NATIONAL PETROLEUM COUNCIL

REPORT OF THE COMMITTEE ON PETROLEUM STORAGE CAPACITY

OCTOBER 31, 1950

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NATIONAL PETROLEUM COUNCIL

REPORT OF THE COMMITTEE ON PETROLEUM STORAGE CAPACITY

October 31, 1950

Members of the
National Petroleum Council

Gentlemen:

In response to the request of July 21st last by Secretary of the Interior Chapman, that the report made by the Council's Committee on Petroleum Storage Capacity during 1948 be brought up to date, Chairman Hallanan reconstituted that Committee shortly after the July Council meeting. The Committee reappointed the same Subcommittee which assisted it in making the 1948 Survey, and the work was begun almost immediately.

In planning the new survey the Committee had before it the communication of Secretary Chapman dated July 21, which contained the following: "The Council submitted a report (on petroleum storage capacity and unavailable inventories) on October 15, 1948. I now request that, the report be made current and that in bringing the report up-to-date, information and data be provided on present and proposed crude oil, clean product and black oil (product) storage capacities, including primary and secondary storage but excluding the small jobber, consumer and service station storage, with a breakdown by location of storage with relation to its principal transportation, that is, by deep water, inland waterway, pipe line, rail and tank truck, each given by PAW districts and principal areas within PAW districts. It would be most helpful if the data showed the storage capacities not available, such as tank bottoms and pipe line fills."

In contemplating the scope of the work assigned, your Committee also had before it the recommendation of your Agenda Committee,

dated July 24th last, namely, that "The Council's Committee on Petroleum Storage Capacity be reactivated. Such Committee should bring its report of October 15, 1948, up-to-date in the detail requested in the Secretary's letter dated July 21, 1950, ("proposed storage" being interpreted to mean storage expected to be completed during 1950) and submit such report to the Council. Such Committee should not attempt to study or suggest minimum working level stocks or recommend any industry plans, programs, or allocations."

In contemplating its assignment your Committee gave considerable time and study to that portion of the request that the 1948 Report be made current, with certain additions, which asked for "a breakdown by location of storage with relation to its principal transportation, that is, by deep water, inland waterway, pipe line, rail and tank truck, each given by PAW districts and principal areas within PAW districts," and realized immediately that the addition of such extremely detailed information with respect to location of storage would tremendously delay reporting on the primary problems involved, namely, storage capacity and unavailable inventories. It therefore decided to proceed as in the case of the 1948 Survey but to obtain, in addition, figures indicating the amount of tankage under construction as of June 30th of this year, and which would be completed by or before December 31st next.

It again became the Committee's opinion that in order to gain maximum usefulness and understanding of the figures to be developed it would be necessary for each company to analyze its unavailable inventories as a part of some previously reported inventory situation. It was therefore decided to request such analysis in relation to the inventories reported to the Bureau of Mines as of

June 30th last. Those inventories represented not only the most up-to-date available when the questionnaires were sent out but also gave an opportunity for analysis of unavailables and tankage at the very mid-point of a summer refining season when the trend of certain product stocks, namely, kerosene, distillate fuel oils and residual fuel oils should normally be moving upward while motor fuel would be following its normal seasonal trend downward.

A total of 368 questionnaires were distrubuted; 297 to companies in the area East of California and 71 to companies in District V - Pacific Coast Territory. Fifty-four returns were received from the Pacific Coast and 235 from companies operating 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 99.5 per cent of the refinery, pipe line and tank farm stocks and the crude oil in transit; the clean products group 95.6 per cent and the residual fuel oil portion, all of the inventories of these products reported for the United States as a whole as of June 30th. Your committee appreciates this extremely gratifying response and takes this opportunity to thank the industry for returning the information requested so promptly.

A few relatively small companies did not return the questionnaires. It is believed that the majority of those not returned went to producers who carry only lease stock, an item for which no analysis was requested, it being the opinion of the Committee that such inventories in practically all circumstances represent working inventories required on producing properties.

The significant facts that may be noted from the survey are:

CRUDE OIL

(1) Total tankage in the country as a whole for the storage of crude oil at refineries, at tank farms, etc. totaled 432,318,000 barrels, (including heavy crude reservoir storage in California of 11,733,000 barrels.) This compares with the 184,656,000 barrels (43 per cent of tankage capacity) actually contained in these facilities on June 30th last. A considerable portion of this tankage is in areas where it is not currently available for use, but some of it is not susceptible to re-location elsewhere because of its condition. Still other portions are available only for limited use.

(2) That 63.3 per cent, or about two-thirds of the total crude oil in storage as of June 30th last, represented unavailable stocks. District III, Arkansas, Louisiana, Texas and New Mexico, was the high individiual district from the point-of-view of percentage unavailable crude oil with 69 per cent, while District IV was the lowest, with 36 per cent.

(3) Approximately 17 per cent of the total crude oil inventory, or 40,000,000 barrels, is in transit. This is made up of the 36,000,000 barrels of crude oil required to fill tank farm and main trunk pipe lines, and almost 4,000,000 as average fill for the crude oil tankers, barges, tank cars and trucks in operation.

(4) That over 100,000,000 barrels of crude oil, in addition to that contained in transportation facilities, are required to assure continuous operation of pipe lines and refineries and the handling and blending of the many grades of crude oil produced in the United States and processed in its refineries.

This amount is equal to 24 per cent of the total tankage capacity.

(5) That about 10,000,000 barrels of tankage for the storage of crude oil, apart from that shown in (2) above, is expected to be completed country-wide during the second half of this year.

Consolidated crude oil comparisons by the general supply and demand districts of the country appear in Table I which follows; all new tankage expected to be completed during the second half of this year is consolidated in Table IV showing crude oil and product tankage separately, by Bureau of Mines refining districts.

TABLE I

ANALYSIS OF ACTUAL AND UNAVAILABLE CRUDE OIL INVENTORIES AND TANKAGE

JUNE 30, 1950 - (Barrels 42 Gallons)

District	Actual B. of M. June 30, 1950 (1)	Questionnaires Returned Total (2)	Questionnaires Returned % (3)	Unavailable in Column 2 Total (4)	Unavailable in Column 2 % (5)	Tankage June 30, 1950 Capacity Reported (6)	Tankage June 30, 1950 Amount in tanks (7)
Inventories at Refineries, in Pipe Line and Tank Farm and in Transit Thereto							
I	19,153,000	19,591,000	102.3	12,225,800	62.4	30,196,400	16,646,200
II	64,616,000	65,421,000	101.2	41,244,600	63.0	122,632,900	48,166,100
III	101,768,000	99,033,000	97.3	68,047,900	68.7	196,094,700	82,398,600
IV	9,916,000	10,182,000	102.7	3,696,800	36.3	18,482,200	8,884,900
V	30,692,000	30,721,000	100.1	17,223,800	56.1	*64,911,800	28,559,800
TOTAL U.S.	226,145,000	224,948,000	99.5	142,438,900	63.3	432,318,000	184,655,600
Producers' Lease Stocks - No analysis Requested - Considered Operating Stocks (Shown as reported by U.S. Bureau of Mines)							
TOTAL U.S.	16,142,000	16,142,000	100.0	16,142,000	100.0	Not Available	16,142,000
Total all Crude Oil Stocks - B. of. M.							
UNITED STATES	242,287,000	241,090,000	99.5	158,580,900	65.8	Not Available	200,797,600

*Includes 11,733,000 barrels of reservoir storage assigned to heavy crude oil on June 30th last.

CLEAN PRODUCTS

The companies responding to the questionnaire owned about 180,595,000 barrels of clean products on June 30, 1950, including gasoline, kerosene and distillate fuel oils. As an indication of the coverage of this Survey, the figure indicated is 95.6 per cent of all of the clean products reported by the Bureau of Mines as in storage of that date. Of the total shown, 74,000,000 barrels, or about 41 per cent were reported as being necessary to assure continuous operation of refinery, terminal and other distributing facilities and therefore unavailable for consumption. Of this unavailable amount about 10,000,000 barrels are required as pipe line, tanker, barge, tank car and tank truck fill. Another 7,000,000 are necessary as clean product pipe line operating reserves.

The East Coast, Texas and California refining districts showed the highest unavailable percentages in comparison with the national average.

Clean product tankage reported to the Survey totaled 348,000,000 barrels. It contained 171,000,000 barrels of products thus indicating these categories of storage to be approximately 50 per cent full.

Consolidated clean product storage unavailable and tankage as of June 30, 1950 are shown in Table II by Bureau of Mines refining districts. Table IV shows the additional clean product tankage that will be completed during the second half of this year.

TABLE II - ANALYSIS OF ACTUAL AND UNAVAILABLE CLEAN PRODUCT INVENTORIES AND TANKAGE
JUNE 30, 1950 - INCLUDES GASOLINE, KEROSENE AND DISTILLATE FUEL OILS

(Barrels 42 Gallons)

B. of M. Refining Districts	Actual B. of M. June 30, 1950 (1)	Questionnaires Returned Total (2)	Questionnaires Returned % (3)	Unavailable in Column 2 Total (4)	Unavailable in Column 2 % (5)	Tankage June 30, 1950 Capacity Reported (6)	Tankage June 30, 1950 Amount In Tanks (7)
Includes Inventories at Refineries, Terminals, Pipe Lines and In Transit Thereto							
East Coast	47,140,000	44,617,000	94.6	21,465,000	48.1	85,001,000	39,604,000
Appalachian:							
District I	3,121,000	2,694,000	86.3	1,030,000	38.2	5,337,000	2,355,000
District II	1,215,000	1,510,000	124.3	665,000	44.0	3,971,000	1,352,000
Ind. Ill. Ky.	35,430,000	34,652,000	97.8	13,434,000	38.8	69,118,000	32,983,000
Okla. Kans. Mo.	18,042,000	14,667,000	81.3	5,141,000	35.1	28,526,000	13,623,000
Texas Inland	4,673,000	4,403,000	94.2	2,239,000	50.9	8,604,000	3,866,000
Texas Gulf	28,269,000	27,572,000	97.5	10,764,000	39.0	56,797,000	27,178,000
La. Gulf	11,693,000	11,441,000	97.8	3,307,000	28.9	17,810,000	11,266,000
No. La.-Ark.	3,222,000	2,378,000	73.8	739,000	31.1	5,005,000	2,295,000
New Mexico	170,000	181,000	106.5	81,000	44.8	333,000	176,000
Other Rocky Mountain	6,544,000	6,863,000	104.9	1,670,000	24.3	11,036,000	6,723,000
California	29,351,000	29,617,000	100.9	13,417,000	45.3	56,526,000	29,098,000
TOTAL U. S.	188,870,000	180,595,000	95.6	73,952,000	41.0	348,064,000	170,519,000

RESIDUAL FUEL OIL

The companies participating in this survey held all of the residual fuel oil reported to the Bureau of Mines as of June 30th last.

Those companies indicated that they required 40 per cent of their 41,000,000 barrel residual fuel oil inventory, or about 16,000,000 barrels in order to keep their residual fuel operating facilities functioning. Country-wide tankage for storing residual fuel oil as of last June 30th totaled 106,000,000 barrels including 20,309,000 of reservoir storage space in California. About 39,000,000 barrels of residual fuel oil inventory shown was actually contained in these facilities at mid-year.

Individual district unavailable requirements ranged percentage-wise from 13 in the North Louisiana-Arkansas district to 47 in the East Coast and 55 in the New Mexico refining district. Complete details on residual fuel unavailable and tankage are shown in Table III. New residual tankage to be completed during the second half of this year is shown in consolidated new tankage Table IV.

TABLE III - ANALYSIS OF ACTUAL & UNAVAILABLE RESIDUAL FUEL OIL INVENTORIES AND TANKAGE

JUNE 30, 1950 (Barrels 42 Gallons)

B. of M. Refining Districts	Actual B. of M. June 30,1950	Questionnaires Returned Total	%	Unavailable in Column 2 Total	%	Tankage June 30, 1950 Capacity Reported	Tankage June 30, 1950 Amount In Tanks
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Includes Inventories at Refineries, Terminals, Pipe Lines and In Transit Thereto							
East Coast	10,031,000	10,080,000	100.5	4,737,000	47.0	17,602,000	9,435,000
Appalachian:							
District I	261,000	223,000	85.4	83,000	37.2	378,000	222,000
District II	162,000	166,000	102.5	53,000	31.9	372,000	146,000
Ind. Ill. Ky.	3,533,000	3,738,000	105.8	1,131,000	30.3	8,611,000	3,673,000
Okla. Kans. Mo.	1,196,000	1,357,000	113.5	526,000	38.8	3,831,000	1,355,000
Texas Inland	737,000	663,000	90.0	245,000	37.0	1,969,000	663,000
Texas Gulf	4,140,000	4,042,000	97.6	1,398,000	34.6	10,317,000	4,016,000
La. Gulf	1,868,000	2,021,000	108.2	413,000	20.4	3,457,000	1,984,000
No. La. - Ark.	154,000	155,000	100.6	20,000	12.9	308,000	155,000
New Mexico	35,000	31,000	88.6	17,000	54.8	99,000	30,000
Other Rocky Mountain	652,000	710,000	108.9	236,000	33.2	1,942,000	710,000
East of California	22,769,000	23,186,000	101.8	8,859,000	38.2	48,886,000	22,389,000
California	17,355,000	17,384,000	100.2	7,373,000	42.4	*57,172,000	16,842,000
TOTAL U. S.	40,124,000	40,570,000	101.1	16,232,000	40.0	106,058,000	39,231,000

*Includes 20,309,000 barrels of reservoir storage.

NEW TANKAGE

The new tankage expected to be completed during the second half of this year at the same locations as are included in the inventory sections of this survey, is shown in Table IV attached, by Bureau of Mines refining districts and for the Crude Oil, Clean Products and Residual Fuel Oil categories. The figures given do not, of course, include any tankage which may be added at installations not in the terminal classification, such as bulk plants.

The Committee is impressed with the large amount of tankage that is actually being put into service in the categories detailed in the table, during the latter six months of this year. The need for additional tankage is practically continuous. Increasing demand necessitating increased throughput at established installations plus the equipment needed in new areas of oil production, processing and consumption, requires continuously increased facilities including storage capacity This means not only increased storage at primary and intermediate points of distribution like bulk terminals, but along both crude and product pipe lines and at refineries, as well as at tank farms in or near producing areas, or those strategically located in relation to refinery facilities.

The total amount of new tankage to be completed in the country as a whole for storage purposes at refineries, at tank farms, along pipe lines and at terminals during the second half of this year is shown below:

Crude Oil	10,196,000 barrels
Clean Products	11,970,000 barrels
Residual Fuel Oil	2,178,000 barrels
TOTAL	24,344,000 barrels.

The figures by Bureau of Mines refining districts are shown in Table IV:

TABLE IV - ANALYSIS OF TANKAGE UNDER CONSTRUCTION AS OF JUNE 30, 1950
AND SCHEDULED FOR COMPLETION BY OR BEFORE DECEMBER 31, 1950
(Expressed in 42 Gallon Barrels of New Capacity)

B. of M. Refining Districts	Crude Oil	Clean Products	Residual Fuel	Total
East Coast	848,000	5,251,000	347,000	6,446,000
Appalachian:				
District I	7,000	222,000	-	229,000
District II	-	74,000	-	74,000
Ind. Ill. Ky.	3,019,000	4,286,000	704,000	8,009,000
Okla. Kans. Mo.	2,298,000	803,000	423,000	3,524,000
Texas Inland	1,494,000	43,000	390,000	1,927,000
Texas Gulf	1,414,000	116,000	-	1,530,000
La. Gulf	-	-	-	-
No. La. - Ark.	215,000	93,000	-	308,000
New Mexico	5,000	35,000	-	40,000
Other Rocky Mountain	602,000	812,000	197,000	1,611,000
East of California	9,902,000	11,735,000	2,061,000	23,698,000
California	294,000	235,000	117,000	646,000
TOTAL U.S.	10,196,000	11,970,000	2,178,000	24,344,000

Note: The above tankage is located at Refineries, along Pipe Lines, at Tank Farms and at Bulk Terminals within the same definitions which apply to the inventory figures and the tankage totals shown in the other tables contained in this report.

COMPARISON OF UNAVAILABLE INVENTORIES JUNE 30, 1950 VS. MARCH 31, 1948

As indicated earlier the amount of crude oil and products that the industry requires as basic working inventories represent a rather large portion of the total amount in storage. These unavailable inventories must, of course, increase as demand increases and as transportation and processing facilities and storage requirements increase in order to supply distributing facilities. During the 27 months ended June 30th this year unavailable inventories increased to the greatest extent in the crude oil group, thus reflecting amounts necessary to fill newly completed pipelines and to assure continuous processing, handling and blending various grades of crude at refineries. Table V shows these comparisons by major supply and demand districts.

TABLE V - COMPARISON OF UNAVAILABLE INVENTORIES JUNE 30, 1950 VS. MARCH 31,1948
(Barrels 42 Gallons)

DISTRICT	*CRUDE OIL (Includes all Crude categories except Producers' Storage)		*CLEAN PRODUCTS (Gasoline, Kerosene and Distillate Fuels)		*RESIDUAL FUEL (Residual Fuel Oils Only)	
	1950	1948	1950	1948	1950	1948
I	12,225,800	11,134,100	22,494,900	21,243,300	4,819,200	4,422,800
II	41,244,600	38,374,800	19,241,200	19,192,500	1,710,000	1,827,000
III	68,047,900	61,896,200	17,129,700	17,249,900	2,093,800	2,511,200
IV	3,696,800	3,520,200	1,670,000	1,201,400	235,800	203,700
EAST OF CALIFORNIA	125,215,100	114,925,300	60,535,800	58,887,100	8,858,800	8,964,700
V	17,223,800	17,999,900	13,416,600	16,346,000	7,373,200	11,837,800
TOTAL U.S.	142,438,900	132,925,200	73,952,400	75,233,100	16,232,000	20,802,500

*At the locations and types of storage covered by the basic definitions used elsewhere in this report, those definitions were identical for 1948 and 1950 in the area East of California. In District V - Pacific Coast Territory, the figures shown are not entirely comparable due to changes in the definitions and methods of reporting which were put into effect on January 1, 1949. This also affects the U. S. totals. East of California the figures are on comparable bases.

COMPARISON OF TANKAGE CAPACITY REPORTED JUNE 30, 1950 VS. MARCH 31, 1948

Again, as in the case of unavailable inventories, capacity to store and handle crude oil and refined products must increase as demand increases and volumes to be handled in relation thereto increase. This cycle moves all the way between crude oil tank farm storage points to distributing facilities.

Crude Oil tankage in the area East of California increased about 10,000,000 barrels between March 31, 1948 and June 30th of this year. Most of that increase was in District III and particularly in the Texas Gulf Coast. New Mexico and the Arkansas-Louisiana Inland areas also show sizeable increases.

In the case of Clean Products East of California, tankage has been increased about 32,000,000 barrels during the period indicated, about 11,000,000 of which was in the East Coast portion of District I. About 6,000,000 barrels of this was at bulk terminals and about 5,000,000 at refineries.

District II shows an increase of almost 14,000,000 barrels, - 9,000,000 of which was in the Indiana-Illinois area through increases of sizeable amounts at refineries and at bulk terminals.

In District III, notably Texas Gulf and Louisiana Gulf, Clean **Product** Tankage increased about 4,000,000 barrels.

District IV, which is "Other Rocky Mountain" not including New Mexico, increased Clean Product Tankage about 3,500,000 barrels, about 2,500,000 being at refineries.

In the Residual Fuel Oil category relatively small increases occurred, the area East of California showing only slightly more

than 2,000,000 barrels; East Coast refinery storage accounting for even more than the net change in that entire area.

In District V, Pacific Coast Territory, Crude Oil storage shows about 5,000,000 barrels additional capacity but in the case of Clean Products, as in Residual, the 1950 tankage figures show less. This is for the reason that the 1948 and 1950 Pacific Coast Territory figures are again, as in the case of unavailables, not entirely comparable because of changes in the definitions which applied and the method of reporting, which changes became effective on January 1, 1949. The District V figures include a total of 32,000,000 barrels of reservoir storage, and while only a portion of this is occupied, its usefulness is limited to the storage of heavy crude and viscous residual fuels. This is less than shown in the 1948 Survey but it should be kept in mind that the tankage figures which represent only the storage assigned to the various categories of inventories to which they relate.

The above comments and the figures shown in Table VI, which follows, are entirely outside of, and give no weight whatever to the new tankage under construction on June 30, 1950 and contemplated for completion before December 31st of this year as shown in Table IV.

TABLE VI

COMPARISON OF TANKAGE CAPACITY REPORTED JUNE 30, 1950 VS MARCH 31, 1948
Figures do not include new tankage shown in Table IV.
(Barrels 42 Gallons.)

DISTRICT	* CRUDE OIL (Includes all Crude categories except Producers' Storage)		* CLEAN PRODUCTS (Gasoline, kerosene and Distillate Fuels)		* RESIDUAL FUEL (Residual Fuel Oils Only)	
	1950 -	1948	1950	1948	1950	1948
I	30,196,400	26,863,800	90,337,200	79,423,900	17,979,800	15,029,700
II	122,632,900	120,618,700	101,614,800	87,924,600	12,814,100	13,231,100
III	196,094,700	191,124,500	88,550,500	84,227,000	16,149,800	16,639,100
IV	18,482,200	18,524,900	11,035,900	7,668,800	1,942,400	1,888,600
EAST OF CALIFORNIA	367,406,200	357,131,900	291,538,400	259,244,300	48,886,100	46,788,500
* V	64,911,800	59,595,300	56,525,900	60,514,700	57,171,600	76,591,500
*TOTAL U.S.	432,318,000	416,727,200	348,064,300	319,759,000	106,057,700	123,380,000

* California and U. S. totals not entirely comparable due to changes in method of reporting in California. Figures for the latter area include reservoir storage as follows: Crude 1950 - 11,733,000; 1948 - 2,525,000. Residual 1950 - 20,309,000 barrels; 1948 - 41,573,500 barrels.

One of the most interesting findings of this study, as in the one made in 1948, is again the very large petroleum storage capacity indicated as necessary to maintain normal flexibility of industry operations over and above that occupied by the crude oil and refined products actually in storage. The last survey showed that on March 31, 1948 there was an average of 100 barrels of storage capacity to every 41 barrels of petroleum inventories. It should be realized, however, as pointed out in the 1948 Report, that there were circumstances which prevailed at the close of the 1947-1948 winter season which indicated that inventories on March 31, 1948 were in a number of instances, at lower than normal levels in several districts. Nevertheless, the current survey shows an average of 100 barrels of storage capacity to every 45 barrels of petroleum inventories in tanks as of June 30th last. The Committee reiterates to those outside of the petroleum industry who may feel that the indicated relationship between storage capacity and product inventories appears unusually large, that these two surveys have simply confirmed to those more familiar with petroleum industry operations, that a relatively high capacity is needed compared with actual inventories in order to operate efficiently and well.

In no sense is the difference in these inventories and capacity figures an indication of useable storage space. If the industry is to operate normally, field and refinery tank farm as well as terminal and other distribution facilities must be completely flexible if refinery operations including the blending of the many and varying grades of crude oils available and shipments to primary distribution and consuming points are to be carried on efficiently and on schedule. Also the large number of different grades and specifications of

finished products that must be carried is another reason that tends to make the relationship of tankage capacity to actual stock appear to be on the high side, but the very situation that demands so many different grades and specifications of products also demands increased tankage with which to handle and distribute these products in a business-like manner. Long time operating experience in the past has indicated that anything higher than 70 per cent product-tankage relationship will begin to develop handling and distribution difficulties, while in processing establishments even a considerably smaller relationship sometimes causes operating problems.

The Committee awaits further instructions as to whether it should proceed at this time to fulfill the request for a breakdown by location of the inventories indicated in this report with relation to their principal means of transportation.

SECONDARY STORAGE CAPACITY

The request from the Secretary of the Interior asked for information also on secondary storage capacity. Your Committee carefully considered this question and possible methods of securing the data as it did when it was making its 1948 Survey. It again finds that it cannot work out any feasible plan of developing either the storage capacity of secondary suppliers or the amount of products that those operators have in storage.

It did again examine trade and press notices of bulk plant expansion which in the aggregate should again amount to considerable additional storage capacity at secondary points for finished products. From what indications are available from the statistics of the industry, but in the absence of any exact measurement of secondary stocks, the

Committee is of the opinion that inventories at those points and in the hands of consumers are in somewhat better position as we go into this winter than they were at the same time a year ago.

Further your Committee has been advised that the Statistical Advisory Committee of the American Petroleum Institute is currently studying and attempting to finalize a method whereby the API would be in a position to create at least an index of the upward or downward movement of this important segment of inventories. The result of this effort should be known soon.

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

Respectfully submitted,

The Committee on Petroleum Storage Capacity

L. S. Wescoat, Chairman
H. T. Ashton
Paul G. Blazer
Horace E. Davenport
Charles S. Jones
John M. Lovejoy
Baird H. Markham
Rankin P. Peck
M. H. Robineau
Roland V. Rodman
Clarendon E. Streeter
W. W. Vandeveer
W. J. Arnold, Secretary

QUESTIONNAIRE FORM #1 - TOTAL FIXED UNAVAILABLE STOCKS OF CRUDE OIL, CLEAN PRODUCTS AND RESIDUAL FUEL OIL AS OF JUNE 30, 1950

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

	East Coast (1)	Appalachian District I (2)	Appalachian District II (3)	Indiana Illinois Kentucky (4)	Oklahoma Kansas Missouri (5)	Texas Inland (6)	Texas Gulf (7)	Louisiana Gulf (8)	Arkansas-Louisiana Inland (9)	New Mexico (10)	Other Rocky Mountain (11)	(a) California (12)	Total United States (13)
CRUDE OIL - Barrels													
1. Crude oil stocks reported to B. of M. June 30, 1950 as at refineries or in transit thereto from Domestic Sources	14,944,810	1,007,388	98,200	8,967,623	4,233,041	1,509,221	16,819,670	3,834,543	686,414	64,206	2,961,969	8,965,299	64,092,384
(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.	7,194,607	548,804	88,496	5,829,339	1,113,995	936,534	13,997,686	1,048,306	436,217	37,632	1,012,542	5,786,766	38,030,924
(b) In Transit to refineries by truck, tank car, barge or tanker from Domestic Sources.	2,213,328	631	-	488,947	2,000	3,000	325,049	331,229	-	-	2,482	308,500	3,675,166
Total Unavailable Refinery - In Transit Crude Oil. (Sum of (a) and (b) above)	9,407,935	549,435	88,496	6,318,286	1,115,995	939,534	14,322,735	1,379,535	436,217	37,632	1,015,024	6,095,266	41,706,090
2. Amount reported to B. of M. as Pipe Line and Tank Farm Stocks of Crude	1,235,575	2,403,670	1,554,900	17,107,312	33,460,263	41,747,557	23,356,723	5,571,837	4,342,220	1,100,416	7,219,699	21,755,838	160,856,010
(a) Unavailable as pipe line fill.	134,333	596,975	321,105	5,551,119	10,892,103	11,836,641	1,951,860	384,764	1,548,096	253,565	1,294,235	1,852,838	36,617,634
(b) Minimum required in tankage to assure continuous operation of pipe lines, including oil content of tank bottoms and other unavailable.	678,079	859,009	561,500	6,914,355	9,481,622	19,233,217	10,877,083	2,475,282	1,595,417	776,291	1,387,584	9,275,678	64,115,117
Total Unavailable Pipe Line-Tank Farm Crude Oil. (Sum of (a) and (b) above)	812,412	1,455,984	882,605	12,465,474	20,373,725	31,069,858	12,828,943	2,860,046	3,143,513	1,029,856	2,681,819	11,128,516	100,732,751

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

(a) Tank bottoms of 11,733,000barrels of reservoir storage in California credited at 3%.

CLEAN PRODUCTS - Barrels

(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.)

1. Amount reported to B. of M. as at Refineries, at Terminals, or in Pipe Lines or In Transit thereto on June 30, 1950.	44,617,213	2,693,581	1,510,031	34,651,996	14,666,815	4,402,799	27,572,124	11,441,171	2,378,470	181,336	6,862,522	29,617,404	180,595,462
2. Analysis of Unavailable Stocks included in Item 1 above:													
(a) Tank bottom credit 7%	5,960,051	387,826	277,614	4,769,259	1,991,970	607,916	3,935,895	1,246,831	313,750	23,431	752,771	3,909,176	24,176,490
(b) Unavailable Unfinished at Refineries	1,156,345	76,406	57,900	1,956,092	763,684	509,476	3,744,179	329,932	157,030	32,320	210,669	409,340	9,403,373
(c) In Refinery Lines and Refinery Operating Equipment	157,871	34,428	300	152,201	170,067	43,849	175,400	27,057	3,000	3,000	48,179	825,105	1,640,457
(d) One-Half of Average Size Water Cargo Receipt. Total of each individual grade calculated separately.	6,371,075	40,535	39,418	1,753,541	36,000	-	102,477	429,436	80,463	-	-	1,223,921	10,076,866
(e) Other Unavailable Stocks. Including Filter House Naphtha and Unavailable Unblended Finished.	1,156,762	114,929	55,784	762,550	414,396	68,740	1,211,509	1,060,128	-	17,000	515,792	6,499,246	11,876,836
(f) Pipe Line Fill.	608,965	297,055	84,248	1,145,241	1,015,138	502,263	146,504	1,870	44,284	-	139,918	61,005	4,046,491
(g) Pipe Line Operating Reserves.	1,650,100	37,000	77,100	2,371,800	721,400	473,000	1,200,140	38,000	101,000	-	2,650	30,015	6,702,205
(h) Unavailable in Transit by truck, tank car, barge or tanker from Domestic Sources (if reported to Bureau only).	4,403,875	41,677	73,190	523,608	28,716	34,278	247,778	173,621	39,042	5,120	-	458,802	6,029,707
Total Unavailable Clean Products. (Sum of (a) to (h) above).	21,465,044	1,029,856	665,554	13,434,292	5,141,371	2,239,522	10,763,882	3,306,875	738,569	80,871	1,669,979	13,416,610	73,952,425

RESIDUAL FUEL OIL - Barrels

(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.)

1. Amount reported to B. of M. as at Refineries, at Terminals, or in Pipe Lines or In Transit thereto on June 30, 1950.	10,079,542	222,666	165,500	3,738,423	1,356,974	663,456	4,041,691	2,021,073	154,947	31,489	710,046	17,384,363	40,570,170
2. Analysis of Unavailable Stocks included in Item 1 above:													
(a) Tank bottom credit 7%	1,244,946	27,048	26,098	591,996	256,005	144,939	697,163	242,632	19,415	7,338	153,978	*2,840,770	*6,252,328
(b) Unavailable Unfinished at Refineries	86,328	2,758	-	122,367	44,937	6,903	85,069	39,103	1,000	5,000	43,672	711,456	1,148,593
(c) In Refinery Lines and Refinery Operating Equipment	29,646	1,914	80	45,707	41,661	9,268	40,146	3,674	-	200	8,010	353,302	533,608
(d) One-Half of Average Size Water Cargo Receipt. Total of each individual grade calculated separately.	1,883,990	2,290	-	36,500	-	-	-	70,862	-	-	-	496,895	2,490,537
(e) Other Unavailable Stocks.	417,065	38,268	6,696	208,248	182,308	58,949	299,260	18,785	-	3,000	30,172	1,892,719	3,155,470
(f) Pipe Line Fill	-	-	20,000	100	-	-	500	-	-	-	-	100,300	120,900
(g) Pipe Line Operating Reserves	430,000	10,000	-	60,100	-	25,000	251,400	-	-	-	-	536,050	1,312,550
(h) Unavailable in Transit by truck, tank car, barge or tanker from Domestic Sources (if reported to Bureau only).	644,782	215	-	65,678	1,500	-	24,888	37,453	-	1,828	-	441,695	1,218,039

RESIDUAL FUEL OIL - Barrels

(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.)

1. Amount reported to B. of M. as at Refineries, at Terminals, or in Pipe Lines or In Transit thereto on June 30, 1950.	10,079,542	222,666	165,500	3,738,423	1,356,974	663,456	4,041,691	2,021,073	154,947	31,489	710,046	17,384,363	40,570,170
2. Analysis of Unavailable Stocks included in Item 1 above:													
(a) Tank bottom credit 7%	1,244,946	27,048	26,098	591,996	256,005	144,939	697,163	242,632	19,415	7,338	153,978	*2,840,770	*6,252,328
(b) Unavailable Unfinished at Refineries	86,328	2,758	-	122,367	44,937	6,903	85,069	39,103	1,000	5,000	43,672	711,456	1,148,593
(c) In Refinery Lines and Refinery Operating Equipment	29,646	1,914	80	45,707	41,661	9,268	40,146	3,674	-	200	8,010	353,302	533,608
(d) One-Half of Average Size Water Cargo Receipt. Total of each individual grade calculated separately.	1,883,990	2,290	-	36,500	-	-	-	70,862	-	-	-	496,895	2,490,537
(e) Other Unavailable Stocks.	417,065	38,268	6,696	208,248	182,308	58,949	299,260	18,785	-	3,000	30,172	1,892,719	3,155,470
(f) Pipe Line Fill	-	-	20,000	100	-	-	500	-	-	-	-	100,300	120,900
(g) Pipe Line Operating Reserves	430,000	10,000	-	60,100	-	25,000	251,400	-	-	-	-	536,050	1,312,550
(h) Unavailable in Transit by truck, tank car, barge or tanker from Domestic Sources (if reported to Bureau only).	644,782	215	-	65,678	1,500	-	24,888	37,453	-	1,828	-	441,695	1,218,039
Total Unavailable Residual Fuel Oil (Sum of (a) to (h) above).	4,736,757	82,493	52,874	1,130,696	526,411	245,059	1,398,426	412,509	20,415	17,366	235,832	7,373,187	16,232,025

*Reservoir tank bottoms in California credited at 3 per cent

QUESTIONNAIRE FORM #2 - CAPACITY OF CRUDE OIL, CLEAN PRODUCT AND RESIDUAL FUEL OIL TANKAGE AS OF JUNE 30, 1950

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 (2)	Appalachian District II (3)	Indiana Illinois Kentucky (4)	Oklahoma Kansas Missouri (5)	Texas Inland (6)	Texas Gulf (7)	Louisiana Gulf (8)	Arkansas-Louisiana Inland (9)	New Mexico (10)	Other Rocky Mountain (11)	California (12)	Total United States (13)
CRUDE OIL TANKAGE - Barrels													
1. Capacity of Tankage at Refineries	20,504,600	1,049,294	114,539	13,984,224	7,919,667	2,629,016	25,435,530	6,570,976	1,250,310	112,000	3,829,897	18,121,217	101,521,270
2. Capacity of Tankage along Pipe Lines and on Tank Farms	2,689,353	5,953,159	2,513,000	30,337,714	67,763,741	79,714,720	58,485,917	9,366,239	10,037,980	2,491,983	14,652,347	46,790,596	330,796,749
3. Total Crude Oil Tankage Capacity (1) and (2) above	23,193,953	7,002,453	2,627,539	44,321,938	75,683,408	82,343,736	83,921,447	15,937,215	11,288,290	2,603,983	18,482,244	64,911,813 (a)	432,318,019 (a)

Note: Tankage involved in Producers' (Lease) Stocks not included.

(a) Includes 11,733,000 barrels of reservoir storage in California.

CLEAN PRODUCTS TANKAGE - Barrels

(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.)

1. Capacity of Tankage at Refineries	29,242,863	3,048,453	1,681,058	41,030,784	22,139,203	5,775,579	54,682,568	15,435,222	2,849,617	333,150	9,843,618	39,716,489	225,778,604
2. Capacity of Tankage along Pipe Lines and on Tank Farms	3,332,624	286,428	538,062	9,291,260	2,842,669	1,977,648	938,000	47,055	398,565	-	40,000	5,707,522	25,399,833
3. Capacity of Tankage at Bulk Terminals	52,425,170	2,001,652	1,752,095	18,795,956	3,543,698	851,000	1,176,768	2,328,163	1,757,162	-	1,152,262	11,101,919	96,885,845
4. Total Clean Product Tankage Capacity - (1), (2) and (3) above.	85,000,657	5,336,533	3,971,215	69,118,000	28,525,570	8,604,227	56,797,336	17,810,440	5,005,344	333,150	11,035,880	56,525,930	348,064,282

RESIDUAL FUEL OIL TANKAGE - Barrels

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

1. Capacity of Tankage at Refineries	9,697,131	377,851	372,244	8,352,924	3,826,292	1,968,726	9,705,552	2,979,116	308,240	99,250	1,942,451	34,448,729	74,078,506
2. Capacity of Tankage along Pipe Lines and on Tank Farms	1,192,259	-	-	500	-	-	-	-	-	-	-	18,104,606	19,297,365
3. Capacity of Tankage at Bulk Terminals	6,712,529	-	-	257,194	5,000	-	611,307	477,628	-	-	-	4,618,215	12,681,873
4. Total Residual Fuel Oil Tankage Capacity - (1), (2) and (3) above.	17,601,919	377,851	372,244	8,610,618	3,831,292	1,968,726	10,316,859	3,456,744	308,240	99,250	1,942,451	57,171,550 (b)	106,057,744 (b)

(b) Includes 20,309,000 barrels of reservoir storage in California.

ADDITIONAL TANKAGE (NOT INCLUDED ABOVE) UNDER CONSTRUCTION ON JUNE 30, 1950

AND CONTEMPLATED FOR COMPLETION BY DECEMBER 31, 1950 - Barrels

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

1. Crude Oil	848,000	7,000	-	3,018,843	2,297,700	1,493,742	1,414,625	-	215,000	5,000	602,000	294,000	10,195,910
2. Clean Products	5,251,600	221,512	74,000	4,286,180	802,500	43,100	116,000	-	93,000	35,000	812,100	235,000	11,969,992
3. Residual Fuel Oil	346,800	-	-	704,400	423,000	390,000	-	-	-	-	197,200	117,000	2,178,400
4. Total New Tankage Second Half 1950	6,446,400	228,512	74,000	8,009,423	3,523,200	1,926,842	1,530,625	-	308,000	40,000	1,611,300	646,000	24,344,302