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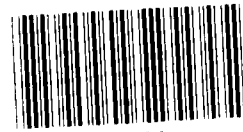
REPORT BY THE U.S.

General Accounting Office

Status Of Strategic Petroleum Reserve Activities As Of June 30, 1984

The Department of Energy reported that the Strategic Petroleum Reserve contained about 413.7 million barrels of oil on June 30, 1984. During the third quarter of fiscal year 1984, about 21.9 million barrels of oil were added for a fill rate of about 241,000 barrels per day.

This report discusses the progress being made in filling, developing, and operating the Reserve. It also discusses other events and activities affecting the Reserve that occurred during the third quarter of fiscal year 1984.



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UNITED STATES GENERAL ACCOUNTING OFFICE
WASHINGTON, D C 20548

RE SOURCE, COMMUNITY
AND ECONOMIC DEVELOPMENT
DIVISION

B-208196

The Honorable James A. McClure
Chairman, Committee on Energy and
Natural Resources
United States Senate

The Honorable J. Bennett Johnston
Ranking Minority Member, Committee
on Energy and Natural Resources
United States Senate

On March 25, 1982, the Senate Committee on Energy and Natural Resources requested that we report on a quarterly basis, through fiscal year 1985, on the Department of Energy's (DOE's) progress in filling the Strategic Petroleum Reserve (SPR) and in complying with the requirements of applicable law. This is the ninth quarterly report. A list of our prior reports is contained in table 11 in appendix II.

This report discusses events and activities related to the administration's progress in filling, developing, and operating the SPR during the third quarter of fiscal year 1984. Specifically, it notes that during the quarter:

- DOE announced that, in response to the planned conversion of the Seaway and Texoma crude oil pipelines to carry natural gas and other petroleum market changes, it is pursuing improvements to the SPR oil distribution system. The proposed projects would connect SPR storage sites by pipeline to two Gulf Coast refining centers and would give the sites access to four more marine terminals.
- DOE added about 21.9 million barrels of oil at an average fill rate of 241,000 barrels per day, bringing the total oil in the SPR to about 413.7 million barrels. DOE paid about \$555 million for oil acquisition and transportation, had unpaid obligations of about \$1 billion, and had about \$243 million in unobligated funds available for additional oil purchases.
- Electrical equipment malfunctions at the West Hackberry SPR storage site shut down the storage cavern development program for about 23 days.

--Peat, Marwick, Mitchell and Co. issued its report on SPR internal accounting control and administrative control procedures for oil receipts. The report concluded that, except for a material weakness caused by accounting records that were not supported by periodic physical inventories of the oil in storage, DOE's procedures were adequate.

--The DOE Oak Ridge Operations Office continued to move toward consolidating the responsibilities of several current SPR contractors. In April 1984, DOE issued a request for proposal for a management, operations, and maintenance contractor. The solicitation closes on July 18, 1984, and DOE expects to select the contractor in December 1984.

This report also presents information on other SPR issues. These include (1) the appointments of the new manager and deputy manager for the SPR Project Management Office, (2) the SPR Project Management Office's efforts to implement the recommendations of the Oak Ridge Operations Office's October 1983 SPR baseline assessment report and March 1984 report on allegations about mismanagement and misconduct within the SPR program, and (3) the backlog of maintenance work at SPR facilities. (See app. I for more details and app. II for supporting tables and figures.)

OBJECTIVES, SCOPE, AND METHODOLOGY

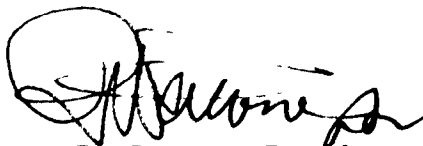
This report provides information on SPR activities which occurred during the quarter ending June 30, 1984. The report is necessarily limited, because of the time allowed, to providing primarily statistical information and highlights of major activities that occurred during the period covered. We reviewed DOE program documents, publications, and studies, and we interviewed DOE managers and operating personnel responsible for planning and managing activities associated with the development and operations of the SPR facilities. We also interviewed employees from the DOE contractors that carry out most project activities. We obtained information on the availability and use of SPR funds from both DOE and the Defense Fuel Supply Center, DOE's purchasing agent for most of the SPR oil.

Our review was performed in accordance with generally accepted government auditing standards, except that we did not verify the volumes or quality of oil that DOE received nor the available capacity of SPR storage facilities. This is because the effort that would be required to do so was beyond the scope of work for this report.

We did not obtain official agency comments because of the required time frame for issuing this report. However, we provided DOE and Defense Fuel Supply Center program officials with a draft of this report, discussed its factual accuracy with them, and made appropriate revisions.

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As arranged with your office, we plan no further distribution of this report until 7 days after the issue date, unless you publicly announce its contents earlier. At that time, we will provide copies to the Secretary of Energy and other interested parties and make copies available to the public upon request.

A handwritten signature in black ink, appearing to read "J. Dexter Peach". The signature is stylized and cursive, with a large initial "J" and "P".

J. Dexter Peach
Director

C o n t e n t s

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ABBREVIATIONS

DFSC	Defense Fuel Supply Center
DOE	Department of Energy
GAO	General Accounting Office
PEMEX	Petroleos Mexicanos
POSSI	Petroleum Operations and Support Services, Inc.
SPR	Strategic Petroleum Reserve

STATUS OF STRATEGIC PETROLEUMRESERVE ACTIVITIES AS OF JUNE 30, 1984

The Energy Policy and Conservation Act (Public Law 94-163, Dec. 22, 1975) authorized the creation of a Strategic Petroleum Reserve (SPR) to store up to one billion barrels of oil. To meet the act's goals, the Department of Energy (DOE) is implementing a three-phase plan to store 750 million barrels of oil. Phase I of this plan, the storage of about 260 million barrels of oil, is complete. It consisted of acquiring and modifying for oil storage existing caverns in salt deposits at Bryan Mound, Texas; Bayou Choctaw, Sulphur Mines, and West Hackberry, Louisiana; and a salt mine at Weeks Island, Louisiana, as well as constructing a marine terminal at St. James, Louisiana. Phase II is scheduled for completion in 1987. It involves creating new caverns through a leaching program at three of the phase I sites to increase SPR capacity to about 550 million barrels. The leaching program entails pumping fresh water into salt deposits and removing the resultant brine. DOE injects oil into the top of the cavern as the leaching process creates the storage capacity. Phase III, which is scheduled for completion in 1990, will create additional capacity to reach the 750 million barrel goal by expanding three existing storage sites and developing a new site at Big Hill, Texas. Because of the time needed to develop capacity, activities associated with phase II and phase III overlap.

The SPR storage sites are connected by pipeline to three marine terminals, as discussed below and shown in figure 1 on p. 14, for oil fill and for oil drawdown and distribution during an oil supply disruption:

- Seaway complex: the Bryan Mound storage site is connected to Seaway Pipeline, Inc.'s terminal in Freeport, Texas.
- Texoma complex: the West Hackberry and Sulphur Mines storage sites are connected and the Big Hill storage site will be connected to Sun Oil Co.'s terminal in Nederland, Texas.
- Capline complex: the Weeks Island and Bayou Choctaw storage sites are connected to DOE's St. James terminal.

In June 1983, DOE reorganized the SPR project management structure. Responsibility for project direction was transferred from the Project Management Office (Project Office) in New Orleans, Louisiana, to the Oak Ridge Operations Office (Operations Office) in Oak Ridge, Tennessee.

This report discusses activities during the quarter ending June 30, 1984, that affect the SPR, including (1) DOE's efforts to improve the SPR oil distribution system, (2) the activities associated with adding 21.9 million barrels of oil to the SPR during the quarter and the status of the SPR oil acquisition and transportation account, (3) the cavern leaching program at the

SPR storage sites, (4) the Peat, Marwick, Mitchell and Co. report on the SPR oil accountability controls, and (5) the Operations Office's effort to consolidate the responsibilities of several current SPR contractors. This report also provides information about the appointments of the new Project Office manager and deputy manager, implementation of the recommendations made in the Operations Office's baseline report and report on allegations about mismanagement or misconduct within the SPR program, and DOE's efforts to reduce the backlog of maintenance work at the SPR facilities. Appendix II presents supporting tables and figures.

SPR OIL DISTRIBUTION

DOE has established SPR oil drawdown and distribution criteria for each phase and each storage complex to respond to an oil supply disruption. (See table 1 on p. 15.) Since the completion of phase I in fiscal year 1982, the SPR design drawdown rate has been 1.7 million barrels per day. Upon completion of phase II in 1987, the drawdown rate is scheduled to be 3.5 million barrels per day. Upon completion of phase III in 1990, the drawdown rate is scheduled to be 4.5 million barrels per day.

In our last quarterly report,¹ we discussed the sale of the Seaway pipeline and the conditional sale of the Texoma pipeline. (These pipelines carried crude oil from Freeport and Nederland, Texas, marine terminals, respectively, to refineries in the Midwest.) The new owners plan to convert the pipelines to transmit natural gas from Oklahoma to the Gulf Coast.

DOE had planned to use these pipelines to distribute SPR oil during a supply disruption. In response to Seaway Pipeline, Inc.'s announcement in the summer of 1983 that it intended to sell its pipeline and marine terminal, DOE initiated an internal study of the SPR oil distribution system. DOE also requested the National Petroleum Council to assess the SPR oil drawdown and distribution system. The council, which plans to release its final report in December 1984, will assess SPR facilities' drawdown capability, the oil distribution system, marine transportation, and oil refinery industry trends.

In May 1984, DOE announced that, based on its internal analysis, it is considering the following three projects at a cost of about \$84 million (in 1984 dollars) to address future marine terminal and oil distribution constraints:

- Construction of a 46-mile pipeline from the Bryan Mound storage site to refineries and a marine terminal in the Texas City, Baytown, and Houston, Texas, area and connection of the Bryan Mound site to a marine terminal at Freeport, Texas.

¹Status of Strategic Petroleum Reserve Activities as of March 31, 1984 (GAO/RCED-84-148, Apr. 13, 1984).

- Three piping and manifolding modifications to the Sun Oil Co. marine terminal at Nederland, Texas, and construction of a 4-mile pipeline to connect the Big Hill storage site to another marine terminal in the Nederland/Beaumont area.
- Construction of a 9-mile pipeline from the West Hackberry storage site to two Lake Charles, Louisiana, refineries and marine terminals.

Pipeline and proposed marine terminal sales

On May 1, 1984, Phillips Petroleum Company took title to the Seaway pipeline. The pipeline has been emptied of oil and filled with water in preparation for carrying natural gas. Phillips plans to begin using the Seaway pipeline to transmit intrastate natural gas by December 1984.²

Houston Natural Gas Corporation delayed the closing date for the sale of the Texoma pipeline by about a month until early August 1984. On June 29, 1984, the Texoma Pipeline Co.'s shareholders entered into a plan of liquidation and dissolution. Texoma is transporting only oil that it had previously contracted to carry. After this oil has entered the pipeline, Texoma will fill the pipeline with water in preparation for conversion to carry natural gas.

On June 8, 1984, Seaway Pipeline, Inc., offered its marine terminal and tank farm at Freeport, Texas, for sale for a second time.³ Seaway Pipeline will close the bidding on July 13, 1984, and plans to review the bids at the July 17, 1984, meeting of its board of directors. DOE's contract for using the Seaway marine terminal extends through 1986.

DOE improvements to the distribution system

DOE's proposed projects are designed to improve the oil distribution capability of the SPR Seaway and Texoma complexes, which were affected by the pipeline sales. DOE also is considering improvements to the SPR Capline complex's oil distribution system, but as a separate exercise. DOE estimates that the projects will enable the distribution rate to increase from the current 2.1 million barrels per day (for a 90-day drawdown) to 3.5 million barrels per day at the end of phase II and 4 million barrels per day for the 750-million-barrel SPR. DOE projects

²Phillips intends to use the pipeline for interstate transmission once it has received Federal Energy Regulatory Commission approval.

³Seaway Pipeline attempted unsuccessfully to sell these facilities with its pipeline in the fall of 1983.

that, if no changes are made to the existing SPR distribution systems, the future distribution rate would be limited to 2.4 million barrels per day.

The improvements will expand the SPR's capability to distribute oil to refineries in the Gulf Coast and increase the number of marine terminals that can be used for SPR oil distribution from three to seven. Unlike the Seaway and Texoma pipelines, however, the improvements will not provide direct access to Midwest refineries. In its assessment of alternatives to improve the SPR distribution system, DOE noted that crude oil imports to the Midwest had dropped from 1.1 million barrels per day in 1980 to 500,000 barrels per day in 1983. Also, operable refining capacity in the Midwest dropped from 4.3 million barrels per day as of January 1, 1980, to 3.6 million barrels per day as of January 1, 1983. In contrast, Gulf Coast refineries refined 1.7 million barrels per day of imported crude oil in 1983, and the Gulf Coast operable refining capacity was 8 million barrels per day as of January 1, 1983.

DOE plans to fund preliminary planning work on the distribution improvements during fiscal year 1984 from \$2.8 million of phase III architecture and engineering funds. (These funds remain available because the cost of these activities was less than the budgeted amount.) DOE expects to submit an amendment letter to the Congress that would make fiscal year 1985 funds available. DOE would then consider additional funding in the fiscal year 1986 budget.

Seaway complex

Currently, DOE can distribute SPR oil from the Bryan Mound storage site only through the Seaway marine terminal and by pipeline to a local refinery. To provide a substantially larger outlet for the Bryan Mound site, DOE has proposed to build a 42-inch pipeline capable of carrying one million barrels per day to the Texas City/Baytown/Houston area. According to Program Office personnel, this area has eight refineries with a total capacity of 1.8 million barrels per day. DOE also has proposed to connect the Bryan Mound site to another Freeport marine terminal. DOE estimates that the Seaway complex improvements will cost \$62 million (in 1984 dollars).

DOE considered upgrading the Seaway terminal by increasing from one to three the number of docks that could be used simultaneously for SPR oil distribution. However, modifications to the Seaway terminal and connection with the Phillips terminal would increase current gross throughput capability⁴ from 387,000

⁴Throughput capability, a terminal's ability to move oil in this case from an SPR pipeline to oil tankers or another pipeline, can be limited by physical constraints, such as pipeline sizes and manifold configurations, or by operating constraints, such as moving tankers in and out of the docks.

barrels per day to only 840,000 barrels per day. The pipeline connection to the Houston/Baytown/Texas City area would increase the gross throughput capability to 1.3 million barrels per day. (DOE estimates the effective throughput capability, allowing for some flexibility, would be 1.1 million barrels per day.)

On June 8, 1984, the Program Office issued a management directive to the Operations Office to proceed with environmental planning, engineering design, and land acquisition activities associated with the Seaway complex improvements. The Program Office requested high priority for this project so that it will be completed by the end of fiscal year 1986. This is when the phase II/III drawdown and distribution criterion of 1.1 million barrels per day for the Bryan Mound site is scheduled to be achieved.

Texoma complex

To adjust to oil market changes in the Texoma complex area, including the sale of the Texoma pipeline, DOE is pursuing modifications to the Sun Oil Co. marine terminal, a pipeline connection to another local marine terminal, and a pipeline connection to two Lake Charles refineries and marine terminals. DOE estimates that these improvements will increase the gross throughput capability of the Texoma complex from 1.1 million barrels per day to 2.4 million barrels per day. (The effective throughput capability would be 2 million barrels per day.) DOE estimates that the improvements will cost \$22 million (in 1984 dollars).

On June 25, 1984, the Program Office issued a management directive to the Operations Office to proceed with environmental planning, engineering design, and land acquisition activities associated with the Texoma complex projects. The Program Office requested high priority so that the projects will be completed by the end of fiscal year 1987, when the West Hackberry storage site is scheduled to complete phase II cavern development and oil fill.

Capline complex

DOE is also considering distribution improvements for the Weeks Island and Bayou Choctaw storage sites. These sites are connected by the Capline pipeline to the Midwest and by the St. James terminal to East Coast and Gulf Coast refineries. DOE stated that, because the current throughput capability of 880,000 barrels per day is near the phase III design criterion of 1,070,000 barrels per day, it will postpone making a decision about improvements to this system. One alternative that DOE is considering is to renegotiate contract terms with Locap Inc., whose pipeline can supply the Capline pipeline and local refiners. (The current terms require SPR oil to be moved into the St. James storage tanks before being delivered to Locap.)

SPR OIL FILL AND OIL ACQUISITION FUNDING

DOE reported that about 21.9 million barrels of oil were added to the SPR during the quarter ending June 30, 1984, for an average fill rate of about 241,000 barrels per day. This brought the total SPR inventory to about 413.7 million barrels as of June 30, 1984. Figures 2 and 3 and tables 2 through 7 on pages 16-23 provide further information on the SPR oil acquisition and fill activities.

About 6.2 million barrels, or 28 percent, of the oil delivered in the quarter came from the 1981 contract with Petroleos Mejicanos (PEMEX), the Mexican national oil company, and about 15.7 million barrels, or 72 percent, came from contracts awarded under the Defense Fuel Supply Center's (DFSC's) open, continuous solicitation.⁵ Of the oil delivered this quarter, about 0.3 million barrels, or 1 percent, was Maya oil that is part of the PEMEX contract oil deliveries; about 7.8 million barrels, or 37 percent, was sour crude; and about 13.8 million barrels, or 62 percent, was sweet crude.⁶

During the quarter, DFSC awarded 22 contracts, totaling about 21.7 million barrels, through the open, continuous solicitation. DFSC officials noted that crude oil spot market prices fell during the quarter. For example, on March 21, 1984, DFSC awarded two contracts for Ninian crude oil, one at \$29.54 per barrel and one at \$29.85 per barrel. On June 27, 1984, DFSC awarded a contract for Ninian oil at \$27.70 per barrel. The British National Oil Company's official selling price for Ninian oil is \$29.70 per barrel.

During the quarter, DOE made payments of about \$555 million for oil acquisition and transportation. DOE estimated the unpaid obligations as of June 30, 1984, to be about \$1 billion. DOE had about \$243 million available as unobligated funds as of June 30, 1984. DOE already has sufficient oil on order for the fourth quarter through the PEMEX contract and the DFSC purchases to achieve the mandated 186,000 barrels per day fill rate for fiscal year 1984.

⁵The open, continuous solicitation is a mechanism DFSC--the purchasing agent for most of the SPR oil--uses to purchase SPR oil. It involves the use of a purchasing solicitation which is not reissued but rather remains open, allowing offers of oil to be made about every 2 weeks. The offers usually involve oil that is available on the "spot," or short-term, market.

⁶DOE established quality specifications for SPR oil which include a maximum of 3.5 percent sulfur content for Maya crude, a range from .5 percent to 1.99 percent sulfur for sour crudes, and a maximum of .5 percent sulfur for sweet crudes.

DEVELOPING STORAGE CAPACITY

During the quarter, DOE experienced an unexpected delay in its phase II storage capacity leaching program at West Hackberry because of electrical equipment malfunctions. The leaching program was shut down for about 23 days because of these problems and an additional 3 days for planned maintenance work.

At the Bryan Mound storage site, DOE initiated an ultrasonic testing program to monitor the onsite brine pipelines, one of which ruptured last quarter because of corrosion. During this quarter the brine disposal system performed without further problems. On June 22, 1984, DOE began leaching the third of four phase III caverns at Bryan Mound. On May 23, 1984, DOE awarded contracts for drilling wells for five caverns at the phase III Big Hill storage site and for site preparation for the one phase III cavern at Bayou Choctaw. (See tables 8 and 9 on pp. 24 and 25 for cavern leaching and oil storage capacity data.)

West Hackberry

During April 1984, West Hackberry electrical equipment malfunctioned twice, interrupting the cavern leaching program for about 23 days. The leaching program also was shut down for 3 days during the quarter for planned maintenance work. As a result, the brine disposal rate for the quarter averaged 711,000 barrels per day in contrast to the baseline rate of 900,000 barrels per day.⁷ However, even though DOE fell behind by about 5 million barrels of cavern capacity development, Project Office personnel stated that the major cavern development milestones still can be achieved.

The first malfunction occurred on April 13, 1984, when electrical switching gear for two fresh water injection pumps failed, causing the site to shut down for 1 day. Site operations were restored and continued routinely without the two pumps until April 25, 1984, when another malfunction of additional electrical switching gear shut down the site's cavern leaching program until May 16, 1984. The site's crude oil fill activities were not affected by these malfunctions.

A Project Office and contractor investigation of the malfunctions identified the most probable cause as a programming error in the logic controller for the pumps' switching gear systems. (The Project Office has corrected the programming error.) Other identified contributing factors were inadequate maintenance and a breakdown of fuses for power control. The Project Office is continuing its investigation and checking the other storage sites for similar problems.

⁷DOE uses the cavern leaching baselines to project the SPR's permanent storage capacity. The baselines include a 10 percent contingency for both planned and unexpected interruptions or slowdowns.

The West Hackberry site was also shut down on April 17, 1984, and on June 25 and 26, 1984, to perform maintenance on electrical equipment, valves, and pipelines and to accommodate instrumentation and control system work. These tasks could not be performed concurrently with normal site operations.

Of the 16 phase II caverns, 3 are full, 1 is in the final fill stage, 5 are in the cavern leaching and oil fill stage, and 7 are in the leaching only stage. DOE's current cavern leaching and oil fill schedule projects the completion of West Hackberry phase II leaching in July 1987 and phase III leaching in August 1987.

Bryan Mound

In our last quarterly report, we discussed the rupture and repair of an onsite brine pipeline due to corrosion. Since then, the brine disposal system has operated without further problems. During the quarter, the brine disposal rate averaged 699,000 barrels per day as compared to the baseline brine disposal rate of 900,000 barrels per day.

In April 1984, DOE instituted an ultrasonic testing program to monitor the condition of the site's brine pipeline. DOE contracted with H&G Inspection Co., Inc., to make bi-weekly tests to gauge the wall thickness of the brine pipes at seven points. DOE expects the brine pipelines to remain serviceable with up to 60 percent corrosion loss in places. So far, the ultrasonic tests show that no brine pipeline in current operation has corroded to this point. The Project Office is developing plans to monitor brine pipeline wall thickness on a monthly basis at the Bryan Mound, West Hackberry, and Bayou Choctaw storage sites.

On June 22, 1984, DOE began leaching the third of four phase III caverns. DOE tested the wells for the fourth cavern in the last week in June and plans to begin leaching by July 16, 1984.

The phase II leaching program at Bryan Mound is winding down. Of the 12 caverns, 6 are filled, 5 are nearing completion, and 1 is scheduled for completion in 1985. With fewer caverns to leach, the volume of fresh water demand is reduced. DOE's current cavern leaching and oil fill schedule projects the completion of Bryan Mound phase II leaching in August 1985 and phase III leaching in August 1986.

Bayou Choctaw

On May 23, 1984, DOE awarded a contract to Eltek, Inc., for site preparation for the phase III cavern at Bayou Choctaw. DOE also issued a contract to buy cavern well heads. Petroleum Operations and Support Services, Inc. (POSSI), the SPR operations and maintenance contractor, is developing procedures to pressure test the crude oil pipeline from Bayou Choctaw to the St. James marine

terminal. The problems with this pipeline were discussed in our December 1983 quarterly report.⁸

Big Hill

Our last quarterly report discussed DOE's contract award to Fruin-Colnon Corporation for surface construction associated with the first five phase III caverns. On May 4, 1984, DOE gave Fruin-Colnon full notice to proceed with site preparation. Also during this quarter, the 10 wells for the first five caverns were tested and certified. On May 23, 1984, DOE awarded a contract to Drillers, Inc., for drilling wells for the next five caverns, with an option for drilling the wells for the remaining four caverns.

SPR OIL ACCOUNTABILITY

In November 1983, the Project Office awarded a contract to Peat, Marwick, Mitchell and Co. to assess the SPR crude oil accounting system and verify the crude oil inventory accounts. On May 11, 1984, Peat Marwick issued its report on the SPR internal accounting control and administrative control procedures. The report was based on tests of recorded transactions relating to the procedures and practices affecting the acquisition, receipt, transfer, storage, inventory adjustments, and recordation of crude oil inventories from July 1977 (the inception of SPR oil acquisition) through December 31, 1983. Peat Marwick did not test or review the related payments for crude oil acquisition, and it did not verify either the quality or quantity of crude oil in storage.

Peat Marwick concluded that, except for one material weakness,⁹ DOE's procedures from July 1977 through December 1983 were adequate to meet DOE's intended purposes, which include providing reasonable assurance that crude oil quantities are accurately recorded and supported by appropriate documents. Peat Marwick stated that the material weakness resulted from accounting records being supported by document flow but not by periodic physical inventories of the oil in storage. (DOE has been attempting to find a method of in-situ physical inventory verification but, to date, has not identified one that provides an acceptable degree of accuracy.)

⁸Status of Strategic Petroleum Reserve Activities as of December 31, 1983 (GAO/RCED-84-92, Jan. 13, 1984).

⁹Peat Marwick defined a material weakness as a condition which results in more than a relatively low risk that errors or irregularities in amounts that would be material in relation to the SPR project as a whole might occur and not be detected within a timely period.

In addition to its overall report, Peat Marwick gave DOE a management letter that summarizes observations that it considered worthy of DOE's attention but that did not represent significant weaknesses in established controls. In the letter, Peat Marwick made 13 recommendations regarding noncompliance with DOE's procedures, weaknesses in DOE's procedures, and inventory accountability.

SPR CONTRACTORS

During the quarter, the Operations Office continued to move toward consolidating the responsibilities of several current SPR prime contractors. (See table 10 on p. 26 for a list of the current prime contractors.) In April 1984, DOE issued a request for proposal for a management, operations, and maintenance contractor. This contractor would not assume responsibility until April 1985. As a result, DOE is negotiating with POSSI to extend its operations and maintenance contract, which expires in September 1984. Also during the quarter, one prime contract expired, and one was extended 3 months to September 30, 1984, to allow ongoing work to be completed. DOE will assign these contractors' responsibilities to other contractors or assume them directly.

Management, operations, and maintenance contract

DOE issued a request for proposal for the management, operations, and maintenance contract on April 16, 1984. Proposals are due on July 18, 1984. DOE plans to select the contractor in December 1984. The contractor then will be phased in between February 1, 1985, and March 31, 1985 (the phase-in will be covered by a separate contract), and will assume full responsibility beginning April 1, 1985.

The management, operations, and maintenance contractor will assume responsibility for operations and maintenance currently performed by POSSI, modification and upgrade construction which was performed by Thacker Construction, some management support services currently performed by the OAO Corporation, and safety and risk analysis currently performed by Spectra Research Systems, Inc.

POSSI contract

As discussed in our last quarterly report, POSSI submitted to DOE a reappraisal of its basic contract costs in February 1984. On June 25, 1984, DOE issued a contract modification raising the basic cost from \$141 million to \$181 million. DOE contracting personnel stated that basic costs could further increase if DOE issues additional technical directives before the expiration of the contract on September 30, 1984. As of June 30, 1984, DOE and POSSI had not agreed on the terms for extending the POSSI contract until the new management, operations, and maintenance contractor takes over.

Other SPR contractor changes

On June 25, 1984, the Thacker Construction contract expired. To provide modification and upgrade construction in the interim until the management, operations, and maintenance contractor assumes this responsibility, the Project Office plans to use POSSI to subcontract for maintenance and repair construction while DOE will contract out for modification and upgrade construction.

On June 30, 1984, the Jacobs D'Appolonia Engineers contract was scheduled to expire; however, the Project Office extended the contract to September 30, 1984, to allow Jacobs D'Appolonia to complete ongoing work. Jacobs D'Appolonia Engineers has been responsible for the architecture and engineering work associated with SPR site modification and upgrade construction. Walk, Haydel and Associates, which is responsible for architecture and engineering work for the Big Hill storage site, was selected as the follow-on contractor for this work.

DOE's contract with the OAO Corporation for management support services is scheduled to expire on September 30, 1984. OAO Corporation was hired under the Small Business Administration section 8(a) criteria;¹⁰ however, OAO Corporation no longer qualifies. Consequently, DOE has packaged most of these services for another 8(a) company, including management support, scheduling, configuration management, planning, word processing, mail handling, report printing and reproduction, financial management, and procurement support. During this quarter, DOE obtained technical and business information proposals from 24 8(a) firms from which 3 were selected for final review. DOE has submitted its recommendation for award to the Small Business Administration and expects its approval in July 1984.

The Project Office plans to continue to use Wells Fargo Guard Services, whose contract provides options for extensions to January 1986 and September 1986, for physical security and Aerospace Corporation, whose contract expires in October 1985, for systems engineering services.

OTHER ISSUES

During our review, we obtained information on the appointments of the new Project Office manager and deputy manager, the implementation of the recommendations made in the Operations Office's baseline report and its report on allegations about mismanagement or misconduct within the SPR program and DOE's efforts to reduce the backlog of maintenance work at the SPR facilities.

¹⁰Section 8(a) of the Small Business Act (15 U.S.C. 637 (a)) encourages the development of small businesses owned by eligible socially or economically disadvantaged persons.

Project Office manager

In April 1984, the SPR deputy project manager was appointed project manager and a new deputy project manager was selected. The new deputy project manager, who is currently the deputy director for the Clinch River breeder reactor project, will report to the SPR Project Office in August 1984.

On June 6, 1984, DOE instituted a hiring freeze that includes the Project Office until further notice. On July 2, 1984, the Project Office requested an exception from the hiring freeze to fill three vacant positions that it considered critical. The Project Office does not plan to fill other vacancies until the hiring freeze is over.

Operations Office reports

In our last quarterly report, we noted that DOE had reported that 81 of 170 recommendations in the Operations Office's Base-line Assessment report had been implemented. Subsequently, the Operations Office reviewed the adequacy of the close-out documentation and found that the implementation actions for many recommendations were insufficiently documented. In addition, the Operations Office modified its follow-up system to indicate whether a recommendation required a discrete action, an intermediate action before discrete actions could be taken, or was general and therefore not conducive to a quick, clear-cut implementation.

As of June 30, 1984, DOE reported that the Project Office had completed closeout documentation for 98 recommendations. The Project Office submitted documentation for 81 recommendations to the Operations Office, which approved the closeout of 32 recommendations. The Project Office still was acting on 72 recommendations. According to the task force's implementation plan, 145 recommendations were scheduled for completion by June 30, 1984.

Our last quarterly report also discussed the issuance of the Operations Office's report on allegations of mismanagement or misconduct within the SPR program; the report made 25 recommendations. On June 12, 1984, the project manager approved the plan for implementing the recommendations.

Maintenance backlog

From October 1983 to March 1984, DOE and POSSI conducted maintenance audits for each SPR storage site to identify corrective and other maintenance backlogs. The audits found that significant maintenance backlogs (measured in man-hours of work) were accumulating. As a result, the Project Office has given increased priority to maintenance and established a monthly maintenance backlog report. During this quarter, POSSI developed maintenance backlog data by site, including type of maintenance (general, corrective, preventive), type of work (five craft groups), and man-hours required.

POSSI personnel said that the data currently are too preliminary to be considered reliable. However, the data generally indicate that 2 to 3 months of cumulative backlog is common at most sites for several of the craft groups. The Project Office's goal is to reduce the maintenance backlog at each site to not more than 40 crew-days. To achieve this goal, the Project Office has authorized POSSI to hire temporary workers (currently, POSSI has 31 temporary workers assigned to maintenance-related tasks) and is considering whether to issue contracts for specific maintenance tasks, such as painting buildings, tanks, and equipment or replacing electrical instrument cables and conduits.

FIGURE 1: SPR OIL DISTRIBUTION SYSTEM IMPROVEMENTS TO REPLACE THE SEAWAY AND TEXOMA PIPELINES

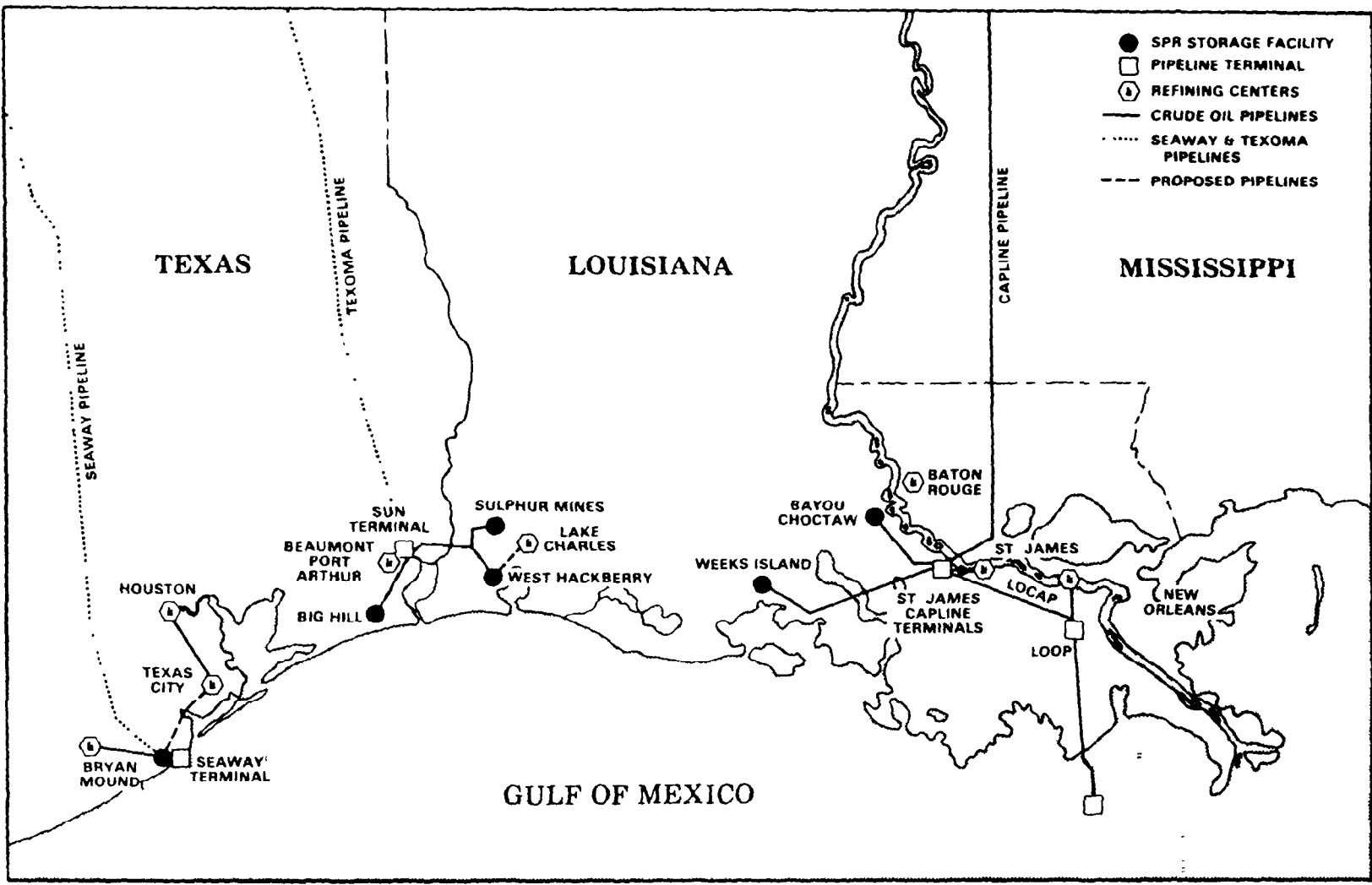


Table 1SPR Oil Distribution Capability
(thousands of barrels per day)

	Design criteria (phases)			Current gross throughput capability ^a	Projected throughput shortfall ^b
	I	II	III		
Seaway ^c	387	1,054	1,054	387	667
Texoma ^d	502	1,402	2,337	1,120	1,217
Capline ^e	<u>830</u>	<u>1,070</u>	<u>1,070</u>	<u>880</u>	<u>190</u>
Total	<u>1,719</u>	<u>3,526</u>	<u>4,461</u>	<u>2,387^f</u>	<u>2,074</u>

^aDOE has demonstrated a 1-day drawdown capability of 2.8 million barrels per day through its site drawdown tests. However, DOE cannot get the oil at this rate from the terminals into the distribution system.

^bIf no changes are made.

^cIncludes the Bryan Mound storage site.

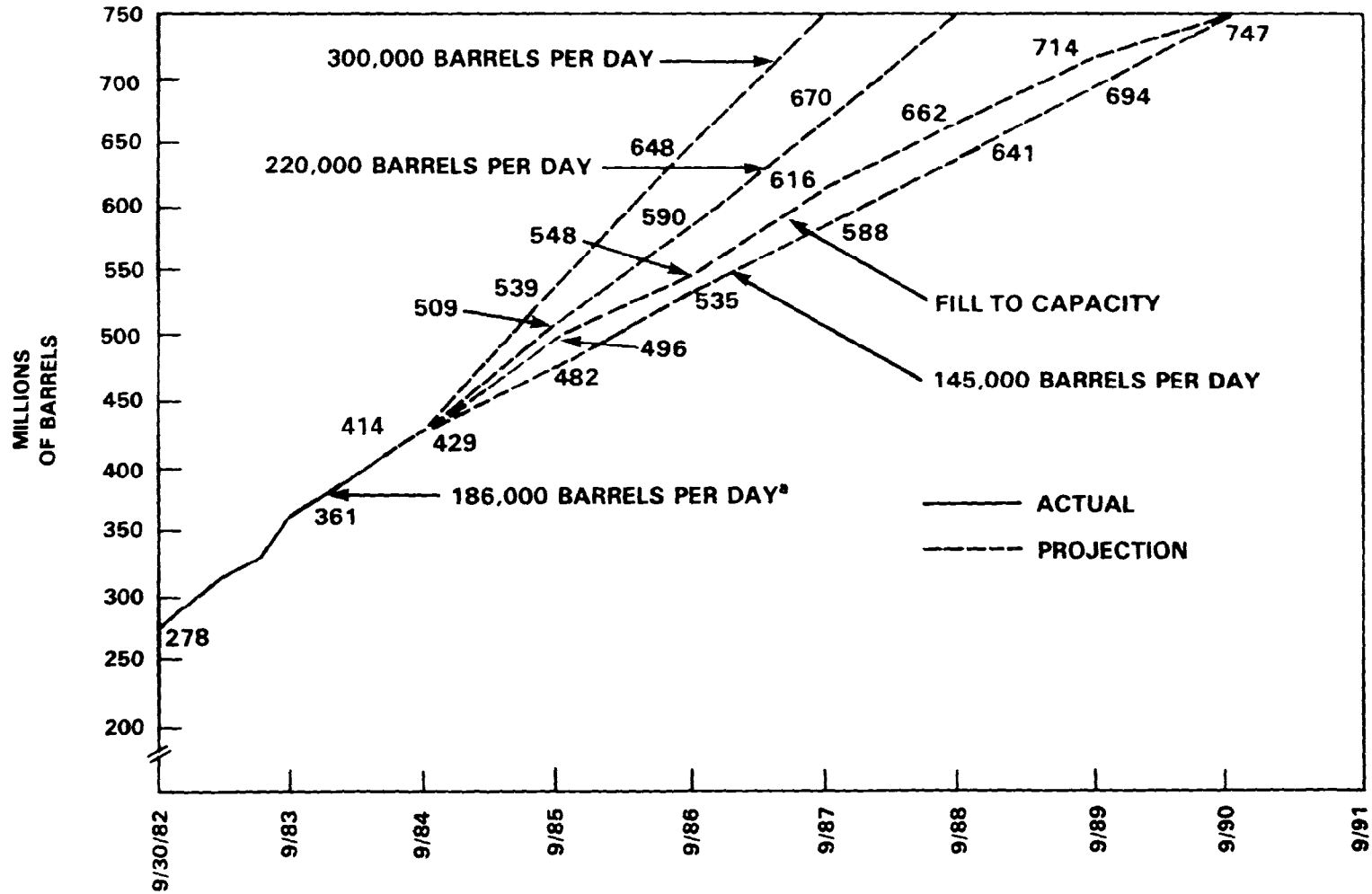
^dIncludes the West Hackberry, Sulphur Mines, and Big Hill storage sites.

^eIncludes the Weeks Island and Bayou Choctaw storage sites.

^fAs of January 1, 1984, DOE estimated the Texoma complex storage site drawdown rate to be 912,000 barrels per day and the Capline complex storage site drawdown rate to be 830,000 barrels per day. This results in an effective maximum system-wide distribution rate of 2,129,000 barrels per day as of January 1, 1984.

Source: DOE.

FIGURE 2: COMPARISON OF FILL RATES IN REACHING 750 MILLION BARRELS



^aTHE DEPARTMENT OF THE INTERIOR AND RELATED AGENCIES FISCAL YEAR 1984 APPROPRIATION ACT (PL/98-146) REQUIRES A MINIMUM FISCAL YEAR 1984 FILL RATE OF 186,000 BARRELS PER DAY.

Table 2
Comparison of Fill Rates and
Storage Requirements in Reaching 750 Million Barrels

Fiscal year	Fill to available storage capacity ^a	300,000 barrels per day after fiscal year 1984 ^b		220,000 barrels per day after fiscal year 1984 ^b		145,000 barrels per day after fiscal year 1984 ^c	
		Oil volume	Storage requirements ^d	Oil volume	Storage requirements ^d	Oil volume	Storage requirements ^d
------(millions of barrels)-----							
1984	430	429	+1	429	+1	429	+1
1985	496	539	-43	509	-13	482	+14
1986	548	648	-100	590	-42	535	+13
1987	616	750	-134	670	-54	588	+28
1988	662	-	-88	750	-88	641	+21
1989	714	-	-36	-	-36	694	+20
1990	750	-	-	-	-	747	+3
1991	-	-	-	-	-	750	-

^aThe available storage capacity is the amount that the administration's fiscal year 1985 budget shows will be available at the end of each fiscal year.

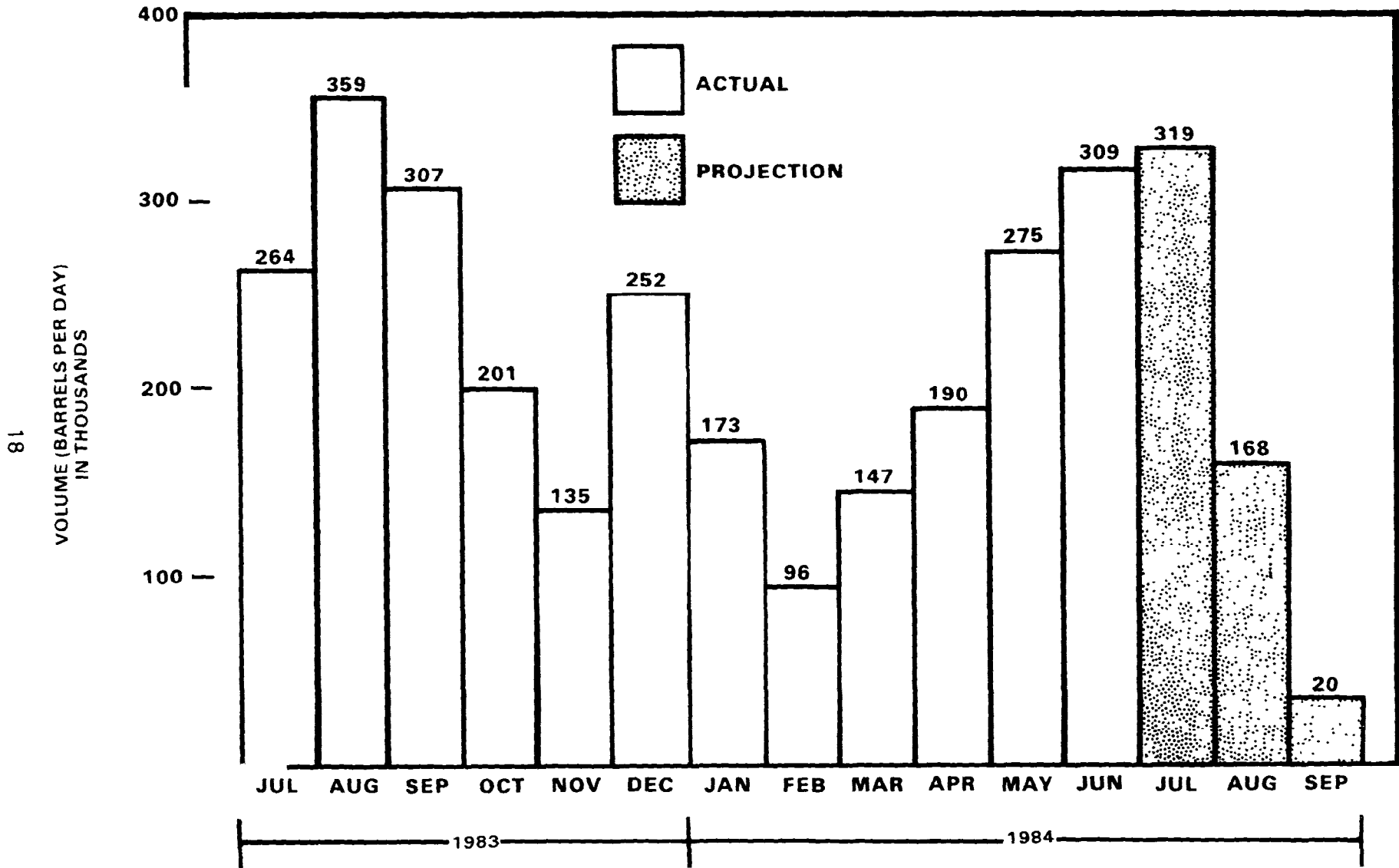
^bFor fiscal year 1984, a minimum fill rate of 186,000 barrels per day is required by the Department of the Interior and Related Agencies Appropriations Act (P.L. 98-146). However, the Energy Emergency Preparedness Act (P.L. 97-229) requires a minimum average annual fill rate of 300,000 barrels per day until at least 500 million barrels of oil are stored. The act also allows a lower rate if the President finds the 300,000 barrel per day rate not to be in the national interest. With the presidential finding, the act requires a minimum rate of at least 220,000 barrels per day, or the highest practicable fill rate achievable with available funds.

^cThe administration's fiscal year 1985 budget proposes to fill the SPR at the 145,000 barrel per day rate until the SPR is filled in early fiscal year 1991.

^dA positive amount indicates excess capacity available while a negative number indicates that additional storage is needed.

Source: DOE and GAO calculations.

FIGURE 3: AVERAGE DAILY SPR OIL RECEIVING RATE^a



^a DAILY RECEIVING RATES FOR JULY, AUGUST, AND SEPTEMBER 1984, ARE BASED ON DOE PROJECTIONS OF FUTURE DELIVERIES AND ARE SUBJECT TO CHANGE

Table 3
SPR Oil Deliveries
by Fiscal Year 1984 Quarter

<u>Quarter</u>	<u>Oil volume</u> <u>at start</u> <u>of quarter</u>	<u>Deliveries</u>	<u>Oil volume</u> <u>at end</u> <u>of quarter</u>	<u>Average receiving rate</u>	
	- - - (millions of barrels) - - -			<u>For</u> <u>quarter</u>	<u>Since</u> <u>10/01/83</u>
				(thousands of barrels per day)	
Oct. 1, 1983 through Dec. 31, 1983	361.0	18.1	379.1	196.7	196.7
Jan. 1, 1984 through March 31, 1984	379.1	12.7	391.8	139.6	168.3
April 1, 1984 through June 30, 1984	391.8	21.9	413.7	241.1	192.5

Source: DOE.

Table 4

SPR Oil Deliveries by Crude
Type as of June 30, 1984

	<u>Type I^a</u>	<u>Types II-V^b</u>	<u>Type VI^c</u>	<u>Type VIa^d</u>	<u>Maya^e</u>	<u>Total</u>
	- - - - - (millions of barrels) - - - - -					
Volume delivered	199.2	154.9	31.4	16.6	11.6	413.7
	- - - - - (percent) - - - - -					
Percentage of total oil delivered	48	37	8	4	3	100

^aHigh-sulfur crude (from .5 to 1.99-percent sulfur content) with an API gravity range of 30 to 36 degrees. Type I oil includes Arabian Light and Isthmus crudes.

^bHigh-quality crudes with a low sulfur content (maximum .5-percent sulfur content and an API gravity range of 30 to 45 degrees. These types include some North Sea and West African crudes.

^cType VI was established for Alaskan North Slope crude, an intermediate-sulfur crude (maximum 1.25-percent sulfur content) with an API gravity range of 26 to 30 degrees.

^dType VIa was established for the Maya/Isthmus blend under the PEMEX contract. The blend is a high-sulfur mixture with an API gravity of at least 28 degrees.

^eMaya crude is a lower quality oil which has a maximum sulfur content of 3.5 percent and an API gravity of at least 22 degrees.

Source: DOE.

Table 5

Summary of Oil Acquisition Activities
for Fiscal Year 1984

	<u>Oil deliveries</u> <u>for quarter</u> <u>ending 6/30/84</u>	<u>Oil deliveries</u> <u>for FY 1984</u> <u>as of 6/30/84</u>	<u>Oil under</u> <u>contract as</u> <u>of 6/30/84^a</u>	<u>Oil to be</u> <u>contracted^b</u>	<u>Total</u>
------(millions of barrels)-----					
Open, continuous solicitation ^c	15.7	33.6	14.1	----	47.7
PEMEX contract	6.2	14.7	4.0	----	18.7
Term contracts					
Shell International Trading Co.	---	2.5	----	----	2.5
BP Oil International Ltd.	---	<u>1.9</u>	----	----	<u>1.9</u>
Total	<u>21.9</u> =====	<u>52.7</u> =====	<u>18.1</u> =====	----	<u>70.8^d</u> =====

^aRepresents the amount of oil that is under contract and to be delivered in fiscal year 1984.

^bRepresents the amount of oil that remains to be contracted for and delivered in fiscal year 1984.

^cThe open, continuous solicitation involves making contract awards without reissuing the solicitation for offers of oil that is available on the "spot," or short-term, market. (See table 6 for individual contract awards.)

^dThis is equivalent to an average annual fill rate of 193,000 barrels per day in fiscal year 1984.

Source: DOE.

Table 6

Open, Continuous Solicitation Awards for
Quarter Ending June 30, 1984

<u>Contract date</u>	<u>Supplier</u>	<u>Oil type^a</u>	<u>Total barrels</u> (millions)
4/03/84	Phibro Energy, Inc.	sweet	.50
		sour	1.86
4/03/84	Coastal States Trading, Inc.	sweet	.50
4/03/84	Tradax America, Inc.	sweet	.50
4/18/84	Sohio Supply Co.	sweet	.57
4/18/84	BP Oil International, Ltd.	sweet	2.00
4/18/84	Phibro Energy, Inc.	sweet	.50
5/02/84	T.W. Oil, Inc.	sweet	.50
5/02/84	Crown Central Petroleum Corp.	sweet	.50
5/02/84	BP Petroleum Development, Ltd.	sweet	1.70
5/02/84	BP Petroleum Development, Ltd.	sweet	1.00
5/02/84	Gulf Oil Trading	sour	1.90
5/16/84	Petrogulf USA	sweet	.52
5/30/84	Tradax Petroleum, Ltd.	sweet	1.00
5/30/84	BP Oil International, Ltd.	sweet	.50
5/30/84	Neste Oy	sweet	.50
6/13/84	Tradax America, Inc.	sweet	.50
6/13/84	T. W. Oil, Inc.	sour	1.10
6/13/84	Phillips Petroleum Trading Co.	sweet	.51
6/13/84	BP Oil International, Ltd.	sweet	.75
6/13/84	Phibro Energy, Inc.	sweet	.77
6/14/84	Coastal States Trading, Inc.	sour	2.56
6/27/84	BP Petroleum Development, Ltd.	sweet	1.00
	Total		<u>21.74</u>

^aDOE established quality specifications for SPR oil, including a range from .5 percent to 1.99 percent sulfur content for sour crudes and a maximum of .5 percent sulfur content for sweet crudes.

Source: DFSC.

Table 7Status of the SPR Petroleum Account
as of June 30, 1984^a

<u>Funds made available</u>	<u>Amount</u> (millions)
Carryover from fiscal year 1981	\$1,806
Fiscal year 1982 appropriations	3,684
Fiscal year 1983 appropriations	2,074
Fiscal year 1984 appropriations	<u>650</u>
Total made available	<u>\$8,214</u>
<u>Funds used or committed</u>	
Fiscal year 1982 payments	\$3,687
Fiscal year 1983 payments	1,641
Estimated fiscal year 1984 payments as of 6/30/84 ^b	1,606
Estimated DOE unpaid obligations as of 6/30/84 ^c	<u>1,037</u>
Total used or committed	<u>\$7,971</u>
Estimated unobligated funds at DOE	<u>\$ 243</u>

^aThe SPR Petroleum Account was established in October 1981 to pay for petroleum acquisition and transportation. This is an off-budget account.

^bAmount consists of DOE's actual reported payments through May 1984 and DOE's estimated payments for June 1984.

^cUnpaid obligations represent funds that have been committed to pay for fiscal year 1984 oil deliveries under the first PEMEX contract, or are obligated to DFSC for upcoming oil deliveries or purchases, and expected transportation costs. DFSC estimates that of the funds obligated to it, about \$158.9 million is available as of June 30, 1984, for future purchases.

Source: DOE and DFSC.

Table 8Status of SPR Underground Capacity
as of June 30, 1984

<u>Storage facilities</u>	<u>Capacity available</u>	<u>Capacity filled</u>
Phase I sites: (permanent capacity)	----- (millions of barrels) -----	
Bayou Choctaw	46.6	45.5
Bryan Mound	66.5	64.4
Sulphur Mines	26.3	26.0
Weeks Island	73.0	73.0
West Hackberry	<u>48.8</u>	<u>48.8</u>
Total	<u>261.2</u>	<u>257.7</u>
Phase II sites: (planned capacity)		
Bayou Choctaw	10.0	(a)
Bryan Mound	120.0	94.8
West Hackberry	<u>160.0</u>	<u>57.5</u>
Total	<u>290.0</u>	<u>152.3</u>
Tanks and pipelines	<u>-</u>	<u>3.7</u>
Total for SPR	<u><u>551.2</u></u>	<u><u>413.7</u></u>

^aA newly leached cavern with 4.5 million barrels of usable capacity will be exchanged for an existing 10-million-barrel cavern owned by Allied Chemical Corporation at the Bayou Choctaw site after leaching is completed. DOE currently expects to complete leaching in August 1984.

Source: DOE.

Table 9

Summary of Leaching Activities
for Quarter Ending June 30, 1984^a

	<u>Brine disposal</u>		<u>Cumulative oil capacity^b</u>		<u>Cumulative oil fill</u>	
	<u>Baseline</u>	<u>Actual</u>	<u>Baseline</u>	<u>Actual</u>	<u>Baseline</u>	<u>Actual</u>
	(thousands of barrels per day)		(millions of barrels)			
Bryan Mound:						
April	900	648	84.8	80.5	89.0	88.8
May	900	672	86.0	85.4	91.2	91.0
June	900	777	88.5	89.5	93.5	94.8
West Hackberry:						
April	900	754	49.0	47.3	50.7	47.3
May	900	576	52.2	51.8	54.1	51.8
June	900	808	57.7	56.7	57.5	57.5
Bayou Choctaw:						
April	53	52	4.6	4.6	C	-
May	53	54	4.9	4.9	-	-
June	53	54	5.1	5.1	-	-

^aThis table compares the actual leaching activities with baselines that have been established for the SPR contractor. To allow for contingencies, the contractor baselines are more stringent than the overall baselines established for the SPR program.

^bCumulative oil capacity represents the amount of cavern volume available for storing oil. The figures shown for Bayou Choctaw represent the cumulative leached volume.

^cThe activities at Bayou Choctaw are directed at creating a cavern that will not store oil but will be exchanged for a larger existing cavern owned by Allied Chemical Corporation.

Table 10SPR Facilities Development Contractors

<u>Contractor</u>	<u>Start date</u>	<u>Termination date</u>	<u>Responsibility</u>
Thacker Construction Co.	6/26/80	6/25/84	Construction for modifications and upgrades
Jacobs D'Appolonia Engineers ^a	12/17/80	9/30/84	Architecture and engineering for modifications and upgrades
Petroleum Operations & Support Services, Inc.	12/30/81	9/30/84	Operations and maintenance
Wells Fargo Guard Services ^b	1/07/82	9/30/84	Security
OA0 Corporation	9/30/81	9/30/84	Management support services
Spectra Research Systems, Inc.	5/16/80	3/31/85	Safety and risk analysis
Aerospace Corporation	10/20/82	10/25/85	Systems engineering
Walk, Haydel and Associates	9/22/81	12/31/85	Architecture and engineering for the Big Hill site

^aThe contract originally was to terminate on June 30, 1984, but was extended 3 months to allow Jacobs D'Appolonia to complete ongoing work.

^bThe contract contains options for extending the termination date to January 1986 and September 1986.

Source: DOE.

Table 11Prior GAO Quarterly Reports

1. Progress in Filling the Strategic Petroleum Reserve Continues, but Capacity Concerns Remain (GAO/EMD-82-112, July 15, 1982).
2. Status of Strategic Petroleum Reserve Activities as of September 30, 1982 (GAO/RCED-83-29, Oct. 15, 1982).
3. Status of Strategic Petroleum Reserve Activities as of December 31, 1982 (GAO/RCED-83-93, Jan. 14, 1983).
4. Status of Strategic Petroleum Reserve Activities as of March 31, 1983 (GAO/RCED-83-136, Apr. 15, 1983).
5. Status of Strategic Petroleum Reserve Activities as of June 30, 1983 (GAO/RCED-83-203, July 13, 1983).
6. Status of Strategic Petroleum Reserve Activities as of September 30, 1983 (GAO/RCED-84-11, Oct. 14, 1983).
7. Status of Strategic Petroleum Reserve Activities as of December 31, 1983 (GAO/RCED-84-92, Jan. 13, 1984).
8. Status of Strategic Petroleum Reserve Activities as of March 31, 1984 (GAO/RCED-84-148, Apr. 13, 1984).

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