

128256

REPORT BY THE U.S.

# General Accounting Office

## Status Of Strategic Petroleum Reserve Activities As Of September 30, 1985

The Department of Energy reported that the Strategic Petroleum Reserve contained 489.3 million barrels of oil on September 30, 1985. During the fourth quarter of fiscal year 1985, about 12.7 million barrels of oil were added, for a fill rate of about 138,000 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 fourth quarter of fiscal year 1985.



128256



GAO/RCED-86-37  
OCTOBER 15, 1985

033610

**Request for copies of GAO reports should be sent to:**

**U.S. General Accounting Office  
Document Handling and Information  
Services Facility  
P.O. Box 6015  
Gaithersburg, Md. 20877**

**Telephone (202) 275-6241**

**The first five copies of individual reports are free of charge. Additional copies of bound audit reports are \$3.25 each. Additional copies of unbound report (i.e., letter reports) and most other publications are \$1.00 each. There will be a 25% discount on all orders for 100 or more copies mailed to a single address. Sales orders must be prepaid on a cash, check, or money order basis. Check should be made out to the "Superintendent of Documents".**



UNITED STATES GENERAL ACCOUNTING OFFICE  
WASHINGTON, D.C. 20548

RESOURCES, 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 14th and last quarterly report under your request. A list of our prior reports is contained in table II.8 in appendix II.

This report discusses events and activities related to the administration's progress in filling, developing, and operating the SPR during the fourth quarter of fiscal year 1985. Specifically, it notes that the following took place during the quarter:

- The Congress passed the fiscal year 1985 Supplemental Appropriations Act, which disapproved the administration's fiscal year 1985 proposed deferral of about \$270.7 million for SPR construction and approximately \$290 million of the \$827 million deferral in the SPR oil account. Funds will therefore be available in fiscal year 1986 for the continued development of SPR facilities and for oil purchases of approximately 11 million barrels.
- DOE added 12.7 million barrels of oil, bringing the total amount of oil in the SPR to 489.3 million barrels. The oil fill rate averaged about 138,000 barrels per day during the quarter and 159,400 per day during the fiscal year.
- DOE made payments of \$364 million for oil acquisition and transportation, had unpaid obligations of about \$289 million, and had \$697 million in unobligated funds. (On October 1, 1985, DOE proposed deferring approximately \$537 million in fiscal year 1986.)

--The storage capacity development program proceeded without any major problems, generally achieving DOE goals. At the Big Hill, Texas site, a construction contract that was modified in June 1985 to place some equipment in storage under a standby plan was changed back to its original project description.

This report also presents information on (1) the implementation of recommendations made in the DOE Oak Ridge Operations Office's reports on its baseline assessment of the SPR Project Office and its review of allegations about mismanagement or misconduct within the SPR program, (2) extensions and modifications of SPR contracts, and (3) DOE preparations to hold an SPR drawdown test sale and distribution exercise. (See app. I for more details and app. II for supporting figures and tables.)

#### OBJECTIVES, SCOPE, AND METHODOLOGY

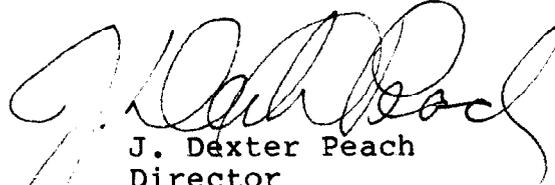
We limited our review, because of the time allowed, to providing primarily statistical information and highlights of major activities that occurred during the period covered. To obtain this information, we reviewed DOE program documents, publications, and studies, and interviewed DOE managers and operating personnel responsible for planning and managing activities associated with the development and operation of the SPR facilities. We also interviewed personnel from DOE contractors and the Defense Fuel Supply Center, DOE's purchasing agent for most of the SPR oil, and the U.S. Army Corps of Engineers, which is responsible for acquiring pipeline rights-of-way for DOE.

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. We did not do this because the effort required was beyond the scope of 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 and discussed its factual accuracy with them. In addition, we discussed the information reported about the acquisition of pipeline rights-of-way with the Project Manager, East Texas Real Estate Project Office, U.S. Army Corps of Engineers, Galveston, Texas, District Office. We made appropriate revisions as necessary.

- - - -

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.



J. Dexter Peach  
Director



## C o n t e n t s

APPENDIX		<u>Page</u>
I	STATUS OF STRATEGIC PETROLEUM RESERVE ACTIVITIES AS OF SEPTEMBER 30, 1985	1
	Fiscal year 1985 Supplemental Appropriations Act	2
	SPR oil fill activities	3
	Status of SPR oil acquisition and transportation account	4
	Storage site activities	5
	Other issues	11
II	FIGURES AND TABLES ON THE STATUS OF THE STRATEGIC PETROLEUM RESERVE	16
	Figure II.1: Average daily SPR oil receiving rate	16
	Table II.1: SPR oil deliveries by fiscal year 1985 quarter	17
	Table II.2: SPR oil deliveries by crude type as of September 30, 1985	18
	Table II.3: Summary of oil acquisition activities for quarter ending September 30, 1985, and fiscal year 1985	19
	Table II.4: Open, continuous solicitation awards for quarter ending September 30, 1985	20
	Table II.5: Status of the SPR oil acquisition and transportation funds as of September 30, 1985	21
	Table II.6: Status of SPR underground capacity as of September 30, 1985	22
	Table II.7: Summary of leaching activities for quarter ending September 30, 1985	23
	Table II.8: Prior GAO quarterly SPR reports	24

### ABBREVIATIONS

API	American Petroleum Institute
DFSC	Defense Fuel Supply Center
DOE	Department of Energy
EPCA	Energy Policy and Conservation Act
GAO	General Accounting Office
GSU	Gulf States Utilities Company
NPR	Naval Petroleum Reserve
OPEC	Organization of Petroleum Exporting Countries
PEMEX	Petroleos Mexicanos
SPR	Strategic Petroleum Reserve



STATUS OF STRATEGIC PETROLEUM RESERVEACTIVITIES AS OF SEPTEMBER 30, 1985

The Energy Policy and Conservation Act (Public Law 94-163, Dec. 22, 1975), as amended, authorized the creation of a Strategic Petroleum Reserve (SPR) to store up to 1 billion barrels of oil for use in the event of an oil import disruption. To meet the act's goals, the Department of Energy (DOE) has been implementing a three-phase plan to store 750 million barrels of oil. Phase I of the SPR plan involved the storage of about 260 million barrels of oil and is now 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 and 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, was designed to 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 phases II and III have overlapping schedules.

The SPR storage sites are connected by pipeline to three marine terminals for oil fill and for oil drawdown and distribution during an oil-supply disruption:

- Seaway complex: The Bryan Mound storage site is connected to Phillips Petroleum Co.'s terminal (formerly the Seaway 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 marine 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. The SPR Program Office in Washington, D.C., retained responsibility for overall program management and planning.

This report discusses activities that occurred during the quarter ending September 30, 1985, that affect the SPR, including (1) passage of the fiscal year 1985 Supplemental Appropriations Act, (2) activities associated with adding 12.7 million barrels of oil to the SPR during the quarter, (3) the status of the SPR oil acquisition and transportation account, and (4) the cavern-leaching program at the SPR storage sites. It also provides information about the implementation of recommendations made in the Operations Office's 1983 baseline assessment of the SPR Project Office and review of allegations concerning mismanagement or misconduct within the SPR program. The report further discusses significant SPR contract extensions and additions and DOE plans for an SPR drawdown test sale and distribution exercise.

#### FISCAL YEAR 1985 SUPPLEMENTAL APPROPRIATIONS ACT

The administration's fiscal year 1986 budget proposed an indefinite moratorium on developing and filling the SPR. Under the proposal, DOE would have stopped filling the SPR at the end of fiscal year 1985, when it contained 489 million barrels of oil. The administration would reassess its position on the moratorium as conditions changed. The administration also proposed deferring the use of about \$1.1 billion of funds that were available in fiscal year 1985 for SPR storage capacity development and oil purchases. Under the moratorium, the completion date of a 750-million-barrel reserve would be delayed beyond 1990. In the fiscal year 1985 Supplemental Appropriations Act (Public Law 99-88, Aug. 15, 1985), however, the Congress disapproved the proposed deferral of \$270.7 million for SPR storage capacity development construction and about \$290 million of the \$827 million for oil acquisition. Therefore, these funds are currently scheduled for the continued development of SPR facilities and for oil purchases of approximately 11 million barrels in fiscal year 1986.

The Supplemental Appropriations Act also amended section 160 (d)(1) of the Energy Policy and Conservation Act (EPCA) to allow a lower SPR fill rate than previously required as long as the SPR will reach 500 million barrels by the end of the fiscal year. As we indicated in our June 1985 quarterly report,<sup>1</sup> the sale of oil

---

<sup>1</sup>Status of Strategic Petroleum Reserve Activities as of  
June 30, 1985 (GAO/RCED-85-149, July 15, 1985).

from the Elk Hills Naval Petroleum Reserve (NPR)<sup>2</sup> was prohibited whenever the SPR was not filled at an average minimum rate of 100,000 barrels per day during the fiscal year until the SPR inventory reaches 500 million barrels. We had pointed out in our June 1985 report that if no legislative changes were made and DOE were unable to sell NPR oil, revenue losses of up to \$5.6 billion for fiscal years 1986 through 1990 could occur under a continued moratorium. The current amendment to EPCA will, therefore, permit NPR production during fiscal year 1986.

#### SPR OIL FILL ACTIVITIES

DOE reported that 58.2 million barrels of oil were added to the SPR during fiscal year 1985, bringing the total SPR inventory to 489.3 million barrels. The average SPR oil fill rate for fiscal year 1985 was 159,400 barrels per day. In the last quarter of fiscal year 1985, 12.7 million barrels of crude oil were added to the SPR. (See fig. II.1 and tables II.1 through II.4 for further information on SPR oil acquisition and fill activities.) About 18.6 million barrels (32 percent) of the oil delivered during fiscal year 1985 came from DOE's 1981 contract with Petroleos Mexicanos (PEMEX), the Mexican national oil company, and about 39.6 million barrels (68 percent) were delivered under contracts that the Defense Fuel Supply Center (DFSC, a Department of Defense agency that serves as the purchasing agent for most SPR oil) had awarded through its open, continuous solicitation.<sup>3</sup>

Of the 489.3 million barrels of oil in storage as of September 30, 1985, 39 percent was sweet (low sulfur) crude, 49 percent was sour (high sulfur) crude, and 12 percent was a combination of lower quality crude oils. (See table II.2 for SPR oil quality specifications.) As stated in our March 1985 quarterly report,<sup>4</sup> all DFSC oil procurements for DOE's account

---

<sup>2</sup>The Elk Hills Naval Petroleum Reserve, located near Bakersfield, California, is jointly owned by the U.S. government and Chevron, U.S.A., Inc. The government's share was 108,000 of the 138,000 barrels per day of oil produced in fiscal year 1984 and resulted in net revenues of \$1.3 billion.

<sup>3</sup>The open, continuous solicitation is a mechanism that DFSC uses to purchase SPR oil. It involves the use of a purchasing solicitation that 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" (short-term) market.

<sup>4</sup>Status of Strategic Petroleum Reserve Activities as of March 31, 1985 (GAO/RCED-85-111, Apr. 15, 1985).

between March 1, 1985, and September 30, 1985, were for sweet crude. DOE, however, continued to purchase sour crude under its PEMEX contract at 50,000 barrels a day through the end of fiscal year 1985.

During the quarter DFSC awarded one contract for SPR oil through the open, continuous solicitation. On August 1, 1985, DFSC paid \$27.10 per barrel for 1 million barrels of "Forties" oil (a sweet crude) to be delivered to the SPR. This purchase satisfied DOE's oil acquisition requirements for fiscal year 1985.

At the height of its SPR oil acquisition program, DFSC provided about 30 staff years of effort. Our June 1985 quarterly reported that DFSC operations committed to the SPR oil acquisition effort would wind down during the last quarter of fiscal 1985 and that most DFSC personnel would leave for other positions. Officials from DFSC and the DOE Program Office told us that if DOE requested DFSC to resume purchases, it would take about 3 months for DFSC to arrange for the first oil purchases, assuming that DFSC would be able to divert resources from other programs. It would be another month before the oil could be moved to DOE's storage sites.

During this quarter, DFSC agreed to continue its program with DOE with about 11 staff years of effort. Although DOE intends to purchase its fiscal year 1986 oil requirements of 11 million barrels directly through its current PEMEX contract, the remaining DFSC staff will provide transportation payments, claims processing, quality assurance for Mexican oil loadings, evaluation of internal controls for oil purchases, and analytical support and advice.

#### STATUS OF SPR OIL ACQUISITION AND TRANSPORTATION ACCOUNT

DOE states that the oil acquisition and transportation account (or SPR petroleum account) provides funds for (1) SPR oil procurements, (2) associated transportation costs such as pipeline, tanker, and marine terminal activities, (3) the operations and maintenance of the SPR terminal at St. James, Louisiana, (4) U.S. Customs duties, and (5) other miscellaneous costs, such as DFSC administrative costs, associated with acquiring and transporting the oil. In the event of an SPR oil drawdown, this account would also fund the federal cost of withdrawing the oil from the storage caverns and transporting it to the point where private purchasers would take title.

During the quarter, DOE made payments of \$364 million for oil acquisition and transportation. Program Office personnel stated that as of September 30, 1985, DOE had unpaid obligations of about \$289 million and unobligated funds of about \$697 million. (See table II.5.)

In July 1985, PEMEX announced that it was moving away from its Organization of Petroleum Exporting Countries (OPEC)-influenced pricing scheme to a more market-responsive system emphasizing competitive pricing.<sup>5</sup> As a result, PEMEX lowered its sales price for a barrel of Isthmus (sour) crude to the United States by \$1.00, or from \$27.75 to \$26.75, retroactive for oil deliveries since June 1, 1985. Previously, beginning with February 1985 oil deliveries, PEMEX had followed an OPEC price reduction and dropped its price of oil to the SPR by \$1.25 per barrel. According to a Program Office official, these price reductions have resulted in the SPR oil acquisition and transportation account's realizing unanticipated savings of approximately \$10 million on the total PEMEX deliveries for fiscal year 1985. Based on the current PEMEX price to the SPR, these savings will cover the purchase cost of approximately 370,000 barrels of PEMEX oil to be delivered in fiscal year 1986.

#### STORAGE SITE ACTIVITIES

During the quarter the phase II storage capacity leaching program proceeded without any major problems, generally achieving DOE goals for capacity development. Phase III leaching also continued at Bryan Mound. (See tables II.6 and II.7.) DOE continued its program to inspect crude oil, water intake, and brine pipelines for corrosion at West Hackberry. Project Office officials announced plans to close the West Hackberry and Bryan Mound sites for 2 weeks of maintenance during the first quarter of fiscal year 1986. At Bayou Choctaw, the ethane transfer between DOE and Allied Chemical Corporation caverns,<sup>6</sup> begun in May 1985, was completed in July 1985 although the official cavern exchange targeted for the end of fiscal year 1985 was not met because of technical difficulties. Also at Bayou Choctaw, a 48-hour drawdown test was successfully conducted without the use of outside electrical power.

At the Big Hill phase III site, DOE cancelled standby planning activities when the Congress reinstated the fiscal year

---

<sup>5</sup>While Mexico was not a member of OPEC, it adhered to OPEC's pricing system.

<sup>6</sup>According to Project Office personnel, in December 1982, Allied Chemical Corp. settled its lawsuit against DOE, which had used federal condemnation procedures to obtain Allied Chemical's land for the Bayou Choctaw SPR storage site. As part of the settlement, DOE agreed to leach a cavern with at least 4.5 million barrels of usable capacity and then exchange it for a 10-million-barrel cavern that Allied Chemical used to store ethane.

1985 construction funding that the administration had proposed deferring. As a result, the Big Hill construction contract for the raw water intake system was modified to install equipment as planned instead of placing equipment in storage under the standby plan.

### West Hackberry

The West Hackberry leaching program operated without major problems during the quarter, creating about 11.6 million barrels of oil storage capacity. The site was shut down for a day and a half in August because of a threat from Hurricane Danny. Of the 16 phase II caverns, 6 are full, 3 are in the final-fill stage, 4 are in the leach-fill stage, and 3 are in the leaching-only stage.

Our June 1985 quarterly report discussed a phase II cavern in the leaching-only stage that was taken out of service because of irregular leaching results and the plans to test and evaluate this cavern for its oil storage capability. According to a Boeing Petroleum Services, Inc.,<sup>7</sup> official, the initial steps of the evaluation program were nitrogen and hydrostatic tests. These tests, completed in July 1985, indicated no leakage. The cavern is now being prepared for further testing planned in October 1985; this will involve a well workover to install piping, a low-pressure test, nitrogen injection, and pressure monitoring for a month. A Boeing engineer stated that the prospects look favorable for leaching to resume by April 1986.

Our June 1985 report discussed the conversion of West Hackberry's raw water intake structure from a manned to an unmanned operation. On July 16, 1985, the conversion work was negotiated with Coggins Systems, Ltd. for a firm-fixed price contract at \$474,000 with a completion date of January 6, 1986.

Our June 1985 quarterly report also addressed DOE's plans to investigate two potential problem points in the crude oil pipeline between West Hackberry and the Sun Oil Co. marine terminal in Nederland, Texas. A Boeing official told us that Boeing has received and evaluated the bids for this work, and that the most acceptable bid package was submitted to DOE on September 18, 1985, for consent. The contract is expected to be awarded in mid-October 1985.

The West Hackberry site will be shut down the 2 weeks between September 30, 1985, and October 11, 1985, for maintenance that

---

<sup>7</sup>The SPR management, operation, and maintenance contractor that assumed responsibility on April 1, 1985.

cannot be performed while the site is in normal operating status. The maintenance work planned will be similar to a fiscal year 1984 maintenance shutdown and should include: valve replacements, electrical maintenance, pressure relief valve calibration, and brine pipeline section replacement. As we discussed in our June 1985 report, ultrasonic and x-ray tests of West Hackberry piping identified brine pipeline corrosion sufficient to warrant some replacements. A contract was awarded on July 23, 1985, to Neches Engineers and Constructors for this work.

#### Bryan Mound

The Bryan Mound leaching program operated without major problems during this quarter, creating about 6 million barrels of permanent oil storage capacity. The phase II leaching program was completed on August 20, 1985, with the last four of the phase II caverns in the final oil-fill stage. Phase III leaching continues with two caverns in the leach-fill stage and two in the leaching-only stage. These phase III caverns are scheduled for completion by the end of fiscal year 1986. The site was shut down for about 5 days in August because of the threat posed by Hurricane Danny and because a new brine pipeline had to be connected between the phase III caverns and the brine pond. (Our September 1984 quarterly report<sup>8</sup> discussed the effects of a leak in this pipeline.) This site is also scheduled for a 2-week planned maintenance shutdown between October 28, 1985, and November 10, 1985. The maintenance work to be performed will be similar to that done during the October 1984 scheduled shutdown and will include electrical work, valve changes, and pressure relief valve calibrations.

Our June 1985 quarterly report discussed the planned new crude oil pipeline from the Bryan Mound site to the Texas City/Baytown/Houston area. The property appraisal work, involving 92 tracts of property, began this quarter for the rights-of-way for this 42-mile, 40-inch pipeline. The current completion schedule for installing this pipeline is the end of calendar year 1986.

#### Bayou Choctaw

The Bayou Choctaw cavern exchange between Allied Chemical Corp. and DOE that we have discussed in prior quarterly reports has not been completed. DOE is exchanging a cavern with at least 4.5 million barrels of useable capacity for a 10-million-barrel

---

<sup>8</sup>Status of Strategic Petroleum Reserve Activities as of September 30, 1984 (GAO/RCED-85-40, Oct. 15, 1984).

cavern owned by Allied Chemical where ethane was being stored. On July 15, 1985, Allied Chemical completed the ethane transfer between the two caverns involved in the exchange. Allied Chemical is testing the 10-million-barrel cavern for oil storage capability, but a problem has now developed with stabilizing the cavern pressure. A Project Office official told us that preliminary data indicate that the pressure stabilization problem stems from the relatively narrow separation between this 10-million-barrel cavern being tested and a Bayou Choctaw phase I cavern. The separation is termed "a web of salt" and is estimated to be about 100 feet thick. As a result, when the Allied Chemical cavern is pressurized, the pressure changes in the DOE phase I cavern. The testing program is expected to require another month to understand the pressure interaction between these two caverns. A Project Office official stated that following DOE's acceptance of the Allied Chemical cavern, another well will be drilled into the cavern and surface piping constructed. This cavern will be available for oil fill about March 1987.

On July 16-18, 1985, a 48-hour power outage drawdown demonstration was conducted at Bayou Choctaw. No outside electrical power was used to operate any of the equipment required to draw down oil from the cavern. Three diesel-driven pumps, including one spare, were rented and placed near the raw water intake structure along with a supplementary fuel tank. The rented diesel pumps provided water injection to move over 375,000 barrels of crude oil from one cavern at Bayou Choctaw to three storage tanks at DOE's St. James terminal within a 48-hour period. According to a July 1985 Boeing report, this drawdown successfully demonstrated that crude oil can be made available in an emergency even if electrical service is disrupted.

Our March and June 1985 quarterly reports discussed a planned hydrostatic testing of the 37-mile crude oil pipeline between Bayou Choctaw and the St. James marine terminal because of extensive corrosion identified in 18 pipeline joints. Boeing awarded a contract to CSI Hydrostatic Testing, Inc., for this work that began on September 23, 1985. The test was successfully completed, and no drops in pressure or significant leaks were noted. A DOE official told us that this test qualifies the pipeline to operate at the pressure required to deliver the phase III drawdown rate (480,000 barrels per day).

#### Weeks Island

In July 1985, the Project Office reduced the Weeks Island permanent crude oil inventory by 35,000 barrels. This adjustment resulted from a May 1984 report by Peat, Marwick, Mitchell and Co. that assessed the SPR crude oil accounting system and verified the crude oil inventory accounts. (We discussed the scope and

overall findings of this report in our June 1984 quarterly.<sup>9</sup>) The report disclosed that during the Weeks Island crude oil-fill process, quantities of crude oil gases were released and flared, or burned-off into the atmosphere. As a result, the report found that losses occurred which were neither measured nor estimated by DOE; the oil losses were still being carried by DOE in the crude oil inventory.

### Big Hill

During the quarter, DOE continued developing the phase III Big Hill storage site. Work was concluded on drilling wells for the last of 14 proposed caverns. On-site construction of the central facilities, leaching systems, piping, and instrumentation for the first five caverns at Big Hill is now approximately 86 percent complete. Off-site construction of the raw water intake structure, which will provide fresh water to the site for leaching storage cavern space, is approximately 86 percent complete. Neither of these construction contracts was completed by the end of fiscal year 1985 as originally planned. The acquisition of the rights-of-way for the crude oil pipeline from the Sun Oil Co. terminal to the site is complete according to a Corps of Engineers official of the Galveston, Texas, District Office. The final order of possession was signed by the U.S. District Court judge on September 5, 1985, in Beaumont, Texas.

As we stated in our last two quarterly reports, the administration's fiscal year 1986 budget submission proposed that all current construction activities at Big Hill be brought to an orderly conclusion by the end of fiscal year 1985. Under the proposal, the Big Hill site was to be maintained in a condition that would permit resumption of construction at a later date, as oil market and fiscal constraints warranted. However, the fiscal year 1985 Supplemental Appropriations Act restored all previously appropriated SPR construction funding for use during fiscal year 1986. Consequently, on August 23, 1985, DOE made preparations to continue with site construction activities as called for prior to the proposed moratorium. A construction contract that was modified in June 1985 to place some equipment in storage instead of having it installed as planned was changed back to its original project description. Project Office officials stated that a Big Hill restart plan is now being formulated that will ensure coordination of construction activities as planned before the proposed moratorium.

---

<sup>9</sup>Status of Strategic Petroleum Reserve Activities as of June 30, 1984 (GAO/RCED-84-182, July 13, 1984).

The proposed moratorium at the Big Hill site has affected construction and procurement schedules. For example, we noted in our December 1984 and June 1985 quarterly reports that DOE had planned to issue an invitation for bids for Big Hill's crude oil pipeline and award a contract for the raw water intake and brine disposal pipelines in December 1984. These contract actions were postponed in December 1984. The invitation for bids for (1) constructing the crude oil pipeline is now scheduled for November 21, 1985, and (2) the raw water intake and brine pipelines and an electrical transmission line from Big Hill's substation to the off-site raw water intake structure are now scheduled to be issued October 24, 1985. Also, the invitation for bids for surface piping construction for nine caverns that was issued November 28, 1984, and subsequently cancelled, is now scheduled for November 21, 1985.

The delays resulting from the administration's proposed moratorium actions have also caused additional problems at Big Hill. According to a DOE Big Hill official, some manufacturer warranties on delivered equipment have lapsed, and it is anticipated that all warranties will expire prior to the equipment's being put into operation. DOE is currently evaluating the cost/benefits of extending manufacturer warranties.

As we reported in our June 1985 quarterly, the DOE power contract with Gulf States Utilities Company (GSU) was renegotiated beginning July 1, 1985, for a 10-year period. During this quarter, DOE agreed to pay GSU approximately \$1.1 million (subject to DOE audit) to cover GSU's costs of building the high-voltage electrical transmission line to the Big Hill site. The original DOE-GSU power contract called for a contribution-in-aid-of-construction arrangement between the two parties to construct the transmission line. DOE had paid about \$1.3 million as its share of the construction, engineering, and design costs when the line was initially built.

During this quarter, GSU did not "energize" or connect the Big Hill electric power substation to the high-voltage transmission line on September 1, 1985, as planned. An October 1985 completion date to finish construction of the substation is now projected. The substation is now scheduled to be energized in November 1985, and the existing low-voltage electrical distribution line will be terminated. The substation will provide power for acceptance testing of installed equipment as well as power to operate the Big Hill facility during its phase III development activities. The existing low-voltage electric line will provide temporary power to test some of the installed equipment as the current construction contracts are completed during the first quarter of fiscal year 1986. The large raw water intake pumps and the automated control system at the off-site raw

waterintake structure will not be operationally tested even when the substation is energized because the project to construct an electric transmission line from the substation to the raw water intake structure site has slipped from its original completion date of September 1, 1985, to December 1, 1986.

### OTHER ISSUES

During our review, we also obtained information on (1) DOE's 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 on DOE's follow-up program, (2) DOE's major contracting actions for the quarter, and (3) DOE's announcement and preparations for a drawdown test sale and distribution exercise.

### Implementation of Operations Office recommendations

Subsequent to being assigned responsibility for SPR project management and direction in June 1983, the Operations Office evaluated the status of the SPR Project Office and in October 1983 issued a baseline assessment report. This report made 170 recommendations which predominantly sought to redirect overall SPR priorities, realign Project Office and contractor responsibilities, and implement existing DOE procedures. The Project Office proposed implementation actions for all 170 recommendations as of June 30, 1985, and the Operations Office had approved these proposed actions.

In March 1984, the Operations Office issued its report on allegations of mismanagement or misconduct in the SPR program. The report made 25 recommendations, which the Project Office is implementing. As of June 30, 1985, the Project Office had proposed implementation actions for all 25 recommendations and the Operations Office had approved the proposed actions.

Our June 1984 quarterly report stated that the Operations Office modified its follow-up system to indicate whether a recommendation required no further follow-up (category A), a follow-up was required and would be accomplished through the appropriate SPR management system (category B), or a follow-up was required and its progress would be reported in follow-up reports (category C).

In June 1985, the Project Office published its first monthly and quarterly reports used in tracking to completion the implementation of the approved proposed actions for recommendations in categories B and C. (The last of the category A recommendations was approved and completed by the Project Office

during the quarter ending June 30, 1985.) As of September 30, 1985, the follow-up reports were tracking the implementation actions for the remaining 26 recommendations (4 in category B, 22 in category C) from the baseline assessment and the 4 category C recommendations from the allegation report.

During this quarter, the Project Office approved and completed 31 recommendations from the baseline assessment and 4 recommendations from the allegation report. Our review of the Project Office follow-up reports noted efforts to strengthen the accountability of its management of government owned and leased property. For example, the Operations Office had recommended that the Project Office revise its property appraisal program to include reviews of (1) disposal and utilization of excess property and (2) procedures and methods to ensure that government owned and leased equipment are used only for official purposes. The Project Office found that all on-site SPR contractors disposed of property through its operations and maintenance contractor. A property appraisal system initiated in July 1984 demonstrated excellent results over its first 9 months of operation; about 600 items valued at about \$5.4 million were determined to be excess property and were subsequently disposed of. In addition, during December 1984 DOE conducted a review of motor vehicle equipment management of all SPR contractors at all SPR sites. No unofficial usage was detected during this review. The Program Office recommended that reviews be continued periodically on an unannounced basis.

#### SPR contract changes

DOE modified the Boeing management, operation, and maintenance contract on August 29, 1985, to increase the estimated cost, exclusive of fee, to cover fiscal year 1986. The estimated cost for fiscal year 1986 is \$94.7 million. The fee is to be negotiated between DOE and Boeing during the next quarter.

DOE also issued to the Aerospace Corporation, on August 22, 1985, a notice of intent to exercise the contract option to extend Aerospace's cost-plus-fixed-fee contract for engineering services through October 19, 1986. This option, which was unpriced in the contract, was negotiated on September 30, 1985, in the amount of about \$3.4 million.

Contracts for capital improvements and services at two marine terminals serving the SPR are in the prenegotiation stage. These enhancement projects will upgrade the (Phillips) Seaway marine terminal that serves Bryan Mound and connects Bryan Mound to a second marine terminal in the Freeport, Texas, area. As part of the overall SPR distribution enhancement program, which we discussed in our June 1984 and June 1985 quarterly reports, DOE proposed to complete all improvements at the two marine terminals by December 30, 1986.

Drawdown test sale and  
distribution exercise

As we reported in June 1985, the Energy Policy and Conservation Amendments Act of 1985 (Public Law 98-58, July 2, 1985) set forth a requirement that DOE conduct a drawdown and distribution test of 1.1 million barrels of SPR oil within 180 days after the enactment of the bill. The test is intended to demonstrate that SPR oil can be withdrawn from the storage caverns, sold, and distributed successfully. The legislation states, however, that the oil should not be sold at less than 90 percent of market price and that the Secretary of Energy may cancel the sale if there are insufficient acceptable offers to purchase the SPR oil.

The drawdown and distribution test will examine the capabilities of four of the SPR oil storage sites, distribution terminals, and marine and pipeline distribution systems. The DOE-planned sale requirements by location, type of oil, and method of delivery will be:

Seaway Complex

--Bryan Mound--300,000 barrels of sour oil to be delivered via a tanker.

Texoma Complex

--West Hackberry--300,000 barrels of sweet oil to be delivered via a tanker and/or barge.

--West Hackberry--100,000 barrels of sweet oil to be delivered via pipeline.

Capline Complex

--Weeks Island--300,000 barrels of sour oil to be delivered via a tanker.

--Bayou Choctaw--100,000 barrels of sweet oil to be delivered via pipeline.

On October 2 and October 7, 1985, DOE published notices to prospective bidders in the Federal Register and Commerce Business Daily, respectively, announcing the test sale and inviting oil industry participation, recommendations, and attendance at a pretest sale conference. DOE plans to issue a final sale notice on November 18, 1985, which will formally begin the test sale and its 30-day sales period. Other planned key test events and their dates of enactment will be:

- November 29, 1985--determine successful offers,
- December 4, 1985--receive bidders' payment or performance guarantees,
- December 9, 1985--begin awarding contracts,
- December 18, 1985--begin the 30-day oil delivery period, and
- January 17, 1986--complete oil deliveries.

Although the intent of the forthcoming SPR drawdown and distribution exercise is to test bidding and purchasing processes, we have reported that in order to test the total reliability of the system, it should be tested at either design capacity or the maximum capacity permitted by conditions existing when the test is conducted. Two recent GAO reports, Analysis of Oil Withdrawal and Distribution Tests for the Strategic Petroleum Reserve (GAO/RCED-85-115, May 8, 1985) and More Assurance Is Needed That Strategic Petroleum Reserve Oil Can Be Withdrawn As Designed (GAO/RCED-85-104, Sept. 27, 1985), concluded that while selling 1.1 million barrels of oil would test DOE's sales procedures, it would not fully test the SPR's drawdown and distribution capability. In addition, in the House Committee on Appropriation's report on the Department of Interior and Related Agencies Appropriations Bill, 1986 (H.R. 99-205, July 16, 1985), the value of a small-scale SPR oil drawdown test sale and distribution exercise was also questioned. The report states that while tests of SPR operational equipment are worthwhile, a limited sale of 1.1 million barrels of oil in the current oil-glutted market will not provide a realistic test of administrative procedures or the capacity to sell oil in an emergency.<sup>10</sup> While DOE does not know the exact cost of the test, it estimates that the cost may approach 50 cents per barrel, or around \$500,000. This cost to DOE will not include the price of transporting the oil from the SPR storage sites to the distribution terminals nor the cost differential of purchasing new oil to replace the oil sold.

---

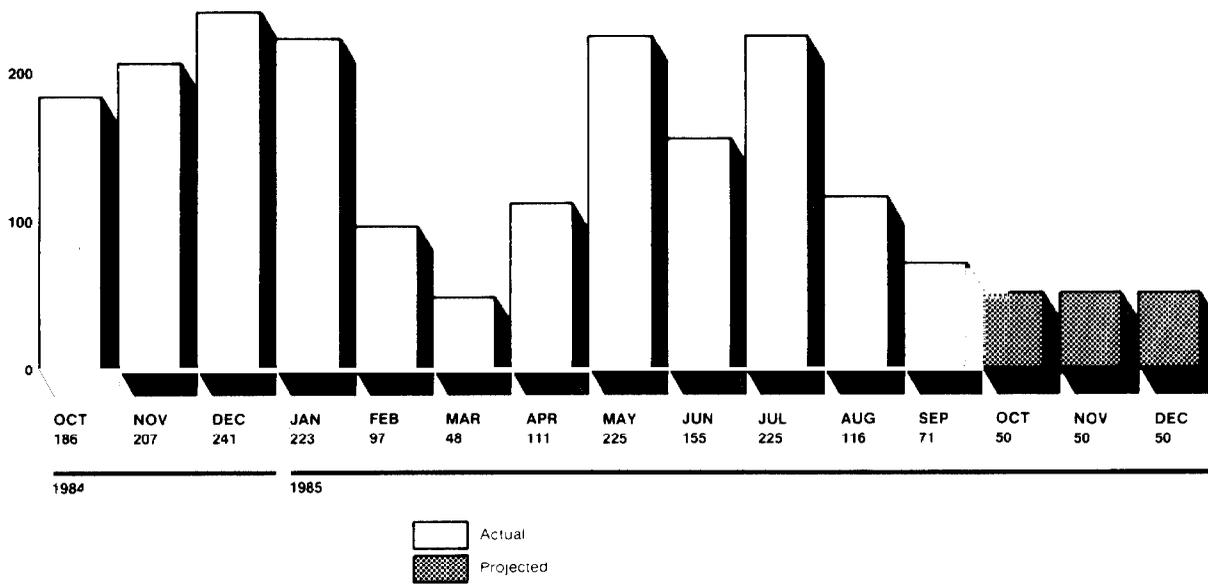
<sup>10</sup>The discussion in the report was on a provision in the Department of Interior and Related Agencies Appropriation Bill, 1986 (H.R. 3011), which would have prohibited funds for the use of an SPR drawdown test sale and distribution exercise. On July 31, 1985, the appropriations bill was passed by the House, but the provision on the SPR test sale prohibition was deleted. As of October 10, 1985, this bill was pending in the Senate.

Because the requirement for an SPR test was contained in legislation recently enacted, funds for its execution were not included in the fiscal year 1986 budget submitted to the Congress. As a result, DOE submitted to the cognizant congressional committees on September 17, 1985, a request to reprogram about \$500,000 of appropriated funds for this purpose. On September 27, 1985, the reprogramming action was approved, and DOE officials are proceeding with preparations for a test sale of oil as required in the Energy Policy and Conservation Amendments Act.

FIGURES AND TABLES ON THE STATUS OF  
THE STRATEGIC PETROLEUM RESERVE

**Figure II.1: Average Daily SPR Oil Receiving Rate<sup>a</sup>**

300 Volume (barrels per day) in thousands



<sup>a</sup> Daily receiving rates for October, November and December 1985 are based on DOE projections of future deliveries and are subject to change.

Table II.1: SPR Oil Deliveries  
by Fiscal Year 1985 Quarter

<u>Quarter</u>	<u>Oil volume</u> <u>at start</u>	<u>Deliveries</u>	<u>Oil volume</u> <u>at end</u>	<u>Average receiving rate</u>	
	<u>of quarter</u>		<u>of quarter</u>	<u>For</u> <u>quarter</u>	<u>Since</u> <u>10/1/84</u>
	————(millions of barrels)————			(thousands of barrels per day)	
Oct. 1, 1984 through Dec. 31, 1984	431.1	19.4	450.5	211.3	211.3
Jan. 1, 1985 through March 31, 1985	450.5	11.1	461.6	123.5	167.8
April 1, 1985 through June 30, 1985	461.6	15.0	476.6	164.3	166.7
July 1, 1985 through Sept. 30, 1985	476.6	12.7	489.3	138.0	159.4

Source: DOE.

Table II.2: SPR Oil Deliveries by Crude Type  
as of September 30, 1985

	<u>Type Ia</u>	<u>Types II-Vb</u>	<u>Type VI<sup>c</sup></u>	<u>Type VIa<sup>d</sup></u>	<u>Maya<sup>e</sup></u>	<u>Total</u>
	(millions of barrels)					
Volume delivered	237.1	192.6	31.4	16.6	11.6	489.3
	(percent)					
Percentage of total oil delivered	49	39	7	3	2	100

<sup>a</sup>High-sulfur crude (from 0.5 to 1.99 percent sulfur content) with an American Petroleum Institute (API) gravity range of 30 to 36 degrees. Type I oil includes Arabian Light and Isthmus crudes. The oil industry uses degrees of API gravity to measure an oil's specific gravity. API gravity measures the mass of a fluid relative to water and ranges from 10 degrees for very heavy crude to 45 degrees for very light crudes.

<sup>b</sup>High-quality crudes with a low sulfur content (maximum 0.5 percent sulfur content) and an API gravity range of 30 to 45 degrees. These types include some North Sea and West African crudes.

<sup>c</sup>Type 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.

<sup>d</sup>Type 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.

<sup>e</sup>Maya crude is a lower quality oil having a maximum sulfur content of 3.5 percent and an API gravity of at least 22 degrees. As of April 1984, Maya crude was no longer being acquired as part of the PEMEX contract.

Source: DOE.

Table II.3: Summary of Oil Acquisition Activities  
for Quarter Ending September 30, 1985, and Fiscal Year 1985

	Oil deliveries for quarter <u>ending 9/30/85</u>	Oil deliveries for FY 1985 <u>for FY 1985</u>
	————(millions of barrels)————	
Open, continuous solicitation <sup>a</sup>	8.2	39.6
PEMEX contract	<u>4.5</u>	<u>18.6</u>
Total	<u>12.7</u>	<u>58.2</u>

<sup>a</sup>The open, continuous solicitation involves making contract awards without reissuing the solicitation for offers of oil that is available on the "spot" (short-term) market. (See table II.4 for individual contract awards.)

Source: DOE and DFSC.

Table II.4: Open, Continuous Solicitation Awards for  
Quarter Ending September 30, 1985

<u>Contract date</u>	<u>Supplier</u>	<u>Oil type<sup>a</sup></u>	<u>Total barrels</u> (millions)
8/1/85	BP Oil International, Ltd.	Sweet	<u>1.0</u>
Total			<u>1.0</u>

<sup>a</sup>DOE established quality specifications for SPR oil, including a range from 0.5 percent to 1.99 percent sulfur content for sour crudes and a maximum of 0.5 percent sulfur content for sweet crudes.

Source: DFSC.

Table II.5: Status of the SPR Oil Acquisition and Transportation Funds as of September 30, 1985<sup>a</sup>

<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	650
Fiscal year 1985 appropriations	<u>2,050</u>
Total made available	<u>10,264</u>
<u>Funds used or committed</u>	
Fiscal year 1982 payments	3,687
Fiscal year 1983 payments	1,641
Fiscal year 1984 payments	2,329
Estimated fiscal year 1985 payments <sup>b</sup>	1,621
Estimated DOE unpaid obligations as of 9/30/85 <sup>c</sup>	<u>289</u>
Total used or committed	<u>9,567</u>
Estimated unobligated funds at DOE <sup>d</sup>	<u>\$ 697</u>

<sup>a</sup>The Omnibus Budget Reconciliation Act of 1981 (Public Law 97-35, Aug. 13, 1981) established the SPR Petroleum Account, effective October 1981, to pay for petroleum acquisition and transportation. This is an off-budget account.

<sup>b</sup>Amount consists of DOE's actual reported payments through August 1985 and DOE's estimated payments for September 1985.

<sup>c</sup>Unpaid obligations represent funds that have been committed to pay for fiscal year 1985 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 \$8.6 million is available as of September 30, 1985, for future purchases.

<sup>d</sup>On October 1, 1985, DOE proposed deferring \$537 million in fiscal year 1986.

Source: DOE and DFSC.

Table II.6: Status of SPR Underground Capacity  
as of September 30, 1985

<u>Storage facilities</u>	<u>Permanent capacity planned</u>	<u>Capacity available</u>	<u>Capacity filled</u>
----- (millions of barrels) -----			
Phase I sites:			
Bayou Choctaw	47.0	46.0	45.7
Bryan Mound	65.0	67.1	64.3
Sulphur Mines	26.0	26.4	26.1
Weeks Island	73.0	73.0	73.0
West Hackberry	<u>49.0</u>	<u>49.2</u>	<u>47.9</u>
Total	<u>260.0</u>	<u>261.7</u>	<u>257.0</u>
Phase II sites:			
Bayou Choctaw	10.0	.0	.0 <sup>a</sup>
Bryan Mound	120.0	121.2	117.4
West Hackberry	<u>160.0</u>	<u>114.0</u>	<u>106.3</u>
Total	<u>290.0</u>	<u>235.2</u>	<u>223.7</u>
Phase III sites:			
Bayou Choctaw	10.0	-	-
Bryan Mound	40.0	6.1	6.1
West Hackberry	10.0	-	-
Big Hill	<u>140.0</u>	<u>-</u>	<u>-</u>
Total	<u>200.0</u>	<u>6.1</u>	<u>6.1</u>
Tanks and pipelines	<u>-</u>	<u>-</u>	<u>2.5</u>
Total for SPR	<u>750.0</u>	<u>503.0</u>	<u>489.3</u>

<sup>a</sup>A newly leached cavern with 4.5 million barrels of usable capacity should be exchanged for an existing 10-million-barrel cavern owned by Allied Chemical Corp. at the Bayou Choctaw site.

Source: DOE.

Table II.7: Summary of Leaching Activities  
for Quarter Ending September 30, 1985<sup>a</sup>

	<u>Brine disposal</u>		<u>Cumulative oil capacity<sup>b</sup></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:						
July	630	659	129.6	123.4	121.1	122.0
August	613	528	131.3	126.4	123.4	124.0
September	496	507	133.0	127.3	123.6	123.4
West Hackberry:						
July	866	844	98.2	106.4	102.9	101.9
August	796	721	101.1	109.5	105.2	104.6
September	500	571	103.0	114.0	107.4	106.3

<sup>a</sup>This 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.

<sup>b</sup>Cumulative oil capacity represents the amount of cavern volume available for storing oil.

Source: DOE.

Table II.8: Prior GAO Quarterly SPR 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).
9. Status of Strategic Petroleum Reserve Activities as of June 30, 1984 (GAO/RCED-84-182, July 13, 1984).
10. Status of Strategic Petroleum Reserve Activities as of September 30, 1984 (GAO/RCED-85-40, Oct. 15, 1984).
11. Status of Strategic Petroleum Reserve Activities as of December 31, 1984 (GAO/RCED-85-58, Jan. 22, 1985).
12. Status of Strategic Petroleum Reserve Activities as of March 31, 1985 (GAO/RCED-85-111, Apr. 15, 1985).
13. Status of Strategic Petroleum Reserve Activities as of June 30, 1985 (GAO/RCED-85-149, July 15, 1985).

(001772)







32602

**AN EQUAL OPPORTUNITY EMPLOYER**

UNITED STATES  
GENERAL ACCOUNTING OFFICE  
WASHINGTON, D.C. 20548

---

OFFICIAL BUSINESS  
PENALTY FOR PRIVATE USE \$300

**BULK RATE  
POSTAGE & FEES PAID  
GAO  
PERMIT No. G100**