# Petroleum Storage & Transportation Capacities

## Volume II • Inventory and Storage

National Petroleum Council • December 1979


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**National Petroleum Council • December 1979**

**Committee on U.S. Petroleum Inventories, and Storage and Transportation Capacities**

**Robert V. Sellers, Chairman**

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Library of Congress Catalog Card Number: 79-93026

Printed in the United States of America

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# INTRODUCTION AND EXECUTIVE SUMMARY

## INTRODUCTION

In June 1978, the Secretary of Energy requested the National Petroleum Council to determine the nation's petroleum and gas storage and transportation capacities as part of the federal government's overall review of emergency preparedness planning (Appendix A). The National Petroleum Council has provided similar studies at the request of the federal government since 1948, most recently the 1967 report entitled U.S. Petroleum and Gas Transportation Capacities and the 1974 report entitled Petroleum Storage Capacity.

To respond to the Secretary's request, the National Petroleum Council established the Committee on U.S. Petroleum Inventories, and Storage and Transportation Capacities, chaired by Robert V. Sellers, Chairman of the Board, Cities Service Company. A Coordinating Subcommittee and five task groups were formed to assist the Committee (Appendix B).

The Inventory and Storage Task Group, chaired by W. P. Madar, Vice President -- Supply, The Standard Oil Company (Ohio), was requested by the Committee to determine:

- The minimum operating level of petroleum inventories; that is, the inventory which is required to fill pipelines and tank bottoms as well as maintain minimal operational flexibility and is, therefore, unavailable in an emergency

- The total primary storage capacity for the United States and that portion of storage capacity which is required for normal operations and could not be used to store petroleum for an emergency

- The capacity of storage facilities under construction.

The National Petroleum Council (NPC) has conducted eight surveys on this subject since 1948. To develop the data for this report, the NPC distributed questionnaires to those companies which report primary inventory data to the Department of Energy. A certified public accounting firm, Price Waterhouse & Co., was contracted by the NPC to receive and aggregate the survey returns. Survey results are discussed in the section of the report entitled "Results." A copy of the questionnaire is included in this report as Appendix D and the tabulation of the survey returns is presented in Appendix E.

In addition, the Task Group was requested to:

- Describe the nature of the relationships between primary, secondary, and consumer storage

- Provide an explanation of the nation's petroleum distribution system
- Discuss the federal government Strategic Petroleum Reserve.

EXECUTIVE SUMMARY

One of the principal objectives of this study was to determine the minimum operating inventory of the primary distribution system. This level is defined as the inventory required to fill pipelines and tank bottoms as well as maintain normal operations; for emergency planning purposes the minimum operating inventory is considered unavailable. Runouts and shortages would begin to occur if inventory were to fall below this level.

Based on the responses to the National Petroleum Council's 1979 Survey of Petroleum Storage Capacity and Inventory Availability in the United States, the NPC has concluded that the minimum operating inventories for crude oil and each of the major refined products are as follows:

U.S. Primary Distribution System
Minimum Operating Inventory -- 1978
(Millions of Barrels)

| | |
|---|---|
| Crude Oil | 290 |
| Gasoline | 210 |
| Kerosine | 35 |
| Distillate Fuel Oil | 125 |
| Residual Fuel Oil | 60 |

The second objective of this study was to determine the amount of tankage capacity in the primary distribution system and the amount of that tankage which could be used to hold petroleum for use in an emergency. The tank capacities for crude oil and each of the major refined products are as follows:

U.S. Primary Distribution System
Total Shell Capacity of Tankage
September 30, 1978
(Millions of Barrels)

| | |
|---|---|
| Crude Oil | 462 |
| Gasoline | 438 |
| Kerosine | 90 |
| Distillate Fuel Oil | 365 |
| Residual Fuel Oil | 162 |

Based on the data from this and previous NPC surveys, the NPC observed that inventory has averaged about 50 percent of tank capacity for the past 30 years. Individual tanks alternate between

full and empty, and at any point in time, the whole storage system is approximately half full. The NPC concluded, therefore, that no significant storage capacity exists for holding emergency supplies.

Inventories and capacities reported in this survey do not include:

- The federal government Strategic Petroleum Reserve (SPR). At the present time, the capacity of the SPR is approaching 250 million barrels with an inventory of about 88.7 million barrels as of July 30, 1979.

- Crude oil and products located in U.S. possessions and territories. At least 45 million barrels of storage capacity are located in these areas.

- Transshipment facilities located in foreign countries adjacent to the U.S.

- Foreign crude and products bound for the United States.

- Most of the Alaskan North Slope crude oil in tankers.

In addition to the capacity of and inventory in the distribution system, the national petroleum supply depends upon the level of domestic crude production, crude imports, product imports, and refining capacity. Furthermore, the distribution system itself consists of the primary system (the principal focus of this report), as well as the secondary distribution system and consuming sector, which contain substantial holding capacity and inventory.

The secondary/consumer storage system has a significant effect on supply. Analysis of the storage capacity for gasoline and distillate fuel oil in the secondary and consumer segments shows that capacity exists for at least 500 million barrels, or 60 percent of the primary storage capacity for these products. The magnitude of this capacity suggests that shifts of sizable volumes of inventory between primary and secondary/consumer segments might occur; these shifts could contribute to shortages or surpluses in the primary system. Further analysis of the secondary distribution system and the consumer sector is recommended.

## THE ROLE OF STORAGE CAPACITY AND INVENTORY IN THE PRIMARY PETROLEUM DISTRIBUTION SYSTEM

The primary crude oil distribution system is a network consisting of tanks, pipelines, tankers, barges, tank cars, and tank trucks, which transport crude oil from producing areas or marine unloading terminals to the nation's refineries. The primary products distribution system moves the finished products away from the refineries to the areas in which they are marketed. (For a more complete description of the petroleum distribution system, see Appendix C.)

### TANKAGE

Storage facilities (tanks) are provided throughout the distribution system. This storage capacity serves the following purposes:

- To receive and hold large shipments which are delivered in discrete parcels but which are utilized continuously. For example, if a refinery receives and processes two tanker deliveries of crude oil in a month, it must have sufficient storage capacity to hold at least one shipment, or about half a month's supply of crude oil.

- To accumulate shipments in anticipation of tanker, barge, or pipeline movements. For example, a barge may have sufficient capacity to hold three days' production of gasoline. Storage capacity at the refinery should be large enough to hold one shipment, or about three days of production of gasoline, preceding the arrival of the barge.

- To meet seasonal peaks in demand. The ability of refineries to shift yields from one product to another is limited, so seasonal demand can only be met by drawing down inventory. Consequently, tankage is provided at both refineries and marketing locations to allow for a buildup of distillate fuel oil for winter consumption and of gasoline for summer consumption.

- To segregate different grades and qualities of crude oils, unfinished oils, and finished products. For example, enough tankage must be provided so that a refiner can separate high and low sulfur crudes, hold unfinished oils which are blended into finished products, and keep separate all the finished products (regular, premium, and unleaded gasoline; kerosine; diesel fuel; heating oil; etc.)

- To accumulate products and crude oil before and during planned maintenance periods. It is economically desirable to keep transportation systems (pipelines, tankers, etc.) operating even when a refinery must be shut down for routine

maintenance. Therefore, the refiner must have sufficient capacity to accommodate a buildup of finished products before the refinery is shut down so that regular deliveries to customers may continue during the shutdown. In a like manner, the crude delivered during the shutdown period can be stored.

- To handle unavoidable but anticipated events, some of which are emergencies and others the result of schedule changes, etc. For example, a storm can delay a tanker from picking up a cargo of gasoline. If there is empty storage capacity at the refinery, the refiner can maintain full production and fill that capacity while waiting for the storm to subside.

- To meet safety and design restrictions. Room must be left at the very top of a tank to allow for thermal expansion or accidental overfilling. The design of floating roof tanks requires that the roof never reach the top of the tank sides.

Finally, there is some storage capacity which is obsolete or is improperly located for current operations. This capacity is currently not used.

INVENTORY

Inventory is held for the following reasons:

- As part of the normal operating cycle of the distribution and refining system. For example, a cycle begins when crude oil is delivered to a refinery by tanker. Inventory at the refinery builds rapidly as the tanker unloads its cargo, and diminishes gradually as the crude oil is refined. This cycle may last hours or days, depending upon the method of delivery and the rate of consumption. Conversely, gasoline inventory builds gradually as it is refined from crude oil and diminishes rapidly as it is removed by barge. Similar cycling occurs with deliveries and receipts of crude and/or petroleum products made by pipelines, tank cars, and tank trucks.

- To meet seasonal peaks in demand. As discussed previously, seasonal demand can only be met by drawing down inventories which were produced prior to the period of high demand.

- To prepare for planned maintenance periods. As discussed previously, a refiner must build up product inventories prior to a shutdown so that regular deliveries may continue during the shutdown. In a like manner, while the refinery is shut down, crude oil will continue to be delivered, thus building inventories.

- To handle unavoidable but anticipated events. For example, if a refiner receives crude oil via pipeline, some crude will be held in inventory to guard against a possible pipeline failure. This inventory is held because it is unsafe to shut down a refinery instantly. Thus, some crude must be held just to provide a safe and orderly shutdown of operations if supply should be cut off.

- To facilitate blending to meet product specifications. Various unfinished products are held until they can be blended to make products such as gasoline, lubricating oils, and various grades of fuel oil.

- To fill tank bottoms. That portion of inventory in the tank which is below the suction line cannot be used. Sediment and water collect in this area. In the case of floating roof tanks it is necessary to keep enough oil or product in the tank in order to keep the legs of the roof off the floor of the tank. Otherwise, air could be drawn into the tank, creating a safety hazard.

- To fill refinery process equipment (as opposed to storage tanks), pipelines, domestic tankers, barges, tank cars, and tank trucks.

- For situations peculiar to particular locations. For example, refineries near the Gulf of Mexico will carry additional oil during hurricane season to keep tanks from floating.

## MINIMUM OPERATING INVENTORY

When inventories drop below the minimum operating inventory level, problems occur and shortages begin to appear. For emergency planning purposes, this inventory is considered unavailable. A large part of the minimum operating inventory is "completely unavailable." The term "completely unavailable" inventory is used in the petroleum industry to include oil needed to fill tank bottoms, refinery process equipment, pipelines, tankers, barges, tank cars, and tank trucks, as well as unfinished oils that cannot be blended to make finished products. This inventory can never be used unless the distribution system is shut down and operators are willing to resort to expensive, one-time-only options (such as forcing product out of a pipeline with water).

In addition to the "completely unavailable" inventory, the minimum operating inventory includes an amount of working stocks required to keep the distribution system operating "normally." First, these working stocks include the volume needed to handle unavoidable but anticipated events such as emergencies and schedule changes. Second, the minimum operating level includes half of the operating cycle volume. As oil is transported throughout the

distribution system from producing area to refinery to product terminal, the inventory level in each tank rises and falls as deliveries are made or oil is removed. The inventory level in all tanks in the system generally averages the midpoint of the operating cycle.

A company's minimum operating inventory is a function of many things, including (but not limited to) the location of both its supply and demand, the level of its demand, the availability of transportation and refining facilities, the mode of transportation, the availability and location of tankage, and the cost of capital. Actual inventory may, at times, go below the minimum operating level, but the company may avoid serious problems by employing expensive supply rearrangements or, on occasion, by a fortuitous exchange with another company which may have additional supply available. However, it would be inappropriate to plan operations on the basis of expensive or fortuitous supply arrangements, particularly for planning involving supply interruptions.

Seasonal inventory is not included in the minimum operating level. This inventory is held in anticipation of demand levels which cannot be met by current production. Refiners generally have target levels for seasonal inventory for various products. For example, a refiner may have a minimum operating level of 2 million barrels for distillate, and, after projecting demand and production for the following winter, may determine that he will need to store 7 million barrels by November 1. He may then set a target inventory level of 5 million barrels, for example, by August 31. If his inventory were to slip below that level at the end of August, he would not necessarily experience operating problems during the summer or fall, but he might be unable to satisfy his customers' requirements that winter. Only after the peak heating season will he know exactly how much seasonal inventory should have been stored.

The buildup of product prior to a planned refinery maintenance period, as well as the buildup of crude oil during that period, is also considered to be beyond the minimum operating level. By accumulating product for such a situation, an oil company may continue to make regular product deliveries to customers and thus maintain smooth operations within the transportation system.

## MAXIMUM OPERATING INVENTORY

Empty space must always be available in tankage. Part of this space is never filled; this space provides room for thermal expansion of the contents and protects against accidental overfilling.

In a distribution system, operating space is always necessary to allow for receipt of inventory. For example, a crude oil tanker cannot begin unloading its cargo at a refinery until there is empty tank capacity to receive the delivery. This operating space represents approximately half of the operating cycle volumes. In addition, some space must be provided for unavoidable but anticipated

events such as emergencies and schedule changes. For example, a barge may be unable to pick up a cargo of product from a refinery because of bad weather. Having emergency space available in tankage allows a refiner to maintain throughput. If the space were not there, the refinery would be forced to shut down when the product tanks were full.

Each company in the primary distribution system has a maximum operating inventory. If inventory were to go above this level, there would not be enough empty space in the system to allow it to keep operating without a slowdown or interruption in the system.

## STORAGE CAPACITY-INVENTORY RELATIONSHIPS

A schematic representation of the relationship between storage capacity and the various inventory levels is shown in Figure 1.

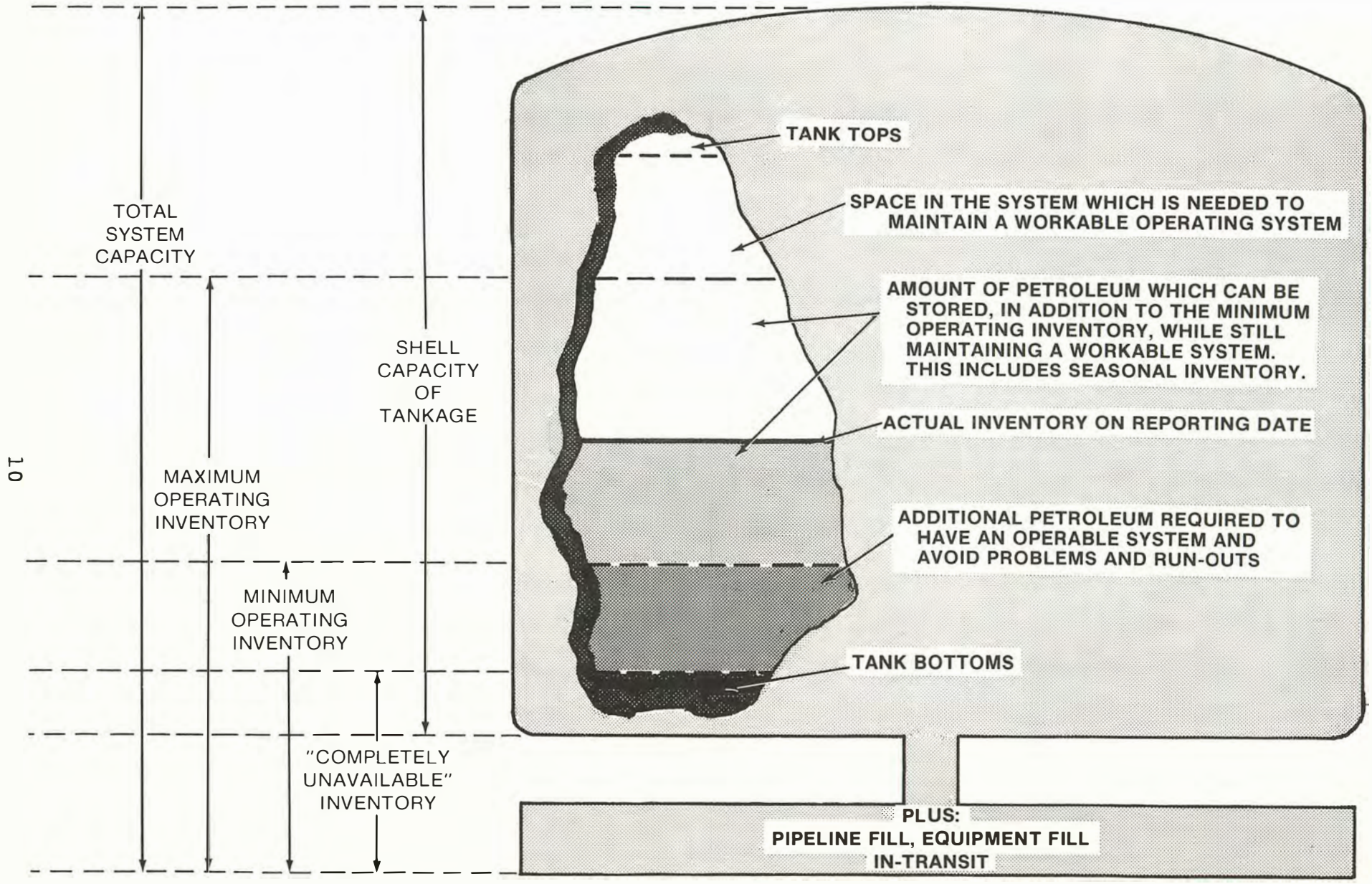



Figure 1. Simplified Diagram of Terms Describing Petroleum Inventories and Storage Capacities.

## METHODOLOGY

The data used in this report were collected by means of a questionnaire sent by the NPC to all companies which respond to the Department of Energy (DOE) monthly inventory survey (Appendix D). The questionnaire was distributed on March 6, 1979, and responses were received over a two-month period following the distribution.

The DOE receives data from each unit of a company; the NPC collected information on a company-wide basis, requesting that each company consolidate into a single report all the data which its units report separately to the DOE. The results apply to the entire primary petroleum distribution system, which consists of:

- Refineries
- Crude oil trunklines and their terminals (producers' lease stocks were not surveyed)
- Product pipelines and their terminals
- Bulk product terminals, defined as those terminals that receive product by tanker, barge, or pipeline, or have an aggregate storage capacity of 50,000 barrels or more
- Barges and tankers in domestic service.

Excluded from the survey were service stations, small marketing bulk plants, and consumer storage. However, inventories and capacities at these locations are addressed qualitatively in the section of this report entitled "Inventory and Storage Capacity in the Secondary Distribution System and Consumer Segment."

In the questionnaire each respondent was asked to indicate his actual inventory and storage capacity by Bureau of Mines refining district. In addition, each was asked to identify that part of inventory which was "completely unavailable" and that part of capacity which was unusable for safety reasons. Finally, each respondent was asked to estimate his minimum and maximum operating inventories by broad geographic region, i.e., either Petroleum Administration for Defense (PAD) districts I-IV and/or PAD district V.

Those respondents who analyze industry inventory levels were also asked to provide estimates of the minimum and maximum operating inventories for the entire U.S. petroleum industry. These industry responses were used as input for the NPC estimates.

Finally, each respondent was asked to indicate the capacity of tankage under construction by his company.

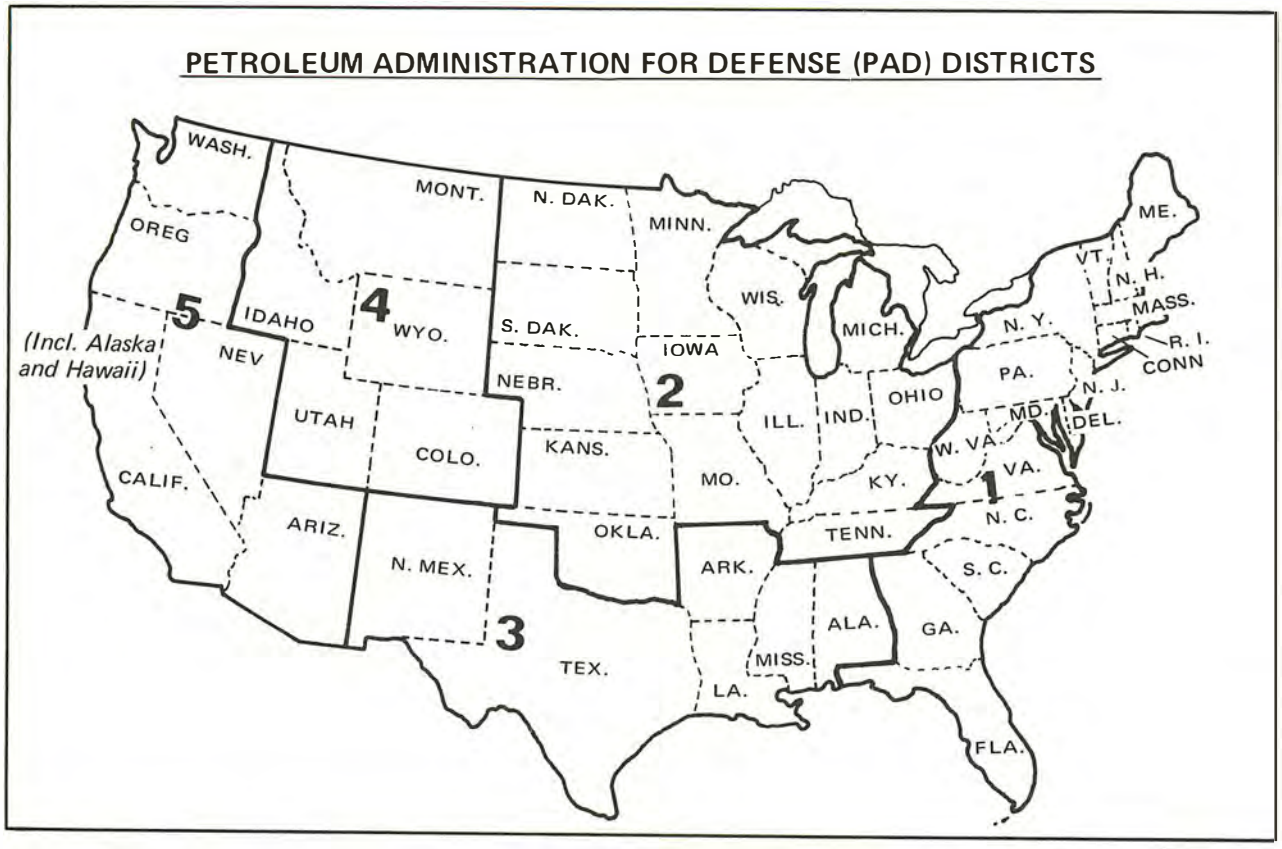
Of the 365 companies surveyed, a total of 202 (55 percent) responded to the questionnaire. When computed on a volumetric basis, the coverage ratio is 75-97 percent. The following summarizes the percentage of the actual inventory reported to the DOE which was reported to the NPC:

| | Actual Inventory Reported to DOE* for the Dates Shown (Millions of Barrels) | Sum of Responses for Actual Inventory Reported to NPC (Millions of Barrels) | Percentage of Coverage |
|---|---|---|---|
| | March 31, 1978 | | |
| Crude Oil | | Not Surveyed | |
| Gasoline | 262.2 | 236.3 | 90.1 |
| Kerosine | 38.1 | 37.0 | 97.2 |
| Distillate Fuel Oil | 137.9 | 124.0 | 90.0 |
| Residual Fuel Oil | 62.2 | 48.6 | 78.2 |
| | September 30, 1978 | | |
| Crude Oil† | 302.6 | 281.6 | 93.1 |
| Gasoline | 219.3 | 202.0 | 92.1 |
| Kerosine | 45.4 | 43.1 | 94.8 |
| Distillate Fuel Oil | 220.8 | 193.2 | 87.5 |
| Residual Fuel Oil | 81.2 | 60.8 | 74.8 |

*Forms P-320, P-321, P-322, P-323.
†Does not include 18.6 million barrels of lease stocks.

The percentage of inventory reported in this year's survey is comparable to that achieved in the 1973 NPC survey for crude oil and all products except residual fuel oil. Since that time, the definition of the primary distribution system has been expanded to include additional independent bulk terminal operators. It is felt that many of the questionnaires not returned were sent to bulk terminal operators.

The coverage is high enough to conclude that the results are representative of the way inventory and tank capacity is managed by the entire U.S. petroleum distribution system. In order to present estimates for the entire system, therefore, all sums of responses were adjusted upward by dividing by the coverage. For example, the sum of all responses for shell capacity of tankage for crude oil was 430.2 million barrels. Based on the response rate for inventory data, the sum of responses for tank capacity is believed to represent 93.1 percent of the true tank capacity which exists in the primary system. Therefore, the total shell capacity of tankage




for the United States has been adjusted to 462 million barrels (430.2 million divided by 0.931). Similar adjustments were made to all important inventory and capacity results.

One further adjustment was necessary for crude oil inventories. Stocks of crude oil in tankage on producing properties (lease stocks) are included in DOE inventory figures. These small storage tanks, with correspondingly small volumes of inventory, were not surveyed since all such inventory is "completely unavailable." Furthermore, this storage capacity could not be used to store additional inventory. However, it was necessary to readjust these figures: the 19 million barrels of lease stocks (as of September 30, 1978) were added to the "completely unavailable" inventory, minimum operating inventory, maximum operating inventory, and storage capacity to make these figures comparable to other data regularly published by the DOE.

Capacities and inventories discussed in this report do not include those in the Strategic Petroleum Reserve. Also, they do not include capacity or inventory at transshipment facilities located in foreign countries adjacent to the United States. (These two areas are discussed elsewhere in this report.) Although the survey questionnaire requested data on storage capacity and inventories for Puerto Rico, the Virgin Islands, and Guam, these data have not been included, as the number of responses for this section was too low to assure confidentiality to the respondents. However, the NPC estimates that at least 45 million barrels of storage capacity are located in U.S. possessions and territories. Finally, crude oil inventories do not include most of the Alaskan North Slope crude oil in tankers. This volume is also excluded from the DOE inventory statistics which are published monthly.

The principal objectives of this study were to determine:

- The minimum level of inventory which must be maintained in order to keep the petroleum distribution system operating
- The amount of storage capacity in the primary distribution system and the portion of that storage which is required for normal operations.

## MINIMUM OPERATING INVENTORY LEVELS

Three data sources were used to help determine U.S. minimum operating inventory levels (Table 1). Each inventory holder was asked to indicate his minimum operating level. The sum of these responses provided one indication of the minimum for the industry. In addition, those companies which analyze industry inventory statistics were asked to provide their estimate of the minimum operating inventory level for the industry. Finally, recent reports published by the U.S. Department of Energy include estimates of the minimum operating inventory for crude oil and key products.

TABLE 1

Minimum Operating Inventory*
(Millions of Barrels)

| | Estimates by Industry† | Sum of the Responses§ | DOE Estimates¶ |
|---|---|---|---|
| Crude Oil** | 292 | 276 | 294 |
| Gasoline | 212 | 192 | 204 |
| Kerosine | 35 | 33 | Not available |
| Distillate | 123 | 111 | 120 |
| Residual | 61 | 52 | 60 |

*All minima are for end-of-season inventory levels.
†Average of all responses to Questionnaire 6.
§Total of all responses to Line A-2, Column 5 for Questionnaires 1-5, adjusted by response ratio.
¶As taken from DOE Weekly Petroleum Status Report of June 22, 1979; DOE estimates are for the lowest point shown for the "Minimum Acceptable Level."
**Crude oil inventory includes lease stocks but excludes Strategic Petroleum Reserve.

As was expected, the sum of responses was lower than the average of the estimates by the industry. In reality, shortages and runouts would occur before inventory dropped to the minimum level indicated by the sum of responses because not all operators would reach their minimum operating level simultaneously. The sum of responses does, however, provide a check on the estimates made by industry members. Since the sum of responses is within 6-15 percent of the industry estimates, the NPC concludes that these estimates provide a reasonable indication of the inventory level at which shortages and runouts would occur. These minimum operating levels are as follows:

U.S. Primary Distribution System
Minimum Operating Inventory -- 1978
(Millions of Barrels)

| | |
|---|---|
| Crude Oil | 290 |
| Gasoline | 210 |
| Kerosine | 35 |
| Distillate Fuel Oil | 125 |
| Residual Fuel Oil | 60 |

The increases in minimum operating inventories from the 1974 NPC report reflect both physical increases in the distribution system and changes in definition which have added to the amount of inventory included in the primary system. Examples of physical changes are the Trans-Alaska Pipeline System (9 million barrels of linefill plus 9.1 million barrels of tank capacity at Valdez); Capline expansion; Texoma Pipeline; Seaway Pipeline; and batching of crude oil in Williams Pipeline and Explorer Pipeline. Two changes in definition which have taken place since 1974 have increased the amount of crude oil and products included in DOE inventory statistics. Beginning in 1975, product inventories at major independent bulk terminals were added to the reporting system. Furthermore, as of January 1977, reporting of crude oil inventories was changed to include crude oil in pipelines which is from foreign sources and has cleared U.S. customs.

## TOTAL TANK CAPACITY AND AMOUNT AVAILABLE FOR STORAGE OF ADDITIONAL INVENTORY

Each respondent was asked to indicate his storage capacity and the amount of tankage which was under construction. Table 2 summarizes the results for crude oil and the various refined products.

TABLE 2

Storage Capacity and Tankage Under Construction
(Millions of Barrels)

September 30, 1978

| | Tank Capacity | Tankage Under Construction | Percentage |
|---|---|---|---|
| Crude Oil | 462 | 12 | 3 |
| Gasoline | 438 | 5 | 1 |
| Kerosine | 90 | less than 1 | 1/2 |
| Distillate | 365 | 3 | 1 |
| Residual | 162 | 1 | 1/2 |

Each respondent was also asked to indicate the maximum amount of inventory he could store in his total system capacity while maintaining normal operations. The difference between system capacity and the maximum operating inventory is the space required to keep the distribution system operating. For some operators, capacity exists which could be used to hold additional inventory but is not currently being used because it is obsolete or in obsolete locations. For example, there are pipelines which deliver oil from fields in which production has declined. Tankage along these pipelines may not be utilized as fully as possible and may therefore be available for storing additional petroleum.

The NPC believes that there is not a significant amount of storage capacity which is underutilized. This conclusion was reached by comparing actual inventory levels to tank capacity for this and previous NPC studies. To make this comparison, it was necessary to reduce inventory figures by the amount which is outside of tankage in pipelines, tankers, barges, tank cars, tank trucks, and refinery processing equipment. Table 3 summarizes this calculation.

TABLE 3

Utilization of Storage Capacity
September 30, 1978
(Millions of Barrels)

| | Crude Oil | Gasoline | Kerosine | Distillate | Residual | Total |
|---|---|---|---|---|---|---|
| Actual Inventory Reported to NPC (Unadjusted) | 281.6 | 202.0 | 43.1 | 193.2 | 60.8 | 780.7 |
| Less: Inventory Outside of Tankage (Unadjusted) | 85.5 | 30.2 | 4.5 | 13.7 | 0.6 | 134.5 |
| Inventory in Tankage | 196.1 | 171.8 | 38.6 | 179.5 | 60.2 | 646.2 |
| Shell Capacity of Tankage Reported to NPC (Unadjusted) | 430.2 | 403.5 | 84.9 | 319.5 | 121.4 | 1359.5 |
| Percentage Utilization | 46 | 43 | 45 | 56 | 50 | 48 |

Table 4 compares this result to previous NPC studies and shows the use of tanks in the primary system over the past 30 years.

TABLE 4

Percentage Utilization of Tank Capacity -- 1948-1978

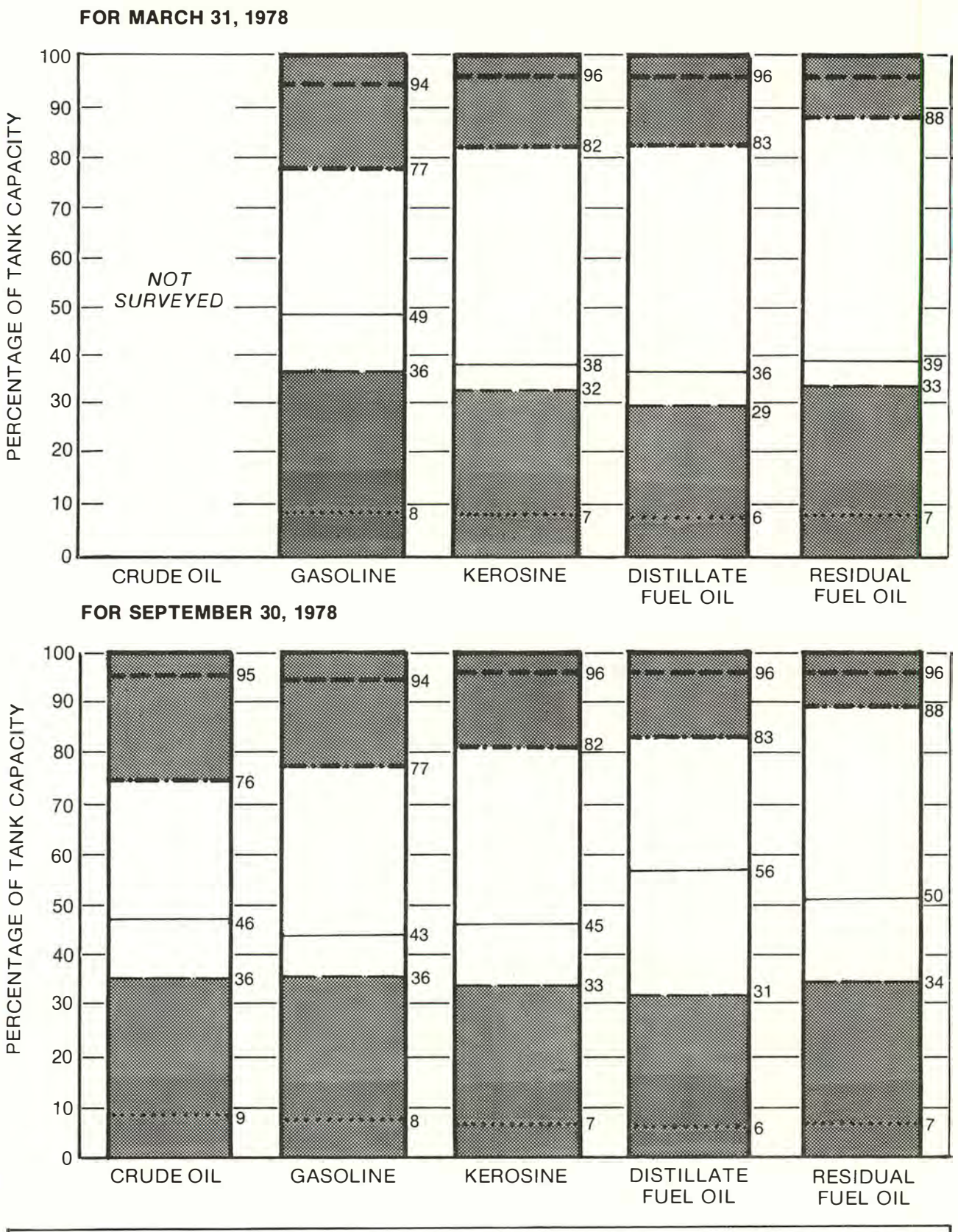
| Survey Date | Inventory as a Percentage of Tank Capacity |
|---|---|
| March 31, 1948 | 42 |
| June 30, 1950 | 45 |
| March 31, 1952 | 45 |
| March 31, 1954 | 48 |
| March 31, 1957 | 45 |
| September 30, 1962 | 50 |
| September 30, 1969 | 53 |
| September 30, 1973 | 48 |
| September 30, 1978 | 48 |

Actual inventory has averaged about 50 percent of storage capacity for the past 30 years. Individual tanks alternate between being full and empty, and at any point in time, the whole storage system is approximately half full. At any given point, some tank owners hold their maximum inventory and some hold their minimum, while most fall somewhere between the two levels. There is no way of predicting where the space will be in the system. Furthermore, this space "moves" throughout the distribution system continually.

Figure 2 illustrates the use of tanks on each of the dates indicated.

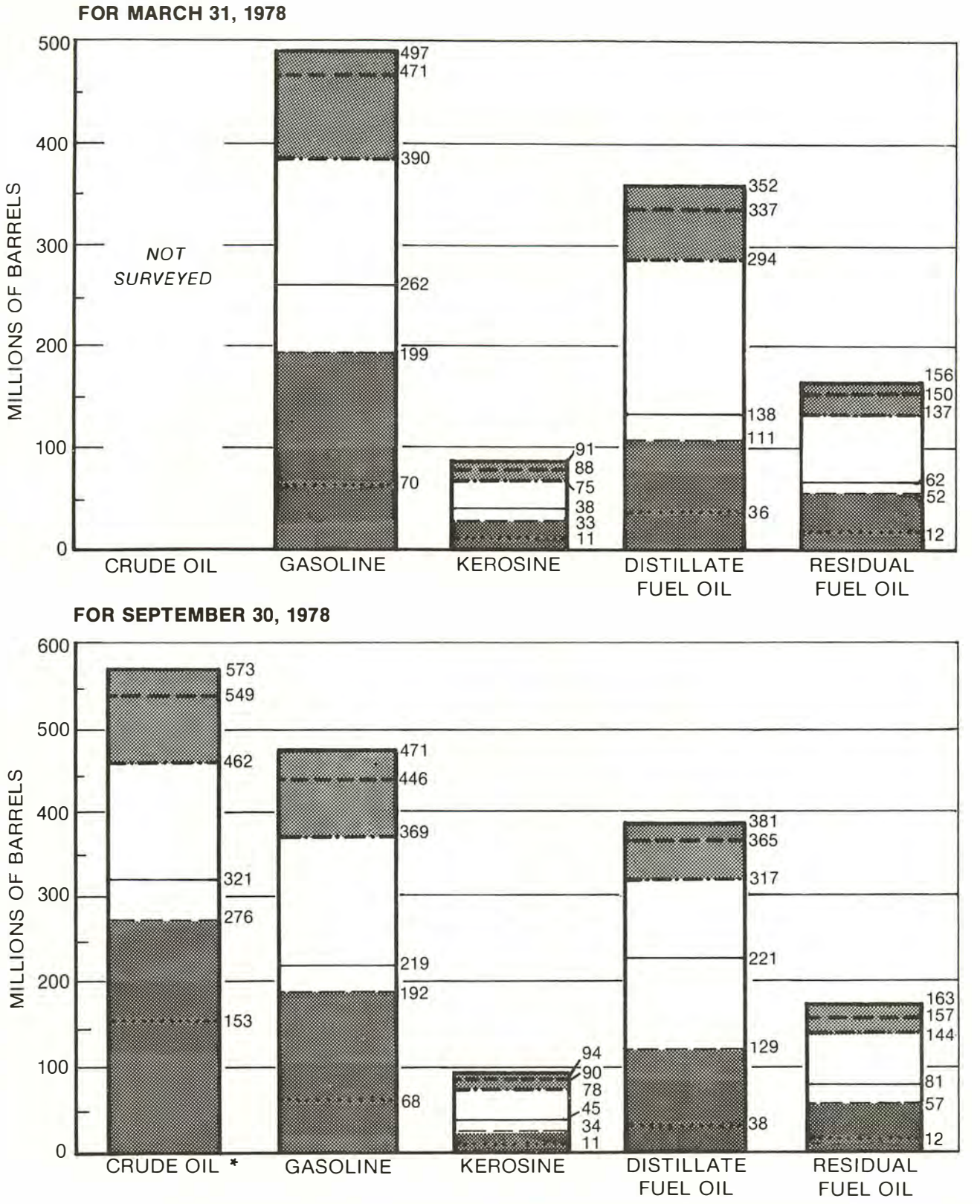
## QUESTIONNAIRE RESULTS

Figure 3 summarizes the responses to the survey, as adjusted. Each bar indicates total system capacity (tankage plus pipeline fill and inventory held outside of tankage); capacity minus storage space unusable for safety reasons (tank tops); maximum operating inventory; actual inventory (for the date shown); minimum operating inventory; and "completely unavailable" inventory. The maxima and minima represent the sums of the responses; in actual operation the operating ranges for the entire petroleum distribution system are narrower.




NOTE: Maxima and minima are sums of responses; in actual operation, the operating ranges for the entire petroleum distribution system are narrower.

Figure 2. Tank Utilization.




* Includes 18.6 million barrels of lease stocks; excludes Strategic Petroleum Reserve.

NOTE: Maxima and minima are sums of responses; in actual operation, the operating ranges for the entire petroleum distribution system are narrower.

Figure 3. Summary of Adjusted NPC Survey Results.

## INVENTORY AND STORAGE CAPACITY IN THE SECONDARY DISTRIBUTION SYSTEM AND CONSUMER SEGMENT

The following analysis of inventory and storage capacity in the secondary distribution system and consumer segment is qualitative rather than quantitative. Selected companies in energy-intensive industries were interviewed about the amount and use of their storage capacity. Interviews were conducted with 16 companies representing the following industries: food, steel, aluminum, chemical, automotive, and paper. Selected utilities were also interviewed.

There was little uniformity in the results. Some companies had as little as 15 days of storage capacity for petroleum products while others had as much as 120 days; the average was about 30 days. Most indicated that they have not added any storage capacity since the 1973 embargo. However, many indicated that their oil storage capacity had been built to serve as a backup for natural gas curtailments. With fuel oil projected to be in tight supply over the next few years, many said they would use the tankage to back up their supplies of petroleum.

Fuel inventory levels also varied by company. Some companies had as little as two days of supply available. Their belief was that there was no point in holding petroleum inventories to keep their operations going if their suppliers and/or customers could not operate through a petroleum supply interruption. Most cited competitive pressures which forced them to keep costs low and therefore maintain close to minimum inventories.

Most companies indicated that they keep little or no inventory for use in an emergency. However, one firm claimed to have 30 days of supply in inventory in case of supply interruptions. When asked what they are doing to prepare for another oil supply crisis, most claimed they would either fill existing capacity with whatever oil they might be able to purchase or rely on government allocation programs to provide some supply during a crisis. One representative of the secondary distribution system felt that his sector increased inventories during the first quarter of 1979, a time when supplies in the primary segment were very tight.

The secondary/consumer storage system has a significant effect on supply. Analysis of the storage capacity for gasoline and distillate fuel oil in the secondary and consumer segments shows that capacity exists for at least 500 million barrels, or 60 percent of the primary storage capacity for these products; Table 5 illustrates how this estimate was derived. The magnitude of this capacity suggests that shifts of sizable volumes of inventory between primary and secondary/ consumer segments might occur; these shifts could contribute to shortages or surpluses in the primary system. (For example, if half of the 130 million vehicles in the United States suddenly carried an additional five gallons of gasoline, the demand on the primary system would be increased by 8 million

barrels). Changes in secondary/consumer inventories could be perceived as supply shortfalls, with no actual increase and perhaps even a decrease in actual consumption. However, it is beyond the scope of this study to further analyze the secondary distribution system and the consumer sector.

TABLE 5

Estimated Storage Capacity
Secondary and Consumer Segment

| Secondary Distribution System* | | Millions of Barrels |
|---|---|---|
| Petroleum Bulk Stations | | 73 |
| Gasoline Service Stations | | 75 |
| Fuel Oil Dealers | | 16 |
| | Subtotal | 164 |
| **Consumer Segment** | | |
| Electric Utilities† | | 120 |
| U.S. Military§ | | 41 |
| Transportation Equipment | | 77 |
| • 102 million cars @ 20 gal/car | | |
| • 24 million light trucks @ 20 gal/truck | | |
| • 4 million medium trucks @ 100 gal/truck | | |
| • 1.5 million heavy diesel trucks @ 200 gal/truck | | |
| Residential Buildings | | 87 |
| • 12.2 million homes (heated with fuel oil) @ 300 gal/home | | |
| | Subtotal | 325 |
| | Total | 489 |
| Federal, State, and Local Governments | | Unknown |
| Other Commercial and Industrial Consumers | | Unknown |
| | TOTAL | >500 |

*An Assessment of Changes in Petroleum Stocks and Storage Capacity Since the 1973 Arab Oil Embargo, American Petroleum Institute, Research Study 003, July 22, 1976, pp. 49-59.

†Monthly Energy Review, Federal Power Commission, November 1978, p. 51.

§An Assessment of Changes in Petroleum Stocks and Storage Capacity Since the 1973 Arab Oil Embargo, American Petroleum Institute, Research Study 003, July 22, 1976, p. 65.

## THE STRATEGIC PETROLEUM RESERVE[1]

The Energy Policy and Conservation Act of 1975 authorized the creation of a Strategic Petroleum Reserve of up to one billion barrels of oil. The legislation established a target of 500 million barrels of petroleum to be in storage by the end of 1982. That target date was subsequently accelerated to 1980 by SPR Plan Amendment No. 1, which was submitted to the Congress in May 1977. SPR Plan Amendment No. 2, submitted to the Congress in May 1978, set the longer term storage target at one billion barrels by 1985 and detailed plans for government storage of 750 million barrels. The amendment indicated that decisions had not been made as to how the level of protection provided by the last 250 million barrels can be most effectively achieved.

The SPR program consists of three phases. Phase I develops capacity for 244 million barrels at the five selected sites -- Bryan Mound, West Hackberry, Bayou Choctaw, Weeks Island, and Sulphur Mines. (These sites are salt domes in the Gulf Coast.) An additional 4 million barrels of storage capacity is also planned for pipelines and above-ground tanks. June 1980 is the target date for completion of storage of this first increment. This phase is now firm with respect to construction.

Phase II provides for expansion by solution mining of two existing sites, Bryan Mound for 120 million barrels and West Hackberry for 160 million barrels. This additional underground capacity of 280 million barrels would permit storage of 528 million barrels for the first two phases by 1986.

In Phase III, new sites will be developed to provide the projected additional capacity of 222 million barrels, to reach the 750 million barrels storage level.

The Reserve now has the capability to receive and store an average of 10 million barrels of crude a month. However, fill rates have been and are currently constrained due to the effects of the world crude oil situation. Crude oil inventory on July 30, 1979, was 88.7 million barrels. As of September 1979, the SPR had a withdrawal ("drawdown") and distribution capability of one million barrels per day.

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[1]Adapted from Federal Register, August 20, 1979, pp. 48696-48707, and Department of Energy reports.

## TANKER TRANSSHIPMENT TERMINALS

A significant volume of crude storage is estimated to be located at transshipment terminals adjacent to the United States. The terminals are not under U.S. control and are not committed exclusively to the U.S. market. These inventory and storage capacities would not have the same value in the event of a petroleum emergency as facilities under direct U.S. control.

Total capacity at these transshipment terminals, located primarily in the Caribbean, is close to 50 million barrels; current expansion projects may add several million barrels to this total. This capacity is significant and is highlighted because it is equivalent to 15 percent of all the existing crude oil storage capacity in PADs I-IV.

New deepwater port facilities in the Gulf Coast are under construction or are planned. For example, the Louisiana Offshore Oil Port (LOOP) will have 32 million barrels of storage capacity initially, and ultimately 40 million barrels. These facilities will accommodate large supertankers that currently utilize the Caribbean transshipment terminals. Therefore, some portion of the transshipment terminal tankage may be underutilized in the future and very possibly available for petroleum reserves. Obviously, the usefulness of the transshipment terminal facilities cannot be totally assured. Their value will depend upon the nature of any supply interruption and other factors that are not subject to further evaluation in this report.

# APPENDICES

Department of Energy
Washington, D.C. 20585

June 20, 1978

Dear Mr. Chandler:

The ability of this Nation to withstand interruptions in normal oil supplies, whether by domestic dislocation or by foreign intervention, is immediately served by recourse to existing inventories of oil stocks. In addition, the United States has embarked on a Strategic Petroleum Reserve program to aid in meeting its commitments abroad and its commitments to consumers at home in case of another interruption of foreign oil supply. For industry and Government to respond appropriately to an emergency, our need for accurate information and understanding of primary petroleum inventories is greater than it has ever been.

Implicit in an understanding of petroleum inventories is the distinction between total stocks and those stocks which would be readily available for use. Such information is essential in evaluating correctly the extent of the contribution our oil stocks would be able to make in times of oil supply emergency and planning the development and use of the Strategic Petroleum Reserve.

Periodically the National Petroleum Council has conducted for the Department of the Interior a survey of the availability of petroleum inventories and storage capacity. The last such report was issued in 1974, the eighth in a series which began in 1948.

Accordingly, the National Petroleum Council is requested to prepare for the Department of Energy a new report on available petroleum inventories and storage capacity. This new report should emphasize the distinction between available stocks and those unavailable. For the purpose of this study, I will designate the Deputy Assistant Secretary for Policy and Evaluation to represent me and to provide the necessary coordination between the Department of Energy and the National Petroleum Council.

Sincerely,

James R. Schlesinger
Secretary

Mr. Collis P. Chandler, Jr.
Chairman
National Petroleum Council
1625 K Street, N.W.
Washington, D. C. 20006

Department of Energy
Washington, D.C. 20585

June 20, 1978

Dear Mr. Chandler:

The National Petroleum Council has prepared numerous studies in the past on the Nation's petroleum transportation systems. The last study on this subject was prepared over ten years ago and published on September 15, 1967.

The transportation data collected over the years by the Council has been used by the Federal Government for emergency preparedness planning purposes. The data includes information on major crude oil and petroleum product pipelines, natural gas transmission lines, inland waterway barges, tank cars and tank trucks. Detailed information is also included on the location, capacity and type of pump stations and compressor stations.

As part of the Government's overall review and update of emergency preparedness planning, current data are needed on the Nation's petroleum transportation systems. I, therefore, request the National Petroleum Council to undertake a detailed study to determine current petroleum and gas transportation capacities including natural gas transmission lines, crude oil and petroleum product pipelines, crude oil gathering lines in major producing areas, inland waterway barges, tank cars and tank trucks. With respect to transportation of oil and petroleum products, the study should cover the spatial and transportation relationships--the match ups--among refineries of varying capacities and crude oil sources.

The study should examine the industry's flexibility to meet dislocations of supply and outline the changing supply patterns of the petroleum and natural gas deliverability systems.

For the purpose of this study, I will designate the Deputy Assistant Secretary for Policy and Evaluation to represent me and to provide the necessary coordination between the Department of Energy and the National Petroleum Council.

Sincerely,

James R. Schlesinger
Secretary

Mr. Collis P. Chandler, Jr.
Chairman, National Petroleum Council
1625 K Street, N.W.
Washington, D. C. 20006

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* * *

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Steven A. Villas
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# OVERVIEW OF THE PETROLEUM DISTRIBUTION SYSTEM

## THE PETROLEUM DISTRIBUTION SYSTEM

The system of pipelines, tankers, and barges that moves crude oil from producing areas to refining centers, and the similar facilities that move refined petroleum products in bulk to marketing areas, are generally categorized as the primary distribution system (Figure 4). In this transportation network, sizable tankage must be provided in order to maintain normal flexibility for the overall operation of the supply system.

### Primary Crude Oil Systems

Primary crude oil systems or trunklines are comparable to the long lines systems in communications or to the main lines of railroads. They are served by gathering systems in producing areas that may pick up crude oil from numerous oil fields as well as from marine unloading terminals.

Because of the variation in quality among crude oils, the transportation systems generally segregate crude by type for movement and delivery. Segregation requirements are usually determined by quality characteristics including sulfur content, specific gravity, asphalt content, lube oil considerations, etc., which may be dictated by the particular needs of a given refinery. Such segregation results in increased storage requirements.

Trunk pipelines are generally routed through focal points, or "hubs" (akin to the hubs of a wheel), where a number of pipelines may converge. These hubs are comparable to such locations on a railroad freight interchange system as Chicago, St. Louis, Philadelphia, Houston, etc. At such points exchanges of oil may be made or transfers to carriers destined elsewhere may be implemented. Examples of such locations are Midland and Odessa, in western Texas; Longview, in eastern Texas; Cushing, Oklahoma; Fort Laramie and Guernsey, Wyoming; and Patoka, Illinois. A large amount of storage capacity is required at these points not only to enable the oil to be brought into the area from numerous producing regions, but also to provide the tankage for segregation, batching, and inventorying necessary for continuous pipeline operation before the oil can be moved to refineries.

### Primary Products Distribution System

The primary products distribution system is made up of the trunk products pipelines which move products overland and the barges and tankers that provide for marine movements. While products are still in refinery tanks there is usually a choice as to the direction in which the products may move, along with a choice of the mode of transportation. Once a product is on its way in an element of the primary distribution system, it is committed to the geographic area which is serviced by the particular element. For

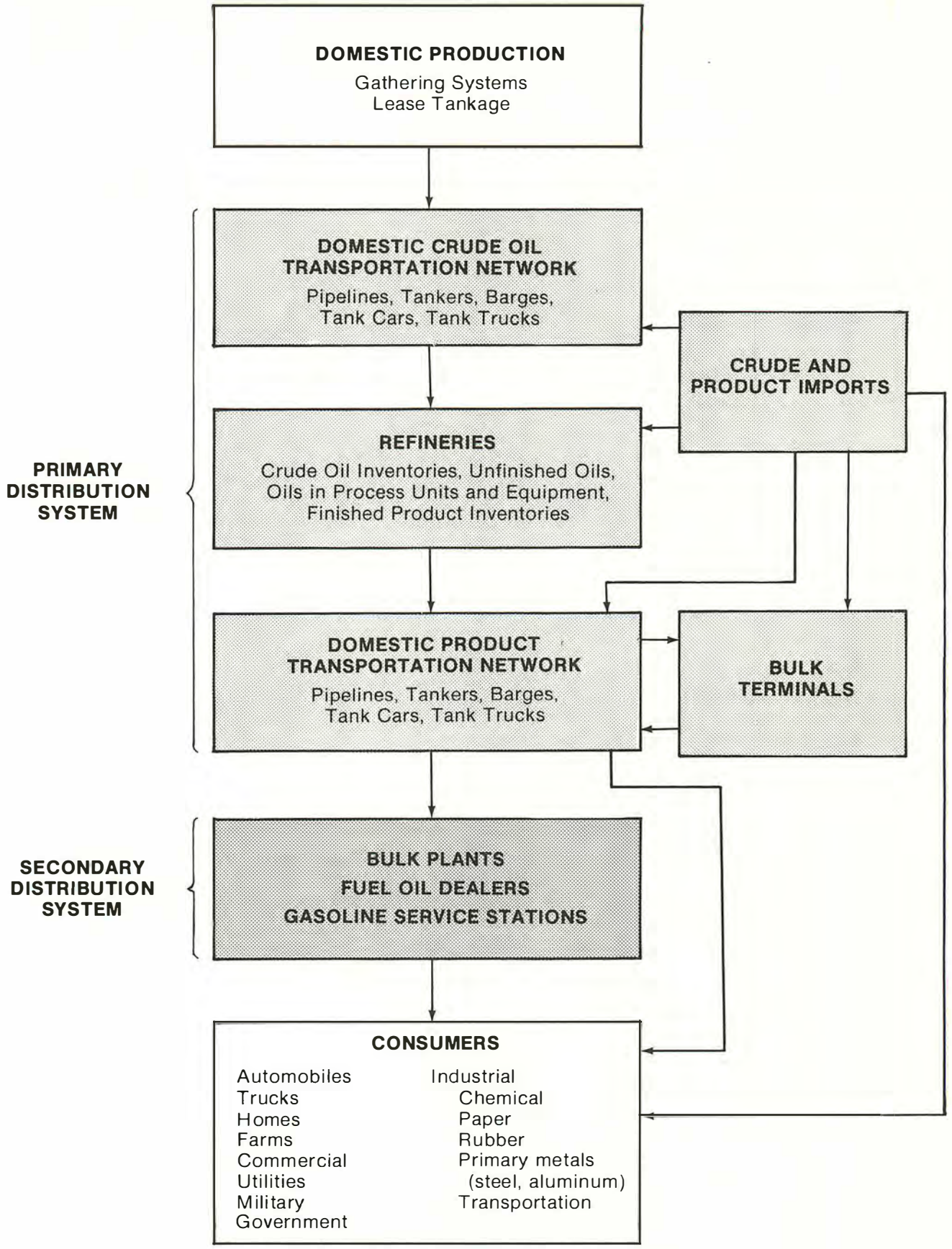



Figure 4. The Petroleum Distribution System.

example, the Colonial Pipeline extends from the Houston-Beaumont, Texas, area to the New York Harbor area, and passes through the Baton Rouge, Atlanta, Greensboro, Richmond, Washington, Baltimore, and Philadelphia areas. The product in this primary distribution system can be delivered or diverted to any delivery point along its geographic route. At any point along the pipeline system decisions can be made regarding its destination until the product has already passed that particular point. When the product is delivered out of the pipeline into a bulk terminal tank along the route, it then leaves the primary system and enters the secondary system, and the ability to divert that product to a different geographic location becomes even more limited.

## SECONDARY DISTRIBUTION

Petroleum products leave the primary distribution system either for further distribution through the secondary system or for direct sale to consumers. This secondary system includes small resellers of petroleum products, such as gasoline service stations or fuel oil dealers. Deliveries are generally made by tank truck. The secondary distribution system also holds considerable inventories and tank capacity.

Ultimately, all petroleum products reach consumers. This group includes individuals buying gasoline for their cars and distillate to heat their homes. Other consumers of petroleum products include the agricultural industry, utilities, industry, and transportation. Almost all consumers have their own storage facilities for the products they consume. Obviously, the behavior of this segment has a significant impact on the ability of the primary system to operate smoothly.

# NATIONAL PETROLEUM COUNCIL
# 1979 SURVEY OF PETROLEUM STORAGE CAPACITY AND INVENTORY AVAILABILITY IN THE UNITED STATES

Reporting Company: _____

Address: _____

_____

_____ Zip Code: _____

Person in reporting company to be contacted if questions arise: _____

Phone: (____) _____

Code: _____
(Price Waterhouse Use Only)

Type of petroleum operations covered in your response:

(check one or more)

1. Refining _____
2. Bulk Terminal _____
3. Products Pipeline _____
4. Crude Oil Pipeline _____

Please return this booklet, when completed, to:

Price Waterhouse & Co.
OGS, Department 82
1801 K Street, N.W.
Washington, D.C. 20006

## INTRODUCTION

At the request of the U.S. Department of Energy (DOE), the National Petroleum Council has agreed to undertake a new study of petroleum storage capacity and available petroleum inventories in the United States. The study has two objectives:

1) To determine how much of the U.S. petroleum inventory reported to the Department of Energy is required for the actual operations of the petroleum distribution system itself and is therefore not available for consumer use.

2) To determine what portion of the Nation's storage capacity is required for normal industry operations and is therefore unavailable for storing additional petroleum which could be used in case of an emergency.

Accordingly, the enclosed questionnaires were designed to provide the National Petroleum Council with the information it requires to respond to the Department of Energy's request. These questionnaires request information on inventories and storage capacity relating to crude oil and principal refined products. Some of the inventory data being requested have already been reported to the DOE by your company. This information will provide a measure of coverage of the survey and assist you in remaining within the scope of the definitions pertaining to the questionnaires.

The National Petroleum Council has retained the services of the certified public accounting firm of Price Waterhouse & Co. to collect and aggregate the data reported in this survey. No individual company data will be published. District totals only will be used in the report provided by Price Waterhouse to the National Petroleum Council. A statement from Price Waterhouse regarding its data collection and processing methodology is enclosed with this mailing.

## GENERAL INSTRUCTIONS

### 1. Reporting of Data

a. Report all figures in THOUSANDS of 42-gallon Barrels.

b. Report all information in a manner consistent with your reports to the DOE; that is,

— Report on a custody basis regardless of ownership of the inventories or facilities,

— In the case of jointly-owned tankage or pipelines, data should be provided by the operator,

— Report inventories less basic settlings and water (BS&W) corrected to 60°F.

c. Crude oil (excluding lease stocks) data—report as of September 30, 1978.

d. Refined product data—report as of both March 31, 1978, and September 30, 1978, for the following:

— Gasoline (motor and aviation)

— Kerosine (including kerosine-type jet fuel)

— Distillate fuel oil (including No. 4 fuel oil)

— Residual fuel oil

Two reporting dates for the principal products have been chosen to better define the seasonal changes in inventories, and to reflect seasonal shifts in tank utilization from gasoline to fuel oils and vice versa.

### 2. Categories of Stocks to be Reported

a. Report stocks only at locations which are currently included in the regular monthly reports to the DOE. These categories include those stocks at refineries, bulk terminals, and in pipeline systems, but exclude producers' lease stocks of crude oil.

b. Do not report tankage and inventories at other locations (such as service stations).

### 3. Reporting by Refining Districts

a. Data for operations in PAD I-IV are to be reported by the DOE's Refining Districts or Subdistricts by inserting the proper location code shown on page 4 in the column headings. Note PAD V consists of only one refining district, i.e., West Coast (513).

b. Data relating to minimum operating inventory (Items A.2 and A.3) and maximum operating inventory (Items B.4 and B.5), which require your best estimates, are to be reported on a system basis in Column (4), Total, PAD I-IV, and in the Total column for PAD V only. These are the inventory levels below or above which operating difficulties would begin to occur. These estimates should be on a custody basis and, therefore, consistent with the numbers you report as actual inventory.

c. Note the East Coast Refining District is divided into three subdistricts: New England (101A), Mid-Atlantic (101B), and South Atlantic (101C).

d. Data for Puerto Rico, the U.S. Virgin Islands, and Guam should be aggregated into one district (888) and reported with PAD I-IV. Individuals with petroleum operations in these locations are asked to follow the same format in completing this questionnaire as those who normally report inventory information to the Department of Energy.

**4. Completing Questionnaire 6**

It is possible that the sum of the companies' assessments of their own minimum and maximum operating inventories (Items A.2 and B.4 on Questionnaires 1-5) will not accurately reflect a picture of the entire petroleum industry's minimum or maximum operating inventory. If your company analyzes industry levels, provide your estimate of the minimum and maximum operating inventories of the U.S. petroleum industry. Enter estimates for PAD I-IV, PAD V, and Total U.S., if available. If your company does not have certain of the estimates requested in this questionnaire, leave those sections blank.

**5. Completing Questionnaire 7**

Please report tankage under construction as of September 30, 1978.

**6. Other**

a. Disregard those forms in the questionnaire booklet which are not applicable to your company's operations, but return the questionnaire intact.

b. Complete the cover page, leaving the code line blank, and send the completed questionnaire in the envelope provided to:

Price Waterhouse & Co.
OGS, Department 82
1801 K Street, N.W.
Washington, D.C. 20006

c. Any questions regarding this questionnaire should be addressed to:

Mrs. Joan Walsh Cassedy
Committee Coordinator
National Petroleum Council
1625 K Street, N.W.
Washington, D.C. 20006
(202) 393-6100

An extra copy of this questionnaire is enclosed for your convenience.

## LOCATION CODES

Insert the location code shown below where indicated in the heading of each questionnaire to identify the area of the country in which the reported stocks or tankage were located. This breakdown is similar to the refining districts and subdistricts used by the Department of Energy in some of its reports.

### PAD DISTRICTS I-IV

| Location Code* | Refining District Name and Description |
|---|---|
| 101A | **New England**—The states of Maine, New Hampshire, Vermont, Massachusetts, Rhode Island, and Connecticut. |
| 101B | **Mid-Atlantic**—The states of New Jersey, Delaware, and Maryland, the District of Columbia, and the following counties of the state of New York: Cayuga, Tompkins, Chemung, and all counties east and north thereof. Also the following counties in the state of Pennsylvania: Bradford, Sullivan, Columbia, Montour, Northumberland, Dauphin, York, and all counties east thereof. |
| 101C | **South Atlantic**—The states of Virginia, North Carolina, South Carolina, Georgia, and Florida. |
| 102 | **Appalachian #1**—The state of West Virginia, and those parts of the states of Pennsylvania and New York not included in the East Coast District. |
| 203 | **Appalachian #2**—The following counties of the state of Ohio: Erie, Huron, Crawford, Marion, Delaware, Franklin, Pickaway, Ross, Pike, Scioto, and all counties east thereof. |
| 204 | **Indiana-Illinois-Kentucky**—The states of Indiana, Illinois, Kentucky, Tennessee, Michigan, and that part of the state of Ohio not included in the Appalachian District. |
| 205 | **Minnesota-Wisconsin-North and South Dakota**—The states of Minnesota, Wisconsin, North Dakota, and South Dakota. |
| 206 | **Oklahoma-Kansas-Missouri**—The states of Oklahoma, Kansas, Missouri, Nebraska, and Iowa. |
| 307 | **Texas Inland**—The state of Texas except the Texas Gulf Coast District. |
| 308 | **Texas Gulf Coast**—The following counties of the state of Texas: Newton, Orange, Jefferson, Jasper, Tyler, Hardin, Liberty, Chambers, Polk, San Jacinto, Montgomery, Harris, Galveston, Waller, Fort Bend, Brazoria, Wharton, Matagorda, Jackson, Victoria, Calhoun, Refugio, Aransas, San Particio, Nueces, Kleberg, Kenedy, Willacy, and Cameron. |
| 309 | **Louisiana Gulf Coast**—The following parishes of the state of Louisiana: Vernon, Rapides, Avoyelles, Pointe Coupee, W. Feliciana, E. Feliciana, St. Helena, Tangipahoa, Washington, and all parishes south thereof. Also the following counties of the state of Mississippi: Pearl River, Stone, George, Hancock, Harrison, and Jackson. Also the following counties of the state of Alabama: Mobile and Baldwin. |

* To be inserted in heading of reporting forms.

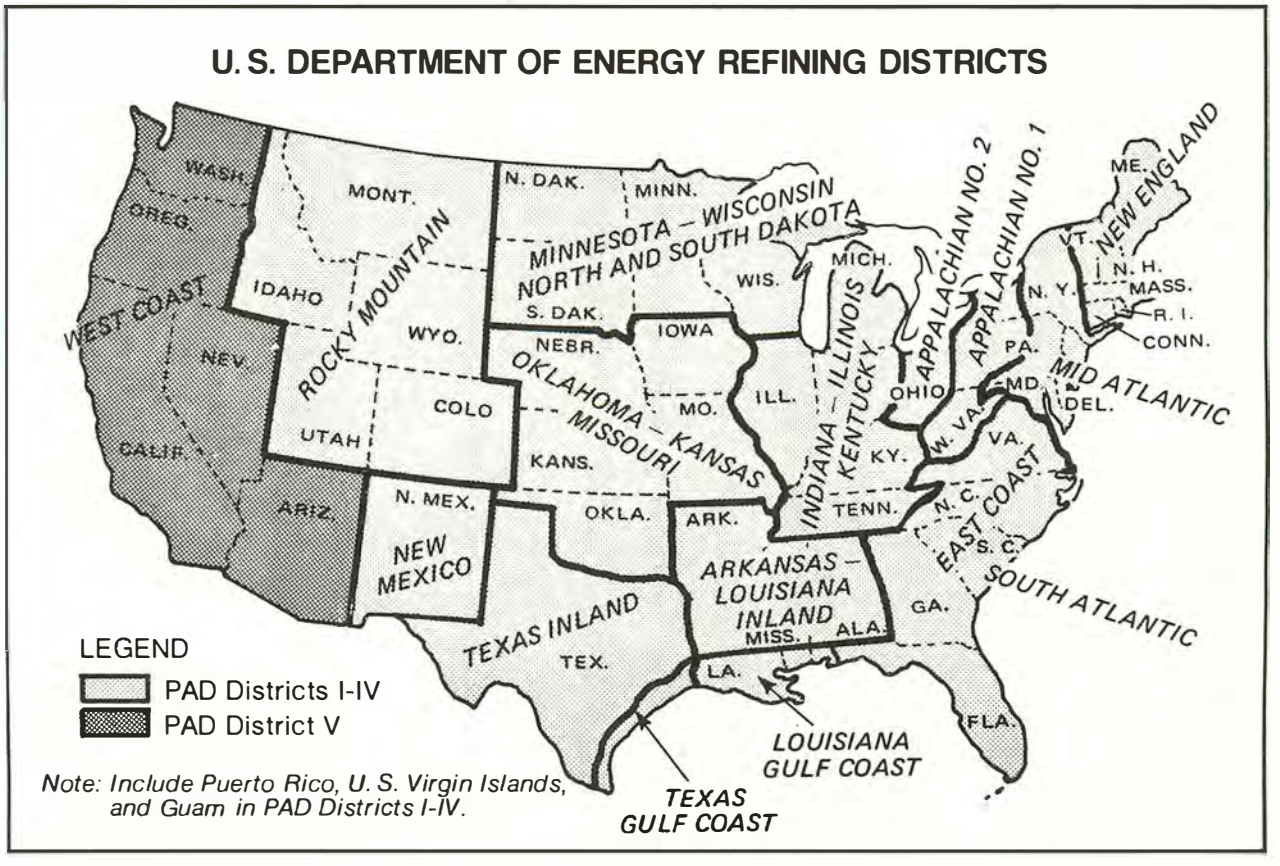
## LOCATION CODES (Continued)

| Location Code* | Refining District Name and Description |
|---|---|
| 310 | **North Louisiana-Arkansas**—The state of Arkansas and those parts of the states of Louisiana, Mississippi, and Alabama not included in the Louisiana Gulf Coast District. |
| 311 | **New Mexico**—The state of New Mexico. |
| 412 | **Rocky Mountain**—The states of Montana, Idaho, Wyoming, Utah, and Colorado. |
| 888 | **Puerto Rico-U.S. Virgin Islands-Guam**—The Commonwealth of Puerto Rico, the U.S. Virgin Islands, and the Territory of Guam. (Report this location in PAD I-IV.) |

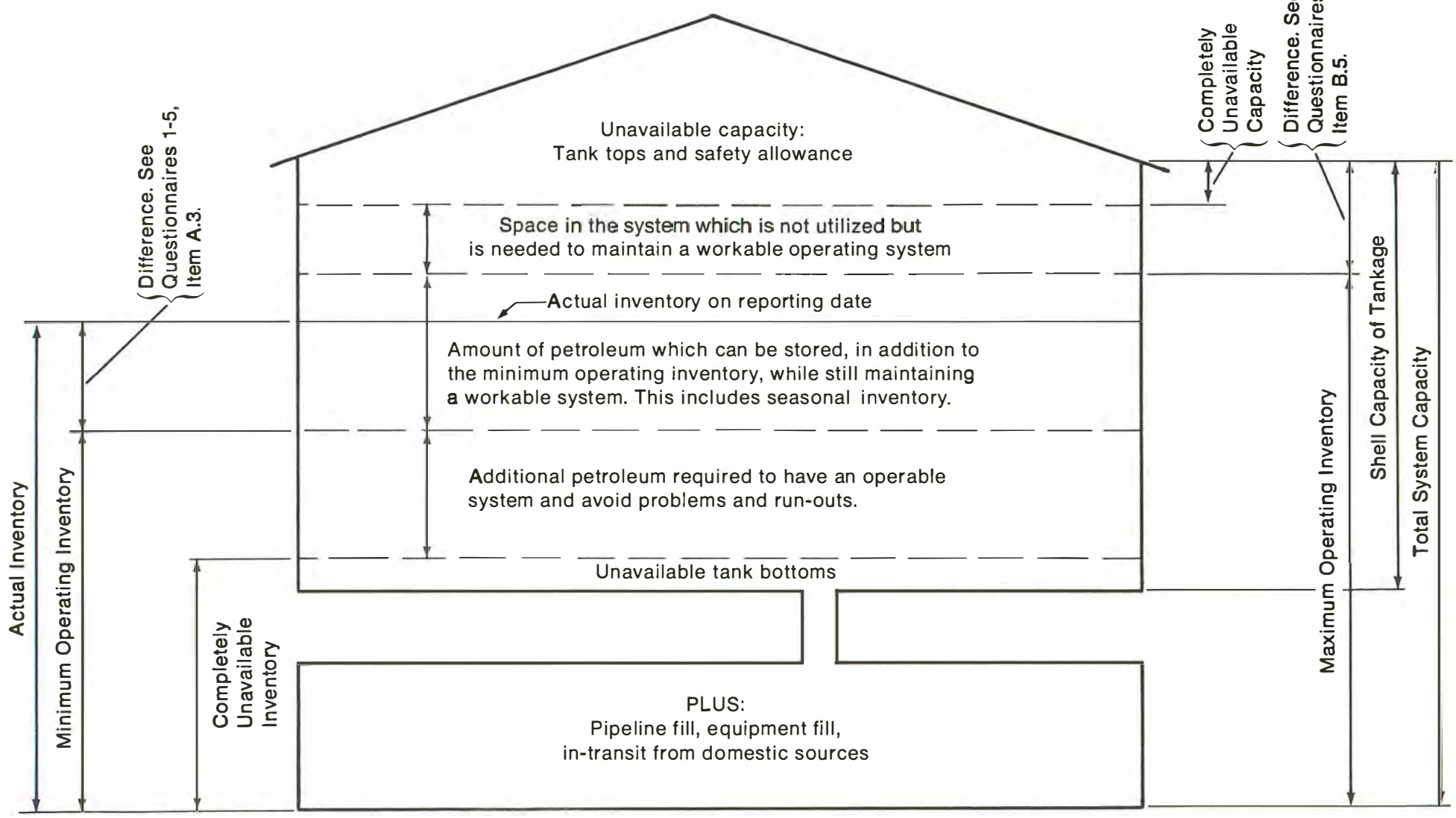
### PAD DISTRICT V

| | |
|---|---|
| 513 | **West Coast**—The states of Washington, Oregon, California, Nevada, Arizona, Alaska, and Hawaii. |

* To be inserted in heading of reporting forms.



**SIMPLIFIED DIAGRAM OF TERMS DESCRIBING PETROLEUM INVENTORIES AND STORAGE CAPACITIES**



## PRODUCT DEFINITIONS

**1. Crude Oil**—A mixture of hydrocarbons that existed in liquid phase in underground reservoirs and remains liquid at atmospheric pressure after passing through surface separating facilities. Also, lease condensate moving to a refinery is included. Lease condensate is defined as a natural gas liquid recovered from gas-well gas (associated and nonassociated) on lease separators or field facilities. Drips are also included but topped crude oil and other unfinished oils are excluded. Natural gas liquids produced at natural gas processing plants and mixed with crude oil are likewise excluded.

**2. Gasoline:**

**A. Motor**—A complex mixture of relatively volatile hydrocarbons, with or without small quantities of additives, which have been blended to form a fuel suitable for use in spark ignition engines. Includes all refinery products listed in ASTM Specification D439, Federal Specification VV-G-766, and those to be marketed as motor gasoline without further processing, i.e., any refinery operation except mechanical blending. Also includes finished components in the gasoline range which will be used for blending or compounding into finished gasoline.

**B. Aviation**—All special grades of gasoline for use in aviation reciprocating engines, as given in ASTM Specification D910. Includes all refinery products within the gasoline range that are to be marketed straight or in blends as aviation gasoline without further processing, i.e., any refinery operation except mechanical blending. Also includes finished components in the gasoline range which will be used for blending or compounding into aviation gasoline.

**3. Kerosine:**

**A. General**—A petroleum distillate in the 300° F to 550° F boiling range and generally having a flash point higher than 100° F by ASTM Method D56, a gravity range from 40° to 46° API, and a burning point in the range of 150° F to 175° F. It is a clean burning product suitable for use as an illuminant when burned in wick lamps. Includes grades of kerosine called range oil having properties similar to No. 1 fuel oil, but with a gravity of about 43° API and an end point of 625° F. Used in space heaters, cook stoves, and water heaters.

**B. Jet Fuel—Kerosine Type**—A quality kerosine product with an average gravity of 40.7° API and a 10 percent distillation temperature of 400° F and an end point of 550° F covered by ASTM Specification D1655 and Military Specification MIL-T-5624J (Grade JP-5). Used primarily as fuel for commercial turbojet and turboprop aircraft engines. A relatively low freezing point distillate of the kerosine type.

**4. Distillate Fuel Oil:**

**A. General**—A general classification for one of the petroleum fractions which, when produced in conventional distillation operations, has a boiling range from 10 percent point at 300° F to 90 percent point at 675° F. Included are products known as Nos. 1 and 2 heating oils conforming to ASTM Specification D396 and diesel fuel conforming to ASTM Specifications D975 for Nos. 1-D and 2-D.

**B. No. 4 Fuel Oil**—A fuel oil for commercial burner installations not equipped with preheating facilities. Extensively used in industrial plants. This grade is a blend of distillate fuel oil and residual fuel oil stocks which conforms to ASTM Specification D396 or Federal Specfication VV-F-815C for this grade. Kinematic viscosities between 5.8 and 26.4 percent at 100° F.

**5. Residual Fuel Oil**—Topped crude of refinery operations. Includes No. 5 and No. 6 fuel oils as defined in ASTM Specification D396 and Federal Specification VV-F-815C; heavy diesel oil as given in ASTM Specification D975 for No. 4-D; Navy Special fuel oil in Military Specification MIL 895E, including Amendment 2; and Bunker C fuel oil.

Source: U.S. Department of Energy

## FOOTNOTES

### Explanation

1. Includes but is not limited to inventories shown as completely unavailable in Memo Item A.4. This is the inventory level below which operating problems and shortages would begin to appear in your system. For example, this includes inventory required to meet minimum pipeline tenders, supply batch operations, meet customer requirements, etc. In making this assessment of your minimum operating inventory, assume that all other companies would be operating at or near their minimum operating inventory and the use of emergency exchanges would not be possible.

2. A positive difference would indicate that you had oil in storage above that needed to meet minimum operating requirements. A negative difference would indicate that you were below the minimum level, and hence, incurring operating problems. This difference may be zero, indicating the actual inventory was that needed to meet minimum operating needs.

3. Includes all unavailable quantities in transit by truck, tank car, barge, or tanker from domestic sources only. However, these should be claimed as unavailable only if you report such in-transit items to the DOE, and therefore, only if the quantities are included in the figures that you reported in Item A.1.

4. Includes quantities set aside as plant fuel or pipeline prime mover fuel. Also includes crude oil which must be held for blocked operations or for blending with other crude oils for normal processing. It may also include that portion of unblended finished oils which would be left over were the different components blended as far as possible in accordance with existing formulas. Accordingly, the total quantity of unblended finished oils should not be considered unavailable but only that which would be left over after blending as far as possible to specifications.

5. Include capacity of swing tankage. Be sure swing tankage is included in only one product or crude oil category for each date.

6. This is the maximum quantity that can be stored in the assigned tankage while still maintaining a workable operating system.

7. In addition to the unavailable capacity shown in Memo Item B.6, this difference includes the operating space needed to maintain a workable operating system. For example, this would include space needed at various places throughout the system to receive batch deliveries from pipelines and tankers, to hold product until a customer can make a lifting, etc.

8. The portion of the shell capacity at the top of the tank that is not utilized for oil storage. This includes the safety allowance which is needed to protect personnel and property from damage that could result from thermal expansion and/or overfilling the tanks.

Questionnaire #1

Code: _____
(Price Waterhouse Use Only)

# NATIONAL PETROLEUM COUNCIL
# 1979 SURVEY OF PETROLEUM STORAGE CAPACITY AND INVENTORY AVAILABILITY IN THE UNITED STATES

## CRUDE OIL

As of September 30, 1978

**(Report All Figures in Thousands of Barrels)**

| LOCATION (Enter refining district code as shown on page 4. Use additional sheets, if necessary.) → | REFINING DISTRICTS IN PAD DISTRICTS I-IV | | | | | | (4) | PAD District V | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | (1) Code No.: _____ | | (2) Code No.: _____ | | (3) Code No.: _____ | | Total, PAD I-IV | (5) Code No.: 513 | | |
| (Deal only with those end-of-the-month stocks reported to the Department of Energy on Form P323-M-O, excluding lease stocks) | Refinery Operations (1,000 bbl) | Pipeline Operations (1,000 bbl) | Refinery Operations (1,000 bbl) | Pipeline Operations (1,000 bbl) | Refinery Operations (1,000 bbl) | Pipeline Operations (1,000 bbl) | Rfy & Pl Operations (1,000 bbl) | Refinery Operations (1,000 bbl) | Pipeline Operations (1,000 bbl) | Total |
| **A. Crude Oil Inventory** | | | | | | | | | | |
| 1. Total inventory reported to the Department of Energy | | | | | | | | | | |
| 2. Less: Minimum operating inventory [1] | | | | | | | | | | |
| 3. *Difference [2] (1 less 2)* | | | | | | | | | | |
| *If not zero, estimate what percentage was:* | | | | Complete Column (4) Only (See note below) | | | | | | |
| a. Seasonal | | | | | | | % | | | % |
| b. Other (Specify _____) | | | | | | | % | | | % |
| (Specify _____) | | | | | | | % | | | % |
| 4. Memo Item: Completely unavailable inventory | | | | | | | | | | |
| a. Pipeline fill | | | | | | | | | | |
| b. In refinery lines and operating equipment | | | | | | | | | | |
| c. In-transit from domestic sources [3] | | | | | | | | | | |
| d. *Subtotal: Unavailable inventory outside of tankage (a+b+c)* | | | | | | | | | | |
| e. Tank bottoms | | | | | | | | | | |
| f. Unavailable stocks [4] | | | | | | | | | | |
| g. *Total (d+e+f)* | | | | | | | | | | |
| **B. Storage Capacity Assigned to Crude Oil** | | | | | | | | | | |
| 1. Shell capacity of tankage [5] | | | | | | | | | | |
| 2. Plus: Unavailable inventory outside of tankage (from A.4.d., above) | | | | | | | | | | |
| 3. *Subtotal: Total system capacity (1+2)* | | | | | | | | | | |
| 4. Less: Maximum operating inventory [6] | | | | Complete Column (4) Only (See note below) | | | | | | |
| 5. *Difference [7] (3 less 4)* | | | | | | | | | | |
| 6. Memo Item: Unavailable storage capacity Tank tops and safety allowance [8] | | | | | | | | | | |

For explanation of footnotes, see page 8.

NOTE: Whether or not you report for one or more refining districts in PAD I-IV, enter estimates for your company's operations for these lines in Column (4), "Total, PAD I-IV." Enter separate estimates for PAD V.

Questionnaire #2

Code: _____
(Price Waterhouse Use Only)

# NATIONAL PETROLEUM COUNCIL
# 1979 SURVEY OF PETROLEUM STORAGE CAPACITY AND INVENTORY AVAILABILITY IN THE UNITED STATES

## GASOLINE (MOTOR AND AVIATION)

As of March 31 and September 30, 1978
**(Report All Figures in Thousands of Barrels)**

| LOCATION (Enter refining district code as shown on page 4. Use additional sheets, if necessary.) → | REFINING DISTRICTS IN PAD DISTRICTS I-IV | | | | | | (4) Total, PAD I-IV | | PAD District V | |
|---|---|---|---|---|---|---|---|---|---|---|
| | (1) Code No.: _____ | | (2) Code No.: _____ | | (3) Code No.: _____ | | | | (5) Code No.: 513 | |
| (Deal only with those end-of-the-month stocks reported to the Department of Energy on Forms P320-M-O, P321-M-O, and P322-M-O) | Mar. 31 (1,000 bbl) | Sept. 30 (1,000 bbl) | Mar. 31 (1,000 bbl) | Sept. 30 (1,000 bbl) | Mar. 31 (1,000 bbl) | Sept. 30 (1,000 bbl) | Mar. 31 (1,000 bbl) | Sept. 30 (1,000 bbl) | Mar. 31 (1,000 bbl) | Sept. 30 (1,000 bbl) |
| **A. Gasoline Inventory** | | | | | | | | | | |
| 1. Total inventory reported to the Department of Energy | | | | | | | | | | |
| 2. Less: Minimum operating inventory [1] | | | | | | | | | | |
| 3. *Difference [2] (1 less 2)* | | | | | | | | | | |
| *If not zero, estimate what percentage was:* | | | | Complete Column (4) Only (See note below) | | | | | | |
| a. Seasonal | | | | | | | % | % | % | % |
| b. Other (Specify _____) | | | | | | | % | % | % | % |
| (Specify _____) | | | | | | | % | % | % | % |
| 4. Memo Item: Completely unavailable inventory | | | | | | | | | | |
| a. Pipeline fill | | | | | | | | | | |
| b. In refinery lines and operating equipment | | | | | | | | | | |
| c. In-transit from domestic sources [3] | | | | | | | | | | |
| d. *Subtotal: Unavailable inventory outside of tankage (a+b+c)* | | | | | | | | | | |
| e. Tank bottoms | | | | | | | | | | |
| f. Unavailable stocks [4] | | | | | | | | | | |
| g. *Total (d+e+f)* | | | | | | | | | | |
| **B. Storage Capacity Assigned to Gasoline** | | | | | | | | | | |
| 1. Shell capacity of tankage [5] | | | | | | | | | | |
| 2. Plus: Unavailable inventory outside of tankage (from A.4.d., above) | | | | | | | | | | |
| 3. *Subtotal: Total system capacity (1+2)* | | | | | | | | | | |
| 4. Less: Maximum operating inventory [6] | | | | Complete Column (4) Only (See note below) | | | | | | |
| 5. *Difference [7] (3 less 4)* | | | | | | | | | | |
| 6. Memo Item: Unavailable storage capacity Tank tops and safety allowance [8] | | | | | | | | | | |

For explanation of footnotes, see page 8.

NOTE: Whether or not you report for one or more refining districts in PAD I-IV, enter estimates for your company's operations for these lines in Column (4), "Total, PAD I-IV." Enter separate estimates for PAD V.

Questionnaire #3

Code: _____
(Price Waterhouse Use Only)

# NATIONAL PETROLEUM COUNCIL
# 1979 SURVEY OF PETROLEUM STORAGE CAPACITY AND INVENTORY AVAILABILITY IN THE UNITED STATES

## KEROSINE
## (INCLUDING KEROSINE-TYPE JET FUEL)

As of March 31 and September 30, 1978
**(Report All Figures in Thousands of Barrels)**

| LOCATION (Enter refining district code as shown on page 4. Use additional sheets, if necessary.) → | REFINING DISTRICTS IN PAD DISTRICTS I-IV | | | | | | (4) Total, PAD I-IV | | PAD District V | |
|---|---|---|---|---|---|---|---|---|---|---|
| | (1) Code No.: ____ | | (2) Code No.: ____ | | (3) Code No.: ____ | | | | (5) Code No.: 513 | |
| (Deal only with those end-of-the-month stocks reported to the Department of Energy on Forms P320-M-O, P321-M-O, and P322-M-O) | Mar. 31 (1,000 bbl) | Sept. 30 (1,000 bbl) | Mar. 31 (1,000 bbl) | Sept. 30 (1,000 bbl) | Mar. 31 (1,000 bbl) | Sept. 30 (1,000 bbl) | Mar. 31 (1,000 bbl) | Sept. 30 (1,000 bbl) | Mar. 31 (1,000 bbl) | Sept. 30 (1,000 bbl) |
| **A. Kerosine Inventory** | | | | | | | | | | |
| 1. Total inventory reported to the Department of Energy | | | | | | | | | | |
| 2. Less: Minimum operating inventory [1] | | | | | | | | | | |
| 3. *Difference [2] (1 less 2)* | | | | | | | | | | |
| *If not zero, estimate what percentage was:* | | | | Complete Column (4) Only (See note below) | | | | | | |
| a. Seasonal | | | | | | | % | % | % | % |
| b. Other (Specify _____) | | | | | | | % | % | % | % |
| (Specify _____) | | | | | | | % | % | % | % |
| 4. Memo Item: Completely unavailable inventory | | | | | | | | | | |
| a. Pipeline fill | | | | | | | | | | |
| b. In refinery lines and operating equipment | | | | | | | | | | |
| c. In-transit from domestic sources [3] | | | | | | | | | | |
| d. *Subtotal: Unavailable inventory outside of tankage (a+b+c)* | | | | | | | | | | |
| e. Tank bottoms | | | | | | | | | | |
| f. Unavailable stocks [4] | | | | | | | | | | |
| g. *Total (d+e+f)* | | | | | | | | | | |
| **B. Storage Capacity Assigned to Kerosine** | | | | | | | | | | |
| 1. Shell capacity of tankage [5] | | | | | | | | | | |
| 2. Plus: Unavailable inventory outside of tankage (from A.4.d., above) | | | | | | | | | | |
| 3. *Subtotal: Total system capacity (1+2)* | | | | | | | | | | |
| 4. Less: Maximum operating inventory [6] | | | | Complete Column (4) Only (See note below) | | | | | | |
| 5. *Difference [7] (3 less 4)* | | | | | | | | | | |
| 6. Memo Item: Unavailable storage capacity Tank tops and safety allowance [8] | | | | | | | | | | |

For explanation of footnotes, see page 8.

NOTE: Whether or not you report for one or more refining districts in PAD I-IV, enter estimates for your company's operations for these lines in Column (4), "Total, PAD I-IV." Enter separate estimates for PAD V.

Questionnaire #4

Code: _____
(Price Waterhouse Use Only)

# NATIONAL PETROLEUM COUNCIL
# 1979 SURVEY OF PETROLEUM STORAGE CAPACITY AND INVENTORY AVAILABILITY IN THE UNITED STATES

## DISTILLATE FUEL OIL (INCLUDING NO. 4 FUEL OIL)

As of March 31 and September 30, 1978
**(Report All Figures in Thousands of Barrels)**

| LOCATION (Enter refining district code as shown on page 4. Use additional sheets, if necessary.) → | REFINING DISTRICTS IN PAD DISTRICTS I-IV | | | | | | (4) Total, PAD I-IV | | PAD District V | |
|---|---|---|---|---|---|---|---|---|---|---|
| | (1) Code No.: _____ | | (2) Code No.: _____ | | (3) Code No.: _____ | | | | (5) Code No.: 513 | |
| (Deal only with those end-of-the-month stocks reported to the Department of Energy on Forms P320-M-O, P321-M-O, and P322-M-O) | Mar. 31 (1,000 bbl) | Sept. 30 (1,000 bbl) | Mar. 31 (1,000 bbl) | Sept. 30 (1,000 bbl) | Mar. 31 (1,000 bbl) | Sept. 30 (1,000 bbl) | Mar. 31 (1,000 bbl) | Sept. 30 (1,000 bbl) | Mar. 31 (1,000 bbl) | Sept. 30 (1,000 bbl) |
| **A. Distillate Fuel Oil Inventory** | | | | | | | | | | |
| 1. Total inventory reported to the Department of Energy | | | | | | | | | | |
| 2. Less: Minimum operating inventory [1] | | | | | | | | | | |
| 3. *Difference [2] (1 less 2)* | | | | | | | | | | |
| *If not zero, estimate what percentage was:* | | | | Complete Column (4) Only (See note below) | | | | | | |
| a. Seasonal | | | | | | | % | % | % | % |
| b. Other (Specify _____) | | | | | | | % | % | % | % |
| (Specify _____) | | | | | | | % | % | % | % |
| 4. Memo Item: Completely unavailable inventory | | | | | | | | | | |
| a. Pipeline fill | | | | | | | | | | |
| b. In refinery lines and operating equipment | | | | | | | | | | |
| c. In-transit from domestic sources [3] | | | | | | | | | | |
| d. *Subtotal: Unavailable inventory outside of tankage (a+b+c)* | | | | | | | | | | |
| e. Tank bottoms | | | | | | | | | | |
| f. Unavailable stocks [4] | | | | | | | | | | |
| g. *Total (d+e+f)* | | | | | | | | | | |
| **B. Storage Capacity Assigned to Distillate Fuel Oil** | | | | | | | | | | |
| 1. Shell capacity of tankage [5] | | | | | | | | | | |
| 2. Plus: Unavailable inventory outside of tankage (from A.4.d., above) | | | | | | | | | | |
| 3. *Subtotal: Total system capacity (1+2)* | | | | | | | | | | |
| 4. Less: Maximum operating inventory [6] | | | | Complete Column (4) Only (See note below) | | | | | | |
| 5. *Difference [7] (3 less 4)* | | | | | | | | | | |
| 6. Memo Item: Unavailable storage capacity Tank tops and safety allowance [8] | | | | | | | | | | |

For explanation of footnotes, see page 8.

NOTE: Whether or not you report for one or more refining districts in PAD I-IV, enter estimates for your company's operations for these lines in Column (4), "Total, PAD I-IV." Enter separate estimates for PAD V.

Questionnaire #5

Code: _____
(Price Waterhouse Use Only)

# NATIONAL PETROLEUM COUNCIL
# 1979 SURVEY OF PETROLEUM STORAGE CAPACITY AND INVENTORY AVAILABILITY IN THE UNITED STATES

## RESIDUAL FUEL OIL

As of March 31 and September 30, 1978
**(Report All Figures in Thousands of Barrels)**

| LOCATION (Enter refining district code as shown on page 4. Use additional sheets, if necessary.) → | REFINING DISTRICTS IN PAD DISTRICTS I-IV | | | | | | (4) Total, PAD I-IV | | PAD District V | |
|---|---|---|---|---|---|---|---|---|---|---|
| | (1) Code No.: _____ | | (2) Code No.: _____ | | (3) Code No.: _____ | | | | (5) Code No.: 513 | |
| (Deal only with those end-of-the-month stocks reported to the Department of Energy on Forms P320-M-O, P321-M-O, and P322-M-O) | Mar. 31 (1,000 bbl) | Sept. 30 (1,000 bbl) | Mar. 31 (1,000 bbl) | Sept. 30 (1,000 bbl) | Mar. 31 (1,000 bbl) | Sept. 30 (1,000 bbl) | Mar. 31 (1,000 bbl) | Sept. 30 (1,000 bbl) | Mar. 31 (1,000 bbl) | Sept. 30 (1,000 bbl) |
| **A. Residual Fuel Oil Inventory** | | | | | | | | | | |
| 1. Total inventory reported to the Department of Energy | | | | | | | | | | |
| 2. Less: Minimum operating inventory [1] | | | | | | | | | | |
| 3. *Difference [2] (1 less 2)* | | | | | | | | | | |
| *If not zero, estimate what percentage was:* | | | | Complete Column (4) Only (See note below) | | | | | | |
| a. Seasonal | | | | | | | % | % | % | % |
| b. Other (Specify _____) | | | | | | | % | % | % | % |
| (Specify _____) | | | | | | | % | % | % | % |
| 4. Memo Item: Completely unavailable inventory | | | | | | | | | | |
| a. Pipeline fill | | | | | | | | | | |
| b. In refinery lines and operating equipment | | | | | | | | | | |
| c. In-transit from domestic sources [3] | | | | | | | | | | |
| d. *Subtotal: Unavailable inventory outside of tankage (a+b+c)* | | | | | | | | | | |
| e. Tank bottoms | | | | | | | | | | |
| f. Unavailable stocks [4] | | | | | | | | | | |
| g. *Total (d+e+f)* | | | | | | | | | | |
| **B. Storage Capacity Assigned to Residual Fuel Oil** | | | | | | | | | | |
| 1. Shell capacity of tankage [5] | | | | | | | | | | |
| 2. Plus: Unavailable inventory outside of tankage (from A.4.d., above) | | | | | | | | | | |
| 3. *Subtotal: Total system capacity (1+2)* | | | | | | | | | | |
| 4. Less: Maximum operating inventory [6] | | | | Complete Column (4) Only (See note below) | | | | | | |
| 5. *Difference [7] (3 less 4)* | | | | | | | | | | |
| 6. Memo Item: Unavailable storage capacity Tank tops and safety allowance [8] | | | | | | | | | | |

For explanation of footnotes, see page 8.

NOTE: Whether or not you report for one or more refining districts in PAD I-IV, enter estimates for your company's operations for these lines in Column (4), "Total, PAD I-IV." Enter separate estimates for PAD V.

Questionnaire #6

Code: _____
(Price Waterhouse Use Only)

Complete this questionnaire only if your company analyzes industry inventory levels.

## ESTIMATED MINIMUM AND MAXIMUM OPERATING INVENTORIES FOR THE ENTIRE U.S. PETROLEUM INDUSTRY

**(Report All Figures in Thousands of Barrels)**

| Crude Oil and Principal Refined Products | Estimated Operating Inventories for the Entire U.S. Petroleum Industry | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Minimum (1,000 bbl) | | | | | | Maximum (1,000 bbl) | | | | | |
| | March 31, 1978 | | | September 30, 1978 | | | March 31, 1978 | | | September 30, 1978 | | |
| | PAD I-IV | PAD V | TOTAL U.S. | PAD I-IV | PAD V | TOTAL U.S. | PAD I-IV | PAD V | TOTAL U.S. | PAD I-IV | PAD V | TOTAL U.S. |
| Crude Oil | | | | | | | | | | | | |
| Gasoline (motor and aviation) | | | | | | | | | | | | |
| Kerosine, including kerosine-type jet fuel | | | | | | | | | | | | |
| Distillate fuel oil, including No. 4 fuel oil | | | | | | | | | | | | |
| Residual fuel oil | | | | | | | | | | | | |

NOTE: It is possible that the sum of the companies' assessments of their own minimum and maximum operating inventories (Items A.2 and B.4 on Questionnaires 1-5) will not accurately reflect a picture of the entire petroleum industry's minimum or maximum operating inventory. If your company analyzes industry levels, provide your estimate of the minimum and maximum operating inventories of the U.S. petroleum industry. Enter estimates for PAD I-IV, PAD V, and Total U.S., if available. If your company does not have certain of the estimates requested in this questionnaire, leave these sections blank.

Questionnaire #7

Code: _____
(Price Waterhouse Use Only)

# NATIONAL PETROLEUM COUNCIL
# 1979 SURVEY OF PETROLEUM STORAGE CAPACITY AND INVENTORY AVAILABILITY IN THE UNITED STATES

## TANKAGE UNDER CONSTRUCTION

As of September 30, 1978

**(Report All Figures in Thousands of Barrels)**

| I. Location (Enter refining district code as shown on page 4) → | Refining District Code No. _____ | Refining District Code No. _____ |
|---|---|---|
| | (1,000 bbl) | (1,000 bbl) |
| II. Tankage capacity under construction assigned to: | | |
| A. Crude Oil | | |
| B. Gasoline (motor & aviation) | | |
| C. Kerosine, including kerosine-type jet fuel | | |
| D. Distillate fuel oil, including No. 4 fuel oil | | |
| E. Residual fuel oil | | |

# NATIONAL PETROLEUM COUNCIL
## 1979 SURVEY OF PETROLEUM STORAGE CAPACITY AND INVENTORY AVAILABILITY IN THE UNITED STATES
## CRUDE OIL
### AS OF SEPTEMBER 30, 1978—THOUSANDS OF BARRELS

| INVENTORY AND STORAGE CAPACITY | REFINING DISTRICT | | PAD I TOTAL | REFINING DISTRICT | | | | PAD II TOTAL | REFINING DISTRICT | | | | | PAD III TOTAL | PAD IV (ROCKY MOUNTAIN) | PADS I-IV TOTAL | PAD V (WEST COAST) | UNITED STATES | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | EAST COAST | APPALACHIAN #1 | | APPALACHIAN #2 | INDIANA, ILLINOIS, KENTUCKY | MINNESOTA, WISCONSIN, N. and S. DAKOTA | OKLAHOMA, KANSAS, MISSOURI | | TEXAS INLAND | TEXAS GULF COAST | LOUISIANA GULF COAST | NORTH LOUISIANA, ARKANSAS | NEW MEXICO | | | | | NPC TOTAL | ADJUSTED NPC TOTAL |
| **REFINING AND PIPELINE OPERATIONS, TOTAL** | | | | | | | | | | | | | | | | | | | |
| **A. CRUDE OIL INVENTORY:** | | | | | | | | | | | | | | | | | | | |
| 1. TOTAL REPORTED BY DOE | N.A. | N.A. | 17,601 | N.A. | N.A. | N.A. | N.A. | 83,372 | N.A. | N.A. | N.A. | N.A. | N.A. | 133,492 | 13,865 | 248,330 | 54,298 | 302,628 | *** |
| 2. TOTAL REPORTED TO NPC | 14,921 | 3,071 | 17,992 | 653 | 34,336 | 2,801 | 32,883 | 70,673 | 40,981 | 48,839 | 25,552 | 9,019 | 3,216 | 127,607 | 13,424 | 229,696 | 51,925 | 281,621 | 302,628 |
| *a. PERCENTAGE OF LINE A.1* | *N.A.* | *N.A.* | *102.2* | *N.A.* | *N.A.* | *N.A.* | *N.A.* | *84.8* | *N.A.* | *N.A.* | *N.A.* | *N.A.* | *N.A.* | *95.6* | *96.8* | *92.5* | *95.6* | *93.1* | *** |
| 3. LESS: MINIMUM OPERATING INVENTORY[1] | | | | | | | | | | | | | | | | 201,795 | 37,968 | 239,763 | 257,533 |
| 4. DIFFERENCE[2] (LINE A.2 LESS LINE A.3) | | | | | | | | | | | | | | | | 27,901 | 13,957 | 41,858 | 45,095 |
| 5. MEMO ITEM: COMPLETELY UNAVAILABLE INVENTORY | | | | | | | | | | | | | | | | | | | |
| a. PIPELINE FILL | 64 | 980 | 1,044 | 117 | 10,997 | 1,402 | 16,233 | 28,749 | 18,538 | 5,504 | 3,329 | 5,647 | 1,335 | 34,353 | 4,399 | 68,545 | 12,428 | 80,973 | *** |
| b. IN REFINERY LINES AND OPERATING EQUIPMENT | 185 | 8 | 193 | 2 | 146 | 20 | 75 | 243 | 6 | 1,104 | 924 | 10 | 8 | 2,052 | 57 | 2,545 | 542 | 3,087 | *** |
| c. IN-TRANSIT FROM DOMESTIC SOURCES[3] | 43 | 0 | 43 | 0 | 270 | 149 | 4 | 423 | 23 | 144 | 0 | 210 | 1 | 378 | 0 | 844 | 582 | 1,426 | *** |
| d. SUBTOTAL: UNAVAILABLE INVENTORY OUTSIDE OF TANKAGE (SUM OF LINES 5a, b, AND c) | 292 | 988 | 1,280 | 119 | 11,413 | 1,571 | 16,312 | 29,415 | 18,567 | 6,752 | 4,253 | 5,867 | 1,344 | 36,783 | 4,456 | 71,934 | 13,552 | 85,486 | 91,822 |
| e. TANK BOTTOMS | 2,813 | 331 | 3,144 | 54 | 4,015 | 233 | 2,738 | 7,040 | 4,482 | 8,360 | 3,189 | 522 | 346 | 16,899 | 1,374 | 28,457 | 6,231 | 34,688 | *** |
| f. UNAVAILABLE STOCKS[4] | 81 | 3 | 84 | 0 | 1,015 | 112 | 196 | 1,323 | 238 | 1,607 | 311 | 71 | 41 | 2,268 | 129 | 3,804 | 969 | 4,773 | *** |
| g. TOTAL (SUM OF LINES 5d, e, AND f) | 3,186 | 1,322 | 4,508 | 173 | 16,443 | 1,916 | 19,246 | 37,778 | 23,287 | 16,719 | 7,753 | 6,460 | 1,731 | 55,950 | 5,959 | 104,195 | 20,752 | 124,947 | 134,207 |
| **B. STORAGE CAPACITY ASSIGNED TO CRUDE OIL:** | | | | | | | | | | | | | | | | | | | |
| 1. SHELL CAPACITY OF TANKAGE[5] | 27,632 | 3,941 | 31,573 | 996 | 44,997 | 3,050 | 38,891 | 87,934 | 49,244 | 97,631 | 47,019 | 7,353 | 4,308 | 205,555 | 21,444 | 346,506 | 83,674 | 430,180 | 462,062 |
| 2. PLUS: UNAVAILABLE INVENTORY OUTSIDE OF TANKAGE (LINE A.5d, ABOVE) | 292 | 988 | 1,280 | 119 | 11,413 | 1,571 | 16,312 | 29,415 | 18,567 | 6,752 | 4,253 | 5,867 | 1,344 | 36,783 | 4,456 | 71,934 | 13,552 | 85,486 | 91,822 |
| 3. SUBTOTAL: TOTAL SYSTEM CAPACITY (SUM OF LINES B.1 AND B.2) | 27,924 | 4,929 | 32,853 | 1,115 | 56,410 | 4,621 | 55,203 | 117,349 | 67,811 | 104,383 | 51,272 | 13,220 | 5,652 | 242,338 | 25,900 | 418,440 | 97,226 | 515,666 | 553,884 |
| 4. LESS: MAXIMUM OPERATING INVENTORY[6] | | | | | | | | | | | | | | | | 344,255 | 68,925 | 413,180 | 443,802 |
| 5. DIFFERENCE[7] (LINE B.3 LESS LINE B.4) | | | | | | | | | | | | | | | | 74,185 | 28,301 | 102,486 | 110,082 |
| 6. MEMO ITEM: UNAVAILABLE STORAGE CAPACITY TANK TOPS AND SAFETY ALLOWANCE[8] | 1,403 | 213 | 1,616 | 46 | 2,480 | 231 | 2,511 | 5,268 | 2,406 | 5,340 | 2,342 | 362 | 205 | 10,655 | 1,059 | 18,598 | 3,706 | 22,304 | 23,957 |
| **REFINING OPERATIONS** | | | | | | | | | | | | | | | | | | | |
| **A. CRUDE OIL INVENTORY:** | | | | | | | | | | | | | | | | | | | |
| 1. TOTAL REPORTED BY DOE | N.A. | N.A. | 14,868 | N.A. | N.A. | N.A. | N.A. | 17,231 | N.A. | N.A. | N.A. | N.A. | N.A. | 43,049 | 3,080 | 78,228 | 25,120 | 103,348 | *** |
| 2. TOTAL REPORTED TO NPC | 14,148 | 721 | 14,869 | 248 | 9,963 | 1,154 | 3,486 | 14,851 | 1,110 | 23,618 | 14,713 | 919 | 461 | 40,821 | 2,787 | 73,528 | 25,018 | 98,346 | 103,348 |
| *a. PERCENTAGE OF LINE A.1* | *N.A.* | *N.A.* | *100.0* | *N.A.* | *N.A.* | *N.A.* | *N.A.* | *86.2* | *N.A.* | *N.A.* | *N.A.* | *N.A.* | *N.A.* | *94.8* | *90.5* | *93.7* | *99.6* | *95.2* | *** |
| 3. MEMO ITEM: COMPLETELY UNAVAILABLE INVENTORY | | | | | | | | | | | | | | | | | | | |
| a. PIPELINE FILL | 0 | 0 | 0 | 0 | 3 | 1 | 1 | 5 | 38 | 54 | 28 | 10 | 0 | 130 | 1 | 136 | 49 | 185 | *** |
| b. IN REFINERY LINES AND OPERATING EQUIPMENT | 185 | 8 | 193 | 2 | 146 | 20 | 72 | 240 | 6 | 1,104 | 923 | 10 | 8 | 2,051 | 57 | 2,541 | 541 | 3,082 | *** |
| c. IN-TRANSIT FROM DOMESTIC SOURCES[3] | 43 | 0 | 43 | 0 | 270 | 149 | 0 | 419 | 1 | 144 | 0 | 15 | 1 | 161 | 0 | 623 | 582 | 1,205 | *** |
| d. SUBTOTAL: UNAVAILABLE INVENTORY OUTSIDE OF TANKAGE (SUM OF LINES 5a, b, AND c) | 228 | 8 | 236 | 2 | 419 | 170 | 73 | 664 | 45 | 1,302 | 951 | 35 | 9 | 2,342 | 58 | 3,300 | 1,172 | 4,472 | 4,697 |
| e. TANK BOTTOMS | 2,783 | 242 | 3,025 | 40 | 1,653 | 210 | 419 | 2,322 | 170 | 4,365 | 2,176 | 98 | 42 | 6,851 | 423 | 12,621 | 3,711 | 16,332 | *** |
| f. UNAVAILABLE STOCKS[4] | 81 | 0 | 81 | 0 | 992 | 60 | 76 | 1,129 | 98 | 1,156 | 310 | 71 | 41 | 1,676 | 126 | 3,011 | 803 | 3,814 | *** |
| g. TOTAL (SUM OF LINES 5d, e, AND f) | 3,092 | 250 | 3,342 | 42 | 3,064 | 440 | 568 | 4,114 | 313 | 6,823 | 3,437 | 204 | 92 | 10,869 | 607 | 18,932 | 5,686 | 24,618 | 25,859 |
| **B. STORAGE CAPACITY ASSIGNED TO CRUDE OIL:** | | | | | | | | | | | | | | | | | | | |
| 1. SHELL CAPACITY OF TANKAGE[5] | 26,712 | 1,964 | 28,676 | 490 | 16,013 | 2,286 | 5,600 | 24,389 | 3,293 | 47,068 | 27,053 | 1,745 | 760 | 79,919 | 4,832 | 138,446 | 44,466 | 182,912 | 192,134 |
| 2. PLUS: UNAVAILABLE INVENTORY OUTSIDE OF TANKAGE (LINE A.5d, ABOVE) | 228 | 8 | 236 | 2 | 419 | 170 | 73 | 664 | 45 | 1,302 | 951 | 35 | 9 | 2,342 | 58 | 3,300 | 1,172 | 4,472 | 4,697 |
| 3. SUBTOTAL: TOTAL SYSTEM CAPACITY (SUM OF LINES B.1 AND B.2) | 26,940 | 1,972 | 28,912 | 492 | 16,432 | 2,456 | 5,673 | 25,053 | 3,338 | 48,370 | 28,004 | 1,780 | 769 | 82,261 | 4,890 | 141,746 | 45,638 | 187,384 | 196,831 |
| 4. MEMO ITEM: UNAVAILABLE STORAGE CAPACITY TANK TOPS AND SAFETY ALLOWANCE[8] | 1,360 | 141 | 1,501 | 20 | 1,043 | 191 | 317 | 1,571 | 279 | 2,767 | 1,328 | 94 | 53 | 4,521 | 349 | 7,942 | 2,232 | 10,174 | 10,687 |
| **PIPELINE OPERATIONS** | | | | | | | | | | | | | | | | | | | |
| **A. CRUDE OIL INVENTORY:** | | | | | | | | | | | | | | | | | | | |
| 1. TOTAL REPORTED BY DOE | N.A. | N.A. | 2,733 | N.A. | N.A. | N.A. | N.A. | 66,141 | N.A. | N.A. | N.A. | N.A. | N.A. | 90,443 | 10,785 | 170,102 | 29,178 | 199,280 | *** |
| 2. TOTAL REPORTED TO NPC | 773 | 2,350 | 3,123 | 405 | 24,373 | 1,649 | 29,397 | 55,822 | 39,871 | 25,221 | 10,839 | 8,100 | 2,755 | 86,786 | 10,637 | 156,368 | 26,907 | 183,275 | 199,280 |
| *a. PERCENTAGE OF LINE A.1* | *N.A.* | *N.A.* | *114.3* | *N.A.* | *N.A.* | *N.A.* | *N.A.* | *84.4* | *N.A.* | *N.A.* | *N.A.* | *N.A.* | *N.A.* | *96.0* | *98.6* | *91.9* | *92.2* | *92.0* | *** |
| 3. MEMO ITEM: COMPLETELY UNAVAILABLE INVENTORY | | | | | | | | | | | | | | | | | | | |
| a. PIPELINE FILL | 64 | 980 | 1,044 | 117 | 10,994 | 1,401 | 16,232 | 28,744 | 18,500 | 5,450 | 3,301 | 5,637 | 1,335 | 34,223 | 4,398 | 68,409 | 12,379 | 80,798 | *** |
| b. IN REFINERY LINES AND OPERATING EQUIPMENT | 0 | 0 | 0 | 0 | 0 | 0 | 3 | 3 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 4 | 1 | 5 | *** |
| c. IN-TRANSIT FROM DOMESTIC SOURCES[3] | 0 | 0 | 0 | 0 | 0 | 0 | 4 | 4 | 22 | 0 | 0 | 195 | 0 | 217 | 0 | 221 | 0 | 221 | *** |
| d. SUBTOTAL: UNAVAILABLE INVENTORY OUTSIDE OF TANKAGE (SUM OF LINES 5a, b, AND c) | 64 | 980 | 1,044 | 117 | 10,994 | 1,401 | 16,239 | 28,751 | 18,522 | 5,450 | 3,302 | 5,832 | 1,335 | 34,441 | 4,398 | 68,634 | 12,380 | 81,014 | 88,059 |
| e. TANK BOTTOMS | 30 | 89 | 119 | 14 | 2,362 | 23 | 2,319 | 4,718 | 4,312 | 3,995 | 1,013 | 424 | 304 | 10,048 | 951 | 15,836 | 2,520 | 18,356 | *** |
| f. UNAVAILABLE STOCKS[4] | 0 | 3 | 3 | 0 | 23 | 52 | 120 | 195 | 140 | 451 | 1 | 0 | 0 | 592 | 3 | 793 | 166 | 959 | *** |
| g. TOTAL (SUM OF LINES 5d, e, AND f) | 94 | 1,072 | 1,166 | 131 | 13,379 | 1,476 | 18,678 | 33,664 | 22,974 | 9,896 | 4,316 | 6,256 | 1,639 | 45,081 | 5,352 | 85,263 | 15,066 | 100,329 | 109,053 |
| **B. STORAGE CAPACITY ASSIGNED TO CRUDE OIL:** | | | | | | | | | | | | | | | | | | | |
| 1. SHELL CAPACITY OF TANKAGE[5] | 920 | 1,977 | 2,897 | 506 | 28,984 | 764 | 33,291 | 63,545 | 45,951 | 50,563 | 19,966 | 5,608 | 3,548 | 125,636 | 16,612 | 208,060 | 39,208 | 247,268 | 268,770 |
| 2. PLUS: UNAVAILABLE INVENTORY OUTSIDE OF TANKAGE (LINE A.5d, ABOVE) | 64 | 980 | 1,044 | 117 | 10,994 | 1,401 | 16,239 | 28,751 | 18,522 | 5,450 | 3,302 | 5,832 | 1,335 | 34,441 | 4,398 | 68,634 | 12,380 | 81,014 | 88,059 |
| 3. SUBTOTAL: TOTAL SYSTEM CAPACITY (SUM OF LINES B.1 AND B.2) | 984 | 2,957 | 3,941 | 623 | 39,978 | 2,165 | 49,530 | 92,296 | 64,473 | 56,013 | 23,268 | 11,440 | 4,883 | 160,077 | 21,010 | 276,694 | 51,588 | 328,282 | 356,829 |
| 4. MEMO ITEM: UNAVAILABLE STORAGE CAPACITY TANK TOPS AND SAFETY ALLOWANCE[8] | 43 | 72 | 115 | 26 | 1,437 | 40 | 2,194 | 3,697 | 2,127 | 2,573 | 1,014 | 268 | 152 | 6,134 | 710 | 10,656 | 1,474 | 12,130 | 13,185 |

*FOR EXPLANATION OF FOOTNOTES, SEE PAGE E-15.*

**** Not Applicable, N.A.— Not Available.*
*a. Crude oil tables exclude 18,585 Mbbl of lease stocks and 47,090 Mbbl located in the Strategic Petroleum Reserve.*
*b. Minimum and maximum operating inventory data were not collected separately for refinery operations and pipeline operations.*
*c. U.S. total data reported to NPC were adjusted according to percentage shown on Line A.2a for the United States.*

1979 SURVEY OF PETROLEUM STORAGE CAPACITY
AND INVENTORY AVAILABILITY IN THE UNITED STATES

## GASOLINE
(MOTOR AND AVIATION)
(Thousands of Barrels)

| INVENTORY AND STORAGE CAPACITY | REFINING DISTRICT | | | | | PAD I TOTAL | REFINING DISTRICT | | | | PAD II TOTAL | REFINING DISTRICT | | | | | PAD III TOTAL | PAD IV (ROCKY MOUNTAIN) | PADS I-IV TOTAL | PAD V (WEST COAST) | UNITED STATES | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | EAST COAST | | | | APPALA-CHIAN #1 | | APPALA-CHIAN #2 | INDIANA, ILLINOIS, KENTUCKY | MINNESOTA, WISCONSIN, N. and S. DAKOTA | OKLAHOMA, KANSAS, MISSOURI | | TEXAS INLAND | TEXAS GULF COAST | LOUISIANA GULF COAST | NORTH LOUISIANA, ARKANSAS | NEW MEXICO | | | | | NPC TOTAL | ADJUSTED NPC TOTAL |
| | NEW ENGLAND | MID ATLANTIC | SOUTH ATLANTIC | TOTAL | | | | | | | | | | | | | | | | | | |
| **MARCH 31, 1978** | | | | | | | | | | | | | | | | | | | | | | |
| **A. GASOLINE INVENTORY:** | | | | | | | | | | | | | | | | | | | | | | |
| 1. TOTAL REPORTED BY DOE | N.A. | N.A. | N.A. | 63,340 | 5,915 | 69,255 | 3,809 | 44,880 | 9,745 | 21,944 | 80,378 | 11,672 | 33,992 | 17,208 | 12,173 | 734 | 76,779 | 11,119 | 237,531 | 24,706 | 262,237 | *** |
| 2. TOTAL REPORTED TO NPC | 5,597 | 30,756 | 23,714 | 60,067 | 5,991 | 66,058 | 3,785 | 42,012 | 8,291 | 19,541 | 73,629 | 11,460 | 26,162 | 17,554 | 3,393 | 584 | 65,153 | 10,551 | 215,391 | 20,957 | 236,349 | 262,237 |
| *a. PERCENTAGE OF LINE A.1* | *N.A.* | *N.A.* | *N.A.* | *94.8* | *101.3* | *95.4* | *99.4* | *93.6* | *85.1* | *89.0* | *91.6* | *98.2* | *77.0* | *102.0* | *77.2* | *80.7* | *84.9* | *94.9* | *90.7* | *84.8* | *90.1* | *** |
| 3. LESS: MINIMUM OPERATING INVENTORY[1] | | | | | | | | | | | | | | | | | | | 160,568 | 18,510 | 179,078 | 198,755 |
| 4. DIFFERENCE[2] (LINE A.2 LESS LINE A.3) | | | | | | | | | | | | | | | | | | | 54,823 | 2,447 | 57,270 | 63,488 |
| 5. MEMO ITEM: COMPLETELY UNAVAILABLE INVENTORY | | | | | | | | | | | | | | | | | | | | | | |
| a. PIPELINE FILL | 3 | 2,639 | 4,734 | 7,376 | 445 | 7,821 | 446 | 3,191 | 847 | 3,741 | 8,225 | 1,974 | 1,141 | 1,765 | 4,210 | 18 | 9,108 | 1,076 | 26,230 | 484 | 26,714 | *** |
| b. IN REFINERY LINES AND OPERATING EQUIPMENT | 1 | 81 | 28 | 110 | 5 | 115 | 3 | 88 | 8 | 39 | 138 | 34 | 117 | 42 | 7 | 37 | 237 | 6 | 496 | 119 | 615 | *** |
| c. IN TRANSIT FROM DOMESTIC SOURCES[3] | 498 | 442 | 741 | 1,681 | 42 | 1,723 | 90 | 438 | 2 | 0 | 530 | 0 | 0 | 15 | 23 | 0 | 38 | 0 | 2,291 | 124 | 2,415 | *** |
| d. SUBTOTAL: UNAVAILABLE INVENTORY OUTSIDE OF TANKAGE (SUM OF LINES 5a, b, AND c) | 502 | 3,162 | 5,503 | 9,167 | 492 | 9,659 | 539 | 3,717 | 857 | 3,780 | 8,893 | 2,008 | 1,258 | 1,822 | 4,240 | 55 | 9,383 | 1,082 | 29,017 | 727 | 29,744 | 33,012 |
| e. TANK BOTTOMS | 717 | 3,535 | 2,211 | 6,463 | 687 | 7,150 | 420 | 5,500 | 879 | 2,284 | 9,083 | 1,103 | 3,773 | 2,474 | 479 | 90 | 7,919 | 1,220 | 25,372 | 4,386 | 29,758 | *** |
| f. UNAVAILABLE STOCKS[4] | 0 | 154 | 60 | 214 | 0 | 214 | 0 | 779 | 0 | 158 | 937 | 324 | 429 | 921 | 14 | 0 | 1,688 | 159 | 2,998 | 396 | 3,394 | *** |
| g. TOTAL (SUM OF LINES 5d, e, AND f) | 1,219 | 6,851 | 7,774 | 15,844 | 1,179 | 17,023 | 959 | 9,996 | 1,736 | 6,222 | 18,913 | 3,435 | 5,460 | 5,217 | 4,733 | 145 | 18,990 | 2,461 | 57,387 | 5,509 | 62,896 | 69,807 |
| **B. STORAGE CAPACITY ASSIGNED TO GASOLINE:** | | | | | | | | | | | | | | | | | | | | | | |
| 1. SHELL CAPACITY OF TANKAGE[5] | 11,665 | 51,478 | 43,328 | 106,471 | 10,246 | 116,717 | 6,912 | 73,489 | 13,569 | 32,530 | 126,500 | 17,349 | 51,552 | 29,005 | 10,983 | 1,220 | 110,109 | 15,538 | 368,864 | 49,020 | 417,884 | 463,800 |
| 2. PLUS: UNAVAILABLE INVENTORY OUTSIDE OF TANKAGE (LINE A.5d. ABOVE) | 502 | 3,162 | 5,503 | 9,167 | 492 | 9,659 | 539 | 3,717 | 857 | 3,780 | 8,893 | 2,008 | 1,258 | 1,822 | 4,240 | 55 | 9,383 | 1,082 | 29,017 | 727 | 29,744 | 33,012 |
| 3. SUBTOTAL: TOTAL SYSTEM CAPACITY (SUM OF LINES B.1 AND B.2) | 12,167 | 54,640 | 48,831 | 115,638 | 10,738 | 126,376 | 7,451 | 77,206 | 14,426 | 36,310 | 135,393 | 19,357 | 52,810 | 30,827 | 15,223 | 1,275 | 119,492 | 16,620 | 397,881 | 49,747 | 447,628 | 496,812 |
| 4. LESS: MAXIMUM OPERATING INVENTORY[6] | | | | | | | | | | | | | | | | | | | 312,208 | 38,835 | 351,043 | 389,615 |
| 5. DIFFERENCE[7] (LINE B.3 LESS LINE B.4) | | | | | | | | | | | | | | | | | | | 95,673 | 10,912 | 96,585 | 107,197 |
| 6. MEMO ITEM: UNAVAILABLE STORAGE CAPACITY TANK TOPS AND SAFETY ALLOWANCE[8] | 584 | 2,775 | 2,454 | 5,813 | 419 | 6,232 | 361 | 5,031 | 899 | 2,174 | 8,465 | 1,168 | 2,284 | 1,314 | 336 | 60 | 5,162 | 987 | 20,846 | 2,599 | 23,445 | 26,021 |
| **SEPTEMBER 30, 1978** | | | | | | | | | | | | | | | | | | | | | | |
| **A. GASOLINE INVENTORY:** | | | | | | | | | | | | | | | | | | | | | | |
| 1. TOTAL REPORTED BY DOE | N.A. | N.A. | N.A. | 52,817 | 5,018 | 57,835 | 3,042 | 36,331 | 6,907 | 20,254 | 66,534 | 9,895 | 26,978 | 15,395 | 10,670 | 687 | 63,623 | 5,253 | 193,245 | 26,063 | 219,308 | *** |
| 2. TOTAL REPORTED TO NPC | 4,693 | 22,627 | 23,021 | 50,341 | 5,071 | 55,412 | 3,216 | 34,011 | 6,426 | 18,065 | 61,718 | 9,761 | 23,987 | 14,682 | 8,829 | 575 | 57,834 | 4,945 | 179,909 | 22,102 | 202,011 | 219,308 |
| *a. PERCENTAGE OF LINE A.1* | *N.A.* | *N.A.* | *N.A.* | *95.3* | *101.1* | *95.8* | *105.7* | *93.6* | *93.0* | *89.2* | *92.8* | *78.6* | *88.9* | *95.4* | *82.7* | *83.7* | *90.9* | *94.1* | *93.1* | *84.8* | *92.1* | *** |
| 3. LESS: MINIMUM OPERATING INVENTORY[1] | | | | | | | | | | | | | | | | | | | 160,216 | 16,978 | 177,194 | 192,393 |
| 4. DIFFERENCE[2] (LINE A.2 LESS LINE A.3) | | | | | | | | | | | | | | | | | | | 19,693 | 5,124 | 24,817 | 26,915 |
| 5. MEMO ITEM: COMPLETELY UNAVAILABLE INVENTORY | | | | | | | | | | | | | | | | | | | | | | |
| a. PIPELINE FILL | 3 | 2,623 | 4,014 | 6,640 | 628 | 7,268 | 533 | 3,501 | 794 | 5,326 | 10,154 | 2,006 | 686 | 1,585 | 4,626 | 18 | 8,921 | 1,061 | 27,404 | 349 | 27,753 | *** |
| b. IN REFINERY LINES AND OPERATING EQUIPMENT | 1 | 83 | 28 | 112 | 5 | 117 | 3 | 79 | 7 | 37 | 126 | 46 | 106 | 43 | 7 | 46 | 248 | 6 | 497 | 121 | 618 | *** |
| c. IN TRANSIT FROM DOMESTIC SOURCES[3] | 379 | 245 | 656 | 1,280 | 34 | 1,314 | 48 | 306 | 4 | 31 | 389 | 0 | 0 | 47 | 24 | 0 | 71 | 0 | 1,774 | 90 | 1,864 | *** |
| d. SUBTOTAL: UNAVAILABLE INVENTORY OUTSIDE OF TANKAGE (SUM OF LINES 5a, b, AND c) | 383 | 2,951 | 4,698 | 8,032 | 667 | 8,699 | 584 | 3,886 | 805 | 5,394 | 10,669 | 2,052 | 792 | 1,675 | 4,657 | 64 | 9,240 | 1,067 | 29,675 | 560 | 30,235 | 32,828 |
| e. TANK BOTTOMS | 714 | 3,489 | 2,306 | 6,509 | 669 | 7,178 | 387 | 5,338 | 846 | 2,173 | 8,744 | 1,021 | 3,692 | 2,449 | 439 | 90 | 7,691 | 1,197 | 24,810 | 4,285 | 29,095 | *** |
| f. UNAVAILABLE STOCKS[4] | 0 | 154 | 60 | 214 | 0 | 214 | 12 | 777 | 0 | 140 | 929 | 324 | 429 | 685 | 14 | 0 | 1,452 | 159 | 2,754 | 396 | 3,150 | *** |
| g. TOTAL (SUM OF LINES 5d, e, AND f) | 1,097 | 6,594 | 7,064 | 14,755 | 1,336 | 16,091 | 983 | 10,001 | 1,651 | 7,707 | 20,342 | 3,397 | 4,913 | 4,809 | 5,110 | 154 | 18,383 | 2,423 | 57,239 | 5,241 | 62,480 | 67,839 |
| **B. STORAGE CAPACITY ASSIGNED TO GASOLINE:** | | | | | | | | | | | | | | | | | | | | | | |
| 1. SHELL CAPACITY OF TANKAGE[5] | 11,298 | 49,953 | 42,735 | 103,986 | 9,908 | 113,894 | 6,895 | 69,473 | 13,094 | 32,467 | 121,929 | 16,300 | 48,570 | 28,005 | 9,791 | 1,232 | 103,898 | 15,294 | 355,015 | 48,513 | 403,532 | 438,145 |
| 2. PLUS: UNAVAILABLE INVENTORY OUTSIDE OF TANKAGE (LINE A.5d, ABOVE) | 383 | 2,951 | 4,698 | 8,032 | 667 | 8,699 | 584 | 3,886 | 805 | 5,394 | 10,669 | 2,052 | 792 | 1,675 | 4,657 | 64 | 9,240 | 1,067 | 29,675 | 560 | 30,325 | 32,828 |
| 3. SUBTOTAL: TOTAL SYSTEM CAPACITY (SUM OF LINES B.1 AND B.2) | 11,681 | 52,904 | 47,433 | 112,018 | 10,575 | 122,593 | 7,479 | 73,359 | 13,899 | 37,861 | 132,598 | 18,352 | 49,362 | 29,680 | 14,448 | 1,296 | 113,138 | 16,361 | 384,690 | 49,077 | 433,767 | 470,973 |
| 4. LESS: MAXIMUM OPERATING INVENTORY[6] | | | | | | | | | | | | | | | | | | | 301,649 | 37,993 | 339,642 | 368,775 |
| 5. DIFFERENCE[7] (LINE B.3 LESS LINE B.4) | | | | | | | | | | | | | | | | | | | 83,041 | 11,084 | 94,125 | 102,198 |
| 6. MEMO ITEM: UNAVAILABLE STORAGE CAPACITY TANK TOPS AND SAFETY ALLOWANCE[8] | 560 | 2,802 | 2,429 | 5,791 | 407 | 6,198 | 336 | 4,836 | 875 | 2,188 | 8,235 | 1,012 | 2,284 | 1,253 | 290 | 60 | 4,897 | 891 | 20,221 | 2,438 | 22,659 | 24,603 |

*FOR EXPLANATION OF FOOTNOTES, SEE PAGE E-15.*

****Not applicable. N.A.—Not available*

*a Product tables include stocks held at refineries, bulk terminals, and by pipelines, but exclude stocks held at natural gas processing plants.*

NATIONAL PETROLEUM COUNCIL
1979 SURVEY OF PETROLEUM STORAGE CAPACITY
AND INVENTORY AVAILABILITY IN THE UNITED STATES

## KEROSINE
(INCLUDING KEROSINE-TYPE JET FUEL)
(Thousands of Barrels)

| INVENTORY AND STORAGE CAPACITY | REFINING DISTRICT | | | | | PAD I TOTAL | REFINING DISTRICT | | | | PAD II TOTAL | REFINING DISTRICT | | | | | PAD III TOTAL | PAD IV (ROCKY MOUNTAIN) | PADS I-IV TOTAL | PAD V (WEST COAST) | UNITED STATES | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | EAST COAST | | | | APPALA-CHIAN #1 | | APPALA-CHIAN #2 | INDIANA, ILLINOIS, KENTUCKY | MINNESOTA, WISCONSIN, N. and S. DAKOTA | OKLAHOMA, KANSAS, MISSOURI | | TEXAS INLAND | TEXAS GULF COAST | LOUISIANA GULF COAST | NORTH LOUISIANA, ARKANSAS | NEW MEXICO | | | | | NPC TOTAL | ADJUSTED NPC TOTAL |
| | NEW ENGLAND | MID ATLANTIC | SOUTH ATLANTIC | TOTAL | | | | | | | | | | | | | | | | | | |
| **MARCH 31, 1978** | | | | | | | | | | | | | | | | | | | | | | |
| **A. KEROSINE INVENTORY:** | | | | | | | | | | | | | | | | | | | | | | |
| 1. TOTAL REPORTED BY DOE | N.A. | N.A. | N.A. | 11,020 | 658 | 11,705 | 471 | 5,025 | 797 | 1,470 | 7,763 | 1,447 | 4,375 | 2,909 | 2,048 | 111 | 10,890 | 678 | 31,036 | 7,041 | 38,077 | *** |
| 2. TOTAL REPORTED TO NPC | 1,449 | 4,703 | 4,547 | 10,699 | 856 | 11,555 | 472 | 4,810 | 823 | 1,388 | 7,493 | 1,390 | 3,856 | 2,890 | 1,926 | 99 | 10,161 | 637 | 29,846 | 7,177 | 37,023 | 38,077 |
| *a. PERCENTAGE OF LINE A.1* | *N.A.* | *N.A.* | *N.A.* | *97.1* | *125.0* | *98.7* | *100.2* | *95.7* | *103.3* | *94.4* | *96.5* | *96.1* | *88.1* | *99.3* | *94.0* | *89.2* | *93.3* | *94.0* | *96.2* | *101.9* | *97.2* | *** |
| 3. LESS: MINIMUM OPERATING INVENTORY[1] | | | | | | | | | | | | | | | | | | | 26,132 | 5,760 | 31,892 | 32,811 |
| 4. DIFFERENCE[2] (LINE A.2 LESS LINE A.3) | | | | | | | | | | | | | | | | | | | 3,714 | 1,417 | 5,131 | 5,266 |
| 5. MEMO ITEM: COMPLETELY UNAVAILABLE INVENTORY | | | | | | | | | | | | | | | | | | | | | | |
| a. PIPELINE FILL | 5 | 201 | 402 | 608 | 19 | 627 | 11 | 301 | 17 | 392 | 721 | 116 | 258 | 443 | 1,736 | 0 | 2,553 | 151 | 4,052 | 150 | 4,202 | *** |
| b. IN REFINERY LINES AND OPERATING EQUIPMENT | 2 | 32 | 6 | 40 | 2 | 42 | 1 | 8 | 0 | 23 | 32 | 0 | 26 | 6 | 0 | 4 | 36 | 0 | 110 | 18 | 128 | *** |
| c. IN TRANSIT FROM DOMESTIC SOURCES[3] | 327 | 148 | 40 | 515 | 0 | 515 | 2 | 55 | 0 | 0 | 57 | 1 | 0 | 0 | 0 | 0 | 1 | 0 | 573 | 0 | 573 | *** |
| d. SUBTOTAL: UNAVAILABLE INVENTORY OUTSIDE OF TANKAGE (SUM OF LINES 5a, b, AND c) | 334 | 381 | 448 | 1,163 | 21 | 1,184 | 14 | 364 | 17 | 415 | 810 | 117 | 284 | 449 | 1,736 | 4 | 2,590 | 151 | 4,735 | 168 | 4,903 | 5,044 |
| e. TANK BOTTOMS | 212 | 729 | 416 | 1,357 | 93 | 1,450 | 61 | 760 | 141 | 232 | 1,194 | 127 | 691 | 487 | 15 | 13 | 1,333 | 113 | 4,090 | 1,124 | 5,214 | *** |
| f. UNAVAILABLE STOCKS[4] | 0 | 55 | 0 | 55 | 0 | 55 | 0 | 192 | 0 | 23 | 215 | 18 | 45 | 40 | 0 | 0 | 103 | 18 | 391 | 33 | 424 | *** |
| g. TOTAL (SUM OF LINES 5d, e, AND f) | 546 | 1,165 | 864 | 2,575 | 114 | 2,689 | 75 | 1,316 | 158 | 670 | 2,219 | 262 | 1,020 | 976 | 1,751 | 17 | 4,026 | 282 | 9,216 | 1,325 | 10,541 | 10,845 |
| **B. STORAGE CAPACITY ASSIGNED TO KEROSINE:** | | | | | | | | | | | | | | | | | | | | | | |
| 1. SHELL CAPACITY OF TANKAGE[5] | 3,892 | 13,012 | 10,497 | 27,401 | 1,972 | 29,373 | 1,127 | 11,457 | 2,282 | 3,926 | 18,792 | 2,264 | 8,831 | 6,948 | 1,152 | 231 | 19,426 | 1,417 | 69,008 | 14,757 | 83,765 | 86,178 |
| 2. PLUS: UNAVAILABLE INVENTORY OUTSIDE OF TANKAGE (LINE A.5d, ABOVE) | 334 | 381 | 448 | 1,163 | 21 | 1,184 | 14 | 364 | 17 | 415 | 810 | 117 | 284 | 449 | 1,736 | 4 | 2,590 | 151 | 4,735 | 168 | 4,903 | 5,044 |
| 3. SUBTOTAL: TOTAL SYSTEM CAPACITY (SUM OF LINES B.1 AND B.2) | 4,226 | 13,393 | 10,945 | 28,564 | 1,993 | 30,557 | 1,141 | 11,821 | 2,299 | 4,341 | 19,602 | 2,381 | 9,115 | 7,397 | 2,888 | 235 | 22,016 | 1,568 | 73,743 | 14,925 | 88,668 | 91,222 |
| 4. LESS: MAXIMUM OPERATING INVENTORY[6] | | | | | | | | | | | | | | | | | | | 61,119 | 12,132 | 73,251 | 75,361 |
| 5. DIFFERENCE[7] (LINE B.3 LESS LINE B.4) | | | | | | | | | | | | | | | | | | | 12,624 | 2,793 | 15,417 | 15,861 |
| 6. MEMO ITEM: UNAVAILABLE STORAGE CAPACITY TANK TOPS AND SAFETY ALLOWANCE[8] | 131 | 613 | 317 | 1,061 | 56 | 1,117 | 53 | 633 | 94 | 200 | 980 | 112 | 365 | 258 | 12 | 13 | 760 | 76 | 2,933 | 558 | 3,491 | 3,592 |
| **SEPTEMBER 30, 1978** | | | | | | | | | | | | | | | | | | | | | | |
| **A. KEROSINE INVENTORY:** | | | | | | | | | | | | | | | | | | | | | | |
| 1. TOTAL REPORTED BY DOE | N.A. | N.A. | N.A. | 14,205 | 803 | 15,008 | 579 | 6,674 | 1,278 | 1,860 | 10,391 | 1,410 | 6,661 | 2,599 | 1,352 | 124 | 12,146 | 888 | 38,433 | 6,979 | 45,412 | *** |
| 2. TOTAL REPORTED TO NPC | 1,933 | 5,660 | 5,901 | 13,494 | 820 | 14,314 | 580 | 6,362 | 1,338 | 2,135 | 10,415 | 1,414 | 5,152 | 2,693 | 1,161 | 98 | 10,518 | 770 | 36,017 | 7,038 | 43,055 | 45,412 |
| *a. PERCENTAGE OF LINE A.1* | *N.A.* | *N.A.* | *N.A.* | *95.0* | *102.1* | *95.4* | *100.0* | *95.3* | *104.7* | *114.8* | *100.2* | *100.3* | *77.3* | *103.6* | *85.9* | *79.0* | *86.6* | *86.7* | *93.7* | *100.8* | *94.8* | *** |
| 3. LESS: MINIMUM OPERATING INVENTORY[1] | | | | | | | | | | | | | | | | | | | 26,787 | 5,773 | 32,560 | 34,346 |
| 4. DIFFERENCE[2] (LINE A.2 LESS LINE A.3) | | | | | | | | | | | | | | | | | | | 9,230 | 1,265 | 10,495 | 11,066 |
| 5. MEMO ITEM: COMPLETELY UNAVAILABLE INVENTORY | | | | | | | | | | | | | | | | | | | | | | |
| a. PIPELINE FILL | 1 | 163 | 1,177 | 1,341 | 0 | 1,341 | 15 | 215 | 42 | 420 | 692 | 311 | 241 | 66 | 1,030 | 0 | 1,648 | 153 | 3,834 | 223 | 4,057 | *** |
| b. IN REFINERY LINES AND OPERATING EQUIPMENT | 2 | 32 | 6 | 40 | 2 | 42 | 1 | 8 | 0 | 23 | 32 | 0 | 24 | 6 | 0 | 1 | 31 | 0 | 105 | 18 | 123 | *** |
| c. IN TRANSIT FROM DOMESTIC SOURCES[3] | 9 | 134 | 1 | 144 | 0 | 144 | 0 | 81 | 93 | 0 | 174 | 1 | 0 | 0 | 0 | 0 | 1 | 0 | 319 | 0 | 319 | *** |
| d. SUBTOTAL: UNAVAILABLE INVENTORY OUTSIDE OF TANKAGE (SUM OF LINES 5a, b, AND c) | 12 | 329 | 1,184 | 1,525 | 2 | 1,527 | 16 | 304 | 135 | 443 | 898 | 312 | 265 | 72 | 1,030 | 1 | 1,680 | 153 | 4,258 | 241 | 4,499 | 4,746 |
| e. TANK BOTTOMS | 217 | 734 | 412 | 1,363 | 87 | 1,450 | 61 | 816 | 141 | 210 | 1,228 | 136 | 671 | 489 | 18 | 13 | 1,327 | 117 | 4,122 | 1,091 | 5,213 | *** |
| f. UNAVAILABLE STOCKS[4] | 0 | 55 | 0 | 55 | 0 | 55 | 0 | 192 | 0 | 12 | 204 | 18 | 45 | 40 | 0 | 0 | 103 | 18 | 380 | 33 | 413 | *** |
| g. TOTAL (SUM OF LINES 5d, e, AND f) | 229 | 1,118 | 1,596 | 2,943 | 89 | 3,032 | 77 | 1,312 | 276 | 665 | 2,330 | 466 | 981 | 601 | 1,048 | 14 | 3,110 | 288 | 8,760 | 1,365 | 10,125 | 10,680 |
| **B. STORAGE CAPACITY ASSIGNED TO KEROSINE:** | | | | | | | | | | | | | | | | | | | | | | |
| 1. SHELL CAPACITY OF TANKAGE[5] | 3,983 | 13,290 | 10,409 | 27,682 | 1,857 | 29,539 | 1,127 | 12,579 | 2,281 | 3,733 | 19,720 | 2,380 | 9,346 | 6,748 | 1,152 | 231 | 19,857 | 1,568 | 70,684 | 14,184 | 84,868 | 89,523 |
| 2. PLUS: UNAVAILABLE INVENTORY OUTSIDE OF TANKAGE (LINE A.5d, ABOVE) | 12 | 329 | 1,184 | 1,525 | 2 | 1,527 | 16 | 304 | 135 | 443 | 898 | 312 | 265 | 72 | 1,030 | 1 | 1,680 | 153 | 4,258 | 241 | 4,499 | 4,746 |
| 3. SUBTOTAL: TOTAL SYSTEM CAPACITY (SUM OF LINES B.1 AND B.2) | 3,995 | 13,619 | 11,593 | 29,207 | 1,859 | 31,066 | 1,143 | 12,883 | 2,416 | 4,176 | 20,618 | 2,692 | 9,611 | 6,820 | 2,182 | 232 | 21,537 | 1,721 | 74,942 | 14,425 | 89,367 | 94,269 |
| 4. LESS: MAXIMUM OPERATING INVENTORY[6] | | | | | | | | | | | | | | | | | | | 62,443 | 11,721 | 74,164 | 78,232 |
| 5. DIFFERENCE[7] (LINE B.3 LESS LINE B.4) | | | | | | | | | | | | | | | | | | | 12,499 | 2,704 | 15,203 | 16,037 |
| 6. MEMO ITEM: UNAVAILABLE STORAGE CAPACITY TANK TOPS AND SAFETY ALLOWANCE[8] | 135 | 626 | 314 | 1,075 | 50 | 1,125 | 51 | 737 | 91 | 179 | 1,058 | 123 | 388 | 248 | 12 | 13 | 784 | 77 | 3,044 | 552 | 3,596 | 3,793 |

*FOR EXPLANATION OF FOOTNOTES, SEE PAGE E-15.*

****Not applicable, N.A.—Not available*

*a. Product tables include stocks held at refineries, bulk terminals, and by pipelines, but exclude stocks held at natural gas processing plants.*

*b. U.S. total data reported to NPC were adjusted according to percentage shown on Line A.2a for the United States.*

NATIONAL PETROLEUM COUNCIL
1979 SURVEY OF PETROLEUM STORAGE CAPACITY
AND INVENTORY AVAILABILITY IN THE UNITED STATES

## DISTILLATE FUEL OIL
(INCLUDING NO. 4 FUEL OIL)
(Thousands of Barrels)

| INVENTORY AND STORAGE CAPACITY | REFINING DISTRICT | | | | | PAD I TOTAL | REFINING DISTRICT | | | | PAD II TOTAL | REFINING DISTRICT | | | | | PAD III TOTAL | PAD IV (ROCKY MOUNTAIN) | PADS I-IV TOTAL | PAD V (WEST COAST) | UNITED STATES | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | EAST COAST | | | | APPALA-CHIAN #1 | | APPALA-CHIAN #2 | INDIANA, ILLINOIS, KENTUCKY | MINNESOTA, WISCONSIN, N. and S. DAKOTA | OKLAHOMA, KANSAS, MISSOURI | | TEXAS INLAND | TEXAS GULF COAST | LOUISIANA GULF COAST | NORTH LOUISIANA, ARKANSAS | NEW MEXICO | | | | | NPC TOTAL | ADJUSTED NPC TOTAL |
| | NEW ENGLAND | MID ATLANTIC | SOUTH ATLANTIC | TOTAL | | | | | | | | | | | | | | | | | | |
| **MARCH 31, 1978** | | | | | | | | | | | | | | | | | | | | | | |
| **A DISTILLATE FUEL OIL INVENTORY:** | | | | | | | | | | | | | | | | | | | | | | |
| 1. TOTAL REPORTED BY DOE | N.A. | N.A. | N.A. | 46,256 | 2,716 | 48,972 | 1,889 | 24,685 | 7,141 | 14,162 | 47,877 | 3,044 | 10,566 | 6,206 | 4,363 | 487 | 24,666 | 4,005 | 125,520 | 12,357 | 137,877 | *** |
| 2. TOTAL REPORTED TO NPC | 8,112 | 20,349 | 12,318 | 40,779 | 2,729 | 43,508 | 1,889 | 22,595 | 6,343 | 12,969 | 43,796 | 2,866 | 9,585 | 5,535 | 3,586 | 307 | 21,879 | 3,671 | 112,854 | 11,193 | 124,047 | 137,877 |
| *a. PERCENTAGE OF LINE A.1* | *N.A.* | *N.A.* | *N.A.* | *87.4* | *100.5* | *88.8* | *100.0* | *91.5* | *88.8* | *91.6* | *91.5* | *94.2* | *90.7* | *89.2* | *82.2* | *63.0* | *88.7* | *91.7* | *89.9* | *90.6* | *90.0* | *** |
| 3. LESS: MINIMUM OPERATING INVENTORY[1] | | | | | | | | | | | | | | | | | | | 93,733 | 6,575 | 100,308 | 111,453 |
| 4. DIFFERENCE[2](LINE A.2 LESS LINE A.3) | | | | | | | | | | | | | | | | | | | 19,121 | 4,618 | 23,739 | 26,424 |
| 5. MEMO ITEM: COMPLETELY UNAVAILABLE INVENTORY | | | | | | | | | | | | | | | | | | | | | | |
| a. PIPELINE FILL | 62 | 498 | 2,988 | 3,548 | 237 | 3,785 | 104 | 1,291 | 529 | 2,780 | 4,704 | 323 | 126 | 299 | 2,512 | 6 | 3,266 | 219 | 11,974 | 194 | 12,168 | *** |
| b. IN REFINERY LINES AND OPERATING EQUIPMENT | 6 | 73 | 13 | 92 | 2 | 94 | 0 | 83 | 2 | 114 | 199 | 21 | 59 | 23 | 6 | 12 | 121 | 2 | 416 | 41 | 457 | *** |
| c. IN TRANSIT FROM DOMESTIC SOURCES[3] | 824 | 369 | 5 | 1,198 | 44 | 1,242 | 17 | 156 | 0 | 0 | 173 | 0 | 0 | 21 | 0 | 0 | 21 | 0 | 1,436 | 0 | 1,436 | *** |
| d. SUBTOTAL: UNAVAILABLE INVENTORY OUTSIDE OF TANKAGE (SUM OF LINES 5a. b. AND c) | 892 | 940 | 3,006 | 4,838 | 283 | 5,121 | 121 | 1,530 | 531 | 2,894 | 5,076 | 344 | 185 | 343 | 2,518 | 18 | 3,408 | 221 | 13,826 | 235 | 14,061 | 15,623 |
| e. TANK BOTTOMS | 1,672 | 4,197 | 823 | 6,692 | 351 | 7,043 | 216 | 2,700 | 679 | 1,705 | 5,300 | 348 | 1,596 | 1,010 | 134 | 20 | 3,108 | 396 | 15,847 | 1,325 | 17,172 | *** |
| f. UNAVAILABLE STOCKS[4] | 13 | 539 | 17 | 569 | 0 | 569 | 0 | 362 | 0 | 60 | 422 | 48 | 55 | 120 | 0 | 0 | 223 | 83 | 1,297 | 201 | 1,498 | *** |
| g. TOTAL (SUM OF LINES 5d, e, AND f) | 2,517 | 5,676 | 3,846 | 12,099 | 634 | 12,733 | 337 | 4,592 | 1,210 | 4,659 | 10,798 | 740 | 1,836 | 1,473 | 2,652 | 38 | 6,739 | 700 | 30,970 | 1,761 | 32,731 | 36,368 |
| **B. STORAGE CAPACITY ASSIGNED TO DISTILLATE FUEL OIL:** | | | | | | | | | | | | | | | | | | | | | | |
| 1. SHELL CAPACITY OF TANKAGE[5] | 29,843 | 75,457 | 23,255 | 128,555 | 7,223 | 135,778 | 4,513 | 44,988 | 12,752 | 26,566 | 88,819 | 6,513 | 25,459 | 15,457 | 4,024 | 629 | 52,082 | 5,956 | 282,635 | 19,659 | 302,294 | 335,882 |
| 2. PLUS: UNAVAILABLE INVENTORY OUTSIDE OF TANKAGE (LINE A.5d, ABOVE) | 892 | 940 | 3,006 | 1,198 | 283 | 5,121 | 121 | 1,530 | 531 | 2,894 | 5,076 | 344 | 185 | 343 | 2,518 | 18 | 3,408 | 221 | 13,826 | 235 | 14,061 | 15,623 |
| 3. SUBTOTAL: TOTAL SYSTEM CAPACITY (SUM OF LINES B.1 AND B.2) | 30,735 | 76,397 | 26,261 | 133,393 | 7,506 | 140,899 | 4,634 | 46,518 | 13,283 | 29,460 | 93,895 | 6,857 | 25,644 | 15,800 | 6,542 | 647 | 55,490 | 6,177 | 296,461 | 19,894 | 316,355 | 351,505 |
| 4. LESS: MAXIMUM OPERATING INVENTORY[6] | | | | | | | | | | | | | | | | | | | 247,530 | 16,632 | 264,162 | 293,513 |
| 5. DIFFERENCE[7](LINE B.3 LESS LINE B.4) | | | | | | | | | | | | | | | | | | | 48,931 | 3,262 | 52,193 | 57,992 |
| 6. MEMO ITEM: UNAVAILABLE STORAGE CAPACITY TANK TOPS AND SAFETY ALLOWANCE[8] | 956 | 2,551 | 760 | 4,267 | 224 | 4,491 | 163 | 2,663 | 744 | 1,648 | 5,218 | 387 | 1,113 | 650 | 119 | 18 | 2,287 | 371 | 12,367 | 617 | 12,984 | 14,427 |
| **SEPTEMBER 30, 1978** | | | | | | | | | | | | | | | | | | | | | | |
| **A. DISTILLATE FUEL OIL INVENTORY:** | | | | | | | | | | | | | | | | | | | | | | |
| 1. TOTAL REPORTED BY DOE | N.A. | N.A. | N.A. | 92,777 | 4,089 | 96,866 | 3,042 | 37,939 | 9,257 | 16,714 | 66,952 | 3,708 | 22,552 | 9,200 | 6,759 | 538 | 42,757 | 3,315 | 209,890 | 10,904 | 220,794 | *** |
| 2. TOTAL REPORTED TO NPC | 18,601 | 46,663 | 13,749 | 79,013 | 4,154 | 83,167 | 3,042 | 33,640 | 7,883 | 17,015 | 61,581 | 3,339 | 18,319 | 8,284 | 5,164 | 442 | 35,548 | 3,048 | 183,344 | 9,868 | 193,212 | 220,794 |
| *a. PERCENTAGE OF LINE A.1* | *N.A.* | *N.A.* | *N.A.* | *85.2* | *101.6* | *85.9* | *100.0* | *88.7* | *85.2* | *101.8* | *91.9* | *90.0* | *81.2* | *90.0* | *76.4* | *82.2* | *83.1* | *91.9* | *87.4* | *90.5* | *87.5* | *** |
| 3. LESS: MINIMUM OPERATING INVENTORY[1] | | | | | | | | | | | | | | | | | | | 104,960 | 8,144 | 113,104 | 129,262 |
| 4. DIFFERENCE[2](LINE A.2 LESS LINE A.3) | | | | | | | | | | | | | | | | | | | 78,384 | 1,724 | 80,108 | 91,532 |
| 5. MEMO ITEM: COMPLETELY UNAVAILABLE INVENTORY | | | | | | | | | | | | | | | | | | | | | | |
| a. PIPELINE FILL | 62 | 798 | 2,521 | 3,381 | 114 | 3,495 | 80 | 1,284 | 370 | 1,924 | 3,658 | 318 | 444 | 1,200 | 2,997 | 6 | 4,965 | 353 | 12,471 | 283 | 12,754 | *** |
| b. IN REFINERY LINES AND OPERATING EQUIPMENT | 6 | 77 | 13 | 96 | 2 | 98 | 3 | 87 | 2 | 114 | 206 | 15 | 73 | 24 | 6 | 6 | 124 | 2 | 430 | 43 | 473 | *** |
| c. IN TRANSIT FROM DOMESTIC SOURCES[3] | 51 | 201 | 0 | 252 | 22 | 274 | 0 | 187 | 0 | 0 | 187 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 461 | 37 | 498 | *** |
| d. SUBTOTAL: UNAVAILABLE INVENTORY OUTSIDE OF TANKAGE (SUM OF LINES 5a, b, AND c) | 119 | 1,076 | 2,534 | 3,729 | 138 | 3,867 | 83 | 1,558 | 372 | 2,038 | 4,051 | 333 | 517 | 1,224 | 3,003 | 12 | 5,089 | 355 | 13,362 | 363 | 13,725 | 15,686 |
| e. TANK BOTTOMS | 1,676 | 4,320 | 846 | 6,842 | 360 | 7,202 | 241 | 2,960 | 715 | 1,869 | 5,785 | 343 | 1,734 | 1,112 | 151 | 20 | 3,360 | 418 | 16,765 | 1,382 | 18,147 | *** |
| f. UNAVAILABLE STOCKS[4] | 13 | 539 | 43 | 595 | 0 | 595 | 0 | 357 | 0 | 62 | 419 | 48 | 55 | 105 | 0 | 0 | 208 | 83 | 1,305 | 200 | 1,505 | *** |
| g. TOTAL (SUM OF LINES 5d, e, AND f) | 1,808 | 5,935 | 3,423 | 11,166 | 498 | 11,664 | 324 | 4,875 | 1,087 | 3,969 | 10,255 | 724 | 2,306 | 2,441 | 3,154 | 32 | 8,657 | 856 | 31,432 | 1,945 | 33,377 | 38,145 |
| **B. STORAGE CAPACITY ASSIGNED TO DISTILLATE FUEL OIL:** | | | | | | | | | | | | | | | | | | | | | | |
| 1. SHELL CAPACITY OF TANKAGE[5] | 30,307 | 78,425 | 24,129 | 132,861 | 7,465 | 140,326 | 5,137 | 48,527 | 13,347 | 29,280 | 96,291 | 6,547 | 27,988 | 16,976 | 4,521 | 654 | 56,686 | 5,898 | 299,201 | 20,271 | 319,472 | 365,111 |
| 2. PLUS: UNAVAILABLE INVENTORY OUTSIDE OF TANKAGE (LINE A.5d, ABOVE) | 119 | 1,076 | 2,534 | 3,729 | 138 | 3,867 | 83 | 1,558 | 372 | 2,038 | 4,051 | 333 | 517 | 1,224 | 3,003 | 12 | 5,089 | 355 | 13,362 | 363 | 13,725 | 15,686 |
| 3. SUBTOTAL: TOTAL SYSTEM CAPACITY (SUM OF LINES B.1 AND B.2) | 30,426 | 79,501 | 26,663 | 136,590 | 7,603 | 144,193 | 5,220 | 50,085 | 13,719 | 31,318 | 100,342 | 6,880 | 28,505 | 18,200 | 7,524 | 666 | 61,775 | 6,253 | 312,563 | 20,634 | 333,197 | 380,797 |
| 4. LESS: MAXIMUM OPERATING INVENTORY[6] | | | | | | | | | | | | | | | | | | | 260,567 | 16,853 | 277,420 | 317,051 |
| 5. DIFFERENCE (LINE B.3 LESS LINE B.4) | | | | | | | | | | | | | | | | | | | 51,996 | 3,781 | 55,777 | 63,746 |
| 6. MEMO ITEM: UNAVAILABLE STORAGE CAPACITY TANK TOPS AND SAFETY ALLOWANCE[8] | 970 | 2,702 | 777 | 4,449 | 224 | 4,673 | 218 | 2,800 | 760 | 1,738 | 5,516 | 368 | 1,224 | 732 | 136 | 18 | 2,478 | 390 | 13,057 | 691 | 13,748 | 15,712 |

*FOR EXPLANATION OF FOOTNOTES, SEE PAGE E-15.*

*** Not applicable, N.A.—Not available

a Product tables include stocks held at refineries, bulk terminals, and by pipelines but exclude stocks held at natural gas processing plants.

b U.S. total data reported to NPC were adjusted according to percentage shown on Line A.2a for the United States

NATIONAL PETROLEUM COUNCIL
1979 SURVEY OF PETROLEUM STORAGE CAPACITY
AND INVENTORY AVAILABILITY IN THE UNITED STATES

## CLEAN PRODUCTS
(GASOLINE, KEROSINE, AND DISTILLATE FUEL OIL)
(Thousands of Barrels)

| INVENTORY AND STORAGE CAPACITY | REFINING DISTRICT | | | | | PAD I TOTAL | REFINING DISTRICT | | | | PAD II TOTAL | REFINING DISTRICT | | | | | PAD III TOTAL | PAD IV (ROCKY MOUNTAIN) | PADS I-IV TOTAL | PAD V (WEST COAST) | UNITED STATES | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | EAST COAST | | | | APPALACHIAN #1 | | APPALACHIAN #2 | INDIANA, ILLINOIS, KENTUCKY | MINNESOTA, WISCONSIN, N. and S. DAKOTA | OKLAHOMA, KANSAS, MISSOURI | | TEXAS INLAND | TEXAS GULF COAST | LOUISIANA GULF COAST | NORTH LOUISIANA, ARKANSAS | NEW MEXICO | | | | | NPC TOTAL | ADJUSTED NPC TOTAL |
| | NEW ENGLAND | MID ATLANTIC | SOUTH ATLANTIC | TOTAL | | | | | | | | | | | | | | | | | | |
| **MARCH 31, 1978** | | | | | | | | | | | | | | | | | | | | | | |
| **A. CLEAN PRODUCTS INVENTORY:** | | | | | | | | | | | | | | | | | | | | | | |
| 1. TOTAL REPORTED BY DOE | N.A. | N.A. | N.A. | 120,616 | 9,316 | 129,932 | 6,169 | 74,590 | 17,683 | 37,576 | 136,018 | 16,163 | 48,933 | 26,323 | 18,584 | 1,332 | 112,335 | 15,802 | 394,087 | 44,104 | 438,191 | *** |
| 2. TOTAL REPORTED TO NPC | 15,158 | 55,808 | 40,579 | 111,545 | 9,576 | 121,121 | 6,146 | 69,417 | 15,457 | 33,898 | 124,918 | 15,716 | 39,603 | 25,979 | 14,905 | 990 | 97,193 | 14,859 | 358,091 | 39,327 | 397,418 | 438,191 |
| *a. PERCENTAGE OF LINE A.1* | *N.A.* | *N.A.* | *N.A.* | *92.5* | *100.3* | *93.2* | *99.6* | *93.1* | *87.4* | *90.2* | *91.8* | *97.2* | *80.9* | *98.7* | *80.2* | *74.3* | *86.5* | *94.0* | *90.9* | *89.2* | *90.7* | *** |
| 3. LESS: MINIMUM OPERATING INVENTORY[1] | | | | | | | | | | | | | | | | | | | 280,433 | 30,845 | 311,278 | 343,196 |
| 4. DIFFERENCE[2] (LINE A.2 LESS LINE A.3) | | | | | | | | | | | | | | | | | | | 77,658 | 8,482 | 96,140 | 94,996 |
| 5. MEMO ITEM: COMPLETELY UNAVAILABLE INVENTORY | | | | | | | | | | | | | | | | | | | | | | |
| a. PIPELINE FILL | 70 | 3,338 | 8,124 | 11,532 | 701 | 12,233 | 561 | 4,783 | 1,393 | 6,913 | 13,650 | 2,413 | 1,525 | 2,507 | 8,458 | 24 | 14,927 | 1,446 | 42,256 | 828 | 43,084 | *** |
| b. IN REFINERY LINES AND OPERATING EQUIPMENT | 9 | 186 | 47 | 242 | 9 | 251 | 4 | 179 | 10 | 176 | 369 | 55 | 202 | 71 | 13 | 53 | 394 | 8 | 1,022 | 178 | 1,200 | *** |
| c. IN TRANSIT FROM DOMESTIC SOURCES[3] | 1,649 | 959 | 786 | 3,394 | 86 | 3,480 | 109 | 649 | 2 | 0 | 760 | 1 | 0 | 36 | 23 | 0 | 60 | 0 | 4,300 | 124 | 4,424 | *** |
| d. SUBTOTAL: UNAVAILABLE INVENTORY OUTSIDE OF TANKAGE (SUM OF LINES 5a, b, AND c) | 1,728 | 4,483 | 8,957 | 15,168 | 796 | 15,964 | 674 | 5,611 | 1,405 | 7,089 | 14,779 | 2,469 | 1,727 | 2,614 | 8,494 | 77 | 15,381 | 1,454 | 47,578 | 1,130 | 48,708 | 53,702 |
| e. TANK BOTTOMS | 2,601 | 8,461 | 3,450 | 14,512 | 1,131 | 15,643 | 697 | 8,960 | 1,699 | 4,221 | 15,577 | 1,578 | 6,060 | 3,971 | 628 | 123 | 12,360 | 1,729 | 45,309 | 6,835 | 52,144 | *** |
| f. UNAVAILABLE STOCKS[4] | 13 | 748 | 77 | 838 | 0 | 838 | 0 | 1,333 | 0 | 241 | 1,574 | 390 | 529 | 1,081 | 14 | 0 | 2,014 | 260 | 4,686 | 630 | 5,316 | *** |
| g. TOTAL (SUM OF LINES 5d, e, AND f) | 4,342 | 13,692 | 12,484 | 30,518 | 1,927 | 32,445 | 1,371 | 15,904 | 3,104 | 11,551 | 31,930 | 4,437 | 8,316 | 7,666 | 9,136 | 200 | 29,755 | 3,443 | 97,573 | 8,595 | 106,168 | 117,054 |
| **B. STORAGE CAPACITY ASSIGNED TO CLEAN PRODUCTS:** | | | | | | | | | | | | | | | | | | | | | | |
| 1. SHELL CAPACITY OF TANKAGE[5] | 45,400 | 139,947 | 77,080 | 262,427 | 19,441 | 281,868 | 12,552 | 129,934 | 28,603 | 63,022 | 234,111 | 26,126 | 85,842 | 51,410 | 16,159 | 2,080 | 181,617 | 22,911 | 720,507 | 83,436 | 803,943 | 886,376 |
| 2. PLUS: UNAVAILABLE INVENTORY OUTSIDE OF TANKAGE (LINE A.5d, ABOVE) | 1,728 | 4,483 | 8,957 | 15,168 | 796 | 15,964 | 674 | 5,611 | 1,405 | 7,089 | 14,779 | 2,469 | 1,727 | 2,614 | 8,494 | 77 | 15,381 | 1,454 | 47,578 | 1,130 | 48,708 | 53,702 |
| 3. SUBTOTAL: TOTAL SYSTEM CAPACITY (SUM OF LINES B.1 AND B.2) | 47,128 | 144,430 | 86,037 | 277,595 | 20,237 | 297,832 | 13,226 | 135,545 | 30,008 | 70,111 | 248,890 | 28,595 | 87,569 | 54,024 | 24,653 | 2,157 | 196,998 | 24,365 | 768,085 | 84,566 | 852,651 | 940,078 |
| 4. LESS: MAXIMUM OPERATING INVENTORY[6] | | | | | | | | | | | | | | | | | | | 620,857 | 67,599 | 688,456 | 759,047 |
| 5. DIFFERENCE[7] (LINE B.3 LESS LINE B.4) | | | | | | | | | | | | | | | | | | | 147,228 | 16,967 | 164,195 | 181,031 |
| 6. MEMO ITEM: UNAVAILABLE STORAGE CAPACITY TANK TOPS AND SAFETY ALLOWANCE[8] | 1,671 | 5,939 | 3,531 | 11,141 | 699 | 11,840 | 577 | 8,327 | 1,737 | 4,022 | 14,663 | 1,667 | 3,762 | 2,222 | 467 | 91 | 8,209 | 1,434 | 36,146 | 3,774 | 39,920 | 44,013 |
| **SEPTEMBER 30, 1978** | | | | | | | | | | | | | | | | | | | | | | |
| **A. CLEAN PRODUCTS INVENTORY:** | | | | | | | | | | | | | | | | | | | | | | |
| 1. TOTAL REPORTED BY DOE | N.A. | N.A. | N.A. | 159,799 | 9,910 | 169,709 | 6,663 | 80,944 | 17,442 | 38,828 | 143,877 | 15,013 | 56,189 | 27,194 | 18,781 | 1,349 | 118,526 | 9,456 | 441,568 | 43,946 | 485,514 | *** |
| 2. TOTAL REPORTED TO NPC | 25,227 | 74,950 | 42,671 | 142,848 | 10,045 | 152,893 | 6,838 | 74,213 | 15,647 | 37,216 | 133,714 | 14,514 | 47,458 | 25,659 | 15,154 | 1,115 | 103,900 | 8,763 | 399,270 | 39,008 | 438,278 | 485,514 |
| *a. PERCENTAGE OF LINE A.1* | *N.A.* | *N.A.* | *N.A.* | *89.4* | *101.4* | *90.1* | *102.6* | *91.7* | *89.7* | *95.8* | *92.9* | *96.7* | *84.5* | *94.4* | *80.7* | *82.7* | *87.7* | *92.7* | *90.4* | *88.8* | *90.3* | *** |
| 3. LESS: MINIMUM OPERATING INVENTORY[1] | | | | | | | | | | | | | | | | | | | 291,963 | 30,895 | 322,858 | 357,539 |
| 4. DIFFERENCE[2] (LINE A.2 LESS LINE A.3) | | | | | | | | | | | | | | | | | | | 107,307 | 8,113 | 115,420 | 127,975 |
| 5. MEMO ITEM: COMPLETELY UNAVAILABLE INVENTORY | | | | | | | | | | | | | | | | | | | | | | |
| a. PIPELINE FILL | 66 | 3,584 | 7,712 | 11,362 | 742 | 12,104 | 628 | 5,000 | 1,206 | 7,670 | 14,504 | 2,635 | 1,371 | 2,851 | 8,653 | 24 | 15,534 | 1,567 | 43,709 | 855 | 44,564 | *** |
| b. IN REFINERY LINES AND OPERATING EQUIPMENT | 9 | 192 | 47 | 248 | 9 | 257 | 7 | 174 | 9 | 174 | 364 | 61 | 203 | 73 | 13 | 53 | 403 | 8 | 1,032 | 182 | 1,214 | *** |
| c. IN TRANSIT FROM DOMESTIC SOURCES[3] | 439 | 580 | 657 | 1,676 | 56 | 1,732 | 48 | 574 | 97 | 31 | 750 | 1 | 0 | 47 | 24 | 0 | 72 | 0 | 2,554 | 127 | 2,681 | *** |
| d. SUBTOTAL: UNAVAILABLE INVENTORY OUTSIDE OF TANKAGE (SUM OF LINES 5a, b, AND c) | 514 | 4,356 | 8,416 | 13,286 | 807 | 14,093 | 683 | 5,748 | 1,312 | 7,875 | 15,618 | 2,697 | 1,574 | 2,971 | 8,690 | 77 | 16,009 | 1,575 | 47,295 | 1,164 | 48,459 | 53,664 |
| e. TANK BOTTOMS | 2,607 | 8,543 | 3,564 | 14,714 | 1,116 | 15,830 | 689 | 9,114 | 1,702 | 4,252 | 15,757 | 1,500 | 6,097 | 4,050 | 608 | 123 | 12,378 | 1,732 | 45,697 | 6,758 | 52,455 | *** |
| f. UNAVAILABLE STOCKS[4] | 13 | 748 | 103 | 864 | 0 | 864 | 12 | 1,326 | 0 | 214 | 1,552 | 390 | 529 | 830 | 14 | 0 | 1,763 | 260 | 4,439 | 629 | 5,068 | *** |
| g. TOTAL (SUM OF LINES 5d, e, AND f) | 3,134 | 13,647 | 12,083 | 28,864 | 1,923 | 30,787 | 1,384 | 16,188 | 3,014 | 12,341 | 32,927 | 4,587 | 8,200 | 7,851 | 9,312 | 200 | 30,150 | 3,567 | 97,431 | 8,551 | 105,982 | 117,367 |
| **B. STORAGE CAPACITY ASSIGNED TO CLEAN PRODUCTS:** | | | | | | | | | | | | | | | | | | | | | | |
| 1. SHELL CAPACITY OF TANKAGE[5] | 45,588 | 141,668 | 77,273 | 264,529 | 19,230 | 283,759 | 13,159 | 130,579 | 28,722 | 65,480 | 237,940 | 25,227 | 85,904 | 51,729 | 15,464 | 2,117 | 180,441 | 22,760 | 724,900 | 82,972 | 807,872 | 894,653 |
| 2. PLUS: UNAVAILABLE INVENTORY OUTSIDE OF TANKAGE (LINE A.5d, ABOVE) | 514 | 4,356 | 8,416 | 13,286 | 807 | 14,093 | 683 | 5,748 | 1,312 | 7,875 | 15,618 | 2,697 | 1,574 | 2,971 | 8,690 | 77 | 16,009 | 1,575 | 47,295 | 1,164 | 48,459 | 53,664 |
| 3. SUBTOTAL: TOTAL SYSTEM CAPACITY (SUM OF LINES B.1 AND B.2) | 46,102 | 146,024 | 85,689 | 277,815 | 20,037 | 297,852 | 13,842 | 136,327 | 30,034 | 73,355 | 253,559 | 27,924 | 87,478 | 54,700 | 24,154 | 2,194 | 196,450 | 24,335 | 772,195 | 84,136 | 856,331 | 948,317 |
| 4. LESS: MAXIMUM OPERATING INVENTORY[6] | | | | | | | | | | | | | | | | | | | 624,659 | 66,567 | 691,226 | 765,477 |
| 5. DIFFERENCE[7] (LINE B.3 LESS LINE B.4) | | | | | | | | | | | | | | | | | | | 147,536 | 17,569 | 165,105 | 182,840 |
| 6. MEMO ITEM: UNAVAILABLE STORAGE CAPACITY TANK TOPS AND SAFETY ALLOWANCE[8] | 1,665 | 6,130 | 3,520 | 11,315 | 681 | 11,996 | 605 | 8,373 | 1,726 | 4,105 | 14,809 | 1,501 | 3,896 | 2,233 | 438 | 91 | 9,159 | 1,358 | 36,322 | 3,681 | 40,003 | 44,300 |

*FOR EXPLANATION OF FOOTNOTES, SEE PAGE E-15.*

***Not applicable, N.A.—Not available.

a. Product tables include stocks held at refineries, bulk terminals, and by pipelines, but exclude stocks held at natural gas processing plants.

b. U.S. total data reported to NPC were adjusted according to percentage shown on Line A.2a for the United States.

NATIONAL PETROLEUM COUNCIL
1979 SURVEY OF PETROLEUM STORAGE CAPACITY
AND INVENTORY AVAILABILITY IN THE UNITED STATES

## RESIDUAL FUEL OIL

(Thousands of Barrels)

| INVENTORY AND STORAGE CAPACITY | REFINING DISTRICT | | | | | PAD I TOTAL | REFINING DISTRICT | | | | PAD II TOTAL | REFINING DISTRICT | | | | | PAD III TOTAL | PAD IV (ROCKY MOUNTAIN) | PADS I-IV TOTAL | PAD V (WEST COAST) | UNITED STATES | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | EAST COAST | | | | APPALA-CHIAN #1 | | APPALA-CHIAN #2 | INDIANA, ILLINOIS, KENTUCKY | MINNESOTA, WISCONSIN, N. and S. DAKOTA | OKLAHOMA, KANSAS, MISSOURI | | TEXAS INLAND | TEXAS GULF COAST | LOUISIANA GULF COAST | NORTH LOUISIANA, ARKANSAS | NEW MEXICO | | | | | NPC TOTAL | ADJUSTED NPC TOTAL |
| | NEW ENGLAND | MID ATLANTIC | SOUTH ATLANTIC | TOTAL | | | | | | | | | | | | | | | | | | |
| **MARCH 31, 1978** | | | | | | | | | | | | | | | | | | | | | | |
| **A. RESIDUAL FUEL OIL INVENTORY:** | | | | | | | | | | | | | | | | | | | | | | |
| 1. TOTAL REPORTED BY DOE | N.A. | N.A. | N.A. | 28,102 | 396 | 28,498 | 269 | 5,288 | 684 | 1,162 | 7,403 | 323 | 6,032 | 5,201 | 433 | 401 | 12,390 | 685 | 48,976 | 13,211 | 62,187 | *** |
| 2. TOTAL REPORTED TO NPC | 3,525 | 12,826 | 4,483 | 20,834 | 388 | 21,222 | 265 | 4,052 | 467 | 802 | 5,589 | 236 | 5,337 | 3,417 | 234 | 347 | 9,571 | 610 | 36,992 | 11,634 | 48,626 | 62,187 |
| *a. PERCENTAGE OF LINE A.1* | *N.A.* | *N.A.* | *N.A.* | *74.1* | *98.0* | *74.5* | *99.6* | *76.6* | *68.3* | *69.0* | *75.5* | *73.1* | *88.5* | *65.7* | *54.0* | *86.5* | *77.2* | *89.1* | *75.5* | *88.1* | *78.2* | *** |
| 3. LESS: MINIMUM OPERATING INVENTORY[1] | | | | | | | | | | | | | | | | | | | 35,287 | 5,403 | 40,690 | 52,033 |
| 4. DIFFERENCE[2] (LINE A.2 LESS LINE A.3) | | | | | | | | | | | | | | | | | | | 1,705 | 6,231 | 7,936 | 10,154 |
| 5. MEMO ITEM: COMPLETELY UNAVAILABLE INVENTORY | | | | | | | | | | | | | | | | | | | | | | |
| a. PIPELINE FILL | 3 | 9 | 0 | 12 | 0 | 12 | 0 | 0 | 0 | 0 | 0 | 0 | 3 | 33 | 0 | 0 | 36 | 0 | 48 | 19 | 67 | *** |
| b. IN REFINERY LINES AND OPERATING EQUIPMENT | 0 | 52 | 6 | 58 | 2 | 60 | 1 | 8 | 43 | 4 | 56 | 0 | 25 | 5 | 1 | 1 | 32 | 2 | 150 | 49 | 199 | *** |
| c. IN TRANSIT FROM DOMESTIC SOURCES[3] | 0 | 282 | 0 | 282 | 0 | 282 | 0 | 0 | 41 | 0 | 41 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 323 | 0 | 323 | *** |
| d. SUBTOTAL: UNAVAILABLE INVENTORY OUTSIDE OF TANKAGE (SUM OF LINES 5a, b, AND c) | 3 | 343 | 6 | 352 | 2 | 354 | 1 | 8 | 84 | 4 | 97 | 0 | 28 | 38 | 1 | 1 | 68 | 2 | 521 | 68 | 589 | 753 |
| e. TANK BOTTOMS | 547 | 2,428 | 401 | 3,376 | 48 | 3,424 | 23 | 674 | 107 | 274 | 1,078 | 34 | 740 | 575 | 28 | 23 | 1,400 | 165 | 6,067 | 1,507 | 7,574 | *** |
| f. UNAVAILABLE STOCKS[4] | 0 | 396 | 10 | 406 | 47 | 453 | 8 | 155 | 1 | 78 | 242 | 4 | 64 | 58 | 0 | 0 | 126 | 64 | 885 | 127 | 1,012 | *** |
| g. TOTAL (SUM OF LINES 5d, e, AND f) | 550 | 3,167 | 417 | 4,134 | 97 | 4,231 | 32 | 837 | 192 | 356 | 1,417 | 38 | 832 | 671 | 29 | 24 | 1,594 | 231 | 7,473 | 1,702 | 9,175 | 11,733 |
| **B. STORAGE CAPACITY ASSIGNED TO RESIDUAL FUEL OIL:** | | | | | | | | | | | | | | | | | | | | | | |
| 1. SHELL CAPACITY OF TANKAGE[5] | 9,616 | 34,422 | 9,558 | 53,596 | 1,095 | 54,691 | 877 | 11,961 | 1,450 | 3,578 | 17,866 | 586 | 12,734 | 8,071 | 655 | 445 | 22,491 | 2,512 | 97,560 | 24,093 | 121,653 | 155,566 |
| 2. PLUS: UNAVAILABLE INVENTORY OUTSIDE OF TANKAGE (LINE A.5d, ABOVE) | 3 | 343 | 6 | 352 | 2 | 354 | 1 | 8 | 84 | 4 | 97 | 0 | 28 | 38 | 1 | 1 | 68 | 2 | 523 | 68 | 589 | 753 |
| 3. SUBTOTAL: TOTAL SYSTEM CAPACITY (SUM OF LINES B.1 AND B.2) | 9,619 | 34,765 | 9,564 | 53,948 | 1,097 | 55,045 | 878 | 11,969 | 1,534 | 3,582 | 17,963 | 586 | 12,762 | 8,109 | 656 | 446 | 22,559 | 2,514 | 98,081 | 24,161 | 122,242 | 156,319 |
| 4. LESS: MAXIMUM OPERATING INVENTORY[6] | | | | | | | | | | | | | | | | | | | 86,194 | 21,199 | 107,393 | 137,331 |
| 5. DIFFERENCE[7] (LINE B.3 LESS LINE B.4) | | | | | | | | | | | | | | | | | | | 11,887 | 2,962 | 14,849 | 18,988 |
| 6. MEMO ITEM: UNAVAILABLE STORAGE CAPACITY TANK TOPS AND SAFETY ALLOWANCE[8] | 257 | 1,039 | 237 | 1,533 | 40 | 1,573 | 11 | 965 | 58 | 198 | 1,232 | 30 | 548 | 409 | 45 | 10 | 1,042 | 121 | 3,968 | 775 | 4,743 | 6,065 |
| **SEPTEMBER 30, 1978** | | | | | | | | | | | | | | | | | | | | | | |
| **A. RESIDUAL FUEL OIL INVENTORY:** | | | | | | | | | | | | | | | | | | | | | | |
| 1. TOTAL REPORTED BY DOE | N.A. | N.A. | N.A. | 40,097 | 557 | 40,654 | 261 | 7,384 | 1,002 | 1,712 | 10,359 | 281 | 7,568 | 6,785 | 857 | 309 | 15,800 | 1,126 | 67,939 | 13,247 | 81,186 | *** |
| 2. TOTAL REPORTED TO NPC | 6,345 | 17,691 | 4,952 | 28,988 | 632 | 29,620 | 261 | 5,360 | 821 | 986 | 7,428 | 210 | 6,657 | 3,495 | 493 | 254 | 11,109 | 857 | 49,014 | 11,738 | 60,752 | 81,186 |
| *a. PERCENTAGE OF LINE A.1* | *N.A.* | *N.A.* | *N.A.* | *72.3* | *113.5* | *72.8* | *100.0* | *72.6* | *81.9* | *57.6* | *71.7* | *74.7* | *88.0* | *51.5* | *57.5* | *82.2* | *70.3* | *76.1* | *72.1* | *88.6* | *74.8* | *** |
| 3. LESS: MINIMUM OPERATING INVENTORY[1] | | | | | | | | | | | | | | | | | | | 37,139 | 5,308 | 42,447 | 56,747 |
| 4. DIFFERENCE[2] (LINE A.2 LESS LINE A.3) | | | | | | | | | | | | | | | | | | | 11,875 | 6,430 | 18,305 | 24,439 |
| 5. MEMO ITEM: COMPLETELY UNAVAILABLE INVENTORY | | | | | | | | | | | | | | | | | | | | | | |
| a. PIPELINE FILL | 3 | 9 | 0 | 12 | 0 | 12 | 0 | 0 | 0 | 0 | 0 | 0 | 3 | 33 | 0 | 0 | 36 | 0 | 48 | 22 | 70 | *** |
| b. IN REFINERY LINES AND OPERATING EQUIPMENT | 0 | 48 | 6 | 54 | 2 | 56 | 1 | 29 | 43 | 4 | 77 | 0 | 25 | 6 | 1 | 1 | 33 | 2 | 168 | 49 | 217 | *** |
| c. IN TRANSIT FROM DOMESTIC SOURCES[3] | 0 | 288 | 0 | 288 | 0 | 288 | 0 | 0 | 31 | 0 | 31 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 319 | 0 | 319 | *** |
| d. SUBTOTAL: UNAVAILABLE INVENTORY OUTSIDE OF TANKAGE (SUM OF LINES 5a, b, AND c) | 3 | 345 | 6 | 354 | 2 | 356 | 1 | 29 | 74 | 4 | 108 | 0 | 28 | 39 | 1 | 1 | 69 | 2 | 535 | 71 | 606 | 810 |
| e. TANK BOTTOMS | 549 | 2,406 | 401 | 3,356 | 44 | 3,400 | 26 | 640 | 108 | 263 | 1,037 | 34 | 708 | 576 | 30 | 23 | 1,371 | 160 | 5,968 | 1,515 | 7,483 | *** |
| f. UNAVAILABLE STOCKS[4] | 0 | 447 | 10 | 457 | 118 | 575 | 6 | 174 | 11 | 50 | 241 | 4 | 64 | 58 | 0 | 0 | 126 | 61 | 1,003 | 124 | 1,127 | *** |
| g. TOTAL (SUM OF LINES 5d, e, AND f) | 552 | 3,198 | 417 | 4,167 | 164 | 4,331 | 33 | 843 | 193 | 317 | 1,386 | 38 | 800 | 673 | 31 | 24 | 1,566 | 223 | 7506 | 1,710 | 9,216 | 12,321 |
| **B. STORAGE CAPACITY ASSIGNED TO RESIDUAL FUEL OIL:** | | | | | | | | | | | | | | | | | | | | | | |
| 1. SHELL CAPACITY OF TANKAGE[5] | 9,649 | 34,157 | 9,489 | 53,295 | 1,076 | 54,371 | 927 | 10,683 | 1,505 | 3,873 | 16,988 | 587 | 13,618 | 8,121 | 736 | 445 | 23,507 | 2,448 | 97,314 | 24,081 | 121,395 | 162,294 |
| 2. PLUS: UNAVAILABLE INVENTORY OUTSIDE OF TANKAGE (LINE A.5d, ABOVE) | 3 | 345 | 6 | 354 | 2 | 356 | 1 | 29 | 74 | 4 | 108 | 0 | 28 | 39 | 1 | 1 | 69 | 2 | 535 | 71 | 606 | 810 |
| 3. SUBTOTAL: TOTAL SYSTEM CAPACITY (SUM OF LINES B.1 AND B.2) | 9,652 | 34,502 | 9,495 | 53,649 | 1,078 | 54,727 | 928 | 10,712 | 1,579 | 3,877 | 17,096 | 587 | 13,646 | 8,160 | 737 | 446 | 23,576 | 2,450 | 97,849 | 24,152 | 122,001 | 163,104 |
| 4. LESS: MAXIMUM OPERATING INVENTORY[6] | | | | | | | | | | | | | | | | | | | 86,241 | 21,063 | 107,304 | 143,455 |
| 5. DIFFERENCE[7] (LINE B.3 LESS LINE B.4) | | | | | | | | | | | | | | | | | | | 11,608 | 3,089 | 14,697 | 19,649 |
| 6. MEMO ITEM: UNAVAILABLE STORAGE CAPACITY TANK TOPS AND SAFETY ALLOWANCE[8] | 257 | 1,039 | 237 | 1,533 | 49 | 1,582 | 11 | 791 | 59 | 172 | 1,033 | 30 | 540 | 410 | 53 | 10 | 1,043 | 128 | 3,786 | 811 | 4,597 | 6,146 |

*FOR EXPLANATION OF FOOTNOTES, SEE PAGE E-15.*

****Not applicable; N.A.—Not available.*

*a. Product tables include stocks held at refineries, bulk terminals, and by pipelines, but exclude stocks held at natural gas processing plants.*

*b. U.S. total data reported to NPC were adjusted according to percentage shown on Line A.2a for the United States.*

## NATIONAL PETROLEUM COUNCIL
### 1979 SURVEY OF PETROLEUM STORAGE CAPACITY AND INVENTORY AVAILABILITY IN THE UNITED STATES

### ESTIMATED MINIMUM AND MAXIMUM OPERATING INVENTORIES
### FOR THE ENTIRE U.S. PETROLEUM INDUSTRY
**(Millions of Barrels)**

| | MINIMUM | | | | | | MAXIMUM | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | MARCH 31, 1978 | | | SEPTEMBER 30, 1978 | | | MARCH 31, 1978 | | | SEPTEMBER 30, 1978 | | |
| | PADS I-IV | PAD V | U.S. TOTAL | PADS I-IV | PAD V | U.S. TOTAL | PADS I-IV | PAD V | U.S. TOTAL | PADS I-IV | PAD V | U.S. TOTAL |
| **CRUDE OIL:** | | | | | | | | | | | | |
| HIGHEST ESTIMATE | | | | 250 | 50 | 313 | | | | 320 | 80 | 406 |
| LOWEST ESTIMATE | | | | 230 | 40 | 275 | | | | 287 | 65 | 354 |
| **AVERAGE** | | | | **240** | **48** | **292** | | | | **305** | **70** | **381** |
| NO. OF COS. REPORTING | | | | 4 | 4 | 7 | | | | 4 | 4 | 5 |
| **GASOLINE (MOTOR AND AVIATION):** | | | | | | | | | | | | |
| HIGHEST ESTIMATE | 245 | 30 | 275 | 195 | 25 | 220 | 245 | 35 | 367 | 245 | 33 | 360 |
| LOWEST ESTIMATE | 215 | 20 | 210 | 185 | 22 | 207 | 260 | 32 | 278 | 245 | 33 | 278 |
| **AVERAGE** | **230** | **25** | **241** | **188** | **24** | **212** | **250** | **34** | **300** | **245** | **33** | **319** |
| NO. OF COS. REPORTING | 2 | 2 | 3 | 5 | 5 | 7 | 4 | 4 | 5 | 1 | 1 | 2 |
| **KEROSINE, INCLUDES KERO-TYPE JET FUEL:** | | | | | | | | | | | | |
| HIGHEST ESTIMATE | 33 | 7 | 40 | 42 | 8 | 50 | 42 | 8 | 78 | 50 | 10 | 77 |
| LOWEST ESTIMATE | 25 | 5 | 30 | 35 | 5 | 37 | 42 | 8 | 50 | 41 | 8 | 50 |
| **AVERAGE** | **29** | **6** | **35** | **39** | **6** | **42** | **42** | **8** | **64** | **46** | **9** | **58** |
| NO. OF COS. REPORTING | 5 | 5 | 7 | 2 | 2 | 3 | 1 | 1 | 2 | 4 | 4 | 5 |
| **DISTILLATE FUEL OIL, INCL. NO. 4 FUEL OIL:** | | | | | | | | | | | | |
| HIGHEST ESTIMATE | 124 | 11 | 135 | 220 | 20 | 240 | 256 | 15 | 301 | 260 | 20 | 319 |
| LOWEST ESTIMATE | 110 | 10 | 115 | 200 | 10 | 125 | 256 | 15 | 271 | 256 | 15 | 271 |
| **AVERAGE** | **116** | **10** | **123** | **210** | **15** | **192** | **256** | **15** | **286** | **259** | **16** | **284** |
| NO. OF COS. REPORTING | 5 | 5 | 7 | 2 | 2 | 3 | 1 | 1 | 2 | 4 | 4 | 5 |
| **RESIDUAL FUEL OIL:** | | | | | | | | | | | | |
| HIGHEST ESTIMATE | 60 | 12 | 70 | 80 | 15 | 95 | 81 | 16 | 127 | 85 | 25 | 127 |
| LOWEST ESTIMATE | 45 | 10 | 55 | 60 | 10 | 70 | 81 | 16 | 97 | 81 | 16 | 97 |
| **AVERAGE** | **50** | **10** | **61** | **70** | **13** | **78** | **81** | **16** | **112** | **84** | **19** | **107** |
| NO. OF COS. REPORTING | 5 | 5 | 7 | 2 | 2 | 3 | 1 | 1 | 2 | 4 | 4 | 5 |

*NOTE: The sum of PADs I-IV and PAD V does not equal U.S. Total since some companies reported for U.S. only.*

## NATIONAL PETROLEUM COUNCIL
### 1979 SURVEY OF PETROLEUM STORAGE CAPACITY AND INVENTORY AVAILABILITY IN THE UNITED STATES

### TANKAGE UNDER CONSTRUCTION
### AS OF SEPTEMBER 30, 1978
### (Thousands of Barrels)

| REFINING AND PAD DISTRICTS | CRUDE OIL | GASOLINE | KEROSINE | DISTILLATE FUEL OIL | RESIDUAL FUEL OIL |
|---|---|---|---|---|---|
| EAST COAST: | | | | | |
| NEW ENGLAND | 0 | 0 | 0 | 0 | 0 |
| MID-ATLANTIC | 465 | 400 | 0 | 388 | 0 |
| SOUTH ATLANTIC | 0 | 160 | 50 | 130 | 0 |
| TOTAL | 465 | 560 | 50 | 518 | 0 |
| APPALACHIAN NO. 1 | 130 | 0 | 35 | 243 | 0 |
| TOTAL PAD I | 595 | 560 | 85 | 761 | 0 |
| APPALACHIAN NO. 2 | 0 | 0 | 0 | 0 | 0 |
| INDIANA, ILLINOIS, KENTUCKY | 1,110 | 570 | 0 | 1,146 | 100 |
| MINNESOTA, WISCONSIN, N. and S. DAKOTA | 0 | 195 | 0 | 0 | 0 |
| OKLAHOMA, KANSAS, MISSOURI | 670 | 130 | 0 | 0 | 0 |
| TOTAL PAD II | 1,780 | 895 | 0 | 1,146 | 100 |
| TEXAS INLAND | 240 | 114 | 0 | 0 | 0 |
| TEXAS GULF COAST | 4,970 | 603 | 120 | 5 | 200 |
| LOUISIANA GULF COAST | 2,145 | 2,473 | 115 | 1,213 | 195 |
| NORTH LOUISIANA, ARKANSAS | 30 | 80 | 0 | 0 | 0 |
| NEW MEXICO | 158 | 0 | 0 | 0 | 0 |
| TOTAL PAD III | 7,543 | 3,269 | 235 | 1,218 | 395 |
| PAD IV, ROCKY MOUNTAIN | 75 | 229 | 0 | 45 | 156 |
| TOTAL PADS I-IV | 9,993 | 4,953 | 320 | 3,170 | 651 |
| PAD V, WEST COAST | 1,818 | 250 | 20 | 0 | 193 |
| TOTAL U.S. | 11,811 | 5,203 | 340 | 3,170 | 844 |

FOOTNOTES

1. Includes but is not limited to completely unavailable inventories. This is the inventory level below which operating problems and shortages would begin to appear in the system. For example, this includes inventory required to meet minimum pipeline tenders, supply batch operations, meet customer requirements, etc.

2. A positive difference would indicate that there was oil in storage above that needed to meet minimum operating requirements. A negative difference would indicate that inventories were below the minimum level, and hence, operating problems were occurring.

3. Includes all unavailable quantities in transit by truck, tank car, barge, or tanker from domestic sources only.

4. Includes quantities set aside as plant fuel or pipeline prime mover fuel. Also includes crude oil which must be held for blocked operations or for blending with other crude oils for normal processing. It may also include that portion of unblended finished oils which would be left over were the different components blended as far as possible in accordance with existing formulas.

5. Includes capacity of swing tankage. However, swing tankage is included in only one product or crude oil category for each date.

6. The maximum quantity that can be stored in the assigned tankage while still maintaining a workable operating system.

7. In addition to the unavailable capacity, this difference includes the operating space needed to maintain a workable operating system. For example, this includes space needed at various places throughout the system to receive batch deliveries from pipelines and tankers, to hold product until a customer can make a lifting, etc.

8. The portion of the shell capacity at the top of the tank that is not utilized for oil storage. This includes the safety allowance which is needed to protect personnel and property from damage that could result from thermal expansion and/or overfilling the tanks.

# GLOSSARY

aviation gasoline -- all special grades of gasoline for use in aviation reciprocating engines, as given in ASTM Specification D910. Includes all refinery products within the gasoline range that are to be marketed straight or in blends as aviation gasoline without further processing; i.e., any refinery operation except mechanical blending. Also includes finished components in the gasoline range which will be used for blending or compounding into aviation gasoline.

barrel -- the standard unit of measurement of liquids in the petroleum industry, containing 42 U.S. standard gallons at 60°F.

basic sediment and water (BS&W) -- bottoms, sediment, and water that collect at the bottom of storage tanks.

bulk plants -- nonconsumer facilities used for storage and/or marketing of petroleum products which have total storage capacity of less than 50,000 barrels and receive petroleum product by tank car or tank truck.

bulk terminals -- nonconsumer facilities used for storage and/or marketing of petroleum products which have total storage capacity of 50,000 barrels or more or receive their petroleum products by barge, tanker, or pipeline.

clean products -- gasoline (motor and aviation), kerosine, jet fuel, and distillate fuel oil.

"completely unavailable" inventory -- a term generally used in the petroleum industry; includes inventory in tank bottoms, pipelines, refinery pipelines and operating equipment, quantities set aside as plant fuel or pipeline prime mover fuel, and oil in transit by truck, tank car, barge, and tanker from domestic sources. "Completely unavailable" inventory also includes crude oil which must be held for blocked operations or for blending with other crude oils for normal processing. They may also include that portion of unblended finished oils which would be left over if the different components were blended as far as possible in accordance with existing formulas. Accordingly, the total quantity of unfinished oils should not be considered unavailable but only that which would be left over after blending as far as possible to specifications.

crude oil -- technically defined as a mixture of hydrocarbons that exists in natural underground reservoirs and remains liquid at atmospheric pressure after passing through surface separating facilities. Crude oil is statistically defined to include also lease condensate (see definition) and small

amounts of nonhydrocarbons produced with the oil. Topped crude oil, unfinished oils, and natural gas liquids produced at natural gas processing plants and mixed with crude oil are excluded.

distillate (general) -- a general classification for one of the petroleum fractions which, when produced in conventional distillation operations, has a boiling range of from 10 percent point at 300°F to 90 percent point at 675°F. Included are products known as No. 1 and No. 2 heating oil conforming to ASTM Specification D396 and diesel fuel conforming to ASTM Specification D975 for No. 1-D and No. 2-D.

distillate (No. 4 fuel oil) -- a fuel oil for commercial burner installations not equipped with preheating facilities. Extensively used in industrial plants. This grade is a blend of distillate fuel oil and residual fuel oil stocks which conforms to ASTM Specification D396 or Federal Specification VV-F-815C for this grade. Has kinematic viscosities of between 5.8 and 26.4 percent at 100°F.

gasoline -- refers to both motor gasoline and aviation gasoline.

in-transit inventory -- inventory that is being transported between domestic storage locations at a given point in time.

inventories -- for purposes of this study, inventories include liquid barrels of crude oil and certain refined petroleum products in the custody of a respondent and within the customs territory of the United States that are stored in refineries or bulk terminals, maintained in pipelines or operating equipment, or in transit by water or overland.

kerosine (non-aviation use) -- a petroleum distillate in the 300-550°F boiling range and generally having a flash point of higher than 100°F by ASTM Method D56, a gravity range of from 40° to 46°API, and a burning point in the range of 150°F to 175°F. It is a clean burning product suitable for use as an illuminant when burned in wick lamps. Includes grades of kerosine called "range oil" having properties similar to No. 1 fuel oil, but with a gravity of about 43°API and an end point of 625°F. Used in space heaters, cook stoves, and water heaters.

kerosine jet fuel (Jet A) -- a quality kerosine product with an average gravity of 40.7°API, a 10 percent distillation temperature of 400°F, and an end point of 550°F covered by ASTM Specification D1655 and Military Specification MIL-T-5624J (Grade JP-5). Used primarily as fuel for commercial turbojet and turboprop aircraft engines. A relatively low freezing point distillate of the kerosine type.

lease condensate (included in crude oil statistics) -- a natural gas liquid recovered from gas well gas (associated and non-associated) in lease separators or field facilities. Lease condensate consists primarily of pentanes and heavier hydrocarbons. Volumes are reported in terms of barrels of 42 U.S. gallons, at atmospheric pressure, and corrected to 60°F.

lease stocks -- crude oil stocks held by crude oil producers on producing properties.

maximum operating inventory -- the maximum quantity that could be stored in the assigned tankage (plus inventories maintained outside of storage facilities) while still maintaining a workable operating system but in addition to that required for normal operations.

minimum operating inventory -- the inventory level below which operating problems and shortages would begin to appear in a defined distribution system. Includes "completely unavailable" inventory as well as inventory required to maintain normal operations; does not include seasonal inventory.

motor gasoline -- a complex mixture of relatively volatile hydrocarbons, with or without small quantities of additives, which have been blended to form a fuel suitable for use in spark ignition engines. Includes all refinery products listed in ASTM Specification D439, Federal Specification VV-G-766, and those to be marketed as motor gasoline without further processing; i.e., any refinery operation except mechanical blending. Also includes finished components in the gasoline range which will be used for blending or compounding into finished gasoline.

Petroleum Administration for Defense (PAD) districts -- a geographic aggregation of the 50 states and the District of Columbia into five districts originally designed by the Petroleum Administration for Defense in 1950 for purposes of administration.

pipeline fill -- inventory located between the shipping and receiving tanks on a pipeline system.

pipeline operations -- in the context of Questionnaire 1, refers to either crude oil inventory in trunklines and their terminals or storage assigned to crude oil at pipeline or bulk terminals.

primary distribution system -- see Appendix C.

refinery operations -- in the context of Questionnaire 1, refers to either crude oil inventory or storage capacity assigned to crude oil within refineries.

refining districts (Bureau of Mines) -- a geographic aggregation of the 50 states and the District of Columbia into 15 districts for statistical purposes.

residual fuel -- topped crude of refinery operations. Includes No. 5 and No. 6 fuel oils as defined in ASTM Specification D396 and Federal Specification VV-F-815C; heavy diesel oil as given in ASTM Specification D975 for No. 4-D; Navy Special fuel oil in Military Specification MIL 895E, including Amendment 2; and Bunker C fuel oil.

seasonal inventory -- inventory that is not immediately needed to support current demand levels, but is maintained in anticipation of higher (seasonal) demand levels that cannot be met from then-current manufacturing or transportation capabilities. Seasonal inventories need not be stored in swing tankage.

secondary distribution systems -- see Appendix C.

shell capacity of tankage -- the design capacity of the tank.

stocks -- see definition of inventories.

swing tankage-- tankage that is used to store different products at different times of the year depending upon their seasonal demand levels.

tank bottoms -- inventory that falls below the normal suction line of the tank. For floating roof tanks, the amount required to keep the legs of the roof from touching the tank bottom. The inventory in tank bottoms (including BS&W) is unavailable.

tank tops -- top portion of a tank that is not available to store inventory but is required for design or safety considerations; e.g., to allow for thermal expansion.

tankage under construction -- storage for which steel erection has commenced.

total system capacity -- the sum of tank shell capacity, earthen/concrete reservoirs, slate pit storage, and unavailable inventory outside of tankage (defined as pipeline fill, inventory in refinery lines, operating equipment, and in-transit from domestic sources). In the case of crude oil inventories, producers' lease tankage is also included in total system capacity.

unfinished oils -- mixture or combination of petroleum oils or any components thereof which are to be further processed.