAGE CAPACITY

The letter from the Oil and Gas Division included a request for information on secondary storage capacity. Your committee carefully considered this question and possible methods of securing the data. It could not work out any feasible plan of sending questionnaires to the over 12,000 jobbers and distributors and the 250,000 primary service stations in the United States. The committee therefore was forced to abandon such a large project. It did examine trade and press notices of many bulk plant expansions which in the aggregate amount to several millions of barrels of additional storage capacity for finished products. The committee also inquired into the matter of consumer storage capacity. It believes that the industry's campaign to encourage the enlarging of these facilities has borne much fruit as tens of thousands of consumers are reported to have installed additional tanks. From these commonly known facts your committee concluded that the secondary storage capacity has increased appreciably during the last year. Further efforts along these lines should still be encouraged because they will assist the industry toward more even operations of all of its facilities so it may better serve the public.

Respectfully submitted:

COMMITTEE ON PETROLEUM STORAGE CAPACITY

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QUESTIONNAIRE FORM #1 - TOTAL FIXED UNAVAILABLE STOCKS OF CRUDE OIL, CLEAN PRODUCTS
AND RESIDUAL FUEL OIL AS OF MARCH 31, 1948

Note: Figures are shown in Barrels of 42 U. S. Gallons by location in Bureau of Mines refining districts and include only those categories of stocks regularly reported to the Bureau. They include foreign oil actually in storage but not crude or products in transit from foreign sources.

	East Coast (1)	Appalachian		Indiana Illinois Kentucky (4)	Oklahoma Kansas Missouri (5)	Texas Inland (6)
		District I (2)	District II (3)			
<u>CRUDE OIL</u>						
1. Crude oil stocks reported to B. of M. March 31, 1948 as at refineries or in transit thereto from Domestic Sources.	14,442,355	439,457	128,683	6,610,088	3,615,307	1,758,533
(a) Unavailable, - such as oil content of tank bottoms, in refinery pipe lines, and the minimum quantity required to assure continuous processing, handling and blending various grades of crude.	5,345,555	285,634	91,070	4,086,578	1,804,137	1,185,710
(b) In Transit to refineries by truck, tank car, barge or tanker from Domestic Sources.	3,900,778	-	-	573,973	48,536	-
Total Unavailable Refinery - In Transit Crude Oil. (Sum of (a) and (b) above)	9,246,333	285,634	91,070	4,660,551	1,852,673	1,185,710
2. Amount reported to B. of M. as Pipe Line and Tank Farm Stocks of Crude	917,997	1,803,690	1,354,114	13,695,158	37,048,010	40,811,444
(a) Unavailable as pipe line fill.	213,501	432,270	424,031	4,702,159	9,130,095	9,297,058
(b) Minimum required in tankage to assure continuous operation of pipe lines, including oil content of tank bottoms and other available.	515,500	440,915	730,792	6,298,982	10,484,401	15,180,484
Total Unavailable Pipe Line-Tank Farm Crude Oil. (Sum of (a) and (b) above).	729,001	873,185	1,154,823	11,001,141	19,614,496	24,477,542
<u>Note:</u> For the purpose of this survey Producers' Lease Stocks are considered as completely unavailable.						

	Texas Gulf (7)	Louisiana Gulf (8)	Arkansas- Louisiana Inland (9)	New Mexico (10)	Other Rocky Mountain (11)	(a) California (12)	Total United States (13)
1. Crude oil stocks reported to B. of M. March 31, 1948 as at refineries or in transit thereto from Domestic Sources.	13,929,435	4,327,332	830,023,	39,153	2,111,752	9,616,282	57,848,400
(a) Unavailable, -such as oil content of tank bottoms, in refinery pipe lines, and the minimum quantity required to assure continuous processing, handling and blending various grades of crude.	11,818,094	870,936	531,055	4,200	1,475,678	6,568,691	34,067,338
(b) In Transit to refineries by truck, tank car, barge or tanker from Domestic Sources.	330,045	133,897	-	-	6,200	172,200	5,165,629
Total Unavailable Refinery - In Transit Crude Oil. (Sum of (a) and (b) above).	12,148,139	1,004,833	531,055	4,200	1,481,878	6,740,891	39,232,967
2. Amount reported to B. of M. as Pipe Line and Tank Farm Stocks of Crude	28,353,007	4,201,060	4,680,987	1,266,770	4,486,462	16,756,778	55,375,477
(a) Unavailable as pipe line fill.	2,081,672	460,850	1,078,672	202,022	941,825	1,614,384	30,578,539
(b) Minimum required in tankage to assure continuous operation of pipe lines, including oil content of tank bottoms and other available.	15,070,667	1,638,424	1,181,388	831,079	1,096,471	9,644,596	63,113,699
Total Unavailable Pipe Line-Tank Farm Crude Oil. (Sum of (a) and (b) above).	17,152,339	2,099,274	2,260,060	1,033,101	2,038,296	11,258,980	93,692,238

Note: For the purpose of this survey Producers' Lease Stocks are considered as completely unavailable.

(a) Tank bottoms of 2,527,000 barrels of reservoir storage in California credited at 3%.

QUESTIONNAIRE FORM #1 (Continued)

CLEAN PRODUCTS

(These include only gasoline, kerosine and distillate fuel oils and deal with only those inventories regularly reported to the Bureau of Mines on Forms 6-1300; 6-1302 and 6-1303, East of California, and the corresponding forms in California.)

	East Coast (1)	Appalachian		Indiana Illinois Kentucky (4)	Oklahoma Kansas Missouri (5)	Texas Inland (6)
		District I (2)	District II (3)			
1. Amount reported to B. of M. as at Refineries, at Terminals, or in Pipe Lines or In Transit thereto on March 31, 1948.	33,307,942	2,247,770	1,342,620	26,373,287	12,689,570	4,510,610
2. Analysis of Unavailable Stocks included in Item 1 above:						
(a) Tank bottom credit 7%	5,206,609	370,826	220,779	4,191,862	1,728,533	520,225
(b) Unavailable Unfinished at Refineries	1,680,812	84,054	32,845	1,187,627	1,024,965	577,609
(c) In Refinery Lines and Refinery Operating Equipment	94,259	16,917	3,247	131,929	70,946	22,720
(d) One-Half of Average Size Water Cargo Receipt. Total of each individual grade calculated separately.	6,101,684	56,541	64,005	1,142,697	34,000	-
(e) Other Unavailable Stocks. Including Filter House Naphtha and Unavailable Unblended Finished.	1,319,344	133,715	5,794	1,884,984	398,859	83,244
(f) Pipe Line Fill.	850,373	208,690	102,550	1,190,811	1,365,800	162,414
(g) Pipe Line Operating Reserves	808,000	22,000	115,000	1,993,000	1,434,090	682,933
(h) Unavailable in Transit by truck, tank car, barge or tanker from Domestic Sources (if reported to Bureau only)	4,228,191	61,278	245	759,801	108,164	-
Total Unavailable Clean Products. (Sum of (a) to (h) above).	20,289,272	954,021	544,465	12,482,711	6,165,357	2,049,145

CLEAN PRODUCTS (Continued)

	Texas Gulf (7)	Louisiana Gulf (8)	Arkansas- Louisiana Inland (9)	New Mexico (10)	Other Rocky Mountain (11)	(a) California (12)	Total United States (13)
1. Amount reported to B. of M. as at Refineries, at Terminals, or in Pipe Lines or In Transit thereto on March 31, 1948.	24,239,471	8,278,478	3,465,446	66,550	4,126,261	29,255,477	149,903,482
2. Analysis of Unavailable Stocks included in Item 1 above:							
(a) Tank bottom credit 7%	3,691,589	1,166,838	386,964	13,664	529,951	4,234,299	22,262,139
(b) Unavailable Unfinished at Refineries	2,646,210	430,078	126,461	-	161,761	1,004,843	8,957,265
(c) In Refinery Lines and Refinery Operating Equipment	328,331	34,552	5,476	3,378	40,664	770,974	1,523,393
(d) One-Half of Average Size Water Cargo Receipt. Total of each individual grade calculated separately.	386,280	345,563	119,825	-	-	1,742,737	9,993,332
(e) Other Unavailable Stocks. Including Filter House Naphtha and Unavailable Unblended Finished.	1,903,042	983,555	10,500	4,000	327,514	7,721,535	14,776,086
(f) Pipe Line Fill	206,055	116,474	453,214	-	108,554	47,586	4,812,521
(g) Pipe Line Operating Reserves	1,126,000	-	235,000	-	30,000	-	6,446,023
(h) Unavailable in Transit by truck, tank car, barge or tanker from Domestic Sources (if reported to Bureau only)	41,200	321,754	114,738	-	3,001	824,000	6,462,372
Total Unavailable Clean Products. (Sum of (a) to (h) above).	10,328,707	3,398,814	1,452,178	21,042	1,201,445	16,345,974	75,233,131

QUESTIONNAIRE FORM #1, (Continued)

RESIDUAL FUEL OIL

(This deals only with those inventories regularly reported on B. of M. Forms 6-1300; 6-1302 and 6-1303, East of California, and the corresponding forms in California.)

	East Coast (1)	Appalachian		Indiana Illinois Kentucky (4)	Oklahoma Kansas Missouri (5)	Texas Inland (6)
		District I (2)	District II (3)			
1. Amount reported to B. of M. as at Refineries, at Terminals, or in Pipe Lines or In Transit thereto on March 31, 1948.	7,797,758	224,553	106,838	3,087,912	1,584,705	772,268.
2. Analysis of Unavailable Stocks included in Item 1 above:						
(a) Tank bottom credit 7%	1,020,752	31,395	26,807	601,438	290,089	128,286
(b) Unavailable Unfinished at Refineries	110,282	1,700	-	221,245	70,262	21,708
(c) In Refinery Lines and Refinery Operating Equipment	12,914	850	80	53,725	58,051	6,653
(d) One-Half of Average Size Water Cargo Receipt. Total of each individual grade calculated separately.	1,658,924	-	-	15,000	-	-
(e) Other Unavailable Stocks.	309,462	31,803	20,000	236,688	100,004	71,920
(f) Pipe Line Fill	-	-	-	200	50	737
(g) Pipe Line Operating Reserves	461,000	6,000	20,000	85,000	-	85,000
(h) Unavailable in Transit by truck, tank car, barge or tanker from Domestic Sources (if reported to Bureau only).	777,706	-	-	27,054	1,350	-
Total Unavailable Residual Fuel Oil. (Sum of (a) to (h) above).	4,351,040	71,748	66,887	1,240,350	519,806	314,304

RESIDUAL FUEL OIL (Continued)

	Texas Gulf (7)	Louisiana Gulf (8)	Arkansas-Louisiana Inland (9)	New Mexico (10)	Other Rocky Mountain (11)	(a) California (12)	Total United States (13)
1. Amount reported to B. of M. as at Refineries, at Terminals, or in Pipe Lines or In Transit thereto on March 31, 1948.	4,330,879	1,593,397	114,984	15,714	656,511	21,011,872	41,297,391
2. Analysis of Unavailable Stocks included in Item 1 above:							
(a) Tank bottom credit 7%	744,605	261,125	26,305	4,734	132,401	*3,697,615	*6,965,552
(b) Unavailable Unfinished at Refineries	30,183	11,714	500	-	9,509	3,635,274	4,112,377
(c) In Refinery Lines and Refinery Operating Equipment	47,905	6,534	500	200	13,927	400,570	601,909
(d) One-Half of Average Size Water Cargo Receipt. Total of each individual grade calculated separately.	108,770	26,696	7,143	-	-	715,093	2,531,626
(e) Other Unavailable Stocks.	427,979	33,000	-	-	47,882	1,946,730	3,225,468
(f) Pipe Line Fill	80	150	-	-	-	121,600	122,817
(g) Pipe Line Operating Reserves	405,000	-	-	-	-	946,000	2,008,000
(h) Unavailable in Transit by truck, tank car, barge or tanker from Domestic Sources (if reported to Bureau only)	43,780	10,000	-	-	-	374,900	1,234,790
Total Unavailable Residual Fuel Oil. (Sum of (a) to (h) above).	1,808,302	349,219	34,448	4,934	203,719	11,837,782	20,802,539

* Reservoir tank bottoms in California credited at 3 per cent, being the weighted average of actuals reported.

QUESTIONNAIRE FORM #2 - CAPACITY OF CRUDE OIL, CLEAN PRODUCT AND RESIDUAL FUEL OIL TANKAGE AS OF MARCH 31, 1948

Note: Figures are shown in Barrels of 42 U. S. Gallons by Bureau of Mines refining districts and include all tankage available for storing Crude Oil, Clean Products and Residual Fuel Oil, as shown below, but deal only with the tankage that is located at the points (Refineries, Pipe Lines, Tank Farms and Terminals) included in the stock figures regularly reported to the Bureau of Mines on Forms 6-1311 Crude (except Producers' Lease Stocks), and Product Forms 6-1300; 6-1302 and 6-1303, East of California, and the corresponding forms in California. They do not include tankage at bulk plants, service stations, etc.

	East Coast (1)	Appalachian District I District II (2) (3)		Indiana Illinois Kentucky (4)	Oklahoma Kansas Missouri (5)	Texas Inland (6)
	<u>CRUDE OIL TANKAGE</u>					
1. Capacity of Tankage at Refineries	19,023,215	964,018	231,952	12,806,704	14,942,646	5,064,155
2. Capacity of Tankage along Pipe Lines and on Tank Farms	2,563,500	4,313,107	2,888,864	24,549,047	65,199,498	77,329,133
Total Crude Oil Tankage Capacity (1) and (2) above	21,586,715	5,277,125	3,120,816	37,355,751	80,142,144	82,393,288
Note: Tankage involved in Producers' (Lease) Stocks not included.						

QUESTIONNAIRE FORM #2 (Continued)

CRUDE OIL TANKAGE (Continued)

	Texas Gulf (7)	Louisiana Gulf (8)	Arkansas- Louisiana Inland (9)	New Mexico (10)	Other Rocky Mountain (11)	California (12)	Total United States (13)	
1. Capacity of Tankage at Refineries	22,584,105	7,505,197	1,041,000	67,000	5,909,442	17,557,072	107,696,506	
2. Capacity of Tankage along Pipe Lines and on Tank Farms	57,202,640	8,690,726	9,540,010	2,100,484	12,615,444	42,038,283	309,030,736	
Total Crude Oil Tankage Capacity (1) and (2) above	79,786,745	16,195,923	10,581,010	2,167,484	18,524,886	(a) 59,595,355	(a) 416,727,242	
	(a) Includes	2,527,000 barrels of reservoir storage in California.						

QUESTIONNAIRE FORM #2 - (Continued)

CLEAN PRODUCTS

(These include only Gasoline, Kerosine and Distillate Fuel Oil and deal only with the tankage at the locations of inventories regularly reported to the National Bureau of Mines.)

	East Coast (1)	Appalachian		Indiana Illinois Kentucky (4)	Oklahoma Kansas Missouri (5)	Texas Inland (6)
		District I (2)	District II (3)			
1. Capacity of Tankage at Refineries	23,603,613	2,934,432	1,225,270	34,598,373	16,892,231	5,900,793
2. Capacity of Tankage along Pipe Lines and on Tank Farms	4,720,233	533,500	537,402	9,349,365	3,117,720	1,446,007
3. Capacity of Tankage at Bulk Terminals	46,040,451	1,591,658	1,385,745	16,327,435	4,491,030	40,000
Total Clean Product Tankage Capacity (1), (2) and (3) above	74,364,297	5,059,590	3,148,417	60,275,173	24,500,981	7,386,800

QUESTIONNAIRE FORM #2 (Continued)

CLEAN PRODUCTS (Continued)

	Texas Gulf (7)	Louisiana Gulf (8)	Arkansas- Louisiana Inland (9)	New Mexico (10)	Other Rocky Mountain (11)	California (12)	Total United States (13)
1. Capacity of Tankage at Refineries	49,271,475	11,793,981	2,021,854	195,190	7,322,425	44,132,982	199,892,619
2. Capacity of Tankage along Pipe Lines and on Tank Farms	1,817,868	1,649,260	2,072,900	-	195,754	6,656,029	32,096,038
3. Capacity of Tankage at Bulk Terminals	3,195,779	3,230,418	1,589,926	1,600	150,634	9,725,702	87,770,378
Total Clean Product Tankage Capacity - (1), (2) and (3) above	54,285,122	16,673,659	5,684,680	196,790	7,668,813	60,514,713	319,759,035

QUESTIONNAIRE #2 (Continued)

RESIDUAL FUEL OIL

(This deals only with the tankage at the locations of inventories regularly reported to the National Bureau of Mines.)

	East Coast (1)	Appalachian		Indiana Illinois Kentucky (4)	Oklahoma Kansas Missouri (5)	Texas Inland (6)
		District I (2)	District II (3)			
1. Capacity of Tankage at Refineries	7,472,543	455,262	383,392	8,259,352	4,034,104	1,705,097
2. Capacity of Tankage along Pipe Lines and on Tank Farms	-	-	-	260,000	-	-
3. Capacity of Tankage at Bulk Terminals	7,101,872	-	-	294,277	-	-
Total Residual Fuel Oil Tankage Capacity - (1), (2) and (3) above.	14,574,415	455,262	383,392	8,813,629	4,034,104	1,705,097

QUESTIONNAIRE FORM #2 - (Continued)

RESIDUAL FUEL OIL (Continued)

	Texas Gulf (7)	Louisiana Gulf (8)	Arkansas- Louisiana Inland (9)	New Mexico (10)	Other Rocky Mountain (11)	California (12)	Total United States (13)
1. Capacity of Tankage at Refineries	9,968,704	3,291,728	382,182	62,050	1,888,562	42,775,520	80,678,496
2. Capacity of Tankage along Pipe Lines and on Tank Farms	-	-	-	-	-	29,491,540	29,751,540
3. Capacity of Tankage at Bulk Terminals	746,823	433,915	48,600	-	-	4,324,456	12,949,943
Total Residual Fuel Oil Tankage Capacity - (1), (2) and (3) above	10,715,527	3,725,643	430,782	62,050	1,888,562	(b) 76,591,516	(b) 123,379,979
(b) Includes 41,573,510 barrels of reservoir storage in California.							