



**Department of Energy**  
Washington, DC 20585

May 26, 2021

Nancy G. Milburn  
Arnold & Porter Kaye Scholer LLP  
250 West 55<sup>th</sup> Street  
New York, NY 10019-9710

Via email: nancy.milburn@arnoldporter.com

Re: FIA-21-0002 (HQ-2020-01130-F)

Dear Ms. Milburn:

This is a partial response to the request for information that you sent to the Department of Energy (DOE) under the Freedom of Information Act (FOIA), 5 U.S.C. § 552. You requested the following:

**A. Annual reports on the Strategic Petroleum Reserves which reference the West Hackberry Strategic Petroleum Reserve, including annual environmental reports and reports issued pursuant to the Comprehensive Environmental Response, Compensation, and Liability Act (“CERCLA”), for 1977-2018, *except* for reports relating exclusively to oceanographic and offshore activities, and *except* for the following reports, which are publicly available:**

- 1. 1989 Strategic Petroleum Reserve Environmental Site Report**
- 2. 1992 Strategic Petroleum Reserve Environmental Site Report**
- 3. Annual report to Congress for Fiscal year 1992 pursuant to CERCLA, as amended by the Superfund Amendments and Reauthorization Act Section 120(e)(5).**
- 4. 1994 Strategic Petroleum Reserve Annual Report**
- 5. 1995 Strategic Petroleum Reserve Environmental Site Report**
- 6. 1996 Strategic Petroleum Reserve Environmental Site Report**
- 7. 1997 Strategic Petroleum Reserve Environmental Site Report**
- 8. 1998 Strategic Petroleum Reserve Annual Report**

**B. All records relating to brine operations conducted prior to the**



- development of the West Hackberry Strategic Petroleum Reserve on or near the property now owned by the federal government for purposes of operating the West Hackberry Strategic Petroleum Reserve, including without limitation brine operations performed by Mathieson Alkali Works, Inc., Mathieson Chemical Corporation, Olin Mathieson Chemical Corporation, and/or Olin Corporation;
- C. All records relating to hydrocarbon storage operations conducted prior to the development of the West Hackberry Strategic Petroleum Reserve on or near the property now owned by the federal government for purposes of operating the West Hackberry Strategic Petroleum Reserve, including without limitation hydrocarbon storage operations performed by Cities Service Refining Corporation, Cities Service Oil Company, and/or Cities Service Company;
  - D. All records relating to releases of brine in or around the West Hackberry Strategic Petroleum Reserve area, including in connection with the use of injection wells, pits, ditches or ponds for brine disposal (excluding documents relating exclusively to offshore brine releases);
  - E. All records relating to spills or releases of chemicals or harmful or potentially harmful materials in or around the West Hackberry Strategic Petroleum Reserve area;
  - F. All reports relating to environmental impacts associated with, the construction, use, maintenance, or other activities of the West Hackberry Strategic Petroleum Reserve, including but not limited to geological impacts, hydrogeological impacts, impacts to surface water, ecological impacts, land loss, or contamination, excluding documents relating exclusively to offshore or oceanographic impacts;
  - G. All reports relating to monitoring, assessment, or observation of any potential environmental impacts associated with the West Hackberry Strategic Petroleum Reserve, excluding documents relating exclusively to offshore or oceanographic impacts;
  - H. All records relating to remediation, restoration, or other restorative work performed or contemplated by the DOE or others to address environmental impacts potentially or actually caused by the West Hackberry Strategic Petroleum Reserve;
  - I. All records relating to leases granted by DOE or other federal entities for use of federally-owned land in the West Hackberry Strategic

## **Petroleum Reserve area.**

In an February 25, 2021, email with Iwetta Pyc, formerly with this office, you agreed to waive the production of publicly available documents responsive to the Request.

Your request was assigned to DOE's Office of Fossil Energy (FE) to conduct a search of its files for responsive documents. DOE started its search on January 14, 2021, which is the cutoff date for responsive documents. In an October 31, 2019, email from Nicholas Mantzaris, formerly with this office, you were provided with public links where more responsive documents to item A could be found. On August 28, 2020, DOE provided you a final response with six (6) documents. On December 11, 2020 DOE granted your request for an appeal and remanded your request for a new search.

At this time, DOE has identified nineteen (19) documents which are responsive to item A of your request. They are being released to you in their entirety as described in the accompanying index. DOE is continuing to process your request for additional responsive documents, which will be provided to you in subsequent responses.

The adequacy of the search may be appealed within 90 calendar days from your receipt of this letter pursuant to 10 C.F.R. § 1004.8. Appeals should be addressed to Director, Office of Hearings and Appeals, HG-1, L'Enfant Plaza, U.S. Department of Energy, 1000 Independence Avenue, S.W., Washington, D.C. 20585-1615. The written appeal, including the envelope, must clearly indicate that a FOIA appeal is being made. You may also submit your appeal to [OHA.filings@hq.doe.gov](mailto:OHA.filings@hq.doe.gov), including the phrase "Freedom of Information Appeal" in the subject line (this is the preferred method by the Office of Hearings and Appeals). The appeal must contain all of the elements required by 10 C.F.R. § 1004.8, including a copy of the determination letter. Thereafter, judicial review will be available to you in the Federal District Court either: 1) in the district where you reside; 2) where you have your principal place of business; 3) where DOE's records are situated; or 4) in the District of Columbia.

You may contact DOE's FOIA Public Liaison, Alexander Morris, FOIA Officer, Office of Public Information, at 202-586-5955, or by mail at MA-46/Forrestal Building, 1000 Independence Avenue, S.W., Washington, D.C. 20585, for any further assistance and to discuss any aspect of your request. Additionally, you may contact the Office of Government Information Services (OGIS) at the National Archives and Records Administration to inquire about the FOIA mediation services they offer. The contact information for OGIS is as follows: Office of Government Information Services, National Archives and Records Administration, 8601 Adelphi Road-OGIS, College Park, Maryland 20740-6001, e-mail at [ogis@nara.gov](mailto:ogis@nara.gov); telephone at 202-741-5770; toll free at 1-877-684-6448; or facsimile at 202-741-5769.

If you have any questions about the processing of the request or this letter, you may contact me or Ms. Chidinma Nwosu of my office at:

MA-46/ Forrestal Building

1000 Independence Avenue, S.W.  
Washington, D.C. 20585  
(202) 586-5922

I appreciate the opportunity to assist you with this matter.

Sincerely,

**Alexander C.  
Morris**  Digitally signed by  
Alexander C. Morris  
Date: 2021.05.26  
14:37:32 -04'00'

Alexander C. Morris  
FOIA Officer  
Office of Public Information

## INDEX

Request #: Re: FIA-21-0002 (HQ-2020-01130-F)

Partial response for request from Ms. Nancy G. Milburn for:

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At this time, DOE has identified nineteen (19) documents responsive to item A of your request.

- Nineteen (19) documents *are being released in their entirety.*

# Strategic Petroleum Reserve Annual Report

February 16, 1984

**U.S. Department of Energy**  
Assistant Secretary for Fossil Energy  
Strategic Petroleum Reserve



This report has been reproduced directly from the best available copy.

Available from the National Technical Information Service, U. S. Department of Commerce, Springfield, Virginia 22161.

Price: Printed Copy<sup>A02</sup>  
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# Strategic Petroleum Reserve Annual Report

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February 16, 1984

**U.S. Department of Energy**  
Assistant Secretary for Fossil Energy  
Strategic Petroleum Reserve  
Washington, D.C. 20585



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## CONTENTS

Section	Page
EXECUTIVE SUMMARY .....	v
I. INTRODUCTION, PROGRAM LEGISLATION AND SPR PLAN AND AMENDMENTS .....	1
II. STATUS OF THE STRATEGIC PETROLEUM RESERVE .....	2
A. Storage Facilities Development .....	2
B. Oil Acquisition and Transportation .....	4
C. Budget and Finance .....	6
D. Organization, Management and Contractual Support .....	8
E. Real Estate, Environmental Compliance, and Permits .....	8
III. DRAWDOWN SYSTEM AND VULNERABILITY IMPACT .....	9
A. Drawdown Capability .....	9
B. Vulnerability Impact .....	10
APPENDIX: SPR SITE STATUS AND CRUDE OIL SPECIFICATIONS .....	A-1
A. Bayou Choctaw .....	A-2
B. Weeks Island .....	A-2
C. Bryon Mound .....	A-3
D. Sulphur Mines .....	A-3
E. West Hackberry .....	A-4
F. Big Hill .....	A-5
G. St. James Terminal .....	A-5
H. Crude Oil Specifications .....	A-6

## FIGURES

Figure	Page
1. Location of Current SPR Site Complexes .....	2
2. SPR Annual Funding for Facilities/Petroleum .....	7
3. SPR Cumulative Funding for Facilities/Petroleum .....	7

## TABLES

Table	Page
1 Phase I Sites, Caverns, and Storage Capacities .....	3
2 SPR Crude Oil Capacities and Inventory .....	4
3 SPR Oil Acquisition History .....	4
4 Crude Oil Received through 1983 by Source .....	5
5 SPR Crude Oil Inventory as of December 31, 1983 .....	5
6 SPR Appropriations .....	6
7 SPR Drawdown System .....	9

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## EXECUTIVE SUMMARY

### Oil Acquisition and Fill Rates

The Strategic Petroleum Reserve (SPR) achieved a fill level of 379.1 million barrels during calendar year 1983, more than half the program fill goal of 750 million barrels and more than triple the level when the present Administration took office. This represented an increase of 85.3 million barrels over the 293.8 million barrels in storage at the end of calendar year 1982, reflecting an average daily fill rate of 233,594 barrels during 1983.

Crude oil deliveries under the 1982 purchase agreement with Petroleos Mexicanos (PEMEX), Mexico's State-owned oil company, were completed. Deliveries are continuing under the 1981 agreement with PEMEX at a current rate of 50,000 barrels per day. The Defense Fuel Supply Center also entered into contracts for 34.8 million barrels in 1983 through competitive procurements. As of December 31, 1983, the SPR had 23.7 million barrels of crude oil under contract for delivery in 1984.

### Facilities and Storage Development

Development of Phase II underground storage capacity expansion, consisting of 290 million barrels, continued on schedule during 1983 at three SPR sites.

By the end of 1983, a total of 77.0 million barrels of new cavern storage capacity had been created at Bryan Mound and 37.5 million barrels of new cavern storage capacity had been created at West Hackberry. Approximately 3.6 million barrels of cavern volume had been developed in a new cavern at Bayou Choctaw which will be exchanged for an existing 10-million-barrel cavern at this site. All available Phase II storage capacity at Bryan Mound and West Hackberry was filled at the end of 1983.

Further progress of Phase III development, which will consist of approximately 200 million barrels, was achieved during 1983. Phase III design for West Hackberry was completed in 1983. Additionally, drilling at West Hackberry and the first five caverns (10 wells) at Big Hill was initiated. Contracts were awarded for long-lead equipment and the construction of the onsite surface facilities for the initial five caverns at Big Hill. At Bryan Mound, drilling of the four Phase III caverns was completed, construction of the aboveground system was initiated and approximately 84 percent complete at the end of 1983.

### Drawdown Exercises

A drawdown exercise, involving the movement of 259,218 barrels of oil, was conducted at the Bayou Choctaw site on July 11 and 12, 1983. The exercise verified the ability of the site to satisfy Phase I drawdown goals of 240,000 barrels per day. A detailed technical assessment of the drawdown reliability conducted by the Department of Energy's (DOE's) Inspector General concluded that the system was acceptable.

Another successful drawdown test was conducted November 3-4, 1983, at the Bryan Mound site. Just over one million barrels were pumped from underground caverns to aboveground facilities. This one-million-barrel drawdown in one day was greater than the test objective of 900,000 barrels.

A DOE-wide comprehensive exercise (DIREX-B) involving the administrative and management procedures associated with an SPR drawdown was performed during the period July 11 through August 19, 1983. This exercise provided invaluable training and experience and an opportunity to identify appropriate improvements to existing procedures.

Based on these tests, current inventory levels and other information, the Department estimates that 189 million barrels of the 379.1-million-barrel inventory on December 31, 1983, could be drawn down during a three month period at an average daily rate of 2.1 million barrels per day. An average daily drawdown of at least 1.7 million barrels per day could be sustained for a period in excess of five months.

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# 1. INTRODUCTION, PROGRAM LEGISLATION AND SPR PLAN AND AMENDMENTS

## Introduction

This SPR 1983 Annual Report is submitted to the President and to the Congress by the U.S. Department of Energy in accordance with Section 165 of the Energy Policy and Conservation Act of 1975. The report covers SPR developmental activities during the 1983 calendar year.

The SPR Annual Report is presented in three sections along with an Appendix. This introductory section briefly covers the legislative basis for the SPR Program and the SPR Plan and Amendments. The current status of the SPR and the appropriations to date are outlined in Section II. The drawdown system and vulnerability impact are set forth in Section III. The Appendix contains detailed information on the status of each SPR site.

## Program Legislation

The Congress authorized the SPR in the Energy Policy and Conservation Act (P.L. 94-163), approved December 22, 1975. This legislation declared it to be United States policy that a Reserve of up to one billion barrels of petroleum products be established to reduce the impact of disruptions in petroleum supplies and to carry out the obligations of the United States under the International Energy Program.

The EPCA provisions regarding the SPR were amended by Title VIII of the Energy Security Act (P.L. 96-294), approved June 30, 1980. The Energy Security Act establishes a minimum average daily fill rate of 100,000 barrels and precludes sale of Naval Petroleum Reserve Number 1 (Elk Hills) crude oil except to fill the SPR, unless the SPR is being filled at the minimum rate or had reached 500 million barrels in inventory.

The Omnibus Budget Reconciliation Act of 1981 (P.L. 97-35), approved August 13, 1981, created the "SPR Petroleum Account" as a method for financing Reserve oil acquisition and transportation without including such transactions in Federal budget totals. It also required quarterly reports on SPR progress and submission of a study on the ultimate size of the Reserve.

The Energy Emergency Preparedness Act of 1982 (P.L. 97-229), approved August 3, 1982, established minimum

SPR fill rate requirements, authorized acquisition of interim storage facilities, and required a series of plans and reports on SPR use and other aspects of energy emergency preparedness.

## SPR Plan and Amendments

The Energy Policy and Conservation Act required an SPR Plan, which was submitted to the Congress on February 16, 1977, and became effective on April 18, 1977. The Plan discussed the development and implementation of the SPR.

SPR Plan Amendment No. 1 accelerated the planned schedule for filling the Reserve. This Amendment was submitted to the Congress on May 25, 1977, and became effective on June 20, 1977. The revised goal of 500 million barrels to be in storage by December 22, 1980, contained in this Amendment, advanced the schedule by two years. Amendment No. 2 to the SPR Plan authorized an increase in the SPR size from 500 million barrels to one billion barrels of stored oil. The Amendment was transmitted to the Congress on May 18, 1978, and became effective on June 13, 1978. The Amendment described the plans to store 750 million barrels of petroleum by the DOE in underground storage facilities. Decisions were not made regarding the methods or timing for developing the final 250 million barrels of storage capacity.

The DOE submitted to the Congress the Distribution Plan for the SPR (Amendment No. 3, Energy Action No. 5) on October 31, 1979. In accordance with the provisions of the Energy Policy and Conservation Act, the Plan became effective on November 15, 1979. The Distribution Plan described the methods for drawdown and distribution of crude oil from the five SPR storage sites.

On December 1, 1982, President Reagan transmitted to the Congress a new "Drawdown" (Distribution) Plan (Amendment No. 4) for the use of the SPR. This plan, required under the Energy Emergency Preparedness Act of 1982 (EEPA) and effective upon its December 1, 1982 submission to the Congress, provides new procedures for the drawdown and distribution of crude oil from the SPR.

## II. STATUS OF THE PETROLEUM RESERVE

### A. STORAGE FACILITIES DEVELOPMENT

The SPR storage facilities system consists of six underground crude oil storage sites in salt domes along the coasts of Texas and Louisiana, and a Government-owned marine terminal on the Mississippi River at St. James, Louisiana. The locations of the SPR storage sites and their interconnecting pipelines to the three major interstate distribution networks, the Seaway, Texoma, and Capline pipeline systems are shown in Figure 1. SPR facilities are being developed in three phases which are described in this section.

#### Phase I

Under Phase I, five sites with existing storage capacity of approximately 260 million barrels were converted for use in storing oil. The Phase I sites are Bryan Mound in Texas, and Bayou Choctaw, West Hackberry, Sulphur Mines, and Weeks Island in Louisiana, plus a Department of Energy marine terminal facility at St. James, Louisiana. Construction of facilities associated with this phase of the SPR was completed in 1980. Phase I sites, number of caverns, and storage capacities are shown in Table I.

#### Phase II

Phase II development consists of the expansion of three Phase I sites by a total of 290 million barrels. The Bryan

Mound storage capacity is being expanded by 120 million barrels, and the West Hackberry storage capacity is being expanded by 160 million barrels, both by leaching (solution mining) new caverns. A further 10-million-barrel capacity is being added in Phase II through the exchange of a new cavern for an additional existing storage cavern at Bayou Choctaw.

Phase II is on schedule with cavern construction or leaching approximately 66 percent complete. Approximately 114.5 million barrels of this capacity was available for oil storage and filled by December 31, 1983. The three Phase II sites are discussed briefly in the following paragraphs.

#### BRYAN MOUND

Phase II cavern leaching operations at Bryan Mound commenced in March 1980 and site construction was completed in 1981. During 1983, brine disposal to the Gulf of Mexico averaged approximately 869,000 barrels per day, creating approximately 37.2 million barrels of new cavern storage capacity. As of December 31, 1983, cavern leaching operations were 87 percent complete. A total of 77 million of the planned 120 million barrels was available for oil storage. Further, six of the 12 planned caverns had been completed and filled. In August, Hurricane Alicia caused a shutdown of the Bryan Mound site

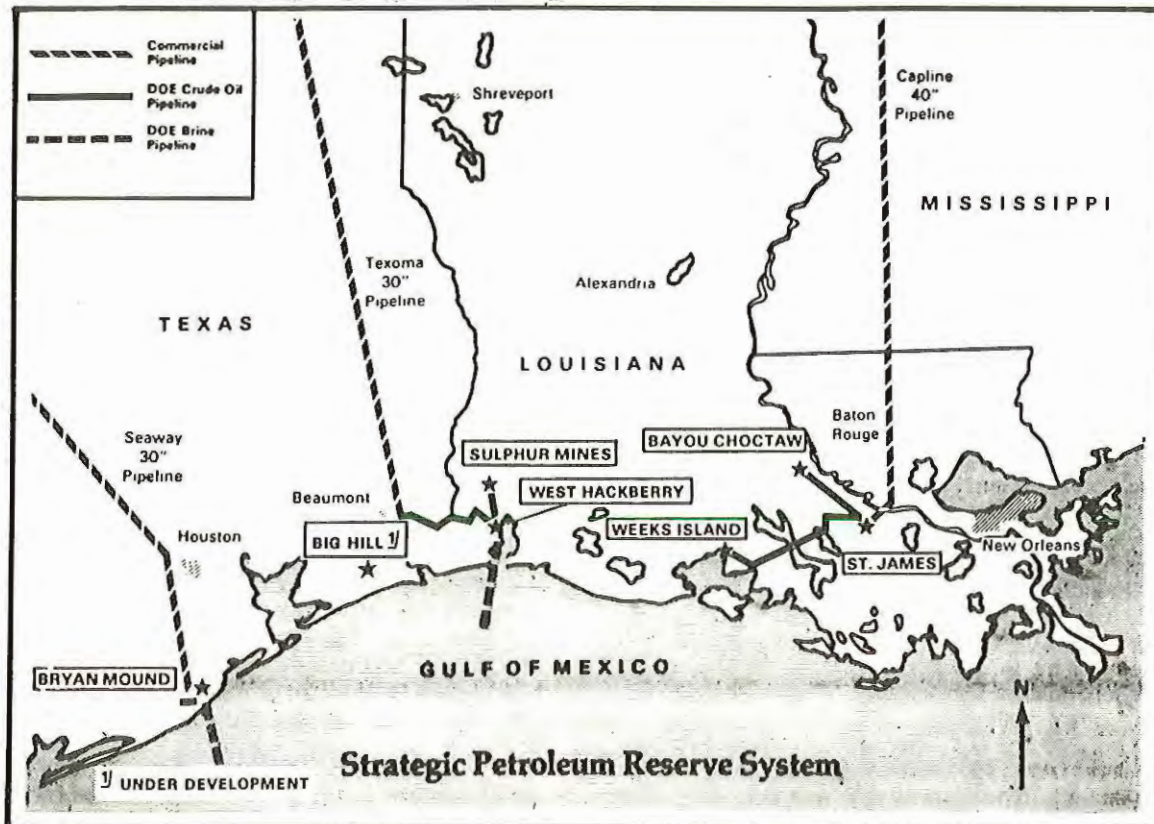


Figure 1. Location of Current SPR Site Complexes



**Table 1. Phase 1 Sites, Caverns, and Storage Capacities**

Site	Location	No. Caverns	Storage Capacities (million barrels)
Bryan Maund	Brazoria County, TX	4	65.3
West Hackberry	Cameron Parish, LA	5	49.1
Bayou Choctaw	Iberville Parish, LA	4	46.6
Sulphur Mines <sup>1/</sup>	Calcasieu Parish, LA	3	26.0
Weeks Island	Iberia Parish, LA	converted salt mine	73.0
St. James Terminal	St. James Parish, LA	ship terminal	N/A
TOTAL			260.0

<sup>1/</sup> Completed fill September 30, 1983; the final Phase I site filled.

for four days. Minor damage was inflicted upon the site. The damage to the offshore brine discharge monitoring system was corrected and the site returned to full operations promptly. Environmental monitoring required by discharge permits was not affected.

#### WEST HACKBERRY

Cavern leaching operations at West Hackberry commenced in May 1981 and site construction was completed by the end of 1981. During 1983, brine disposal to the Gulf of Mexico averaged approximately 904,000 barrels per day, creating approximately 28.8 million barrels of new cavern storage capacity. As of December 31, 1983, cavern leaching operations were 51 percent complete. A total of 37.5 million of the planned 160 million barrels was available for oil storage. During the year, the leach rate improved markedly as minor electrical problems were solved and a pump component metallurgy-improvement program was implemented.

#### BAYOU CHOCTAW

Phase II at Bayou Choctaw consists solely of the leaching of a new 5.5-million-barrel cavern which will be exchanged for an existing Union Texas Petroleum-owned cavern of approximately 10 million barrels. This industry-owned cavern presently contains ethane, a petrochemical currently being used by local industries. The new cavern, which was initiated in June 1982, has been leached to a volume of 3.6 million barrels and is projected for completion in 1984. Storage of crude oil in the ethane cavern to be acquired by the SPR is not scheduled until 1987, as the ethane gas will have to be transferred to the new cavern and piping modifications made to the existing ethane cavern for crude oil storage.

#### Phase III

Phase III development consists of the construction of a new 140-million-barrel storage site in a salt dome at Big Hill, Texas, and the further expansion of three existing SPR storage sites by a total of 60 million barrels. The sites being expanded are Bryan Mound, Texas (40 million barrels), West Hackberry, Louisiana (10 million barrels),

and Bayou Choctaw, Louisiana (10 million barrels). These sites are discussed briefly in the following paragraphs.

#### BRYAN MOUND

Phase III development at Bryan Mound consists of the construction and leaching of four 10-million-barrel storage caverns, increasing the site total to 24 caverns. Drilling for these four caverns was completed in April 1983 and surface construction, initiated in February, was 84 percent complete as of December 31, 1983. Leaching of the first two Phase III caverns at Bryan Mound is scheduled to start in early 1984.

#### WEST HACKBERRY

During 1983, the planned Phase III development of West Hackberry was reduced from a 20 to a 10-million-barrel expansion in favor of a further 10-million-barrel expansion at Bayou Choctaw. This action eliminated the need to acquire additional land at West Hackberry and, at the same time, enhanced the SPR's Capline system drawdown capability. Design and procurement of casing for the new cavern was completed in September 1983 and drilling, initiated in October 1983, was approximately 50 percent complete as of December 31, 1983.

#### BAYOU CHOCTAW

Phase III development at Bayou Choctaw consists of the construction and leaching of a single 10-million-barrel storage cavern. This expansion enhances the SPR's drawdown posture by increasing the Capline System storage volume and by increasing the Bayou Choctaw drawdown capability to achieve 480,000 barrels per day for both crude types stored at this site. During 1983, the Department completed geological studies to determine the optimal location of the new cavern on existing DOE property and initiated detailed design.

#### BIG HILL

DOE took possession of 238.6 acres of land required for the Big Hill site in December 1982. Additional parcels of land required for Big Hill site development totaling 32.5

acres, including land required for a raw water intake structure, water and brine pipelines, and road easements, were acquired with the signing of the Possession Order by the U.S. District Court on July 13, 1983. Drilling for the first five caverns began in May 1983, and seven of the ten wells were completed by December 31, 1983. Contracts were awarded for the procurement of major long-lead equipment (pumps, transformers, switchgear, control systems). On December 30, a Stage I site construction contract was awarded to perform the civil, mechanical, and electrical work associated with central pumping facilities and the initial five caverns at the Big Hill site.

A summary of the SPR crude oil capacities and inventories, by phase, is shown in Table 2.

**Table 2. SPR Crude Oil Capacities and Inventory**

	Planned Storage Capacity (million bbls)	End of 1983	
		Storage Capacity (million bbls)	Inventory (million bbls)
Phase I	260	260	260.7*
Phase II	290	115	118.4**
Phase III	200	-	-
<b>Total</b>	<b>750</b>	<b>375</b>	<b>379.1</b>

\*Includes crude oil stored in tanks and pipelines.

\*\*Includes 3.9 million barrels temporarily stored in cavern space which ultimately will be required for thermal expansion/creep closure which occurs during long-term storage in salt caverns.

## B. OIL ACQUISITION AND TRANSPORTATION

On December 31, 1983, the SPR oil inventory was 379.1 barrels. The annual inventories since 1977 and average daily fill rates are presented in Table 3.

**Table 3. SPR Oil Acquisition History**

	Year-End Inventory (million bbls)	Fiscal Year	Year-End Inventory (million bbls)	Calendar Year
		Average Daily Fill Rate (thousand bbl/d)		Average Daily Fill Rate (thousand bbl/d)
1977	1.1	3	7.2	20
1978	49.1	131	68.5	168
1979	91.2	88	91.7	64
1980	92.8	4	107.8	44
1981	199.2	292	230.3	336
1982	277.9	215	293.8	174
1983	361.0	228	379.1	234

## Oil Acquisition Contracts

During 1983, contracts were awarded by the SPR's crude oil procurement agent, the Defense Fuel Supply Center, under an open continuous solicitation, for delivery of 30.4 million barrels during 1983 and 1984. Under this solicitation, offers and subsequent awards are made on a biweekly basis. This method of crude oil acquisition may be continued in 1984, depending on market conditions and requirements for this portion of SPR crude oil acquisition.

In addition to the contracts awarded under the open continuous solicitation, the Defense Fuel Supply Center, on August 31, 1983, awarded term contracts for delivery of 6.9 million barrels of sweet crude oil during the period October 1983 through March 1984. Subsequently, however, due to an inability to reduce the contract prices commensurate with declining world oil market prices, the contracts were amended to provide for delivery of 4.4 million barrels.

During 1983, the SPR continued to receive crude oil deliveries under its 1981 and 1982 purchase agreements with Petroleos Mexicanos (PEMEX), Mexico's state-owned oil company. Deliveries were completed under the 1982 agreement and are continuing under the 1981 agreement at a current rate of 50,000 barrels per day, which will ultimately provide approximately 107 million barrels by August 1986.

Of the 85.3 million barrels of crude oil delivered in 1983:

- 29.1 million barrels of sweet and sour crude oil were acquired under the open continuous solicitation issued by the Defense Fuel Supply Center for spot market purchases.
- 50.7 million barrels of sour crude oil were delivered under the two commercial contracts with PEMEX.
- 5.5 million barrels of sweet crude oil were delivered under the Defense Fuel Supply Center's term contracts awarded August 31, 1983, and other term contracts awarded in 1982.

In addition, on December 31, 1983, the Reserve had 23.7 million barrels of oil under contract for delivery in 1984.

Table 4 shows the crude oil received since inception of the program by state or country of origin. Of the total oil in storage, 64.6 percent is high sulfur (sour) and 35.4 percent is low sulfur (sweet). Table 5 provides information on the location of this inventory by site. A description of SPR crude oil specifications is included in the Appendix.

#### Cargo Preference Act Compliance

The Cargo Preference Act of 1954 requires that a government agency take such steps as may be necessary and practicable to assure that at least 50 percent of its cargo transported on ocean vessels in a calendar year is transported by privately-owned U.S.-flag vessels, to the extent they are available at fair and reasonable rates. By agreement between DOE and the Department of Transportation (DOT), the SPR's Cargo Preference Act compliance is measured in long-ton miles.

On September 15, 1983, the Assistant Attorney General for Legal Counsel rendered an opinion to the Secretaries of Energy and Transportation that Alaskan crude oil deliveries could be counted towards the U.S.-flag share required by the Cargo Preference Act. As of December 31, 1983, consistent with this ruling and an agreement between DOE and DOT providing for cumulative compliance beginning with calendar year 1981, 90.9 BLTMs or 53.5 percent of the total ton-miles involved in SPR deliveries since January 1981 have been by U.S.-flag vessels. This compliance status represents the makeup of a 8.3 BLTM deficit which occurred in 1981 and provides a

**Table 4. Crude Oil Received Through 1983**

Source Country or State	Net Quantity (million barrels)	Percent of Total (%)
Mexico	134.7	35.5
United Kingdom	88.0	23.2
Alaska	31.4	8.3
Libya	23.8	6.3
Saudi Arabia	20.5	5.4
Iran	20.0	5.3
Nigeria	13.9	3.7
Dubai	12.1	3.2
Egypt	8.5	2.2
Oman	6.0	1.6
Ecuador	4.8	1.3
Algeria	4.2	1.1
Texas	2.5	0.7
Gabon	2.4	0.6
Norway	2.4	0.6
Cameroon	1.6	0.4
Venezuela	0.9	0.2
Qatar	0.6	0.2
Other Domestic	0.4	0.1
Peru	0.4	0.1
<b>Total Receipts</b>	<b>379.1</b>	<b>100.0</b>

compliance credit of 11.8 BLTMs for application in future year compliance calculations. Additionally, just during the year 1983, 20.9 BLTMs or 61.5 percent of the crude oil deliveries to the SPR were on U.S.-flag vessels.

**Table 5. SPR Crude Oil Inventory  
(December 31, 1983)**

Storage Site	Location	Crude Oil Inventory (million bbls)			End of Year 1982
		Sour*	Sweet**	Total	
Bryan Mound	Brazoria County, TX	81.4	64.4	145.8	104.2
West Hackberry	Cameron Parish, LA	35.7	50.3	86.0	56.9
Bayou Chactaw	Iberville Parish, LA	26.8	18.3	45.1	44.5
Weeks Island	Iberia Parish, LA	72.3	0.0	72.3	72.6
Sulphur Mines	Calcasieu Parish, LA	26.0	0.0	26.0	13.2
<b>Subtotal</b>		<b>242.2</b>	<b>133.0</b>	<b>375.2</b>	<b>291.4</b>
Tanks and Pipelines		2.7	1.2	3.9	2.4
<b>Total</b>		<b>244.9</b>	<b>134.2</b>	<b>379.1</b>	<b>293.8</b>

\* Sulphur Content greater than 0.5 percent

\*\* Sulphur Content less than 0.5 percent

## C. BUDGET AND FINANCE

### I. Appropriations

Nearly \$15.3 billion has been appropriated for the SPR through FY 1984, including entitlements receipts for FY 1981 under the authority of the Energy Security Act. Distribution of appropriated funds among program activities is shown in Table 6. Figures 2 and 3 illustrate SPR funding on an annual basis and on a cumulative basis, respectively.

As required by the Omnibus Budget Reconciliation Act of 1981, P.L. 97-35, which amended Section 167 of the Energy Policy and Conservation Act, P.L. 94-163 (42 U.S.C. Section 6247), the SPR Petroleum Account was established in the Treasury, placing SPR oil spending "off-budget" and providing for the reappropriation of SPR oil sales receipts for oil acquisition following a drawdown.

### 2. Major Budget and Financing Actions During 1983<sup>1</sup>

President Reagan's FY 1984 budget proposed budget authority of \$741,870,000 for the SPR, consisting of \$583,100,000 for Petroleum Acquisition and Transportation, \$142,357,000 for Storage Facilities Development and Operations, \$6,250,000 for Planning, and \$10,163,000 for Program Direction.

On October 1, 1983, the Congress passed a FY 1984 Continuing Resolution which permitted SPR on-budget and off-budget expenditures to continue at FY 1983 levels through November 11, 1983.

**Table 6. SPR Appropriations  
(In Thousands of Dollars)**

Fiscal Year	Petroleum Acquisition and Transportation	Storage Facilities Development and Operations	Planning	Program <sup>1/</sup> Direction	Total
1976	---	300,000	12,000	1,975	313,975
1977	440,000	---	4,000	3,824	447,824
1978	2,703,469	463,933	7,215	7,489	3,182,106
1979	2,885,670	103,290	12,200	5,911	3,007,071
Reprogramming	- 529,214	+529,214	---	---	---
	<u>2,356,456</u>	<u>632,504</u>	<u>12,200</u>	<u>5,911</u>	<u>3,007,071</u>
1980	-2,000,000 <sup>2/</sup>	---	---	---	-2,000,000
Reprogrammings					
#1	- 20,391	---	+12,000	+ 8,391	---
#2	- 1,881	---	---	+ 1,881	---
	<u>-2,022,272</u>	<u>---</u>	<u>12,000</u>	<u>10,272</u>	<u>-2,000,000</u>
1981	2,688,282 <sup>3/</sup>	82,834	8,000	11,391	2,790,507
Entitlements	+ 542,146	---	---	---	+ 542,146
Reprogrammings					
#1	- 18,000	+ 18,000	---	---	---
#2	- 7,334	+ 7,334	---	---	---
	<u>3,205,094</u>	<u>108,168</u>	<u>8,000</u>	<u>11,391</u>	<u>3,332,653</u>
1982	3,684,000 <sup>4/</sup>	171,356	8,640	11,436	3,875,432
Reprogramming	- 4,300 <sup>5/</sup>	+ 4,300	---	---	---
	<u>3,679,700</u>	<u>175,656</u>	<u>8,640</u>	<u>11,436</u>	<u>3,875,432</u>
1983	2,074,060	222,528	8,000	11,590	2,316,178
1984	650,000	142,357	6,250	10,163	808,770
<b>Total Appropriations</b>	<b>13,086,507</b>	<b>2,045,146</b>	<b>78,305</b>	<b>74,051</b>	<b>15,284,009</b>

1/ Excludes funds appropriated to other DOE accounts but used to finance aspects of SPR Program Direction.

2/ Recision

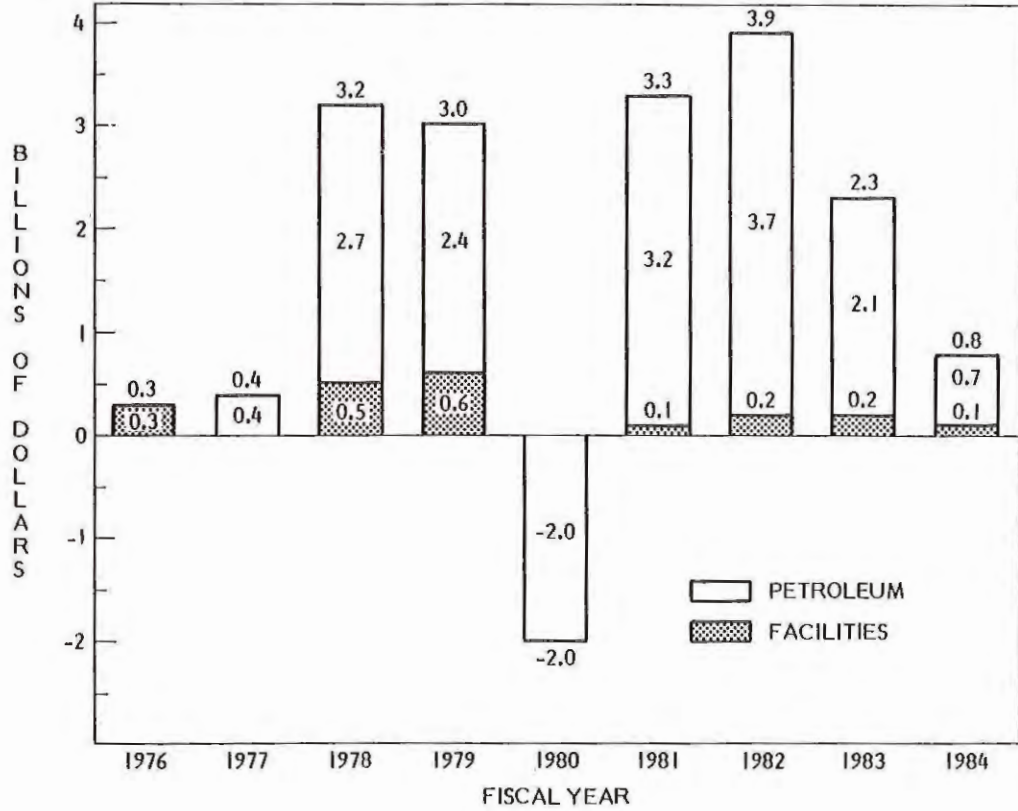
3/ Includes supplemental appropriations of \$1,305,000,000.

4/ Pursuant to the Omnibus Budget Reconciliation Act of 1981, Petroleum Acquisition and Transportation funding was placed off-budget beginning in FY 1982.

5/ Reprogramming was funded from on-budget FY 1981 Petroleum Acquisition and Transportation carryover funds.

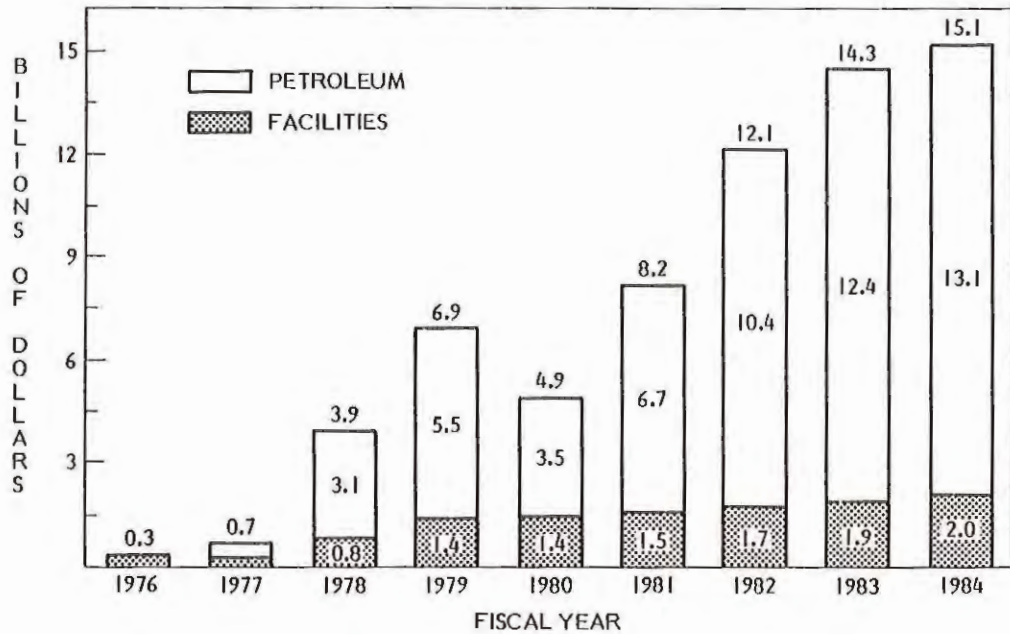
**Figure 2. Strategic Petroleum Reserve  
Annual Funding**

Storage Facilities Development/Operations and Petroleum Acquisition/Transportation



**Figure 3. Strategic Petroleum Reserve  
Cumulative Funding**

Storage Facilities Development/Operations and Petroleum Acquisition/Transportation



On November 4, 1983, the President approved Public Law 98-146, making appropriations to the Department of the Interior and Related Agencies for FY 1984. This law appropriated \$650,000,000 for the off-budget SPR Petroleum Account and \$158,770,000 for on-budget activities, i.e., Storage Facilities Development and Operations, Planning and Program Direction.

The appropriation for the SPR Petroleum Account was \$66,900,000 more than requested by the President, reflecting that P.L. 98-146 also provides that the SPR be filled at an average rate of 186,000 barrels per day in FY 1984, rather than of the 145,000 barrels per day rate proposed by the President.

### **3. Oil Costs through FY 1983**

Inclusive of entitlements receipts, the cumulative cost for the 361 million barrels delivered to the Reserve through FY 1983 was \$10,391 million, an average of \$28.78 per barrel.

From appropriations for FY 1983 and prior years, an estimated \$2,030 million remained available for oil deliveries in FY 1984, providing a total of \$2,680 million for deliveries in FY 1984 and advance orders for FY 1985 when the \$650 million appropriation to the SPR Petroleum Account for FY 1984 is included.

## **D. ORGANIZATION, MANAGEMENT AND CONTRACTUAL SUPPORT**

### **I. Program/Project Management**

The Energy Policy and Conservation Act, which authorized the SPR Program, created the Strategic Petroleum Reserve Office for the establishment, management, and maintenance of the Strategic Petroleum Reserve. The Assistant Secretary for Fossil Energy, William A. Vaughan has overall programmatic responsibility for achieving the goals and objectives of the SPR Program. This responsibility has been delegated to the Deputy Assistant Secretary, Strategic Petroleum Reserve, Richard D. Furiga.

In June 1983, the Secretary of Energy assigned responsibility for SPR project management and implementation activities to the Manager, Oak Ridge Operations Office (ORO), Joe La Grone. A management agreement, approved August 9, 1983, between the Assistant Secretary for Environmental Protection, Safety and Emergency Preparedness (presently Fossil Energy) and the Manager, Oak Ridge Operations Office, defined respective program and project authorities and responsibilities. The Manager, ORO, directs SPR activities through the Assistant Manager for Strategic Petroleum Reserve (AM-SPR). Percy Brewington was named AM-SPR effective December 12, 1983. The Project Management Office (PMO), located in New Orleans, carries out day-to-day project implementation activities as delegated by the Manager, ORO, in accordance with programmatic guidance provided by the Deputy Assistant Secretary-SPR. The SPR had a total staff of 200 Full Time Equivalents in FY 1983.

Upon assignment of SPR management functions to ORO, the Manager ORO established a multidisciplinary task force under a charter which included direction to conduct a review of the SPR PMO and to prepare a report which

would establish a baseline PMO status at the time of this management transition. The findings and recommendations of this review were documented in a report entitled "Baseline Assessment of the SPR PMO" issued on October 24, 1983. Implementation plans are being developed for the 170 recommendations in this report which will be tracked until closeout.

### **2. Procurement and Contractor Support**

During 1983, the SPR PMO procurements totaled approximately \$993 million, including orders for \$792 million for crude oil. Procurements for other than crude oil totaled \$201 million. The SPR PMO, in conjunction with prime contractors, awarded over \$56 million to small businesses and over \$27 million to disadvantaged businesses, which exceeds the goals established by the Department of Energy.

Services continued to be provided in 1983 under existing contracts by: Petroleum Operations and Support Services, Inc. for operation and maintenance; Jacobs/D'Appolonia Engineers for design engineering of modifications and upgrades to existing sites and for Phase III expansion projects; the Aerospace Corporation for systems engineering and integration; Walk-Haydel & Associates, Inc. for design engineering services for the Big Hill, Texas site; Sandia National Laboratories for geotechnical engineering; OAO Corporation for management and technical support services; Spectra Research Systems, Inc. for safety and risk analysis; Thacker Construction Company for construction services in support of capital improvements of existing SPR sites; Wells Fargo Guard Services for security protection services for SPR sites; Drillers, Inc. for the drilling of eight wells for Phase III expansion of the Bryan Mound site; and York Research Consultants, Inc. for onshore environmental monitoring of SPR sites.

A competitive award was made in April 1983 to Texas A&M Research Foundation which consolidated under one contract the continuation of offshore oceanographic environmental services for monitoring brine disposal into the Gulf of Mexico from the Bryan Mound and West Hackberry sites. Other major new contractors included Big Chief Drilling, Inc. for drilling at Big Hill, Voss International for Phase III site construction at Bryan Mound, and Fruin Colnon Carp. for Stage I site construction at Big Hill. Several awards were also made for long-lead equipment for Big Hill.

## **E. REAL ESTATE, ENVIRONMENTAL COMPLIANCE, AND PERMITS**

### **1. Real Estate**

Acquisition actions were completed for 75 percent of the real property interest required for constructing six underground storage facilities and a marine terminal under Phases I, II and III. Acquisition of rights-of-way for constructing the crude oil and brine pipelines for Big Hill is proceeding on schedule. Efforts were continued to finalize purchase transactions, settle court actions and obtain final opinions for the real property interests in support of all phases of construction. A number of outgrants for utility easements and letters of consent were issued to firms to permit them to cross Government-owned easements.

## 2. Environmental Compliance and Permits

Environmental protection activities in support of construction and operation of all SPR facilities continued through 1983 in compliance with applicable DOE Orders. Offshore environmental conditions were extensively monitored at the West Hackberry and Bryan Mound brine discharge sites throughout the year. The brine diffusers are performing as designed and effectively dilute and disperse the brine. Environmental impacts at both sites are within predicted levels and are so subtle as to be considered negligible.

State water quality certification and permits for water appropriation, air quality, underground hydrocarbon storage, drilling, and pipeline operations were obtained for Big Hill in 1983. Also, the Corps of Engineers construction permit has been issued for the Big Hill raw water intake and raw water, brine, and crude oil pipelines. In addition, the Environmental Protection Agency published the draft National Pollutant Discharge Elimination System permit for Big Hill in December. This permit is anticipated to be effective by mid-1984. Other permits for Phase III acquired in 1983 were well pad and drilling permits for Bayou Choctaw and drilling permits for West Hackberry.

## III. DRAWDOWN SYSTEM AND VULNERABILITY IMPACT

### A. DRAWDOWN CAPABILITY

SPR drawdown and distribution capabilities are affected by at least three categories of factors: storage site capabilities (including cavern fill levels and pumping systems); point-of-sale capabilities, such as terminal throughput rates and private sector transportation capacities; and crude oil demand factors affecting offers to the Government to purchase SPR oil. The Department has established design criteria for the first category of factors, onsite capabilities, but does not fully control the remaining factors.

Major changes have occurred in recent years regarding the pattern of United States crude oil imports, refining capabilities, and transportation systems. These changes could affect the distribution capabilities for SPR crude oil. In November 1983, Secretary Hadel requested the National Petroleum Council to undertake a study of this subject, and the Council accepted this assignment.

Based on the current SPR inventory, commercial distribution systems, and patterns and levels of U.S crude oil imports, 189 million barrels of the 379.1 million barrels in storage as of December 31, 1983 could be drawn down during the first three months at a sustained average daily rate of 2.1 million barrels per day. The Phase I drawdown rate of 1.7 million barrels per day could currently be sustained for a period in excess of five months.

Table 7 compares the Phase I, Phase II, and Phase III planned drawdown capabilities. While most of the physical hardware is in place for the Phase II drawdown systems, the ability to sustain the Phase II rate of 3.5 million barrels per day is dependent upon further increases in Phase II inventory levels and on commercial demand for SPR crude oil. The drawdown rate will continue to increase as Phase II development and fill proceed.

Table 7. SPR Drawdown System

Site	Distribution System		Maximum Initial Drawdown Rate Capability (thousand bbl/d)		
	Pipeline	Tanker Terminal	Phase I	Phase II	Phase III
Bryan Mound	Seaway	Seaway	387	1,054	1,054
West Hackberry	Texoma	Sun	402	1,402	1,402
Sulphur Mines	Texoma	Sun	100	*	*
Big Hill	Texoma	Sun	---	---	935
Bayou Choctaw	Capline	DOE/St. James	240	480	480
Weeks Island	Capline	DOE/St. James	590	590	590
<b>Total</b>			<b>1,719</b>	<b>3,526</b>	<b>4,461</b>

\*Combined drawdown rate of West Hackberry and Sulphur Mines is 1.4 million bbl/d.

Tie-ins are in place to accommodate drawdown through the commercial facilities. In addition, detailed plans and procedures have been developed for moving crude oil out of storage into the commercial distribution system.

During 1983 the Department performed two tests of physical system, capabilities.

- In July 1983, a drawdown exercise demonstrated the ability to draw down oil from the Bayou Choctow site at a rate of 240,000 barrels per day.
- In November 1983, over one million barrels of oil were pumped from underground storage at the Bryan Mound site to aboveground facilities within a 24-hour period.

In addition, during July and August 1983, the Department conducted a test, entitled DIREX-B, of its management, sales and operations procedures involved in the drawdown, sale and distribution process of SPR crude oil.

## **B. VULNERABILITY IMPACT**

The vulnerability of the United States to oil supply disruptions is affected by a number of factors in addition to changes in the SPR inventory. These factors include levels of U.S. petroleum use and imports, levels and locations of spare petroleum production capacity worldwide, and petroleum inventories held in the U.S. private sector and abroad.

On balance, in 1983, as in 1982, the vulnerability of the United States to oil supply disruptions continued to be less than in the prior decade. Domestic use of petroleum declined approximately 1 percent from 1982 to 1983 and

by 11 percent from 1980 to 1983. Net private sector oil imports (excluding imports for the SPR) declined by approximately 200,000 barrels per day or nearly 5 percent, from 1982 to 1983 to approximately 4 million barrels per day. Overall, such import levels declined by 37 percent from 1980 to 1983.

Private sector primary stocks of petroleum declined by approximately 2 percent by December 1983 as compared to December 1982 levels, continuing a trend which includes a 14 percent decline from December 1980 to December 1983. This rate of decline was slightly higher than the rate of decline in total domestic use of petroleum over the same period but less than the rate of decline in petroleum imports.

In calendar year 1980, the United States imported approximately 2.31 billion barrels of oil on a net basis, excluding oil for the Reserve, and the Reserve inventory in December 1980 stood at 107.8 million barrels or less than 5 percent of such annual imports. During 1983 the U.S. imported an estimated 1.46 billion barrels of oil on the same net basis, and the December 1983 SPR oil inventory was equivalent to nearly 26 percent of 1983 annual net oil imports. Thus while the actual SPR inventory has grown in three years to 3.5 times the December 1980 level, the SPR has grown by approximately 5.5 times during the same period in relation to U.S. oil import levels.

In December, 1982, the SPR oil inventory of 294 million barrels represented an estimated 20 percent of calendar year 1982 U.S. oil imports so the growth in the Reserve inventory during 1983, coupled with continued decline in annual U.S. import levels has expanded the import replacement capability of the Reserve by approximately 30 percent over one year.



**APPENDIX**  
**SPR SITE STATUS AND CRUDE OIL SPECIFICATIONS**

- A. Bayou Choctaw
- B. Weeks Island
- C. Bryan Mound
- D. Sulphur Mines
- E. West Hackberry
- F. Big Hill
- G. St. James Terminal
- H. Crude Oil Specifications

**INTRODUCTION**

The storage sites described in this Appendix are located on the Gulf Coast where they are accessible to major interstate crude oil distribution pipelines and port facilities. These locations will allow rapid withdrawal (drawdown) of the Reserve should supplies to the United States be disrupted for any reason, and will expedite its entrance into the normal commercial crude oil distribution system of the country.

Most crude oil transported to the United States enters through the Gulf of Mexico, supplying local refineries or is transported to inland refineries via pipelines. A significant portion of the imported crude oil is transferred inland through three major pipelines: the Seaway and Texoma pipelines to Cushing, Oklahoma, and the Capline pipeline to Patoka, Illinois. Additional smaller pipelines further distribute oil from the major pipelines throughout the Midwest. The Gulf Coast is a desirable location for storage because the Department of Energy can take advantage of existing commercial crude oil pipeline distribution systems as well as ocean transportation during a drawdown of the Reserve.

Each of the site complexes currently being developed for the SPR will be connected to one of the three major commercial crude oil pipeline systems with their associated marine terminal facilities. The SPR site complexes have been grouped according to their associated major pipelines and marine terminal facilities.

## A. BAYOU CHOCTAW

### Location

Iberville Parish, Louisiana (12 miles southwest of Baton Rouge, Louisiana).

### Acquisition

Acquired 355.95 acres fee simple by condemnation April 1977, from numerous private owners. Union Texas Petroleum (a subsidiary of Allied Corporation) was the previous operator.

Action has been initiated to acquire existing Cavern No. 17 for SPR crude oil storage which will provide an additional 10 million barrels of storage volume in Phase II. In conjunction with that acquisition, a new cavern, No. 102, is being developed to approximately 5.5-million-barrel capacity. An agreement for the exchange of this cavern for cavern 17 has been negotiated with Union Texas Petroleum.

### Environmental/Permits

Environmental Impact Statement published December 1976; supplement published May 1977.

Four major Federal and State permits related to pipeline, well pad, storage, and storm water runoff acquired in 1978, and updated in 1980 and 1981.

### Site Description

A 45-million-barrel Phase I storage facility consisting of four existing caverns. An additional 10 million barrels of storage capacity will be provided in Phase II and another 10 million barrels in Phase III.

Oil, brine, raw water piping distribution system connecting caverns with central piping and 18 pumps totaling over 20,000 horsepower.

Twelve brine disposal wells 2.5 miles offsite; pipeline for supplying brine to Union Texas Petroleum.

100,000-barrel brine pit, control center, buildings, roads, well pads, and dikes.

Water intake structure in Cavern Lake on site.

### System Parameters

Oil fill via 36-inch-diameter, 37.2-mile pipeline to St. James Terminal.

Sustained system rate - 110,000 bbl/d (brine disposal-constrained).

Raw water design pumping rate - 480,000 bbl/d.

Brine disposal - 110,000 bbl/d projected disposal rate.

### Drawdown

Drawdown via 36-inch-diameter, 37.2-mile pipeline to St. James Terminal and to Capline pipeline.

480,000 bbl/d design capability (at end of Phase II).

### Major Accomplishments

Development of Phase II Cavern 102 was 70 percent completed.

Design of Phase III Cavern 101 was initiated.

As of December 31, 1983, 45.1 million barrels of crude oil were in storage.

## B. WEEKS ISLAND

### Location

Iberia Parish, Louisiana (95 miles southwest of New Orleans).

### Acquisition

Acquired 382.92 acres fee simple subsurface and 6.63 acres fee simple surface by condemnation September 1977 from Morton Salt Company.

### Environmental/Permits

Environmental Impact Statement published January 1977; supplement published August 1977.

Major Federal permit related to oil pipeline to St. James Terminal acquired in 1978. Three major Federal and State permits related to oil storage, air emissions and storm water, and treated sewage

effluent discharge acquired in 1979; NPDES updated in 1982.

### Site Description

Conventional salt mine containing two levels of rooms and pillars dedicated to sour crude oil storage.

Oil piping distribution system consists of 11 (10 operational and one reserve) submersible electric pumps in the mine to boost crude to the surface and twin main-line pumps (plus one reserve) to push crude to St. James Terminal during drawdown. Pumps total 17,000 horsepower.

500,000-gallon firewater tank and pumps.

Mine inert gas and vapor recovery systems.

## B. WEEKS ISLAND (cont.)

### System Parameters

Oil fill via 36-inch-diameter, 67.2-mile pipeline from St. James Terminal.

Sustained system rate - 350,000 bbl/d (terminal thruput limited).

### Drawdown

Drawdown via 36-inch-diameter, 67.2-mile pipeline to St. James Terminal and to Capline pipeline.

590,000 bbl/d design capability.

## C. BRYAN MOUND

### Location

Brazoria County, Texas (three miles southwest of Freeport, Texas).

### Acquisition

Acquired 499.47 acres fee simple by condemnation April 1977, from Freeport Mineral Company and other owners. Dow Chemical Company was the previous operator.

### Environmental/Permits

Environmental Impact Statement published January 1977; supplement published December 1977. Phase II supplement published October 1981.

Five major Federal and State permits related to pipelines, water intake, and storage acquired in 1977 and 1978. NPDES updated 1981.

Seaway Environmental Impact Statement published June 1978. Supplement published October 1981.

Two major Federal permits related to brine disposal pipeline issued in 1978. Permit for brine discharge increased to 1.1 million barrels per day August 1981.

### Site Description

225-million-barrel storage facility consisting of 65.2 million barrels of capacity in four existing caverns plus 160 million barrels of new leached capacity in 16 other caverns.

36-inch-diameter, 14.6-mile brine disposal pipeline (13 miles offshore) to the Gulf of Mexico.

Oil, brine, and raw water piping distribution system connecting caverns with central plant, water intake structure and brine disposal wells, consists of over 101,000 feet of piping and 33 pumps totaling over 38,000 horsepower.

Four 200,000-barrel oil storage tanks.

15,000 and 100,000-barrel brine pits, oil-brine separator, maintenance and control center buildings, roads, well pads, and dikes.

Water intake structure on the Brazos River, connected by a 36-inch-diameter pipeline.

### System Parameters

Fill via 30-inch-diameter, 3.6-mile pipeline to Seaway docks.

Design oil injection rate - 240,000 bbl/d.

Sustained system rate - 180,000 bbl/d.

Raw water design pumping rate - 1,054,000 bbl/d.

Brine disposal - 980,000 bbl/d average projected disposal rate (permit limitation 1,100,000 bbl/d).

### Drawdown

Drawdown via 30-inch-diameter pipelines, 3.6 miles to Seaway docks and 4.6 miles to Seaway pipeline.

1,054,000 bbl/d design capability (at end of Phase II).

### Major Accomplishments

Created 37.2 million barrels of additional cavern storage volume in Phase II.

Completed drilling four new Phase III caverns (eight wells) in April 1983.

Construction of the leaching system for the four new Phase III caverns was 84 percent complete.

As of December 31, 1983, 145.8 million barrels of crude oil were in storage.

## D. SULPHUR MINES

### Location

Colcasieu Parish, Louisiana (two miles west of Sulphur, Louisiana, and 20 miles north of West Hackberry salt dome).

### Acquisition

Acquired 109.63 acres fee simple and 64.52 acres conditional fee by condemnation in February 1979 from Union Texas Petroleum (a subsidiary of Allied Corporation).

## D. SULPHUR MINES (cont.)

### Environmental/Permits

Environmental Impact Statement published March 1978.

Three major Federal and State permits for pipeline construction, oil storage, and air emission acquired in 1978. Environmental Protection Agency discharge permits for storm water and sewage acquired in 1980.

### Site Description

25.6-million-barrel storage facility consisting of three existing caverns.

Oil, brine, raw water piping distribution system connecting caverns with central plant, water intake structure, and brine disposal wells. Consists of over 77,000 feet of piping and 18 pumps totaling over 8,000 horsepower.

Four deep-injection brine disposal wells.

Two 100,000-barrel brine ponds, control center buildings, roads, well pads, and dikes.

Water intake structure 1.5 miles offsite on Houston Canal (Sabine River Diversion Canal No. 5) connected to facility by a combination of 16- and 12-inch pipeline.

### System Parameters

Oil fill via 16-inch-diameter, 15.9-mile spur pipeline connecting to DOE West Hackberry pipeline at Intracoastal Waterway.

Design pumping rate - 100,000 bbl/d.

Sustained system rate - 80,000 bbl/d (brine disposal-constrained).

Brine disposal - 80,000 bbl/d projected sustained rate.

### Drawdown

Drawdown via 16-inch-diameter, 15.9-mile spur pipeline to Intracoastal Waterway, then through 42-inch-diameter West Hackberry line, 34.4 miles to Sun Terminal, Nederland, Texas.

Design capability - 100,000 bbl/d.

### Major Accomplishments

As of September 1983, 26 million barrels of crude oil were in storage and site fill was completed.

## E. WEST HACKBERRY

### Location

Cameron Parish, Louisiana (12 miles southwest of Lake Charles, Louisiana).

### Acquisition

Acquired 405.36 acres fee simple by condemnation in April 1977, from numerous landowners including the Lowery, Ellender, and Hamilton families. Olin Corporation was the previous site operator.

Acquired 160.0 additional acres fee simple adjacent to Phase I property in two actions: July 1979 and March 1980. Total acreage through Phase II is 565.36 acres fee simple.

### Environmental/Permits

Environmental Impact Statement published January 1977; supplement published April 1977. Phase III supplement published October 1981.

Six major Federal and State permits related to pipelines, drilling pads, water intake, and storage acquired in 1977 and 1978; NPDES permit updated 1982.

Texoma Environmental Impact Statement published November 1978; supplement published in October 1981.

Two major Federal permits related to a brine pipeline acquired in 1980.

### Site Description

219-million-barrel storage facility consisting of 48.7 million barrels in five caverns existing upon site acquisition plus 170 million barrels of planned leached storage capacity in 17 caverns.

Oil, brine, raw water piping distribution system connecting caverns with central plant, water intake structure, and disposal wells. Consists of over 160,000 feet of piping and 47 pumps totaling over 62,000 horsepower.

36-inch-diameter, 27-mile brine disposal pipeline (nine miles offshore) to Gulf of Mexico.

175,000-barrel brine pit, oil-brine separator, control center and maintenance buildings, roads, well pads, and dikes.

Water intake structure on Intracoastal Waterway, 42-inch-diameter, 4.5-mile pipeline connecting to site.

### System Parameters

Fill via 42-inch-diameter, 42.8-mile pipeline from Sun Terminal, Nederland, Texas.

Design oil injection rate - 225,000 bbl/d.

Sustained system rate - 175,000 bbl/d (brine disposal - constrained).

## E. WEST HACKBERRY (cont.)

Raw water design pumping rate -1,400,000 bbl/d.

Brine disposal - 1,000,000 bbl/d projected sustained disposal rate (permit limitation 1,088,000 bbl/d) via 36-inch pipeline to the Gulf of Mexico.

### Drawdown

Drawdown via 42-inch-diameter, 42.8-mile pipeline to Sun Terminal, Nederland, Texas.

1,400,000 bbl/d drawdown capability (at end of Phase II).

### Major Accomplishments

Created 28.8 million barrels of additional cavern storage volume in Phase II.

Acquired 3.85 acres of land for Phase III expansion.

Initiated drilling for the new Phase III cavern (two wells).

As of December 31, 1983, 86.0 million barrels of crude oil were in storage.

## F. BIG HILL

### Location

Jefferson County, Texas (20 miles southwest of Beaumont, Texas).

### Acquisition

Acquired 271.07 acres fee simple by condemnation from two landowners i.e., 238.55 acres from Amoco and 32.52 acres from the Pipkin Estate.

### Environmental/Permits

Environmental Impact Statement published in October 1981.

State permits for drilling, underground hydrocarbon storage, pipeline operations, air quality, water appropriation, and water quality certifications were acquired in 1983. EPA National Pollutant Discharge Elimination System and Corps of Engineers construction permits are proceeding on schedule.

### Site Description

140-million-barrel storage facility consisting of 14 caverns.

Oil, brine, and raw water systems connecting caverns with central plant, water intake structure, and brine disposal system.

48-inch-diameter brine disposal pipeline to the Gulf of Mexico. Awaiting final regulatory approvals for 4.5-mile offshore distance to seaward end of diffuser.

Water intake structure on the Intracoastal Waterway connecting to the site by a 48-inch-diameter pipeline.

### System Parameters

Fill via 36-inch-diameter pipeline from Sun Terminal, Nederland, Texas.

Sustained system rate - 280,000 bbl/d.

Raw water design pumping rate - 1,400,000 bbl/d.

Brine disposal - 1,400,000 bbl/d.

### Drawdown

Drawdown via 36-inch-diameter pipeline to Sun Terminal, Nederland, Texas.

935,000 bbl/d drawdown capability.

### Major Accomplishments

Performed preliminary site work for drilling the first five cavern wells.

Acquired State permits for drilling, underground storage of hydrocarbons, pipeline operations, air quality and water appropriation.

Initiated drilling of the first five caverns (10 wells).

Awarded Stage IA contract for onsite surface facilities required to initiate leach.

## G. ST. JAMES TERMINAL

### Location

St. James Parish, Louisiana (45 miles southeast of Baton Rouge, Louisiana, on the Mississippi River).

### Acquisition

Acquired 104.76 acres fee simple for terminal by condemnation in May 1978.

Acquired 47.68 acres fee simple for docks by condemnation in July 1978.

### Environmental/Permits

St. James' Environmental Impact Statement is a component of the Bayou Choctaw supplement, published May 1977, and the Weeks Island supplement, published August 1977.

## G. ST. JAMES TERMINAL (cont.)

Two major Federal and State permits related to dock construction acquired in 1978. Environmental Protection Agency discharge permit for storm water and sewage acquired in 1980. Dock Construction Permit modified 1982.

### Site Description

Terminal facilities include six storage tanks totaling two million barrels of capacity, tie-ins to Bayou Choctaw, Weeks Island, and to LOCAP Capline pipeline and Capline terminal complex.

Oil distribution piping system connecting docks, tanks, and pump station. Consists of over 35,000 feet of piping and eight pumps totaling over 12,000 horsepower, metering systems, and maintenance and central buildings.

Two docks with one berth each, able to accommodate vessels of up to 123,000 long tons maximum loaded displacement. A 42-inch-diameter pipeline connects the docks with the storage tanks.

### System Parameters

Tanker unloading - design unloading capacity of 40,000 bbl/hr.

Distribution from terminal:

To Bayou Choctaw: design pumping rate - 240,000 bbl/d;

To Weeks Island: design pumping rate - 480,000 bbl/d.

Terminal throughput:

Fill sustained system rate -350,000 bbl/d;

Drawdown rate - 1,070,000 bbl/d (combined rate of Bayou Choctaw and Weeks Island sites.)

### Drawdown

Crude oil from Bayou Choctaw and/or Weeks Island to be distributed across docks and to Capline.

## H. SPR CRUDE OIL SPECIFICATIONS

Characteristic	SPR Type							Appropriate ASTM Test Method
	I	II	III	IV	V	VI	VII	
API Gravity ( <sup>o</sup> API)	30 Min.	40-45	30-36	34-40	36-41	26 Min.	22 Min.	D 1298
Total Sulfur (Wt. %), Max.	1.99	0.25	0.50	0.25	0.50	1.25	3.5	D 129, D 1552, or D 2622
Pour Point <sup>o</sup> F( <sup>o</sup> C), Max.	50 (10)	50 (10)	50 (10)	50 (10)	50 (10)	50 (10)	50 (10)	D 97
Salt Content (Lbs./1,000 Bbls.), Max.	50	50	50	50	50	50	50	D 3230
Viscosity SUS @ 60 <sup>o</sup> F (cSt @ 15.6 <sup>o</sup> C), Max.	150 (32)	150 (32)	150 (32)	150 (32)	150 (32)	200 (43)	1500 (325)	D 445 & D 2161
Reid Vapor Pressure Psia @ 100 <sup>o</sup> F (kPa @ 37.8 <sup>o</sup> C), Max.	11 (76)	11 (76)	11 (76)	11 (76)	11 (76)	11 (76)	11 (76)	D 323
Total Acid Number (mg KOH/g), Max.	0.40	0.40	0.40	0.40	0.40	0.40	0.40	D 664
Mercaptans, dissolved, in whole crude (ppm)	No limit	Report	Report	Report	Report	No limit	No limit	D 3227
Water and Sediment (Vol. %), Max.	1.0	1.0	1.0	1.0	1.0	1.0	1.0	D 95 & D 473
Yields (Vol. %)								D 2892 and/or D 1160
Naphtha < 375 <sup>o</sup> F(191 <sup>o</sup> C)	24-30	35-42	21-29	29-36	30-38	15-20	10 Min.	
Distillate 375-620 <sup>o</sup> F (191-327 <sup>o</sup> C)	17-31	21-35	23-37	31-45	19-33	24-27	15 Min.	
Gas Oil 620-1050 <sup>o</sup> F (327-566 <sup>o</sup> C)	26-38	20-34	20-42	20-34	23-37	38-42	20 Min.	
Residuum > 1050 <sup>o</sup> F (>566 <sup>o</sup> C)	10-19	4-9	7-14	0-5	7-14	15-20	50 Max.	

Navy

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WASHINGTON, D.C. 20585

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# Strategic Petroleum Reserve Annual Report

February 15, 1985

**U.S. Department of Energy**  
Assistant Secretary Fossil Energy  
Strategic Petroleum Reserve



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# **Strategic Petroleum Reserve Annual Report**

February 16, 1985

**U.S. Department of Energy**  
Assistant Secretary for Fossil Energy  
Strategic Petroleum Reserve



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## CONTENTS

Section	Page
EXECUTIVE SUMMARY .....	v
I. INTRODUCTION .....	1
II. STATUS OF THE STRATEGIC PETROLEUM RESERVE .....	2
A. Storage Facilities Development .....	2
B. Oil Acquisition and Transportation .....	4
III. BUDGET AND FINANCE .....	7
A. Appropriations .....	7
B. Major Budget and Financing Actions During 1984 .....	9
C. Oil Costs Through FY 1984 .....	9
IV. ORGANIZATION, MANAGEMENT AND CONTRACTUAL SUPPORT ..	9
A. Program/Project Management .....	9
B. Procurement and Contractor Support .....	9
C. Real Estate, Environmental Compliance, and Permits .....	10
V. DRAWDOWN SYSTEM AND VULNERABILITY IMPACT .....	10
A. Drawdown and Distribution Capabilities .....	10
B. SPR Distribution Study and NPC Study .....	11
C. Vulnerability Impact .....	12
APPENDIX: SPR SITE STATUS AND CRUDE OIL SPECIFICATIONS	
A. Bayou Choctaw .....	A-2
B. Weeks Island .....	A-2
C. Bryan Mound .....	A-3
D. Sulphur Mines .....	A-3
E. West Hackberry .....	A-4
F. Big Hill .....	A-5
G. St. James Terminal .....	A-5
H. Crude Oil Specifications .....	A-6

## FIGURES

Figure	Page
1. SPR Sites .....	2
2. Annual SPR Oil Fill .....	5
3. Cumulative SPR Oil Fill .....	5
4. SPR Annual Funding for Facilities/Petroleum .....	8
5. SPR Cumulative Funding for Facilities/Petroleum .....	8
6. SPR System Drawdown/Distribution Capability Rate Profile .....	11

## TABLES

Table	Page
1 Phase I Sites, Caverns, and Storage Capacities .....	3
2 SPR Crude Oil Storage Inventory .....	4
3 SPR Oil Fill History .....	4
4 Crude Oil Received Through 1984 .....	6
5 SPR Crude Oil Inventory as of December 31, 1984 .....	6
6 SPR Appropriations .....	7

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## EXECUTIVE SUMMARY

### Oil Acquisition and Fill Rates

During calendar year 1984, the Strategic Petroleum Reserve (SPR) achieved an inventory level of 450.5 million barrels of oil, an increase of 71.4 million barrels over the 379.1 million barrels in storage at the end of calendar year 1983. The SPR was filled at an average daily fill rate of 195,000 barrels per day during 1984.

Crude oil deliveries under the 1981 purchase agreement with Petroleos Mexicanos (PEMEX), Mexico's state-owned oil company, continued during 1984 at a rate of 50,000 barrels per day. The Defense Fuel Supply Center entered into other contracts through competitive procurements for delivery of 51.4 million barrels in 1984. As of December 31, 1984, the SPR also had 20.3 million barrels of oil under contract for delivery in the remainder of fiscal year 1985.

### Facilities and Storage Development

During calendar year 1984, the SPR increased its crude oil storage capability from 375 million barrels to 453 million barrels, adding approximately 36 million barrels of new storage capacity at the Bryan Mound storage site and 42 million barrels at the West Hackberry storage site. Development of the Phase II storage caverns is approximately 83 percent complete. At Bryan Mound, ten new caverns have been completed, and at West Hackberry, seven new caverns have been completed. Development of the Phase II 5.6-million-barrel-cavern at Bayou Choctaw was completed in October 1984. This cavern will be exchanged in FY 1985 for an existing privately-owned 10-million-barrel cavern at this site.

Development of Phase III facilities continued during 1984. Construction of surface facilities for the four Phase III caverns at Bryan Mound was completed and leaching initiated. At West Hackberry, drilling was completed on the single Phase III cavern and construction of the surface systems was approximately 40 percent completed at the end of 1984. At Big Hill, drilling was completed on 18 of the 28 cavern wells. Construction of the on-site surface facilities for the first five caverns and the Raw Water Intake Structure (RWIS) located on the Intracoastal Waterway, approximately five miles from the site, was initiated. At the Bayou Choctaw site, drilling was initiated on the single Phase III cavern.

### Distribution Enhancements

Since the SPR system was planned, major changes have occurred in the level of crude oil imports and their distribution within the U.S. During 1984, the Seaway and Texoma Interstate Pipelines, previously planned for use in the distribution of SPR oil, were sold and converted from crude oil to natural gas movement. As a result of these changes, the SPR has proposed some distribution enhancements to enable the SPR to achieve its future drawdown and distribution requirements. These proposed enhancements include pipelines from the Bryan Mound site to Texas City, Texas; from the West Hackberry site to the Lake Charles, Louisiana, refining area; and a connection of the Big Hill site pipeline to an additional marine terminal in Nederland, Texas. An environmental review is underway; preliminary real estate planning and acquisition activities have been initiated; and a new Architect/Engineer firm has been selected to perform the detailed design of the proposed enhancements.

### Drawdown Exercises

During 1984, the SPR performed two drawdown related tests. In February, over one million barrels of oil were pumped from underground storage at the West Hackberry site to the Sun Terminal's facilities at Nederland, Texas, within a 24-hour period. In addition, during June and July 1984, the SPR conducted an internal drawdown training exercise, SPRITE II. This exercise involved a simulated drawdown and sale of SPR oil in order to evaluate the management, sales, operations and financial management procedures associated with a drawdown under the revised Standard Sales Provisions published in January, 1984.

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## I. INTRODUCTION

The Secretary of Energy is required to submit annual reports to the President and the Congress on developmental activities of the Strategic Petroleum Reserve (SPR) in accordance with Section 165 of the Energy Policy and Conservation Act of 1975. This report covers SPR activities during 1984.

The report is presented in five sections with an Appendix. This introductory section briefly covers the program legislation and the SPR Plan and Amendments. The current status of the SPR is outlined in Section II and the appropriations to date are in Section III. Section IV addresses organization, management and contractor support. A discussion of the drawdown system and vulnerability impact are set forth in Section V. The Appendix contains detailed information on the status of each SPR site and SPR crude oil specifications.

### Program Legislation

The Strategic Petroleum Reserve was authorized by Congress with the passage of the Energy Policy and Conservation Act (P.L. 94-163), approved December 22, 1975. This legislation declared it to be United States policy to establish a Strategic Petroleum Reserve of up to one billion barrels of petroleum products to reduce the impact of disruptions in petroleum supplies and to carry out the obligations of the United States under the International Energy Program.

The Energy Policy and Conservation Act provisions regarding the SPR were amended by Title VIII of the Energy Security Act (P.L. 96-294), approved June 30, 1980. This Act established a minimum average daily fill rate of 100,000 barrels and precludes sale of Naval Petroleum Reserve Number 1 (Elk Hills) crude oil except to fill the SPR unless the SPR is being filled at the minimum rate or has reached 500 million barrels in inventory.

The Omnibus Budget Reconciliation Act of 1981 (P.L. 97-35), approved August 13, 1981, created the off-budget "SPR Petroleum Account" as a method for financing Reserve oil acquisition and transportation without including such transactions in Federal budget totals. It also required quarterly reports on SPR progress and submission of a study on the ultimate size of the Reserve.

The Energy Emergency Preparedness Act of 1982 (P.L. 97-229), approved August 3, 1982, established minimum SPR fill rate requirements, authorized acquisition of interim storage facilities, and required a series of plans and reports on SPR use and other aspects of energy emergency preparedness.

### SPR Plan and Amendments

The Energy Policy and Conservation Act required an SPR Plan, which was submitted to the Congress on February 16, 1977, and became effective on April 18, 1977. The Plan discussed the development and implementation of the SPR.

SPR Plan Amendment No. 1 accelerated the planned schedule for filling the Reserve. This Amendment was submitted to the Congress on May 25, 1977 and became effective on June 20, 1977. The revised goal of 500 million barrels to be in storage by December 22, 1980 advanced the original schedule by two years. Amendment No. 2 to the SPR plan authorized an increase in the SPR size from 500 million barrels to one billion barrels. This Amendment was transmitted to the Congress on May 18, 1978 and became effective on June 13, 1978. The Amendment described the plans to store 750 million barrels of petroleum by the Department of Energy in underground storage facilities. Decisions were not made regarding the methods or timing for developing the final 250 million barrels of storage capacity.

On October 31, 1979, the Department of Energy submitted to the Congress the Distribution Plan for the SPR (Amendment No. 3, Energy Action No. 5). In accordance with the provisions of the Energy Policy and Conservation Act, the Plan became effective on November 15, 1979. The Distribution Plan described the methods for drawdown and distribution of crude oil from five SPR storage sites.

On December 1, 1982, President Reagan transmitted to the Congress a new "Drawdown" (Distribution) Plan (Amendment No. 4) for the use of the SPR. This plan, required under the Energy Emergency Preparedness Act of 1982 (EEPA) and effective upon its December 1, 1982 submission to the Congress, provides new procedures for the drawdown, sale and distribution of crude oil from the SPR.

## II. STATUS OF THE STRATEGIC PETROLEUM RESERVE

### A. STORAGE FACILITIES DEVELOPMENT

The SPR storage facilities system consists of six underground crude oil storage facilities in salt domes along the coasts of Texas and Louisiana, and a Government-owned marine terminal on the Mississippi River at St. James, Louisiana. The locations of the SPR storage sites and their associated distribution pipelines and terminals are shown in Figure 1. SPR facilities are being developed in three phases which are described below.

#### Phase I

Phase I consisted of the conversion of five sites with existing underground capacity of approximately 260 million barrels for use in storing oil. The five sites are Bryan Mound in Texas, and Bayou Choctaw, West Hackberry, Sulphur Mines, and Weeks Island in Louisiana. Phase I also included the development of a Department of Energy distribution terminal facility (both marine and pipeline) at St. James, Louisiana. Phase I facilities construction began in July 1977 and was completed in 1980. Storage capacities and number of caverns for each Phase I site are shown in Table 1. All Phase I caverns are filled and two of these sites, Sulphur Mines and Weeks Island, have been converted to an operational standby status.

#### Phase II

Phase II consists of the expansion of three Phase I sites by a total of 290 million barrels. At Bryan Mound, storage capacity is being expanded by 120 million barrels, and the West Hackberry storage capacity is being expanded by 160 million barrels, both by leaching (solution mining) new caverns. At

Bayou Choctaw, an existing 10-million-barrel cavern is being acquired through a cavern exchange agreement with Union Texas Petroleum.

Phase II is on schedule with cavern construction or leaching approximately 84 percent complete. Approximately 193 million barrels of this capacity were available for oil storage and filled by December 31, 1984. The three Phase II sites are discussed briefly in the following paragraphs.

#### BRYAN MOUND

At Bryan Mound, Phase II cavern leaching operations commenced in March 1980 and site construction was completed in 1981. During 1984, brine disposal to the Gulf of Mexico averaged approximately 720,000 barrels per day, creating approximately 36 million barrels of new cavern storage capacity. Ten of the planned 12 caverns have been completed, and a total of 112.8 million of the planned 120 million barrel capacity is available for oil storage.

#### WEST HACKBERRY

At West Hackberry, Phase II cavern leaching operations commenced in May 1981, and site construction was completed by the end of 1981. During 1984, brine disposal to the Gulf of Mexico averaged approximately 765,000 barrels per day, creating approximately 42 million barrels of new cavern storage capacity. Seven of the planned 16 caverns have been completed, and a total of 80.3 million of the planned 160 million barrel capacity is available for oil storage.

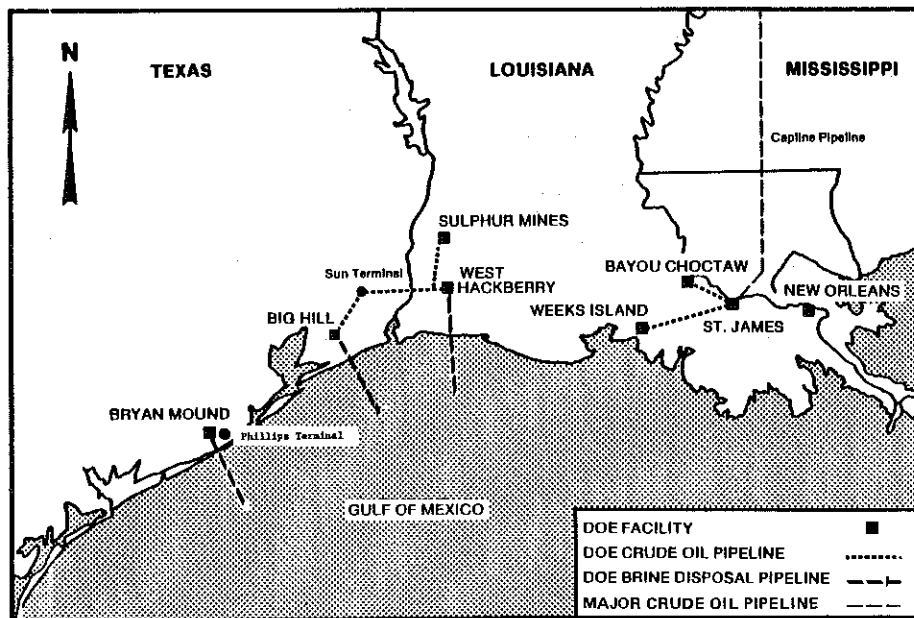


Figure 1. Strategic Petroleum Reserve Sites

Table 1. Phase I Sites, Caverns, and Storage Capacities

SITE	LOCATION	NO. CAVERNS	STORAGE CAPACITY (million bbls)
BRYAN MOUND	BRAZORIA COUNTY, TX	4	66.0
WEST HACKBERRY	CAMERON PARISH, LA	5	49.0
BAYOU CHOCTAW	IBERVILLE PARISH, LA	4	46.0
SULPHUR MINES	CALCASIEU PARISH, LA	3	26.0
WEEKS ISLAND	IBERIA PARISH, LA	CONVERTED SALT MINE	73.0
ST. JAMES TERMINAL	ST. JAMES PARISH, LA	N/A	N/A
<b>TOTAL</b>			<b>260.0</b>

### BAYOU CHOCTAW

At Bayou Choctaw, Phase II consists of the acquisition of an existing privately-owned 10-million-barrel cavern in exchange for a DOE-developed 5.6 million barrel cavern. This cavern exchange was initiated in 1979 to resolve a potential safety issue wherein the privately-owned cavern, which currently stores industrial ethane, was not sufficiently distant from a Phase I SPR cavern. Development of the new 5.6 million barrel cavern was initiated in June 1982 and was completed in October 1984. The ethane will be transferred to the new cavern as soon as final cavern testing has been completed.

#### Phase III

The planned Phase III development consists of the construction of a new 140-million-barrel storage site in the Big Hill salt dome near Winnie, Texas, and the further expansion of three existing SPR storage sites by a total of 60 million barrels. The Phase III expansion sites are Bryan Mound, Texas (40 million barrels); West Hackberry, Louisiana (10 million barrels); and Bayou Choctaw, Louisiana (10 million barrels). These sites are briefly discussed in the following paragraphs.

### BRYAN MOUND

Phase III development at Bryan Mound consists of the construction and leaching of four 10-million-barrel storage caverns. Drilling for these four caverns was completed in April 1983, and surface construction was completed in July 1984. Leaching of the first two Phase III caverns at Bryan Mound started in February 1984, and the third and the fourth were started in June and July 1984, respectively. Cavern leaching was approximately 20 percent complete as of the end of 1984.

### WEST HACKBERRY

Phase III development at West Hackberry consists of the construction and leaching of one 10-million-barrel storage cavern. Drilling of the two wells for this cavern was completed in May 1984. Surface construction was started in September 1984 and was about 40 percent complete by the end of 1984.

### BAYOU CHOCTAW

Phase III development at Bayou Choctaw consists of the construction and leaching of a single 10-million-barrel storage cavern. During 1984, the SPR completed the engineering design for this new storage cavern. In May, DOE awarded a site preparation contract to construct an elevated and diked surface area for drilling. In September 1984, site preparation was completed and drilling commenced.

### BIG HILL

Development of the Big Hill storage facilities was initiated in 1982. All land acquisition actions, with the exception of the crude oil pipelines, have been completed. Drilling of the first five caverns was completed in January 1984, and drilling of the remaining nine caverns was initiated in March 1984. A total of 18 of the 28 wells was completed as of the end of 1984. A construction contract for the surface facilities for the first five caverns was awarded in January 1984, and construction was approximately 35 percent complete as of December, 31, 1984. The long lead-time government furnished equipment (pumps, transformers, switchgear, etc.) which was procured during 1983, was delivered and available to the construction contractor for installation. A construction contract for the Raw Water Intake Structure (RWIS) was also awarded in 1984 and, as a December 31, 1984, construction was approximately 30 percent complete.

A summary of the current SPR crude oil storage capacities and inventories, by phase, is shown in Table 2.

#### Capital Improvements

Capital improvements in 1984 involve numerous site construction and modification projects to existing facilities to assure that mission objectives can continue to be achieved in the areas of reliability, security and safety. During 1984, the SPR completed the construction of new warehouses at three sites: Bayou Choctaw, St. James and West Hackberry. These warehouses provide needed space for controlled spare parts storage and maintenance support. Also during 1984, the installation of a major upgrade of the automated instrumentation and control system at West

Hackberry to enhance operational control and monitoring capability at the site was completed.

In addition, during the year, the SPR completed new comprehensive audits and studies of its security and fire protection systems. A number of capital improvement projects have been proposed to upgrade site security and to achieve the Department of Energy's "improved risk" criterion for fire protection.

## B. OIL ACQUISITION AND TRANSPORTATION

On December 31, 1984, the SPR oil inventory was 450.5 million barrels. Fiscal and calendar year inventories and average daily fill rates since 1977 are presented in Table 3. The SPR oil fill by crude type is illustrated on an annual basis and cumulative basis in Figures 2 and 3 respectively.

### Oil Acquisition Contracts

During 1984, 58 contracts were awarded by the SPR's crude oil procurement agent, the Defense Fuel Supply Center, under an open continuous solicitation for delivery of 55.3 million barrels during 1984 and 1985. Under this solicitation, offers and subsequent awards are made on a bi-weekly basis. This method of crude oil acquisition is anticipated to continue in 1985, depending on market conditions and SPR crude oil acquisition requirements.

### Oil Deliveries

During 1984, the SPR continued to receive crude oil deliveries under its 1981 purchase agreement with Petroleos Mexicanos (PEMEX), Mexico's state-owned oil company. Deliveries are continuing under this agreement at a current rate of approximately 50,000 barrels per day.

Of the 71.4 million barrels of crude oil delivered in 1984:

- 51.4 million barrels of sweet and sour crude oils were acquired under the open continuous solicitation issued by the Defense Fuel Supply Center for spot market purchases.
- 18.4 million barrels of sour crude oil were acquired under the commercial contract with PEMEX.
- 1.6 million barrels of sweet crude oil were acquired under the Defense Fuel Supply Center's term contracts awarded on August 31, 1983.

In addition, on December 31, 1984, the SPR had 20.3 million barrels of oil under contract for delivery in the remainder of fiscal year 1985.

Table 2. SPR Crude Oil Storage Inventory

	PLANNED	END OF 1984	
	STORAGE CAPACITY (million bbls)	STORAGE CAPACITY (million bbls)	INVENTORY (million bbls)
PHASE I	260	260	260.7*
PHASE II	290	193	189.8
<b>TOTAL</b>	<b>550</b>	<b>453</b>	<b>450.5</b>

\*INCLUDES CRUDE OIL STORED IN TANKS AND PIPELINES.

Table 3. SPR Oil Fill History

	FISCAL YEAR		CALENDAR YEAR	
	YEAR-END INVENTORY (million bbls)	AVERAGE DAILY FILL RATE (thousand bbl/d)	YEAR-END INVENTORY (million bbls)	AVERAGE DAILY FILL RATE (thousand bbl/d)
1977	1.1	3	7.2	20
1978	49.1	131	68.5	168
1979	91.2	115	91.7	64
1980	92.8	4	107.8	44
1981	199.2	292	230.3	336
1982	277.9	215	293.8	174
1983	361.0	228	379.1	234
1984	431.1	191	450.5	195

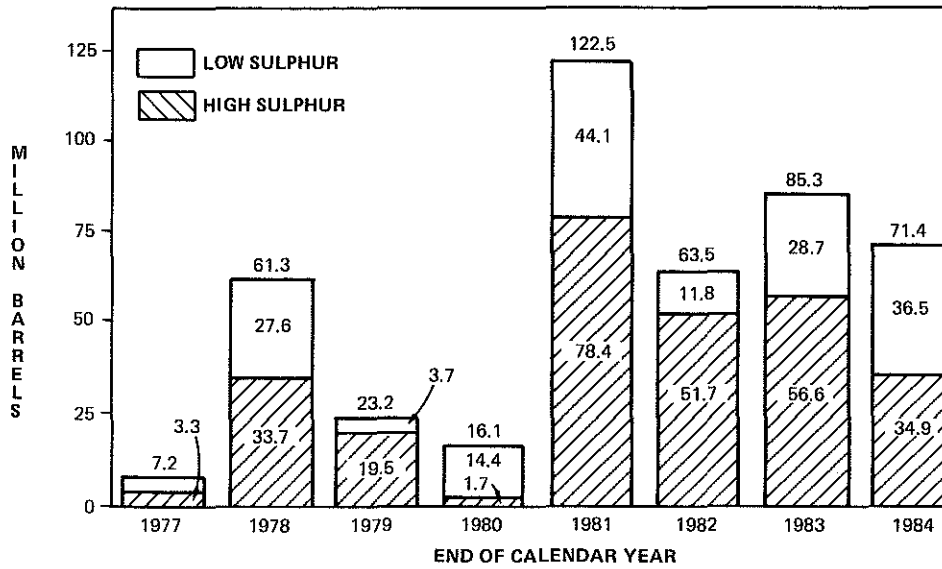


Figure 2. Annual SPR Oil Fill

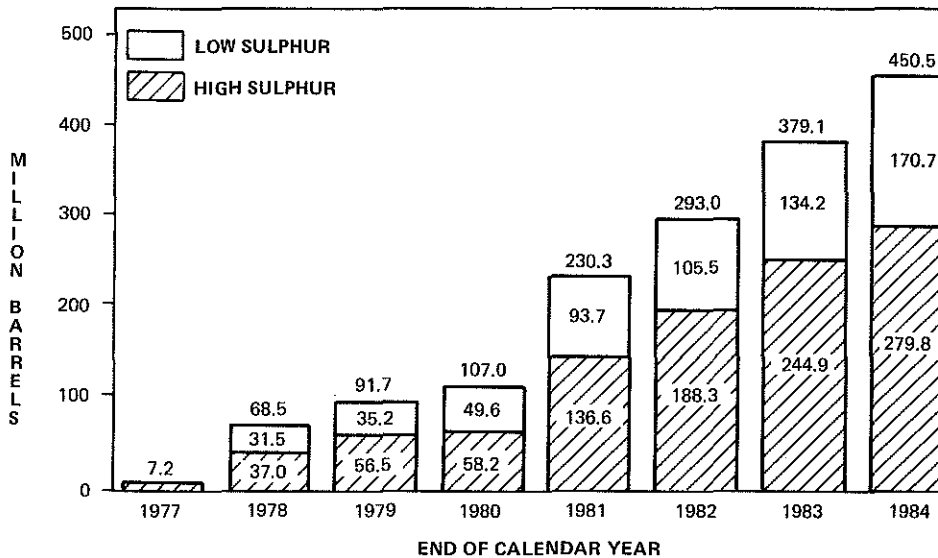


Figure 3. Cumulative SPR Oil Fill

Table 4 shows the crude oil received since inception of the SPR program by state or country of origin. Of the total oil in storage, 62.1 percent is high sulfur (sour) and 37.9 percent is low sulfur (sweet). Table 5 provides information on the location of this inventory by site. The SPR crude oil acquisition specifications are included in the Appendix.

**Cargo Preference Act Compliance**

The Cargo Preference Act of 1954 requires that Federal agencies take such steps as may be necessary and practicable to assure that at least 50 percent of its cargo transported on ocean vessels in a calendar

year is transported by privately-owned U.S. flag vessels to the extent they are available at fair and reasonable rates. By agreement between DOE and the Department of Transportation (DOT), the SPR's Cargo Preference Act compliance is measured in terms of long-ton miles, i.e., cargo tons multiplied by the distances transported.

During 1984, 27 U.S.-flag vessels, transporting a total of 33.9 million barrels were involved in delivering crude oil to SPR. These deliveries equaled 26.9 billion long-ton miles (BLTMS) or 51.4 percent of the total ton miles.

Table 4. Crude Oil Received Through 1984

SOURCE COUNTRY OR STATE	NET QUANTITY (million bbls)	PERCENT OF TOTAL (%)
MEXICO	153.1	34.0
UNITED KINGDOM	115.3	25.6
ALASKA	31.4	7.0
SAUDI ARABIA	27.1	6.0
LIBYA	23.8	5.3
IRAN	20.0	4.4
DUBAI	15.9	3.5
NIGERIA	15.2	3.4
EGYPT	8.9	2.0
OMAN	8.3	1.8
NORWAY	6.3	1.4
ECUADOR	6.2	1.4
ALGERIA	6.2	1.4
CAMEROON	3.4	.7
TEXAS	2.5	.6
GABON	2.4	.5
QATAR	2.3	.5
VENEZUELA	.9	.2
ABU DHABI	.5	.1
OTHER DOMESTIC	.4	.1
PERU	.4	.1
<b>TOTAL RECEIPTS</b>	<b>450.5</b>	<b>100.0</b>

Table 5. SPR Crude Oil Inventory  
(December 31, 1984)

STORAGE SITE	LOCATION	CRUDE OIL INVENTORY (million bbls)			END OF YEAR 1983
		1984 CUMULATIVE TOTAL	SOUR*	SWEET**	
BRYAN MOUND	BRAZORIA COUNTY, TX	113.3	64.4	177.7	145.8
WEST HACKBERRY	CAMERON PARISH, LA	38.4	86.7	125.1	86.0
BAYOU CHOCTAW	IBERVILLE, PARISH, LA	27.4	18.2	45.6	45.1
WEEKS ISLAND	IBERIA PARISH, LA	72.7	0.0	72.7	72.3
SULPHUR MINES	CALCASIEU PARISH, LA	26.2	0.0	26.2	26.0
<b>SUBTOTAL</b>		<b>278.0</b>	<b>169.3</b>	<b>447.3</b>	<b>375.2</b>
TANKS AND PIPELINES		1.8	1.4	3.2	3.9
<b>TOTAL</b>		<b>279.8</b>	<b>170.7</b>	<b>450.5</b>	<b>379.1</b>

\* SULPHUR CONTENT GREATER THAN 0.5 PERCENT

\*\* SULPHUR CONTENT LESS THAN 0.5 PERCENT

### III. BUDGET AND FINANCE

#### A. APPROPRIATIONS

Approximately \$17.8 billion was appropriated for the SPR through FY 1984, including entitlements receipts for FY 1981 under the authority of the Energy Security Act. Distribution of appropriated funds among program activities is shown in Table 6. Figures 4 and 5 illustrate SPR funding on an annual basis and on a cumulative basis, respectively.

As required by the Omnibus Budget Reconciliation Act of 1981, P.L. 97-35, which amended Section 167 of the Energy Policy and Conservation Act, P.L. 94-163 (42 U.S.C. Section 6247), the SPR Petroleum Account was established in the Treasury, placing SPR oil spending "off-budget" and providing for the reappropriation of SPR oil sales receipts for oil acquisition following a drawdown.

Table 6. SPR Appropriations  
(In Thousands of Dollars)

FISCAL YEAR	PETROLEUM ACQUISITION AND TRANSPORTATION	STORAGE FACILITIES DEVELOPMENT AND OPERATIONS	PLANNING	PROGRAM <sup>1/</sup> DIRECTION	TOTAL
1976	—	300,000	12,000	1,975	313,975
1977	440,000	—	4,000	3,824	447,824
1978	2,703,469	463,933	7,215	7,489	3,182,106
1979	2,885,670	103,290	12,200	5,911	3,007,071
REPROGRAMMING	- 529,214	+ 529,214	—	—	—
	<u>2,356,456</u>	<u>632,504</u>	<u>12,200</u>	<u>5,911</u>	<u>3,007,071</u>
1980	- 2,000,000 <sup>2/</sup>	—	—	—	- 2,000,000
REPROGRAMMINGS	—	—	—	—	—
NO. 1	- 20,391	—	+ 12,000	+ 8,391	—
NO. 2	- 1,881	—	—	+ 1,881	—
	<u>- 2,022,272</u>	<u>—</u>	<u>12,000</u>	<u>10,272</u>	<u>- 2,000,000</u>
1981	2,688,282 <sup>3/</sup>	82,834	8,000	11,391	2,790,507
ENTITLEMENTS	+ 542,146	—	—	—	+ 542,146
REPROGRAMMINGS	—	—	—	—	—
NO. 1	- 18,000	+ 18,000	—	—	—
NO. 2	- 7,334	+ 7,334	—	—	—
	<u>3,205,094</u>	<u>108,168</u>	<u>8,000</u>	<u>11,391</u>	<u>3,332,653</u>
1982	3,684,000 <sup>4/</sup>	171,356	8,640	11,436	3,875,432
REPROGRAMMING	- 4,300 <sup>5/</sup>	+ 4,300	—	—	—
	<u>3,679,700</u>	<u>175,656</u>	<u>8,640</u>	<u>11,436</u>	<u>3,875,432</u>
1983	2,074,060	222,528	8,000	11,590	2,316,178
1984	650,000	142,357	6,250	10,163	808,770
1985	2,049,550	441,300 <sup>6/</sup>	5,600 <sup>6/</sup>	12,290 <sup>6/</sup>	2,508,740
<b>TOTAL APPROPRIATIONS</b>	<b>15,136,057</b>	<b>2,486,446</b>	<b>83,905</b>	<b>86,341</b>	<b>17,792,749</b>

1) Excludes funds appropriated to other DOE accounts but used to finance aspects of SPR program direction.

2) Recision.

3) Included supplemental appropriations of \$1,305,000,000.

4) Pursuant to the Omnibus Budget Reconciliation Act of 1981, petroleum acquisition and transportation funding was placed off-budget beginning in FY 1982.

5) Reprogramming was funded from on-budget FY 1981 petroleum acquisition and transportation carryover funds.

6) Included in FY 1984 second supplemental appropriations.

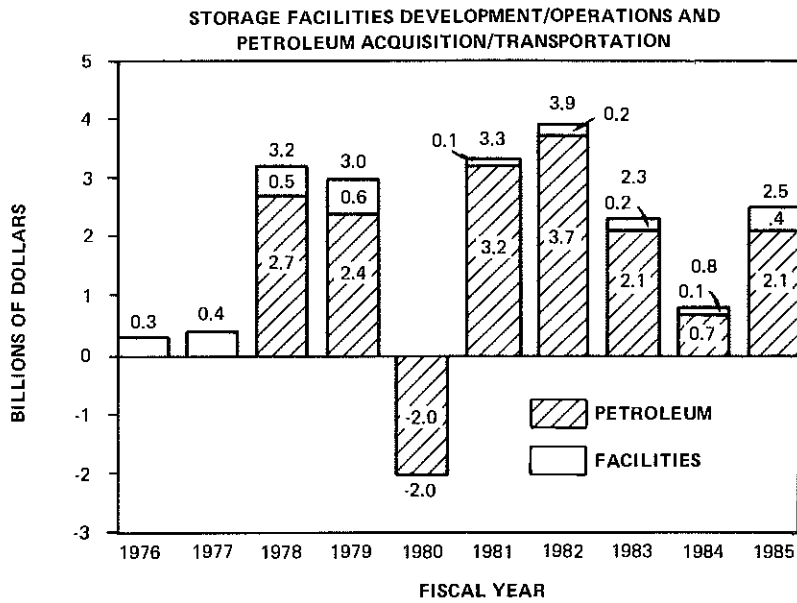


Figure 4. Strategic Petroleum Reserve Annual Funding

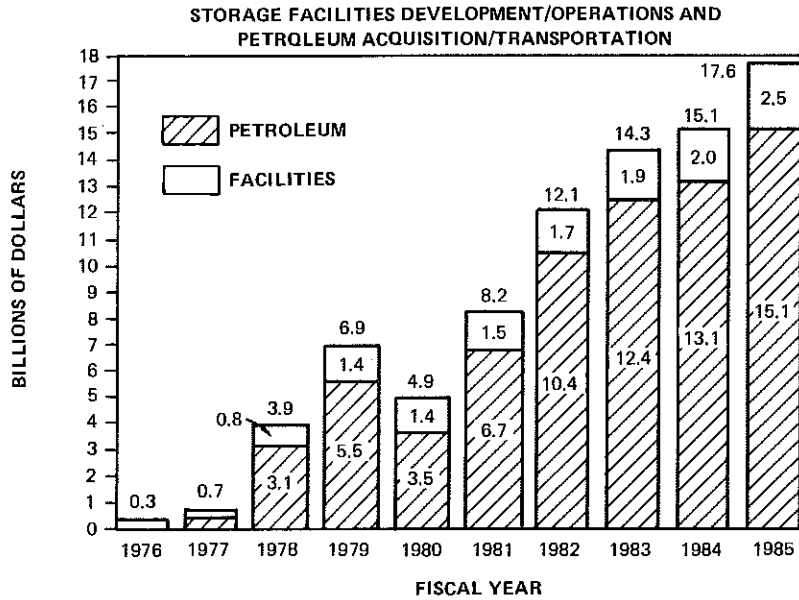


Figure 5. Strategic Petroleum Reserve Cumulative Funding



## B. Major Budget and Financing Actions During 1984

President Reagan's FY 1985 budget proposed budget authority of \$2,348,740,000 for the SPR, consisting of \$1,889,550,000 for the SPR Petroleum Account, \$441,300,000 for Storage Facilities Development and Operations, \$5,600,000 for Planning and Management Support and \$12,290,000 for Program Direction. On August 22, 1984, the President signed the Second Supplemental Appropriations Act of 1984 (P.L. 98-396) which included \$459,190,000 for SPR on-budget expenditures in FY 1985. On October 12, 1984, the President signed the FY 1985 Continuing Appropriations Act (H.J. Res. 648 ) into law. Included in the appropriations was \$2,049,550,000 for the off budget SPR Petroleum Account. This appropriation for the SPR Petroleum Account was \$160,000,000 more than requested by the President

for FY 1985, reflecting that the Continuing Resolution also provides that the SPR be filled at an average rate of at least 159,000 barrels per day in FY 1985, rather than at the 145,000 barrels per day rate proposed by the President.

## C. Oil Costs Through FY 1984

Inclusive of entitlements receipts, the cumulative cost for the 431 million barrels delivered to the Reserve through FY 1984 was \$12,559 million, an average of approximately \$29.14 per barrel.

From Appropriations for FY 1984 and prior years, an estimated \$512.7 million remained available for future oil deliveries providing a total of \$2,562.3 million when the \$2,049.6 million appropriation to the SPR Petroleum Account for FY 1985 is included.

# IV. ORGANIZATION, MANAGEMENT, AND CONTRACTUAL SUPPORT

## A. Program/Project Management

Under the Energy Policy and Conservation Act, which authorized the SPR Program, the Strategic Petroleum Reserve Office was created for the establishment, management, and maintenance of the SPR. The Assistant Secretary for Fossil Energy, William A. Vaughan has overall programmatic responsibility for achieving the goals and objectives of the SPR Program. This responsibility has been delegated to the Deputy Assistant Secretary, Strategic Petroleum Reserve, Richard D. Furiga.

Responsibility for SPR project management and implementation activities is assigned to the Manager, Oak Ridge Operations Office (ORO), Joe La Grone. The Manager, ORO, directs SPR activities through the Assistant Manager for the SPR, Percy Brewington. The Project Management Office (PMO), located in New Orleans, carries out day-to-day project implementation activities as delegated by the Manager, ORO, and in accordance with programmatic guidance provided by the Deputy Assistant Secretary-SPR. The SPR staffing allocation for FY 1984 was 200 full-time equivalents.

## B. Procurement and Contractor Support

During 1984, SPR PMO procurements totaled approximately \$681 million, including \$450 million for crude oil purchased under an agreement with Petroleos Mexicanos (PEMEX), Mexico's State-owned oil company. Procurements for other than crude oil totaled \$231 million. The SPR PMO, in conjunction with prime contractors, awarded \$68 million to small businesses, including \$16.3 million to disadvantaged businesses and \$3.4 million to businesses owned by women.

Services continued to be provided in 1984 under existing contracts by: Petroleum Operations and Support Services, Inc. for operation and maintenance; Jacobs/D'Appolonia Engineers for design engineering and inspection of capital improvements to existing sites and for Phase III expansion projects (contract expired in September 1984); The Aerospace Corporation for systems engineering and integration; Walk Haydel & Associates, Inc. for design engineering and inspection services for the Big Hill, Texas site;

Sandia National Laboratories for geotechnical engineering; OAO Corporation for management and technical support services (contract expired in October 1984; OAO ADP services continued into 1985); SRS, Inc. for safety and risk analysis; Thacker Construction Company for construction services in support of capital improvements at existing SPR sites (contract expired in June 1984); Big Chief Drilling, Inc. for drilling at Big Hill (contract completed in February 1984); Voss International for Phase III site construction at Bryan Mound; Wells Fargo Guard Services for security protection services for SPR sites; York Research Consultants, Inc. for onshore environmental monitoring of SPR sites (contract expired in March 1984); and Texas A&M Research Foundation for oceanographic environmental services for monitoring brine disposal into the Gulf of Mexico from the Bryan Mound and West Hackberry sites.

A major competitive procurement was initiated in FY 1984 for selection of a management, operations and maintenance (MOM) contractor; the request for proposal was issued in April 1984. The contract will encompass a number of management and service functions (e.g., operation and maintenance, on-shore environmental monitoring, safety and risk analysis, automatic data processing and technical data control system support, and management of capital improvements construction), heretofore provided under several separate contracts. On December 24, 1984, Boeing Petroleum Services Inc. was selected for negotiation of the MOM contract. DOE intends to enter into a separate cost-plus-fixed-fee contract for a phase-in period from February 1, 1985 through March 31, 1985. The cost-plus-fixed-fee contract, which will convert to a cost-plus-award-fee contract after six months, will be negotiated with Boeing Petroleum Services, Inc. to begin about April 1, 1985. This contract will be awarded for five years with an option by DOE to extend the contract for up to an additional five-year period. In addition, Systematic Management Services, Inc., a disadvantaged business concern, was selected under the Small Business Administration's 8(a) program to succeed the OAO Corporation for management and technical support services. Walk Haydel & Associates was selected to provide design

engineering and inspection services for capital improvement at existing SPR sites.

Other major new contractors include ELTEK, Inc. for site preparation at Bayou Choctaw and Phase III construction at West Hackberry; Fruin-Colnon Corporation for Stage 1A and 1B construction (separate contracts) at Big Hill; Drillers, Inc. for drilling at Big Hill; Houston Laboratories for drilling of Phase III wells at West Hackberry (contract completed in May 1984); Dillco, Inc. for drilling of Phase III wells at Bayou Choctaw; and Bingham Willamette, Bryon Jackson, AMI Systems, Inc., McGraw-Edison, H.K. Porter, Coggins System, Inc., WRI, Inc., Superior Casing, Petro-Drive, Inc., Louisiana Tubular and S&C Electric Company for major equipment such as pumps, transformers and drill casings required for construction at Big Hill and Bayou Choctaw.

### C. REAL ESTATE, ENVIRONMENTAL COMPLIANCE, AND PERMITS

#### 1. Real Estate

Acquisition actions were completed for 80 percent of real property interest required for constructing the six underground storage facilities under Phases I, II and III. During the year, DOE has acquired 22 of the 137 tracts of the pipeline easements for the Big Hill crude oil pipeline to Nederland, Texas.

## V. DRAWDOWN SYSTEM AND VULNERABILITY IMPACT

### A. DRAWDOWN AND DISTRIBUTION CAPABILITIES

SPR drawdown and distribution capabilities are affected by at least three categories of factors: storage site drawdown capabilities, including cavern fill levels and pumping systems; distribution capabilities comprised of terminal throughput and private sector transportation system capabilities; and crude oil demand factors affecting offers to the Government to purchase SPR oil. The Department has established performance criteria for the first category of factors (storage site performance) and for terminal throughput, but does not control the remaining factors relating to private crude oil logistics systems and regional demands for certain types and quantities of oil.

Based on the SPR's December 31, 1984 crude oil storage inventory of 450.5 million barrels and the existing SPR drawdown and commercial distribution systems, the SPR is capable of initially being drawn down and distributed at an average sustained rate of 2.3 million barrels per day (MMBD) for a 90-day period. Subsequent to this initial 90-day drawdown period, the balance of the SPR's inventory can be drawn down and distributed at gradually decreasing rates over succeeding months until all the SPR storage sites are empty.

Figure 6 shows the current SPR drawdown/distribution capability rate profile. The depicted decline in drawdown/distribution rate capability in the periods subsequent to the initial 90-day period is the result of the depletion of crude oil inventory in certain storage caverns and sites, thereby eliminating the

### 2. Environmental Compliance and Permits

Environmental protection activities in support of construction and operation of all SPR facilities continued through 1984 in compliance with applicable DOE Orders.

All Federal, State and local permits have been acquired for Phase III, with the exception of crossings associated with the Big Hill crude oil pipeline. The initial National Pollutant Discharge Elimination System permit was issued by the Environmental Protection Agency for the Big Hill site, and permit renewals were issued for the Bryan Mound and West Hackberry sites. The special requirement for monitoring of the salt solution point source discharged into the Gulf of Mexico is no longer a condition of the permits at any of the three sites, based on a determination that the brine discharged does not cause any unreasonable degradation to the marine environment.

During 1984, an environmental review was undertaken to address the proposed Seaway and Texoma distribution enhancements in accordance with the National Environmental Policy Act requirements. DOE published a Floodplain/Wetlands Assessment in the Federal Register on December 28, 1984 for the proposed construction of a crude oil pipeline from the Bryan Mound storage site to Texas City, Texas.

drawdown rate capability associated with those caverns and/or sites.

At current inventory levels, the SPR storage sites are capable of sustaining an initial 90-day drawdown rate of 2.9 MMBD; however, due to the current pattern and levels of U.S. crude oil imports and the capability of commercial distribution systems the SPR drawdown rate is constrained to the distribution capability of 2.3 MMBD as discussed above. The ability of the SPR to sustain higher daily drawdown and distribution rates is dependent upon completion of distribution enhancements, further increases in inventory levels, and on the level of commercial demand for SPR crude oil.

In conjunction with its physical drawdown and distribution capabilities, the SPR has developed detailed plans and procedures for moving crude oil out of storage, conducting its sale, and delivering it into commercial distribution systems. Of significance during 1984, was the Department's publishing of interim final Standard Sales Provisions in the Federal Register on January 20, 1984. These provisions contain the contract clauses, terms and conditions of sale, and performance and financial measures for use in the event of a drawdown and sale of SPR oil.

During 1984, the SPR performed two tests of its drawdown system capabilities:

- In February, over one million barrels of oil were pumped from underground storage at the West Hackberry site to an aboveground distribution

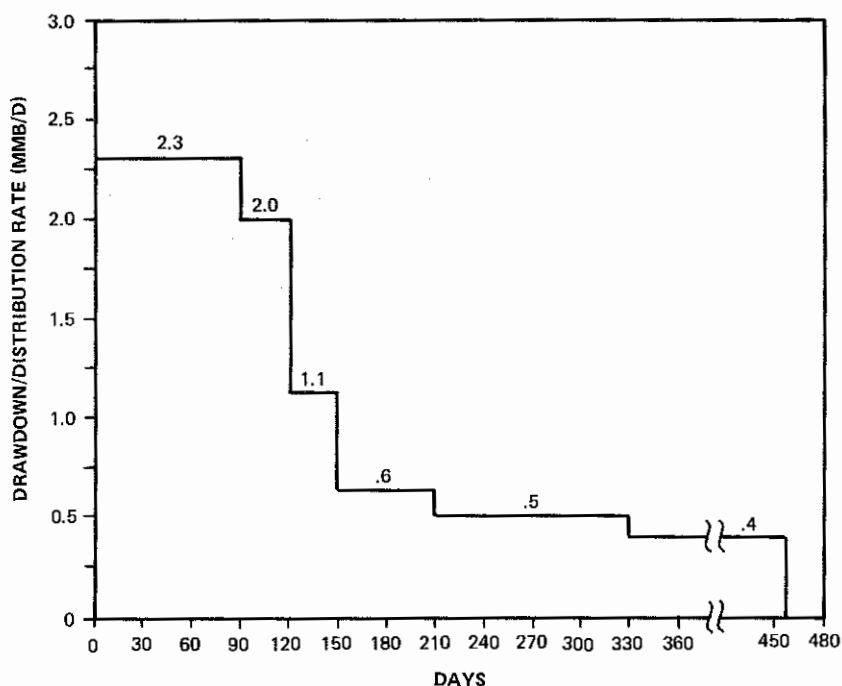


Figure 6. SPR System Drawdown/Distribution Capability Rate Profile (As of January 1, 1985)

terminal facility (Sun Terminal at Nederland, Texas) within a 24-hour period.

- During June and July 1984, the SPR conducted an internal training exercise, SPRITE II. This exercise involved a simulated drawdown and sale of SPR oil in order to address the management, sales, and financial management procedures associated with an SPR drawdown.

#### B. SPR DISTRIBUTION STUDY AND NPC STUDY

During the past year, the Department completed a comprehensive study of the SPR's distribution capability in light of numerous changes that had taken place over recent years in the crude oil logistics and refining industry. The most significant of these changes for the SPR program was the reduction in crude oil demand by the Mid-West refiners, resulting in conversion to natural gas carriage of two major interstate crude oil pipelines, Seaway and Texoma, to which the SPR was connected.

In its assessment of SPR distribution capabilities, the Department first analyzed the maximum distribution rate which was feasible with no further improvements. The study concluded that unless changes were made in SPR distribution systems, a maximum rate of only 2.4 million barrels per day in distribution would be possible by 1990. The Department then conducted an engineering and cost analysis of a broad range of alternatives for enhancing the distribution capabilities from the Seaway and Texoma complexes.

The Seaway and Texoma enhancements were screened using cost-effectiveness and system balance factors

and consolidated into four alternative levels. An economic analysis was conducted to compare the net economic benefits of the alternative distribution capability levels to their estimated life cycle costs.

As a result of this study, in October 1984 the Department proposed to the Congress the reprogramming of \$49.5 million in Phase III funds to initiate a set of capital improvements to enhance future SPR distribution capabilities. These improvements include constructing a one-million-barrel-per-day pipeline from the Bryan Mound site to Texas City, Texas with interconnections to common carrier pipelines serving the Houston refining area and access to marine terminal outloading capability at Texas City; constructing a 700,000 barrel-per-day pipeline from the West Hackberry site to the Lake Charles, Louisiana area with access to local refineries and marine terminals; and a 4-mile pipeline extension connecting Big Hill site to the Nederland, Texas area to an additional 200,000 barrel-per-day marine outloading capability.

The proposed improvements were estimated to provide a 4.0 MMB/D distribution capability at the completion of the currently planned 750 MMB system. However, the actual distribution during a disruption could be greater or less than this amount based on the regional refinery demands for SPR crude oil.

The National Petroleum Council (NPC) also conducted a study of SPR distribution capabilities. This study was requested by Secretary Hodel in November 1983 and included: an evaluation of SPR facilities and terminals; overland distribution of crude oil and products; marine transportation requirements for

crude oil and products and refinery crude oil requirements for a 1990 oil supply disruption involving a total cutoff of U.S. crude and product imports. The NPC study substantiated many of the recommendations of the DOE internal study and provided some additional recommendations concerning crude mix, storage locations, need for deballasting facilities and Jones Act waivers.

Both the Department's analysis and the NPC work were based on a series of assumptions concerning future petroleum industry trends. Because of the dynamic nature of that industry, the Department plans to review SPR distribution capabilities on an ongoing basis in the future.

### C. VULNERABILITY IMPACT

The vulnerability of the United States to oil supply disruptions is affected by a number of factors in addition to changes in the SPR inventory. These factors include levels of U.S. petroleum use and imports, levels and locations of spare petroleum production capacity worldwide, and petroleum inventories held in the U.S. private sector and abroad.

Private sector primary stocks of petroleum declined by approximately 1.3 percent by December 1984 as compared to December 1983 levels, continuing a trend of 17.4 percent decline from December 1980 to December 1984.

In calendar year 1980, the United States imported approximately 1.89 billion barrels of oil on a net basis, excluding oil for the SPR, and the SPR inventory in December 1980 stood at 107.8 million barrels or approximately 5.7 percent of such annual imports. During 1984, the U.S. imported an estimated 1.68 billion barrels of oil on the same net basis, and the December 1984 SPR oil inventory was equivalent to nearly 27 percent of 1984 annual net oil imports. Thus, while the actual SPR inventory has grown in three years to 4.2 times the December 1980 level, the SPR has grown by approximately 4.7 times during the same period in relation to U.S. oil import levels.

In December, 1983, the SPR oil inventory of 379 million barrels represented an estimated 25.5 percent of calendar year 1983 U.S. oil imports; so the growth in the Reserve inventory during 1984, coupled with continued decline in annual U.S. import levels, has expanded the import replacement capability of the SPR by approximately 5 percent over one year.

On balance, in 1984 as in 1983, the vulnerability of the United States to oil supply disruptions continued to be less than in the prior decade. Domestic use of petroleum was up slightly in 1984 compared to 1983 by approximately 4.3 percent, although still lower by 6.9 percent compared to 1980. Net private sector oil imports (excludes imports for the SPR) increased by approximately a half million barrels per day or 12.3 percent from 1983 to 1984 to approximately 4.6 million barrels per day. Overall, such import levels declined by 27 percent from 1980 to 1984.

**APPENDIX**  
**SPR SITE STATUS AND CRUDE OIL SPECIFICATIONS**

- A. BAYOU CHOCTAW**
- B. WEEKS ISLAND**
- C. BRYAN MOUND**
- D. SULPHUR MINES**
- E. WEST HACKBERRY**
- F. BIG HILL**
- G. ST. JAMES TERMINAL**
- H. CRUDE OIL SPECIFICATIONS**

## A. BAYOU CHOCTAW

### Location

Iberville Parish, Louisiana (12 miles southwest of Baton Rouge, Louisiana).

### Acquisition

Acquired 355.95 acres fee simple by condemnation April 1977 from numerous private owners. Union Texas Petroleum (a subsidiary of Allied Corporation) was the previous operator. Action has been initiated to acquire existing Cavern No. 17 for SPR crude oil storage, which will provide an additional 10 million barrels of storage volume in Phase II. In conjunction with that acquisition, a new cavern No. 102, has been developed to a 5.6-million-barrel capacity and an agreement for the exchange of this cavern for cavern 17 has been negotiated with Union Texas Petroleum.

### Site Description

A 46-million-barrel Phase I storage facility consisting of four existing caverns. An additional 10 million barrels of storage capacity will be provided in Phase II and another 10 million barrels in Phase III.

Oil, brine, raw water piping distribution system connecting caverns with central piping and 18 pumps totaling over 20,000 horsepower.

Twelve brine disposal wells 2.5 miles offsite; pipeline for supplying brine to Union Texas Petroleum.

One hundred thousand barrel brine pit, control center, buildings, roads, well pads, and dikes.

Water intake structure in Cavern Lake on site.

### System Parameters

Oil fill via 36-inch-diameter, 37.2-mile pipeline to St. James Terminal. Sustained system rate - 110,000 bbl/d (brine disposal-constrained).

Raw water design pumping rate - 480,000 bbl/d.

Brine disposal - 110,000 bbl/d projected disposal rate.

### Drawdown

Drawdown via 36-inch-diameter, 37.2-mile pipeline to St. James Terminal and to Capline pipeline.

480,000 bbl/d design capability (at end of Phase II).

### Major Accomplishments

Development of Phase II Cavern 102 was completed.

Design of Phase III Cavern 101 was completed and drilling was initiated.

As of December 31, 1984, 45.6 million barrels of crude oil were in storage.

## B. WEEKS ISLAND

### Location

Iberia Parish, Louisiana (95 miles southwest of New Orleans).

### Acquisition

Acquired 382.92 acres fee simple subsurface and 6.63 acres fee simple surface by condemnation September 1977 from Morton Salt Company.

### Environmental/Permits

Environmental Impact Statement published January 1977; supplement published August 1977.

Major Federal permit related to oil pipeline to St. James Terminal acquired in 1978. Three major Federal and State permits related to oil storage, air emissions and storm water, and treated sewage effluent discharge acquired in 1979; NPDES updated in 1982.

### Site Description

Conventional salt mine containing 73 million barrels of storage capacity in two levels, room and pillar design, dedicated to sour crude oil storage.

Oil piping distribution system consists of 11 (10 operational and one reserve) submersible electric pumps in the mine to boost crude to the surface and twin main-line pumps (plus one reserve) to push crude to the St. James, Louisiana Terminal during drawdown. Pumps total 17,000 horsepower.

500,000-gallon firewater tank and pumps.

Mine inert gas and vapor recovery systems.

### System Parameters

Oil fill via 36-inch-diameter, 67.2-mile pipeline from St. James Terminal. Sustained system rate - 350,000 bbl/d (terminal throughput limited).

### Drawdown

Drawdown via 36-inch-diameter, 67.2-mile pipeline to St. James Terminal and to Capline pipeline.

590,000 bbl/d design capacity.

## C. BRYAN MOUND

### Location

Brazoria County, Texas (three miles southwest of Freeport, Texas).

### Acquisition

Acquired 499.47 acres fee simple by condemnation April 1977, from Freeport Mineral Company and other owners. Dow Chemical Company was the previous operator.

Approval has been received to relocate Brazoria County Road 242 outside the site.

### Environmental/Permits

Environmental Impact Statement published January 1977; supplement published December 1977. Phase III supplement published October 1981.

Five major Federal and State permits related to pipelines, water intake, and storage acquired in 1977 and 1978. NPDES updated 1981; renewed 1984. Seaway Environmental Impact Statement published June 1978. Supplement published October 1981.

Two major Federal permits related to brine disposal pipeline issued in 1978. Permit for brine discharge increased to 1.1 million bbl/d August 1981.

### Site Description

226-million-barrel storage facility consisting of 66 million barrels of capacity in four caverns existing upon site acquisition, plus 160 million barrels of planned leached storage capacity in 16 caverns.

36-inch-diameter, 14.6-mile brine disposal pipeline (13 miles offshore) to the Gulf of Mexico.

Oil, brine and raw water piping distribution system connecting caverns with central plant and water intake structure consists of over 101,000 feet of piping and 33 pumps totaling over 38,000 horsepower. Four 200,000-barrel oil storage tanks.

15,000 and 150,000-barrel brine pits, oil-brine separator, maintenance and control center buildings, roads, well pads, and dikes. Water intake structure on the Brazos River, connected by a 36-inch pipeline.

### System Parameters

Fill via 30-inch-diameter, 3.6-mile pipeline to Phillips docks.

Design oil injection rate - 240,000 bbl/d.

Sustained system rate - 180,000 bbl/d.

Raw water design pumping rate - 1,170,000 bbl/d.

Brine disposal - 980,000 bbl/d average projected disposal rate (permit limitation 1,100,000 bbl/d).

### Drawdown

Drawdown via 30-inch-diameter pipelines, 3.6 miles to Phillips Petroleum Company.

Docks and 4.6 miles to the Phillips Tank Farm.

1,054,000 bbl/d design capability (at end of Phase II).

### Major Accomplishments

Created 36 million barrels of additional cavern storage in Phase II and Phase III caverns.

Construction for four Phase III caverns was completed and leaching started.

Six brine disposal wells were plugged in accordance with Texas Railroad Commission requirements. The property was returned to the owners.

Approximately 32 million barrels of crude oil were placed in storage during 1984.

As of December 31, 1984, 178 million barrels of crude oil were in storage.

## D. SULPHUR MINES

### Location

Calcasieu Parish, Louisiana (two miles west of Sulphur, Louisiana, and 20 miles north of West Hackberry salt dome).

### Acquisition

Acquired 109.63 acres fee simple and 64.52 acres conditional fee by condemnation in February 1979 from Union Texas Petroleum (a subsidiary of Allied Corporation).

### Environmental/Permits

Environmental Impact Statement published March 1978.

Three major Federal and State permits for pipeline construction, oil storage, and air emission acquired in 1978. Environmental Protection Agency discharge permits for storm water and sewage acquired in 1980.

### Site Description

26-million-barrel storage facility consisting of three

## D. SULPHUR MINES (cont.)

existing caverns. Oil, brine, raw water piping distribution system connecting caverns with central plant, water intake structure, and brine disposal wells. Consists of over 77,000 feet of piping and 18 pumps totaling over 8,000 horsepower. Four deep-injection brine disposal wells.

Two 100,000-barrel brine ponds, control center building, well pads, and dikes.

Water intake structure 1.8 miles offsite on Houston Canal (Sabine River Diversion Canal No. 5) connected to facility by a combination of 16 and 12 inch pipelines.

### System Parameters

Oil fill via 16-inch-diameter, 15.9-mile spur pipeline connecting to DOE West Hackberry pipeline at Intracoastal Waterway.

Design pumping rate - 100,000 bbl/d.

Sustained system rate - 80,000 bbl/d (brine disposal-constrained).

Brine disposal - 80,000 bbl/d projected sustained rate.

### Drawdown

Drawdown via 16-inch-diameter, 15.9-mile spur pipeline to Intracoastal Waterway, then through 42-inch-diameter West Hackberry line, 34.4 miles to Sun Terminal, Nederland, Texas.

Design capability - 100,000 bbl/d.

### Major Accomplishments

As of September 1983, 26.2 million barrels of crude oil were in storage and site fill was completed.

## E. WEST HACKBERRY

### Location

Cameron Parish, Louisiana (12 miles southwest of Lake Charles, Louisiana).

### Acquisition

Acquired 405.36 acres fee simple by condemnation in April 1977, from numerous landowners including the Lowery, Ellender, and Hamilton families.

Olin Corporation was the previous site operator.

Acquired 160.0 additional acres fee simple adjacent to Phase I property in two actions, July 1979 and March 1980. Total acreage through Phase II is 565.36 acres.

### Environmental/Permits

Environmental Impact Statement published January 1977; supplement published April 1977. Phase III supplement published October 1981.

Six major Federal and State permits related to pipelines, drilling pads, water intake, and storage acquired in 1977 and 1978; NPDES permit renewed 1984.

Texoma Environmental Impact Statement published November 1978; supplement published in October 1981.

Two major Federal permits related to a brine pipeline acquired in 1980.

### Site Description

219-million-barrel storage facility consisting of 49 million barrels in five caverns existing upon site acquisition, plus 170 million barrels of planned leached storage capacity in 17 caverns.

Oil, brine, raw water piping distribution system connecting caverns with central plant, water intake structure, and disposal wells. Consists of over 160,000 feet of piping and 47 pumps totaling over 62,000 horsepower. 36-inch-diameter, 27-mile brine disposal pipeline (nine miles offshore) to Gulf of Mexico.

175,000-barrel brine pit, oil-brine separator, control center and maintenance buildings, roads, well pads, and dikes.

Water intake structure on Intracoastal Waterway, 42-inch-diameter, 4.5-mile pipeline connecting to site.

### System Parameters

Fill via 42-inch-diameter, 42.8-mile pipeline to Sun Terminal, Nederland, Texas.

Design oil injection rate - 225,000 bbl/d.

Sustained system rate - 175,000 bbl/d.

Raw water design pumping rate - 1,400,000 bbl/d.

Brine disposal - 900,000 bbl/d projected sustained disposal rate (permit limitation 1,088,000 bbl/d) via 36-inch pipeline to the Gulf of Mexico.

### Drawdown

Drawdown via 42-inch-diameter, 42.8-mile pipeline to Sun Terminal, Nederland, Texas.

1,400,000 bbl/d drawdown capability (at end of Phase II).



## E. WEST HACKBERRY (cont.)

### Major Accomplishments

Created 35-million barrels of additional cavern storage volume in Phase II.

Completed drilling of two wells for the planned Phase III cavern.

Initiated construction of surface systems and facilities for the Phase III cavern.

Approximately 39 million barrels of crude oil were placed in storage during 1984.

As of December 31, 1984, 125.1 million barrels of crude oil were in storage.

## F. BIG HILL

### Location

Jefferson County, Texas (20 miles southwest of Beaumont, Texas).

### Acquisition

Acquired 271.07 acres fee simple by condemnation from two landowners, i.e., 238.55 acres from Amoco and 32.52 acres from the Pipkin estate.

### Environmental/Permits

Environmental Impact Statement published in October 1981.

State permits for drilling, underground hydrocarbon storage, pipeline operations, air quality, water appropriation, and water quality certifications were acquired in 1983. EPA National Pollutant Discharge Elimination System, a major Federal permit was acquired in 1984.

### Site Description

140-million-barrel storage facility consisting of 14 caverns.

Oil, brine, and raw water systems connecting caverns with central plant, water intake structure, and brine disposal system.

48-inch diameter brine disposal pipeline extending to a point 3.5 nautical miles into the Gulf of Mexico.

Water intake structure on the Intracoastal Waterway connecting to the site by a 48-inch diameter pipeline.

### System Parameters

Fill via 36-inch-diameter pipeline from Sun Terminal, Nederland, Texas.

Sustained system rate - 280,000 bbl/d.

Raw water design pumping rate - 1,400,000 bbl/d.

Brine disposal - 1,400,000 bbl/d.

### Drawdown

Drawdown via 36-inch-diameter pipeline to Sun Terminal, Nederland, Texas.

935,000 bbl/d drawdown capability.

### Major Accomplishments

Completed drilling 10 wells for the first five planned caverns and eight additional wells on the remaining nine planned caverns.

Initiated construction of the Stage 1A contract for onsite surface facilities.

Initiated construction of the Raw Water Intake Structure.

## G. ST. JAMES TERMINAL

### Location

St. James Parish, Louisiana (45 miles southeast of Baton Rouge, Louisiana, on the Mississippi River).

### Acquisition

Acquired 104.76 acres fee simple for terminal by condemnation in May 1978.

Acquired 47.68 acres fee simple for docks by condemnation in July 1978.

### Environmental/Permits

St. James Terminal Environmental Impact Statement is a component of the Bayou Choctaw supplement, published May 1977, and the Weeks Island supplement, published August 1977.

Two Major Federal and State permits related to dock construction acquired in 1978. Environmental Protection Agency discharge permit for storm water and sewage acquired in 1980. Dock Construction Permit modified 1982.

## G. ST. JAMES TERMINAL (cont.)

### Site Description

Terminal facilities include six storage tanks totaling two million barrels of capacity, tie-ins to Bayou Choctaw, Weeks Island, and to LOCAP Capline pipeline and Capline terminal complex.

Oil distribution piping system connecting docks, tanks, and pump station.

Consists of over 35,000 feet of piping and eight pumps totaling over 12,000 horsepower, metering systems, and maintenance and central buildings. Two docks with one berth each, able to accommodate vessels of up to 123,000 long tons maximum loaded displacement. A 42-inch-diameter pipeline connects the docks with the storage tanks.

### System Parameters

Tanker unloading - design unloading capacity of 40,000 bbl/hr.

### Distribution from terminal:

To Bayou Choctaw: design pumping rate - 240,000,000 bbl/d;

To Weeks Island: design pumping rate - 480,000 bbl/d.

### Terminal throughput:

Fill sustained system rate - 350,000 bbl/d;

Drawdown rate - 1,070,000 bbl/d (combined rate of Bayou Choctaw and Weeks Island sites).

### Drawdown

Crude oil from Bayou Choctaw and/or Weeks Island to be distributed across docks and to Capline.

## H. CRUDE OIL SPECIFICATIONS

### SPR CRUDE OIL SPECIFICATIONS (SPRO 1985 JAN)<sup>a</sup>

CHARACTERISTIC	I	II	III	IV	V	VI	VII	PRIMARY ASTM
								TEST METHOD <sup>b</sup>
API GRAVITY [°API]	30-45	40-45	30-40	34-40	36-41	26-45	22.0 MIN.	D 1298
TOTAL SULFUR [Wt. %], Max.	1.99	0.25	0.50	0.25	0.50	1.25	3.5	D 1552
FOUR PDINT [°F(°C)], Max.	50 (10)	50 (10)	50 (10)	50 (10)	50 (10)	50 (10)	50 (10)	D 97
SALT CONTENT [Lbs./1,000 Bbls.], Max.	50	50	50	50	50	50	50	D 3230
VISCOSITY [SUS @ 60°F (cST @15.6°C)], Max	150 (32)	150 (32)	150 (32)	150 (32)	150 (32)	200 (43)	1500 (325)	D 445 & D 2161
[SUS @ 100°F (cST @37.8°C)], Max	70 (13)	70 (13)	70 (13)	70 (13)	70 (13)	80 (16)	350 (75)	
REID VAPOR PRESSURE [P <sub>sia</sub> @ 100°F (kPa @ 37.8°C)], Max	11 (76)	11 (76)	11 (76)	11 (76)	11 (76)	11 (76)	11 (76)	D 323
TOTAL ACID NUMBER [mg KOH/g] Max	0.40	0.40	0.40	0.40	0.40	0.40	0.40	D 664
WATER & SEDIMENT [Vol. %], Max	1.0	1.0	1.0	1.0	1.0	1.0	1.0	D 473 & D 4006
YIELDS [Vol. %]								D 2892 & D 1160
NAPHTHA [<375°F (<191°C)]	24-30	35-42	21-29	29-36	30-38	15-20	10 MIN.	
DISTILLATE [375-620°F (191-327°C)]	17-31	21-35	23-37	31-45	19-33	24-27	15 MIN.	
GAS OIL [620-1050°F (327-566°C)]	26-38	20-34	28-42	20-34	23-37	38-42	20 MIN.	
RESIDUM [>1010°F (>566°C)]	10-19	4-9	7-14	0-5	7-14	15-20	50 MAX.	

<sup>a</sup>Marketable virgin crude petroleum suitable for normal refinery processing and free of foreign contaminants or chemicals including, but not limited to, chlorinated and/or oxygenated hydrocarbon, and lead.

<sup>b</sup>To the maximum extent practicable, the primary ASTM test methods listed are to be used in characterizing crude oil. While other methods may be used when the primary method is unavailable, the primary method is designated as the binding method should results of the alternative method be questioned.



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DEPARTMENT OF ENERGY  
WASHINGTON, D.C. 20585

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# STRATEGIC PETROLEUM RESERVE ANNUAL/QUARTERLY REPORT

February 15, 1986

**U.S. Department of Energy**  
Assistant Secretary for Fossil Energy  
Office of Petroleum Reserves



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February 15, 1986

**U.S. Department of Energy**  
Assistant Secretary for Fossil Energy  
Office of Petroleum Reserves  
Washington, D.C. 20585



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## Contents

Section	Page
EXECUTIVE SUMMARY .....	v
I. INTRODUCTION .....	1
II. STATUS OF THE STRATEGIC PETROLEUM RESERVE .....	3
A. Storage Facilities Development.....	3
B. Oil Acquisition and Transportation.....	6
III. BUDGET AND FINANCE .....	9
A. Appropriations.....	9
B. Major Budget and Financing Actions During FY 1985.....	9
C. Major Budget Actions, Last Quarter 1985 (First Quarter FY 1986).....	9
D. Oil Cost Through FY 1985.....	10
IV. ORGANIZATION, MANAGEMENT AND CONTRACTUAL SUPPORT .....	13
A. Program/Project Management.....	13
B. Procurement and Contractor Support.....	13
C. Real Estate, Environmental Compliance, and Permits.....	13
V. DRAWDOWN SYSTEM AND VULNERABILITY IMPACT .....	15
A. Drawdown and Distribution Capabilities.....	15
B. Drawdown Exercises.....	15
C. Distribution Enhancements.....	16
D. Vulnerability Impact.....	17
APPENDIX: STRATEGIC PETROLEUM RESERVE SITES STATUS	
A. Bayou Choctaw.....	A-3
B. Weeks Island.....	A-3
C. Bryan Mound.....	A-4
D. Sulphur Mines.....	A-4
E. West Hackberry.....	A-5
F. Big Hill.....	A-6
G. St. James Terminal.....	A-6

### Figures

1. Strategic Petroleum Reserves Sites.....	3
2. 1985 Storage Facilities Development & Fill Status.....	5
3. Annual Strategic Petroleum Reserve Oil Fill.....	7
4. Cumulative Strategic Petroleum Reserve Oil Fill.....	7
5. Strategic Petroleum Reserve Annual Funding.....	9
6. Strategic Petroleum Reserve Cumulative Funding.....	9
7. Strategic Petroleum Reserve Drawdown Capability.....	15
8. Strategic Petroleum Reserve Drawdown/Distribution Capability.....	16
9. Current and Planned Strategic Petroleum Reserve Distribution System for the Seaway, Texoma, and Capline Groups.....	18

### Tables

1. Strategic Petroleum Reserve Storage and Drawdown Capacity.....	4
2. 1985 Storage Capacity Development by Quarter.....	6
3. Strategic Petroleum Reserve Oil Inventory and Delivery Statistics.....	6
4. Strategic Petroleum Reserve Oil Fill History.....	6
5. Crude Oil Received Through 1985.....	7
6. Strategic Petroleum Reserve Crude Oil Inventory.....	8
7. Strategic Petroleum Reserve Appropriations.....	11
8. Current Sustained Capabilities.....	15

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## EXECUTIVE SUMMARY

### New Legislation Enacted

During 1985, a number of bills related to the Strategic Petroleum Reserve were enacted. The Energy Policy and Conservation Amendments Act of 1985 (P.L. 99-58) enacted on July 2, 1985, extended the provisions relating to the Strategic Petroleum Reserve Program until June 30, 1989. The Supplemental Appropriations Act for Fiscal Year 1985 (P.L. 99-88), enacted on August 15, 1985, amended the Energy Policy and Conservation Act and also provided funding for continuing development of the Strategic Petroleum Reserve during fiscal year 1986 and for increasing the inventory of crude oil in storage at the Reserve by approximately 11 million barrels to a total of 500 million barrels by the end of fiscal year 1986. The Food Security Act (P.L. 99-198) providing for the barter of agricultural commodities for oil, was passed on December 18, 1985 and signed by the President on December 23, 1985. On December 19, 1985, the President signed the Continuing Appropriations Bill for Fiscal Year 1986 (P.L. 99-190), which permits the Department of Energy to trade surplus agricultural products in Government stockpiles for crude oil for the Reserve.

### Oil Acquisition and Fill Rates

As of December 31, 1985, the Strategic Petroleum Reserve (SPR) crude oil inventory was 493.3 million barrels of crude oil, an increase of 42.8 million barrels over the 1984 year end inventory of 450.5 million barrels. The Strategic Petroleum Reserve was filled at an average fill rate of 118,506 barrels per day during 1985.

### Facilities and Storage Development

During the calendar year 1985, the Strategic Petroleum Reserve increased its crude oil storage capability from 453 million barrels to 509 million barrels, adding approximately 19.8 million barrels of new storage capacity at the Bryan Mound storage site and 36.5 million barrels at the West Hackberry storage site. At Bryan Mound, two new caverns have been completed, and at West Hackberry, four new caverns have been completed. At Bayou Choctaw, a Strategic Petroleum Reserve developed 5.6-million-barrel cavern was officially exchanged in 1985 for an existing 10-million-barrel Union Texas Petroleum Company-owned cavern which will be converted for Strategic Petroleum Reserve crude oil storage. Additionally, drilling was completed on the single Phase III cavern at Bayou Choctaw in the third quarter of fiscal year 1985.

As of December 31, 1985, drilling at Big Hill was completed on all of the site's 28 cavern wells. Construction of the on-site surface facilities for leaching of the first five caverns was 93 percent complete; the Raw Water Intake Structure, located on the Intracoastal Waterway approximately five miles from the site, was approximately 92 percent complete.

### Distribution Enhancements

Since the Strategic Petroleum Reserve storage and distribution systems were originally planned, major decreases have occurred in U.S. refining capacity, in the level of crude oil imports and in private industrial distribution systems capability within the U.S. As a result of these changes in distribution capability, the Strategic Petroleum Reserve has identified distribution enhancements that would enable the Strategic Petroleum Reserve to achieve its future drawdown and distribution requirements and to remain compatible with drawdown capability. The enhancements initiated during 1985 include construction of a pipeline from the Bryan Mound site to Texas City, Texas; terminal configuration changes to the ARCO Terminal at Texas City, Texas, and the Phillips Terminal at Freeport, Texas. For the Bryan Mound-to-Texas City pipeline, an environmental review process is in final stages, land acquisition activities are in progress and U.S. Steel Corporation has been awarded a contract to provide the pipe for the pipeline.

### Drawdown Exercises

In July 1985, a drawdown test was conducted to validate the capability of the Reserve to function in the event of electrical power supply interruption at the sites. The drawdown was accomplished using diesel-fueled pumps to force fresh water from a nearby lake into one of the 10-million barrel caverns at Bayou Choctaw, and resulted in more than 375,000 barrels of crude oil being moved to the St James terminal facility.

On July 2, 1985, the Energy Policy and Conservation Amendments Act of 1985 (P.L. 99-58) was enacted, providing for the sale or exchange of approximately 1.1 million barrels of Strategic Petroleum Reserve oil to test the drawdown and distribution capabilities of the Strategic Petroleum Reserve. The Department of Energy commenced a test sale of Strategic Petroleum Reserve crude oil on November 18, 1985, with the issuance of a Notice of Sale and received bids for purchasing the oil on November 25, 1985. Contracts were awarded to 5 firms for a total of 1 million barrels, of which 443,830 barrels were delivered in 1985. Deliveries commenced on December 11, 1985 and were scheduled to be completed on January 8, 1986.

### Vulnerability Impact

By the end of 1985, the Strategic Petroleum Reserve inventory was nearly 4.6 times the size of the December 1980 inventory, but the United States net oil imports declined by approximately one-fifth during this same period. The vulnerability of the United States to oil supply disruptions has thus diminished considerably during the 1980's.

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## I. INTRODUCTION

The Secretary of Energy is required to submit annual and quarterly reports to the President and the Congress on developmental activities of the Strategic Petroleum Reserve in accordance with Section 165 of the Energy Policy and Conservation Act of 1975. This report combines the fourth quarter 1985 Quarterly Report and the 1985 Annual Report and is presented in five sections with an Appendix.

This introductory section briefly covers the program legislation and the Strategic Petroleum Reserve Plan and its amendments. The current status of the Strategic Petroleum Reserve is outlined in Section II and the appropriations, budget and finances to date are provided in Section III. Section IV addresses organization, management and contractor support. A discussion of the drawdown system and vulnerability impact are set forth in Section V. The Appendix contains detailed information on the status of each Strategic Petroleum Reserve site.

### Program Legislation

The Strategic Petroleum Reserve was authorized by Congress with the passage of the Energy Policy and Conservation Act (P.L. 94-163), which was approved December 22, 1975, and extended in July of 1985. This legislation declared it to be United States policy to establish a Strategic Petroleum Reserve of up to one billion barrels of petroleum products to reduce the impact of disruptions in petroleum supplies and to carry out the obligations of the United States under the International Energy Program.

The Energy Policy and Conservation Act provisions regarding the Strategic Petroleum Reserve were amended by Title VIII of the Energy Security Act (P.L. 96-294), approved June 30, 1980. This Act established a minimum average daily fill rate of 100,000 barrels and precluded sale of Naval Petroleum Reserve Number 1 (Elk Hills) crude oil except to fill the Strategic Petroleum Reserve unless the Strategic Petroleum Reserve is being filled at the minimum rate or has reached 500 million barrels in inventory.

The Omnibus Budget Reconciliation Act of 1981 (P.L. 97-35), approved August 13, 1981, created the off-budget "SPR Petroleum Account" as a method for financing Reserve oil acquisition and transportation without including such transactions in Federal budget totals. It also required quarterly reports on Strategic Petroleum Reserve progress and submission of a study on the ultimate size of the Reserve.

The Energy Emergency Preparedness Act of 1982 (P.L. 97-229), approved August 3, 1982, established minimum Strategic Petroleum Reserve fill rate requirements, authorized acquisition of interim storage facilities, and required a series of plans and reports on Strategic Petroleum Reserve use and other aspects of energy emergency preparedness.

The Energy Policy and Conservation Amendments Act of 1985 (P.L. 99-58) enacted on July 2, 1985, extended

the provisions relating to the Strategic Petroleum Reserve Program until June 30, 1989, and directed the Secretary of Energy to conduct a sale or exchange of 1.1 million barrels of Strategic Petroleum Reserve oil to test the drawdown and distribution capabilities of the Strategic Petroleum Reserve.

The Supplemental Appropriations Act for Fiscal Year 1985 (P.L. 99-88) enacted on August 15, 1985, amended the Energy Policy and Conservation Act to provide a lower minimum average daily fill rate in any year in which a level of 500 million barrels will be achieved. It also provided funding for continuing development of the Strategic Petroleum Reserve during fiscal year 1986 and for increasing the inventory of crude oil in storage at the Reserve by approximately 11 million barrels to a total of 500 million barrels by the end of fiscal year 1986 through the disapproval of the \$271 million deferral of funds appropriated for the Strategic Petroleum Reserve Account and the disapproval of \$290 million of the \$827 million deferral of appropriations for the SPR Petroleum Account.

The Food Security Act (P.L. 99-198) providing for the barter of agricultural commodities for crude oil was passed on December 18, 1985 and signed by the President on December 23, 1985.

On December 19, 1985, the President signed the Continuing Appropriations Bill for Fiscal Year 1986 (P.L. 99-190) which provides \$112,365,000 in FY 1986 for the on-budget Strategic Petroleum Reserve Account for continued development of a 750-million barrel Strategic Petroleum Reserve, and permits the Department of Energy to trade surplus agricultural products in Government stockpiles for crude oil for the Reserve.

### SPR Plan and Amendments

The Energy Policy and Conservation Act required a Strategic Petroleum Reserve Plan, which was submitted to Congress on February 16, 1977, and became effective on April 18, 1977. The Plan discussed the development and implementation of the Strategic Petroleum Reserve.

Strategic Petroleum Reserve Plan Amendment No. 1 accelerated the planned schedule for filling the Reserve. This Amendment was submitted to the Congress on May 25, 1977, and became effective on June 20, 1977. The revised goal of 500 million barrels of crude oil to be in storage by December 22, 1980, advanced the original schedule by two years. Amendment No. 2 to the Strategic Petroleum Reserve plan authorized an increase in the Strategic Petroleum Reserve size from 500 million barrels to one billion barrels. This Amendment was transmitted to the Congress on May 18, 1978, and became effective on June 13, 1978. The Amendment described the plans to store 750 million barrels of petroleum by the Department of Energy in underground storage facilities. Decisions were not made regarding the methods or timing for developing the final 250 million barrels of storage capacity.

On October 31, 1979, the Department of Energy submitted to the Congress the Distribution Plan for the Strategic Petroleum Reserve (Amendment No. 3, Energy Action No. 5). In accordance with the provisions of the Energy Policy and Conservation Act, the Plan became effective on November 15, 1979. The Distribution Plan described the methods for drawdown and distribution of crude oil from the five Strategic Petroleum Reserve storage sites.

On December 1, 1982, President Reagan transmitted to the Congress a new "Drawdown" (Distribution) Plan (Amendment No. 4) for the use of the Strategic Petroleum Reserve. This plan, required under the Energy Emergency Preparedness Act of 1982 (EEPA) and effective upon its December 1, 1982 submission to the Congress, provided new procedures for the drawdown, sale and distribution of crude oil from the Strategic Petroleum Reserve.

## II. STATUS OF THE STRATEGIC PETROLEUM RESERVE

### A. STORAGE FACILITIES DEVELOPMENT

Since 1976, the Department of Energy has been involved in a major storage facilities development program to stockpile crude oil. The Strategic Petroleum Reserve has acquired and developed six underground crude oil storage facilities in salt domes along the coasts of Texas and Louisiana, and a Government-owned marine terminal on the Mississippi River at St. James, Louisiana. These six sites are West Hackberry, Sulphur Mines, Bayou Choctaw and Weeks Island in Louisiana, and Bryan Mound and Big Hill in Texas. The Strategic Petroleum Reserve storage sites have been organized into three functionally independent groups based on proximity to the three existing (or former) major interstate crude oil pipeline systems serving the Mid-West: Seaway, Texoma and Capline. Each of the Strategic Petroleum Reserve sites is linked via Department of Energy pipelines to commercial crude oil distribution systems and marine terminalling facilities for water-borne distribution. The locations of the Strategic Petroleum Reserve storage sites and their associated distribution pipelines and terminals are shown in Figure 1.

The current Strategic Petroleum Reserve facilities development program is designed to provide a cumulative storage capacity of 750 million barrels and a drawdown capability of 4.5 million barrels per day (MMB/D). Table 1 illustrates the Strategic Petroleum Reserve's storage and drawdown capacity criteria for the six storage facilities.

### Bryan Mound

The Bryan Mound site is located in Brazoria County, Texas, approximately three miles south of Freeport. The Department of Energy acquired this storage site in 1977 and converted four existing brine caverns with a total capacity of 66 million barrels to oil storage. The Department of Energy is currently developing 16 additional new 10-million-barrel storage caverns at Bryan Mound through solution mining, increasing the site's total storage capacity to 226 million barrels. During 1985, brine disposal to the Gulf of Mexico averaged 551,000 barrels per day, creating approximately 19.8 million barrels of new storage capacity. By the end of 1985, 12 of the 16 new caverns had been completed; the remaining four caverns are approximately 74 percent complete, bringing total storage capacity to 198.6 million barrels or 88 percent of the planned 226 million barrels.

### West Hackberry

The West Hackberry site is located in Cameron Parish, Louisiana, approximately 12 miles southwest of Lake Charles. The Department of Energy acquired this storage site in 1977 and converted 5 existing brine caverns with a capacity of 49 million barrels to oil storage. The Department of Energy is currently developing 17 additional new 10-million-barrel storage caverns at West Hackberry through solution mining, increasing the site's total storage capacity to 219 million barrels. During 1985, brine disposal to the Gulf of Mexico averaged 700,000 barrels per day, creating

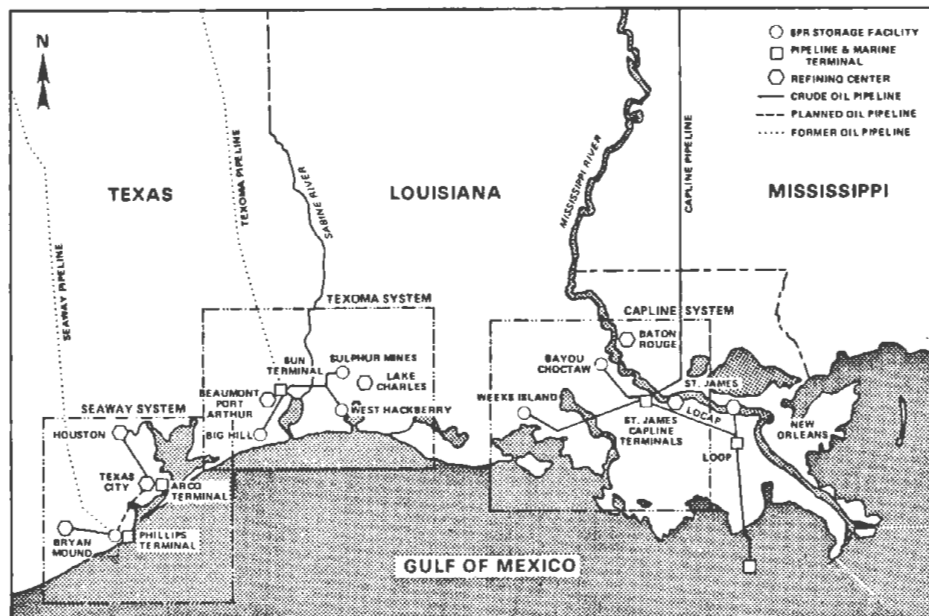


Figure 1. Strategic Petroleum Reserve Sites

approximately 36.6 million barrels of new storage capacity. By the end of 1985, 11 of the 17 new caverns had been completed; the remaining 6 caverns range between 13 and 85 percent complete, bringing the total storage capacity to 165.8 million barrels or 76 percent of the planned 219 million barrels.

TABLE 1

STRATEGIC PETROLEUM RESERVE STORAGE AND DRAWDOWN CAPACITY

Storage Group	Storage Facility	Storage Capacity (MMB)		Drawdown Capability
		Planned	Completed by 12/85	
Seaway	Bryan Mound	226.0	198.6	1.10 MMB/D
Texoma	West Hackberry	219.0	165.8	1.40 MMB/D
	Sulphur Mines	26.0	26.0	*
	Big Hill	140.0	0.0	0.93 MMB/D
Capline	Bayou Choctaw	66.0	46.0	0.48 MMB/D
	Weeks Island	73.0	73.0	0.59 MMB/D
TOTAL		750.0	509.4	4.50 MMB/D

\*Sulphur Mines has a drawdown capability of 0.10 MMB/D; however, the combined West Hackberry and Sulphur Mines drawdown capability is constrained to 1.40 MMB/D.

**Bayou Choctaw**

The Bayou Choctaw site is located in Iberville Parish, Louisiana, approximately 12 miles southwest of Baton Rouge. The Department of Energy acquired this storage site in 1977 and converted 4 existing brine caverns with a capacity of 46 million barrels to oil storage.

Under a 1980 agreement with Union Texas Petroleum, the Department of Energy completed the exchange of a 5.6-million-barrel cavern developed by the Strategic Petroleum Reserve with a 10-million-barrel cavern owned by Union Texas Petroleum to resolve a potential safety issue. The Union Texas Petroleum cavern, which stored industrial ethane at high pressure, was extremely close to a Strategic Petroleum Reserve storage cavern. During 1985, Union Texas Petroleum accepted the Strategic Petroleum Reserve developed cavern, installed a piping system to transfer stored ethane between caverns, and completed the ethane transfer and certification of the cavern as required by the Department of Energy. In addition to the cavern exchange, the Department of Energy completed the drilling of 2 wells for a planned additional 10-million-barrel cavern which will increase the total storage capacity of the site to 66 million barrels.

**Weeks Island**

The Weeks Island site is located in Iberia Parish, Louisiana, approximately 95 miles southwest of New Orleans. The Department of Energy acquired this storage site in 1977 and converted an existing conventional salt mine with a capacity of 73 million barrels to oil storage. Development and fill of this site was completed in 1982. The Weeks Island site is currently in an operational standby mode.

**Sulphur Mines**

The Sulphur Mines site is located in Calcasieu Parish, Louisiana, approximately 12 miles west of Lake Charles. The Department of Energy acquired this storage site in 1979 and converted 3 existing brine caverns with a capacity of 26 million barrels to oil storage. Development and fill of this site was completed in 1983. The Sulphur Mines site is currently in an operational standby mode.

**Big Hill**

The Big Hill storage site is located in Jefferson County, Texas, 20 miles southwest of Beaumont. The Department of Energy acquired this undeveloped site in 1982. The Department has been constructing a new storage facility at this site with a planned storage capacity of 140 million barrels and a drawdown capability of 930,000 barrels per day. All drilling (28 wells) for the 14 caverns was completed in 1985. On-site construction of the major site facilities, including piping and instrumentation for the first five caverns, and off-site construction of the raw-water intake structure which will provide fresh water to the site for cavern leaching are 92 to 93 percent complete. In response to the President's proposed moratorium in January 1985, the Department cancelled planned procurements for additional site and pipeline construction at Big Hill. In August, with the enactment of the Supplemental Appropriations Act for fiscal year 1985, the Department of Energy took action to reinstate procurement for Stage II construction and the raw water, brine and crude oil pipelines. In December, contract bids were received for the fixed-price construction of the raw water, brine and crude oil pipelines.

**Strategic Petroleum Reserve Storage Capacity Development**

Figure 2 illustrates the Strategic Petroleum Reserve's storage capacity development and fill status by storage facility. As of December 31, 1985, the Strategic Petroleum Reserve's total permanent storage capacity created was approximately 509 million barrels, an increase of 56 million barrels over the volume at the end of 1984. Table 2 summarizes the 1985 storage capacity development by quarter.



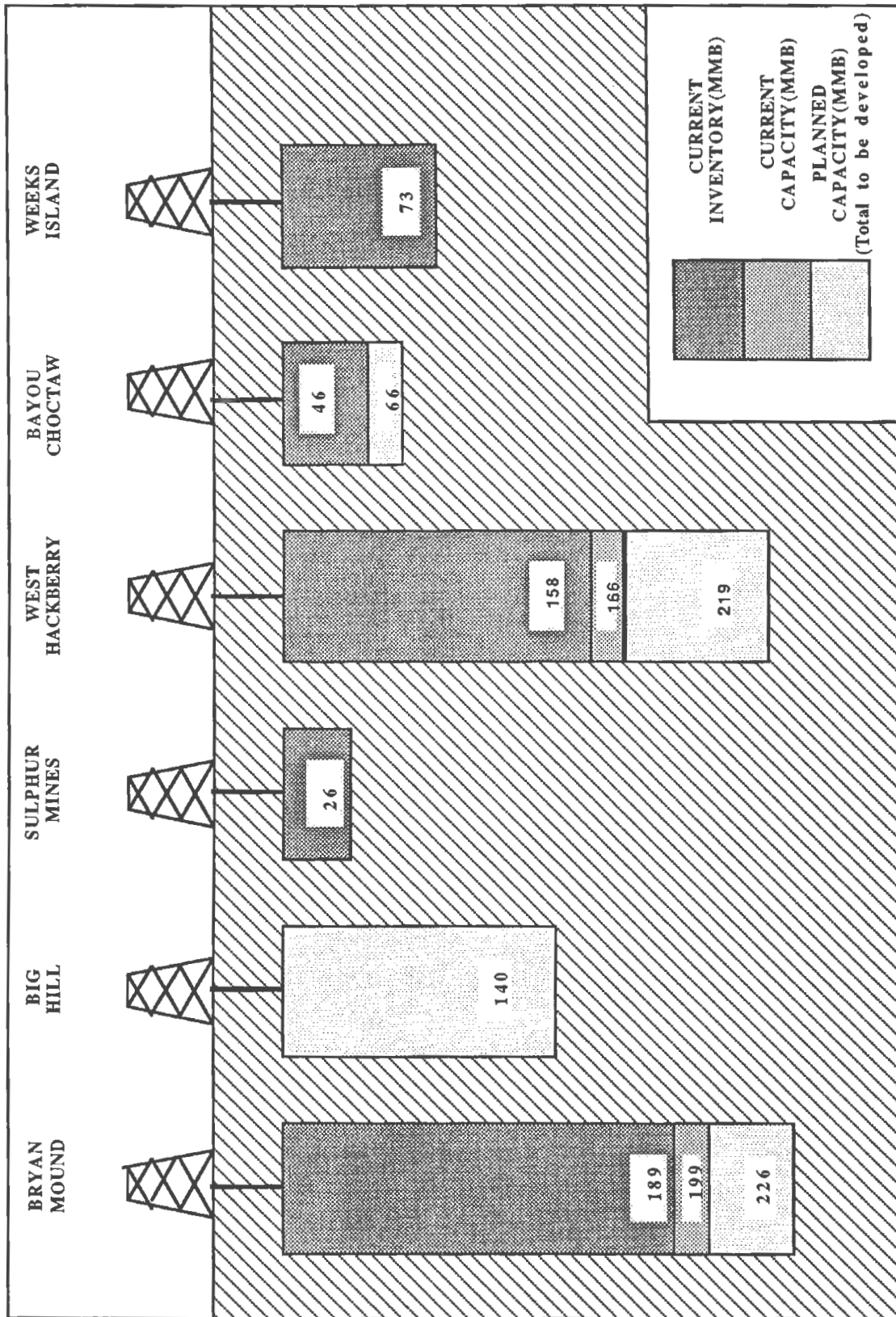


FIGURE 2 - 1985 STORAGE FACILITIES DEVELOPMENT & FILL STATUS

## B. OIL ACQUISITION AND TRANSPORTATION

### Statistics For Fourth Quarter, 1985

The Strategic Petroleum Reserve was filled at a rate of 48,970 barrels per day during the calendar quarter ending December 31, 1985. Additionally, 443,830 barrels were delivered to purchasers of Strategic Petroleum Reserve oil under the Test Sale. As of December 31, 1985, the net Strategic Petroleum Reserve crude oil inventory was 493,316,301 barrels after deducting the quantities delivered by December 31, 1985 as part of the Test Sale. Table 3 summarizes the Strategic Petroleum Reserve crude oil inventory and delivery statistics as of December 31, 1985.

Table 2

1985 STORAGE CAPACITY DEVELOPMENT BY QUARTER  
(IN MILLION BARRELS)

Storage Facility	1984 Year End	1st Quarter	2nd Quarter	3rd Quarter	4th Quarter	1985 Year End
Bryan Mound	178.8	5.9	2.7	5.9	5.3	198.6
West Hackberry	129.3	9.6	12.6	11.5	2.8	165.8
Bayou Choctaw	46.0	0.0	0.0	0.0	0.0	46.0
Weeks Island	73.0	0.0	0.0	0.0	0.0	73.0
Sulphur Mines	26.0	0.0	0.0	0.0	0.0	26.0
<b>TOTAL</b>	<b>453.1</b>	<b>15.5</b>	<b>15.3</b>	<b>17.4</b>	<b>8.1</b>	<b>509.4</b>

During the period of October 1, 1985, through December 31, 1985, no low sulphur crude (sweet) oil was delivered to the Strategic Petroleum Reserve terminals. The weighted average price per barrel of the high sulphur (sour) crude oil delivered to the Strategic Petroleum Reserve terminals during this period was \$27.33 per barrel. This information is based on the contract price per barrel for crude oil and its transportation cost only. Demurrage, customs duties, environmental taxes, contract discounts, terminal costs and other administrative costs are not included.

Fiscal and calendar year inventories and average daily fill rates since 1977 are presented in Table 4. Strategic Petroleum Reserve crude oil fill is illustrated on an annual basis and cumulative basis in Figures 3 and 4 respectively.

TABLE 3

STRATEGIC PETROLEUM RESERVE  
OIL INVENTORY AND DELIVERY STATISTICS  
(As of December 31, 1985)

Total Strategic Petroleum Reserve Inventory	493,316,301 Barrels
Amount of Crude Oil Remaining to be Delivered Under Test Sale	540,000 Barrels
Amount of Crude Oil in Transit	0 Barrels
Contracted Quantity Remaining to be Delivered to the Strategic Petroleum Reserve in Fiscal Year 1986	6,200,000 Barrels (Estimated)
Fill Rate for Reported Calendar Quarter	48,970 Barrels
Crude Oil Delivered Under Test Sale During Reported Calendar Quarter	443,830 Barrels
Fill Rate for Calendar Year	118,506 Barrels per Day
Projected Fill Rate for Next Calendar Quarter	50,000 Barrels per Day (Estimated)

TABLE 4

STRATEGIC PETROLEUM RESERVE OIL FILL HISTORY

	FISCAL YEAR		CALENDAR YEAR	
	Year-End Inventory (million bbls)	Average Daily Fill Rate (thousand bbls/d)	Year-End Inventory (million bbls)	Average Daily Fill Rate (thousand bbls/d)
1977	1.1	3	7.2	20
1978	49.1	131	68.5	168
1979	91.2	115	91.7	64
1980	92.8	4	107.8	44
1981	199.2	292	230.3	336
1982	277.9	215	293.8	174
1983	361.0	228	379.1	234
1984	431.1	191	450.5	195
1985	489.3	159	493.3	119*

\* Fill rate unadjusted for oil deliveries under Test Sale

### Oil Acquisition Contracts, Calendar Year 1985

Of the 43.2 million barrels of crude oil delivered in 1985:
 

- o 24.6 million barrels of sweet and sour crude oils were acquired under the open continuous solicitation issued by the Defense Fuel Supply Center for spot oil market purchases.

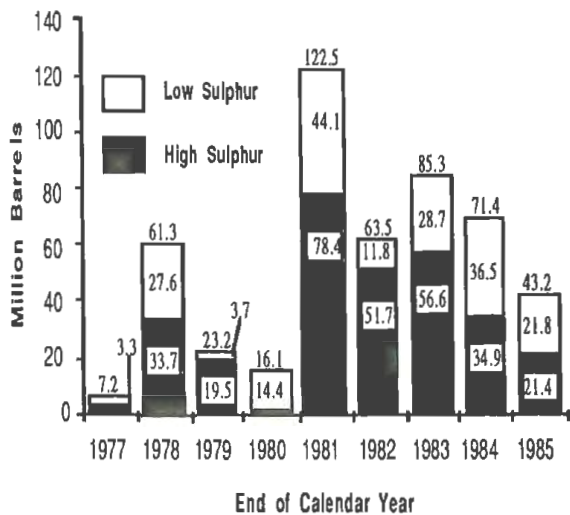


Figure 3. Annual Strategic Petroleum Reserve Oil Fill

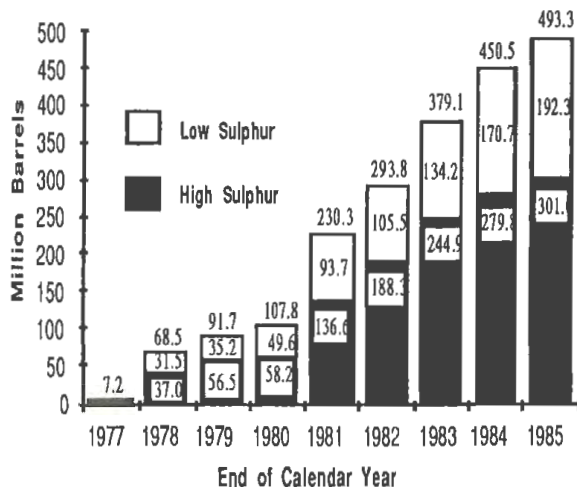


Figure 4. Cumulative Strategic Petroleum Reserve Oil Fill

o 18.6 million barrels of sour crude oil were acquired under the Department of Energy's 1981 purchase agreement with Petroleos Mexicanos (PEMEX), Mexico's state-owned oil company.

These acquisitions were offset by the delivery of 443,830 barrels to purchasers under the Test Sale, for a net inventory increase of 42.8 million barrels.

Table 5 shows the crude oil received during 1985 and since inception of the Strategic Petroleum Reserve program by state or country of origin. Of the total oil in storage, 61 percent is high sulfur (sour) and 39 percent is low sulfur (sweet). Table 6 provides information on the location of this inventory by site. The Strategic Petroleum Reserve crude oil acquisition specifications did not change during 1985 and can be found in the 1984 Strategic Petroleum Reserve Annual Report.

TABLE 5

Crude Oil Received Through 1985  
(million barrels)

Source Country or State	Quantity During 1985	Cumulative	Percent of Total
Mexico	18.5	171.6	34.8
United Kingdom	20.7	136.0	27.5
Alaska		31.4	6.4
Saudi Arabia		27.1	5.5
Libya		23.8	4.8
Iran		20.0	4.1
Dubai		15.9	3.2
Nigeria		15.2	3.1
Oman	0.7	9.0	1.8
Egypt		8.9	1.8
Norway	1.1	7.4	1.5
Ecuador		6.2	1.2
Algeria		6.2	1.2
Cameroon		3.4	0.7
Texas	0.2	2.7	0.5
Abu Dhabi	2.0	2.5	0.5
Gabon		2.4	0.5
Qatar		2.3	0.5
Venezuela		0.9	0.2
Other Domestic		0.4	0.1
Peru		0.4	0.1
<b>Total Receipts</b>	<b>43.2</b>	<b>493.7</b>	<b>100.0</b>
Less Test Sale Deliveries	0.4	0.4	
<b>NET INVENTORY</b>	<b>42.8</b>	<b>493.3</b>	

Table 6

**STRATEGIC PETROLEUM RESERVE CRUDE OIL INVENTORY**  
As of December 31, 1985  
(Million Barrels)

Storage Site	Location	1985 Cumulative Total			End of Year 1984
		Sour*	Sweet**	Total	
Bryan Mound	Brazoria County, TX	125.6	64.4	190.0	177.7
West Hackberry	Cameron Parish, LA	47.0	109.3	156.3	125.1
Bayou Choctaw	Iberville Parish, LA	27.7	18.1	45.8	45.6
Weeks Island	Iberia Parish, LA	72.5	-	72.5	72.7
Sulphur Mines	Calcasieu Parish, LA	26.1	-	26.1	26.2
Subtotal		298.9	191.8	490.7	447.3
Tanks and Pipelines		2.1	0.5	2.6	3.2
<b>TOTAL</b>		<b>301.0</b>	<b>192.3</b>	<b>493.3</b>	<b>450.5</b>

\* Sulphur content greater than 0.5 percent

\*\*Sulphur content less than 0.5 percent

### Cargo Preference Act Compliance

The Cargo Preference Act of 1954 requires that Federal agencies take such steps as may be necessary and practicable to assure that at least 50 percent of its cargo transported on ocean vessels in a calendar year is transported by privately-owned U.S.-flag vessels, to the extent they are available at fair and reasonable rates. By agreement between the Department of Energy and the Department of Transportation, the Strategic Petroleum Reserve's Cargo Preference Act compliance is measured in terms of long-ton miles, i.e., cargo tons multiplied by the distances transported.

During 1985, 16 U.S.-flag vessels, transporting a total of 20.9 million barrels were involved in delivering crude oil to Strategic Petroleum Reserve. These deliveries equaled 8.8 billion long-ton miles or 50.3 percent of the total long-ton miles.

### III. BUDGET AND FINANCE

#### A. APPROPRIATIONS

Approximately \$17.9 billion was appropriated for the Strategic Petroleum Reserve through December 31, 1985, including entitlement receipts for FY 1981 under the authority of the Energy Security Act. Distribution of appropriated funds among program activities is shown in Table 7. Figures 5 and 6 illustrate Strategic Petroleum Reserve funding on an annual basis and on a cumulative basis, respectively.

As required by the Omnibus Budget Reconciliation Act of 1981, P.L. 97-35, which amended Section 167 of the Energy Policy and Conservation Act, P.L. 94-163 (42 U.S.C. Section 6247), the SPR Petroleum Account was established in the Treasury, placing Strategic Petroleum Reserve crude oil spending "off-budget" and providing for the reappropriation of crude oil sales receipts for oil acquisition following a drawdown.

#### B. MAJOR BUDGET AND FINANCING ACTIONS DURING FY 1985

The Administration's budget for fiscal year 1986 provided for an indefinite moratorium on Strategic Petroleum Reserve development and crude oil fill at the end of fiscal year 1985. It also provided for the deferral in fiscal year 1985 of \$271 million appropriated for the on-budget Strategic Petroleum Reserve Account and \$827 million appropriated for the off-budget SPR Petroleum Account. However, the Supplemental Appropriations Act for fiscal year 1985 (P.L. 99-88), enacted on August 15, 1985, provided funding for continuing development of the Strategic Petroleum Reserve during fiscal year 1986 and for increasing the inventory of crude oil in storage at the Reserve by approximately 11 million barrels, to a total of 500 million barrels, by the end of fiscal year 1986, through the disapproval of the \$271 million deferral of funds appropriated for the Strategic Petroleum Reserve Account and the disapproval of \$290 million of the \$827 million deferral of appropriations for the SPR Petroleum Account.

As a result of these disapproval actions, funds available for obligation in fiscal year 1985 were increased from \$1,238 million to \$1,528 million for activities funded from the SPR Petroleum Account and from \$258 million to \$529 million for those funded from the Strategic Petroleum Reserve Account. An additional \$538 million of SPR Petroleum Account funds remained in a deferred status at the end of fiscal year 1985.

#### C. MAJOR BUDGET ACTIONS, LAST QUARTER 1985 (FIRST QUARTER FY 1986)

On December 19, 1985, the President signed the Continuing Appropriations Bill for fiscal year 1986 (P.L. 99-190). This act provided an additional \$112 million in the Strategic Petroleum Reserve Account for continued

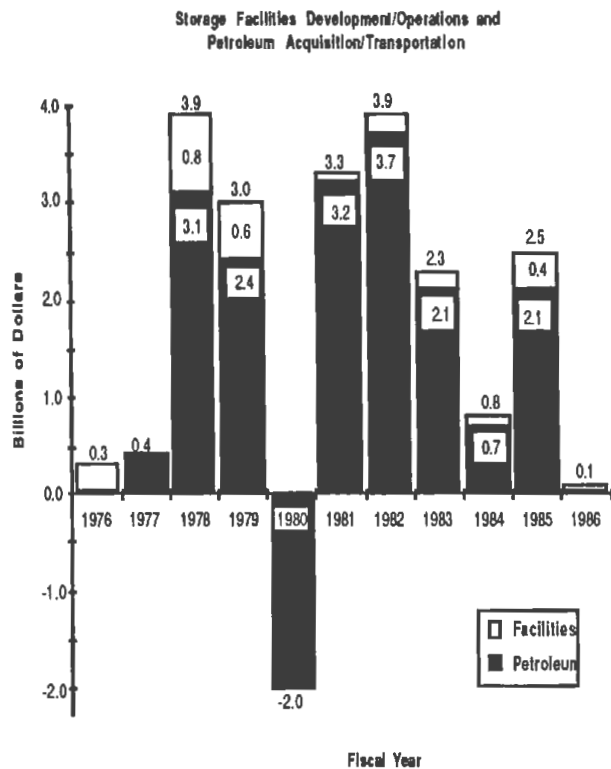


Figure 5. Strategic Petroleum Reserve Annual Funding

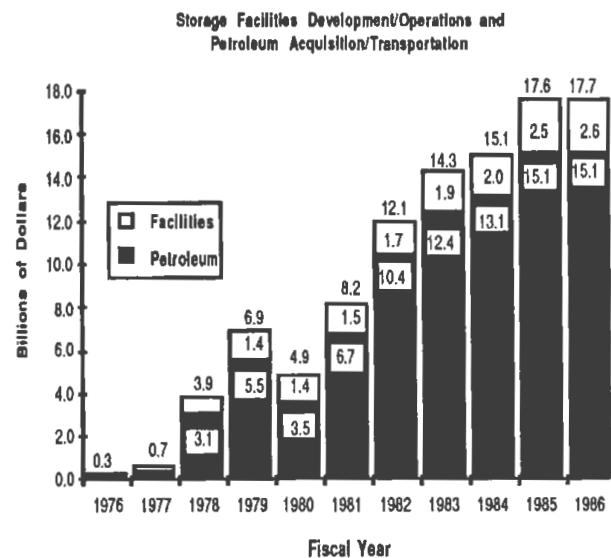


Figure 6. Strategic Petroleum Reserve Cumulative Funding

development of a 750 million barrel Strategic Petroleum Reserve, and also permits the Secretary of Energy to

trade surplus Government-owned agriculture commodities for crude oil to fill the Reserve.

### **SPR Petroleum Account**

This account finances (1) Strategic Petroleum Reserve oil procurements; (2) associated transportation costs such as pipeline, tanker, and marine terminalling; (3) the operations and maintenance of the Strategic Petroleum Reserve terminal at St. James, Louisiana; (4) U.S. Customs duties; and (5) other miscellaneous costs, such as Defense Fuel Supply Center administration costs associated with acquiring and transporting the oil. In the event of a drawdown, this account would also fund the Federal cost of drawing down the Strategic Petroleum Reserve oil from the caverns and transporting it to the point where purchasers would take title. Additionally, the Federal receipts from a drawdown and sale of Strategic Petroleum Reserve oil create additional budget authority for refilling the Reserve.

### **Petroleum Acquisition and Transportation Financial Transactions, Last Quarter of 1985 (First Quarter)**

Approximately \$697 million of the funds appropriated for the SPR Petroleum Account remained unobligated at the beginning of fiscal year 1986. No additional funds were provided for the Account in the appropriations for fiscal year 1986.

Of the \$697 million available, \$35 million was obligated to Petroleos Mexicanos (PEMEX), Mexico's state-owned oil company, in the quarter ended December 31, 1985, leaving a balance of \$662 million available for future obligation.

Outlays (payments) for the first quarter of FY 1986 were \$178 million.

### **Strategic Petroleum Reserve Account (On Budget)**

The Strategic Petroleum Reserve Account provides the financing for the Strategic Petroleum Reserve facilities program, including the construction, operations and maintenance of the Strategic Petroleum Reserve sites, the planning activities pertinent to major issues concerning the development and use of the Strategic Petroleum Reserve, and Program Direction, including the salaries and expenses necessary to plan and manage the Strategic Petroleum Reserve and to operate the Project Management Office in New Orleans, Louisiana.

### **Strategic Petroleum Reserve Account Transactions Last Quarter of 1985 (First Quarter of FY 1986)**

Approximately \$307 million of Strategic Petroleum Reserve Account funds were available for obligation at the beginning of fiscal year 1986. The appropriation for fiscal year 1986 increased these available funds by \$112 million, to a total of approximately \$419 million. Of this total, approximately \$36 million was obligated in the quarter ended December 31, 1985, leaving a balance of \$383 million available for future obligation.

### **D. OIL COST THROUGH FY 1985**

Inclusive of entitlement receipts, the cumulative cost for the 489 million barrels delivered to the Reserve through FY 1985 was \$14,259 million, an average of approximately \$29.16 per barrel.

Table 7

**Strategic Petroleum Reserve Appropriations**  
(thousands of dollars)

Fiscal Year	Petroleum Acquisition and Transportation	Storage Facilities Development and Operations	Planning	Program Direction <u>6 /</u>	Total
1976	\$ 0	\$ 300,000	\$ 12,000	\$ 1,975	\$ 313,975
1977	440,000	0	4,000	3,824	447,824
1978	2,703,469	463,933	7,215	7,489	3,182,106
1979	2,885,670	103,290	12,200	5,911	3,007,071
Reprogramming	<u>-529,214</u>	<u>529,214</u>	<u>0</u>	<u>0</u>	<u>0</u>
	2,356,456	632,504	12,200	5,911	3,007,071
1980	-2,000,000 <u>2 /</u>	0	0	0	-2,000,000
Reprogrammings:					
Number 1	-20,391	0	12,000	8,391	0
Number 2	<u>-1,881</u>	<u>0</u>	<u>0</u>	<u>1,881</u>	<u>0</u>
	-2,022,272	0	12,000	10,272	-2,000,000
1981	2,688,282 <u>3 /</u>	82,834	8,000	11,391	2,790,507
Entitlements	542,146	0	0	0	542,146
Reprogrammings:					
Number 1	-18,000	18,000	0	0	0
Number 2	<u>-7,334</u>	<u>7,334</u>	<u>0</u>	<u>0</u>	<u>0</u>
	3,205,094	108,168	8,000	11,391	3,332,653
1982	3,684,000 <u>4 /</u>	171,356	8,640	11,436	3,875,432
Reprogramming	<u>-4,300</u> <u>5 /</u>	<u>4,300</u>	<u>0</u>	<u>0</u>	<u>0</u>
	3,679,700	175,656	8,640	11,436	3,875,432
1983	2,074,060	222,528	8,000	11,590	2,316,178
1984	650,000	142,357	6,250	10,163	808,770
1985	2,049,550	441,300 <u>6 /</u>	5,600 <u>6 /</u>	12,290 <u>6 /</u>	2,508,740
1986	0	98,240	4,405	9,720	112,365
Reprogramming	<u>-12,964</u> <u>7 /</u>	<u>12,964</u>	<u>0</u>	<u>0</u>	<u>0</u>
	-12,964	111,204	4,405	9,720	112,365
Total Appropriations	<u>15,123,093</u>	<u>2,597,650</u>	<u>88,310</u>	<u>96,061</u>	<u>17,905,114</u>

1) Excludes funds appropriated to other DOE accounts but used to finance aspects of SPR program direction.

2) Rescission.

3) Included supplemental appropriations of \$1,305,000,000.

4) Pursuant to the Omnibus Budget Reconciliation Act of 1981, petroleum acquisition and transportation funding was placed off-budget beginning in FY 1982.

5) Reprogramming was funded from on-budget FY 1981 petroleum acquisition and transportation carryover funds.

6) Included in FY 1984 second supplemental appropriations.

7) Balance of on-budget FY 1981 petroleum acquisition and transportation carryover funds.

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## **IV. ORGANIZATION, MANAGEMENT AND CONTRACTUAL SUPPORT**

### **A. PROGRAM/PROJECT MANAGEMENT**

The Strategic Petroleum Reserve Office was created under the Energy Policy and Conservation Act for the establishment, management, and maintenance of the Strategic Petroleum Reserve. The Acting Assistant Secretary for Fossil Energy, Donald L. Bauer, has overall programmatic responsibility for achieving the goals and objectives of the Strategic Petroleum Reserve Program. This responsibility has been delegated to the Deputy Assistant Secretary for Petroleum Reserves, Richard D. Furiga. The Offices of the Strategic Petroleum Reserve and Naval Petroleum and Oil Shale Reserves were combined under the Deputy Assistant Secretary for Petroleum Reserves in September 1985.

Responsibility for Strategic Petroleum Reserve project management and implementation activities is assigned to the Manager, Oak Ridge Operations Office, Joe La Grone. The Manager, Oak Ridge Operations Office, directs Strategic Petroleum Reserve activities through the Acting Assistant Manager for the Strategic Petroleum Reserve, John Milloway. The Project Management Office (PMO), located in New Orleans, Louisiana, carries out day-to-day project implementation activities as delegated by the Manager, Oak Ridge Operations Office, and in accordance with programmatic guidance provided by the Deputy Assistant Secretary for Petroleum Reserves through the Project Manager, John Wagoner.

### **B. PROCUREMENT AND CONTRACTOR SUPPORT**

Obligations for FY 1985 Strategic Petroleum Reserve procurements totaled approximately \$678.7 million, including \$451.4 million for crude oil purchased under an agreement with Petroleos Mexicanos (PEMEX), Mexico's state-owned oil company. Obligations for procurements for other than crude oil totaled \$227.3 million. The Strategic Petroleum Reserve, in conjunction with prime contractors, awarded \$22.5 million to small businesses, including \$15.9 million to disadvantaged businesses and \$1.3 million to businesses owned by women.

The Management, Operations and Maintenance Contract for the Strategic Petroleum Reserve was awarded to Boeing Petroleum Services, Incorporated, on March 28, 1985. Boeing commenced management, operations and maintenance responsibilities on April 1, 1985. This contract was awarded for five years with an option by the Department of Energy to extend the contract for an additional five year period.

Other prime contractors who provided services to the Strategic Petroleum Reserve during 1985 included: the Aerospace Corporation for systems engineering; Texas A&M Research Foundation for environmental support services; Walk, Haydel & Associates Incorporated for architectural engineering; Wells Fargo Guard services for security protection services for Strategic Petroleum

Reserve sites; Coggins Systems Ltd. for the hardware control system; Bingham-Willamette Company for hardware horizontal water pumps; Fruin-Colnon Corporation for construction; Fluor Engineers Incorporated for architectural engineering services for distribution enhancements; Drillers Incorporated for drilling services; Systematic Management Services Incorporated for support services; AMC Mechanical Contractors for construction; V&P Electric for construction; Kaough & Jones Electric Company for construction; Elvin Hill Incorporated for hardware; Texcom Incorporated for telephone systems; and U.S. Steel Corporation for pipeline materials.

### **C. REAL ESTATE, ENVIRONMENTAL COMPLIANCE, AND PERMITS**

#### **Real Estate**

During 1985, the Department of Energy acquired real property interests in additional real estate at Bayou Choctaw and West Hackberry. At Bayou Choctaw, the Department of Energy acquired an existing cavern from Union Texas Petroleum under a cavern exchange agreement. This transaction involved an exchange of 3.5 acres of land, with no net change in Government-owned acreage. At West Hackberry, the Department of Energy acquired four residential properties of 7.2 acres adjacent to the storage site to resolve potential safety and security problems.

Throughout 1985, the Department of Energy continued to acquire permanent and construction easements for the planned 24-mile crude oil pipeline from Big Hill to Nederland, Texas. As of December 31, 1985, the Department of Energy had completed acquisition actions for 127 of the 137 tracts required. In October 1985, the Department of Energy initiated land negotiations and condemnation action to acquire permanent and construction easements for the planned 47-mile crude oil pipeline from Bryan Mound to Texas City, Texas. As of December 31, 1985, the Department of Energy had submitted offers to 20 property owners and secured signed options with five.

#### **Environmental Compliance and Permits**

Environmental protection activities in support of construction and operation of all Strategic Petroleum Reserve facilities continued through 1985 in compliance with applicable Department of Energy Orders.

In May, the Department of Energy issued an Environmental Assessment and a Finding of No Significant Impact regarding the crude oil pipeline from Bryan Mound to Texas City, Texas. During the engineering design phase, however, a more desirable pipeline route was identified which would reduce the overall pipeline length by seven miles and, therefore, reduce cost and impact fewer landowners. The new alternative would also bypass crowded pipeline rights-of-way inherent in the initial route alternatives. In

compliance with environmental regulations, the proposed new pipeline route was identified as a new alternative to be reviewed in a revised Environmental Assessment. A revised Flood Plain/Wetlands Assessment was published in the Federal Register December 26, 1985, and a revised Environmental Assessment and Finding of No Significant Impact were in preparation for Department approval upon completion of the no-action period.

Regarding Texoma distribution enhancements, a Flood Plain/Wetlands Assessment was published October 31, 1985, in the Federal Register and an Environmental Assessment and Finding of No Significant Impact were available for approval at the end of the year.

## V. DRAWDOWN SYSTEM AND VULNERABILITY IMPACT

### A. DRAWDOWN AND DISTRIBUTION CAPABILITIES

Based on the Strategic Petroleum Reserve's December 31, 1985 crude oil storage inventory of 493.3 million barrels and the existing Strategic Petroleum Reserve drawdown and commercial distribution systems, the Strategic Petroleum Reserve's current drawdown and distribution capabilities are as shown in Table 8. The Strategic Petroleum Reserve storage facilities are physically capable of initially being drawn down at a sustained rate of 3.3 million barrels per day (MMBD) for a 90-day period. After 90 days, the Strategic Petroleum Reserve's drawdown rate would decrease gradually as various site inventories deplete and the declining number of remaining caverns containing crude oil become a constraint on the site's drawdown rate. Figure 7 illustrates the Strategic Petroleum Reserve's current physical drawdown capability, without distribution constraints, which provides for a drawdown of approximately 60 percent of the Reserve in 90 days, 90 percent of the Reserve in 180 days, and 100 percent of the Reserve in 338 days.

Table 8

#### Current Sustained Capabilities (barrels per day)

	Drawdown	Distribution
Seaway Group	1,100,000	390,000
Texoma Group	1,400,000	1,200,000
Capline Group	830,000	730,000
	3,330,000	2,320,000

The Strategic Petroleum Reserve's drawdown capabilities are currently constrained by the Strategic Petroleum Reserve's distribution terminal throughput capabilities and the private sector distribution and refining capabilities. Based on these current distribution constraints, the Strategic Petroleum Reserve is currently capable of being initially drawn down and distributed at a maximum sustained rate of 2.3 million barrels per day (MMBD) for a 90-day period. After 90 days, the Strategic Petroleum Reserve drawdown/distribution rate would decrease gradually as the site inventories deplete. Figure 8 illustrates the Strategic Petroleum Reserve's current physical drawdown/distribution capability, which provides for a distribution of approximately 43 percent of the Reserve in 90 days, 72 percent of the Reserve in 180 days and 100 percent of the Reserve of the Reserve in 474 days.

The Strategic Petroleum Reserve currently has a Distribution Enhancement Program underway to improve the SPR's distribution system in order to achieve a higher drawdown/distribution capability. Details of the

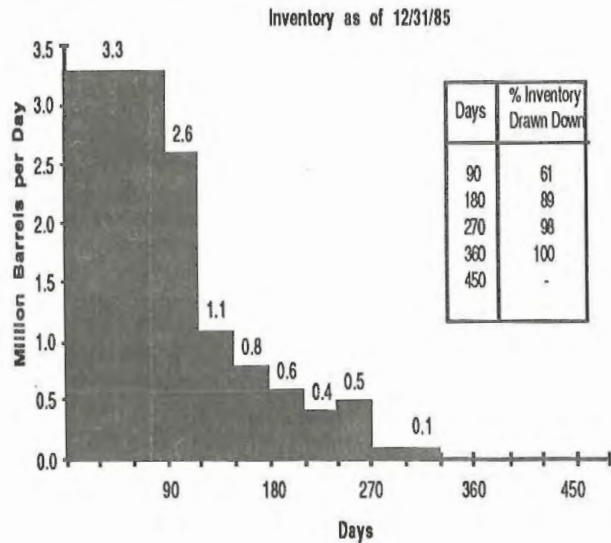


Figure 7. Strategic Petroleum Reserve Drawdown Capability

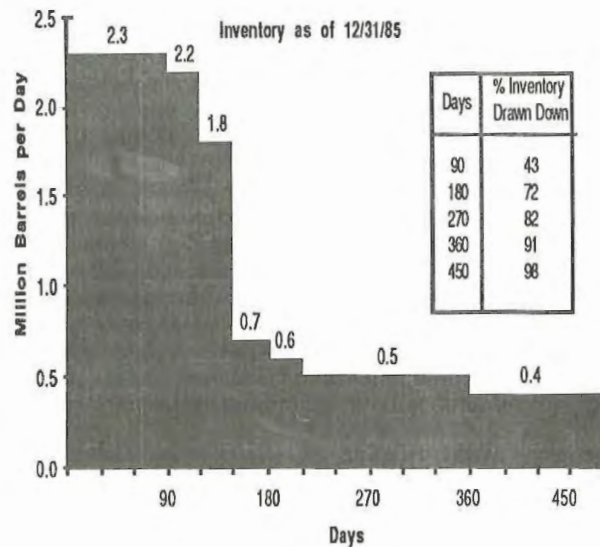


Figure 8. Strategic Petroleum Reserve Drawdown/Distribution Capability

Strategic Petroleum Reserve Distribution Enhancement Program are described in sub-section C.

### B. DRAWDOWN EXERCISES

In July 1985, a 2-day drawdown test was conducted to validate the capability of the Reserve to function in the event of an electrical power supply interruption at the

sites. The drawdown was accomplished using diesel-fueled pumps to inject fresh water from a nearby lake into one of the storage caverns at Bayou Choctaw. The drawdown test resulted in the movement of more than 375,000 barrels of crude oil to the St. James Terminal facility.

On July 2, 1985, the Energy Policy and Conservation Amendments Act of 1985 (P.L. 99-58) was enacted, providing for the sale or exchange of 1.1 million barrels of Strategic Petroleum Reserve crude oil to test the Strategic Petroleum Reserve's drawdown and distribution capabilities. Pursuant to this Act, plans were developed for a test sale in lieu of an exchange so as to enable the testing of the competitive sales process. To encourage industry participation, the test sale was announced in the Commerce Business Daily and the Federal Register in early October, and a pre-test sale conference was held with industry representatives on October 21, 1985.

The test sale commenced November 18, 1985, when a Notice of Sale for 1.1 million barrels was issued to all interested offerors. Seventeen offers were submitted by November 25, 1985 for a total of 7.17 million barrels with bid prices ranging from \$26.50 per barrel for sour crude oil to \$31.25 per barrel for sweet crude oil. Following evaluation of the offers and receipt of payment and performance guarantees, sales contracts for a total of 1 million barrels were awarded the week of December 2, 1985, to Phillips Petroleum, La Gloria Oil and Gas, Conoco, Amoco and Marathon Petroleum. The weighted average price of the crude oil sold was \$27.89 per barrel for sour crude oil and \$30.36 per barrel for sweet crude oil. Deliveries of the crude oil commenced on December 11, 1985, and are anticipated to be completed by mid-January 1986.

As part of the test sale, drawdown operations at two Strategic Petroleum Reserve storage sites were performed in December 1985 to test the Strategic Petroleum Reserve's physical drawdown capabilities:

- o On December 6, 1985, 678,316 barrels were drawn down from West Hackberry to Sun Terminal; and
- o On December 11 and 12, 1985, 736,316 barrels were drawn down from Weeks Island to St. James Terminal.

Additional drawdowns of the Bayou Choctaw and Bryan Mound storage sites were conducted in early January 1986.

### C. DISTRIBUTION ENHANCEMENTS

In 1984 the Department performed a comprehensive study of the Strategic Petroleum Reserve's physical distribution system in light of the numerous physical and market changes that had taken place in the private sector during the early 1980's. The most significant of these changes was the decline in crude oil demands by the Mid-West refiners, resulting in the conversion to

natural gas transmission of two major interstate pipelines to which the Strategic Petroleum Reserve was connected (Seaway and Texoma). The 1984 distribution study revealed that the Strategic Petroleum Reserve's distribution capability would be limited to 2,320,000 barrels per day if no distribution system enhancements were made, and identified a set of distribution enhancements that would increase the Strategic Petroleum Reserve's distribution capability to approximately 4.0 million barrels per day for the completed 750 million barrel program.

### Seaway Group

Distribution enhancements identified for the Strategic Petroleum Reserve's Seaway group distribution system included meter modification to Phillips Petroleum Company's marine terminal in Freeport, Texas, to which the Strategic Petroleum Reserve's Seaway group is currently connected for oil fill and drawdown, and construction of a new pipeline from the Bryan Mound storage site to the ARCO pipeline terminal and docks in Texas City, Texas and enhancements to the ARCO terminal in Texas City. These enhancements were approved by Congress in January 1985 and are in the process of being implemented. As of December 31, 1985, engineering design and pipeline acquisition were completed and land rights were in the process of being acquired for the construction of a 46-mile, 40-inch pipeline to Texas City, Texas. Contract negotiations with both the ARCO Pipeline company and Phillips Petroleum Company for Strategic Petroleum Reserve terminalling services at the Texas City and Freeport marine facilities, respectively, are in process. These enhancements will increase the Seaway group distribution capability from 390,000 B/D to 1,100,000 B/D consistent with the Strategic Petroleum Reserve's planned drawdown objective.

### Texoma Group

Distribution enhancements identified for the Strategic Petroleum Reserve's Texoma group distribution system included modification of the Sun Terminal manifold to increase its distribution capability, construction of a new oil pipeline from the West Hackberry storage site to the Lake Charles, Louisiana, refining area with additional marine distribution capabilities through two commercial terminals in Lake Charles, and construction of a pipeline to a second commercial marine terminal in the Beaumont, Texas, area in the general vicinity of Sun Terminal.

During 1985, the Strategic Petroleum Reserve re-analyzed the Sun Terminal's operations and distribution capabilities. This updated analysis revealed that, based on projected refinery demands and normal tanker loading operations, the Sun Terminal is currently capable of achieving a sustained distribution capability of approximately 1,200,000 B/D, as compared to 1,120,000 B/D reported in the 1984 distribution study. This analysis also concluded that the Sun Terminal is capable of achieving its maximum physical dock and pipeline distribution capability, and previously proposed

modifications would not substantially increase the terminal's throughput. As a result, implementation plans for Sun Terminal enhancements have been cancelled.

### Capline Group

The Strategic Petroleum Reserve's 1984 distribution study did not identify or recommend distribution enhancements to the Capline Group because a detailed Capline distribution analysis had not yet been completed. In 1985, the Strategic Petroleum Reserve completed an in-depth study of the Strategic Petroleum Reserve's Capline group distribution system. The Strategic Petroleum Reserve's Capline study revealed the need for distribution enhancements to alleviate physical constrictions on simultaneous pipeline and dock distribution and operational restrictions associated with distributions through the LOCAP Terminal.

The 1985 Capline distribution study identified and evaluated a number of alternatives which would enhance the distribution capability of the Capline group. Based on a cost-benefit analysis of the various alternatives, the Capline study identified the most cost-effective system distribution enhancements to achieve the current and planned distribution objectives. Distribution enhancements necessary to increase the Capline Group's distribution capability from 730,000 B/D to 830,000 B/D, commensurate with the current Capline group drawdown rate, have been proposed for implementation in FY 1987. These include St. James Terminal metering and piping modifications and a direct Capline Terminal connection. Additional enhancements have also been identified to further increase the Capline distribution capability to 1,070,000 B/D for the completed 750 million barrel program.

Figure 9 illustrates the current and planned Strategic Petroleum Reserve distribution system as provided for under the Distribution Enhancement Program.

### D. VULNERABILITY IMPACT

The vulnerability of the United States to oil supply disruptions is affected by a number of factors in addition to changes in the Strategic Petroleum Reserve inventory. These factors include levels of U.S. petroleum use and imports, levels and locations of spare petroleum production capacity worldwide, and petroleum inventories held in the United States private sector and abroad.

Private sector primary stocks of petroleum declined by approximately 7 percent by December 1985 as compared to December 1984 levels, continuing a trend of a 26 percent decline from December 1980 to December 1985.

In calendar year 1980, the United States imported approximately 1.89 billion barrels of crude oil on a net basis, excluding crude oil for the Strategic Petroleum Reserve. The Strategic Petroleum Reserve inventory in December 1980 stood at 107.8 million barrels or approximately 5.7 percent of such annual imports. During 1985, the United States imported an estimated 1.50 billion barrels of crude oil on the same net basis, and the December 1985 Strategic Petroleum Reserve oil inventory was equivalent to nearly 33 percent of 1985 annual net oil imports. Thus, while the actual Strategic Petroleum Reserve inventory has grown in five years to 4.6 times the December 1980 level, the Strategic Petroleum Reserve has grown by approximately 5.8 times during the same period in relation to United States oil import levels.

In 1985 as in 1984, the vulnerability of the United States to crude oil supply disruptions continued to be less than in the prior decade. Domestic use of petroleum was approximately the same in 1985 compared to 1984, although still lower by 8.3 percent compared to 1980. Net private sector crude oil imports (excluding imports for the Strategic Petroleum Reserve) declined by approximately 400,000 barrels per day or 9.3 percent from 1984 to 1985 to approximately 4.1 million barrels per day. Overall, such import levels declined by 35 percent from 1980 to 1985.

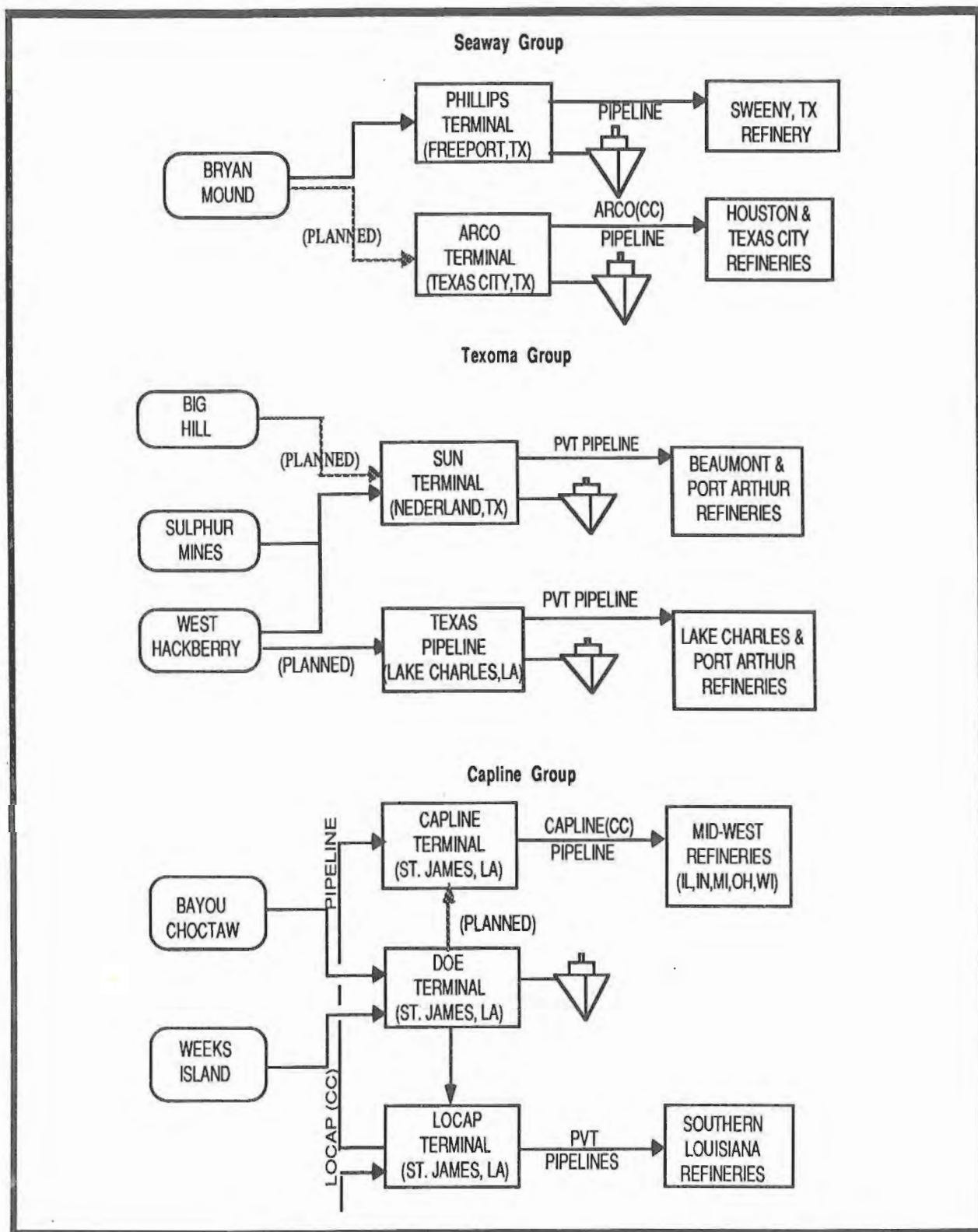


Figure 9 - Current and Planned Strategic Petroleum Reserve Distribution System for the Seaway, Texoma, and Capline Groups

**APPENDIX  
STRATEGIC PETROLEUM RESERVE  
SITE STATUS**

- A. Bayou Choctaw
- B. Weeks Island
- C. Bryan Mound
- D. Sulphur Mines
- E. West Hackberry
- F. Big Hill
- G. St. James Terminal

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## **A. BAYOU CHOCTAW**

### **Location**

Iberville Parish, Louisiana (12 miles southwest of Baton Rouge, Louisiana).

### **Acquisition**

In April 1977, DOE acquired 355.95 acres fee simple by condemnation from numerous private owners. Union Texas Petroleum (a subsidiary of Allied Corporation) was the previous operator.

In 1985, DOE acquired an additional existing cavern through a cavern exchange agreement with Union Texas Petroleum. The transaction involved a 3.5 acre exchange with no net change in Government-owned acreage.

### **Site Description**

A 66-million-barrel storage facility consisting of 56 million barrels in five existing caverns, plus 10 million barrels of storage capacity in a new SPR-developed cavern.

Oil, brine, raw water piping distribution system connecting caverns with central piping and 18 pumps totaling over 20,000 horsepower.

Twelve brine disposal wells 2.5 miles offsite; pipeline for supplying brine to Union Texas Petroleum.

One hundred thousand barrel brine pit, control center, buildings, roads, well pads, and dikes.

Water intake structure in Cavern Lake on site.

### **System Parameters**

Oil fill via 36-inch-diameter, 37.2-mile pipeline to St. James Terminal. Sustained system rate - 110,000 bbl/d (brine disposal-constrained).

Raw water design pumping rate - 480,000 bbl/d.

Brine disposal - 110,000 bbl/d projected disposal rate.

### **Drawdown**

Drawdown via 36-inch-diameter, 37.2-mile pipeline to St. James Terminal and to Capline pipeline.

480,000 bbl/d design capability upon completion.

### **Major Accomplishments**

Exchange of the SPR-Cavern 102 for the Union Texas Petroleum Cavern 17 was completed.

A construction contract for Cavern 17 conversion was awarded.

Drilling of wells for Cavern 101 was completed.

Site drawdown capability was demonstrated with "power-out" conditions.

Crude oil pipeline integrity was successfully demonstrated.

Approximately 45.8 million barrels of oil are in storage.

## **B. WEEKS ISLAND**

### **Location**

Iberia Parish, Louisiana (95 miles southwest of New Orleans).

### **Acquisition**

Acquired 382.92 acres fee simple subsurface and 6.63 acres fee simple surface by condemnation September 1977 from Morton Salt Company.

### **Environmental/Permits**

Environmental Impact Statement published January 1977; supplement published August 1977.

Major Federal permit related to oil pipeline to St. James Terminal acquired in 1978. Three major Federal and State permits related to oil storage, air emissions and storm water, and treated sewage effluent discharge acquired in 1979; NPDES updated in 1982.

### **Site Description**

Conventional salt mine containing 73 million barrels of storage capacity in two levels, room and pillar design, dedicated to sour crude oil storage.

Oil piping distribution system consists of 11 (10 operational and one reserve) submersible electric pumps in the mine to boost crude to the surface and twin main-line pumps (plus one reserve) to push crude to the St. James, Louisiana Terminal during drawdown. Pumps total 17,000 horsepower.

500,000 gallon firewater tank and pumps.

Mine inert gas and vapor recovery systems.

### **System Parameters**

Oil fill via 36-inch-diameter, 67.2-mile pipeline from St. James Terminal. Sustained system rate - 350,000 bbl/d (terminal throughput limited).

### Drawdown

Drawdown via 36-inch-diameter, 67.2-mile pipeline to St. James Terminal and to Capline pipeline.

590,000 bbl/d design capability.

### Major Accomplishments

Implemented major program for upgrading submersible oil pumps.

Approximately 73 million barrels of crude oil are in storage.

## **C. BRYAN MOUND**

### Location

Brazoria County, Texas (three miles southwest of Freeport, Texas).

### Acquisition

Acquired 499.47 acres fee simple by condemnation April 1977, from Freeport Mineral Company and other owners. Dow Chemical Company was the previous operator.

Approval has been received to relocate Brazoria County Road 242 outside the site.

### Environmental/Permits

Environmental Impact Statement published January 1977; supplement published December 1977. Phase III supplement published October 1981.

Five major Federal and State permits related to pipelines, water intake, and storage acquired in 1977 and 1978. NPDES updated 1981; renewed 1984. Seaway Environmental Impact Statement published June 1978. Supplement published October 1981.

Two major Federal permits related to brine disposal pipeline issued in 1978. Permit for brine discharge increased to 1.1 million bbl/d August 1981.

### Site Description

226-million-barrel storage facility consisting of 66 million barrels of capacity in four caverns existing upon site acquisition, plus 160 million barrels of storage capacity in 16 new SPR-developed caverns.

36-inch-diameter, 14.6-mile brine disposal pipeline (13 miles offshore) to the Gulf of Mexico.

Oil, brine and raw water piping distribution system connecting caverns with central plant and water intake structure consists of over 101,000 feet of piping and 33

pumps totaling over 38,000 horsepower. Four 200,000-barrel oil storage tanks.

15,000 and 150,000-barrel brine pits, oil-brine separator, maintenance and control center buildings, roads, well pads, and dikes. Water intake structure on the Brazos River, connected by a 36-inch pipeline.

### System Parameter

Fill via 30-inch-diameter, 3.6-mile pipeline to Phillips docks.

Design oil injection rate - 240,000 bbl/d.

Sustained system rate - 180,000 bbl/d.

Raw water design pumping rate - 1,170,000 bbl/d.

Brine disposal - 980,000 bbl/d design pumping rate (permit limitation 1,100,000 bbl/d).

### Drawdown

Drawdown via 30-inch-diameter pipelines, 3.6 miles to Phillips Petroleum Company Docks.

1,100,00 bbl/d design capability.

### Major Accomplishments

Approximately 165.8 million barrels of storage capacity have been created.

Approximately 190.0 million barrels of crude oil are in storage.

## **D. SULPHUR MINES**

### Location

Calcasieu Parish, Louisiana (two miles south west of Sulphur, Louisiana, and 20 miles north of West Hackberry salt dome).

### Acquisition

Acquired 109.63 acres fee simple and 64.52 acres conditional fee by condemnation in February 1979 from Union Texas Petroleum ( a subsidiary of Allied Corporation).

### Environmental/Permits

Environmental Impact Statement published March 1978.

Three major Federal and State permits for pipeline construction, oil storage, and air emissions acquired in 1978. Environmental Protection Agency discharge permits for storm water and sewage acquired in 1980.

### Site Description

26-million-barrel storage facility consisting of three existing caverns.

Oil, brine, raw water piping distribution system connecting caverns with central plant, water intake structure, and brine disposal wells. Consists of over 77,000 feet of piping and 18 pumps totaling over 8,000 horsepower. Four deep-injection brine disposal wells.

Two 100,000 barrels brine ponds, control center building, roads, well pads, and dikes.

Water intake structure 1.8 miles offsite on Houston Canal (Sabine River Diversion Canal No. 5) connected to facility by a combination of 16 and 12 inch pipelines.

### System Parameters

Oil fill via 16-inch-diameter, 15.9-mile spur pipeline connecting to DOE West Hackberry pipeline at Intracoastal Waterway.

Design pumping rate - 10,000 bbl/d.

Sustained system rate - 80,000 bbl/d (brine disposal-constrained).

Brine disposal - 80,000 bbl/d projected sustained rate.

### Drawdown

Drawdown via 16-inch-diameter, 15.9-mile spur pipeline to Intracoastal Waterway, then through 42-inch-diameter West Hackberry line, 34.4 miles to Sun Terminal, Nederland, Texas.

Design capability - 100,000 bbl/d.

### Major Accomplishments

Approximately 26 million barrels of crude oil are in storage.

## **E. WEST HACKBERRY**

### Location

Cameron Parish, Louisiana (12 miles southwest of Lake Charles, Louisiana).

### Acquisition

Acquired 405.36 acres fee simple by condemnation in April 1977, from numerous landowners including the Lowery, Ellender, and Hamilton families. Olin Corporation was the previous site operator.

Acquired 160.0 additional acres fee simple by condemnation in two actions, July 1979 and March 1980.

### Environmental/Permits

Environmental Impact Statement published January 1977; supplement published April 1977. Phase III supplement published October 1981.

Six major Federal and State permits related to pipelines, drilling pads, water intake, and storage acquired in 1977 and 1978; NPDES permit renewed 1984.

Texoma Environmental Impact Statement published November 1978; supplement published in October 1981.

Two major Federal permits related to a brine pipeline acquired in 1980.

### Site Description

219-million-barrel storage facility consisting of 49 million barrels in five caverns existing upon site acquisition, plus 170 million barrels of storage capacity in 17 new SPR-developed caverns.

Oil, brine, raw water piping distribution system connecting caverns with central plant, water intake structure, and disposal wells. Consists of over 160,000 feet of piping and 47 pumps totaling over 62,000 horsepower. 36-inch-diameter, 27-mile brine disposal pipeline (nine miles offshore) to Gulf of Mexico.

175,000-barrel brine pit, oil-brine separator, control center and maintenance buildings, roads, well pads, and dikes.

Water intake structure on Intracoastal Waterway, 42-inch-diameter, 4.5-mile pipeline connecting to site.

### Site Parameters

Fill via 42-inch diameter, 42.8-mile pipeline to Sun Terminal, Nederland, Texas.

Design oil injection rate - 225,00 bbl/d.

Sustained system rate - 175,000 bbl/d.

Raw water design pumping rate - 1,400,000 bbl/d

Brine disposal - 900,000 bbl/d projected sustained disposal rate (permit limitation 1,088,000 bbl/d) via 36-inch pipeline to the Gulf of Mexico.

### Drawdown

Drawdown via 42-inch-diameter, 42.8-mile pipeline to Sun Terminal, Nederland, Texas.

1,400,000 bbl/d drawdown capability.

### Major Accomplishments

Approximately 165.8 million barrels of storage capacity have been created.

Approximately 156.3 million barrels of crude oil are in storage.

## **F. BIG HILL**

### Location

Jefferson County, Texas (20 miles southwest of Beaumont, Texas).

### Acquisition

Acquired 268.61 acres fee simple by condemnation from two landowners, i.e., 238.55 acres from Amoco and 24.60 acres from the Pipkin estate and 5.46 acres from the Patrick Henry Phelan estate.

### Environmental/Permits

Environmental Impact Statement published in October 1981.

State permits for drilling, underground hydrocarbon storage, pipeline operations, air quality, water appropriation, and water quality certifications were acquired in 1983. EPA National Pollutant Discharge Elimination System, a major Federal permit was acquired in 1984.

### Site Description

140-million-barrel storage facility consisting of 14 10-million barrel storage caverns.

Oil, brine, and raw water systems connecting caverns with central plant, water intake structure, and brine disposal system.

48-inch diameter brine disposal pipeline extending to a point 3.5 nautical miles into the Gulf of Mexico.

Water intake structure on the Intracoastal Waterway connecting to the site by a 48-inch diameter pipeline.

### System Parameters

Fill via 36-inch pipeline from Sun Terminal, Nederland, Texas.

Sustained system rate - 280,000 bbl/d.

Raw water design pumping rate - 1,400,000 bbl/d.

Brine disposal - 1,400,000 bbl/d.

### Drawdown

Drawdown via 36-inch-diameter pipeline to Sun Terminal, Nederland, Texas.

930,000 bbl/d drawdown capability.

### Major Accomplishments

Drilling of wells for 14 caverns was completed.

Construction of Stage I Site Facilities was 93 percent completed.

Construction of Raw Water Intake Structure was 92 percent completed.

Acquisition of crude oil pipeline right-of-way was 98 percent completed.

## **G. ST. JAMES TERMINAL**

### Location

St. James Parish, Louisiana (45 miles southeast of Baton Rouge, Louisiana, on the Mississippi River).

### Acquisition

Acquired 104.76 acres of fee simple for terminal by condemnation in May 1978.

Acquired 47.68 acres fee simple for docks by condemnation in July 1978.

### Environmental/Permits

St. James' Terminal Environmental Impact Statement is a component of the Bayou Choctaw supplement, published May 1977, and the Weeks Island supplement, published August 1977.

Two Major Federal and State permits related to dock construction acquired in 1978. Environmental Protection Agency discharge permit for storm water and sewage acquired in 1980. Dock Construction Permit modified 1982.

### Site Description

Terminal facilities include six storage tanks totaling two million barrels of capacity, tie-ins to Bayou Choctaw, Weeks Island, and to LOCAP Capline pipeline and Capline terminal complex.

Oil distribution piping system connecting docks, tanks, and pump station consists of over 35,000 feet of piping and eight pumps totaling over 12,000 horsepower, metering systems, and maintenance and central buildings.

Two docks with one berth each, able to accommodate vessels of up to 123,000 long tons maximum loaded displacement. A 42-inch-diameter pipeline connects the docks with the storage tanks.

### **System Parameters**

Tanker unloading - design unloading capacity of 40,000 bbl/hr.

Distribution from terminal to:

Bayou Choctaw: design pumping rate - 240,000,000 bbl/d;

Weeks Island: design pumping rate - 480,000 bbl/d.

Terminal throughput:

Fill sustained system rate - 350,000 bbl/d;

Across docks - 400,000 bbl/d.

### **Drawdown**

Crude oil from Bayou Choctaw and/or Weeks Island to be distributed across docks and to Capline.

### **Major Accomplishments**

Installation of mooring buoys for St. James docks.





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# Strategic Petroleum Reserve Annual/Quarterly Report

February 1987

**U.S. Department of Energy**  
Assistant Secretary Fossil Energy  
Office of Petroleum Reserves



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# **Strategic Petroleum Reserve Annual/Quarterly Report**

February 1987

**U.S. Department of Energy**  
Assistant Secretary Fossil Energy  
Office of Petroleum Reserves  
Washington, D.C. 20585





## Contents

Section	Page
EXECUTIVE SUMMARY .....	v
I. INTRODUCTION .....	1
II. STATUS OF THE STRATEGIC PETROLEUM RESERVE .....	3
A. Storage Facilities Development.....	3
B. Oil Acquisition and Transportation.....	8
III. BUDGET AND FINANCE .....	11
A. Appropriations.....	11
B. Major Budget and Financing Actions During FY 1986.....	11
C. Major Budget Actions, Last Quarter 1986(First Quarter FY1987).....	11
D. Oil Costs Through FY 1986.....	14
E. Estimated Cost to Complete the Strategic Petroleum Reserve.....	14
IV. ORGANIZATION, MANAGEMENT AND CONTRACTUAL SUPPORT .....	15
A. Program/Project Management.....	15
B. Procurement and Contractor Support.....	15
C. Real Estate, Environmental Compliance, and Permits.....	15
D. Security.....	16
V. DRAWDOWN AND DISTRIBUTION SYSTEM AND VULNERABILITY IMPACT .....	17
A. Distribution Plan.....	17
B. Drawdown and Distribution Capabilities.....	17
C. Distribution and Distribution Tests.....	19
D. Distribution Enhancements.....	19
E. Vulnerability Impact.....	20
APPENDIX: STRATEGIC PETROLEUM RESERVE SITES STATUS .....	A-1
A. Bayou Choctaw.....	A-3
B. Weeks Island.....	A-3
C. Bryan Mound.....	A-4
D. Sulphur Mines.....	A-5
E. West Hackberry.....	A-6
F. Big Hill.....	A-6
G. St. James Terminal.....	A-7
H. Strategic Petroleum Reserve Crude Oil Specifications.....	A-8

### Figures

1. Strategic Petroleum Reserves Sites.....	3
2. 1986 Storage Facilities Development & Fill Status.....	7
3. Annual Strategic Petroleum Reserve Oil Fill.....	9
4. Cumulative Strategic Petroleum Reserve Oil Fill.....	9
5. Strategic Petroleum Reserve Annual Funding.....	13
6. Strategic Petroleum Reserve Cumulative Funding.....	13
7. Strategic Petroleum Reserve Drawdown Capability.....	18
8. Strategic Petroleum Reserve Drawdown/Distribution Capability.....	18
9. Current and Planned Strategic Petroleum Reserve Distribution System.....	21

### Tables

1. Strategic Petroleum Reserve Storage and Drawdown Criteria.....	4
2. 1986 Storage Capacity Development by Quarter.....	6
3. Strategic Petroleum Reserve Oil Inventory and Delivery Statistics.....	8
4. Strategy Petroleum Reserve Oil Fill History.....	8
5. Crude Oil Received Through 1986.....	10
6. Strategic Petroleum Reserve Crude Oil Inventory.....	10
7. Strategic Petroleum Reserve Appropriations.....	12
8. Current Sustained Capabilities.....	17
9. Current and Planned Strategic Petroleum Reserve Distribution Sytems.....	21



## EXECUTIVE SUMMARY

### Administration Policy Review

In August 1986 the President reaffirmed the Administration's strong support for development of a 750 million-barrel Strategic Petroleum Reserve and committed the Administration to filling the Reserve throughout fiscal year 1987.

### New Legislation Enacted

During 1986, a number of bills related to the Strategic Petroleum Reserve were enacted. The Consolidated Omnibus Budget Reconciliation Act of 1985 (P.L. 99-272), enacted on April 7, 1986, directed that the Reserve be filled at an average rate of 35,000 barrels per day beginning in fiscal year 1986 and continuing until the inventory of crude oil in storage reached a level of 527 million barrels. The Urgent Supplemental Appropriations Act, 1986 (P.L. 99-349), enacted on July 2, 1986, restored approximately \$619 million of appropriated funds which the Administration sought to defer in 1986. These funds included \$578 million for oil acquisition and transportation and \$41 million for the development and management of the Reserve. The Continuing Resolution for fiscal year 1987 (P.L. 99-500 and 99-591), enacted on October 15, 1986, provided new budget authority of \$147 million in fiscal year 1987 to continue the development of a 750 million-barrel Strategic Petroleum Reserve. The Omnibus Budget Reconciliation Act of 1986 (P.L. 99-509), enacted on October 20, 1986, requires that the Reserve be filled at a minimum average rate of 75,000 barrels a day until at least 750 million barrels are in storage. It also restricts the sale or other disposal of crude oil from the Naval Petroleum Reserve Number 1 (Elk Hills) if this minimum fill rate is not met.

### Oil Acquisition and Fill Rates

As of December 31, 1986, the Strategic Petroleum Reserve (SPR) crude oil inventory was 511.6 million barrels of crude oil, an increase of 18.3 million barrels over the 1985 year end inventory of 493.3 million barrels. The Strategic Petroleum Reserve was filled at an average fill rate of 51,430 barrels per day during 1986.

### Facilities and Storage Development

During the calendar year 1986, the Strategic Petroleum Reserve increased its crude oil storage capability from 509.4 million barrels to 550.7 million barrels, adding approximately 27.4 million barrels of new storage capacity at the Bryan Mound storage site and 13.9 million barrels at the West Hackberry

storage site. At Bryan Mound, all of the sixteen new caverns have been completed, and at West Hackberry, twelve new caverns have been completed. At Bayou Choctaw, a Strategic Petroleum Reserve developed 5.6-million-barrel cavern was officially exchanged in 1985 for an existing 10-million-barrel Union Texas Petroleum Company-owned cavern which is being converted for Strategic Petroleum Reserve crude oil storage. Additionally, drilling was completed on the single Phase III cavern at Bayou Choctaw in the third quarter of fiscal year 1985 and surface construction commenced in 1986. At Big Hill, construction of the on-site surface facilities for leaching of the first five caverns was completed and all remaining pipeline and site facility construction requirements were initiated.

### Drawdown Exercises

As required by the Energy Policy and Conservation Amendments Act of 1985, enacted July 2, 1985, the Department of Energy conducted a test sale of Strategic Petroleum Reserve crude oil between November 18, 1985 and January 31, 1986, to test the Strategic Petroleum Reserve's drawdown and distribution capabilities.

In addition to the test sale, three subsequent tests of the Strategic Petroleum Reserve's physical drawdown capabilities were conducted. In April 1986, 1.1 million barrels were drawn down from the Weeks Island storage site and delivered to the Reserve's St. James Terminal. In May 1986, 900,000 barrels were drawn down from the Bayou Choctaw storage site and delivered to the St. James Terminal and in December 1986, approximately 500,000 barrels were drawn down from the Bryan Mound storage site and delivered to the Phillips 66 Jones Creek tank farm.

### Distribution Enhancements

Substantial progress was made in distribution enhancement program during 1986, with the construction of a 46-mile oil distribution pipeline from Bryan Mound to the ARCO common carrier pipeline system at Texas City, TX. Completion of this pipeline during 1987 will increase the Strategic Petroleum Reserve's distribution capability from 2,320,000 barrels per day to 3,030,000 barrels per day, enhancing both pipeline and waterborne distribution capabilities. Engineering design was also initiated for distribution enhancements to the Strategic Petroleum Reserve's Texoma and Capline systems.





## I. INTRODUCTION

The Secretary of Energy is required to submit annual and quarterly reports to the President and the Congress on developmental activities of the Strategic Petroleum Reserve in accordance with Section 165 of the Energy Policy and Conservation Act of 1975, as amended. Additional prospective information related to the development and fill of the Strategic Petroleum Reserve is required by the Omnibus Budget Reconciliation Act of 1986 (P.L. 99-509). This report combines the fourth quarter 1986 Quarterly Report and the 1986 Annual Report and is presented in five sections with an Appendix.

This introductory section briefly covers the program legislation and the Strategic Petroleum Reserve Plan and its amendments. The current status of the Strategic Petroleum Reserve is outlined in Section II and the appropriations, budget and finances to date are provided in Section III. Section IV addresses organization, management and contractor support. A discussion of the drawdown system and vulnerability impact are set forth in Section V. The Appendix contains detailed information on the status of each Strategic Petroleum Reserve site.

### Program Legislation

The Strategic Petroleum Reserve was authorized by Congress with the passage of the Energy Policy and Conservation Act (P.L. 94-163), which was approved December 22, 1975, and extended in July of 1985. This legislation declared it to be United States policy to establish a Strategic Petroleum Reserve of up to one billion barrels of petroleum products to reduce the impact of disruptions in petroleum supplies and to carry out the obligations of the United States under the International Energy Program.

The Energy Policy and Conservation Act provisions regarding the Strategic Petroleum Reserve were amended by Title VIII of the Energy Security Act (P.L. 96-294), approved June 30, 1980. This Act established a minimum average daily fill rate of 100,000 barrels and precluded sale of Naval Petroleum Reserve Number 1 (Elk Hills) crude oil except to fill the Strategic Petroleum Reserve unless the Strategic Petroleum Reserve was being filled at the minimum rate or had reached 500 million barrels in inventory.

The Omnibus Budget Reconciliation Act of 1981 (P.L. 97-35), approved August 13, 1981, created the off-budget "SPR Petroleum Account" as a method for financing Reserve oil acquisition and transportation without including such transactions in

Federal budget totals. It also required quarterly reports on Strategic Petroleum Reserve progress and submission of a study on the ultimate size of the Reserve.

The Energy Emergency Preparedness Act of 1982 (P.L. 97-229), approved August 3, 1982, established minimum Strategic Petroleum Reserve fill rate requirements, authorized acquisition of interim storage facilities, and required a series of plans and reports on Strategic Petroleum Reserve use and other aspects of energy emergency preparedness.

The Energy Policy and Conservation Amendments Act of 1985 (P.L. 99-58) enacted on July 2, 1985, extended the provisions relating to the Strategic Petroleum Reserve Program until June 30, 1989, and directed the Secretary of Energy to conduct a sale or exchange of 1.1 million barrels of Strategic Petroleum Reserve oil to test the drawdown and distribution capabilities of the Strategic Petroleum Reserve.

The Supplemental Appropriations Act for Fiscal Year 1985 (P.L. 99-88) enacted on August 15, 1985, amended the Energy Policy and Conservation Act to provide a lower minimum average daily fill rate in any year in which a level of 500 million barrels will be achieved. It also provided funding for continuing development of the Strategic Petroleum Reserve during fiscal year 1986 and for increasing the inventory of crude oil in storage at the Reserve by approximately 11 million barrels to a total of 500 million barrels by the end of fiscal year 1986 through the disapproval of the \$271 million deferral of funds appropriated for the Strategic Petroleum Reserve Account and the disapproval of \$290 million of the \$827 million deferral of appropriations for the SPR Petroleum Account.

The Food Security Act (P.L. 99-198) providing for the barter of agricultural commodities for crude oil was passed on December 18, 1985 and signed by the President on December 23, 1985.

On December 19, 1985, the President signed the Continuing Appropriations Bill for Fiscal Year 1986 (P.L. 99-190) which provides \$112,365,000 in FY 1986 for the on-budget Strategic Petroleum Reserve Account for continued development of a 750-million barrel Strategic Petroleum Reserve, and permits the Department of Energy to trade surplus agricultural products in Government stockpiles for crude oil for the Reserve.

On April 7, 1986, the President approved P.L. 99-272, the Omnibus Budget Reconciliation Act of 1985, which provides for a minimum Strategic Petroleum Reserve fill rate of 35,000 barrels per day through FY 1988.

The Urgent Supplemental Appropriations Act, 1986 (P.L. 99-349), signed on July 2, 1986, disapproved the deferral of \$41.2 million of the fiscal year 1986 appropriations for activities associated with storage capacity development, distribution enhancements and program management. P.L. 99-349 also disapproved the deferral of \$577.5 million of SPR Petroleum Account funds, consisting of \$549.6 million of the funds appropriated for the Account in fiscal year 1985 and \$27.9 million of Strategic Petroleum Reserve Test Sale receipts deposited in the Account during December 1985 and January 1986.

On October 18, 1986, the President signed the Continuing Resolution for fiscal year 1987 (P.L. 99-500 and 99-591), which provided \$147.4 million of new budget authority in fiscal year 1987 for development, operations and management activities.

On October 21, 1986, the President signed the Omnibus Budget Reconciliation Act of 1986 (P.L. 99-509). This legislation requires that the Strategic Petroleum Reserve be filled at a minimum rate of 75,000 barrels a day until at least 750 million barrels are in storage, or the sale or other disposal of crude oil from the Naval Petroleum Reserve Number 1 (Elk Hills) is restricted. In addition, P.L. 99-509 expanded the information required to be included in the annual report for the Strategic Petroleum Reserve.

### **SPR Plan and Amendments**

The Energy Policy and Conservation Act required a Strategic Petroleum Reserve Plan, which was submitted to Congress on February 16, 1977, and became effective on April 18, 1977. The Plan

discussed the development and implementation of the Strategic Petroleum Reserve.

Strategic Petroleum Reserve Plan Amendment No. 1 accelerated the planned schedule for filling the Reserve. This Amendment was submitted to the Congress on May 25, 1977, and became effective on June 20, 1977. The revised goal of 500 million barrels of crude oil to be in storage by December 22, 1980, advanced the original schedule by two years. Amendment No. 2 to the Strategic Petroleum Reserve plan authorized an increase in the Strategic Petroleum Reserve size from 500 million barrels to one billion barrels. This Amendment was transmitted to the Congress on May 18, 1978, and became effective on June 13, 1978. The Amendment described the plans to store 750 million barrels of petroleum by the Department of Energy in underground storage facilities. Decisions were not made regarding the methods or timing for developing the final 250 million barrels of storage capacity.

On October 31, 1979, the Department of Energy submitted to the Congress the Distribution Plan for the Strategic Petroleum Reserve (Amendment No. 3, Energy Action No. 5). In accordance with the provisions of the Energy Policy and Conservation Act, the Plan became effective on November 15, 1979. The Distribution Plan described the methods for drawdown and distribution of crude oil from the five Strategic Petroleum Reserve storage sites.

On December 1, 1982, President Reagan transmitted to the Congress a new "Drawdown" (Distribution) Plan (Amendment No. 4) for the use of the Strategic Petroleum Reserve. This plan, required under the Energy Emergency Preparedness Act of 1982 (EEPA) and effective upon its December 1, 1982 submission to the Congress, provided new procedures for the drawdown, sale and distribution of crude oil from the Strategic Petroleum Reserve.

## II. STATUS OF THE STRATEGIC PETROLEUM RESERVE

### A. STORAGE FACILITIES DEVELOPMENT

Since 1976, the Department of Energy has been involved in a major storage facilities development program to stockpile crude oil. The Strategic Petroleum Reserve facility development program is presently designed to provide a cumulative storage capacity of 750 million barrels and a drawdown/distribution capability of 4.5 million barrels per day.

Over the last 10 years, the Strategic Petroleum Reserve has acquired and developed six underground crude oil storage facilities in salt domes along the gulf coasts of Texas and Louisiana and a Government-owned marine terminal on the Mississippi River at St. James, Louisiana. The six storage sites are Bayou Choctaw, Weeks Island, West Hackberry and Sulphur Mines in Louisiana, and Bryan Mound and Big Hill in Texas. These six storage sites are organized into three distribution systems and connected by Department of Energy pipelines to commercial crude oil pipeline networks and marine terminalling facilities for drawdown/distribution. The locations of the current Strategic Petroleum Reserve storage sites and their associated distribution pipelines and terminals are shown in Figure 1.

In 1986, the Department of Energy revised its facilities development plan for the Strategic Petroleum Reserve providing for a more cost effective long-term operating system. The revised

plan provides for the future decommissioning of the Sulphur Mines 26 million barrels storage facility through the expansion of two other storage sites, Big Hill and Bayou Choctaw. Table 1 provides a comparison of the previous and current development plans for the Strategic Petroleum Reserve, including planned site storage capacities, storage configurations, and drawdown capabilities.

### Bryan Mound

The Bryan Mound site is located in Brazoria County, Texas, approximately three miles south of Freeport. The Department of Energy acquired this storage site in 1977 and converted four existing brine caverns with a total capacity of 66 million barrels to oil storage. In 1986 the Department of Energy completed development of the 16 additional new 10-million-barrel storage caverns at Bryan Mound through solution mining, increasing the site's total storage capacity to 226 million barrels. During 1986, brine disposal to the Gulf of Mexico averaged 100,000 barrels per day, creating approximately 27.4 million barrels of new storage capacity.

During 1986, a cavern configuration enhancement was initiated in order to ensure the site's capability to achieve the maximum drawdown rate for both sweet and sour crude oil. Under this plan, 31 million barrels of sweet crude will be transferred from existing Cavern 5 into four of the new caverns. A one-million-

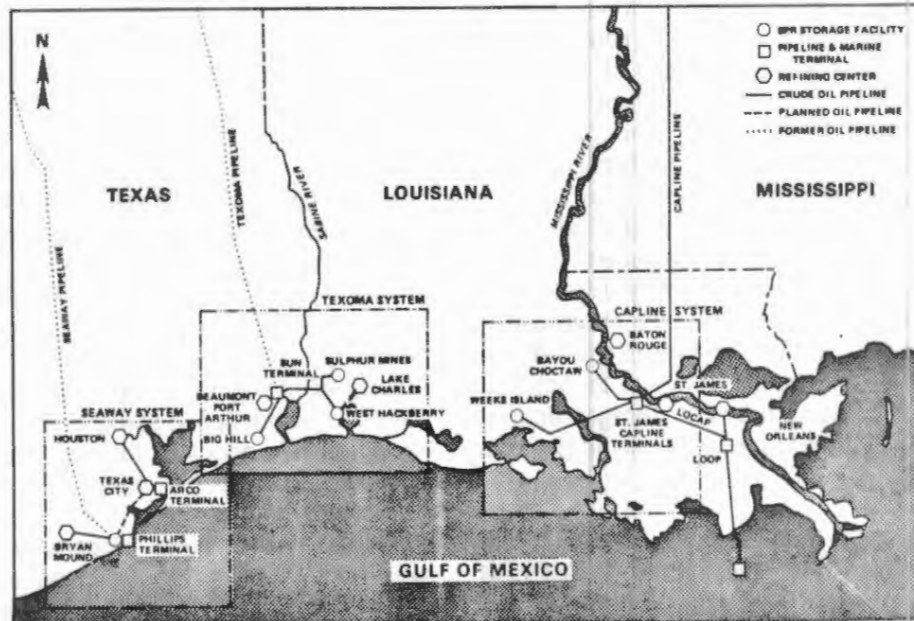


Figure 1. Strategic Petroleum Reserve Sites

TABLE 1. Strategic Petroleum Reserve Storage and Drawdown Criteria

STORAGE GROUP	STORAGE FACILITIES	PREVIOUS PLAN			CURRENT PLAN		
		STORAGE CAPACITY (MMB)	CRUDE MIX (Sweet/Sour)	DRAWDOWN CAPABILITY (MB/D)	STORAGE CAPACITY (MMB)	CRUDE MIX (Sweet/Sour)	DRAWDOWN CAPABILITY (MB/D)
SEAWAY GROUP	Bryan Mound	226	66/160	1,100	226	66/160	1,100
TEXOMA GROUP	West Hackberry	219	113/106	1,400	219	113/106	1,400
	Sulphur Mines	26	0/26	100	--	--	--
	Elig Hill	140	70/70	930	160	69/91	930
		<u>385</u>	<u>183/202</u>	<u>2,330 *</u>	<u>379</u>	<u>182/197</u>	<u>2,330</u>
CAPLINE GROUP	Eyayou Choctaw	66	28/38	480	72	34/38	480
	Weeks Island	73	0/73	590	73	0/73	590
		<u>139</u>	<u>28/111</u>	<u>1,070</u>	<u>145</u>	<u>34/111</u>	<u>1,070</u>
TOTAL		750	277/473 37%/63%	4,500	750	282/468 38%/62%	4,500

\*Combined drawdown rate for West Hackberry and Sulphur Mines is 1,400 MB/D.

barrel trap in Cavern 5 will then be eliminated through leaching and the cavern converted to sour crude storage. The cavern configuration enhancement is scheduled to be completed by October 1987. Due to this configuration enhancement, approximately 30 million barrels of the site's capacity will not be available for oil fill until FY 1988.

#### West Hackberry

The West Hackberry site is located in Cameron Parish, Louisiana, approximately 12 miles southwest of Lake Charles. The Department of Energy acquired this storage site in 1977 and converted five existing brine caverns with a capacity of 49 million barrels to oil storage. The Department of Energy is currently developing 17 additional new 10-million-barrel storage caverns at West Hackberry through solution mining, increasing the site's total storage capacity to 219 million barrels. During 1986, brine disposal to the Gulf of Mexico averaged 150,000 barrels per day, creating approximately 13.9 million barrels of new storage capacity. By the end of 1986, 12 of the 17 new caverns had been completed; the remaining five caverns range between 26 and 87 percent complete, bringing the total storage capacity to 179.7 million barrels or 82 percent of the planned 219 million barrels.

In December 1985, the 26-mile, 36-inch brine disposal pipeline from West Hackberry into the Gulf of Mexico, developed a leak in the bottom of the pipeline as a result of corrosion/erosion. Temporary repairs were completed in June 1986 to permit the

line to be returned to service at a reduced rate of approximately 300,000 barrels per day. An oxygen scavenging system was also installed at the West Hackberry site to preclude further pipeline corrosion. Permanent repairs through replacement of damaged sections of the line, totalling approximately 3,800 feet, are underway and scheduled for completion in early January 1987. During 1986, a study was initiated to evaluate the entire pipeline and develop plans to ensure its long-term availability.

#### Sulphur Mines

The Sulphur Mines site is located in Calcasieu Parish, Louisiana, approximately 12 miles west of Lake Charles. The Department of Energy acquired this storage site in 1979 and converted three existing brine caverns with a capacity of 26 million barrels to oil storage. Development and fill of this site was completed in 1983. The Sulphur Mines site is currently in an operational standby mode.

In 1986, the Department of Energy conducted a cost-benefit analysis of the potential consolidation of the Sulphur Mines storage capacity of 26 million barrels into the remaining five storage sites. Sulphur Mines was originally acquired to meet the accelerated fill schedule established under the initial Strategic Petroleum Reserve Plan. However, Sulphur Mines' small capacity and operational capabilities significantly limit its cost effectiveness and drawdown utility. With only 26 million barrels of capacity, Sulphur Mines incurs the highest per-barrel standby costs, and drawdown of Sulphur Mines would be of

limited value due to its low drawdown rate and distribution configuration. The consolidation of Sulphur Mines storage capacity into the remaining storage sites would enhance the Strategic Petroleum Reserve's drawdown performance and provide a net savings of approximately \$90 million in 20 years.

The development plan for the Strategic Petroleum Reserve has been revised to provide for the enlargement of the 14 planned caverns at Big Hill by approximately 1.5 million barrels each and the enlargement of an existing Bayou Choctaw cavern by 6 million barrels to accommodate a Sulphur Mines decommissioning. The Sulphur Mines oil transfer and decommissioning will be integrated into the program at a future date to preclude any impact on the current oil fill program.

### **Big Hill**

The Big Hill storage site is located in Jefferson County, Texas, 20 miles southwest of Beaumont. The Department of Energy acquired this undeveloped site in 1982. The Department has been constructing a new storage facility at this site with a planned storage capacity of 140 million barrels and a drawdown capability of 930,000 barrels per day. The sites storage capacity has been expanded to 160 million barrels which is 20 million barrels greater in order to accommodate the future decommissioning of the Sulphur Mines site as mentioned above. The extra capacity will be achieved by increasing the size of each Big Hill cavern from 10 million barrels to approximately 11.5 million barrels, which can be accomplished without any site redesign, drilling or further surface construction. During 1986, site construction of the major site facilities, including piping and instrumentation for the first five caverns, and off-site construction of the raw-water intake structure was completed.

In response to the proposed moratorium in the FY 1987 budget in January 1986, the Department cancelled planned contract awards for additional site and pipeline construction at Big Hill. However, in April, the Department changed its plans and proceeded to award construction contracts for the remaining surface construction and water, brine and oil pipeline construction. By the end of 1986, site construction, exclusive of cavern leaching, was approximately 70 percent complete. The Big Hill construction is scheduled for completion by March 1988 with a capability to commence cavern development (leaching) in October 1987.

### **Bayou Choctaw**

The Bayou Choctaw site is located in Iberville Parish, Louisiana, approximately 12 miles southwest of

Baton Rouge. The Department of Energy acquired this storage site in 1977 and converted four existing brine caverns with a capacity of 46 million barrels to oil storage.

The Department of Energy acquired a fifth existing cavern in 1985 through an exchange agreement with United Texas Petroleum Company. During 1986, the Strategic Petroleum Reserve completed drilling a second well into this cavern and commenced surface construction to integrate the cavern with the central pumping and control facilities. This construction was approximately 94 percent complete by the end of the year and is expected to be available for oil fill in April 1987.

The Department has plans to develop one new 10-million-barrel cavern at Bayou Choctaw through solution mining. The Strategic Petroleum Reserve completed drilling two wells for the cavern in 1985 and commenced surface construction of piping, electrical and instrumentation systems for the cavern in 1986. This construction was approximately 33 percent complete by the end of the year and is expected to be available for solution mining in August 1987.

As a result of the planned future decommissioning of the Sulphur Mines storage facility, the Department expanded the development plans for Bayou Choctaw to include the enlargement of an existing cavern (No. 18) by 6 million barrels. The two cavern additions and the Cavern 18 enlargement will provide a cumulative storage capacity at Bayou Choctaw of 72 million barrels which will greatly enhance the sustainable drawdown capability of the Bayou Choctaw site.

### **Weeks Island**

The Weeks Island site is located in Iberia Parish, Louisiana, approximately 95 miles southwest of New Orleans. The Department of Energy acquired this storage site in 1977 and converted an existing conventional salt mine with a capacity of 73 million barrels to oil storage. Development and fill of this site was completed in 1982. The Weeks Island site is currently in an operational standby mode.

### **Strategic Petroleum Reserve Storage Capacity Development**

In response to the fiscal year 1987 budget proposal, the Strategic Petroleum Reserve's storage capacity development operations were placed in a moratorium status on January 1, 1986. At that time, cavern leaching was approximately 96 percent complete at Bryan Mound and 85 percent complete

at West Hackberry. The total storage capacity of the Reserve remained at approximately 510 million barrels for both the first and second quarters.

On July 2, 1986 the President signed the Urgent Supplemental Appropriations Act, 1986 (P.L. 99-349) which directed the release of funds and the resumption of storage capacity development activities. At the end of August, the Strategic Petroleum Reserve completed cavern leaching activities at Bryan Mound bringing the site's total storage capacity to the final 226 million barrels. At the end of December, the Strategic Petroleum Reserve completed an additional 10.9 million barrels at West Hackberry bringing the site's total storage

### Capital Improvements

During 1986, the Strategic Petroleum Reserve completed numerous capital improvement projects to upgrade site facilities and fire protection systems. At Bryan Mound, the Strategic Petroleum Reserve installed a water line to Freeport City's water system for potable site water, completed the relocation of County Road 242 to outside the storage site boundary and upgraded several cavern well pads. At West Hackberry, the Strategic Petroleum Reserve constructed a pipeline scraper trap at the raw water intake structure to permit periodic pipeline cleaning operations, constructed retaining dikes around the brine pumping station, and installed erosion control

TABLE 2. STORAGE CAPACITY DEVELOPMENT BY QUARTER  
(IN MILLION BARRELS)

Storage Facility	1985 Year End	1st Quarter	2nd Quarter	3rd Quarter	2/ 4th Quarter	1986 Year End
Bryan Mound	198.6	0.5 1/	0.0	26.9	0.0	226.0
West Hackberry	165.8	0.2 1/	0.0	3.4	10.3	179.7
Bayou Choctaw	46.0	0.0	0.0	0.0	0.0	46.0
Weeks Island	73.0	0.0	0.0	0.0	0.0	73.0
Sulphur Mines	26.0	0.0	0.0	0.0	0.0	26.0
<b>TOTAL</b>	<b>509.4</b>	<b>0.7</b>	<b>0.0</b>	<b>30.3</b>	<b>10.3</b>	<b>550.7</b>

1/ Capacity adjustments as a result of oil-brine interface measurements during fill.

2/ Leaching resumed July 3, 1986.

capacity to 180.3 million barrels. Bayou Choctaw is not currently in a cavern leaching mode, and Weeks Island and Sulphur Mines developments and oil fill are completed. Table 2 summarizes the 1986 storage capacity development performance by quarter. Figure 2 illustrates the Strategic Petroleum Reserve's storage capacity development status by storage facility.

Under the fiscal year 1988 budget, the Department of Energy plans to complete the development of the Reserve to 581 million barrels by the end of FY 1987 and to 750 million barrels at a rate necessary to achieve an annual oil fill of 35,000 barrels per day.

measures at the Black Lake shore line. The Strategic Petroleum Reserve also initiated the installation of automatic foam deluge systems at both the West Hackberry and Bayou Choctaw facilities to meet the Department of Energy's "improved risk" criteria for fire protection.

At the St. James marine terminal, the Strategic Petroleum Reserve constructed a new Oil Quality Assurance Laboratory to provide on-site crude oil testing and analysis and modified the site's oil handling systems. At Weeks Island, the Strategic Petroleum Reserve initiated the construction of a replacement head frame and hoisting system for the mine's main service shaft elevator.

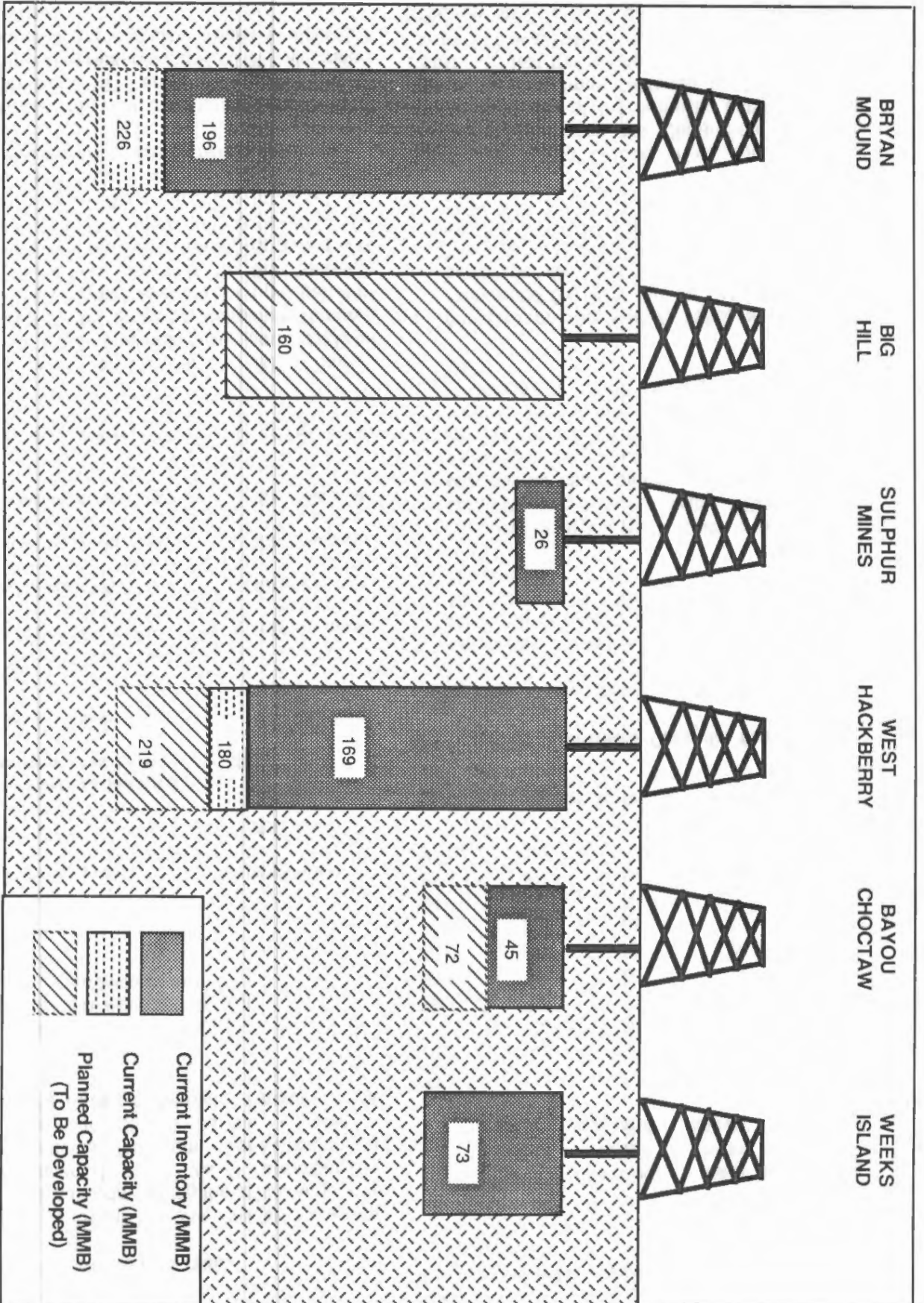


FIGURE 2. STORAGE FACILITIES DEVELOPMENT & FILL STATUS

**B. OIL ACQUISITION AND TRANSPORTATION**

**Statistics For Fourth Quarter 1986**

The Strategic Petroleum Reserve was filled at a rate of 56,307 barrels per day during the calendar quarter ending December 31, 1986. As of December 31, 1986, the Strategic Petroleum Reserve crude oil inventory was 511,565,036 barrels. Table 3 summarizes the Strategic Petroleum Reserve crude

TABLE 3  
STRATEGIC PETROLEUM RESERVE  
OIL INVENTORY AND DELIVERY STATISTICS  
(As of December 31, 1986)

Total Strategic Petroleum Reserve Inventory	511,565,036 Barrels
Amount of Crude Oil in Transit	390,960 Barrels
Contracted Quantity Remaining to be Delivered to the Strategic Petroleum Reserve in Fiscal Year 1987	22,860,384 Barrels
Fill Rate for Reported Calendar Quarter	56,307 Barrels per Day
Projected Fill Rates for:	
Calendar Quarter Ending March 31, 1987	99,000 Barrels per Day
Calendar Quarter Ending June 30, 1987	80,000 Barrels per Day
Calendar Quarter Ending September 30, 1987	67,000 Barrels per Day
Calendar Quarter Ending December 31, 1987	35,000 Barrels per Day

oil inventory and delivery statistics as of December 31, 1986.

During the period of October 1, 1986, through December 31, 1986, only high sulfur (sour) crude oil was delivered to the Strategic Petroleum Reserve terminals. The weighted average price per barrel of the sour crude oil delivered to the Strategic Petroleum Reserve terminals during this period was \$14.68 per barrel. This information is based on the contract price for crude oil and the transportation costs only and does not include demurrage, customs duties or terminal and administration costs.

Fiscal and calendar year inventories and average daily fill rates since 1977 are presented in Table 4. Strategic Petroleum Reserve crude oil fill is illustrated on both an annual and cumulative basis in Figures 3 and 4, respectively.

TABLE 4

STRATEGIC PETROLEUM RESERVE OIL FILL HISTORY

	FISCAL YEAR		CALENDAR YEAR	
	Year-End Inventory (million bbls)	Average Daily Fill Rate (thousand bbls/d)	Year-End Inventory (million bbls)	Average Daily Fill Rate (thousand bbls/d)
1977	1.1	3	7.2	20
1978	49.1	131	68.5	168
1979	91.2	115	91.7	64
1980	92.8	4	107.8	44
1981	199.2	292	230.3	336
1982	277.9	215	293.8	174
1983	361.0	228	379.1	234
1984	431.1	191	450.5	195
1985	489.3	159	493.3	119 *
1986	506.4	47 *	511.6	51 *

\* Fill rates unadjusted for oil deliveries under the test sale

**Oil Acquisition Contracts, Calendar Year 1986**

During 1986, the Department of Energy:

- o Completed crude oil deliveries under its 1981 crude oil purchase agreement with Petroleos Mexicanos (PEMEX), Mexico's state-owned oil company.
- o Executed on November 7, 1986, a new crude oil purchase agreement with PEMEX which provides for crude oil deliveries to the Strategic Petroleum Reserve at an average rate of 65,000 barrels per day (plus or minus 10 percent by mutual agreement) during the period of December 1, 1986, through November 30, 1987.
- o Awarded on October 7, 1986, a contract to Transworld Oil USA, Inc. for delivery of 10,000 barrels per day of domestic sour crude oil to the Strategic Petroleum Reserve during the period of November 1, 1986, through October 31, 1987.

Additionally during October 1986, for emergency contingency purposes, the Department of Energy conducted a test of the domestic common carrier pipeline system from California to the U.S. Gulf Coast. To test the system, approximately 267,000 barrels of Naval Petroleum Reserves Number 1 (Elk Hills) low sulfur (sweet) crude oil were delivered to



Figure 3. Annual Strategic Petroleum Reserve Oil Fill

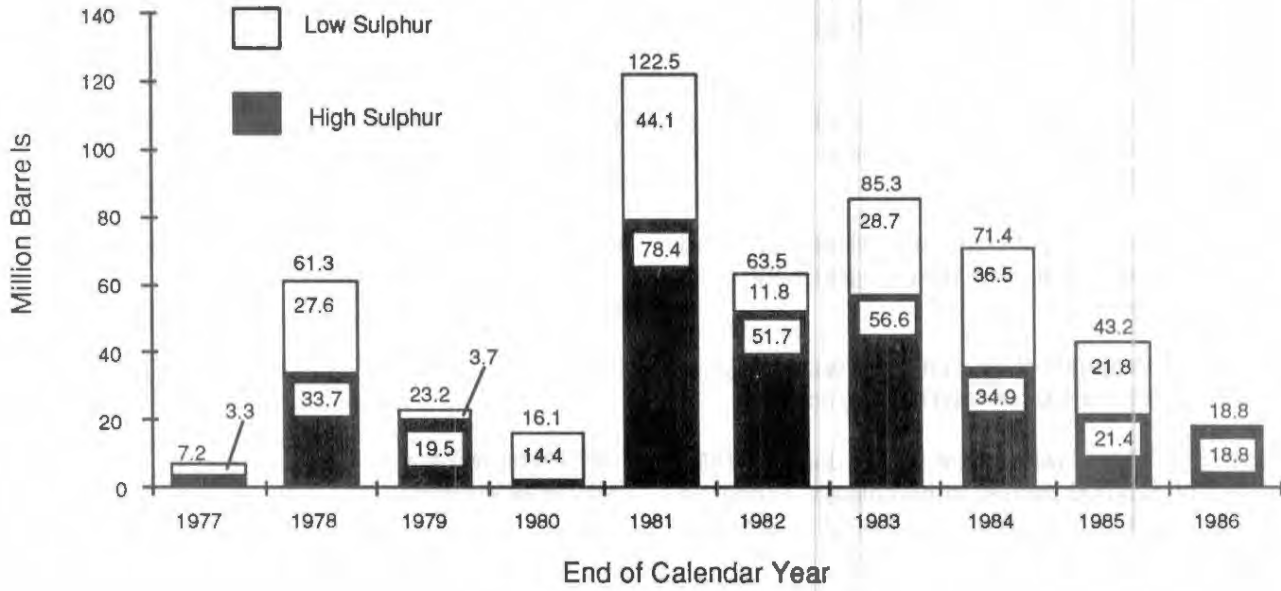
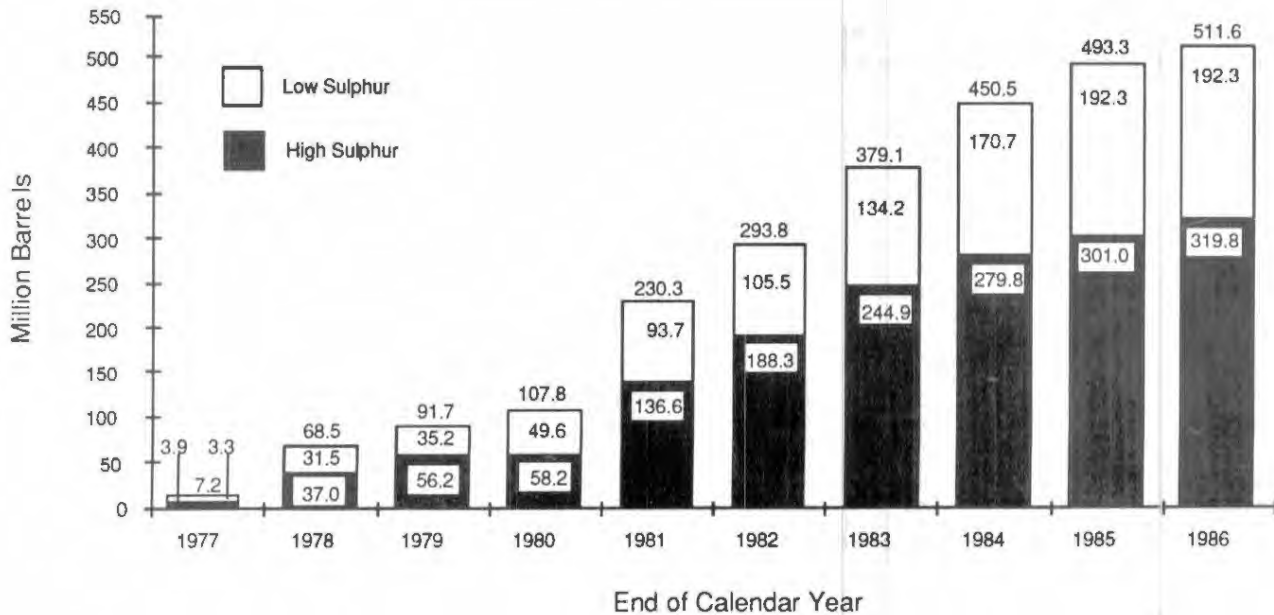


Figure 4. Cumulative Strategic Petroleum Reserve Oil Fill



the domestic common carrier pipeline system in California for shipment to the Sun Marine Terminal, Nederland, Texas. Upon receipt at the Sun Terminal in early 1987, this crude oil will be stored at the Strategic Petroleum Reserve's West Hackberry storage site.

During calendar year 1986, 18.8 million barrels of crude oil were delivered to the Strategic Petroleum Reserve. Of this crude oil:

- o 16.1 million barrels of sour crude oil were acquired under the 1981 purchase agreement with PEMEX.
- o 1.5 million barrels of sour crude oil were acquired under the 1986 purchase agreement with PEMEX; and,
- o 1.2 million barrels of sour crude oil were acquired under the domestic crude oil delivery contract.

These acquisitions were offset by the January 1986 delivery of 523,000 barrels to purchasers under the test sale, for a net inventory increase of 18.3 million barrels.

Table 5 shows the crude oil received during 1986 and since inception of the Strategic Petroleum Reserve program by state or country of origin. Of the total oil in storage, 62.5 percent is high sulfur (sour) and 37.5 percent is low sulfur (sweet). Table 6 provides information on the location of this inventory by site.

TABLE 5  
Crude Oil Received Through 1986  
(million barrels)

Source Country or State	Quantity During 1986	Cumulative	Percent of Total
Mexico	17.6	189.2	36.9
United Kingdom		136.0	26.5
Alaska		31.4	6.1
Saudi Arabia		27.1	5.3
Libya		23.8	4.6
Iran		20.0	3.9
Dubai		15.9	3.1
Nigeria		15.2	3.0
Oman		9.0	1.8
Egypt		8.9	1.7
Norway		7.4	1.4
Ecuador		6.2	1.2
Algeria		6.2	1.2
Texas	1.2	3.9	0.8
Cameroon		3.5	0.7
Abu Dhabi		2.5	0.5
Gabon		2.4	0.5
Qatar		2.3	0.4
Venezuela		0.9	0.2
Other Domestic		0.4	0.1
Peru		0.4	0.1
<b>Total Receipts</b>	<b>18.8</b>	<b>512.6</b>	<b>100.0</b>
<b>Less Test Sale Deliveries</b>	<b>0.5</b>	<b>1.0</b>	
<b>NET INVENTORY</b>	<b>18.3</b>	<b>511.6</b>	

Table 6

STRATEGIC PETROLEUM RESERVE CRUDE OIL INVENTORY  
As of December 31, 1986  
(Million Barrels)

Storage Site	Location	1986 Cumulative Total			End of Year 1985
		Sour*	Sweet**	Total	
Bryan Mound	Brazoria County, TX	131.5	64.3	195.8	190.0
West Hackberry	Cameron Parish, LA	59.9	109.3	169.2	156.3
Bayou Choctaw	Iberville Parish, LA	27.7	17.2	44.9	45.8
Weeks Island	Iberia Parish, LA	72.8	0.0	72.8	72.5
Sulphur Mines	Calcasieu Parish, LA	25.9	0.0	25.9	26.1
<b>Subtotal</b>		<b>317.8</b>	<b>190.8</b>	<b>508.6</b>	<b>490.7</b>
<b>Tanks and Pipelines</b>		<b>1.8</b>	<b>1.2</b>	<b>3.0</b>	<b>2.6</b>
<b>TOTAL</b>		<b>319.6</b>	<b>192.0</b>	<b>511.6</b>	<b>493.3</b>

\* Sulphur content greater than 0.5 percent

\*\* Sulphur content less than 0.5 percent

The Strategic Petroleum Reserve crude oil specifications can be found in Appendix H of this report.

### Cargo Preference Act Compliance

The Cargo Preference Act of 1954 requires that Federal agencies take such steps as may be necessary and practicable to assure that at least 50 percent of its cargo transported on ocean vessels in a calendar year is transported by privately-owned U.S.-flag vessels, to the extent they are available at fair and reasonable rates. By agreement between the Department of Energy and the Department of Transportation, the Strategic Petroleum Reserve's Cargo Preference Act compliance is measured in terms of long-ton miles, i.e., cargo tons multiplied by the distances transported.

During 1986, 9 U.S.-flag vessels, transporting a total of approximately 9.179 million barrels, were involved in delivering crude oil to Strategic Petroleum Reserve. These deliveries equaled 853.8 million long-ton miles or 50.4 percent of the total long-ton miles.

### III. BUDGET AND FINANCE

#### A. APPROPRIATIONS

Approximately \$18 billion was appropriated for the Strategic Petroleum Reserve through December 31, 1986, including entitlement receipts for fiscal year 1981 under the authority of the Energy Security Act. The distribution of appropriated funds on an annual basis and in total is shown in Table 7. Figures 5 and 6 illustrate appropriations for facilities development and operations and oil acquisition and transportation on an annual and cumulative basis, respectively.

#### B. MAJOR BUDGET AND FINANCING ACTIONS DURING FY 1986

The Administration's fiscal year 1987 budget, transmitted to the Congress on February 3, 1986, proposed a moratorium on Strategic Petroleum Reserve development at the end of 1985 and a moratorium on oil fill when the inventory of crude oil in storage reached a level of 499 million barrels. It further proposed to defer in fiscal year 1986 all available funds in excess of the estimated requirements to implement the proposed moratorium policy. These funds consisted of approximately \$198 million that had been appropriated for the SPR Petroleum Account for storage facilities development and operations and program management and approximately \$578 million of Strategic Petroleum Reserve Account appropriations for oil acquisition and transportation. However, on April 7, 1986, the President signed the Consolidated Omnibus Budget Reconciliation Act of 1985 (P.L. 99-272) thereby committing the Administration to filling the Reserve at an average rate of at least 35,000 barrels per day beginning in fiscal year 1986 and continuing until the inventory of crude oil in storage reached 527 million barrels. This implied a total fill of not less than 502 million barrels by the end of fiscal year 1986, since P.L. 99-272 also required that one million barrels of oil delivered in December 1985 and January 1986 in connection with the Strategic Petroleum Reserve Test Sale be replaced by the end of fiscal year 1986. Additionally, on April 11, 1986, the Administration decided to continue with the new construction necessary to complete surface facilities at the Big Hill and Bayou Choctaw sites and released \$157 million that had been appropriated for that purpose. Subsequently, on July 2, 1986, the President also signed the Urgent Supplemental Appropriations Act, 1986 (P.L. 99-349), which restored all other funds the Administration sought to defer in fiscal year 1986 and provided that the Reserve be filled at a rate which would fully utilize existing storage capacity plus that which would be created as a result of the deferral disapprovals.

As a result of the Administration's decision to proceed with new construction and of the enactment of P.L. 99-349, funds available in the Strategic Petroleum Reserve Account for obligation in fiscal year 1986 increased from approximately \$217 million to \$415 million. SPR Petroleum Account funds in fiscal year 1986, including the \$578 million of deferred funds restored by P.L. 99-349 and \$28 million deposited in the account as a result of the Strategic Petroleum Reserve Test Sale, amounted to \$725 million. Of this total, \$202 million were made available for obligation in fiscal year 1986. An additional \$426 million has been made available for use in fiscal year 1987 to achieve a fill rate of 75,000 barrels a day in fiscal year 1987. The balance of \$97 million was apportioned for use in fiscal year 1988.

#### C. MAJOR BUDGET ACTIONS, LAST QUARTER 1986 (FIRST QUARTER FY 1987)

On October 18, 1986, the President signed the Continuing Resolution for fiscal year 1987 (P.L. 99-500 and 99-591), which provided an additional \$147 million in the Strategic Petroleum Reserve Account for continued development of a 750 million-barrel Strategic Petroleum Reserve. No additional funds were provided for the SPR Petroleum Account. The report on the bill refers to available prior year funds which allow for continued fill of the Reserve in fiscal year 1987. On October 20, 1986, the President also signed the Omnibus Budget Reconciliation Act of 1986 (P.L. 99-509). This legislation requires that the Strategic Petroleum Reserve be filled at a minimum rate of 75,000 barrels a day until at least 750 million barrels are in storage. It also restricts the sale or other disposal of crude oil from Naval Petroleum Reserve Number 1 (Elk Hills) if this minimum fill rate is not met.

#### SPR Petroleum Account

The SPR Petroleum Account was established as an off-budget account in the Treasury pursuant to the provisions of the Omnibus Budget Reconciliation Act of 1981 (P.L. 97-35) which amended Section 167 of the Energy Policy and Conservation Act of 1975 (P.L. 94-163).

This account finances (1) Strategic Petroleum Reserve oil procurements; (2) associated transportation costs such as pipeline, tanker, and marine terminalling; (3) U.S. Customs duties; and, (4) other miscellaneous costs, such as Defense Fuel

Table 7

Strategic Petroleum Reserve Appropriations  
(thousands of dollars)

Fiscal Year	Petroleum Acquisition and Transportation	Storage Facilities Development and Operations	Management	1 /	Total
1976	\$ 0	\$ 300,000	\$ 13,975		\$ 313,975
1977	440,000	0	7,824		447,824
1978	2,703,469	463,933	14,704		3,182,106
1979	2,885,670	103,290	18,111		3,007,071
Reprogramming	<u>-529,214</u>	<u>529,214</u>	<u>0</u>		<u>0</u>
	2,356,456	632,504	18,111		3,007,071
1980	-2,000,000	<u>2 /</u> 0	0		-2,000,000
Reprogrammings:					
Number 1	-20,391	0	20,391		0
Number 2	<u>-1,881</u>	<u>0</u>	<u>1,881</u>		<u>0</u>
	-2,022,272	0	22,272		-2,000,000
1981	2,688,282	<u>3 /</u> 82,834	19,391		2,790,507
Entitlements	542,146	0	0		542,146
Reprogrammings:					
Number 1	-18,000	18,000	0		0
Number 2	<u>-7,334</u>	<u>7,334</u>	<u>0</u>		<u>0</u>
	3,205,094	108,168	19,391		3,332,653
1982	3,684,000	<u>4 /</u> 171,356	20,076		3,875,432
Reprogramming	<u>-4,300</u>	<u>5 /</u> 4,300	<u>0</u>		<u>0</u>
	3,679,700	175,656	20,076		3,875,432
1983	2,074,060	222,528	19,590		2,316,178
1984	650,000	142,357	16,413		808,770
1985	2,049,550	441,300	<u>6 /</u> 17,890	<u>6 /</u>	2,508,740
1986	0	94,015	<u>7 /</u> 13,518	<u>7 /</u>	107,533
Reprogramming	<u>-12,964</u>	<u>8 /</u> 12,964	<u>0</u>		<u>0</u>
	-12,964	111,204	13,518		107,533
1987	0	134,021	13,412		147,433
Total Appropriations	15,123,093	2,727,446	197,176		18,047,715

1) Excludes funds appropriated to other DOE accounts but used to finance aspects of SPR program management.

2) Rescission.

3) Included supplemental appropriations of \$1,305,000,000.

4) Pursuant to the Omnibus Budget Reconciliation Act of 1981, petroleum acquisition and transportation funding was placed off-budget beginning in FY 1982.

5) Reprogramming was funded from on-budget FY 1981 petroleum acquisition and transportation carryover funds.

6) Included in FY 1984 second supplemental appropriations.

7) Adjusted for amounts sequestered under the Balanced Budget and Emergency Deficit Control Act of 1985. (P.L. 99-177).

8) Balance of on-budget FY 1981 petroleum acquisition and transportation carryover funds.

### Storage Facilities Development/Operations and Petroleum Acquisition/Transportation

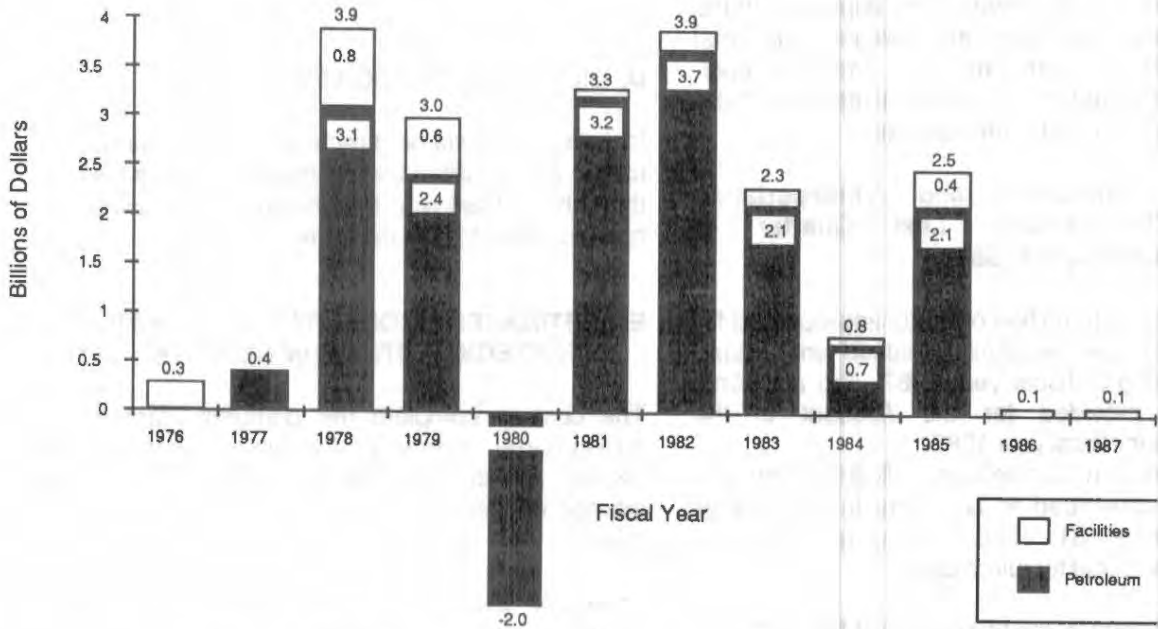


Figure 5. Strategic Petroleum Reserve Annual Funding

### Storage Facilities Development/Operations and Petroleum Acquisition/Transportation

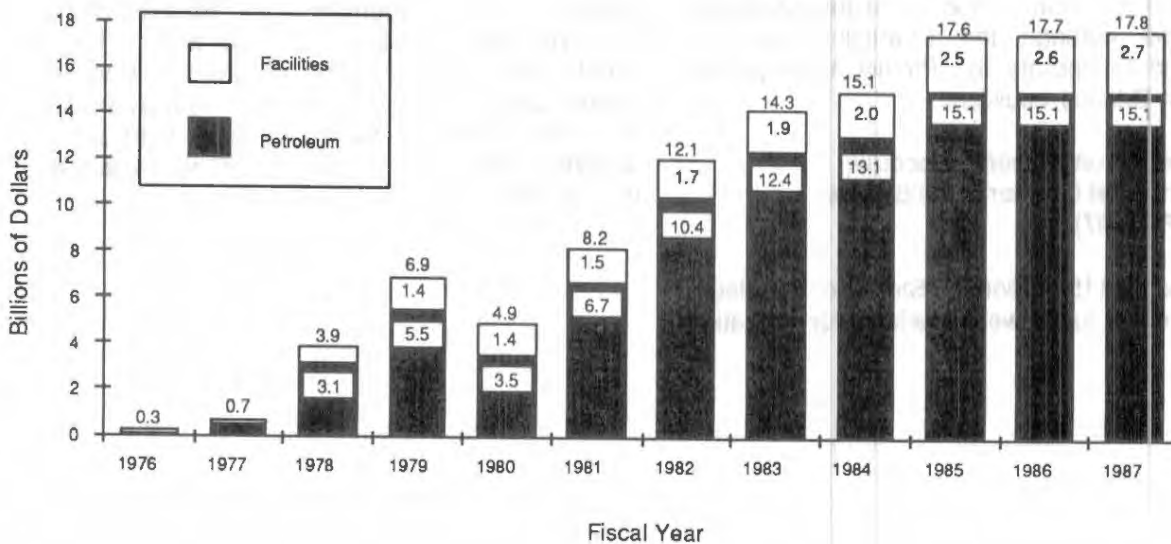


Figure 6. Strategic Petroleum Reserve Cumulative Funding

Supply Center administration costs associated with acquiring and transporting the oil. In the event of a drawdown, this account would also fund the Federal cost of drawing down Strategic Petroleum Reserve oil from the caverns and transporting it to the point where purchasers would take title. Additionally, the Federal receipts from a drawdown and sale of Strategic Petroleum Reserve oil are deposited in the SPR Petroleum Account and create additional budget authority for refilling the Reserve. Accordingly, the receipts from the fiscal year 1986 test sale were deposited in this account.

**Petroleum Acquisition and Transportation Financial Transactions, Last Quarter of 1986 (First Quarter of FY 1987)**

Approximately \$526 million of funds appropriated for the SPR Petroleum Account remained unobligated at the beginning of fiscal year 1987. No additional funds were provided for the Account in the appropriations for fiscal year 1987. Of the \$526 million, approximately \$381 million was obligated or committed to contracts in the quarter ended December 31, 1986, leaving a balance of \$145 million available for future use.

Outlays (payments) for the first quarter of FY 1987 were approximately \$62 million.

**Strategic Petroleum Reserve Account**

The Strategic Petroleum Reserve Account provides the financing for the Strategic Petroleum Reserve facilities program, including the construction, operations and maintenance of the Strategic Petroleum Reserve sites, the planning activities pertinent to major issues concerning the development and use of the Strategic Petroleum Reserve, and the salaries and expenses necessary to plan and manage the Strategic Petroleum Reserve and to operate the Project Management Office in New Orleans, Louisiana.

**Strategic Petroleum Reserve Account Transactions Last Quarter of 1986 (First Quarter of FY 1987)**

Approximately \$115 million of Strategic Petroleum Reserve Account funds were available for obligation

at the beginning of fiscal year 1987. The appropriation for fiscal year 1987 increased these available funds by \$147 million, to a total of approximately \$262 million. Of this total, approximately \$53 million was obligated in the quarter ended December 31, 1986, leaving a balance of \$209 million available for future obligation.

**D. OIL COSTS THROUGH FY 1986**

Inclusive of entitlement receipts, the cumulative cost for the 506.4 million barrels delivered to the Reserve through FY 1986 was \$14.556 million, an average of approximately \$28.74 per barrel.

**E. ESTIMATED COST TO COMPLETE THE STRATEGIC PETROLEUM RESERVE**

The cost to complete the currently planned 750 million-barrel Strategic Petroleum Reserve will depend on decisions about future fill rates and storage capacity development, as well as future oil prices.

Based on the "Current Services" concept, which assumes no changes in existing legislation, development of storage facilities would continue on a schedule that would provide the full 750 million barrels of storage capacity by the end of fiscal year 1992 and oil fill would be sustained at an average rate of 75,000 barrels a day from fiscal year 1987 to completion of a 750 million barrel inventory in late fiscal year 1995. Using current assumptions about oil prices in fiscal year 1987 and future years, the estimated total cost to completion in this scenario is \$24.1 billion, consisting of \$4.4 billion for the development, operation and management of the Reserve through fiscal year 1995 and \$19.7 billion for oil fill. Through fiscal year 1987, a total of \$18.0 billion was appropriated for the Reserve, including \$2.9 billion for development, operations and management activities and \$15.1 billion for oil acquisition and transportation.

## IV. ORGANIZATION, MANAGEMENT AND CONTRACTUAL SUPPORT

### A. PROGRAM/PROJECT MANAGEMENT

The Strategic Petroleum Reserve Office was created under the Energy Policy and Conservation Act for the establishment, management, and maintenance of the Strategic Petroleum Reserve. The Assistant Secretary for Fossil Energy, J. Allen Wampler, has overall programmatic responsibility for achieving the goals and objectives of the Strategic Petroleum Reserve Program. This responsibility has been delegated to the Deputy Assistant Secretary for Petroleum Reserves, Richard D. Furiga. The Offices of the Strategic Petroleum Reserve and Naval Petroleum Reserves were combined under the Deputy Assistant Secretary for Petroleum Reserves in September 1985.

Responsibility for Strategic Petroleum Reserve project management and implementation activities is assigned to the Manager, Oak Ridge Operations Office, Joe La Grone. The Manager, Oak Ridge Operations Office, directs Strategic Petroleum Reserve activities through the Assistant Manager for the Strategic Petroleum Reserve, John Milloway. The Project Management Office (PMO), located in New Orleans, Louisiana, carries out day-to-day project implementation activities as delegated by the Manager, Oak Ridge Operations Office, and in accordance with programmatic guidance provided by the Deputy Assistant Secretary for Petroleum Reserves.

### B. PROCUREMENT AND CONTRACTOR SUPPORT

Obligations for fiscal year 1986 Strategic Petroleum Reserve procurements totaled approximately \$481.7 million, including \$195.8 million for crude oil purchased under an agreement with Petroleos Mexicanos (PEMEX), Mexico's state-owned oil company. Obligations for procurements for other than crude oil totaled \$285.9 million. The Strategic Petroleum Reserve, in conjunction with prime contractors, awarded \$83.7 million to small businesses, including \$19.9 million to small disadvantaged businesses and \$5.0 million to businesses owned by women.

Boeing Petroleum Services, Incorporated, in the second year of a five year contract which began in April 1985, provided management, operations and maintenance of the crude oil storage facilities.

Other prime contractors who provided services to the Strategic Petroleum Reserve during 1986 included: the Aerospace Corporation for systems

engineering; Walk, Haydel & Associates, Inc. and Fluor Engineers for architectural engineering; Wells Fargo Guard services for security protection services for Strategic Petroleum Reserve sites; Coggins Systems Ltd., U.S. Steel Corporation, Enpro Systems, Inc., Taylor Forge Engineered Systems, Inc., and Cameron Iron Works for the hardware; Fruin-Colnon Corporation, Kaough & Jones Electric Company, V&P Electric Company, AMC Mechanical Contractors, Gregory & Cook, Inc./Associated Pipeline - Joint Venture, Michael Curran and Associates, Kiewit/Tulsa-Houston - Joint Venture, L.S. Womack, Inc. for construction; Texcom Incorporated for telephone systems; Systematic Management Services, Inc. for support services; Texas A&M Research Foundation for environmental support; and, ARCO Pipeline Company, Phillips Petroleum Company and Sun Marine Terminal for terminalling services.

### C. REAL ESTATE, ENVIRONMENTAL COMPLIANCE, AND PERMITS

#### Real Estate

During 1986, the Department of Energy acquired 749 acres of permanent and construction easements for the 46-mile, 40-inch crude oil pipeline from Bryan Mound to Texas City (ARCO Terminal), currently under construction. The acquisition of 417 acres of permanent and construction easements for the planned Big Hill 24-mile, 36-inch crude oil pipeline from Big Hill to Sun Terminal, Nederland, Texas was also completed. Preliminary work for the planned 12-mile crude oil pipeline from West Hackberry to Lake Charles, Louisiana, was initiated during 1986.

#### Environmental Compliance and Permits

Environmental protection activities in support of construction and operation of all Strategic Petroleum Reserve facilities continued through 1986 in compliance with applicable Department of Energy orders.

Several environmental planning and review activities for distribution enhancements were completed during 1986 to comply with requirements of the National Environmental Policy Act. The Environmental Assessment for Seaway Complex Distribution Enhancements was revised to address a change in pipeline route through Freeport, Texas. Subsequently, the Department of Energy issued a

Floodplain/Wetlands Statement of Findings and a Finding of No Significant Impact on March 24, 1986. In addition, the Department issued a Floodplain/Wetlands Statement of Findings and a Finding of No Significant Impact for the Texoma Complex Distribution Enhancements on October 24, 1986.

An Installation Assessment Report addressing all Strategic Petroleum Reserve facilities was issued August 8, 1986, in compliance with Department of Energy Order 5480.14, Comprehensive Environmental Response, Compensation and Liability Act Program. The second phase of the program, confirmation, is underway.

#### **D. SECURITY**

During 1986, Department Of Energy transferred management responsibility for Strategic Petroleum Reserve security services to Boeing Petroleum Services under its management, operations and maintenance contract. In September 1986, Boeing awarded a protection services contract to Wackenhut Services International having a basic term of three years with two one-year options. The Wackenhut contract was a successor to the Department Of Energy Wells Fargo Guard Services contract of 1982 and the transition was accomplished in a highly successful manner.

The Department of Energy Office of Security Evaluation conducted a security Inspection and Evaluation (I&E) of the Strategic Petroleum Reserve during July, 1986. Facilities inspected included the Strategic Petroleum Reserve Project Management Office, Boeing Petroleum Services, Inc., and Wells Fargo Guard Services in New Orleans, Louisiana, as well as the Bayou Choctaw and Weeks Island storage sites. The areas of evaluation were: (1) protection program planning, (2) protective force training, (3) protective force skills and knowledge, (4) physical security systems, and (5) a system performance test which included support from local law enforcement agencies and used outside aggressors. The Strategic Petroleum Reserve received four satisfactory ratings and one marginally satisfactory rating for which deficiency was subsequently corrected. The final report concluded that the Strategic Petroleum Reserve has a well-documented security program which provides reasonable assurance of successfully performing its mission.

To maintain security proficiency, the Strategic Petroleum Reserve conducted security training exercises at five of its sites during 1986. These exercises simulated responses to outside aggressors and incorporated participants from federal, state and local law enforcement agencies.



## V. DRAWDOWN AND DISTRIBUTION SYSTEM AND VULNERABILITY IMPACT

### A. DISTRIBUTION PLAN

The current plan for distributing Strategic Petroleum Reserve petroleum, in the event that the Reserve is drawn down to respond to a severe energy supply interruption or to meet obligations of the United States under the Agreement of an International Energy Program, is provided in the "Strategic Petroleum Reserve Drawdown (Distribution) Plan", Amendment Number 4, of December 1, 1982.

The Strategic Petroleum Reserve Distribution Plan provides that, pursuant to the President's decision to use the Strategic Petroleum Reserve, the principal method of distributing Strategic Petroleum Reserve oil will be price competitive sale with the oil being sold and delivered to bidders offering the highest prices. The sale will be open to the largest possible universe of eligible buyers to ensure efficient distribution of Strategic Petroleum Reserve oil. The plan also provides that in any calendar month, the Secretary of Energy may direct the distribution of up to 10 percent of the volume of oil sold in that calendar month in a manner which the Secretary selects at his discretion. The price for such oil will be the average price of Strategic Petroleum Reserve oil sold at the contemporaneous competitive sale, or at the most recent competitive sale if no contemporaneous competitive sale is held.

Appendix A to the Department of Energy's final rule (10 CFR Part 625) governing price competitive sales of petroleum from the Strategic Petroleum Reserve provides Standard Sales Provisions containing or describing contract clauses, terms and conditions of sale, and performance and financial responsibility measures, which may be applicable to a particular sale of Strategic Petroleum Reserve oil.

### B. DRAWDOWN AND DISTRIBUTION CAPABILITIES

Based on the Strategic Petroleum Reserve's December 31, 1986 crude oil storage inventory of 511.6 million barrels and the existing Strategic Petroleum Reserve drawdown and commercial distribution systems, the Strategic Petroleum Reserve's current drawdown and distribution capabilities are as shown in Table 8. The Strategic Petroleum Reserve storage facilities are physically capable of initially being drawn down at a sustained rate of 3.3 million barrels per day for a 90-day period. After 90 days, the Strategic Petroleum Reserve's drawdown rate would decrease gradually as various site inventories deplete and the declining number of

remaining caverns containing crude oil become a constraint on the site's drawdown rate. Figure 7 illustrates the Strategic Petroleum Reserve's current physical drawdown capability, without distribution constraints, which provides for a drawdown of approximately 60 percent of the Reserve in 90 days, 89 percent of the Reserve in 180 days, and 100 percent of the Reserve in 330 days.

Table 8

Current Sustained Capabilities  
(thousands of barrels per day)

	Drawdown	Distribution
Seaway Group	1,100	390
Texoma Group	1,400	1,200
Capline Group	830	730
	3,330	2,320

The Strategic Petroleum Reserve's drawdown capabilities are currently constrained by the Strategic Petroleum Reserve's distribution terminal throughput capabilities and the private sector distribution and refining capabilities. Based on these current distribution constraints, the Strategic Petroleum Reserve is currently capable of being initially drawn down and distributed at a maximum sustained rate of 2.3 million barrels per day for a 120-day period. After 120 days, the Strategic Petroleum Reserve drawdown/ distribution rate would decrease gradually as the site inventories deplete. Figure 8 illustrates the Strategic Petroleum Reserve's current physical drawdown/distribution capability, which provides for a distribution of approximately 42 percent of the Reserve in 90 days, 71 percent of the Reserve in 180 days and 100 percent of the Reserve of the Reserve in 490 days.

The Strategic Petroleum Reserve currently has a Distribution Enhancement Program underway to improve the SPR's distribution system in order to achieve a higher drawdown/distribution capability. Details of the Strategic Petroleum Reserve Distribution Enhancement Program are described in sub-section D.

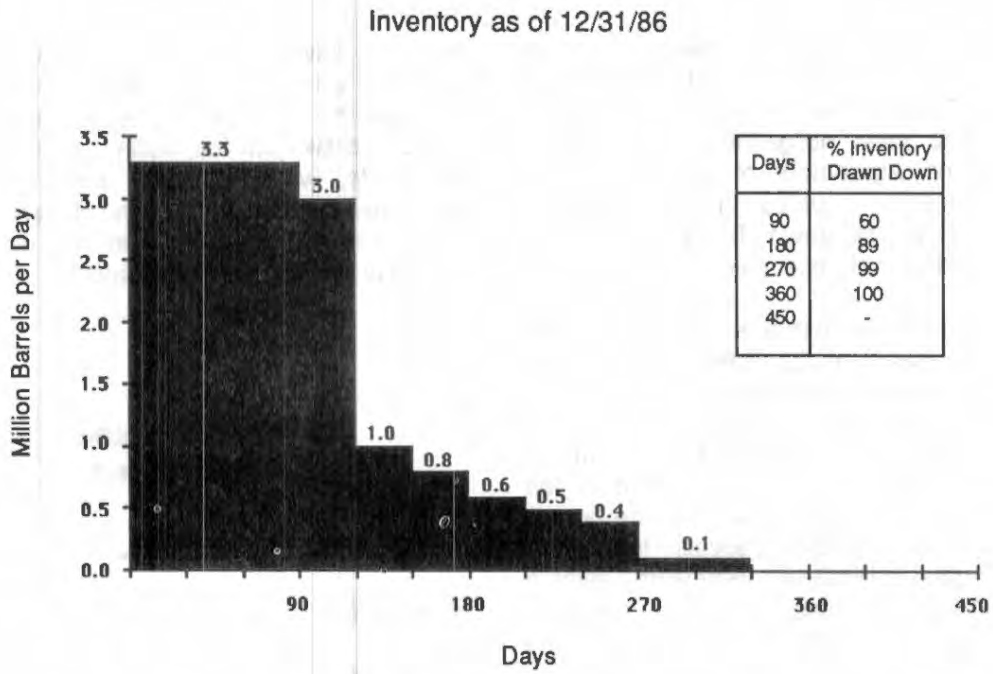


Figure 7. Strategic Petroleum Reserve Drawdown Capability

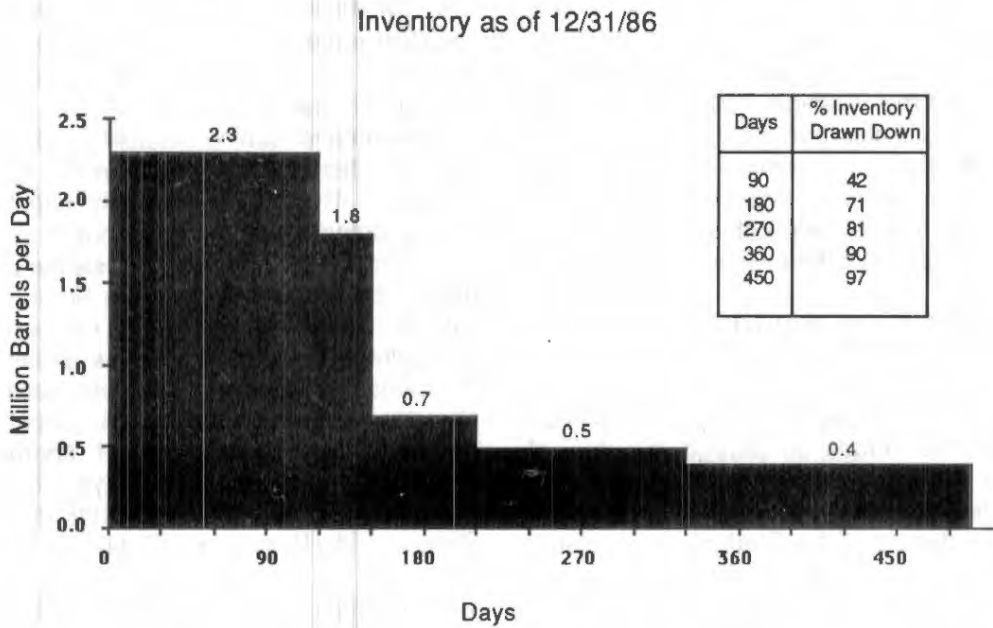


Figure 8. Strategic Petroleum Reserve Drawdown/Distribution Capability

**C. DRAWDOWN AND DISTRIBUTION TESTS**

During January 1986, the Strategic Petroleum Reserve completed its test sale of crude oil which commenced November 18, 1985, pursuant to the Energy Policy and Conservation Amendments Act of 1985. A detailed explanation of the test sale can be found in the "Strategic Petroleum Reserve Quarterly and Test Sale Report", dated May 15, 1986.

In addition to the test sale, three subsequent successful tests of the Strategic Petroleum Reserve's physical drawdown capabilities were conducted during 1986:

- o On April 22 and 23, 1986, 1.1 million barrels were drawn down from the Weeks Island storage site and delivered to the Reserve's St. James Terminal;
- o On May 6 and 7, 1986, 900,000 barrels were drawn down from the Bayou Choctaw storage site and delivered to the St. James Terminal; and,
- o On December 18 and 19, 1986, approximately 500,000 barrels were drawn down from the Bryan Mound storage site and delivered to the Phillips 66 Jones Creek tank farm.

**D. DISTRIBUTION ENHANCEMENTS**

In 1984 the Department performed a comprehensive study of the Strategic Petroleum Reserve's physical distribution system in light of the numerous physical and market changes that had taken place in the private sector during the early 1980's. The most significant of these changes was the decline in crude oil demands by the Mid-West refiners, resulting in the conversion to natural gas transmission of two major interstate pipelines to which the Strategic Petroleum Reserve was connected (Seaway and Texoma). The 1984 distribution study revealed that the Strategic Petroleum Reserve's distribution capability would be limited to 2,320,000 barrels per day if no distribution system enhancements were made. In late 1984 the Strategic Petroleum Reserve initiated a distribution enhancement program to assure the Strategic Petroleum Reserve distribution capability will adequately support the Strategic Petroleum Reserve drawdown performance. Distribution enhancements underway will provide the following capability:

<u>End of</u>	<u>Drawdown Capability</u>	<u>Distribution Capability</u>	<u>Percent</u>
1986	3,300 MB/D	2,320 MB/D	70
1987	3,570 MB/D	3,030 MB/D	85
1988	3,570 MB/D	3,270 MB/D	92
1989	3,570 MB/D	3,570 MB/D	100

**Seaway Group**

Distribution enhancements identified for the Strategic Petroleum Reserve's Seaway group distribution system include meter modifications for custody metering at Phillips 66 marine terminal in Freeport, Texas, to which the Strategic Petroleum Reserve's Seaway group is currently connected for oil fill and drawdown, and construction of a new pipeline from the Bryan Mound storage site to the ARCO pipeline terminal and docks in Texas City, Texas, as well as enhancements to the ARCO terminal in Texas City. These enhancements were approved by Congress in January 1985 and are in the process of being implemented. During 1985, engineering design and acquisition of line pipe were completed. Land rights for the construction of a 46-mile, 40-inch pipeline to Texas City, Texas were acquired, and construction began during 1986. Pipeline construction was approximately 77 percent complete by the end of 1986. Contract negotiations with both the ARCO Pipeline Company and Phillips 66 for Strategic Petroleum Reserve terminaling services at the Texas City and Freeport marine facilities, respectively, were completed as of the end of 1986 and modifications to these terminals were initiated. These enhancements will increase the Seaway group distribution capability from 390,000 barrels per day to 1,100,000 barrels per day, consistent with the Strategic Petroleum Reserve's planned drawdown objective, and are scheduled to be completed by July 1987.

**Texoma Group**

Distribution enhancements identified for the Strategic Petroleum Reserve's Texoma group distribution system include construction of a new oil pipeline from the West Hackberry storage site to the Lake Charles, Louisiana, refining area with additional marine distribution capabilities through two commercial terminals in Lake Charles, and construction of a pipeline to a second commercial marine terminal in the Beaumont, Texas, area in the general vicinity of Sun Terminal.

During 1986, engineering design and acquisition of land rights for the West Hackberry-to-Lake Charles pipeline were initiated, with construction expected to begin in 1988.

The identified Texoma Group enhancements are scheduled to be complete by September 1991 and will increase the group's distribution capability from 1,200,000 barrels per day to 1,830,000 barrels per day. The planned drawdown rate for Texoma, with completion of the Big Hill site, is 2,330,000 barrels per day. Actions regarding the additional required 500,000 barrels per day distribution capability have been deferred pending further analysis of available alternatives with the objective of securing the most cost-effective alternative by the time the additional capability is required.

### **Capline Group**

The Strategic Petroleum Reserve's original 1984 distribution study did not identify or recommend distribution enhancements to the Capline Group because a detailed Capline distribution analysis had not yet been completed. In 1985, the Strategic Petroleum Reserve completed an in-depth study of the Strategic Petroleum Reserve's Capline group distribution system. The Strategic Petroleum Reserve's Capline study revealed the need for distribution enhancements to alleviate physical constrictions on simultaneous pipeline and dock distribution and operational restrictions associated with distributions through the LOCAP Terminal.

Distribution enhancements identified for the Strategic Petroleum Reserve's Capline group distribution system include St. James Terminal metering and piping modifications, a direct pipeline connection to the Capline Pipeline Terminal, and connecting the Capline group to additional dock facilities in the St. James area. These enhancements will increase the Capline group's distribution capability from 730,000 barrels per day to 1,070,000 barrels per day. Engineering design of the Capline Terminal connection was initiated during 1986. Capline group enhancements are scheduled for completion by March 1989.

### **E. VULNERABILITY IMPACT**

During 1986, world oil prices declined significantly, affecting U.S. petroleum consumption, production, and imports. In 1985 U.S. oil imports were low and came from relatively secure sources. Net crude oil imports, less Strategic Petroleum Reserve fill volume, were 1.05 billion barrels in 1985 and 1.43 billion barrels in 1986 for an increase of approximately 36 percent. This increase in imports can be attributed to increased U.S. consumption triggered by the precipitous drop in crude oil prices that occurred in early 1986. As might be expected,

the incremental source of greater imports are the Middle East OPEC nations, whose exports to the U.S. are more than two times the 1985 level. In this case, Saudi Arabia is the primary source of the incremental increase.

Perception of this trend led the Department of Energy to conduct a "U.S. Strategic Petroleum Reserve Fill Analysis" in July 1986, on the basis of which, the Administration issued a statement in August 1986 reaffirming support for a 750 MMB Strategic Petroleum Reserve. The major conclusions of this study are as follows:

With rising oil consumption and reduced non-OPEC production, OPEC countries may regain a greater than 50 percent share of the world oil market. Most of the world's oil production will again originate from the potentially insecure Persian Gulf region.

Rising import levels and reliance on Persian Gulf oil increase U.S., European, and Japanese vulnerability to possible oil supply disruption.

The most important energy security precaution is to maintain adequate strategic petroleum reserves. Studies of the proper size for the U.S. Strategic Petroleum Reserves have shown that the costs of the expansion to 750 million barrels are exceeded by the expected benefits even at a low probability of disruption occurrence.

Since oil is traded worldwide with rapid price equalization in all markets, no nation is isolated from events anywhere in the oil market and releases from strategic stockpiles of any nation ease worldwide market conditions. Therefore the U.S. supports proportional stockpiling in all importing nations and coordinated drawdown plans to respond to any emergency.

In terms of total days of supply, the Strategic Petroleum Reserve inventory at the end of 1985 was 493 million barrels or an equivalent of 117 days at the 1985 average net import rate, for both crude oil and products, of 4.2 MMBD. At the end of 1986, Strategic Petroleum Reserves inventory had increased by 4 percent to 512 million barrels but the days of supply equivalent have dropped by 23.9 percent to 98 due to the higher 1986 import rate of 5.2 MMBD.

In comparison with the status in 1985, the private sector primary stocks of petroleum increased by 5% in 1986 to approximately 1.08 billion barrels. This level is fairly high within the EIA projected range of expected inventories based on historical experience. Domestic use of petroleum is up by nearly 3% in 1986 relative to the prior year. Total products supplied were 15.652 million barrels per day in 1985 and 76.1 million barrels per day in 1986.

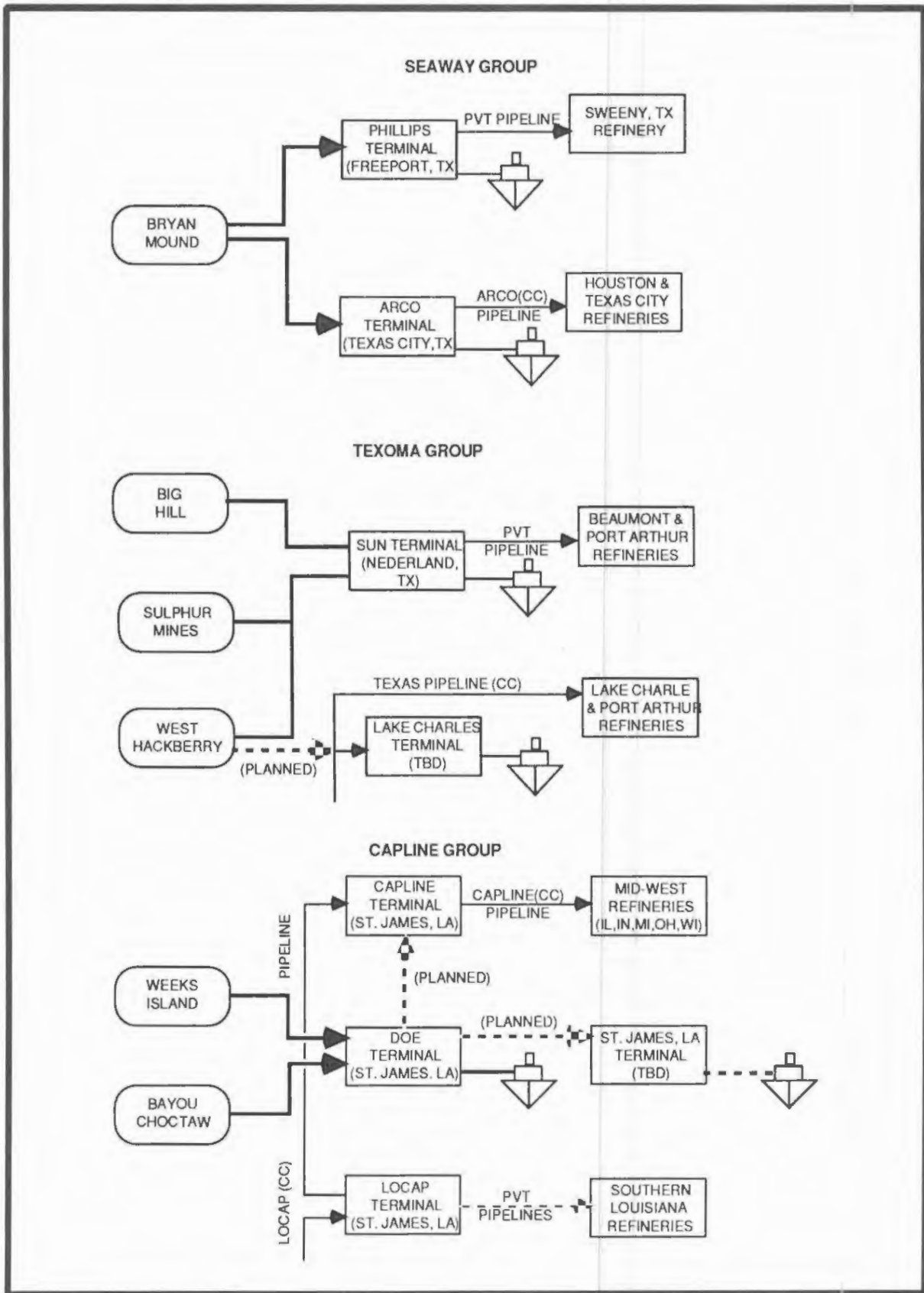


Figure 9 - Current and Planned Strategic Petroleum Reserve Distribution System for the Seaway, Texoma, and Capline Groups



**APPENDIX  
STRATEGIC PETROLEUM RESERVE  
SITE STATUS AND CRUDE OIL SPECIFICATIONS**

- A. Bayou Choctaw
- B. Weeks Island
- C. Bryan Mound
- D. Sulphur Mines
- E. West Hackberry
- F. Big Hill
- G. St. James Terminal
- H. Strategic Petroleum Reserve  
Crude Oil Specifications





## A. BAYOU CHOCTAW

### Location

Iberville Parish, Louisiana (12 miles southwest of Baton Rouge, Louisiana).

### Acquisition

In April 1977, DOE acquired 355.95 acres fee simple by condemnation from numerous private owners. Union Texas Petroleum (a subsidiary of Allied Corporation) was the previous operator.

In 1985, DOE acquired an additional existing cavern through a cavern exchange agreement with Union Texas Petroleum. The transaction involved a 3.5 acre exchange with no net change in Government-owned acreage.

### Environmental/Permits

Environmental Impact Statement published December 1976; supplement published May 1977.

Four major Federal and State permits related to pipeline, well pad, storage, and storm water runoff acquired in 1978, and updated in 1980 and 1981.

### Site Description

A 72-million-barrel storage facility consisting of 62 million barrels in five existing caverns, plus 10 million barrels of storage capacity in a new SPR-developed cavern.

Oil, brine, raw water piping distribution system connecting caverns with central plant, water intake structure, and brine disposal wells. Consists of over 50,000 feet of piping and 18 pumps totaling over 20,000 horsepower.

Twelve brine disposal wells 2.5 miles offsite; pipeline for supplying brine to Union Texas Petroleum.

One hundred thousand barrel brine pit, control center, buildings, roads, well pads, and dikes.

Water intake structure in Cavern Lake on site.

### System Parameters

Oil fill via 36-inch-diameter, 37.2-mile pipeline to St. James Terminal. Sustained system rate - 110,000 bbl/d (brine disposal-constrained).

Raw water design pumping rate - 495,000 bbl/d.

Brine disposal design pumping rate - 110,000 bbl/d.

### Drawdown

Drawdown via 36-inch-diameter, 37.2-mile pipeline to St. James Terminal and to Capline pipeline.

Design drawdown capability upon completion - 480,000 bbl/d.

### Major Accomplishments

Exchange of the SPR-Cavern 102 for the Union Texas Petroleum Cavern 17 was completed.

A construction contract for Cavern 101 surface facilities was awarded.

Drawdown exercise successfully delivered 900,000 MB of crude oil to St. James Terminal at design rate.

Approximately 45 million barrels of oil are in storage.

## B. WEEKS ISLAND

### Location

Iberia Parish, Louisiana (95 miles southwest of New Orleans).

### Acquisition

Acquired 382.92 acres fee simple subsurface and 6.63 acres fee simple surface by condemnation September 1977 from Morton Salt Company.

### Environmental/Permits

Environmental Impact Statement published January 1977; supplement published August 1977.

Major Federal permit related to oil pipeline to St. James Terminal acquired in 1978. Three major Federal and State permits related to oil storage, air emissions and storm water, and treated sewage effluent discharge acquired in 1979; NPDES updated in 1982.

### Site Description

Conventional salt mine containing 73 million barrels of storage capacity in two levels, room and pillar design, dedicated to sour crude oil storage.

## B. WEEKS ISLAND (cont.)

Oil piping distribution system consists of 11 (10 operational and one reserve) submersible electric pumps in the mine to boost crude to the surface and twin main-line pumps (plus one reserve) to deliver crude to the St. James, Louisiana Terminal during drawdown. Pumps total 17,000 horsepower.

500,000 gallon firewater tank and pumps.

Mine inert gas and vapor recovery systems.

### System Parameters

Oil fill via 36-inch-diameter, 67.2-mile pipeline from St. James Terminal. Sustained system rate - 350,000 bbl/d (terminal throughput limited).

### Drawdown

Drawdown via 36-inch-diameter, 67.2-mile pipeline to St. James Terminal and to Capline pipeline.

Design drawdown capability - 590,000 bbl/d.

### Major Accomplishments

Implemented major risk abatement program to assure long-term mine stability.

Drawdown exercise successfully delivered 1.1 million barrels of crude oil to St. James Terminal, exceeding design drawdown capability.

Approximately 73 million barrels of crude oil are in storage.

## C. BRYAN MOUND

### Location

Brazoria County, Texas (three miles southwest of Freeport, Texas).

### Acquisition

Acquired 499.47 acres fee simple by condemnation April 1977, from Freeport Mineral Company and other owners. Dow Chemical Company was the previous operator.

In 1986, DOE acquired the preexisting Brazoria County Road 242 within the site boundary through a relocation agreement with the county.

### Environmental/Permits

Environmental Impact Statement published January 1977; supplement published December 1977. Phase III supplement published October 1981.

Five major Federal and State permits related to pipelines, water intake, and storage acquired in 1977 and 1978. NPDES updated 1981; renewed 1984. Seaway Environmental Impact Statement published June 1978. Supplement published October 1981.

Two major Federal permits related to brine disposal pipeline issued in 1978. Permit for brine discharge increased to 1.1 million bbl/d August 1981.

### Site Description

226-million-barrel storage facility consisting of 66 million barrels of capacity in four caverns existing upon site acquisition, plus 160 million barrels of storage capacity in 16 new SPR-developed caverns.

36-inch-diameter, 14.6-mile brine disposal pipeline (13 miles offshore) to the Gulf of Mexico.

Oil, brine and raw water piping distribution system connecting caverns with central plant and water intake structure. Consists of over 101,000 feet of piping and 33 pumps totaling over 38,000 horsepower. Four 200,000-barrel oil storage tanks.

15,000 and 150,000-barrel brine pits, oil-brine separator, maintenance and control center buildings, roads, well pads, and dikes. Water intake structure on the Brazos River, connected by a 36-inch pipeline.

### System Parameters

Fill via 30-inch-diameter, 3.6-mile pipeline to Phillips 66 Freeport Marine Terminal. Design oil fill rate - 240,000 bbl/d. Sustained system rate - 180,000 bbl/d.

Raw water design pumping rate - 1,140,000 bbl/d.

Brine disposal design pumping rate - 980,000 bbl/d (permit limitation 1,100,000 bbl/d).

## C. BRYAN MOUND (cont.)

### Drawdown

Drawdown via 30-inch-diameter, 3.6 mile pipeline, to Phillips 66 Freeport Marine Terminal.

Drawdown via 40-inch-diameter, 46-mile pipeline to ARCO Pipeline Company's Texas City Pipeline Terminal and Docks (to be completed in FY 1987).

Design drawdown capability - 1,100,000 bbl/d.

### Major Accomplishments

Planned 226 million barrels of storage capacity have been completed.

Initiated Cavern Storage Configuration Project to enhance sweet crude drawdown capability.

Approximately 196 million barrels of crude oil are in storage.

## D. SULPHUR MINES

### Location

Calcasieu Parish, Louisiana (two miles south west of Sulphur, Louisiana, and 20 miles north of West Hackberry salt dome).

### Acquisition

Acquired 109.63 acres fee simple and 64.52 acres conditional fee by condemnation in February 1979 from Union Texas Petroleum ( a subsidiary of Allied Corporation).

### Environmental/Permits

Environmental Impact Statement published March 1978.

Three major Federal and State permits for pipeline construction, oil storage, and air emissions acquired in 1978. Environmental Protection Agency discharge permits for storm water and sewage acquired in 1980.

### Site Description

26-million-barrel storage facility consisting of three existing caverns.

Oil, brine, raw water piping distribution system connecting caverns with central plant, water intake structure, and brine disposal wells. Consists of over 77,000 feet of piping and 18 pumps totaling over 8,000 horsepower. Four deep-injection brine disposal wells.

Two 100,000 barrels brine ponds, control center building, roads, well pads, and dikes.

Water intake structure 1.8 miles offsite on Houston Canal (Sabine River Diversion Canal No. 5) connected to facility by a combination of 16 and 12 inch pipelines.

### System Parameters

Oil fill via 16-inch-diameter, 15.9-mile spur pipeline connecting to DOE West Hackberry pipeline at Intracoastal Waterway. Sustained system rate - 80,000 bbl/d (brine disposal-constrained).

Raw water design pumping rate - 100,000 bbl/d.

Brine disposal design pumping rate - 80,000 bbl/d.

### Drawdown

Drawdown via 16-inch-diameter, 15.9-mile spur pipeline to Intracoastal Waterway, then through 42-inch-diameter West Hackberry line, 34.4 miles to Sun Terminal, Nederland, Texas.

Design drawdown capability - 100,000 bbl/d.

### Major Accomplishments

Approximately 26 million barrels of crude oil are in storage.

## E. WEST HACKBERRY

### Location

Cameron Parish, Louisiana (12 miles southwest of Lake Charles, Louisiana).

### Acquisition

Acquired 405.36 acres fee simple by condemnation in April 1977, from numerous private landowners. Olin Corporation was the previous site operator.

Acquired 160.0 additional acres fee simple by condemnation in two actions, July 1979 and March 1980.

### Environmental/Permits

Environmental Impact Statement published January 1977; supplement published April 1977. Phase III supplement published October 1981.

Six major Federal and State permits related to pipelines, drilling pads, water intake, and storage acquired in 1977 and 1978; NPDES permit renewed 1984.

Texoma Environmental Impact Statement published November 1978; supplement published in October 1981.

Two major Federal permits related to a brine pipeline acquired in 1980.

### Site Description

219-million-barrel storage facility consisting of 49 million barrels in five caverns existing upon site acquisition, plus 170 million barrels of storage capacity in 17 new SPR-developed caverns.

Oil, brine, raw water piping distribution system connecting caverns with central plant, water intake

structure, and disposal wells. Consists of over 160,00 feet of piping and 47 pumps totaling over 62,000 horsepower. 36-inch-diameter, 27-mile brine disposal pipeline (nine miles offshore) to Gulf of Mexico.

175,000-barrel brine pit, oil-brine separator, control center and maintenance buildings, roads, well pads, and dikes.

Water intake structure on Intracoastal Waterway, 42-inch-diameter, 4.5-mile pipeline connecting to site.

### System Parameters

Fill via 42-inch diameter, 42.8-mile pipeline to Sun Terminal, Nederland, Texas. Design oil fill rate - 225,000 bbl/d. Sustained system rate - 175,000 bbl/d.

Raw water design pumping rate - 1,450,000 bbl/d

Brine disposal design pumping rate - 900,000 bbl/d (permit limitation 1,088,000 bbl/d) via 36-inch pipeline to the Gulf of Mexico.

### Drawdown

Drawdown via 42-inch-diameter, 42.8-mile pipeline to Sun Terminal, Nederland, Texas.

Design drawdown capability - 1,400,000 bbl/d.

### Major Accomplishments

Approximately 180 million barrels of storage capacity have been completed.

Approximately 169 million barrels of crude oil are in storage.

## F. BIG HILL

### Location

Jefferson County, Texas (20 miles southwest of Beaumont, Texas).

### Acquisition

Acquired 268.61 acres fee simple by condemnation from two landowners, i.e., 238.55 acres from Amoco

and 24.60 acres from the Pipkin estate and 5.46 acres from the Patrick Henry Phelan estate.

### Environmental/Permits

Environmental Impact Statement published in October 1981.

## F. BIG HILL (cont.)

State permits for drilling, underground hydrocarbon storage, pipeline operations, air quality, water appropriation, and water quality certifications were acquired in 1983. EPA National Pollutant Discharge acquired in 1984.

### Site Description

160-million-barrel storage facility consisting of fourteen 11.5-million barrel storage caverns.

Oil, brine, and raw water systems connecting caverns with central plant, water intake structure, and brine disposal system.

48-inch diameter brine disposal pipeline extending to a point 3.5 nautical miles into the Gulf of Mexico.

Water intake structure on the Intracoastal Waterway connecting to the site by a 48-inch diameter pipeline.

### System Parameters

Fill via 36-inch-diameter, 25 mile pipeline from Sun Terminal, Nederland, Texas. Sustained system rate - 280,000 bbl/d.

Raw water design pumping rate - 1,400,000 bbl/d.

Brine disposal design pumping rate - 1,400,000 bbl/d (permit limitation of 1,700,000 bbl/d).

### Drawdown

Drawdown via 36-inch-diameter, 25 mile pipeline to Sun Terminal, Nederland, Texas.

Design Drawdown capability - 930,000 bbl/d.

### Major Accomplishments

Construction of Stage I Site Facilities was completed.

Construction of Raw Water Intake Structure was completed.

Acquisition of crude oil, brine and raw water pipeline rights-of-way was completed.

Construction of Raw Water and Brine Pipelines was awarded in May 1986 and was 94% complete at end of 1986.

Construction of Crude Oil Pipeline was awarded in May 1986 and was 98% complete at end of 1986.

Construction of Stage II site facilities was awarded in August 1986.

## G. ST. JAMES TERMINAL

### Location

St. James Parish, Louisiana (45 miles southeast of Baton Rouge, Louisiana, on the Mississippi River).

### Acquisition

Acquired 104.76 acres of fee simple for terminal by condemnation in May 1978.

Acquired 47.68 acres fee simple for docks by condemnation in July 1978.

### Environmental/Permits

St. James' Terminal Environmental Impact Statement is a component of the Bayou Choctaw supplement, published May 1977, and the Weeks Island supplement, published August 1977.

Two Major Federal and State permits related to dock construction acquired in 1978. Environmental Protection Agency discharge permit for storm water and sewage acquired in 1980. Dock Construction Permit modified 1982.

### Site Description

Terminal facilities include six storage tanks totaling two million barrels of capacity, tie-ins to Bayou Choctaw, Weeks Island, and to LOCAP Capline pipeline and Capline terminal complex.

Oil distribution piping system connecting docks, tanks, and pump station consists of over 35,000 feet of piping and eight pumps totaling over 12,000 horsepower, metering systems, and maintenance and control buildings.

## G. ST. JAMES TERMINAL (cont.)

Two docks with one berth each, able to accommodate vessels of up to 123,000 long tons maximum loaded displacement. A 42-inch-diameter pipeline connects the docks to the storage tanks.

### System Parameters

Tanker unloading - design unloading capacity of 40,000 bbl/hr.

Distribution from terminal to:

Bayou Choctaw: design pumping rate - 240,000,000 bbl/d;

Weeks Island: design pumping rate - 480,000 bbl/d.

Terminal throughput:

Fill sustained system rate - 350,000 bbl/d;  
Across docks - 400,000 bbl/d.

### Drawdown

Crude oil from Bayou Choctaw and/or Weeks Island to be distributed across docks and to Capline Pipeline Terminal.

### Major Accomplishments

Completed construction of a Crude Oil Quality Assurance Laboratory to provide on-site crude oil testing and analysis.

Successfully received crude oil from Weeks Island and Bayou Choctaw during two drawdown tests.

Attachment H  
SPR Crude Oil Specifications (SPRO 1985 JAN) *a*

Characteristic	Categories <i>b</i>					Primary ASTM Test Method <i>c</i>
	I	II	III	IV	V	
API Gravity [ °API]	30 - 45	40 - 45	30 - 40	34 - 40	36 - 41	D 1298
Total Sulphur [Wt. %], Max.	1.99	0.25	0.50	0.25	0.50	D 1552
Pour Point [°F(°C)], Max.	50 (10)	50 (10)	50 (10)	50 (10)	50 (10)	D 97
Salt Content [Lbs./1,000 Bbls.], Max.	50	50	50	50	50	D 3230
Viscosity [SUS @ 60°F (cSt @ 15.6°C)], Max.	150 (32)	150 (32)	150 (32)	150 (32)	150 (32)	D 445 & D 2161
Viscosity [SUS @ 100°F (cSt @ 37.8°C)], Max.	70 (13)	70 (13)	70 (13)	70 (13)	70 (13)	
Reid Vapor Pressure [Psia @ 100°F (kPa @ 37.8°C)], Max.	11 (76)	11 (76)	11 (76)	11 (76)	11 (76)	D 323
Total Acid Number [mg KOH/g], Max.	0.40	0.40	0.40	0.40	0.40	D 664
Water and Sediment [Vol. %], Max.	1.00	1.00	1.00	1.00	1.00	D473 & D 4006
Yields [Vol. %]						D 2892 & D 1160
Naphtha [ < 375°F ( < 191°C)]	24 - 30	35 - 42	21 - 29	29 - 36	30 - 38	
Distillate [ 375 - 620°F (191-327°C)]	17 - 31	21 - 35	23 - 37	31 - 45	19 - 33	
Gas Oil [620-1050°F (327-566°C)]	26 - 38	20 - 34	28 - 42	20 - 34	23 - 37	
Residuum [ > 1050°F ( >566°C)]	10 - 19	4 - 9	7 - 14	0 - 5	7 - 14	

*a*) Marketable virgin crude petroleum suitable for normal refinery processing and free of foreign contaminants or chemicals including, but not limited to, chlorinated and/or oxygenated hydrocarbon, and lead.

*b*) For SPR acquisition and storage purposes, crude oil meeting the characteristics of Category I is designated as sour, while crude oil meeting the characteristics of Categories II, III, IV and V is designated as sweet.

*c*) To the maximum extent practicable, the primary ASTM test methods listed are to be used in characterizing crude oil. While other methods may be used when the primary method is unavailable, the primary method is designated as the binding method should results of the alternative method be questioned.





UNITED STATES  
DEPARTMENT OF ENERGY  
WASHINGTON, D. C. 20585  
FE-432  
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# Strategic Petroleum Reserve Annual/Quarterly Report



February 15, 1988

**U.S. Department of Energy**  
Assistant Secretary for Fossil Energy  
Office of Petroleum Reserves

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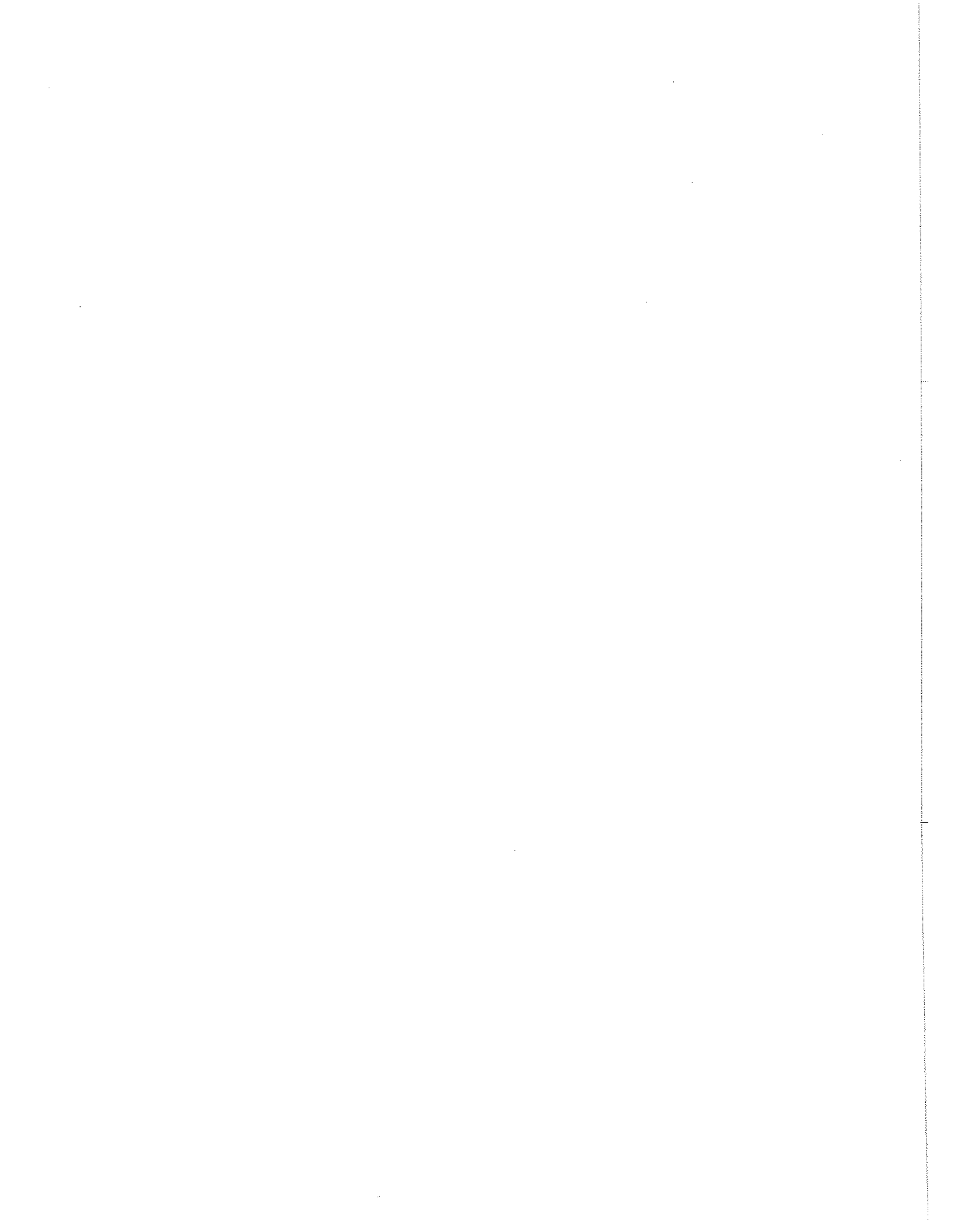
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# Strategic Petroleum Reserve Annual/Quarterly Report



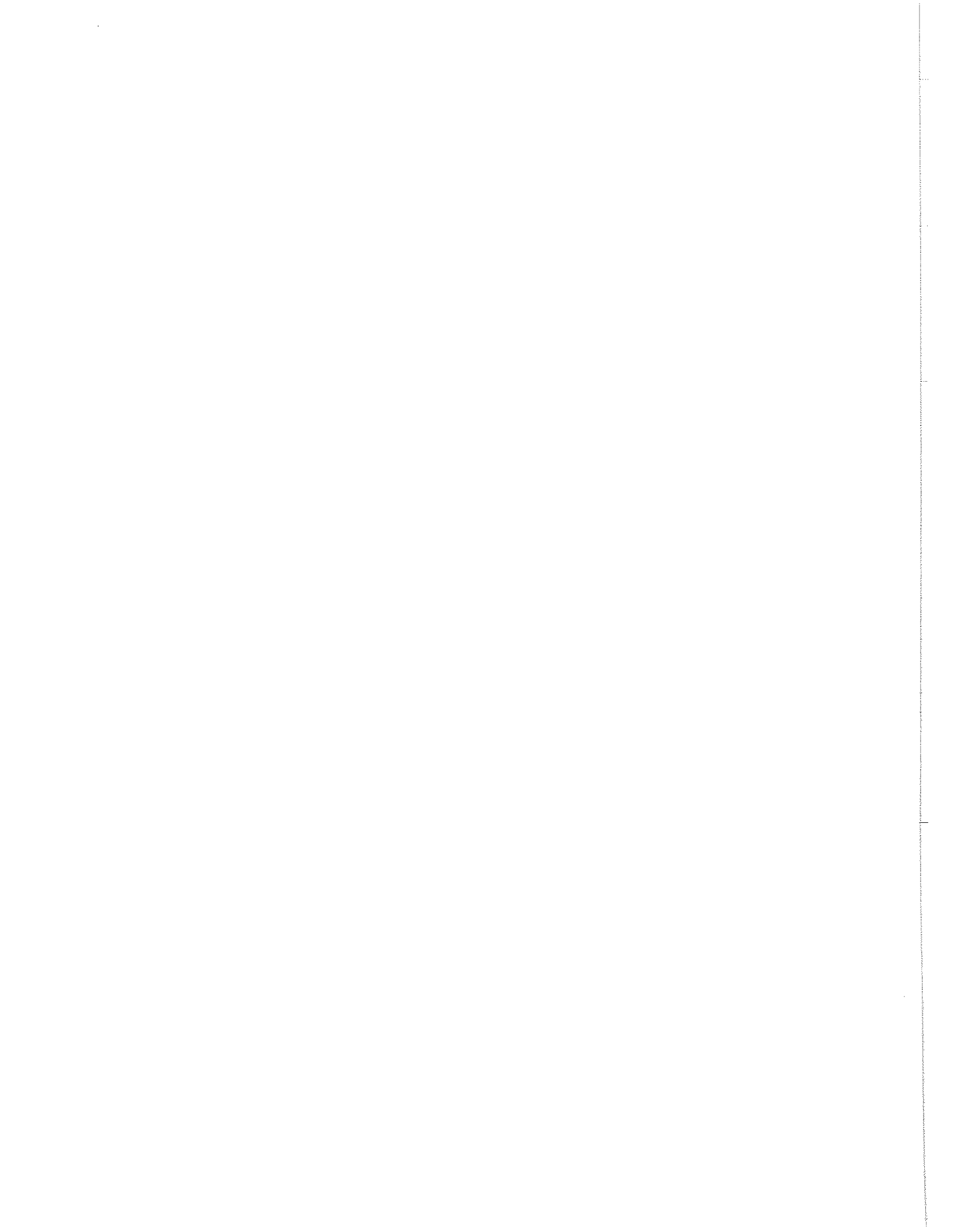
February 15, 1988

**U.S. Department of Energy**  
Assistant Secretary for Fossil Energy  
Office of Petroleum Reserves  
Washington, DC 20585



## Contents

Section	Page
EXECUTIVE SUMMARY .....	V
I. INTRODUCTION .....	1
II. STATUS OF THE STRATEGIC PETROLEUM RESERVE	
A. Storage Facilities Development.....	3
B. Oil Acquisition and Transportation.....	6
III. BUDGET AND FINANCE	
A. Appropriations.....	9
B. Major Budget and Financing Actions During FY1987.....	9
C. Major Budget Actions, Last Quarter 1987(First Quarter FY1987).....	9
D. Oil Costs Through FY 1987.....	10
E. Estimated Cost to Complete the Strategic Petroleum Reserve.....	10
IV. ORGANIZATION, MANAGEMENT, AND CONTRACTUAL SUPPORT	
A. Program/Project Management.....	12
B. Procurement and Contractor Support.....	12
C. Real Estate, Environmental Compliance, and Permits.....	12
D. Security.....	13
V. DRAWDOWN AND DISTRIBUTION SYSTEM AND VULNERABILITY IMPACT	
A. Distribution Plan.....	14
B. General Sales Procedures.....	14
C. Drawdown and Distribution Capabilities.....	14
D. Drawdown and Distribution Tests.....	15
E. Distribution Enhancements.....	16
F. Vulnerability Impact.....	17
APPENDIX: STRATEGIC PETROLEUM RESERVE SITE STATUS .....	A-1
A. Bayou Choctaw.....	A-2
B. Weeks Island.....	A-3
C. Bryan Mound.....	A-3
D. Sulphur Mines.....	A-3
E. West Hackberry.....	A-4
F. Big Hill.....	A-5
G. St. James Terminal.....	A-5
H. Strategic Petroleum Reserve Crude Oil Specifications.....	A-7
Figures	
1. Strategic Petroleum Reserve Sites .....	3
2. Annual Strategic Petroleum Reserve Oil Fill .....	7
3. Cumulative Strategic Petroleum Reserve Oil Fill .....	7
4. Strategic Petroleum Reserve Annual Funding .....	9
5. Strategic Petroleum Reserve Cumulative Funding .....	11
6. Strategic Petroleum Reserve Drawdown Capability .....	15
7. Strategic Petroleum Reserve Drawdown/Distribution Capability .....	15
8. Current and Planned Drawdown and Distribution Capabilities (year end).....	16
9. Current and Planned Strategic Petroleum Reserve Distribution System .....	18
Tables	
1. Strategic Petroleum Reserve Storage and Drawdown Criteria.....	4
2. 1987 Storage Capacity Development by Quarter.....	5
3. Strategic Petroleum Reserve Oil Inventory and Delivery Statistics.....	6
4. Strategic Petroleum Reserve Oil Fill History.....	6
5. Crude Oil Received through 1987.....	8
6. Strategic Petroleum Reserve Crude Oil Inventory.....	8
7. Strategic Petroleum Reserve Appropriations.....	11
8. Current Sustained Capabilities.....	15



## EXECUTIVE SUMMARY

### New Legislation Enacted

On December 22, 1987, the President signed the full year Continuing Resolution for fiscal year 1988 (P.L. 100-202). This legislation provides appropriations of \$164.2 million for the Strategic Petroleum Reserve Account to continue with the development and management of the Reserve and \$438.7 million for the SPR Petroleum Account to allow for filling the Reserve at an average rate of approximately 50,000 barrels a day in fiscal year 1988. Fiscal year 1988 outlays resulting from the use of the appropriation for the SPR Petroleum Account are limited to \$256.5 million. Public Law 100-202 also provides that notwithstanding the limitations in Section 160(d) of the Energy Policy and Conservation Act, as amended, the United States' share of crude oil in Naval Petroleum Reserve Number 1 (Elk Hills) may be sold or otherwise disposed of to other than the Strategic Petroleum Reserve. Further, P.L. 100-202 provides that sums in excess of \$836 million received in fiscal year 1988 as a result of the sale of products produced from Naval Petroleum Reserves Numbers 1 and 3 (Teapot Dome) shall be deposited in the SPR Petroleum Account for the acquisition and transportation of petroleum and for other necessary expenses.

### Oil Acquisition and Fill Rates

As of December 31, 1987, the Strategic Petroleum Reserve crude oil inventory was 540.6 million barrels, an increase of 29.0 million barrels over the 1986 year-end inventory of 511.6 million barrels. The Strategic Petroleum Reserve was filled at an average rate of 79,452 barrels per day during 1987.

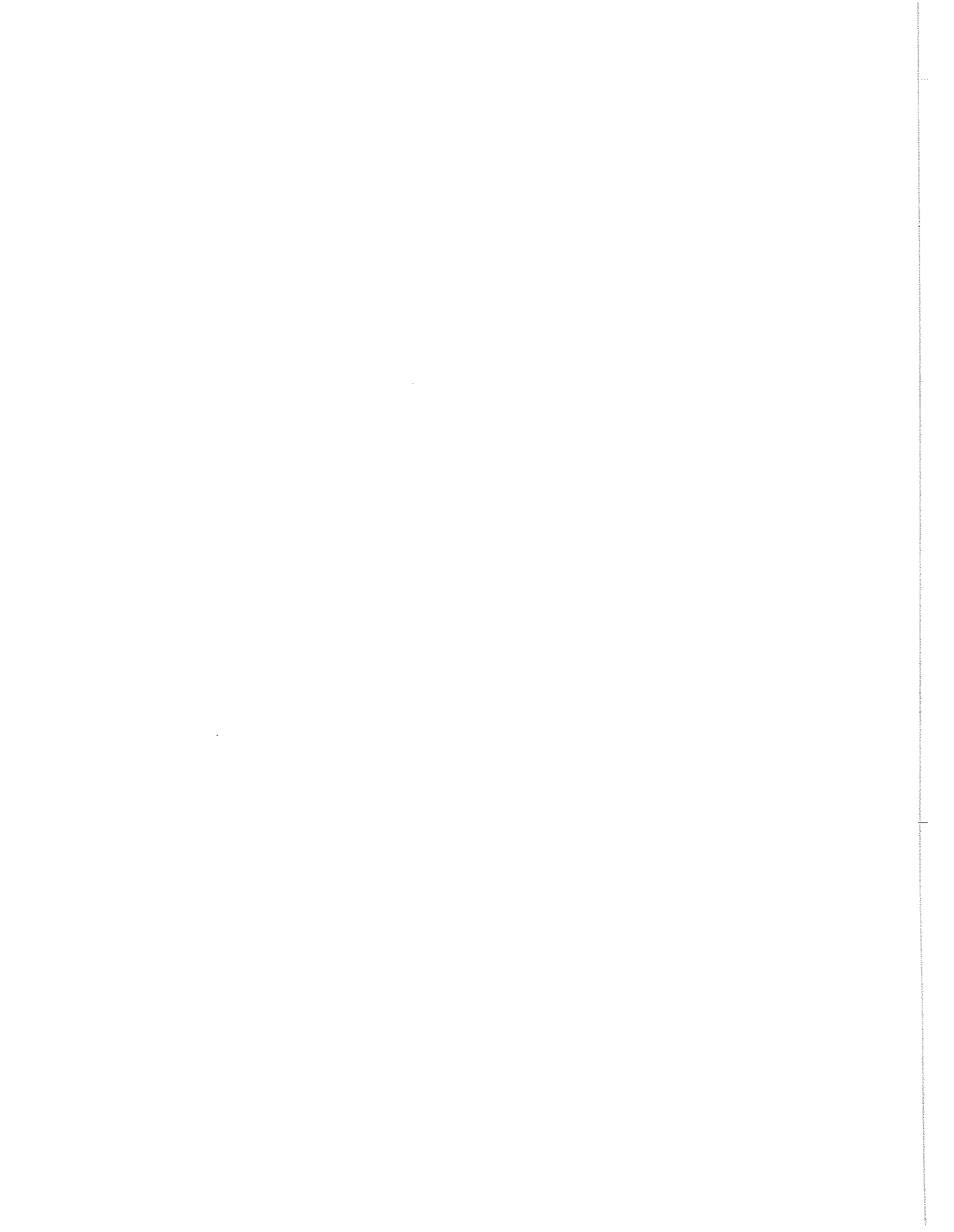
### Facilities and Storage Development

During the calendar year 1987, the Strategic Petroleum Reserve increased its crude oil storage capability from 550.7 million barrels to 578.8 million barrels. At Bryan Mound, the cavern configuration enhancement project designed to increase the site's drawdown capability for sweet crude has been completed and the site has resumed oil fill operations. West Hackberry storage capacity has increased by 18.1 million barrels and is now 90 percent completed. Bayou Choctaw's storage capacity has increased by 10 million barrels with the conversion of Cavern 17. New cavern development (or leaching) activities were initiated in July at Bayou Choctaw (1 cavern) and in October at Big Hill (10 caverns).

### Drawdown Exercises

During 1987, a number of tests of the Strategic Petroleum Reserve's physical drawdown capabilities and drawdown procedures were conducted. At Weeks Island, 4.8 million barrels of oil were circulated for 308 continuous hours to demonstrate the reliability of the drawdown system. From June 1 to July 10, 1987, the Department of Energy conducted an extensive drawdown training exercise called SPREX-87, which included the physical drawdown of 1.1 million barrels. SPREX-87 tested the readiness of the Strategic Petroleum Reserve drawdown systems and personnel as well as the enhanced drawdown and sales procedures. On October 28th, 430,000 barrels were drawn down from the Bryan Mound site to the ARCO terminal, achieving the designed flow rate of one million barrels per day.





## I. INTRODUCTION

The Secretary of Energy is required to submit annual and quarterly reports to the President and the Congress on developmental activities of the Strategic Petroleum Reserve in accordance with Section 165 of the Energy Policy and Conservation Act of 1975, as amended. Additional prospective information related to the development and fill of the Strategic Petroleum Reserve is required by the Omnibus Budget Reconciliation Act of 1986 (P.L. 99-509). This report combines the fourth quarter 1987 Quarterly Report with the 1987 Annual Report and is presented in five sections with an Appendix.

This introductory section briefly covers the program legislation and the Strategic Petroleum Reserve Plan and its amendments. The current status of the Strategic Petroleum Reserve is outlined in Section II and the appropriations, budget and finances to date are provided in Section III. Section IV addresses organization, management, and contractor support. A discussion of the drawdown system and vulnerability impact are set forth in Section V. The Appendix contains detailed information on the status of each Strategic Petroleum Reserve site and crude oil specifications.

### Program Legislation

The Strategic Petroleum Reserve was authorized by Congress with the enactment of the Energy Policy and Conservation Act (P.L. 94-163), on December 22, 1975. The authorization was extended in July 1985. P.L. 94-163 declared it to be United States policy to establish a Strategic Petroleum Reserve of up to one billion barrels of petroleum products to reduce the impact of disruptions in petroleum supplies and to carry out the obligations of the United States under the International Energy Program.

The Energy Policy and Conservation Act provisions regarding the Strategic Petroleum Reserve were amended by Title VIII of the Energy Security Act (P.L. 96-294), approved June 30, 1980. This Act established a minimum average daily fill rate of 100,000 barrels and precluded sale of Naval Petroleum Reserve Number 1 (Elk Hills) crude oil except to fill the Strategic Petroleum Reserve unless the Strategic Petroleum Reserve was being filled at the minimum rate or had reached 500 million barrels in inventory.

The Omnibus Budget Reconciliation Act of 1981 (P.L. 97-35), enacted August 13, 1981, created the off-budget "SPR Petroleum Account" as a method for financing Reserve oil acquisition and transportation without including such transactions in Federal budget totals. It also required quarterly reports on Strategic Petroleum Reserve progress and submission of a study on the ultimate size of the Reserve.

The Energy Emergency Preparedness Act of 1982 (P.L. 97-229), enacted August 3, 1982, established minimum Strategic Petroleum Reserve fill rate requirements, authorized acquisition of interim storage facilities, and required a series of plans and reports on Strategic Petroleum Reserve use and other aspects of energy emergency preparedness.

The Energy Policy and Conservation Amendments Act of 1985 (P.L. 99-58) enacted on July 2, 1985, extended the provisions relating to the Strategic Petroleum Reserve until June 30, 1989, and directed the Secretary of Energy to conduct a sale or exchange of 1.1 million barrels of Strategic Petroleum Reserve oil to test the drawdown and distribution capabilities of the Strategic Petroleum Reserve.

The Supplemental Appropriations Act for Fiscal Year 1985 (P.L. 99-88), enacted on August 15, 1985, provided, through the disapproval of deferrals, funds to continue with the development of the Reserve in fiscal year 1986 and to increase the inventory of crude oil in storage to 500 million barrels by the end of fiscal year 1986. This legislation also amended the Energy Policy and Conservation Act to permit a lower fill rate in any year in which a fill level of 500 million barrels would be reached.

The Food Security Act (P.L. 99-198), enacted on December 23, 1985, provides for the barter of agricultural commodities for crude oil to fill the Strategic Petroleum Reserve.

The Omnibus Budget Reconciliation Act of 1985 (P.L. 99-272), enacted on April 7, 1986, amended the Energy Policy and Conservation Act to require that the Strategic Petroleum Reserve be filled at a minimum rate of 35,000 barrels a day in fiscal years 1987 and 1988.

The Omnibus Budget Reconciliation of 1986 (P.L. 99-509), enacted on October 18, 1986, amended the Energy Policy and Conservation Act to require that the Strategic Petroleum Reserve be filled at a minimum rate of 75,000 barrels a day until at least 750 million barrels are in storage.

The full year Continuing Resolution for Fiscal Year 1988 (P.L. 100-202), approved by the President on December 22, 1987, provides \$164.2 million to continue with the development of a 750 million barrel Strategic Petroleum Reserve and \$438.7 million to allow for filling the Reserve in fiscal year 1988 at a rate of approximately 50,000 barrels per day. P.L. 100-202 also provides that notwithstanding the limitations in Section 160(d) of the Energy Policy and Conservation Act, as amended, the United States' share of crude oil from Naval Petroleum Reserve Numbered 1 (Elk Hills) may be sold or otherwise disposed of to other than the Strategic Petroleum Reserve.

### SPR Plan and Amendments

The Energy Policy and Conservation Act required a Strategic Petroleum Reserve Plan, which was submitted to Congress on February 16, 1977, and became effective on April 18, 1977. The Plan discussed the development and implementation of the Strategic Petroleum Reserve.

Strategic Petroleum Reserve Plan Amendment No. 1 accelerated the planned schedule for filling the Reserve. This Amendment was submitted to the Congress on May 25, 1977, and became effective on June 20, 1977. The revised goal of

500 million barrels of crude oil to be in storage by December 22, 1980, advanced the original schedule by two years. Amendment No. 2 to the Strategic Petroleum Reserve Plan authorized an increase in the Strategic Petroleum Reserve size from 500 million barrels to one billion barrels. This amendment was transmitted to the Congress on May 18, 1978, and became effective on June 13, 1978. The Amendment described the plans to store 750 million barrels of petroleum by the Department of Energy in underground storage facilities. Decisions were not made regarding the methods or timing for developing the final 250 million barrels of storage capacity.

On October 31, 1979, the Department of Energy submitted the Distribution Plan for the Strategic Petroleum Reserve (Amendment No. 3, Energy Action No. 5) to the Congress. In accordance with the provisions of the Energy Policy and Conservation Act, the Plan became effective on November 15, 1979. The Distribution Plan described the methods for drawdown and distribution of crude oil from the five existing Strategic Petroleum Reserve storage sites.

On December 1, 1982, President Reagan transmitted a new "Drawdown" (Distribution) Plan (Amendment No. 4) to the Congress for the use of the Strategic Petroleum Reserve. This plan, required under the Energy Emergency Preparedness Act of 1982 (EEPA) and effective upon its December 1, 1982 submission to the Congress, provided new procedures for the drawdown, sale, and distribution of crude oil from the Strategic Petroleum Reserve.

## II. STATUS OF THE STRATEGIC PETROLEUM RESERVE

### A. STORAGE FACILITIES DEVELOPMENT

Since 1976, the Department has been involved in a major storage facilities development program to stockpile crude oil. The Strategic Petroleum Reserve facility development program is presently designed to provide a cumulative storage capacity of 750 million barrels and a drawdown/distribution capability of 4.5 million barrels per day.

Over the last 12 years, the Strategic Petroleum Reserve has acquired and developed six underground crude oil storage facilities in salt domes along the gulf coasts of Texas and Louisiana and a Government-owned marine terminal on the Mississippi River at St. James, Louisiana. The six storage sites are Bayou Choctaw, Weeks Island, West Hackberry and Sulphur Mines in Louisiana, and Bryan Mound and Big Hill in Texas. These six storage sites are organized into three distribution systems and connected by Department of Energy pipelines to commercial crude oil pipeline networks and marine terminal facilities for drawdown/distribution. The locations of the current Strategic Petroleum Reserve storage sites and their associated distribution pipelines and terminals are shown in Figure 1.

Table 1 provides a summary of current development plans for the Strategic Petroleum Reserve, including planned site storage capacities, storage configurations, and drawdown capabilities. The current plan provides for the future (1992) decommissioning of the Sulphur Mines 26-million-barrel storage facility with replacement capacity through the expansion of two other storage sites, Big Hill and Bayou Choctaw.

### Bryan Mound

The Bryan Mound site is located in Brazoria County, Texas, approximately three miles south of Freeport. The Department acquired this storage site in 1977 and converted four existing brine caverns with a total capacity of 66 million barrels to oil storage. Expansion of the site capacity to 226 million barrels through development of 16 additional 10-million-barrel caverns was completed in 1986.

During 1987, the Department completed the conversion of the 35 million-barrel Cavern 5 from sweet to sour crude storage and four other caverns from sour to sweet. This cavern conversion project established a site capability to achieve a one-million barrel-per-day drawdown rate capability for sweet crude oil, and eliminated a pre-existing one-million-barrel oil trap in Cavern 5. The Bryan Mound site has completed all cavern development activities and has resumed oil fill operations.

### West Hackberry

The West Hackberry site is located in Cameron Parish, Louisiana, approximately 12 miles southwest of Lake Charles. The Department acquired this storage site in 1977 and converted five existing brine caverns with a capacity of 49 million barrels to oil storage. The Department is developing 17 additional 10-million-barrel storage caverns at West Hackberry through solution mining, increasing the site's total storage capacity to 219 million barrels. During 1987, the West Hackberry site increased its total storage capacity from 179.7

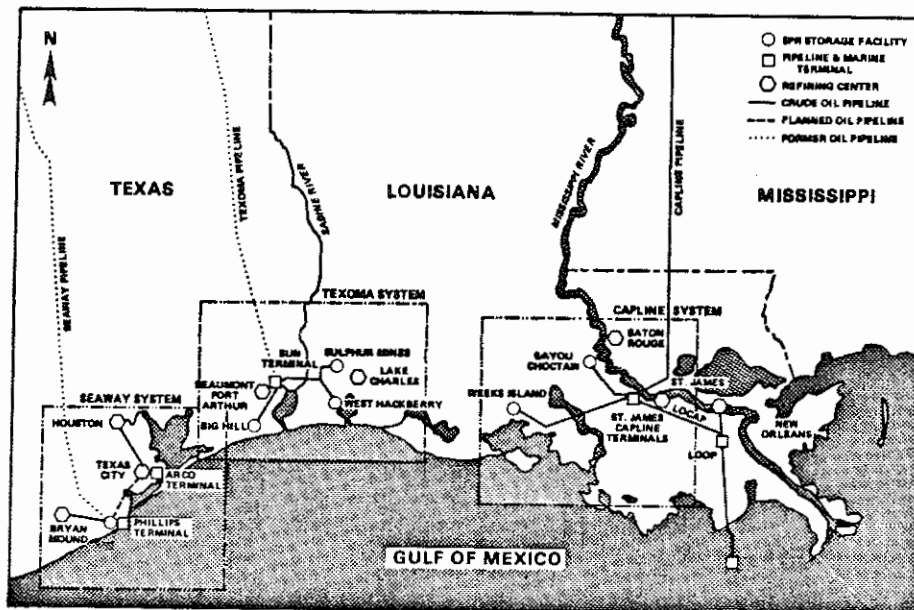


Figure 1  
Strategic Petroleum Reserve Site

million barrels to 197.8 million barrels, or 90 percent of the planned 219 million barrels goal. Four caverns which range between 55 and 90 percent completion continue to be developed. These caverns will be completed during 1988.

**Table 1**  
**Strategic Petroleum Reserve Storage and Drawdown Criteria**

STORAGE GROUP	STORAGE FACILITIES	STORAGE CAPACITY (MMB)	CRUDE MIX (Sweet/Sour)	DRAWDOWN CAPABILITY (MB/D)
SEAWAY GROUP	Bryan Mound	226	66/160	1,100
TEXOMA GROUP	West Hackberry	219	112/107	1,400
	Sulphur Mines	--	--	--
	Big Hill	160	69/91	930
		<u>379</u>	<u>181/198</u>	<u>2,330</u>
CAPLINE GROUP	Bayou Choctaw Weeks Island	72	34/38	480
		73	0/73	590
		<u>145</u>	<u>34/111</u>	<u>1,070</u>
TOTAL		750	281/469 37%/63%	4,500

### Sulphur Mines

The Sulphur Mines site is located in Calcasieu Parish, Louisiana, approximately 12 miles west of Lake Charles. The Department acquired this storage site in 1979 and converted three existing brine caverns with a capacity of 26 million barrels to oil storage. Development and fill of this site were completed in 1983. The Sulphur Mines site is currently in an operational standby mode.

Sulphur Mines was originally acquired to meet the accelerated fill schedule established under the initial Strategic Petroleum Reserve Plan. However, Sulphur Mines' small capacity and operational capabilities significantly limit its cost effectiveness and drawdown utility. With only 26 million barrels of capacity, Sulphur Mines incurs the highest per-barrel standby costs, and the site's low drawdown rate and distribution configuration limit its value as an oil storage facility for the Strategic Petroleum Reserve.

Following completion of a 1986 study, the Department concluded that the government would save up to \$90 million over 20 years, and enhance the Strategic Petroleum Reserve's drawdown performance through consolidation of the 26 million barrels of Sulphur Mines storage capacity at other Strategic Petroleum Reserve storage sites. The Department plans to decommission the site in 1992. Sulphur Mines storage capacity will be replaced by developing an additional 20 million barrels of capacity at Big Hill and 6 million at Bayou Choctaw. Oil transfer to the Big Hill site is planned to be

initiated in fiscal year 1991; site decommissioning and transfer to the General Services Administration for appropriate disposition would occur in fiscal year 1992 following completion of oil transfer.

### Big Hill

The Big Hill storage site is located in Jefferson County, Texas, 20 miles southwest of Beaumont. The Department of Energy acquired this undeveloped site in 1982. The Department has been constructing a new storage facility at this site with a planned storage capacity of 160 million barrels and a drawdown capability of 930,000 barrels per day. The site's planned storage capacity was expanded to 160 million barrels to accommodate the future decommissioning of the Sulphur Mines site, as mentioned above. The expanded (20 million barrels) capacity will be achieved by increasing the size of each Big Hill cavern from 10 million barrels to approximately 11.5 million barrels, which can be accomplished without any site redesign, drilling or further surface construction.

During 1987, significant onsite and offsite construction efforts were completed. Five new cavern well pads were constructed and major site piping was installed. In May, the Department completed construction of the 5.3 mile fresh water pipeline to the raw water intake structure and the 14.1 mile brine disposal pipeline to the Gulf of Mexico. In June, the Department completed construction of the 25.2 mile crude oil pipeline to the Sun Terminal at Nederland, Texas. A final tie-in to the Sun Terminal pumping facilities is planned during 1988. In August, the Department completed construction of the central control building and installation of the site's distributive control system which will remotely control all site systems and equipment. Construction of the site's crude oil handling system for oil storage and withdrawal is in progress with completion planned for spring 1988.

In preparation for cavern development (leaching) operations, the Department tested brine from the 28 wells and found some atypical elements and compounds. After flushing, the brine has been determined to be normal and acceptable for disposal into the Gulf of Mexico.

Cavern development operations commenced on schedule on October 1, 1987. By the end of the year the Department had a total of ten caverns being leached and plans to have all fourteen under development by May 1, 1988. The Big Hill storage site is planned to achieve an initial oil fill capability by May 31, 1989 and complete its 160 million barrel capacity development by June 30, 1991. The total development cost for the Big Hill storage facility through 1991 is estimated to cost approximately \$400 million or \$2.50 per barrel.

### Bayou Choctaw

The Bayou Choctaw site is located in Iberville Parish, Louisiana, approximately 12 miles southwest of Baton Rouge. The Department acquired this storage site in 1977 and converted four existing brine caverns with a capacity of 46 million barrels to oil storage.

In 1985, the Department acquired a fifth existing cavern (No.

17) through an exchange agreement with Union Texas Petroleum. In March 1987, the SPR completed the conversion and certification testing of this cavern. Approximately 6.2 million barrels of oil were injected into the cavern between April and July 1987.

Further development plans for Bayou Choctaw include the construction of a new 10-million barrel cavern (No. 101) and the enlargement of one of the initial four existing caverns (No. 18) by 6 million barrels. During 1987, the Department completed construction of the cavern 101 well pad and all cavern piping and instrumentation required for leaching. In preparation for leaching operations, DOE refurbished and expanded the brine filtration system, installed additional polishing filters, and worked-over 10 of the 12 brine disposal wells. Leaching of Cavern 101 was initiated in July 1987. Cavern 101 is planned to complete its 10-million-barrel capacity development by April 1990. At that time the oil in Cavern 18 will be transferred to Cavern 101 and leaching of Cavern 18 will commence. The Bayou Choctaw site is planned to achieve its total storage capacity of 72 million barrels by September 1991.

#### Weeks Island

The Weeks Island site is located in Iberia Parish, Louisiana, approximately 95 miles southwest of New Orleans. The Department of Energy acquired this storage site in 1977 and converted an existing conventional salt mine with a capacity of 73 million barrels to oil storage. Development and fill of this site was completed in 1982. The Weeks Island site is currently in an operational standby mode.

During February and March 1987, 4.8 million barrels were pumped to the surface and then reinjected into the mine's fill holes to determine the site's drawdown system reliability. Shortly thereafter, the brine level was observed to be rising in the fill-hole sump which caused concern that there might be water entering the mine. A complete investigation, which included pumping brine from the sump and reworking the fill holes revealed that no measurable water intrusion was occurring. The source of the brine currently in the mine fill-hole sump and also beneath the oil throughout the mine consists both of water normally contained in crude oil which settles-out over time, and water injected into the mine following pipeline hydrotesting. The majority of this brine is contained in depressions in the irregular mine floor where it was allowed to accumulate and minimize oil entrapment in these depressions upon withdrawal. Several thousand barrels of the brine collected in the fill-hole sump is being removed to enable accurate and regular monitoring of the oil/brine interface.

The Department has established a preliminary cooperative agreement with Morton Thiokol, Incorporated, to install subsidence detection monuments on Thiokol's adjacent property and to measure long-term subsidence over the Strategic Petroleum Reserve's oil storage facility (mine) and Morton's active salt mine.

### Strategic Petroleum Reserve Storage Capacity Development

The Strategic Petroleum Reserve's total permanent storage capacity increased by 28.1 million barrels during the year, from 550.7 to 578.8 million barrels (Table 2). All of this new permanent capacity was developed at Bayou Choctaw and West Hackberry. Bayou Choctaw accounted for 10.0 million barrels of new permanent sour crude capacity with the completion of Cavern 17 conversion in March 1987.

At West Hackberry, 18.1 million barrels of new permanent storage capacity was developed. A negative adjustment of 2.2 million barrels was made in the fourth quarter to correct inaccuracies in previously stated permanent capacity of certain caverns. These errors were revealed by final cavern oil fill and are attributed to inaccurate sonar measurements. To correct for these undersized caverns, minor adjustments have been made to the leaching plan to achieve the final site capacity of 219 million barrels. The current plan provides for the size of four caverns to be increased slightly. This change in cavern sizing results in a minor change in the site's sweet/sour crude mix ratio. Approximately 1.3 million barrels of capacity has been shifted from sweet to sour crude oil storage.

**Table 2**  
**Storage Capacity Development By Quarter**  
**(In Millions Barrels)**

Storage Facility	1986 Year End	1st Quarter	2nd Quarter	3rd Quarter	4th Quarter	1987 Year End
Bryan Mound	226.0	0.0	0.0	0.0	0.0	226.0
West Hackberry	179.7	2.4	7.4	10.5	-2.2*	197.8
Bayou Choctaw	46.0	10.0	0.0	0.0	0.0	56.0
Weeks Island	73.0	0.0	0.0	0.0	0.0	73.0
Sulphur Mines	26.0	0.0	0.0	0.0	0.0	26.0
<b>TOTAL</b>	<b>550.7</b>	<b>12.4</b>	<b>7.4</b>	<b>10.5</b>	<b>-2.2*</b>	<b>578.8</b>

\* Capacity adjustment to correct inaccuracies in sonar measurements revealed by final oil fill.

#### Capital Improvements

Several major capital improvement projects designed to upgrade site facilities, particularly in the areas of fire protection and personnel safety, were completed or initiated in 1987 at all of the Strategic Petroleum Reserve's facilities. At Bryan Mound, all cast iron fire-water piping between the raw water intake and the foam generator building was replaced with cement-lined steel pipe, and vehicle/personnel emergency exit gates for rapid escape in the event of fire were installed at all well pads. General fire protection systems were expanded or upgraded by adding more hydrants, replacing piping, and installing halon fire-depressant systems in the control room.

At Bayou Choctaw and West Hackberry, fire-protection foam deluge systems were placed into operation and a flammable

material storage building was constructed at West Hackberry. At St. James, installation of the foam deluge system was initiated and erosion control measures around Dock No. 1 supports were completed.

At the Weeks Island site, a new production shaft headframe and modified hoist system for personnel and equipment was completed and placed in service, and the emergency power generator for the service shaft hoist was modified to increase dependability. At Sulphur Mines, the Strategic Petroleum Reserve completed construction of a bulkhead to prevent erosion around a 16-inch pipeline crossing the Intracoastal Waterway.

## B. OIL ACQUISITION AND TRANSPORTATION

### Statistics For Fourth Quarter 1987

The Strategic Petroleum Reserve was filled at an average rate of 73,464 barrels per day during the calendar quarter ending December 31, 1987. As of December 31, 1987, the Strategic Petroleum Reserve crude oil inventory was 540,648,299 barrels. Table 3 summarizes the Strategic Petroleum Reserve crude oil inventory and delivery statistics as of December 31, 1987.

During the period of October 1, 1987, through December 31, 1987, only high sulfur (sour) crude oil was delivered to the Strategic Petroleum Reserve terminals. The weighted average price per barrel of the sour crude oil delivered to the Strategic Petroleum Reserve terminals during this period was \$17.27 per barrel including costs for, transportation, but excluding costs for customs duties, environmental taxes, and terminal handling.

### Oil Fill, Calendar Year 1987

During 1987, the Strategic Petroleum Reserve crude oil inventory was increased by 29.0 million barrels, representing an average annual fill rate of 79,452 barrels per day. This average daily fill rate exceeded the 70,066 barrels per day fill rate projected in the February 1987 Strategic Petroleum Reserve Annual/Quarterly Report due to the larger than planned quantity acquired during the fourth quarter 1987.

Fiscal and calendar year inventories and average daily fill rates since 1977 are presented in Table 4. Strategic Petro-

**TABLE 4**  
**Strategic Petroleum Reserve Oil Fill History**

	FISCAL YEAR		CALENDAR YEAR	
	Year-End Inventory (million bbls)	Average Daily Fill Rate (thousand bbls/d)	Year-End Inventory (million bbls)	Average Daily Fill Rate (thousand bbls/d)
1977	1.1	3	7.2	20
1978	49.1	131	68.5	168
1979	91.2	115	91.7	64
1980	92.8	4	107.8	44
1981	199.2	292	230.3	336
1982	277.9	215	293.8	174
1983	361.0	228	379.1	234
1984	431.1	191	450.5	195
1985	489.3	159	493.3	119
1986	506.4	47	511.6	51
1987	533.9	75	540.6	79

\* Fill rates unadjusted for oil deliveries under the 1985/86 test sale

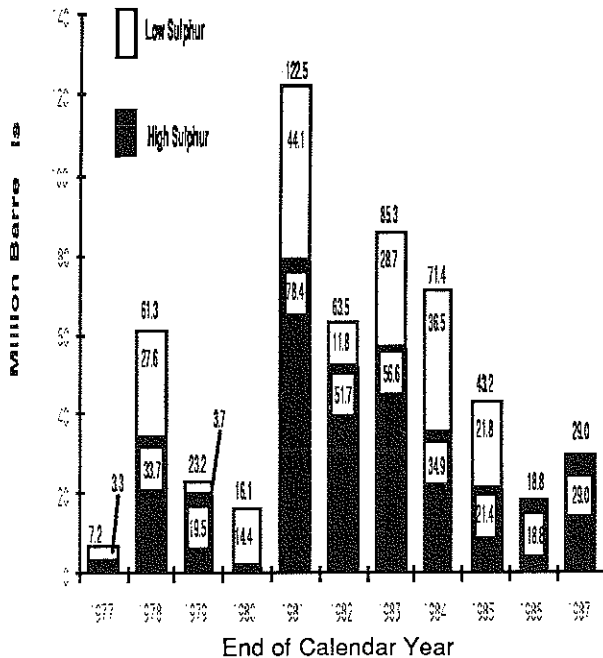
**Table 3**  
**Strategic Petroleum Reserve**  
**Oil Inventory And Delivery Statistics**  
**1987 INVENTORY AND DELIVERY SUMMARY**

CALENDAR 1987	AVG DAILY FILL RATE	QUARTER OIL RECEIPTS	ENDING OIL INVENTORY
1st QUARTER	93,575	8,421,751	519,986,787
2nd QUARTER	79,119	7,199,828	527,186,515
3rd QUARTER	72,860	6,703,091	533,889,606
4th QUARTER	73,464	6,758,693	540,648,299
TOTAL	79,680	29,083,363	540,648,299
TOTAL CRUDE OIL IN TRANSIT (DECEMBER 31, 1987)			338,685
TOTAL CRUDE OIL CONTRACTED FOR DELIVERY REMAINING IN FY 1988			11,600,000

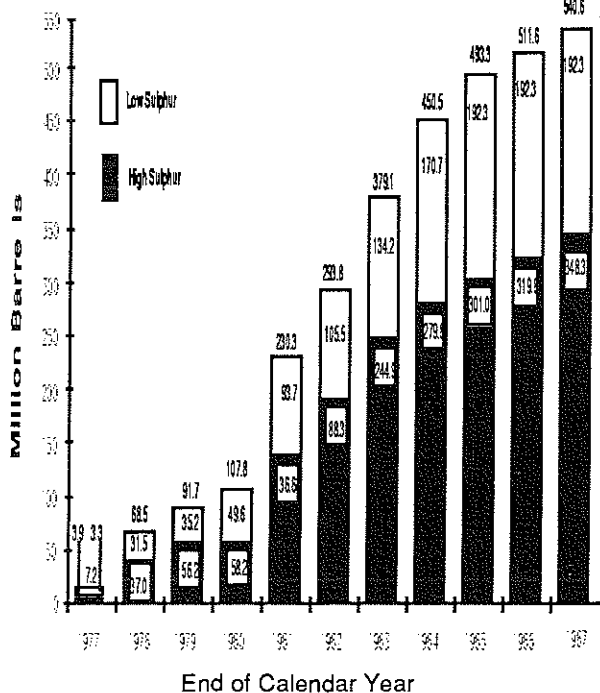
### 1988 INVENTORY AND DELIVERY PROJECTIONS

CALENDAR 1988	AVG DAILY FILL RATE	QUARTER OIL RECEIPTS
1st QUARTER	57,000	5,187,000
2nd QUARTER	35,000	3,185,000
3rd QUARTER	35,000	3,220,000
4th QUARTER	50,000	4,600,000
TOTAL	44,362	16,192,000

**Figure 2**  
Annual Strategic Petroleum Reserve Oil Fill



**Figure 3**  
Cumulative Strategic Petroleum Reserve Oil Fill



leum Reserve crude oil fill is illustrated on both an annual and cumulative basis in Figures 2 and 3, respectively.

**Oil Acquisition, Calendar Year 1987**

During 1987, 29.0 million barrels of crude oil were delivered to the Strategic Petroleum Reserve. Of this crude oil:

- o 24.8 million barrels were delivered under the Department November 1986 crude oil purchase agreement with Petroleos Mexicanos (PEMEX), Mexico's state-owned oil company, the delivery of which completed the terms of this agreement;
- o 1.6 million barrels were delivered under a new agreement with PEMEX which was executed on November 30, 1987, and provides for crude oil deliveries to the Strategic Petroleum Reserve at an average daily rate of approximately 65,000 barrels for a two-year period beginning December 1, 1987, subject to availability of funds;
- o 2.4 million barrels oil were delivered under a Department of Energy contract awarded in October 1986 to Transworld Oil USA, Inc.; and
- o 266 thousand barrels were delivered from the Naval Petroleum Reserves in California in a test of the domestic common carrier pipeline system.

Table 5 shows the crude oil received during 1987 and since inception of the Strategic Petroleum Reserve by state or country of origin. Of the total oil in storage, 64 percent is high sulfur (sour) and 36 percent is low sulfur (sweet). Table 6 provides information on the location of this inventory by site. The Strategic Petroleum Reserve crude oil acquisition specifications may be found in Appendix H of this report.

**Cargo Preference Act Compliance**

The Cargo Preference Act of 1954 requires that Federal agencies take such steps as may be necessary and practicable to assure that at least 50 percent of their cargo transported on ocean vessels in a calendar year is transported by privately-owned U.S. flag vessels, to the extent that they are available at fair and reasonable rates. By agreement between the Department of Energy and the Department of Transportation, the Strategic Petroleum Reserve's Cargo Preference Act compliance is measured in terms of long-ton-miles, i.e., cargo tons multiplied by the distances transported.

During 1987, 7 U.S.-flag vessels, transporting a total of 13.3 million barrels on 38 voyages, were involved in delivering crude oil to the Strategic Petroleum Reserve. These deliveries equaled 1.3 billion long-ton-miles or 50.9 percent of the total long-ton-miles.



**Table 5**  
**Crude Oil Received Through 1987**  
**(million barrels)**

Source Country or State	Quantity During 1987	Cumulative	Percent of Total
Mexico	26.3	215.5	39.7
United Kingdom		136.0	25.1
United States:		38.4	7.0
Alaska		31.4	5.8
Other	2.7	7.0	1.3
Saudi Arabia		27.1	5.0
Libya		23.8	4.3
Iran		20.0	3.7
Dubai		15.9	3.0
Nigeria		15.2	2.8
Oman		9.0	1.7
Egypt		8.9	1.6
Norway		7.4	1.4
Ecuador		6.2	1.1
Algeria		6.2	1.1
Cameroon		3.5	0.6
Abu Dhabi		2.5	0.5
Gabon		2.4	0.4
Qatar		2.3	0.4
Venezuela		0.9	0.2
Peru		0.4	0.1
<b>Total Receipts</b>	<b>29.0</b>	<b>541.6</b>	<b>100.0</b>

**Table 6**  
**Strategic Petroleum Reserve Crude Oil Inventory**  
**As Of December 31, 1987**  
**(million barrels)**

Storage Site	Location	1987 Cumulative Total			End of Year 1986
		Sour*	Sweet**	Total	
Bryan Mound	Brazoria County, TX	138.0	64.5	202.5	195.8
West Hackberry	Cameron Parish, LA	75.7	109.3	185.0	169.2
Bayou Choctaw	Iberville Parish, LA	34.2	18.2	52.4	44.9
Weeks Island	Iberia Parish, LA	71.8	0.0	71.8	72.8
Sulphur Mines	Calcasieu Parish, LA	25.4	0.0	25.4	25.9
Subtotal		345.1	192.0	537.1	508.6
Tanks and Pipelines	Tanks and Pipelines	3.5	0.0	3.5	3.0
<b>TOTAL</b>		<b>348.6</b>	<b>192.0</b>	<b>540.6</b>	<b>511.6</b>

\* Sulfur content greater than 0.5 percent

\*\*Sulfur content less than 0.5 percent

### III. BUDGET AND FINANCE

#### A. APPROPRIATIONS

Approximately \$18.7 billion was appropriated for the Strategic Petroleum Reserve through December 31, 1987, including entitlement receipts for fiscal year 1981 under the authority of the Energy Security Act. The distribution of appropriated funds on an annual basis and in total is shown in Table 7. Figures 4 and 5 illustrate appropriations for facilities development and operations and oil acquisition and transportation on an annual and cumulative basis, respectively.

#### B. MAJOR BUDGET AND FINANCING ACTIONS DURING FISCAL YEAR 1987

The Administration's fiscal year 1988 budget, transmitted to the Congress on January 3, 1987, proposed that development of new storage capacity for the Strategic Petroleum Reserve be suspended in fiscal year 1988 at a level of approximately 580 million barrels, and that the oil fill rate in fiscal year 1988 be limited to an average of 35,000 barrels per day. The requested appropriations for fiscal year 1988 consisted of \$147.4 million for the Strategic Petroleum Reserve Account for storage facilities development and operations and program management, and \$127.4 million for the SPR Petroleum Account for oil acquisition and transportation. However, on May 6, 1987, the President sent the Energy Security Study to the Congress and in his letter expressed his support for filling the Reserve at a rate of 100,000 barrels per day in order to reach the goal of 750 million barrels in storage by 1993. Subsequently, on September 16, 1987, an amended fiscal year 1988 budget request for the Strategic Petroleum Reserve was sent to the Congress. This amended request proposed to fill the Reserve at 100,000 barrels per day in fiscal year 1988 and continued capacity development in fiscal year 1988 on a schedule to include commencement of capacity development at the Big Hill site. Proposed fiscal year 1988 appropriations included \$164.2 million for the Strategic Petroleum Reserve Account, and \$842.9 million for the SPR Petroleum Account.

#### C. MAJOR BUDGET ACTIONS, LAST QUARTER 1987 (FIRST QUARTER FISCAL YEAR 1988)

On December 22, 1987, the President signed the full year Continuing Resolution for fiscal year 1988 (P.L. 100-202). This legislation provides \$164.2 million of new budget authority for the Strategic Petroleum Reserve Account for the continued development and management of the Reserve and \$438.7 for the SPR Petroleum Account to allow for filling the Reserve in fiscal year 1988 at an average rate of approximately 50,000 barrels per day. Fiscal year 1988 outlays from the new budget authority for the SPR Petroleum Account are limited to approximately \$265.5 million.

#### SPR Petroleum Account

The SPR Petroleum Account finances (1) Strategic Petroleum Reserve oil procurements; (2) associated transportation

Figure 4  
Strategic Petroleum Reserve Annual Funding  
Storage Facilities Development/Operations and  
Petroleum Acquisition/Transportation

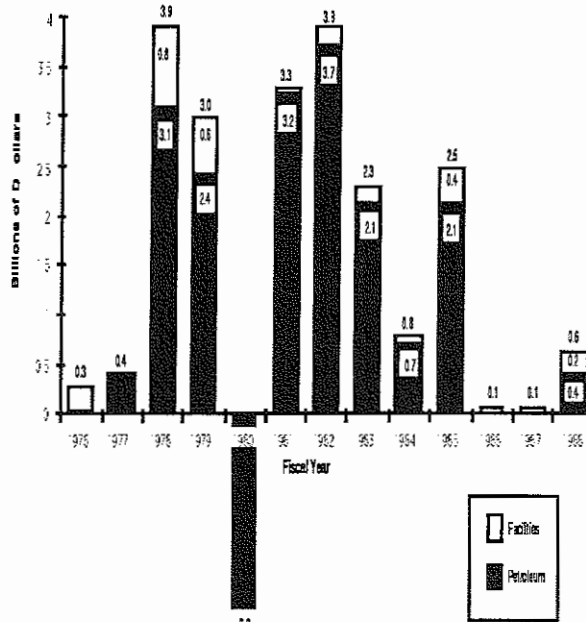
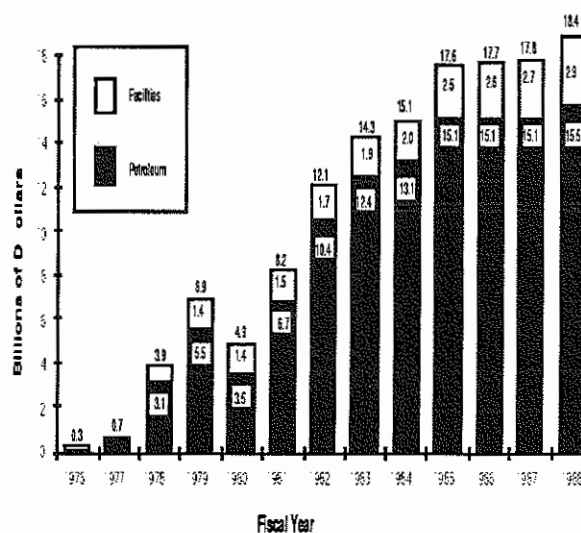


Figure 5  
Strategic Petroleum Reserve Cumulative Funding  
Storage Facilities Development/Operations and  
Petroleum Acquisition/Transportation



costs such as pipeline, tanker, and marine terminalling; (3) U.S. Customs duties and environmental taxes; and, (4) other miscellaneous costs, such as Defense Fuel Supply Center administration costs associated with acquiring and transporting oil. In the event of a drawdown, this account would also fund the Federal cost of drawing down Strategic Petroleum Reserve oil from caverns and transporting it to the point where

purchasers would take title. Additionally, the Federal receipts from a drawdown and sale of Strategic Petroleum Reserve oil are deposited in the SPR Petroleum Account and create additional budget authority for refilling the Reserve.

**Petroleum Acquisition and Transportation Financial Transactions, Last Quarter of 1987 (First Quarter of Fiscal Year 1988)**

There were no funds available for obligation from the SPR Petroleum Account at the end of fiscal year 1987.

Of the \$439 million appropriated for fiscal year 1988, approximately \$106 million were obligated during the first quarter ended December 31, 1987, leaving a balance of \$333 million available for future use. Outlays (payments) during the quarter were approximately \$115 million.

**Strategic Petroleum Reserve Account**

The Strategic Petroleum Reserve Account provides the financing for the Strategic Petroleum Reserve facilities program, including the construction, operations and maintenance of the Strategic Petroleum Reserve sites, the planning activities pertinent to major issues concerning the development and use of the Strategic Petroleum Reserve, and the salaries and expenses necessary to plan and manage the Strategic Petroleum Reserve, including the operation of the Project Management Office in New Orleans, Louisiana.

**Strategic Petroleum Reserve Account Transactions Last Quarter of 1987 (First Quarter of Fiscal Year 1988)**

Approximately \$68 million of Strategic Petroleum Reserve Account funds were available for obligation at the end of fiscal year 1987. The appropriation for fiscal year 1988 increased these available funds by \$164 million, to a total of approximately \$232 million. Of this total, approximately \$44 million were obligated in the quarter ended December 31, 1987, leaving a balance of \$188 million available for future obligation.

**D. OIL COSTS THROUGH FISCAL YEAR 1987**

Inclusive of entitlement receipts, the cumulative cost for the 533.9 million barrels delivered to the Reserve through fiscal year 1987 was \$15.061 billion, an average of approximately \$28.21 per barrel.

**E. ESTIMATED COST TO COMPLETE THE STRATEGIC PETROLEUM RESERVE**

The cost to complete the currently planned 750 million-barrel Strategic Petroleum Reserve will depend on decisions about future fill rates and storage capacity development, as well as future oil prices.

Based on the "Current Services" concept, which assumes no changes in existing legislation, development of storage facilities would continue on a schedule that would provide the full 750 million barrels of storage capacity by the end of fiscal year 1991 and oil fill would be sustained at an average rate of 50,000 barrels a day in fiscal year 1988 and 75,000 barrels a day from fiscal year 1989 to completion of a 750 million barrel inventory in early fiscal year 1996. Using current assumptions about oil prices in fiscal year 1988 and future years, the estimated total cost to completion in this scenario is \$24.6 billion, consisting of \$4.5 billion for the development, operation and management of the Reserve through fiscal year 1996 and \$20.2 billion for oil fill. Through fiscal year 1988, a total of \$18.7 billion was appropriated for the Reserve, including \$3.1 billion for development, operations and management activities and \$15.6 billion for oil acquisition and transportation.

**Table 7**  
**Strategic Petroleum Reserve Appropriations**  
(thousands of dollars)

<u>Fiscal Year</u>	<u>Petroleum Acquisition and Transportation</u>	<u>Storage Facilities Development and Operations</u>	<u>Management</u> <u>1 /</u>	<u>Total</u>
1976	\$ 0	\$ 300,000	\$ 13,975	\$ 313,975
1977	440,000	0	7,824	447,824
1978	2,703,469	463,933	14,704	3,182,106
1979	2,885,670	103,290	18,111	3,007,071
Reprogramming	<u>-529,214</u>	<u>529,214</u>	<u>0</u>	<u>0</u>
	2,356,456	632,504	18,111	3,007,071
1980	-2,000,000 <u>2 /</u>	0	0	-2,000,000
Reprogrammings:				
Number 1	-20,391	0	20,391	0
Number 2	<u>-1,881</u>	<u>0</u>	<u>1,881</u>	<u>0</u>
	-2,022,272	0	22,272	-2,000,000
1981	2,688,282 <u>3 /</u>	82,834	19,391	2,790,507
Entitlements	542,146	0	0	542,146
Reprogrammings:				
Number 1	-18,000	18,000	0	0
Number 2	<u>-7,334</u>	<u>7,334</u>	<u>0</u>	<u>0</u>
	3,205,094	108,168	19,391	3,332,653
1982	3,684,000	171,356	20,076	3,875,432
Reprogramming	<u>-4,300</u>	<u>4,300</u>	<u>0</u>	<u>0</u>
	3,679,700	175,656	20,076	3,875,432
1983	2,074,060	222,528	19,590	2,316,178
1984	650,000	142,357	16,413	808,770
1985	2,049,550	441,300 <u>4 /</u>	17,890 <u>4 /</u>	2,508,740
1986	0	94,015 <u>5 /</u>	13,518 <u>5 /</u>	107,533
Reprogramming	<u>-12,964</u>	<u>12,964</u>	<u>0</u>	<u>0</u>
	-12,964	106,979	13,518	107,533
1987	0	134,021	13,412	147,433
1988	<u>438,744</u>	<u>151,886</u>	<u>12,276</u>	<u>602,906</u>
Total Appropriations	15,561,837	2,879,332	209,452	18,650,621

- 1) Excludes funds appropriated to other DOE accounts but used to finance aspects of SPR program management.  
2) Rescission.  
3) Included supplemental appropriations of \$1,305,000,000.  
4) Included in FY 1984 second supplemental appropriations.  
5) Adjusted for amounts sequestered under the Balanced Budget and Emergency Control Act of 1985 (P.L. 99-177).

## IV. ORGANIZATION, MANAGEMENT AND CONTRACTUAL SUPPORT

### A. PROGRAM/PROJECT MANAGEMENT

The Strategic Petroleum Reserve Office was created under the Energy Policy and Conservation Act for the establishment, management, and maintenance of the Strategic Petroleum Reserve. The Assistant Secretary for Fossil Energy, J. Allen Wampler, has overall programmatic responsibility for achieving the goals and objectives of the Strategic Petroleum Reserve Program. This responsibility has been delegated to the Deputy Assistant Secretary for Petroleum Reserves, Richard D. Furiga. The Director of the Office of the Strategic Petroleum Reserve, John W. Bartholomew, reports to the Deputy Assistant Secretary for Petroleum Reserves.

Responsibility for Strategic Petroleum Reserve project management and implementation activities is assigned to the Manager, Oak Ridge Operations Office, Joe La Grone. The Manager, Oak Ridge Operations Office, directs Strategic Petroleum Reserve activities through the Assistant Manager for the Strategic Petroleum Reserve, John Milloway. The Project Management Office (PMO), located in New Orleans, Louisiana, carries out day-to-day project implementation activities as delegated by the Manager, Oak Ridge Operations Office, and in accordance with programmatic guidance provided by the Deputy Assistant Secretary for Petroleum Reserves.

### B. PROCUREMENT AND CONTRACTOR SUPPORT

Obligations in fiscal year 1987 for Strategic Petroleum Reserve procurements totaled approximately \$718 million, including \$525 million for crude oil and associated transportation and other costs. Obligations for procurements for other than crude oil totaled \$193 million.

Boeing Petroleum Services, Incorporated, in the third year of a five year contract which began in April 1985, provided management, operations and maintenance of the crude oil storage facilities.

Other prime contractors that provided services to the Strategic Petroleum Reserve during 1987 included: the Aerospace Corporation for systems engineering; Walk, Haydel & Associates, Inc. and Fluor Engineers for architectural engineering; Wackenhut Services, International for site security protection services; Coggins Systems Ltd., Berg Steel Pipe Corporation, U.S. Filter Fluid Systems, and Latoka Engineering for hardware; Coggins Systems Ltd., V&P Electric Company, AMC Mechanical Contractors, Gregory & Cook, Inc./Associated Pipeline - Joint Venture, L.S. Womack, Inc., Michael Curran, Firth Construction, Griffin and Butler, M.A. Baheth and Company, EBASCO Constructors, Salazar Construction, Kiewit/Tulsa-Houston - Joint Venture, Plaquemine Contracting Company, R. M. Walker, Wendells Electric, Big "O" Oilfield, Gibson Hart, J. W. Kelso, Trevino, Incorporated, Arch-Holli, Cole's Construction, Battle Investment, T.C.Q., Incorporated, and DILLCO, Incorporated for construction; Texcom

Incorporated for telecommunications systems; Systematic Management Services, Inc., PB-KBB, Incorporated and ICF, Incorporated for support services; Texas A&M Research Foundation for environmental support; and ARCO Pipeline Company, Phillips 66 Company and Sun Marine Terminal for terminalling services.

### C. REAL ESTATE, ENVIRONMENTAL COMPLIANCE, AND PERMITS

#### Real Estate

During 1987, the Department of Energy acquired 0.13 acre of permanent easement for the 30-inch crude oil pipeline that will directly connect the Department's St. James Terminal to the Capline Terminal. The Department also acquired in fee title, 7.927 acres of land under the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970, Public Law 91-646; this land was an uneconomic remnant at the Big Hill site. Negotiations are currently underway and near completion on acquisition of real estate for the Department's 12-mile crude oil pipeline connecting the West Hackberry oil storage site to the Lake Charles, Louisiana area and the Texas 22-inch pipeline.

#### Environmental Compliance and Permits

Environmental protection activities in support of construction and operation of all Strategic Petroleum facilities continued through 1987 in compliance with applicable Department of Energy Orders.

Several construction-type activities focused on distribution enhancements were undertaken in 1987 following related environmental planning and review actions completed in 1986. Natural drainage patterns were restored along the newly constructed Department of Energy's Bryan Mound-to-Texas City, Texas crude oil pipeline. Pre-construction National Environmental Policy Act (NEPA) requirements for the Department's planned West Hackberry-to-Lake Charles, Louisiana crude oil pipeline were completed with the acceptance of the Cultural Resource Investigation by the State Historical Preservation Officer in November.

In 1986, all Strategic Petroleum Reserve oil storage facilities were assessed, and a report was issued on the possible existence of hazardous or toxic disposals that might have occurred prior to the current use of these sites for crude oil storage in the Strategic Petroleum Reserve program. The study was undertaken in compliance with Department of Energy Order 5480.14, "Comprehensive Environmental Response, Compensation and Liability Act Program." In 1987, the second or confirmation phase of the study, i.e., the discovery of positive identification of any such disposals, was completed and a report issued in April 1987. As a consequence of this effort, two unused brine caverns at Bayou Choctaw, caverns created by the previous owner, continue to be evaluated as suspected low-level concentrations of chemi-

cal contaminants have been tentatively identified in a few of the well bores. Contaminated brine was suspected in a few well bores at the Big Hill site where storage capacity is being developed. The Department worked closely with the Environmental Protection Agency and the Texas Water Commission to develop an acceptable plan for safe and appropriate disposal and chemical monitoring of the brine. Bore hole flushing and surface tank containment at the Big Hill site has reduced the low-level contaminant concentration to levels significantly below current offshore water quality criteria providing for normal disposal into the Gulf of Mexico.

#### **D. SECURITY**

Since 1986, management responsibility for most security service program elements has been borne by Boeing Petroleum Services Incorporated under its management, operations and maintenance contract. Boeing administers the protection services program through a subcontract to Wackenhut Services International.

To maintain security proficiency, the Strategic Petroleum Reserve conducted security training exercises at six of its sites during 1987. These exercises simulated responses to outside aggressors and incorporated participants from Federal, state, and local law enforcement agencies.

The majority of the protection officers currently lack police commissions and possess only citizens arrest authority, which limits their ability to protect Strategic Petroleum Reserve personnel, property and critical resources. Current DOE directives, which provide for arrest authority and the arming of security inspectors under the provisions of the Atomic Energy Act, do not apply to the Strategic Petroleum Reserve. In order to address this disparity between the responsibility and the authority of the protection force, the Senate passed S.836, and a similar H.R. 3659 was introduced in the House of Representatives during 1987. The legislation, as introduced in H.R. 3659, would provide authority to certain Department of Energy, contractor, and subcontractor personnel to carry firearms as a means of preventing unlawful intrusions at Strategic Petroleum Reserve facilities and to make arrests.

## V. DRAWDOWN SYSTEM AND VULNERABILITY IMPACT

### A. DISTRIBUTION PLAN

The current plan for distributing Strategic Petroleum Reserve petroleum, in the event that the Reserve is drawn down to respond to a severe energy supply interruption or to meet obligations of the United States under the Agreement of the International Energy Program, is provided in the "Strategic Petroleum Reserve Drawdown (Distribution) Plan," Amendment Number 4, of December 1, 1982.

The Strategic Petroleum Reserve Distribution Plan provides that, pursuant to the President's decision to use the Strategic Petroleum Reserve, the principal method of distributing Strategic Petroleum Reserve oil will be price competitive sale with the oil being sold and delivered to bidders offering the highest prices. The sale will be open to the largest possible universe of eligible buyers to ensure efficient distribution of Strategic Petroleum Reserve oil. The plan also provides that in any calendar month, the Secretary of Energy may direct the distribution of up to 10 percent of the volume of oil sold in that calendar month in a manner which the Secretary selects at his discretion. The price for such oil will be the average price of Strategic Petroleum Reserve oil sold at the contemporaneous competitive sale, or at the most recent competitive sale if no contemporaneous competitive sale is held.

### B. GENERAL SALES PROCEDURES

Appendix A to the Department of Energy's final rule (10 CFR Part 625) governing price competitive sales of petroleum from the Strategic Petroleum Reserve provides Standard Sales Provisions (SSPs) containing or describing contract clauses, terms, and conditions of sale, and performance and financial responsibility measures, which may be applicable to a particular sale of Strategic Petroleum Reserve oil.

Under the SSPs, the Strategic Petroleum Reserve sales process starts with the issuance of a Notice of Sale. The Notice of Sale announcing the sale of Strategic Petroleum Reserve petroleum would indicate the amount, characteristics, and location of the petroleum being sold; the delivery dates and the procedures for submitting offers, as well as providing other information pertinent to a particular sale. In addition, it would specify what contractual provisions and performance and financial responsibility measures were applicable.

Over the course of a Strategic Petroleum Reserve drawdown, a number of Notices of Sale may be issued, each covering a sales period of one to two months. Initially, Notices of Sale issued during Strategic Petroleum Reserve drawdown could allow an extremely short lead time for offers and deliveries. Under the SSPs, it is contemplated that offerors might be given as little as seven days from the issuance of the Notice of Sale until offers were due, and as little as 30 days from the time of such issuance until oil delivery started, with a less compressed schedule becoming more feasible after the initial stages of drawdown. Because of the possible short lead time,

the SSPs provide for the establishment of a list of prospective offerors, to whom the Department of Energy would furnish copies of all Notices of Sale.

The next step in the sales process is the preparation by prospective purchasers of their offers, which must be submitted before a time specified in the Notice of Sale. The SSPs require that the offerors unconditionally accept all terms and conditions made applicable to that sale by the Notice of Sale, include an offer guarantee, and offer at least the minimum price, if any, specified in the Notice of Sale.

Following the receipt of offers, the Department of Energy would evaluate the offers to select the "apparently successful" offerors. The evaluation process is structured so that the highest offerors can select the method by which the Strategic Petroleum Reserve petroleum is to be transported, up to the limits of the Strategic Petroleum Reserve distribution systems, with specific delivery arrangements to be negotiated later.

Under the SSPs, all apparently successful offerors are required, within as little as five days, to provide a letter of credit or a cash deposit as a guarantee of performance and of payment of amounts due under the contract. Upon timely receipt of the guarantee, and upon a final determination by the Contracting Officer that the offer was responsive and the offeror responsible, the Department of Energy will issue the Notice of Award.

The only other bases in the SSPs upon which the Contracting Officer can make a finding of nonresponsibility, other than nonperforming purchasers that had been excluded from Strategic Petroleum Reserve sales under the procedures established by the sales rule, are: (1) the offeror is on either the Department of Energy's or the Federal Government's list of debarred, ineligible and suspended bidders; (2) evidence of an offeror's conduct or activity which represents a violation of law or regulation, or Executive Order having the force and effect of law; and (3) evidence which shows a lack of integrity (including actions inimical to the welfare of the United States) or willingness to perform, and which would substantially diminish the Contracting Officer's confidence in the offeror's performance.

### C. DRAWDOWN AND DISTRIBUTION CAPABILITIES

Based on the Strategic Petroleum Reserve's December 31, 1987 crude oil storage inventory of 540.6 million barrels and the existing Strategic Petroleum Reserve drawdown and commercial distribution systems, the Strategic Petroleum Reserve's current maximum drawdown and distribution capabilities are as shown in Table 8. The capabilities shown and described in this subsection have increased from those explained in the February 1987 Strategic Petroleum Reserve Annual/Quarterly Report primarily due to the increase in crude oil inventory and the completed Bryan Mound pipeline

**Table 8**  
**Current Maximum Capabilities**  
**(thousands of barrels per day)**

	<u>Drawdown</u>	<u>Distribution</u>
Seaway Group	1,100	1,100
Texoma Group	1,400	1,150
Capline Group	1,070	765
	<u>3,570</u>	<u>3,015</u>

connection to the ARCO Terminal in Texas City, Texas. The Strategic Petroleum Reserve storage facilities are physically capable of initially being drawn down at a sustained rate of 3.5 million barrels per day for a 90-day period. After 90 days, the Strategic Petroleum Reserve's drawdown rate would decrease gradually as various site inventories deplete and the declining number of remaining caverns containing crude oil become a constraint on a site's drawdown rate. Figure 6 illustrates the Strategic Petroleum Reserve's current physical drawdown capability, without distribution constraints, which provides for a drawdown of approximately 59 percent of the Reserve in 90 days, 95 percent of the Reserve in 180 days, and 100 percent of the Reserve in 340 days.

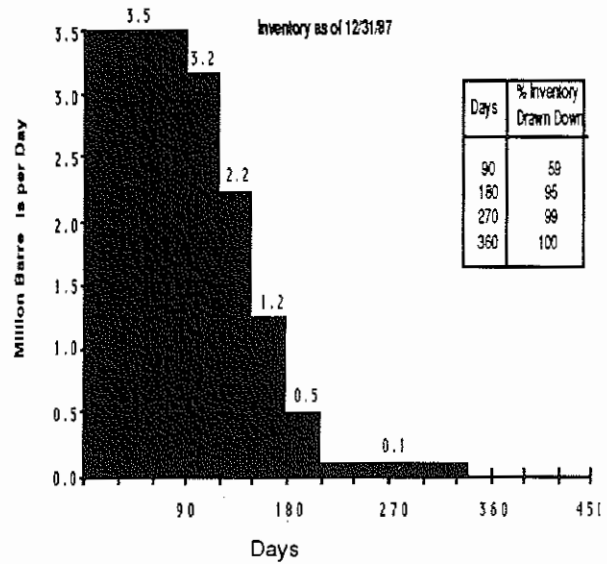
The Strategic Petroleum Reserve's drawdown capabilities are currently constrained by the Strategic Petroleum Reserve's distribution terminal throughput capabilities and the private sector distribution and refining capabilities. Based on these current distribution constraints, the Strategic Petroleum Reserve is currently capable of being initially drawn down and distributed at a maximum sustained rate of 3.0 million barrels per day for a 120-day period. After 120 days, the Strategic Petroleum Reserve drawdown/distribution rate would decrease gradually as the site inventories deplete. Figure 7 illustrates the Strategic Petroleum Reserve's current physical drawdown/distribution capability, which provides for a distribution of approximately 51 percent of the Reserve in 90 days, 95 percent of the Reserve in 180 days and 100 percent of the Reserve of the Reserve in 350 days.

The Strategic Petroleum Reserve currently has a Distribution Enhancement Program underway to improve the Strategic Petroleum Reserve's distribution systems in order to achieve a higher distribution capability. Details of the Strategic Petroleum Reserve Distribution Enhancement Program are described in sub-section E.

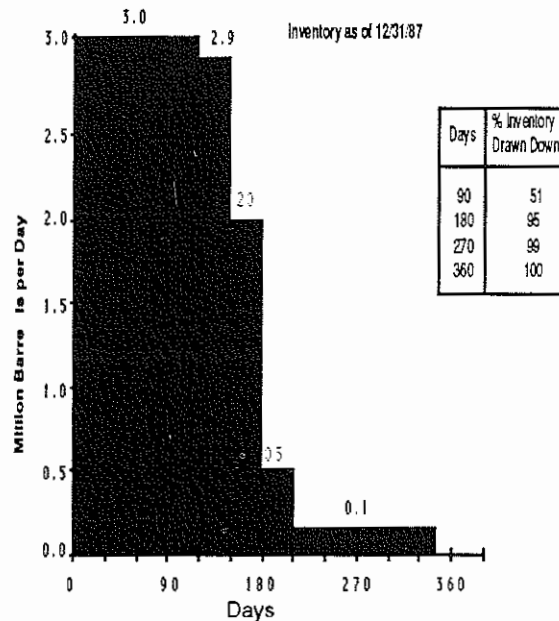
**D. DRAWDOWN AND DISTRIBUTION TESTS**

During calendar year 1987, various tests of the Strategic Petroleum Reserve's physical drawdown capabilities, as well as the procedures associated with conducting a drawdown, were conducted:

**Figure 6**  
**Strategic Petroleum Reserve**  
**Drawdown Capability**



**Figure 7**  
**Strategic Petroleum Reserve Drawdown/Distribution**  
**Capability**



- o From February 17 to March 2, at the Weeks Island storage site, 4.8 million barrels of crude oil were circulated using the site's drawdown system for 308 continuous hours in order to demonstrate the system's reliability;
- o From June 1 through July 10, the Strategic Petroleum Reserve conducted an extensive



drawdown training exercise, named SPREX-87. This exercise consisted of a simulated competitive sale of Strategic Petroleum Reserve crude oil and involved the entire Strategic Petroleum Reserve organization and all management, operational and financial functions associated with a drawdown and distribution of Strategic Petroleum Reserve oil. SPREX-87, designed to improve the readiness of the Strategic Petroleum Reserve drawdown systems and personnel, as well as to test recently enhanced drawdown and sales procedures, added to the confidence level that the Strategic Petroleum Reserve can respond effectively to a drawdown requirement;

- o As part of SPREX-87, the Strategic Petroleum Reserve also tested the physical drawdown systems at three storage sites. On June 16 and 17, 490,000 barrels were drawn down from Bryan Mound and delivered to the ARCO Terminal, Texas City, Texas, which, for the first time, exercised this recently added Strategic Petroleum Reserve distribution capability. On June 20, a total of 628,000 barrels were drawn down simultaneously from West Hackberry and Sulphur Mines and delivered to the Sun Terminal, Nederland, Texas. This was the first time such a simultaneous drawdown was executed; and
- o On October 28, 430,000 barrels were drawn down from the Bryan Mound storage site to the ARCO Terminal, achieving the designed flow rate of one million barrels per day.

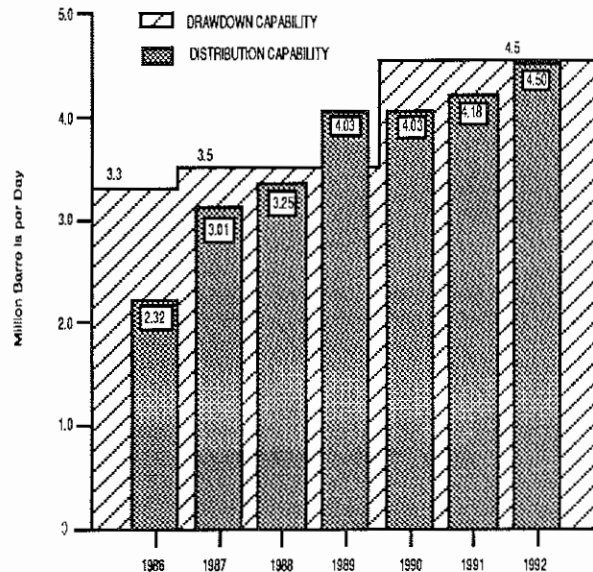
## E. DISTRIBUTION ENHANCEMENTS

In late 1984 the Strategic Petroleum Reserve initiated a distribution enhancement program to assure that the Strategic Petroleum Reserve distribution capability will adequately support the Strategic Petroleum Reserve drawdown performance. This program was prompted by a major decline in foreign crude oil demands by the Mid-West refiners, resulting in the conversion to natural gas transmission of two major interstate pipelines to which the Strategic Petroleum Reserve was connected (Seaway and Texoma). The distribution enhancement program has been designed to increase the SPR's distribution capability from its 1986 level of 2.3 million barrels per day to 4.5 million barrels per day as shown in Figure 8, and to provide waterborne access to at least two marine terminals within each storage group.

### Seaway Group

Distribution enhancements previously planned for the Strategic Petroleum Reserve's Seaway Group distribution system included modifications for custody metering at the Phillips 66 marine terminal in Freeport, Texas, to which the Strategic Petroleum Reserve's Seaway Group is connected for oil fill

Figure 8  
Current and Planned Drawdown and Distribution Capabilities (Year End)



and drawdown, and construction of a new pipeline from the Bryan Mound storage site to the ARCO pipeline terminal and docks in Texas City, Texas, as well as modifications for outloading at the ARCO terminal in Texas City. These enhancements were approved by Congress in January 1985 and have been completed. In June, 1987, the Department completed and placed into service the Government-owned 46-mile, 40-inch crude oil pipeline connecting the Strategic Petroleum Reserve's largest oil storage site, Bryan Mound, located near Freeport, Texas, to the ARCO Pipeline Company's commercial distribution terminal in Texas City, Texas. These enhancements increased the Seaway group distribution capability from 390,000 barrels per day to 1,100,000 barrels per day, consistent with the Strategic Petroleum Reserve's current drawdown capability.

During 1987, the Department performed a new study of the distribution capabilities provided by the current distribution enhancement plans, with the objective of securing the most cost effective means of achieving the ultimate distribution capability of 4.5 million barrels per day. The study concluded that surplus distribution capabilities are available within the Seaway Group, and that shifting drawdown capability (increasing Bryan Mound's drawdown rate to 1.25 million barrels per day and derating West Hackberry's drawdown rate to 1.25 million barrels per day) would provide significant savings in the distribution enhancement program as well as providing an overall system balance of drawdown capabilities among the sites. As a result, DOE plans to increase Bryan Mound drawdown capability from 1.1 to 1.25 million barrels per day by October 1991 and reduce Texoma Group commercial marine distribution requirements accordingly.

### Texoma Group

Distribution enhancements planned for the Strategic Petroleum Reserve's Texoma Group distribution system include

construction of a new oil pipeline from the West Hackberry storage site to the Lake Charles, Louisiana refining area, with a connection to the Texas 22-inch pipeline, and with additional marine distribution capabilities through commercial marine terminals in Lake Charles, and construction of a pipeline to a second commercial marine terminal in the Beaumont, Texas area in the general vicinity of Sun Terminal.

During 1987, engineering design for the West Hackberry-to-Lake Charles pipeline was completed. Title evidence and appraisals were completed for all 42 tracts of land, negotiations with landowners were initiated in October, and official Department of Energy offers were sent to landowners in November. The landowners have until January, 1988 to respond; any remaining unacquired land after January will be acquired through condemnation procedures. Berg Steel Pipe Corporation of Panama City, Florida, has been contracted to manufacture the pipe for the pipeline, while the steel plate for the pipe is being manufactured at Bethlehem's Burus Harbor, Illinois plant. The Department concluded an agreement with the Texas Pipeline Company to connect the Strategic Petroleum Reserve's 12-mile, 36-inch West Hackberry-to-Lake Charles pipeline, to be constructed in 1988, to the Texaco 22-inch pipeline; this work will be competitively advertised in 1988. The Department also issued a solicitation in 1987 for marine terminalling service in Lake Charles, Louisiana to handle throughput of 200-400 thousand barrels per day of Strategic Petroleum Reserve oil from the Department's West Hackberry-to-Lake Charles, Louisiana pipeline.

The identified Texoma Group enhancements are scheduled to be complete by September 1992 and will increase the group's distribution capability from 1,200,000 barrels per day to 2,180,000 barrels per day, consistent with the planned drawdown rate for the Texoma storage sites.

#### **Capline Group**

Distribution enhancements planned for the Strategic Petroleum Reserve's Capline Group distribution system include St. James Terminal metering and piping modifications, a direct pipeline connection to the Capline Pipeline Terminal, and connection of the Capline group to additional dock facilities in the St. James area. A tie-in agreement with Capline Pipeline owners for the direct pipeline connection between the Strategic Petroleum Reserve's St. James Terminal and the Capline Pipeline and a servitude (easement) agreement with Capline Terminal operator (Shell Pipeline Corporation) were completed during the last quarter of 1987. The Department awarded a small and disadvantaged business set aside contract to construct the direct pipeline connection between the Strategic Petroleum Reserve's St. James Terminal and

the Capline Pipeline in December 1987. Construction of this pipeline will commence in early January 1988.

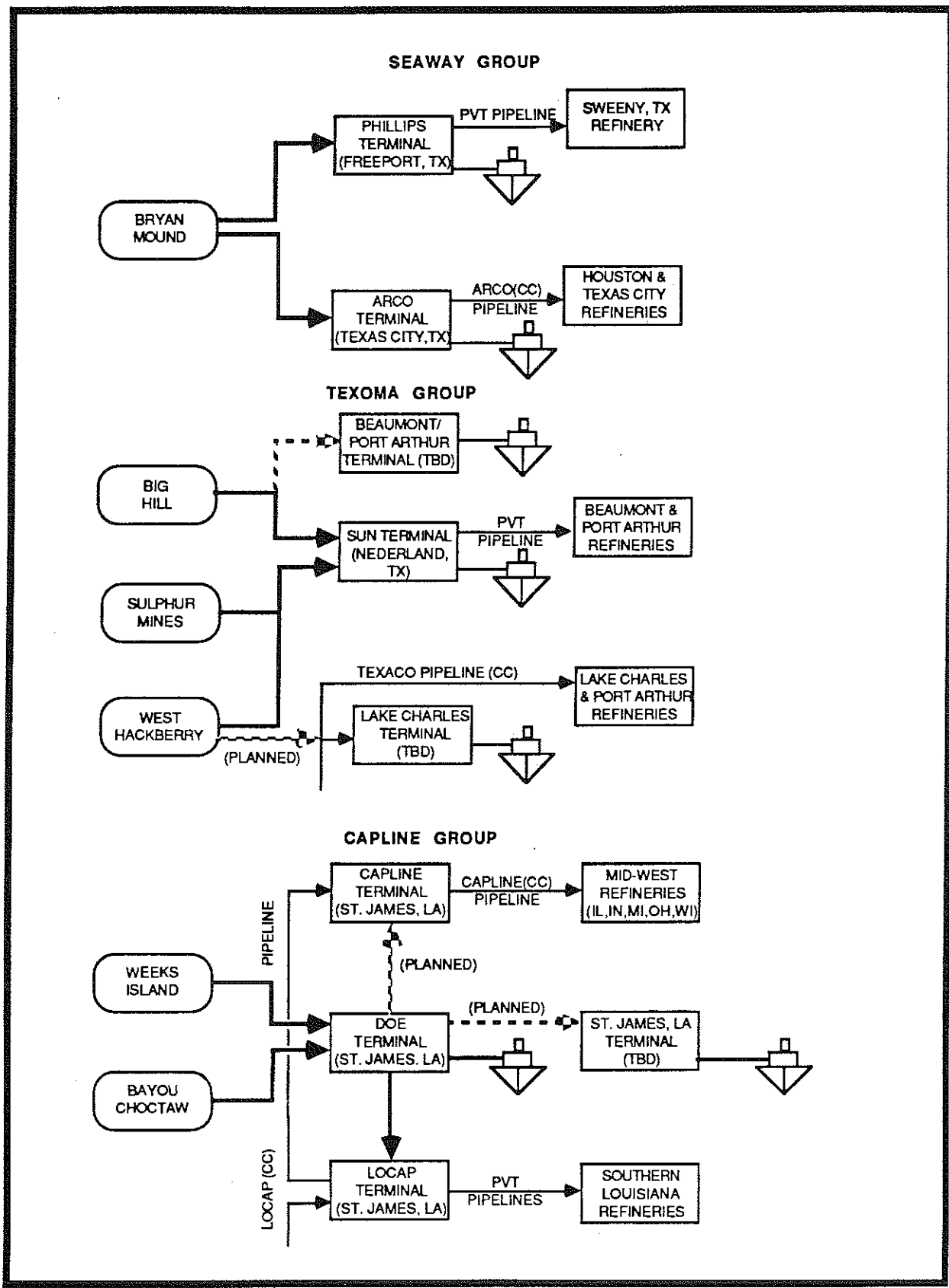
Additionally, the Department is evaluating proposals and plans a contract award in fiscal year 1988 for expansion of the Strategic Petroleum Reserve marine distribution capability in the St. James/Capline area. These enhancements will increase the Capline Group's distribution capability from 765,000 barrels per day to 1,070,000 barrels per day. Capline Group enhancements are scheduled for completion by March 1989.

#### **F. VULNERABILITY IMPACT**

As measured by days of crude and product import protection offered by SPR storage, U.S. vulnerability to world oil supply disruption was little changed in 1987 from the 1986 level, when days of equivalent imports fell some 18 percent. During 1987, roughly 95 days of imports were available from the Strategic Petroleum Reserve whereas two years ago 115 days of protection had been stockpiled. Last year's SPR fill rate, averaging about 71 thousand barrels per day and a modest expansion recorded in crude and product imports, held days of protection essentially flat.

In the private sector, trends in stockpile conditions were roughly similar to those in the public sector. For total crude and product stocks, days of equivalent import protection fell marginally following a similar sharp slump the year before. In 1987, about 190 days of equivalent crude and product imports were offered by private stocks in storage, as compared to 198 days of equivalent imports in private storage in 1986.

The United States currently leads the free world in both Government owned and/or controlled reserves and private oil stocks. By the end of December 1987, 540.6 million barrels — up approximately 29 million barrels from the previous year — were being held in the SPR whereas about 1.081 billion barrels were held in U.S. private stocks. Japan's petroleum reserves (next largest) were roughly a third as big, West Germany's about a fifth, and smaller volumes were held by



**Figure 9**  
**Current and Planned Strategic Petroleum Reserve Distribution System**  
**for the Seaway, Texoma, and Capline Groups**

**APPENDIX  
STRATEGIC PETROLEUM RESERVE  
SITE STATUS**

- A. Bayou Choctaw
- B. Weeks Island
- C. Bryan Mound
- D. Sulphur Mines
- E. West Hackberry
- F. Big Hill
- G. St. James Terminal
- H. Strategic Petroleum Reserve Crude Oil  
Specifications

## A. BAYOU CHOCTAW

### Location

Iberville Parish, Louisiana (12 miles southwest of Baton Rouge, Louisiana).

### Acquisition

In April 1977, the Department of Energy acquired 355.95 acres fee simple by condemnation from numerous private owners. Union Texas Petroleum (a subsidiary of Allied Corporation) was the previous operator.

In 1985, the Department of Energy acquired an additional existing cavern through a cavern exchange agreement with Union Texas Petroleum. The transaction involved a 3.5 acre exchange with no net change in Government-owned acreage.

### Environmental/Permits

Environmental Impact Statement published December 1976; supplement published May 1977.

Four major Federal and state permits related to pipeline, well pad, storage, and storm water runoff acquired in 1978, and updated in 1980 and 1981.

### Site Description

A 72-million-barrel storage facility consisting of 62 million barrels in five existing caverns, plus 10 million barrels of storage capacity in a new Strategic Petroleum Reserve-developed cavern.

Oil, brine, raw water piping distribution system connecting caverns with central plant, water intake structure, and brine disposal wells. Consists of over 50,000 feet of piping and 18 pumps totaling over 20,000 horsepower.

Twelve brine disposal wells 2.5 miles offsite; pipeline for supplying brine to Union Texas Petroleum.

One hundred thousand barrel brine pit, control center, buildings, roads, well pads, and dikes.

Water intake structure in Cavern Lake on site.

### System Parameters

Oil fill via 36-inch-diameter, 37.2-mile pipeline to St. James Terminal. Sustained system rate - 110,000 bbl/d (brine disposal-constrained).

Raw water design pumping rate - 495,000 bbl/d.

Brine disposal design pumping rate - 110,000 bbl/d.

### Drawdown

Drawdown via 36-inch-diameter, 37.2-mile pipeline to St. James Terminal and to Capline pipeline.

Design drawdown capability upon completion - 480,000 bbl/d.

### Major Accomplishments

Completed conversion and certification of Cavern 17.

Major modifications to the brine filtration system which provided for greater longevity of the brine disposal wells were completed.

Approximately 52.4 million barrels of oil are in storage.

## B. WEEKS ISLAND

### Location

Iberia Parish, Louisiana (95 miles southwest of New Orleans).

### Acquisition

Acquired 382.92 acres fee simple subsurface and 6.63 acres fee simple surface by condemnation September 1977 from Morton Salt Company.

### Environmental/Permits

Environmental Impact Statement published January 1977; supplement published August 1977.

Major Federal permit related to oil pipeline to St. James Terminal acquired in 1978. Three major Federal and state permits related to oil storage, air emissions and storm water, and treated sewage effluent discharge acquired in 1979; EPA National Pollutant Discharge Elimination System permit updated in 1982.

### Site Description

Conventional salt mine containing 73 million barrels of storage capacity in two levels, room and pillar design, dedicated to sour crude oil storage.

Oil piping distribution system consists of 11 (10 operational and one reserve) submersible electric pumps in the mine to boost crude to the surface and twin main-line pumps (plus one reserve) to deliver crude to the St. James, Louisiana Terminal during drawdown. Pumps total 17,000 horsepower.

500,000 gallon firewater tank and pumps.

Mine inert gas and vapor recovery systems.

### System Parameters

Oil fill via 36-inch-diameter, 67.2-mile pipeline from St. James Terminal. Sustained system rate - 350,000 bbl/d (terminal throughput limited).

### Drawdown

Drawdown via 36-inch-diameter, 67.2-mile pipeline to St. James Terminal and to Capline pipeline.

Design drawdown capability - 590,000 bbl/d.

### Major Accomplishments

Concluded preliminary agreement with Morton Thiokol for placement and monitoring of subsidence monuments in relation to major risk abatement program to assure long-term mine stability.

Approximately 73 million barrels of crude oil are in storage.

## **C. BRYAN MOUND**

### Location

Brazoria County, Texas (three miles southwest of Freeport, Texas).

### Acquisition

Acquired 499.47 acres fee simple by condemnation April 1977, from Freeport Mineral Company and other owners. Dow Chemical Company was the previous operator.

In 1986, Department of Energy acquired the preexisting Brazoria County Road 242 within the site boundary through a relocation agreement with the county.

### Environmental/Permits

Environmental Impact Statement published January 1977; supplement published December 1977. Phase III supplement published October 1981.

Five major Federal and state permits related to pipelines, water intake, and storage acquired in 1977 and 1978. NPDES updated 1981; renewed 1984. Seaway Environmental Impact Statement published June 1978. Supplement published October 1981.

Two major Federal permits related to brine disposal pipeline issued in 1978. Permit for brine discharge increased to 1.1 million bbl/d August 1981.

### Site Description

226-million-barrel storage facility consisting of 66 million barrels of capacity in four caverns existing upon site acquisition, plus 160 million barrels of storage capacity in 16 new Strategic Petroleum Reserve-developed caverns.

36-inch-diameter, 14.6-mile brine disposal pipeline (13 miles offshore) to the Gulf of Mexico.

Oil, brine and raw water piping distribution system connecting caverns with central plant and water intake structure. Con-

sists of over 101,000 feet of piping and 33 pumps totaling over 38,000 horsepower. Four 200,000-barrel oil storage tanks.

15,000 and 150,000-barrel brine pits, oil-brine separator, maintenance and control center buildings, roads, well pads, and dikes. Water intake structure on the Brazos River, connected by a 36-inch pipeline.

### System Parameters

Fill via 30-inch-diameter, 3.6-mile pipeline to Phillips 66 Freeport Marine Terminal. Design oil fill rate - 240,000 bbl/d. Sustained system rate - 180,000 bbl/d.

Raw water design pumping rate - 1,140,000 bbl/d.

Brine disposal design pumping rate - 980,000 bbl/d (permit limitation 1,100,000 bbl/d).

### Drawdown

Drawdown via 30-inch-diameter, 3.6 mile pipeline, to Phillips 66 Freeport Marine Terminal.

Drawdown via 40-inch-diameter, 46-mile pipeline to ARCO Pipeline Company's Texas City Pipeline Terminal and Docks.

Design drawdown capability - 1,100,000 bbl/d.

### Major Accomplishments

Planned 226 million barrels of storage capacity have been completed.

Completed Cavern Storage Configuration Project to enhance sweet crude oil to a one million barrel-per-day drawdown rate capability and eliminated a pre-existing one million-barrel oil trap in Cavern 5.

Approximately 202.5 million barrels of crude oil in storage.

Completed construction and testing of 46 mile, 40-inch diameter crude oil pipeline between Bryan Mound and ARCO Terminal at Texas City, Texas.

Completed major enhancements to the ARCO Terminal to provide for pipeline throughput and across-the-dock distribution of Strategic Petroleum Reserve crude oil.

## **D. SULPHUR MINES**

### Location

Calcasieu Parish, Louisiana (two miles south west of Sulphur, Louisiana, and 20 miles north of West Hackberry salt dome).

### Acquisition

Acquired 109.63 acres fee simple and 64.52 acres conditional fee by condemnation in February 1979 from Union Texas Petroleum ( a subsidiary of Allied Corporation).

## Environmental/Permits

Environmental Impact Statement published March 1978.

Three major Federal and State permits for pipeline construction, oil storage, and air emissions acquired in 1978. Environmental Protection Agency discharge permits for storm water and sewage acquired in 1980.

## Site Description

26-million-barrel storage facility consisting of three existing caverns.

Oil, brine, raw water piping distribution system connecting caverns with central plant, water intake structure, and brine disposal wells. Consists of over 77,000 feet of piping and 18 pumps totaling over 8,000 horsepower. Four deep-injection brine disposal wells.

Two 100,000 barrels brine ponds, control center building, roads, well pads, and dikes.

Water intake structure 1.8 miles offsite on Houston Canal (Sabine River Diversion Canal No. 5) connected to facility by a combination of 16 and 12 inch pipelines.

## System Parameters

Oil fill via 16-inch-diameter, 15.9-mile spur pipeline connecting to Department of Energy West Hackberry pipeline at Intracoastal Waterway. Sustained system rate - 80,000 bbl/d (brine disposal-constrained).

Raw water design pumping rate - 100,000 bbl/d.

Brine disposal design pumping rate - 80,000 bbl/d.

## Drawdown

Drawdown via 16-inch-diameter, 15.9-mile spur pipeline to Intracoastal Waterway, then through 42-inch-diameter West Hackberry line, 34.4 miles to Sun Terminal, Nederland, Texas.

Design drawdown capability - 100,000 bbl/d.

## Major Accomplishments

Successfully tested simultaneous drawdown of Sulphur Mines and West Hackberry sites.

## **E. WEST HACKBERRY**

### Location

Cameron Parish, Louisiana (12 miles southwest of Lake Charles, Louisiana).

## Acquisition

Acquired 405.36 acres fee simple by condemnation in April 1977, from numerous private landowners. Olin Corporation was the previous site operator.

Acquired 160.0 additional acres fee simple by condemnation in two actions, July 1979 and March 1980.

## Environmental/Permits

Environmental Impact Statement published January 1977; supplement published April 1977. Phase III supplement published October 1981.

Six major Federal and state permits related to pipelines, drilling pads, water intake, and storage acquired in 1977 and 1978; NPDES permit renewed 1984.

Texoma Environmental Impact Statement published November 1978; supplement published in October 1981.

Two major Federal permits related to a brine pipeline acquired in 1980.

## Site Description

219-million-barrel storage facility consisting of 49 million barrels in five caverns existing upon site acquisition, plus 170 million barrels of storage capacity in 17 new Strategic Petroleum Reserve-developed caverns.

Oil, brine, raw water piping distribution system connecting caverns with central plant, water intake structure, and disposal wells. Consists of over 160,00 feet of piping and 47 pumps totaling over 62,000 horsepower. 36-inch-diameter, 27-mile brine disposal pipeline (nine miles offshore) to Gulf of Mexico.

175,000-barrel brine pit, oil-brine separator, control center and maintenance buildings, roads, well pads, and dikes.

Water intake structure on Intracoastal Waterway, 42-inch-diameter, 4.5-mile pipeline connecting to site.

## System Parameters

Fill via 42-inch diameter, 42.8-mile pipeline to Sun Terminal, Nederland, Texas. Design oil fill rate - 225,00 bbl/d. Sustained system rate - 175,000 bbl/d.

Raw water design pumping rate - 1,450,000 bbl/d

Brine disposal design pumping rate - 900,000 bbl/d (permit limitation 1,088,000 bbl/d) via 36-inch pipeline to the Gulf of Mexico.

## Drawdown

Drawdown via 42-inch-diameter, 42.8-mile pipeline to Sun Terminal, Nederland, Texas.

Design drawdown capability - 1,400,000 bbl/d.

### **Major Accomplishments**

Storage capacity was increased from 180 to 198 million barrels.

Approximately 185 million barrels of crude oil are in storage.

Completed design and all real estate actions necessary to acquire land for the Strategic Petroleum Reserve's 12-mile crude oil pipeline which will connect the West Hackberry site to the Lake Charles, Louisiana area and the Texas 22-inch pipeline.

## **F. BIG HILL**

### **Location**

Jefferson County, Texas (20 miles southwest of Beaumont, Texas).

### **Acquisition**

Acquired 268.61 acres fee simple by condemnation from three landowners, i.e., 238.55 acres from Amoco, 24.60 acres from the Pipkin estate, and 5.46 acres from the Patrick Henry Phelan estate.

### **Environmental/Permits**

Environmental Impact Statement published in October 1981.

State permits for drilling, underground hydrocarbon storage, pipeline operations, air quality, water appropriation, and water quality certifications were acquired in 1983. The EPA National Pollutant Discharge Elimination System permit was acquired in 1984.

### **Site Description**

160-million-barrel storage facility consisting of fourteen 11.5-million barrel storage caverns.

Oil, brine, and raw water systems connecting caverns with central plant, water intake structure, and brine disposal system.

48-inch diameter brine disposal pipeline extending to a point 3.5 nautical miles into the Gulf of Mexico.

Water intake structure on the Intracoastal Waterway connecting to the site by a 48-inch diameter pipeline.

### **System Parameters**

Fill via 36-inch-diameter, 25 mile pipeline from Sun Terminal, Nederland, Texas. Sustained system rate - 280,000 bbl/d.

Raw water design pumping rate - 1,400,000 bbl/d.

Brine disposal design pumping rate - 1,400,000 bbl/d (permit limitation of 1,700,000 bbl/d).

### **Drawdown**

Drawdown via 36-inch-diameter, 25 mile pipeline to Sun Terminal, Nederland, Texas.

Design Drawdown capability - 930,000 bbl/d.

### **Major Accomplishments**

Construction of raw water and brine pipelines was completed.

Construction of 25.2 mile crude oil pipeline to Sun Terminal was completed.

Initiated cavern development (leaching) on schedule on October 1, 1987.

Construction of the central control building and installation of the site's distributive control system.

## **G. ST. JAMES TERMINAL**

### **Location**

St. James Parish, Louisiana (45 miles southeast of Baton Rouge, Louisiana, on the Mississippi River).

### **Acquisition**

Acquired 104.76 acres of fee simple for terminal by condemnation in May 1978.

Acquired 47.68 acres fee simple for docks by condemnation in July 1978.

### **Environmental/Permits**

St. James' Terminal Environmental Impact Statement is a component of the Bayou Choctaw supplement, published May 1977, and the Weeks Island supplement, published August 1977.

Two Major Federal and state permits related to dock construction were acquired in 1978. Environmental Protection Agency discharge permit for storm water and sewage acquired in 1980. Dock Construction Permit modified 1982.

### **Site Description**

Terminal facilities include six storage tanks totaling two million barrels of capacity, tie-ins to Bayou Choctaw, Weeks Island, and to LOCAP, Capline pipeline, and the Capline terminal complex.



UNITED STATES  
DEPARTMENT OF ENERGY  
WASHINGTON, D.C. 20585  
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Oil distribution piping system connecting docks, tanks, and pump station consists of over 35,000 feet of piping and eight pumps totaling over 12,000 horsepower, metering systems, and maintenance and control buildings.

Two docks with one berth each, able to accommodate vessels of up to 123,000 long tons maximum loaded displacement. A 42-inch-diameter pipeline connects the docks to the storage tanks.

### **System Parameters**

Tanker unloading - design unloading capacity of 40,000 bbl/hr.

Distribution from terminal to:

Bayou Choctaw: design pumping rate - 240,000,000 bbl/d;

Weeks Island: design pumping rate - 480,000 bbl/d.

Terminal throughput:

Fill sustained system rate - 350,000 bbl/d;

Across docks - 400,000 bbl/d.

### **Drawdown**

Crude oil from Bayou Choctaw and/or Weeks Island to be distributed across docks and to Capline Pipeline Terminal.

### **Major Accomplishments**

Concluded a tie-in agreement with Capline Pipeline owners for a direct pipeline connection between the Strategic Petroleum Reserve's St. James Terminal and the Capline Pipeline. Construction of the pipeline is scheduled for early 1988.

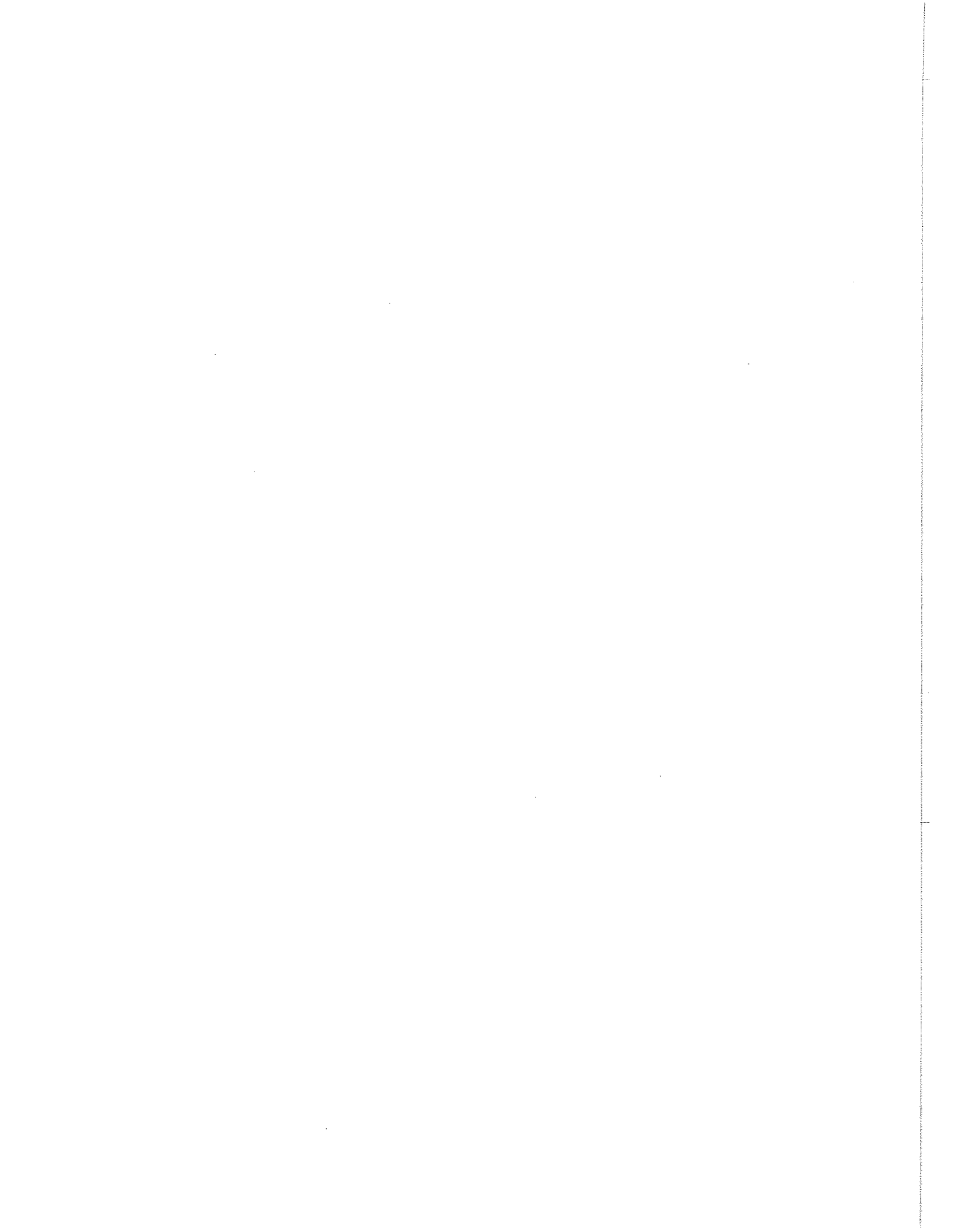
Attachment H  
SPR Crude Oil Specifications (SPRO 1985 JAN) a/

Characteristic	Categories b/					Primary ASTM Test Method c/
	I	II	III	IV	V	
API Gravity [ °API]	30 - 45	40 - 45	30 - 40	34 - 40	36 - 41	D 1298
Total Sulphur [Wt. %], Max.	1.99	0.25	0.50	0.25	0.50	D 1552
Pour Point [°F(°C)], Max.	50 (10)	50 (10)	50 (10)	50 (10)	50 (10)	D 97
Salt Content [Lbs./1,000 Bbls.], Max.	50	50	50	50	50	D 3230
Viscosity [SUS @ 60°F (cSt @ 15.6°C)], Max.	150 (32)	150 (32)	150 (32)	150 (32)	150 (32)	D 445 & D 2161
Viscosity [SUS @ 100°F (cSt @ 37.8°C)], Max.	70 (13)	70 (13)	70 (13)	70 (13)	70 (13)	
Reid Vapor Pressure [Psia @ 100°F (kPa @ 37.8°C)], Max.	11 (76)	11 (76)	11 (76)	11 (76)	11 (76)	D 323
Total Acid Number [mg KOH/g], Max.	0.40	0.40	0.40	0.40	0.40	D 664
Water and Sediment [Vol. %], Max.	1.00	1.00	1.00	1.00	1.00	D473 & D 4006
Yields [Vol. %]						D 2892 & D 1160
Naphtha [ < 375°F (< 191°C)]	24 - 30	35 - 42	21 - 29	29 - 36	30 - 38	
Distillate [ 375 - 620°F (191-327°C)]	17 - 31	21 - 35	23 - 37	31 - 45	19 - 33	
Gas Oil [620-1050°F (327-566°C)]	26 - 38	20 - 34	28 - 42	20 - 34	23 - 37	
Residuum [ > 1050°F (>566°C)]	10 - 19	4 - 9	7 - 14	0 - 5	7 - 14	

a) Marketable virgin crude petroleum suitable for normal refinery processing and free of foreign contaminants or chemicals including, but not limited to, chlorinated and/or oxygenated hydrocarbon, and lead.

b) For SPR acquisition and storage purposes, crude oil meeting the characteristics of Category I is designated as sour, while crude oil meeting the characteristics of Categories II, III, IV, and V is designated as sweet.

c) To the maximum extent practicable, the primary ASTM test methods listed are to be used in characterizing crude oil. While other methods may be used when the primary method is unavailable, the primary method is designated as the binding method should results of the alternative method be questioned.



# Strategic Petroleum Reserve Annual/Quarterly Report



February 16, 1989

**U.S. Department of Energy**  
Assistant Secretary for Fossil Energy  
Office of Petroleum Reserves

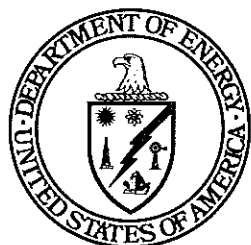
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# Strategic Petroleum Reserve Annual/Quarterly Report



February 16, 1989

**U.S. Department of Energy**  
Assistant Secretary for Fossil Energy  
Office of Petroleum Reserves  
Washington, DC 20585





# TABLE OF CONTENTS

	<u>Page</u>
EXECUTIVE SUMMARY .....	1
PROGRAM DEFINITION .....	3
SPECIAL REPORTS ON THE SIZE AND FINANCING OF THE STRATEGIC PETROLEUM RESERVE .....	7
STORAGE FACILITIES DEVELOPMENT .....	8
Development Status .....	10
Capital Improvements .....	14
OIL ACQUISITION AND TRANSPORTATION .....	15
OTHER PROJECT ACTIVITIES	
Procurement and Contractor Support .....	23
Real Estate .....	23
Environmental Compliance and Permits .....	23
Security .....	24
BUDGET AND FINANCE .....	25
DRAWDOWN AND DISTRIBUTION SYSTEM AND VULNERABILITY IMPACT .....	31
Distribution Plan .....	31
Competitive Sales Procedures .....	31
Drawdown and Distribution Capabilities .....	32
Drawdown and Distribution Tests .....	35
Distribution Enhancements .....	35
Vulnerability Impact .....	37
APPENDIX: STRATEGIC PETROLEUM RESERVE SITE STATUS .....	A-1
A. Bayou Choctaw	
B. Weeks Island	
C. Bryan Mound	
D. Sulphur Mines	
E. West Hackberry	
F. Big Hill	
G. St. James Terminal	
H. Strategic Petroleum Reserve Crude Oil Specifications	



## LIST OF TABLES

	<u>Page</u>
Table 1 - Strategic Petroleum Reserve Storage and Drawdown Criteria .....	10
Table 2 - 1988 Storage Capacity Development by Quarter .....	14
Table 3 - Strategic Petroleum Reserve Oil Inventory and Delivery Statistics .....	16
Table 4 - Strategic Petroleum Reserve Oil Fill History .....	17
Table 5 - Crude Oil Received through 1988 .....	20
Table 6 - Strategic Petroleum Reserve Crude Oil Inventory .....	21
Table 7 - Strategic Petroleum Reserve Appropriations .....	26
Table 8 - Current Sustained Capabilities .....	33

## LIST OF FIGURES

	<u>Page</u>
Figure 1 - Program/Project Management Structure .....	6
Figure 2 - Strategic Petroleum Reserve Sites .....	9
Figure 3 - Annual Strategic Petroleum Reserve Oil Fill .....	18
Figure 4 - Cumulative Strategic Petroleum Reserve Oil Fill .....	18
Figure 5 - Strategic Petroleum Reserve Annual Funding .....	27
Figure 6 - Strategic Petroleum Reserve Cumulative Funding .....	27
Figure 7 - Strategic Petroleum Reserve Drawdown Capability .....	34
Figure 8 - Strategic Petroleum Reserve Drawdown/Distribution Capability .....	34
Figure 9 - Current and Planned Drawdown and Distribution Capabilities (year end) .....	36
Figure 10 - Current and Planned Strategic Petroleum Reserve Distribution System .....	38
Figure 11 - Days of Net Import Protection .....	40



## **EXECUTIVE SUMMARY**

### **NEW LEGISLATION**

On September 27, 1988, the President signed the Interior and Related Agencies Appropriations Act, Fiscal Year 1989 (Public Law No. 100-446), which provides funding for the development, operation and management of the Strategic Petroleum Reserve and for oil acquisition and transportation. Public Law No. 100-446 also requires that a report be submitted to Congress before April 1, 1989, addressing the steps which would be necessary to develop sites and facilities to expand the Reserve to a one billion barrel capacity. On October 28, 1988, the President signed an amendment to the Department of Energy Organization Act (Public Law No. 100-531), which provides arrest authority to the Strategic Petroleum Reserve's protective forces and permits them to carry firearms.

### **OIL ACQUISITION AND FILL RATES**

As of December 31, 1988, the Strategic Petroleum Reserve crude oil inventory was 559.5 million barrels, an increase of 18.9 million barrels over the 1987 year-end inventory of 540.6 million barrels. The Strategic Petroleum Reserve was filled at a rate of 51,548 barrels per day during calendar year 1988.

### **FACILITIES AND STORAGE DEVELOPMENT**

During calendar year 1988, the Strategic Petroleum Reserve increased its crude oil storage capability from 578.8 million

barrels to 600.0 million barrels. At the West Hackberry site, storage capacity development was completed in September; 21.2 million barrels of capacity was created in 1988, bringing the total site storage capacity to 219 million barrels. Bayou Choctaw's Cavern 101, the final new cavern to be developed at that site, achieved a gross volume of 5.9 million barrels (52 percent completion). New storage capacity development at Big Hill continued on schedule toward completion in 1991.

### **DISTRIBUTION ENHANCEMENTS**

The Strategic Petroleum Reserve also increased its distribution capability from 3.0 to 3.2 million barrels per day during 1988, with the completion of a direct pipeline connection between the Department's St. James marine terminal and the adjacent Capline Pipeline terminal. Additionally, the Department initiated the design of an enhancement of the Bryan Mound site drawdown capability to achieve 1.25 million barrels per day and effected the construction of a crude oil pipeline from the West Hackberry site to access the Lake Charles refining area.

### **DRAWDOWN EXERCISES**

From October 12 through November 15, 1988, the Strategic Petroleum Reserve Office conducted a comprehensive drawdown training exercise named SPRITE IV. The exercise involved two consecutive simulated competitive sales of Strategic Petroleum Reserve crude oil and tested the management, sales, and financial functions associated with a drawdown and distribution.



## **PROGRAM DEFINITION**

Section 165 of the Energy Policy and Conservation Act of 1975 (Public Law No. 94-163), as amended, requires the Secretary of Energy to submit annual and quarterly reports to the President and the Congress on activities to develop the Strategic Petroleum Reserve. Additional prospective information related to the development and fill of the Strategic Petroleum Reserve is required by the Omnibus Budget Reconciliation Act of 1986 (Public Law No. 99-509). This report combines the fourth quarter 1988 Quarterly Report with the 1988 Annual Report.

## **PROGRAM LEGISLATION**

The Strategic Petroleum Reserve was authorized by Congress with the enactment on December 22, 1975, of the Energy Policy and Conservation Act, which declared it to be United States policy to establish a Strategic Petroleum Reserve of up to one billion barrels of petroleum products to reduce the impact of disruptions in petroleum supplies and to carry out the obligations of the United States under the International Energy Program.

The Energy Policy and Conservation Act provisions regarding the Strategic Petroleum Reserve were amended by Title VIII of the Energy Security Act (Public Law No. 96-294), approved June 30, 1980. This Act established a minimum average daily fill rate of 100,000 barrels and precluded sale of Naval Petroleum Reserve Number 1 (Elk Hills, California) crude oil except to fill the Strategic Petroleum Reserve, unless the Strategic Petroleum

Reserve was being filled at the minimum rate or had reached 500 million barrels in inventory.

The Energy Policy and Conservation Amendments Act of 1985 (Public Law No. 99-58) enacted on July 2, 1985, extended the provisions of Title I, Part B, of that Act relating to the Strategic Petroleum Reserve until June 30, 1989, and directed the Secretary of Energy to conduct a sale or exchange of 1.1 million barrels of Strategic Petroleum Reserve oil to test the drawdown and distribution capabilities of the Strategic Petroleum Reserve.

The Food Security Act (Public Law No. 99-198), enacted on December 23, 1985, provided for the barter of agricultural commodities for crude oil to fill the Strategic Petroleum Reserve.

The Omnibus Budget Reconciliation Act of 1986 (Public Law No. 99-509), enacted on October 18, 1986, amended the Energy Policy and Conservation Act to require that the Strategic Petroleum Reserve be filled at a minimum rate of 75,000 barrels a day until at least 750 million barrels are in storage.

On September 27, 1988, the President signed the Interior and Related Agencies Appropriation Act for Fiscal Year 1989 (Public Law No. 100-446). This legislation provides \$173.4 million in fiscal year 1989 for the continued development, operations and management of the Strategic Petroleum Reserve and \$242 million for oil acquisition and transportation. The Congress, at the time the Act was being considered, estimated that this funding

would support an average fill rate of approximately 50,000 barrels per day in fiscal year 1989. Public Law No. 100-446 also provides \$91.6 million, to become available on October 1, 1989, for oil to be delivered to the Strategic Petroleum Reserve in the first quarter of fiscal year 1990. Further, Public Law No. 100-446 requires a report to be submitted to the appropriate Congressional committees before April 1, 1989, addressing the steps necessary to develop storage sites and facilities to expand the Reserve to a one billion barrel capacity. The report will address potential storage sites, benefits and budgetary considerations, cost, distribution and possible schedules for implementation.

The Department of Energy Organization Act Amendment Act (Public Law No. 100-531), signed by the President on October 28, 1988, authorizes protective force personnel who guard the Strategic Petroleum Reserve's storage and related facilities to carry firearms while performing official duties and to make arrests without warrants. The legislation also establishes trespass on Strategic Petroleum Reserve property as a Federal offense.

### **SPR PLAN AND AMENDMENTS**

The Energy Policy and Conservation Act required a Strategic Petroleum Reserve Plan. The plan, addressing the development and implementation of the Strategic Petroleum Reserve, was submitted to Congress on February 16, 1977, and became effective on April 18, 1977.

Strategic Petroleum Reserve Plan Amendment No. 1 accelerated the planned

schedule for filling the Reserve. This Amendment was submitted to the Congress on May 25, 1977, and became effective on June 20, 1977. The revised goal of 500 million barrels of crude oil to be in storage by December 22, 1980, advanced the original schedule by two years. Amendment No. 2 to the Strategic Petroleum Reserve Plan authorized an increase in the Strategic Petroleum Reserve size from 500 million barrels to one billion barrels. This amendment was transmitted to the Congress on May 18, 1978, and became effective on June 13, 1978. The Amendment described Department of Energy plans to store 750 million barrels of petroleum in underground storage facilities. Decisions were not made regarding the methods or timing for developing the final 250 million barrels of storage capacity.

On October 31, 1979, the Department of Energy submitted the Distribution Plan for the Strategic Petroleum Reserve (Amendment No. 3, Energy Action No. 5) to the Congress. In accordance with the provisions of the Energy Policy and Conservation Act, this Plan became effective on November 15, 1979. The Distribution Plan described the methods for drawdown and distribution of crude oil from the five existing Strategic Petroleum Reserve storage sites.

On December 1, 1982, President Reagan transmitted a new "Drawdown" (Distribution) Plan (Amendment No. 4) to the Congress for the use of the Strategic Petroleum Reserve. This plan, required under the Energy Emergency Preparedness Act of 1982, provides procedures for the drawdown, sale, and distribution of crude oil from the Strategic Petroleum Reserve.

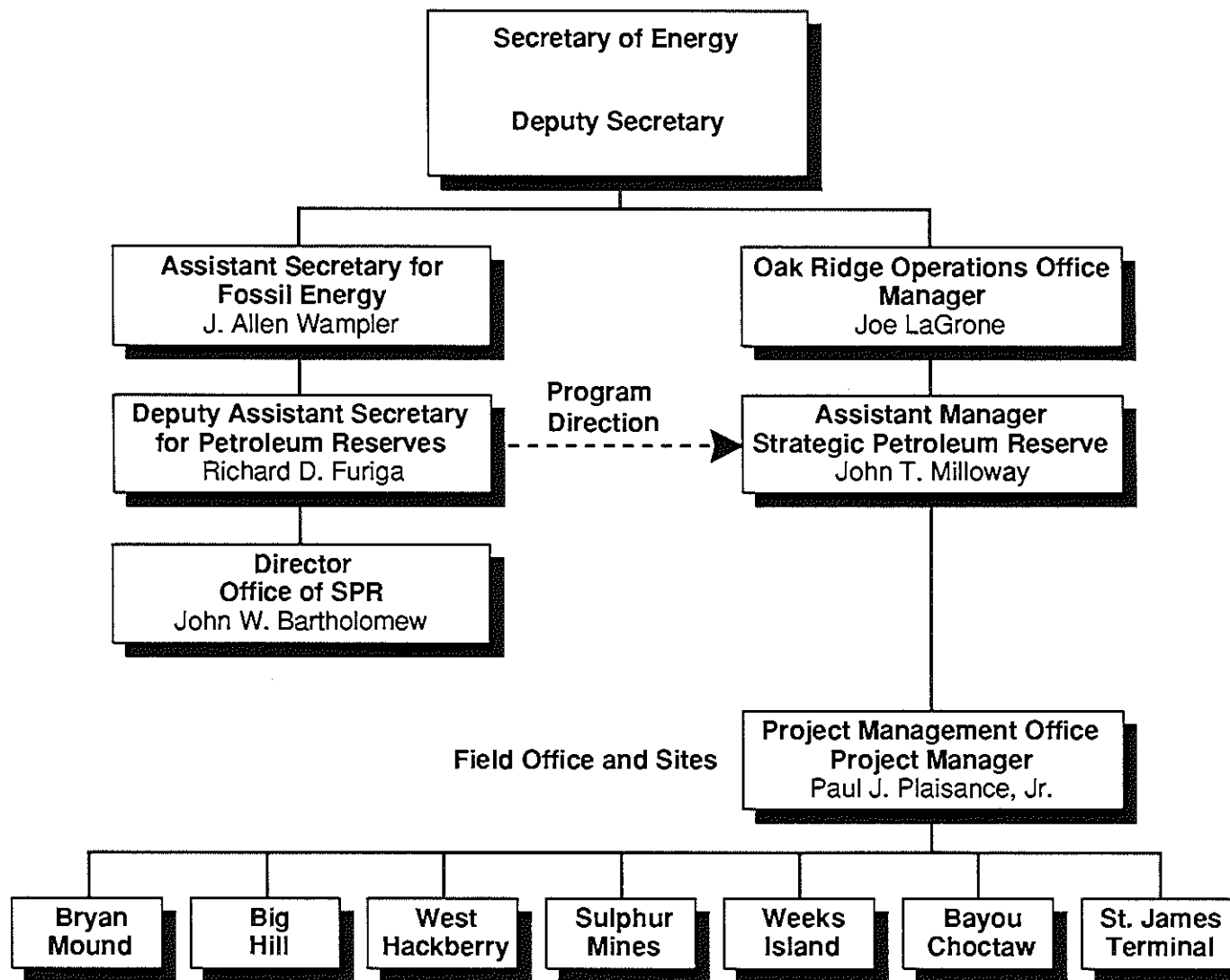


## PROGRAM/PROJECT MANAGEMENT

The Strategic Petroleum Reserve Office was created under the Energy Policy and Conservation Act for the establishment, management, and maintenance of the Strategic Petroleum Reserve. The Assistant Secretary for Fossil Energy, J. Allen Wampler, has overall programmatic responsibility for achieving the goals and objectives of the Strategic Petroleum Reserve Program. This responsibility has been delegated to the Deputy Assistant Secretary for Petroleum Reserves, Richard D. Furiga and is exercised through offices located in Washington, D.C. Under the Deputy Assistant Secretary for Petroleum Reserves, the Director of the Office of Strategic Petroleum Reserve, John W.

Bartholomew, establishes plans and performance specifications for the Reserve's development, fill, drawdown, and distribution.

Strategic Petroleum Reserve project management and implementation activities are assigned to the Manager, Oak Ridge Operations Office, Joe La Grone, who directs Strategic Petroleum Reserve activities through the Assistant Manager for the Strategic Petroleum Reserve, John T. Milloway. The Project Management Office, located in New Orleans, Louisiana, and headed by Paul J. Plaisance, Jr., carries out day-to-day project activities as delegated by the Manager, Oak Ridge Operations Office. Figure 1 shows the project management structure for the program.



9

Figure 1

**Program/Project Management Structure**

## **SPECIAL REPORTS ON THE SIZE AND FINANCING OF THE STRATEGIC PETROLEUM RESERVE**

On August 8, 1988, the Senate Committee on Energy and Natural Resources conducted a hearing regarding financing approaches and the size of the Strategic Petroleum Reserve. The testimony included mention of two studies regarding these subjects that were due to be presented to the Department of Energy and which were completed in November 1988.

The study on Strategic Petroleum Reserve financing approaches is represented by the report "SPR Financing Alternatives" prepared by the Energy Futures Group, Inc., under contract to the Department of Energy. The report focused on four general categories of alternative Strategic Petroleum Reserve financing for incremental fill, and generally concluded that utilizing the Federal Financing Bank or dedicating the revenues of the Naval Petroleum Reserves were the best alternatives in terms of achieving more immediate results, if an alternative

to current financing of the Strategic Petroleum Reserve were necessary. The report also identified and discussed the attributes of several other alternatives, including bonds and user fees, that might be more difficult to pursue.

The study on Strategic Petroleum Reserve size, which examines the benefits of expanding the Reserve to one billion barrels, is represented by three cross-referenced reports. They are "Input Assumptions for the Teisberg Model: OPEC Supply Behavior, Probability and Size of Disruptions, Private Stockpile Behavior, Non-OPEC Supply Behavior, and Price and Income Elasticities of Demand" prepared by ICF Incorporated; "Preliminary Results of the SPR Size Cost-Benefit Study" prepared by Oak Ridge National Laboratory (operated by Martin Marietta Energy Systems, Inc.); and "Expansion of the Strategic Petroleum Reserve to One Billion Barrels" prepared by ICF Incorporated. As previously noted, the Department is required to provide a report to Congress by April 1, 1989, addressing the steps necessary to develop storage sites and facilities to expand the Strategic Petroleum Reserve to one billion barrels.

## **STORAGE FACILITIES DEVELOPMENT**

The Department of Energy has been involved in a major storage facilities development program to stockpile crude oil since 1976. Over the last 12 years, the Department has acquired and developed six underground crude oil storage facilities in salt domes along the gulf coasts of Texas and Louisiana and a Government-owned marine terminal on the Mississippi River at St. James, Louisiana. The six storage sites are Bayou Choctaw, Weeks Island, West Hackberry and Sulphur Mines in Louisiana, and Bryan Mound and Big Hill in Texas. These six storage sites are organized into three distribution systems and connected by Department of Energy pipelines to commercial crude oil pipeline networks and to commercial and government-owned marine terminal distribution

facilities. The Strategic Petroleum Reserve facilities development program is presently directed toward providing a total storage capacity of 750 million barrels and a drawdown/distribution capability of 4.5 million barrels per day. The locations of the current Strategic Petroleum Reserve storage sites and their associated distribution pipelines and terminals are shown in Figure 2.

A summary of facilities development plans and specifications for the Strategic Petroleum Reserve, including planned site storage capacities, storage configurations and drawdown capabilities is presented in Table 1. Current plans provide for the decommissioning in 1992 of the Sulphur Mines 26-million barrel storage facility, with replacement capacity to be developed by the enlargement of caverns at Big Hill and Bayou Choctaw.

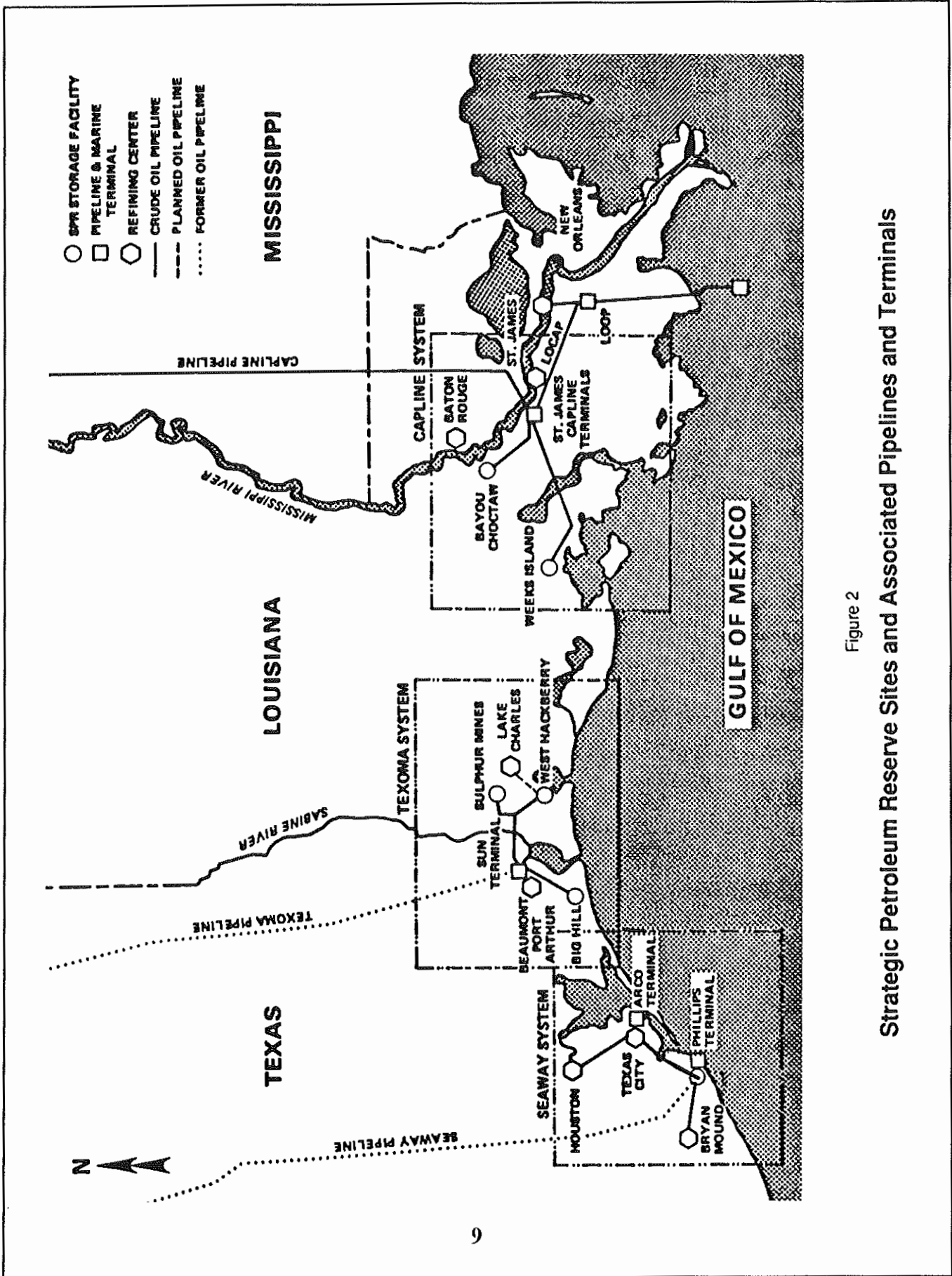


Figure 2  
Strategic Petroleum Reserve Sites and Associated Pipelines and Terminals

**FACILITIES DEVELOPMENT STATUS**

**Bryan Mound**

The Bryan Mound site is located in Brazoria County, Texas approximately three miles southwest of Freeport. The Department acquired this storage site in 1977 and converted four existing brine caverns with a total capacity of 66 million barrels to oil storage. Subsequently, site capacity was expanded to 226 million barrels through the solution mining of 16

additional 10-million-barrel caverns. The expansion was completed in 1986, and final oil fill is in progress. In 1988, 14.4 million barrels of oil were added to the site's inventory, which reached 217 million barrels.

**West Hackberry**

The West Hackberry site is located in Cameron Parish, Louisiana, approximately 22 miles southwest of Lake Charles. The Department acquired this storage site in 1977 and converted five existing brine

Table 1

**STRATEGIC PETROLEUM RESERVE STORAGE AND DRAWDOWN CRITERIA**

<u>Storage Group</u>	<u>Storage Facilities</u>	<u>Storage Capacity (MMB)</u>	<u>Crude Mix (Sweet/Sour) (MMB)</u>	<u>Drawdown Capability (MB/D)</u>
Seaway Group	Bryan Mound	226	66/160	1,250
Texoma Group	West Hackberry	219	112/107	1,250
	Sulphur Mines	-	-	-
	Big Hill	<u>160</u>	<u>69/91</u>	<u>930</u>
		379	181/198	2,180
Capline Group	Bayou Choctaw	72	34/38	480
	Weeks Island	<u>73</u>	<u>0/73</u>	<u>590</u>
		145	34/111	1,070
Total		750	281/469 37%/63%	4,500

MMB: million barrels  
MB/D: thousands of barrels per day

caverns with a capacity of 49 million barrels to oil storage. Subsequently, the Department expanded this storage site through solution mining of 17 additional 10-million-barrel storage caverns. Development of this site to the planned level of 219 million barrels was completed in September 1988. Oil fill is in progress and projected to be completed in late 1990 at currently projected fill rates.

During 1988, Cavern 111, which was in the final stage of development, underwent a comprehensive series of cavern integrity tests to ascertain the reason for anomalous oil/brine interface movements. Nitrogen and hydrostatic pressure testing have concluded that the cavern integrity is sound and certifiable. The cavern is now available for fill.

### **Sulphur Mines**

The Sulphur Mines site is located in Calcasieu Parish, Louisiana, approximately 12 miles west of Lake Charles. The Department acquired this storage site in 1979 and converted three existing brine caverns with a capacity of 26 million barrels to crude oil storage. Development and fill of this site were completed in 1983. The site is currently in an operational standby mode.

Sulphur Mines was originally acquired to meet early and accelerated oil fill schedules established under the Strategic Petroleum Reserve Plan. With the development of additional and larger Strategic Petroleum Reserve storage facilities, it was recognized that Sulphur Mines' comparatively small storage capacity and limited operational capabilities significantly reduced its cost effectiveness and drawdown

utility. Sulphur Mines has the highest per barrel standby costs which, coupled with the lowest site-drawdown rate and restricted distribution configuration, limits its value as an oil storage facility for the Strategic Petroleum Reserve.

Based on a 1986 study, reviewed and updated in 1988, the Department concluded that the Government could realize a savings of approximately \$83 million over 20 years and enhance the Strategic Petroleum Reserve's drawdown performance through the development of an additional equivalent volume (26 million barrels) of storage capacity at other Strategic Petroleum Reserve sites. The Department plans to decommission the site in 1992. Plans provide for 20 million barrels of replacement capacity to be developed at Big Hill and 6 million barrels at Bayou Choctaw. Oil transfer to the Big Hill site is planned to be initiated in fiscal year 1991. Site decommissioning and transfer to the General Services Administration for disposition, or sale of the site by the Department, would occur in fiscal year 1992 following transfer of the oil to Big Hill.

The Department is currently conducting a market analysis to ascertain potential industrial uses of the Sulphur Mines site, and the degree of interest of commercial companies. Further, the Department has initiated the appropriate assessment of environmental impacts of the planned action.

### **Big Hill**

The Big Hill storage site is located in Jefferson County, Texas, 20 miles southwest of Beaumont. The Department ac-

quired this undeveloped site in 1982 and has been constructing a new storage facility with a planned storage capacity of 160 million barrels and a drawdown capability of 930,000 barrels per day. The site's planned total capacity includes 20 million barrels of storage capacity to replace a portion of that lost through the planned decommissioning of the Sulphur Mines site.

Cavern development (leaching) operations were initiated at Big Hill in October 1987; all 14 caverns are now being leached. Gross cavern volume is increasing by more than 4 million barrels per month and reached a total of 44.5 million barrels by the end of 1988. The Big Hill storage facility is planned to achieve an initial oil fill capability in February 1990. Development of the site to its planned capacity of 160 million barrels is projected to be completed by September 1991.

During the third quarter of 1988, the Department contracted with Sun Pipe Line Company to interconnect the Big Hill and West Hackberry distribution pipelines at the Sun Terminal in Nederland, Texas; this pipeline connection provides for inter-site movement of crude oil between Sulphur Mines and Big Hill and between West Hackberry and Big Hill. The Big Hill pipeline to Sun Terminal became operational in September 1988.

On December 6, 1988, the Department awarded a 10-year contract to Sun Pipe Line Company for terminalling services to support Big Hill oil fill and drawdown operations. The Sun Terminal tie-in and related terminal modifications required for distribution are to be completed by

November 1989.

### Bayou Choctaw

The Bayou Choctaw site is located in Iberville Parish, Louisiana, approximately 12 miles southwest of Baton Rouge. The Department acquired this storage site in 1977 and converted four existing brine caverns with a capacity of 46 million barrels to oil storage. Subsequently, the Department acquired a fifth existing cavern (No. 17) through an exchange agreement with Union Texas Petroleum. Also one new 10-million-barrel cavern (No. 101) is currently under development through solution mining.

During 1988, the gross volume of Cavern 101 reached 5.9 million barrels. An additional 6 million barrels of capacity will be leached in Cavern 18 upon completion of Cavern 101. The additional 6 million barrels achieved by enlarging Cavern 18 will constitute part of the replacement capacity for capacity to be lost as a result of decommissioning the Sulphur Mines site, and will bring Bayou Choctaw to its total designed storage capacity of 72 million barrels by September 1991. The brine filtering system underwent significant improvements during 1987 and 1988, resulting in improved brine disposal and increased longevity of the brine injection wells.

### Weeks Island

The Weeks Island site is located in Iberia Parish, Louisiana, approximately 95 miles southwest of New Orleans. The Department acquired this storage site in 1977 and converted an existing conven-



tional salt mine with a capacity of 73 million barrels to oil storage. Development and fill of this site was completed in 1982. The site is currently in an operational standby mode.

A 1987 investigation into the source of brine entering the fill-hole sump of the Weeks Island mine revealed that the brine accumulating in the sump originated from water which has separated from the crude oil and has settled-out due to its greater density, and also from brine injected into the mine following hydrotesting of the crude oil pipeline between the site and the Department's St. James marine terminal. No other measurable water intrusion has been detected. Monitoring of the rate of the brine return to the fill-hole sump continued throughout 1988, and the rate of brine return continued to decrease as expected.

During 1988, the Department initiated the design of several improvements to the Weeks Island storage site to detect and mitigate risks of any potential water entry into the mine. A system is being designed for removal of moisture from the air circulated through the mine's manway; this drying of the air will reduce condensation and therefore enable small leaks to be more readily detected and corrected. Also, an alternative oil drawdown system is being designed to enable oil drawdown in the event that the primary drawdown system becomes disabled. In-mine bulkheads for isolating the abandoned Morton Thiokol Markel Mine from the underground Strategic Petroleum Reserve operations area are also being designed to reduce the risk of any problems that may develop in the

Markel Mine. In 1988, subsidence monitoring survey monuments were installed at the surface in cooperation with Morton Thiokol, Inc., to provide enhanced subsidence analyses and predictions. In 1989, the Department also plans to install subsurface convergence-measuring instrumentation which will provide data to further enhance analyses and predictions of the subsidence.

### **STRATEGIC PETROLEUM RESERVE STORAGE CAPACITY DEVELOPMENT**

The Strategic Petroleum Reserve's total permanent storage capacity increased by 21.2 million barrels during the year, from 578.8 million barrels to 600.0 million barrels (Table 2). All of this new permanent capacity was developed at West Hackberry.

Storage capacity development has now been completed at 4 storage sites - Bryan Mound, West Hackberry, Sulphur Mines and Weeks Island; and storage capacity development is proceeding on schedule at the two remaining sites - Bayou Choctaw and Big Hill. Different from the earlier site developments, caverns at Bayou Choctaw and Big Hill are being developed in a mode in which the caverns are being solution mined to their final shape and capacity prior to storing any significant quantity of oil. During 1988, approximately 5.1 million barrels of gross cavern volume were developed at Bayou Choctaw and 40.9 million barrels of gross cavern volume at Big Hill. This volume is not shown in the table above since it is not considered storage capacity available for oil fill.

**Table 2**

**STORAGE CAPACITY DEVELOPMENT BY QUARTER  
(In Million Barrels)**

<u>Storage Facility</u>	<u>1987 Year-End</u>	<u>1st Quarter</u>	<u>2nd Quarter</u>	<u>3rd Quarter</u>	<u>4th Quarter</u>	<u>1988 Year-End</u>
Bryan Mound	226.0					226.0*
West Hackberry	197.8	1.2	1.3	18.7	0.0	219.0*
Bayou Choctaw	56.0	0.0	0.0	0.0	0.0	56.0
Weeks Island	73.0					73.0*
Sulphur Mines	26.0					26.0*
Big Hill	<u>0.0</u>	<u>0.0</u>	<u>0.0</u>	<u>0.0</u>	<u>0.0</u>	<u>0.0</u>
<b>Total</b>	<b>578.8</b>	<b>1.2</b>	<b>1.3</b>	<b>18.7</b>	<b>0.0</b>	<b>600.0</b>

\* Capacity Development Complete.

**CAPITAL IMPROVEMENTS**

Capital improvement projects designed to upgrade site facilities continued in 1988. Major fire protection improvements were completed or initiated at several sites in an on-going equipment and personnel safety protection program. Construction of foam deluge fire extinguishing systems at Bryan Mound, Weeks Island and St. James were near completion at the end of 1988. Bayou Choctaw and West Hackberry foam deluge systems were completed in 1987. Installation of emergency shutdown valves on the crude oil pipelines at each cavern wellhead was initiated at West Hackberry and Bayou Choctaw; installation of such valves at Bryan Mound is planned for 1989.

Additional cathodic protection of site piping and well-casings was completed at Bayou Choctaw, essentially completed at Bryan Mound, and initiated at West Hackberry and St. James. All cathodic protection upgrades should be completed in 1989.

Construction of permanent office facilities at West Hackberry, Bayou Choctaw, Bryan Mound, Weeks Island and St. James was initiated with completion scheduled for mid-1989. Additionally, construction of a warehouse for vehicles and heavy equipment was initiated at Weeks Island.

At St. James, security upgrades were initiated with the relocation of a taut-wire sensor fence.

## **OIL ACQUISITION AND TRANSPORTATION**

### **Statistics for Fourth Quarter, 1988**

The Strategic Petroleum Reserve was filled at an average rate of 52,779 barrels per day during the calendar quarter ending December 31, 1988. As of December 31, 1988, the Strategic Petroleum Reserve crude oil inventory was 559,514,886 barrels. Table 3 summarizes the Strategic Petroleum Reserve crude oil inventory and delivery statistics as of December 31, 1988 and includes projections for calendar year 1989.

During the period of October 1, 1988 through December 31, 1988, only high sulfur (sour) crude oil was delivered to the Strategic Petroleum Reserve terminals. The weighted average price per barrel of the sour crude oil delivered to the Strategic Petroleum Reserve terminals during this

period was approximately \$12.24 per barrel, including costs for transportation, but excluding costs for customs duties, Superfund taxes, terminal services and miscellaneous costs.

### **OIL FILL, CALENDAR YEAR 1988**

During 1988, the Strategic Petroleum Reserve crude oil inventory was increased by 18.9 million barrels, representing an average annual fill rate of 51,548 barrels per day. This average daily fill rate exceeded the 44,362 barrels per day fill rate projected in the 1987 Strategic Petroleum Reserve Annual/Quarterly Report primarily due to a decline in crude oil prices.

Fiscal and calendar year inventories and average daily fill rates since 1977 are presented in Table 4. Strategic Petroleum Reserve crude oil fill is illustrated on both an annual and cumulative basis in Figures 3 and 4, respectively.

Table 3

**STRATEGIC PETROLEUM RESERVE  
OIL INVENTORY AND DELIVERY STATISTICS**

**1988 Inventory and Delivery Summary  
(Barrels)**

<u>Calendar 1988</u>	<u>Planned Average Daily Fill Rate</u>	<u>Average Daily Fill Rate</u>	<u>Actual</u>	
			<u>Quarter Oil Receipts</u>	<u>Ending Oil Inventory</u>
1st Quarter	57,000	47,140	4,289,695	544,937,994
2nd Quarter	35,000	56,239	5,117,730	550,055,724
3rd Quarter	35,000	50,038	4,603,519	554,659,243
4th Quarter	50,000	52,779	4,855,643	559,514,886
<b>TOTAL</b>	44,362	51,548	18,866,587	559,514,886
Total Crude Oil in Transit (December 31, 1988)				752,983
Crude Oil available under contract for delivery during CY 1989				26,300,000

**1989 Inventory and Delivery Projections\***

<u>Calendar 1989</u>	<u>Average Daily Fill Rate</u>	<u>Quarter Oil Receipts</u>
1st Quarter	88,000	7,920,000
2nd Quarter	75,000	6,825,000
3rd Quarter	75,000	6,900,000
4th Quarter	22,000	2,024,000
<b>TOTAL</b>	65,000	23,669,000

\* Based on anticipated crude oil prices and FY 1990 budget assumptions.

Table 4

STRATEGIC PETROLEUM RESERVE OIL FILL HISTORY

	<u>Fiscal Year</u>		<u>Calendar Year</u>	
	<u>Year-End Inventory (Million bbls)</u>	<u>Average Daily Fill Rate (Thousand bbls/d)</u>	<u>Year-End Inventory (Million bbls)</u>	<u>Average Daily Fill Rate (Thousand bbls/d)</u>
1977	1.1	3	7.2	20
1978	49.1	131	68.5	168
1979	91.2	115	91.7	64
1980	92.8	4	107.8	44
1981	199.2	292	230.3	336
1982	277.9	215	293.8	174
1983	361.0	228	379.1	234
1984	431.1	191	450.5	195
1985	489.3	159	493.3	119 *
1986	506.4	47 *	511.6	51 *
1987	533.9	75	540.6	80
1988	554.7	57	559.5	52

\* Fill rates unadjusted for oil deliveries under the 1985/86 test sale.

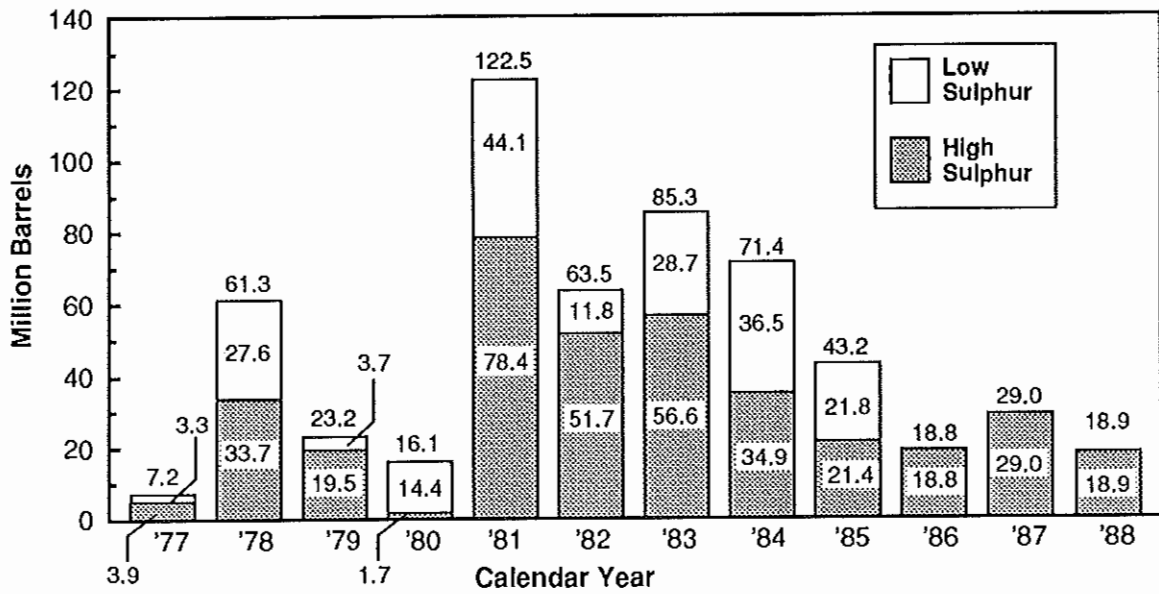


Figure 3

### Annual Strategic Petroleum Reserve Oil Fill

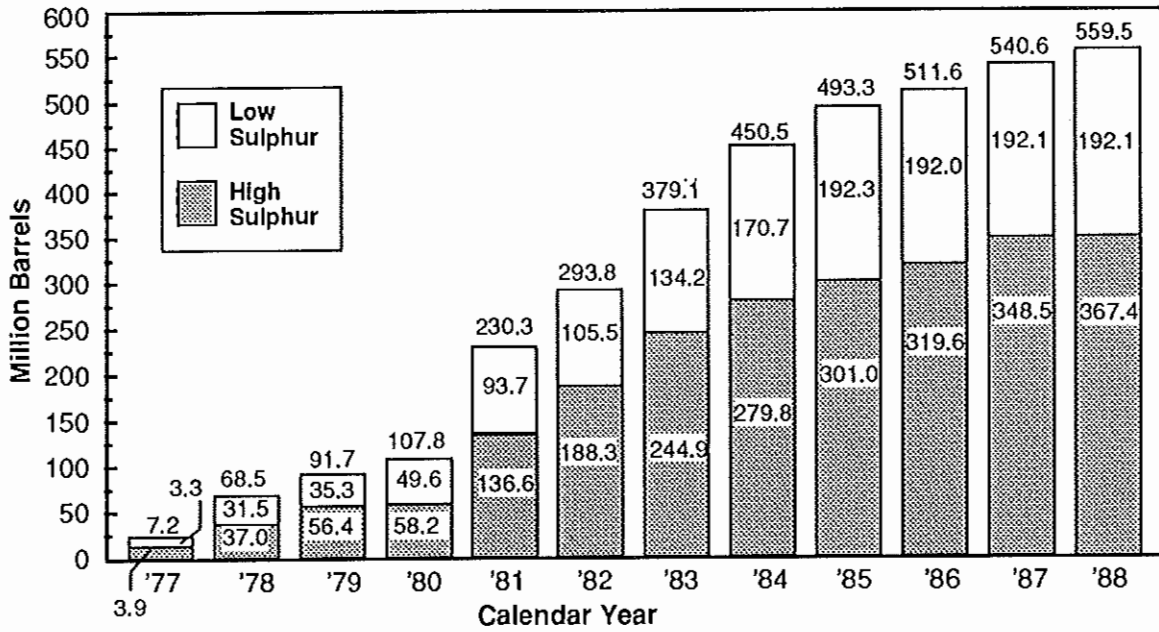


Figure 4

### Cumulative Strategic Petroleum Reserve Oil Fill

## OIL ACQUISITION, CALENDAR YEAR 1988

The 18.9 million barrels of crude oil delivered to the Strategic Petroleum Reserve in 1988 were acquired under a Department of Energy crude oil purchase agreement with Petroleos Mexicanos, Mexico's state-owned oil company. This agreement, executed on November 30, 1987, provides for crude oil deliveries to the Strategic Petroleum Reserve at an average daily rate of approximately 65,000 barrels for a two-year period beginning December 1, 1987, subject to availability of funds.

Table 5 shows the crude oil quantities received during 1988 and since inception of the Strategic Petroleum Reserve program by country of origin. Of the total oil in storage, 65.7 percent is high sulfur (sour) and 34.3 percent is low sulfur (sweet). Table 6 provides information on the location of this inventory by site. The applicable crude oil specifications used in acquiring Strategic Petroleum Reserve oil can be found in Appendix H of this report.

## CARGO PREFERENCE ACT COMPLIANCE

The Cargo Preference Act of 1954 requires that Federal agencies take such steps as may be necessary and practicable to assure that at least 50 percent of their cargos transported on ocean vessels in a calendar year is transported by privately-owned U.S.-flag vessels, to the extent they are available at fair and reasonable rates. By agreement between the Department of Energy and the Department of Transportation, the Strategic Petroleum Reserve's Cargo Preference Act compliance is measured in terms of long-ton miles, i.e., cargo tons multiplied by the distances over which they are transported.

During 1988, seven different U.S.-flag vessels, transporting a total of 9.8 million barrels on 25 voyages, were involved in delivering crude oil to the Strategic Petroleum Reserve. These deliveries equaled 903.6 million long-ton miles or 50.9 percent of the total long-ton miles.

Table 5

**CRUDE OIL RECEIVED THROUGH 1988**  
(Million Barrels)

<u>Source Country</u>	<u>Quantity During 1988</u>	<u>Cumulative</u>	<u>Percent Of Total</u>
Mexico	18.9	234.6	41.8
United Kingdom		136.1	24.3
United States:		38.4	6.8
Alaska		31.4	5.6
Other		7.0	1.2
Saudi Arabia		27.1	4.8
Libya		23.8	4.2
Iran		20.0	3.6
United Arab Emirates		18.4	3.3
Nigeria		15.2	2.7
Oman		9.0	1.6
Egypt		8.9	1.6
Norway		7.4	1.3
Ecuador		6.2	1.1
Algeria		6.2	1.1
Cameroon		3.5	0.6
Gabon		2.4	0.4
Qatar		2.3	0.4
Venezuela		0.9	0.2
Peru		<u>0.4</u>	<u>0.1</u>
<b>TOTAL RECEIPTS</b>	<b>18.9</b>	<b>560.7</b>	<b>100.0</b>



Table 6

STRATEGIC PETROLEUM RESERVE CRUDE OIL INVENTORY  
 As of December 31, 1988  
 (Million Barrels)

<u>Storage Site</u>	<u>Location</u>	<u>1988 Cumulative Total</u>			<u>Total End of Year 1987</u>
		<u>Sour*</u>	<u>Sweet**</u>	<u>Total</u>	
Bryan Mound	Brazoria County, TX	152.4	64.5	216.9	202.5
Big Hill	Jefferson County, TX	***.2	0.0	.2	0.0
West Hackberry	Cameron Parish, LA	80.5	109.3	189.8	185.0
Bayou Choctaw	Iberville Parish, LA	34.6	18.3	52.9	52.4
Weeks Island	Iberia Parish, LA	71.8	0.0	71.8	71.8
Sulphur Mines	Calcasieu Parish, LA	25.0	0.0	25.0	25.4
<b>Subtotal</b>		364.5	192.1	556.6	537.1
Tanks and Pipelines		<u>2.9</u>	<u>0.0</u>	<u>2.9</u>	<u>3.5</u>
<b>TOTAL</b>		<b>367.4</b>	<b>192.1</b>	<b>559.5</b>	<b>540.6</b>

\* Sulphur content greater than 0.5 percent.

\*\* Sulphur content not exceeding 0.5 percent.

\*\*\* Blanket oil for cavern development purposes.



## **OTHER PROJECT ACTIVITIES**

### **PROCUREMENT AND CONTRACTOR SUPPORT**

Obligations in Fiscal Year 1988 for Strategic Petroleum Reserve procurements totaled approximately \$632 million, including \$439 million for crude oil and associated transportation and other costs. Obligations for procurements for other than crude oil totaled \$193 million.

Boeing Petroleum Services, Incorporated, in the fourth year of a five year contract which began in April 1985, provided management and operating services for the crude oil storage facilities.

Other prime contractors that provided services to the Strategic Petroleum Reserve during 1988 included: Jacobs Engineering Group, Walk, Haydel & Associates, Inc., and Fluor Daniel, Inc., for architectural engineering; and Systematic Management Services, Inc., for support services.

### **REAL ESTATE**

During 1988, the Department of Energy acquired temporary easements for 120.469 acres, perpetual easements for 185.380 acres, and fee title for 3.31 acres for the Strategic Petroleum Reserve's 12-mile crude oil pipeline connecting the West Hackberry oil storage site to the Texas 22-inch common carrier pipeline. The Department also acquired 16.236 acres of perpetual road easement for the Wilber

Road Upgrade at the Big Hill site, and awarded a 5-year lease contract with options to Elmwood Office Park on January 6, 1988, for 102,822 square feet of office space for the Strategic Petroleum Reserve's Project Management Office in New Orleans, Louisiana.

### **ENVIRONMENTAL COMPLIANCE AND PERMITS**

Construction-related environmental activities in 1988 focused primarily on the Strategic Petroleum Reserve's 12-mile West Hackberry-to-Lake Charles crude oil pipeline, which is scheduled for completion in March, 1989. No cultural resource sites were discovered along the pipeline route and no significant environmental problems developed in the trenching phase of this project. Protection of wetland areas adjoining the pipeline right-of-way will be afforded by restoring the right-of-way and by the construction of waterway crossing plugs (reinforced dikes) installed to ensure that no wetland intrusion from the waterway ensues.

The hazardous waste study of Strategic Petroleum Reserve sites, undertaken in 1987 in compliance with Department of Energy Order 5480.14, "Comprehensive Environmental Response, Compensation and Liability Act Program," identified no hazardous waste sites at Strategic Petroleum Reserve facilities. However, collection of additional data (sampling) in a few locations continued through 1988. Wellbore brines from Big Hill and Bayou Choctaw that were above normal concentrations for some elements-- but below a "hazardous" classification-- were disposed into non-hazardous oilfield waste facili-

ties. In the process of plugging (required by state law) an old well connecting to a cavern previously owned and operated by Union Texas Petroleum Company at the Bayou Choctaw site, about 400 gallons of toxic blanket oil were recovered and transferred to a hazardous waste disposal facility.

During a Department of Energy headquarters' baseline environmental survey of all Strategic Petroleum Reserve facilities, conducted in 1987 and 1988, a few "Administrative Non-Compliance" findings were identified and subsequently corrected. Other more substantive findings of non-compliance were identified at St. James and Bryan Mound. At the Department's St. James terminal, some oil storage tanks were found to be exceeding air quality standards; appropriate repairs to the tank seals were made to correct the situation. At Bryan Mound, higher than normal salinities were noted in the area immediately adjacent to the brine pits; sampling is continuing to identify the source(s). The results of the baseline survey and sample analyses are expected in mid-1989 whereupon corrective action will be initiated for those situations not already resolved.

## **SECURITY**

Since 1986, responsibility for most security service program elements has been borne by Boeing Petroleum Services, Inc., under its Management and Operating contract. Boeing Petroleum Service administers the protection services program through a subcontract to Wackenhut Services, International.

To maintain security proficiency, the Strategic Petroleum Reserve conducted comprehensive security training exercises at all of its sites during 1988. These exercises simulated responses to outside aggressors and incorporated participants from Federal, state, and local law enforcement agencies. In addition, beginning in September 1988, the Strategic Petroleum Reserve conducted 30 tactical exercises per month utilizing blank ammunition and laser-weapons, to test on-duty Wackenhut Services, International, protection officers' ability to respond to simulated aggressor actions.

Current Department of Energy directives, which provide for arrest authority and the arming of security inspectors under the provisions of the Atomic Energy Act, do not apply to the Strategic Petroleum Reserve. On October 28, 1988, the President signed Public Law No. 100-531, which amends the Department of Energy Organization Act to authorize protective force personnel who guard the Strategic Petroleum Reserve to carry firearms while discharging their official duties and, in certain instances, to make arrests without warrant. The legislation also establishes a Federal offense of trespass on federally-owned Strategic Petroleum Reserve sites.

The Strategic Petroleum Reserve has expanded the protection force strength by about 10 percent to 300 armed officers and increased the quality and quantity of training. All officers have received tactical training and 100 have been certified by the Department of Energy Central Training Academy at the advanced skill level as Special Response Team members.

## **BUDGET AND FINANCE**

### **APPROPRIATIONS**

A total of \$19.1 billion was appropriated for the Strategic Petroleum Reserve through December 31, 1988, including entitlement receipts for fiscal year 1981 under the Authority of the Energy Security Act. The distribution of annual and total appropriations is shown in Table 7. Figure 5 illustrates appropriations for facilities development and operations and oil acquisition and transportation on an annual and cumulative basis, respectively.

### **MAJOR BUDGET AND FINANCING ACTIONS DURING 1988**

The Administration's fiscal year 1989 budget, transmitted to the Congress on February 18, 1988, proposed the continued development of the Strategic Petroleum Reserve on a schedule to achieve a full 750 million barrels of storage capacity by the end of fiscal year 1991 and a distribution capability of 4.5 million barrels a day by the end of fiscal year 1992. It also proposed to fill the Strategic Petroleum Reserve in fiscal year 1989 at an average rate of 50,000 barrels a day and advance order three months of fiscal year 1990 fill at 50,000 barrels a day. The appropriations requested for fiscal year 1989 included \$173.4 million for the Strategic Petroleum Reserve Account for facilities development and operations and program management and \$333.6 million for the SPR Petroleum Account for oil acquisition and transportation.

On September 27, 1988, the President signed the Interior and Related Agencies Appropriations Act, Fiscal Year 1989 (Public Law No. 100-446). This legislation provides \$173.4 million in fiscal year 1989 for the continued development and management of the Reserve and \$242.0 million to allow for oil fill in fiscal year 1989 at an average rate of approximately 50,000 barrels a day.

Public Law No. 100-446 provides an additional \$91.6 million, to become available on October 1, 1989, to permit orders for oil to be delivered in the first quarter of fiscal year 1990.

### **STRATEGIC PETROLEUM RESERVE ACCOUNT TRANSACTIONS, LAST QUARTER OF 1988 (FIRST QUARTER OF FISCAL YEAR 1989)**

The Strategic Petroleum Reserve Account funds the development, operation and maintenance of Strategic Petroleum Reserve facilities; the salaries and expenses necessary to plan and manage the program, including the operation of the Project Management Office in New Orleans, Louisiana; and the activities pertinent to major issues concerning the development and use of the Strategic Petroleum Reserve.

Approximately \$40 million of Strategic Petroleum Reserve Account funds remained available for obligation at the end of fiscal year 1988. The appropriation for fiscal year 1989 provided in Public Law No. 100-446 increased these available funds by \$173 million, to a total of approximately \$213 million. Of this total, approximately \$77 million were obligated

Table 7

**STRATEGIC PETROLEUM RESERVE APPROPRIATIONS**  
(Thousands of Dollars)

<u>Fiscal Year</u>	<u>Petroleum Acquisition and Transportation</u>	<u>Storage Facilities Development and Operations</u>	<u>Management<sup>1</sup></u>	<u>Total</u>
1976	\$ 0	\$ 300,000	\$ 13,975	\$ 313,975
1977	440,000	0	7,824	447,824
1978	2,703,469	463,933	14,704	3,182,106
1979	2,885,670	103,290	18,111	3,007,071
Reprogramming	<u>-529,214</u>	<u>529,214</u>	<u>0</u>	<u>0</u>
	2,356,456	632,504	18,111	3,007,071
1980	-2,000,000 <sup>2</sup>	0	0	-2,000,000
Reprogrammings:				
Number 1	- 20,391	0	20,391	0
Number 2	<u>- 1,881</u>	<u>0</u>	<u>1,881</u>	<u>0</u>
	-2,022,272	0	22,272	-2,000,000
1981	2,688,282 <sup>3</sup>	82,834	19,391	2,790,507
Entitlements	542,146	0	0	542,146
Reprogrammings:				
Number 1	- 18,000	18,000	0	0
Number 2	<u>- 7,334</u>	<u>7,334</u>	<u>0</u>	<u>0</u>
	3,205,094	108,168	19,391	3,332,653
1982	3,684,000	171,356	20,076	3,875,432
Reprogramming	<u>- 4,300</u>	<u>4,300</u>	<u>0</u>	<u>0</u>
	3,679,700	175,656	20,076	3,875,432
1983	2,074,060	222,528	19,590	2,316,178
1984	650,000	142,357	16,413	808,770
1985	2,049,550	441,300 <sup>4</sup>	17,890 <sup>4</sup>	2,508,740
1986	0	94,015	13,518	107,533
Reprogramming	<u>- 12,964</u>	<u>12,964</u>	<u>0</u>	<u>0</u>
	- 12,964	106,979	13,518	107,533
1987	0	134,021	13,412	147,433
1988	438,744	151,886	12,276	602,906
1989	<u>242,000</u>	<u>160,021</u>	<u>13,400</u>	<u>415,421</u>
Total				
Appropriations	\$15,803,837	\$3,039,353	\$222,852	\$19,066,042

<sup>1</sup> Excludes funds appropriated to other DOE accounts but used to finance aspects of SPR program management.

<sup>2</sup> Rescission.

<sup>3</sup> Included supplemental appropriations of \$1,305,000,000.

<sup>4</sup> Included in FY 1984 second supplemental appropriations.

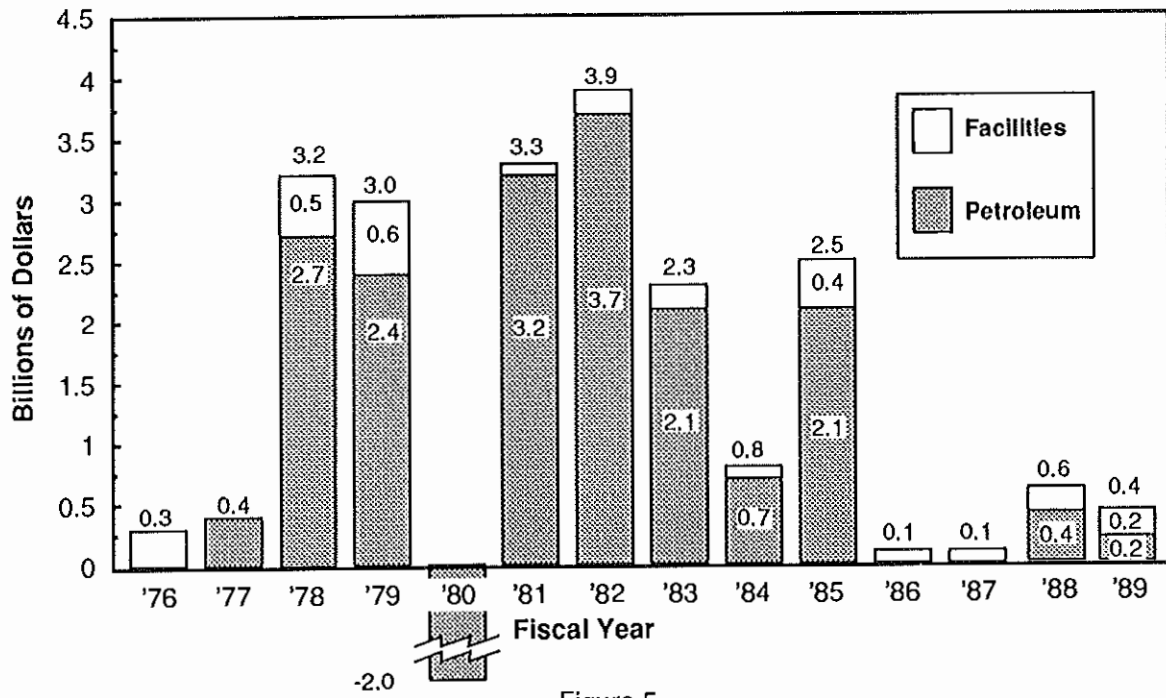


Figure 5

### Strategic Petroleum Reserve Annual Funding

Storage Facilities Development/Operations and  
Petroleum Acquisition/Transportation

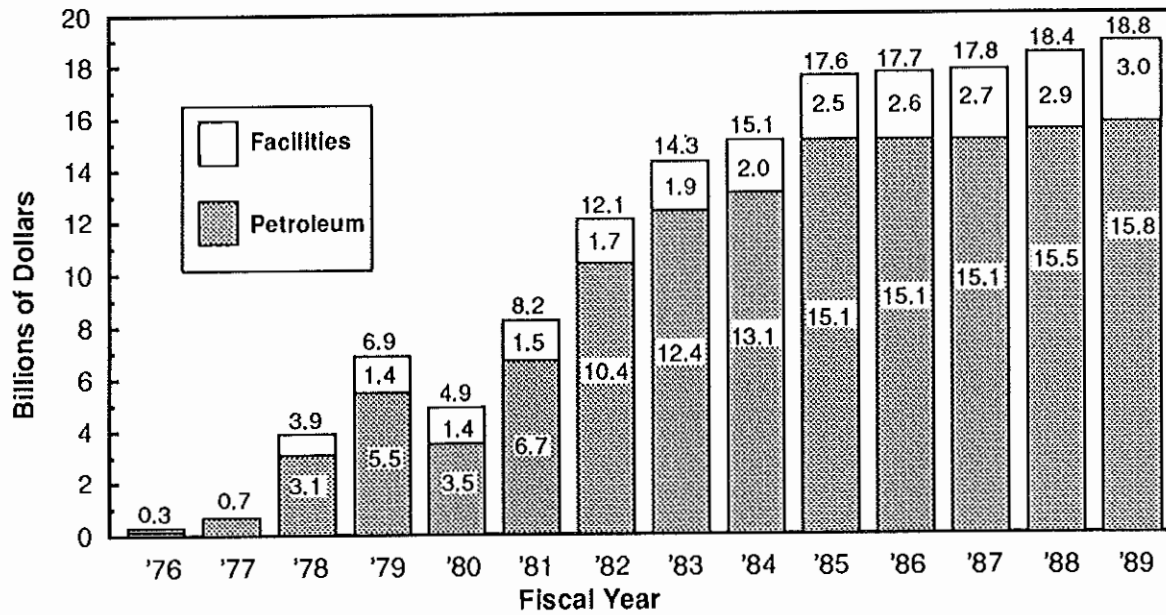


Figure 6

### Strategic Petroleum Reserve Cumulative Funding

Storage Facilities Development/Operations and  
Petroleum Acquisition/Transportation

in the quarter ended December 31, 1988 (first quarter of fiscal year 1989), leaving a balance of \$136 million available for future obligation. It is currently planned to obligate this balance by the end of fiscal year 1989.

**SPR PETROLEUM ACCOUNT  
TRANSACTIONS, LAST QUARTER  
OF 1988 (FIRST QUARTER OF  
FISCAL YEAR 1989)**

The SPR Petroleum Account funds the acquisition of oil for the Strategic Petroleum Reserve; the associated costs for transportation and terminalling; U.S. customs duties and Superfund taxes; and other miscellaneous costs, such as Defense Fuel Supply Center administration costs associated with acquiring and transporting oil. In the event of a drawdown and sale of Strategic Petroleum Reserve oil, the SPR Petroleum Account would also fund the costs of withdrawing oil from the storage caverns and transporting it to the point where the purchasers would take title. All federal receipts from a drawdown and sale are deposited in the SPR Petroleum Account and create additional budget authority for refilling the Reserve.

There were no unobligated funds in the SPR Petroleum Account at the end of fiscal year 1988. Of the \$242 million appropriated for the account in fiscal year 1989 under Public Law 100-446, approximately \$5 million were obligated during the quarter ended December 31, 1988 (first quarter of fiscal year 1989), leaving a balance of \$237 million available for future obligation. This balance is also currently planned for obligation by the end of fiscal year 1989. Outlays (payments) from

the account during the quarter were approximately \$80 million.

**OIL COSTS THROUGH FISCAL  
YEAR 1988**

A total of 554.7 million barrels of crude oil were delivered to the Strategic Petroleum Reserve through fiscal year 1988. The cumulative costs for this oil, including entitlement receipts, were \$15.397 billion, for an average of approximately \$27.76 per barrel. For the 20.8 million barrels delivered in fiscal year 1988, the average cost was \$16.18 per barrel.

**ESTIMATED COST TO  
COMPLETE THE STRATEGIC  
PETROLEUM RESERVE**

The cost to complete the Strategic Petroleum Reserve will depend on future decisions about storage capacity development, fill rates and financing alternatives, as well as future oil prices.

Based on the assumptions for the Department's fiscal year 1990 budget request, transmitted to the Congress on January 9, 1989, development of the currently planned 750 million barrels of storage capacity would be complete at the end of fiscal year 1991 and a distribution capability of 4.5 million barrels a day would be reached by the end of fiscal year 1992. Oil fill would be at an average rate of approximately 78,000 and 72,000 barrels a day, respectively, in fiscal years 1989 and 1990, and at a rate of 75,000 barrels a day in fiscal years 1991 through 1995. Final fill to achieve a total inventory of 750 million barrels would occur in early fiscal year 1996. The Department's request assumes



that the Naval Petroleum Reserves Number 1 (Elk Hills) and 3 (Teapot Dome) will be sold at the end of fiscal year 1990 for a cash bonus payment estimated to be \$1 billion or more in FY 1990 and a commitment by the purchaser(s) to deliver an average of 50,000 barrels of oil a day to the Strategic Petroleum Reserve in fiscal years 1990 through 1995, plus 10 million barrels of oil during fiscal years 1991 and 1992 for a Defense Petroleum Inventory. Using the oil price assumptions for the fiscal year

1990 request, the estimated total cost to completion of a 750 million barrel Reserve in this scenario is \$4.5 billion for the development, operation and management of the Reserve through fiscal year 1996 and \$19.0 billion for oil fill. The estimate for oil fill includes an illustrative \$1.9 billion for the 50,000 barrels a day that would be delivered for the Reserve in fiscal years 1990 through 1995 by the purchaser(s) of the Naval Petroleum Reserves.



## **DRAWDOWN AND DISTRIBUTION SYSTEM AND VULNERABILITY IMPACT**

### **DISTRIBUTION PLAN**

The current plan for distributing Strategic Petroleum Reserve oil, in the event that the Reserve is drawn down to respond to a severe energy supply interruption or to meet obligations of the United States under the Agreement on an International Energy Program, is provided in the "Strategic Petroleum Reserve Drawdown (Distribution) Plan", Amendment Number 4, of December 1, 1982.

The Strategic Petroleum Reserve Distribution Plan provides that, pursuant to the President's decision to use the Strategic Petroleum Reserve, the principal method of distributing Strategic Petroleum Reserve oil will be by price competitive sale with the oil being sold to those offering the highest prices. The sale will be open to the largest possible universe of eligible buyers to ensure efficient distribution of Strategic Petroleum Reserve oil. The plan also provides that in any calendar month, the Secretary of Energy may direct the distribution of up to 10 percent of the volume of oil sold in that calendar month in a manner which the Secretary chooses. The price for such oil will be the average price of Strategic Petroleum Reserve oil sold at the contemporaneous competitive sale, or at the most recent competitive sale if no contemporaneous competitive sale is held.

## **COMPETITIVE SALES PROCEDURES**

Appendix A to the Department of Energy's final rule (10 CFR Part 625) governing price competitive sales of petroleum from the Strategic Petroleum Reserve provides for Standard Sales Provisions containing or describing contract clauses, terms and conditions of sale, and performance and financial responsibility measures, which may be applicable to a particular sale of Strategic Petroleum Reserve oil. During 1988, the Department of Energy revised these Standard Sales Provisions to incorporate changes resulting from public comments, the Reserve's 1985/1986 test sale, various internal training exercises, and changes to the Reserve's distribution system. These revised provisions were published in the Federal Register on June 3, 1988.

Under the Standard Sales Provisions, the Strategic Petroleum Reserve sales process starts with the issuance of a Notice of Sale which would specify the amount, characteristics and location of the petroleum being sold, the delivery dates and the procedures for submitting offers, as well as providing other information pertinent to a particular sale. In addition, the Notice of Sale would specify what sales provisions and performance and financial responsibility measures were applicable.

Over the course of a Strategic Petroleum Reserve drawdown, a number of Notices of Sale may be issued, each covering a sales period of one to two months. Initially, Notices of Sale issued during a

Strategic Petroleum Reserve drawdown could allow an extremely short lead time for offers and deliveries. Under the Standard Sales Provisions, it is contemplated that offerors might be given as little as seven days from the issuance of the Notice of Sale until offers were due, and 30 days or less from the time of such issuance until oil delivery started, with a less compressed schedule becoming more feasible after the initial stages of drawdown. Because of the possible short lead time, the Standard Sales Provisions provide for the establishment of a list of prospective offerors, to whom the Department of Energy would furnish copies of all Notices of Sale.

The next step in the sales process is the preparation by prospective purchasers of their offers, which must be submitted before a time specified in the Notice of Sale. The Standard Sales Provisions require that the offerors unconditionally accept all terms and conditions made applicable to that sale by the Notice of Sale, include an offer guarantee, and offer at least the minimum price, if any, specified in the Notice of Sale.

Following the receipt of offers, the Department of Energy would evaluate the offers to select the "apparently successful" offerors. The evaluation process is structured so that the offerors submitting the highest prices can select the method by which the Strategic Petroleum Reserve petroleum is to be transported, up to the limits of the Strategic Petroleum Reserve distribution systems, with specific delivery arrangements to be settled later.

Under the Standard Sales Provisions, all apparently successful offerors are re-

quired, within as little as 5 days, to provide a letter of credit or a cash deposit as a guarantee of performance and payment of amounts due under the contract.

Upon timely receipt of the guarantee, and upon a final determination by the Contracting Officer that the offer is responsive and that the offeror is responsible, the Department would issue the Notice of Award.

### **DRAWDOWN AND DISTRIBUTION CAPABILITIES**

Based on the December 31, 1988, Strategic Petroleum Reserve crude oil inventory of 559.5 million barrels and the existing Strategic Petroleum Reserve drawdown and commercial distribution systems, the current drawdown and distribution capabilities of the Strategic Petroleum Reserve are shown in Table 8. The capabilities have increased from those shown in the 1987 Strategic Petroleum Reserve Annual/Quarterly Report due primarily to the increase in crude oil inventory and the completed pipeline connection between the Department's St. James Terminal and the commercial Capline Terminal at St. James, Louisiana. The Strategic Petroleum Reserve storage facilities are physically capable of initially being drawn down at a sustained rate of 3.5 million barrels per day for a 90-day period. After 90 days, the drawdown rate would decrease gradually as various site inventories deplete and the declining number of remaining caverns containing crude oil become a constraint on the sites' drawdown rates. Figure 7 illustrates the current physical drawdown capability, without distribution constraints, which provides for a drawdown of ap-

Table 8

**CURRENT CAPABILITIES**  
(Thousands of Barrels Per Day)

	<u>Drawdown</u>	<u>Distribution</u>
Seaway Group	1,100	1,100
Texoma Group	1,400	1,245
Capline Group	<u>1,070</u>	<u>910</u>
	<b>3,570</b>	<b>3,255</b>

proximately 56 percent of the Reserve in 90 days, 93 percent in 180 days, and 100 percent in 330 days.

The Strategic Petroleum Reserve drawdown capabilities are currently constrained by the distribution terminal throughput capabilities and private sector distribution and refining capabilities. Based on these constraints, the Strategic Petroleum Reserve is currently capable of being initially drawn down and distributed at a maximum sustained rate of 3.2 million barrels per day for a 120-day period. After 120 days, drawdown/distribution rate would decrease gradually as the site inventories deplete. Figure 8 illustrates Strategic

Petroleum Reserve current physical drawdown/distribution capability, which provides for a distribution of approximately 53 percent of the Reserve in 90 days, 93 percent of the Reserve in 180 days, and 100 percent of the Reserve in 330 days.

The Strategic Petroleum Reserve currently has a Distribution Enhancement Program underway to improve its distribution systems in order to achieve a higher drawdown/distribution capability.

Details of the Distribution Enhancement Program are described later in this Chapter.

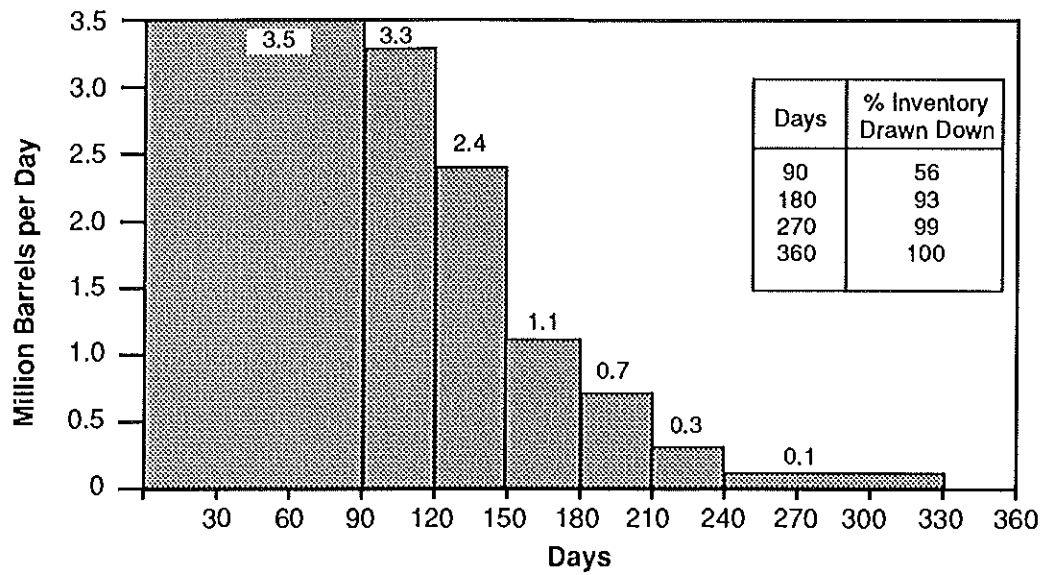


Figure 7

### Strategic Petroleum Reserve Drawdown Capability

Inventory as of 12/31/88

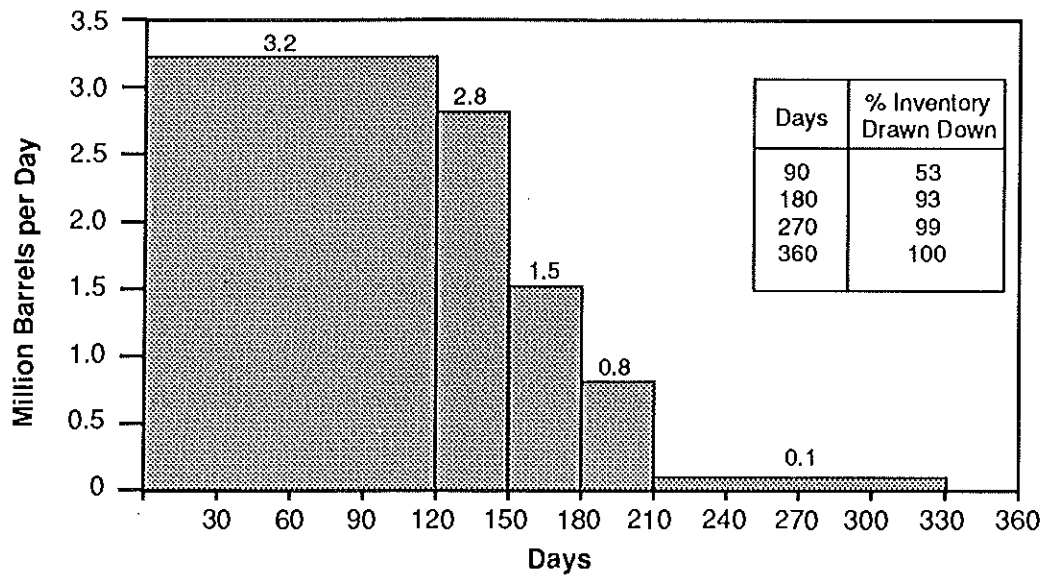


Figure 8

### Strategic Petroleum Reserve Drawdown/ Distribution Capability

Inventory as of 12/31/88

## **DRAWDOWN AND DISTRIBUTION TESTS**

Under its program for assuring readiness to meet a requirement to draw down and distribute crude oil, the Strategic Petroleum Reserve conducted a drawdown training exercise, named SPRITE IV, during the period from October 12 through November 15, 1988. This exercise consisted of two consecutive simulated competitive sales of Strategic Petroleum Reserve crude oil and involved the entire Strategic Petroleum Reserve field organization and all management, sales and financial functions associated with the drawdown and distribution of Strategic Petroleum Reserve oil. SPRITE IV, designed to train and improve the readiness of the Strategic Petroleum Reserve personnel, as well as to test recently enhanced automated data support systems and drawdown and sales procedures, provided additional assurance that the Strategic Petroleum Reserve can respond effectively to a drawdown requirement.

## **DISTRIBUTION ENHANCEMENTS**

In late 1984, the Strategic Petroleum Reserve initiated a Distribution Enhancement Program to assure that Strategic Petroleum Reserve distribution capability will adequately support drawdown performance. This program was prompted by a major decline in foreign crude oil demands by the Mid-West refiners, resulting in the conversion to natural gas transmission of two major interstate pipelines to which the Strategic Petroleum Reserve was connected (Seaway and Texoma). The Distribution Enhancement Program has

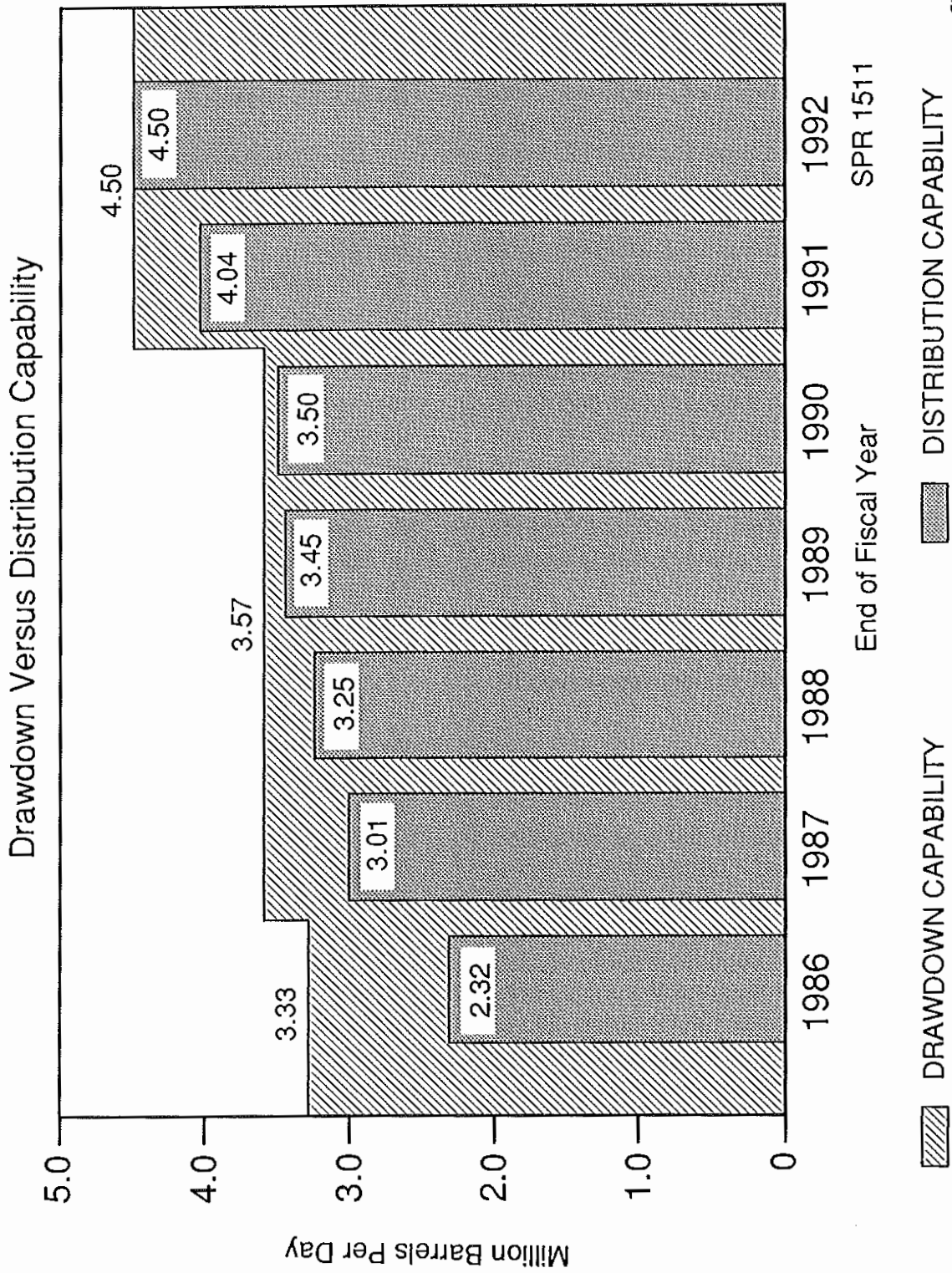
been designed to increase distribution capability from the 1986 level of 2.3 million barrels per day to 4.5 million barrels per day, as shown in Figure 9.

## **SEAWAY GROUP**

Distribution enhancements planned for the Seaway Group distribution system include the construction of a new distribution pipeline from the Bryan Mound storage site to the ARCO pipeline terminal in Texas City, modifications of two commercial marine facilities for Strategic Petroleum Reserve waterborne distribution and increasing the Bryan Mound site drawdown capability from 1.1 to 1.25 million barrels per day. The latter enhancement was added in 1987 to reduce the requirements and costs of commercial marine distribution services in the Texoma Group as well as to provide a better system balance of drawdown capabilities among Strategic Petroleum Reserve sites.

The Department completed construction of the distribution pipeline to Texas City and modifications of two commercial marine facilities for waterborne distribution in 1987, and in 1988 initiated the design of the project to increase the Bryan Mound site drawdown capability. The latter project will require construction of a second raw water pipeline and installation of additional pumps, piping and meters at Bryan Mound. This project is scheduled to be complete by June 1990, and will increase the Seaway Group's distribution capability from the current 1.1 million barrels per day to 1.25 million barrels per day.

# STRATEGIC PETROLEUM RESERVE



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Figure 9



## TEXOMA GROUP

Distribution enhancements previously planned for the Texoma Group distribution system include construction of a new distribution pipeline from the West Hackberry storage site to the Lake Charles junction of Texaco's 22-inch common carrier pipeline system, and acquisition of marine distribution services at commercial terminals in the Lake Charles and Beaumont/Port Arthur areas.

During 1988, the Department completed the acquisition of all land tracts for the West Hackberry to Lake Charles pipeline and awarded a small business set-aside contract for the pipeline construction. In October, the Department awarded a second small business set-aside contract for construction of a custody metering station at the Lake Charles pipeline exit point. These contracts will be completed in mid-1989 and will provide the Strategic Petroleum Reserve with the capability to distribute crude oil to refineries in both the Lake Charles and Port Arthur areas.

In late 1987, the Department issued a competitive solicitation for marine distribution services at commercial terminals in the Lake Charles area. Similar to existing Strategic Petroleum Reserve marine distribution service contracts, the procurement provided for use of existing commercial facilities that would be underutilized during an oil supply disruption. However, because offerors proposed the construction of major new facilities which required significant government financing, the Department canceled the procurement. As a result, the Department plans to propose new strategies in 1989 and resol-

icit for the marine distribution capabilities service in 1990 to achieve the planned Texoma Group distribution system requirement of 2,180,000 barrels per day.

## CAPLINE GROUP

Distribution enhancements previously planned for the Capline Group distribution system included the construction of a direct pipeline connection from the Department of Energy St. James Terminal to the adjacent Capline Pipeline Terminal, and the acquisition of additional marine distribution services at commercial terminals in the St. James, Louisiana area.

During 1988, the Department completed construction of the direct pipeline connection between the Department's St. James Terminal, and the Capline Pipeline Terminal. This connection eliminates a potential distribution bottleneck and provides for simultaneous Strategic Petroleum Reserve distribution to both Capline and LOCAP Pipeline terminals.

In 1987, the Department issued a competitive solicitation for marine distribution services at commercial terminals in the St. James area. However, only one offer was received and because of the offeror's terms, the Department was unsuccessful in securing a commercial contract for those marine distribution services. The Department is currently reevaluating its Capline marine distribution requirements.

## VULNERABILITY IMPACT

United States vulnerability to oil import disruptions is determined by world oil

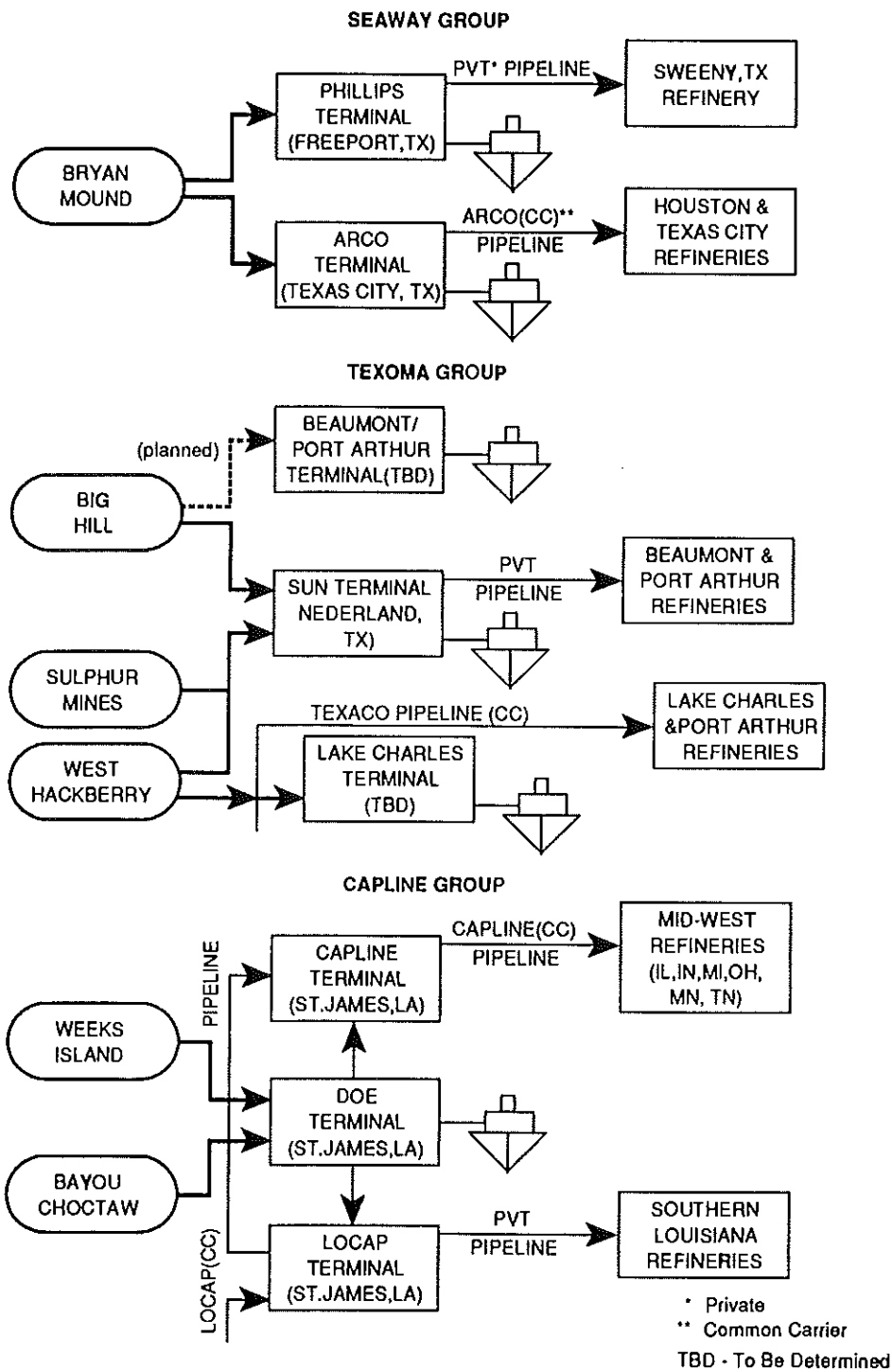


Figure 10

**CURRENT AND PLANNED STRATEGIC PETROLEUM RESERVE DISTRIBUTION SYSTEM FOR THE SEAWAY, TEXOMA, AND CAPLINE GROUPS**

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reserve levels, the ability of the U.S. energy consumers to adapt to price changes, the diversity of U.S. and free world energy supplies, and the source of oil imports into the United States. The absolute size of the Strategic Petroleum Reserve and private inventories must be considered as well. Nevertheless, when measured by the single criteria of the number of days of imports in the Strategic Petroleum Reserve as required by the Energy Policy and Conservation Act, U.S. vulnerability increased slightly during 1988. The days of equivalent imports stored in the Strategic Petroleum Reserve at the end of 1988 were roughly 91 days, down slightly from the 1987 level of 93 days. The days of crude oil and product protection are calculated, using a worst-case scenario, by dividing the total crude oil stored in the Strategic Petroleum Reserve by the average daily volume of crude oil and products imported to the U.S., less exports and crude oil imported for the Reserve. The increase in 1988 crude oil and product imports contributed to the lower level of days of protection. The Strategic Petroleum Reserve's inventory has exceeded the Energy Policy and Conservation Act goal of 90 days of net import protection for the last six years as shown in Figure 10. However, based on Energy Information Administration's projections of rapidly increasing United

States petroleum imports, the planned Strategic Petroleum Reserve fill rates for 1989 and beyond will not be sufficient to continue this level of protection.

Private sector stockpile trends in 1988 were similar to the public sector. The days of equivalent import protection for total crude and product stocks held by private companies fell from 190 days of protection in 1987 to 170 days of protection in 1988. Domestic use of petroleum was up slightly, by about 3 percent, relative to the prior year. Total domestic product use was 16.6 million barrels per day in 1987 and 17.1 million barrels per day in 1988.

The United States continued to lead the Organization for Economic Cooperation and Development nations in public and privately held stocks with 559.5 million barrels of oil stored in the Strategic Petroleum Reserve and 1,055.6 million barrels in private inventories at the end of 1988. Japan has the second largest supply, followed by West Germany and Sweden. Only the United States, West Germany, Sweden and Japan have large government owned strategic petroleum reserves. Other nations require individual companies to hold stocks of crude oil or product equal to a specific number of days of consumption.

# DAYS OF NET IMPORT PROTECTION

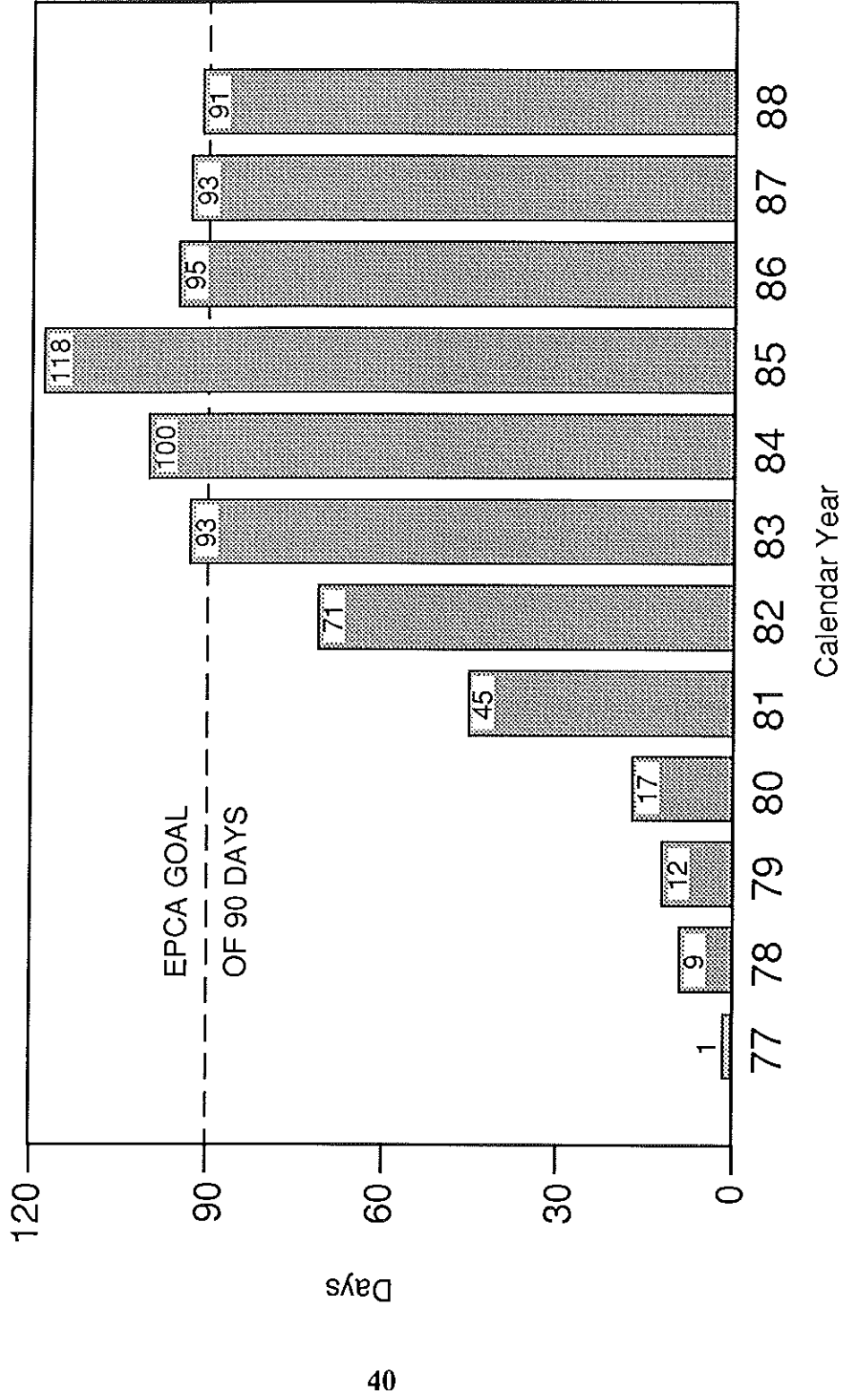


Figure 11

## APPENDICES

### STRATEGIC PETROLEUM RESERVE SITE STATUS

- A. Bayou Choctaw
- B. Weeks Island
- C. Bryan Mound
- D. Sulphur Mines
- E. West Hackberry
- F. Big Hill
- G. St. James Terminal
- H. Strategic Petroleum Reserve Crude Oil Specifications



## **A. BAYOU CHOCTAW**

### **LOCATION**

Iberville Parish, Louisiana (12 miles southwest of Baton Rouge, Louisiana)

### **ACQUISITION**

Acquired 355.95 acres fee simple, by condemnation April 1977, from numerous private owners. Union Texas Petroleum (a subsidiary of Allied Corporation) was the previous operator.

In 1985, the Department of Energy acquired an additional existing cavern through a cavern exchange agreement with Union Texas Petroleum. The transaction involved a 3.5 acre exchange with no net change in Government-owned acreage.

### **ENVIRONMENTAL/PERMITS**

Environmental Impact Statement published December 1976; supplement published May 1977.

Four major Federal and state permits related to pipeline, well pad, storage, and storm water runoff acquired in 1978, and updated in 1980 and 1981.

### **SITE DESCRIPTION**

A 72-million-barrel storage facility consisting of 62 million barrels in five existing caverns, plus 10 million barrels of storage capacity in a new Strategic Petroleum Reserve-developed cavern.

Oil, brine, and raw water piping distribution system connecting caverns with cen-

tral plant, a water intake structure, 12 brine disposal wells located 2.5 miles offsite, and a pipeline for supplying brine to Union Texas Petroleum, Inc. Oil and water distribution system consists of over 50,000 feet of piping and 18 pumps totaling over 20,000 horsepower. A 100,000 barrel brine pit and an oil/brine separator.

Numerous permanent specialized buildings include: Control Center, Security Operations Center, Maintenance Shop and Laboratory, Electrical Switch Gear (5KV), Spare Parts Warehouse, Foam Storage, Instrument Shop, Documentation Storage and a Guard House.

### **SYSTEM PARAMETERS**

Oil fill via 36-inch-diameter, 37.2-mile pipeline from St. James Terminal. Sustained system rate - 110,000 bbl/d (brine disposal-constrained).

Raw water design pumping rate - 495,000 bbl/d.

Brine disposal design pumping rate - 110,000 bbl/d.

### **DRAWDOWN**

Drawdown via 36-inch-diameter, 37.2-mile pipeline to St. James Terminal and to Capline pipeline.

Design drawdown capability upon completion - 480,000 bbl/d.

### **MAJOR ACCOMPLISHMENTS**

Approximately 52.9 million barrels of oil are in storage.





## **B. WEEKS ISLAND**

### **LOCATION**

Iberia Parish, Louisiana (95 miles southwest of New Orleans).

### **ACQUISITION**

Acquired 382.92 acres fee simple subsurface and 6.63 acres fee simple surface, by condemnation September 1977, from Morton Salt Company.

### **ENVIRONMENTAL/PERMITS**

Environmental Impact Statement published January 1977; supplement published August 1977.

Major Federal permit related to oil pipeline to St. James Terminal acquired in 1978. Three major Federal and state permits related to oil storage, air emissions and storm water, and treated sewage effluent discharge acquired in 1979; EPA National Pollutant Discharge Elimination System permit updated in 1982.

### **SITE DESCRIPTION**

Conventional room and pillar salt mine containing 72 million barrels of storage capacity in two levels. Dedicated to sour crude oil storage.

Oil piping distribution system consists of 11 (10 operational and one reserve) submersible electric pumps in the mine to boost crude to the surface and twin mainline pumps (plus one reserve) to deliver

crude to the St. James, Louisiana Terminal during drawdown. Pumps total 17,000 horsepower. A 500,000 gallon-firewater tank with pumps and mine inert gas and vapor recovery systems.

Numerous permanent specialized buildings include: Administration and maintenance, Control Center, Security Operations Center, Spare Parts Warehouse, Electrical Substation, Laboratory and Sample, Inert Gas Generator, Foam Storage, Fire Water Pump House, Mainline Pump House, Headframe Production Shaft, Production Shaft Hoist, Headframe-Service Shaft, Service Shaft Hoist, Service Shaft Motor Control Center and a Guard House.

### **SYSTEM PARAMETERS**

Oil fill via 36-inch-diameter, 67.2 mile pipeline from St. James Terminal. Sustained system rate - 350,000 bbl/d (terminal throughput limited).

### **DRAWDOWN**

Drawdown via 36-inch-diameter 67.2-mile pipeline to St. James Terminal and to Capline pipeline.

Design drawdown capability - 590,000 bbl/d.

### **MAJOR ACCOMPLISHMENTS**

Approximately 72 million barrels of crude oil are in storage.

The Department of Energy contracted with a geotechnical Architectural/Engineering firm to design enhancements to the storage

facility and to reduce perceived risks to ensure long-term storage stability. Surface subsidence monitoring survey monuments were installed on Department of Energy and Morton Thiokol's property.

## **C. BRYAN MOUND**

### **LOCATION**

Brazoria County, Texas (three miles southwest of Freeport, Texas).

### **ACQUISITION**

Acquired 499.47 acres fee simple, by condemnation April 1977, from Freeport Mineral Company and other owners. Dow Chemical Company was the previous operator.

In 1986, Department of Energy acquired the preexisting Brazoria County Road 242 within the site boundary through a relocation agreement with the county.

### **ENVIRONMENTAL/PERMITS**

Environmental Impact Statement published January 1977; supplement published December 1977. Phase III supplement published October 1981.

Five major Federal and state permits related to pipelines, water intake, and storage acquired in 1977 and 1978. National Pollution Discharge Elimination System updated 1981; renewed 1984. Seaway Environmental Impact Statement published June 1978. Supplement published October 1981.

Two major Federal permits related to brine disposal pipeline issued in 1978. Permit for brine discharge increased to 1.1 million bbl/d August 1981.

### **SITE DESCRIPTION**

226-million-barrel storage facility consisting of 66 million barrels of capacity in four caverns existing upon site acquisition, plus 160 million barrels of storage capacity in 16 Strategic Petroleum Reserve-developed caverns.

36-inch-diameter, 14.6-mile brine disposal pipeline extending 13 miles offshore in the Gulf of Mexico.

Oil, brine and raw water piping distribution system connecting caverns with central plant and water intake structure located on Brazos River and connected by a 36-inch pipeline. Oil/brine/water distribution system consists of over 101,000 feet of piping and 33 pumps totaling over 38,000 horsepower. Four 200,000-barrel oil storage tanks, two brine pits (15,000 and 150,000) and an oil-brine separator.

Numerous permanent specialized build-ups include: Control Center, Security Operations Center, Maintenance, Spare Parts Warehouse, Foam Generator, Foam Storage (3), Electrical Switch Gear and a Guard House.

### **SYSTEM PARAMETERS**

Fill via 30-inch-diameter, 3.6-mile pipeline from Phillips 66 Freeport Marine Terminal. Design oil fill rate - 240,000 bbl/d. Sustained system rate - 180,000 bbl/d.

Raw water design pumping rate - 1,140,000 bbl/d.

Brine disposal design pumping rate -

980,000 bbl/d (permit limitation 1,100,000 bbl/d).

### **DRAWDOWN**

Drawdown via 30-inch diameter, 3.6 mile pipeline, to Phillips 66 Freeport Marine Terminal.

Drawdown via 40-inch diameter, 46-mile pipeline to ARCO Pipeline Company's Texas City Pipeline Terminal and Docks.

Design drawdown capability - 1,100,000 bbl/d.

### **MAJOR ACCOMPLISHMENTS**

Approximately 217 million barrels of crude oil in storage.

Initiated distribution enhancement project to increase drawdown capability to 1,250,000 bbl/day by mid 1990.

## **D. SULPHUR MINES**

### **LOCATION**

Calcasieu Parish, Louisiana (two miles south west of Sulphur, Louisiana, and 20 miles north of West Hackberry salt dome).

### **ACQUISITION**

Acquired 109.63 acres fee simple and 64.52 acres conditional fee, by condemnation February 1979, from Union Texas Petroleum Company.

### **ENVIRONMENTAL/PERMITS**

Environmental Impact Statement published March 1978.

Three major Federal and State permits for pipeline construction, oil storage, and air emissions acquired in 1978. Environmental Protection Agency discharge permits for storm water and sewage acquired in 1980.

### **SITE DESCRIPTION**

26-million-barrel storage facility consisting of three existing caverns.

Oil, brine, and raw water piping distribution system connecting caverns with central plant, water intake structure located 1.8 miles offsite on Sabine River Diversion Canal No. 5, connected by 12 and 16-inch pipelines, 4 brine disposal wells, and 2 100,000 barrels brine ponds. Consists of over 77,000 feet of piping and 18 pumps totaling over 8,000 horsepower.

Permanent specialized buildings include: Control & Maintenance Center, Security Operations Center and Foam Storage.

### **SYSTEM PARAMETERS**

Oil fill via 16-inch-diameter, 15.9-mile spur pipeline connecting to Department of Energy West Hackberry pipeline at Intra-coastal Waterway. Sustained system rate - 80,000 bbl/d (brine disposal-constrained).

Raw water design pumping rate - 100,000 bbl/d.

Brine disposal design pumping rate - 80,000 bbl/d.

### **DRAWDOWN**

Drawdown via 16-inch-diameter, 15.9 mile spur pipeline to Intracoastal Waterway, which connects to the 42-inch-diameter West Hackberry line to Sun Terminal, Nederland, Texas.

Design drawdown capability - 100,000 bbl/d.

### **MAJOR ACCOMPLISHMENTS**

- Initiated environmental documentation (Environmental Assessment) for decommissioning the site in 1992.
- Initiated arrangements with the Houston River Water Authority and the City of Sulphur to connect the site to a potable water distribution system.



## **E. WEST HACKBERRY**

### **LOCATION**

Cameron Parish, Louisiana (22) miles southwest of Lake Charles, Louisiana).

### **ACQUISITION**

Acquired 405.36 acres fee simple, by condemnation April 1977, from numerous private landowners. Olin Corporation was the previous site operator.

Acquired 160.0 additional acres fee simple by condemnation in two actions, July 1979 and March 1980.

### **ENVIRONMENTAL/PERMITS**

Environmental Impact Statement published January 1977; supplement published April 1977. Phase III supplement published October 1981.

Six major Federal and state permits related to pipelines, drilling pads, water intake, and storage acquired in 1977 and 1978; National Pollutant Discharge Elimination System permit renewed 1984.

Texoma Environmental Impact Statement published November 1978; supplement published in October 1981.

Two major Federal permits related to a brine pipeline acquired in 1980.

### **SITE DESCRIPTION**

219-million-barrel storage facility consist-

ing of 49 million barrels in five caverns existing upon site acquisition, plus 170 million barrels of storage capacity in 17 Strategic Petroleum Reserve-developed caverns.

Oil, brine, and raw water piping distribution system connecting caverns with central plant, water intake structure located on Intracoastal waterway connected by a 42-inch diameter, 4.5 mile pipeline, and 10 brine disposal wells. Consists of over 160,00 feet of piping and 47 pumps totaling over 62,000 horsepower. 36-inch-diameter, 27-mile brine disposal pipeline extending nine miles offshore in the Gulf of Mexico, a 175,000-barrel brine pit and an oil-brine separator.

Numerous permanent specialized buildings include: Control Center, Security Operations Center, Maintenance, Spare Parts Warehouse, Covered Lay-Down, Film Storage, Foam Storage and a Guard House.

### **SYSTEM PARAMETERS**

Fill via 42-inch diameter, 42.8-mile pipeline from Sun Terminal, Nederland, Texas. Design oil fill rate - 225,000 bbl/d. Sustained system rate - 175,000 bbl/d.

Raw water design pumping rate - 1,450,000 bbl/d.

Brine disposal design pumping rate - 900,000 bbl/d (permit limitation 1,088,000 bbl/d) via 36-inch pipeline to the Gulf of Mexico.

### **DRAWDOWN**

Drawdown via 42-inch-diameter, 42.8-mile

pipeline to Sun Terminal, Nederland, Texas.

Design drawdown capability - 1,400,000 bbl/d.

**MAJOR ACCOMPLISHMENTS**

Completed development of designed storage capacity of 219 million barrels.

Initiated construction of a 12-mile, 36-inch oil pipeline connecting to the Texas 22-inch common carrier pipeline near Lake Charles, Louisiana, and to refineries in Lake Charles, to enhance Strategic Petroleum Reserve distribution capability.

Approximately 190 million barrels of crude oil are in storage.



## **F. BIG HILL**

### **LOCATION**

Jefferson County, Texas (20 miles southwest of Beaumont, Texas).

### **ACQUISITION**

Acquired 271 acres fee simple, by condemnation November 1982 and July 1983, from three landowners, i.e., 238.48 acres from Amoco, 27.06 acres from the Pipkin estate, and 5.46 acres from the Patrick Henry Phelan estate.

### **ENVIRONMENTAL/PERMITS**

Environmental Impact Statement published October 1981.

State permits for drilling, underground hydrocarbon storage, pipeline operations, air quality, water appropriation, and water quality certifications were acquired in 1983. The EPA National Pollutant Discharge Elimination System permit was acquired in 1984.

### **SITE DESCRIPTION**

160-million-barrel storage facility consisting of fourteen Strategic Petroleum Reserve-developed 11.5 million barrel storage caverns.

Oil, brine, and raw water systems connecting caverns with central plant, water intake structure located on the Intracoastal Waterway connected by a 48-inch diameter, and brine disposal pipeline extending 3 miles offshore in the Gulf of Mexico.

Numerous permanent specialized buildings include: Control Center, Administration, Security Operations Center, Communications, Guard House, Covered Lay-Down, Fire House, Sample Storage and a Maintenance.

### **SYSTEM PARAMETERS**

Fill via 36-inch-diameter, 25 mile pipeline from Sun Terminal, Nederland, Texas. Sustained system rate 280,000 bbl/d.

Raw water design pumping rate - 1,400,000 bbl/d.

Brine disposal design pumping rate - 1,400,000 bbl/d (permit limitation of 1,700,000 bbl/d).

### **DRAWDOWN**

Drawdown via 36-inch-diameter, 25 mile pipeline to Sun Terminal, Nederland, Texas.

Design Drawdown capability - 930,000 bbl/d.

### **MAJOR ACCOMPLISHMENTS**

Completed connections via Sun Terminal to provide for intersite crude oil movements between Sulphur Mines, West Hackberry and Big Hill.

Completed Stage II Construction  
Awarded Stage II Security Enhancements Contract

Completed Construction of Warehouse Enhancements

Completed Construction of Administration (office) Building



## **G. ST. JAMES TERMINAL**

### **LOCATION**

St. James Parish, Louisiana (45 miles southeast of Baton Rouge, Louisiana, on the Mississippi River).

### **ACQUISITION**

Acquired 104.76 acres of fee simple for terminal by condemnation in May 1978.

Acquired 47.68 acres fee simple for docks by condemnation in July 1978.

### **ENVIRONMENTAL/PERMITS**

St. James' Terminal Environmental Impact Statement is a component of the Bayou Choctaw supplement, published May 1977, and the Weeks Island supplement, published August 1977.

Two major Federal and state permits related to dock construction were acquired in 1978. Environmental Protection Agency discharge permit for storm water and sewage acquired in 1980. Dock Construction Permit modified 1982.

### **SITE DESCRIPTION**

Terminal facilities include six storage tanks totaling two million barrels of capacity, tie-ins to Bayou Choctaw and Weeks Island sites, and to LOCAP and Capline pipeline terminals.

Oil distribution piping system connecting docks, tanks, and pump station consists of

over 35,000 feet of piping and eight pumps totaling over 12,000 horsepower, metering systems, and maintenance and control buildings.

Two docks with one berth each, able to accommodate vessels of up to 123,000 long tons maximum loaded displacement. A 42-inch-diameter pipeline connects the docks to the storage tanks.

### **SYSTEM PARAMETERS**

Tanker unloading - design unloading capacity of 40,000 bbl/hr.

Distribution from terminal to:

Bayou Choctaw: design pumping rate - 240,000 bbl/d.

Weeks Island: design pumping rate - 480,000 bbl/d.

Terminal throughput: fill sustained system rate - 350,000 bbl/d;

Across docks - 435,000 bbl/d.

### **DRAWDOWN**

Crude oil from Bayou Choctaw and/or Weeks Island to be distributed across docks and to LOCAP and Capline Pipeline Terminal.

### **MAJOR ACCOMPLISHMENTS**

- Completed construction of a direct pipeline connection between the St. James and Capline Pipeline Terminal, increasing distribution capability.



## H. SPR Crude Oil Specifications<sup>a</sup>

	<u>Characteristics</u>	<u>Categories<sup>b</sup></u>					<u>Primary ASTM Test Method<sup>c</sup></u>
		<u>I</u>	<u>II</u>	<u>III</u>	<u>IV</u>	<u>V</u>	
	API Gravity [°API]	30-45	40-45	30-40	34-40	36-41	D 1298
	Total Sulphur [Wt. %] Max.	1.99	0.25	0.50	0.25	0.50	D 1552
	Pour Point [°F(°C)], Max.	50(10)	50(10)	50(10)	50(10)	50(10)	D 97
	Salt Content [Lbs./1,000 Bbls.] Max.	50	50	50	50	50	D 3230
A-17	Viscosity [SUS @ 60°F (cSt @ 15.6°C)] Max.	150(32)	150(32)	150(32)	150(32)	150(32)	D 445 & D 2161
	Viscosity [SUS @ 100°F (cST @ 37.8°C)] Max.	70(13)	70(13)	70(13)	70(13)	70(13)	
	Reid Vapor Pressure [Psia @ 100°F(kPa @ 37.8°C)], Max.	11(76)	11(76)	11(76)	11(76)	11(76)	D 323
	Total Acid Number [mg KOH/g], Max.	0.40	0.40	0.40	0.40	0.40	D 664
	Water and Sediment [Vol. %], Max.	1.00	1.00	1.00	1.00	1.00	D 473 & D 4006

**H. SPR Crude Oil Specifications<sup>a</sup>  
(continued)**

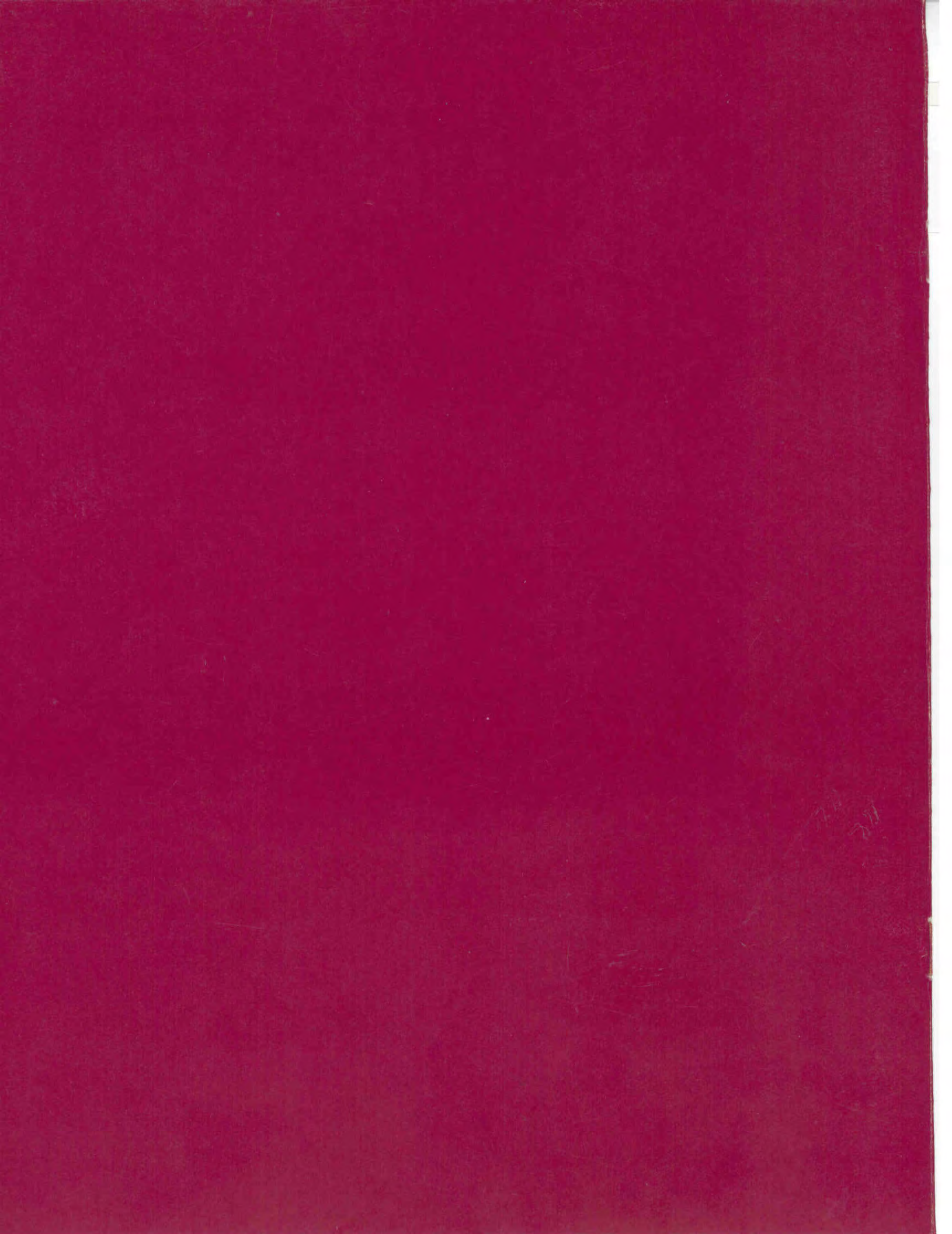
A-18

<u>Characteristics</u>	<u>I</u>	<u>II</u>	<u>Categories<sup>b</sup> III</u>	<u>IV</u>	<u>V</u>	<u>Primary ASTM Test Method<sup>c</sup></u>
Yields [Vol. %]						D 2892 & D 1160
Naphtha [<375°F(<191°C)]	24-30	35-42	21-29	29-36	30-38	
Distillate [375-620°F) (191-327°C)]	17-31	21-35	23-37	31-45	19-33	
Gas Oil [620=1050°F (327-566°C)]	26-38	20-34	28-42	20-34	23-37	
Residuum [>1050°F (>566°C)]	10-19	4-9	7-14	0-5	7-14	

<sup>a</sup> Marketable virgin crude petroleum suitable for normal refinery processing and free of foreign contaminants or chemicals including, but not limited to, chlorinated and/or oxygenated hydrocarbon, and lead.

<sup>b</sup> For SPR acquisition and storage purposes, crude oil meeting the characteristics of Category I is designated as sour, while crude oil meeting the characteristics of Categories II, III, IV, and V is designated as sweet.

<sup>c</sup> To the maximum extent practicable, the primary ASTM test methods listed are to be used in characterizing crude oil. While other methods may be used when the primary method is unavailable, the primary method is designated as the binding method should results of the alternative method be questioned.



# Strategic Petroleum Reserve Annual/Quarterly Report



February 15, 1990

**U.S. Department of Energy**  
Assistant Secretary for Fossil Energy  
Office of Petroleum Reserves



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# Strategic Petroleum Reserve Annual/Quarterly Report



February 15, 1990

**U.S. Department of Energy**  
Assistant Secretary for Fossil Energy  
Office of Petroleum Reserves  
Washington, DC 20585



# TABLE OF CONTENTS

	<u>Page</u>
<b>EXECUTIVE SUMMARY</b> .....	1
<b>PROGRAM DEFINITION</b> .....	2
<b>SPR REPORTS SUBMITTED TO CONGRESS</b> .....	6
<b>STORAGE FACILITIES DEVELOPMENT</b> .....	8
Facilities Development Status .....	10
Strategic Petroleum Reserve Storage Capacity Development .....	13
Capital Improvements .....	14
<b>OIL ACQUISITION AND TRANSPORTATION</b> .....	15
<b>OTHER PROJECT ACTIVITIES</b> .....	22
Procurement and Contractor Support .....	22
Real Estate .....	22
Environmental Compliance and Permits .....	22
Security .....	22
<b>BUDGET AND FINANCE</b> .....	24
<b>DRAWDOWN AND DISTRIBUTION SYSTEM AND VULNERABILITY IMPACT</b> .....	28
Distribution Plan .....	28
Competitive Sales Procedures .....	28
Drawdown and Distribution Capabilities .....	29
Drawdown and Distribution Tests .....	31
Distribution Enhancements .....	31
Vulnerability Impact .....	34
<b>APPENDIX: STRATEGIC PETROLEUM RESERVE SITE STATUS</b> .....	A-1
A. Bayou Choctaw .....	A-3
B. Weeks Island .....	A-5
C. Bryan Mound .....	A-7
D. Sulphur Mines .....	A-9
E. West Hackberry .....	A-11
F. Big Hill .....	A-13
G. St. James Terminal .....	A-15
H. Strategic Petroleum Reserve Crude Oil Specifications .....	A-16

## LIST OF TABLES

	<u>Page</u>
Table 1 – Strategic Petroleum Reserve Storage and Drawdown Criteria .....	10
Table 2 – Storage Capacity Development by Quarter .....	13
Table 3 – Strategic Petroleum Reserve Oil Inventory and Delivery Statistics .....	16
Table 4 – Strategic Petroleum Reserve Oil Fill History .....	17
Table 5 – Crude Oil Received through 1989 .....	20
Table 6 – Strategic Petroleum Reserve Crude Oil Inventory .....	21
Table 7 – Strategic Petroleum Reserve Appropriations .....	26
Table 8 – Current Sustained Capabilities .....	29

## LIST OF FIGURES

	<u>Page</u>
Figure 1 – Program/Project Management Structure .....	3
Figure 2 – Strategic Petroleum Reserve Sites .....	9
Figure 3 – Annual Strategic Petroleum Reserve Oil Fill .....	18
Figure 4 – Cumulative Strategic Petroleum Reserve Oil Fill .....	18
Figure 5 – Strategic Petroleum Reserve Annual Funding .....	27
Figure 6 – Strategic Petroleum Reserve Cumulative Funding .....	27
Figure 7 – Strategic Petroleum Reserve Drawdown/Distribution Capability .....	30
Figure 8 – Current and Planned Strategic Petroleum Reserve Distribution System .....	33
Figure 9 – Days of Net Import Protection .....	35

## **EXECUTIVE SUMMARY**

### **NEW LEGISLATION**

On June 30, 1989, President Bush signed Public Law No. 101-46, which extended the Strategic Petroleum Reserve authorities contained in the Energy Policy and Conservation Act until April 1, 1990. The bill also required the Secretary of Energy to submit a report to Congress by February 1, 1990 on alternative means of financing oil acquisition for the Strategic Petroleum Reserve.

On October 23, 1989, the President signed the Department of the Interior and Related Agencies Appropriations Act, Fiscal Year 1990 (Public Law No. 101-121), providing funding in FY 1990 for the development, operation and management of the Strategic Petroleum Reserve and oil acquisition and transportation for the Reserve.

### **OIL ACQUISITION AND FILL RATES**

As of December 31, 1989, the Strategic Petroleum Reserve crude oil inventory was 579.9 million barrels, an increase of 20.4 million barrels over the 1988 year-end inventory of 559.5 million barrels. The Strategic Petroleum Reserve was filled at a rate of 55,732 barrels per day during calendar year 1989.

### **FACILITIES AND STORAGE DEVELOPMENT**

The Department has completed all major surface construction at the six SPR facilities, and cavern development is in progress to achieve 750 million barrels of storage by the end of 1991. During calendar year 1989, the Strategic Petroleum Reserve's crude oil storage capacity remained the same since additional leached cavern volume is not considered available for oil storage until a cavern is completed. Gross cavern volume, however, increased by nearly 73 million barrels, all of which was developed at the Big Hill and Bayou Choctaw storage facilities.

Bayou Choctaw's Cavern 101, the final new cavern to be developed at that site, achieved a gross volume of 11.2 million barrels (99 percent completion). New storage capacity development at Big Hill, where gross volume increased by approximately 68 million barrels, continued on schedule toward completion in 1991.

Planning for decommissioning of the Sulphur Mines storage facility continued on schedule. Expressions of interest in acquiring the facility were sought by the Government through advertisements placed in the Federal Register, Commerce Business Daily and Wall Street Journal. Several responses from private industry were received. The Department anticipates issuing a solicitation to sell the site, with or without an exchange of the oil stored there, in the first quarter of 1990.

The SPR's distribution capability increased from 3.25 to 3.50 million barrels per day during 1989. This increase was primarily a result of the completion of construction and tie in of a new distribution pipeline from the West Hackberry storage facility to the Lake Charles, Louisiana junction of the Texaco 22-inch common carrier pipeline system. Additional distribution enhancements are underway to increase the Reserve's capability 4.5 million barrels per day by increasing the drawdown capability in the Seaway systems and acquiring additional commercial marine distribution services in the Texoma system.

### **STUDIES FOR CONGRESS**

In April, the Department of Energy forwarded a report to Congress, addressing the likely expansion configuration, cost, and schedule to achieve one billion barrels of storage capacity by the year 2000. The report provided a preliminary assessment of potential candidate sites for expansion of the Reserve, and estimates of cost and schedule to achieve a one billion barrel capacity. The report concluded that this issue would be a subject of an interagency study in the next year.

## **PROGRAM DEFINITION**

Section 165 of the Energy Policy and Conservation Act (Public Law No. 94-163), as amended, requires the Secretary of Energy to submit annual and quarterly reports to the President and the Congress on activities to develop the Strategic Petroleum Reserve. Additional prospective information related to the development and fill of the Strategic Petroleum Reserve is required by the Omnibus Budget Reconciliation Act of 1986 (Public Law No. 99-509). This report combines the fourth quarter, 1989 Quarterly Report with the 1989 Annual Report.

## **PROGRAM/PROJECT MANAGEMENT**

The Strategic Petroleum Reserve Office was created under the Energy Policy and Conservation Act for the establishment, management, and maintenance of the Strategic Petroleum Reserve. The Assistant Secretary for Fossil Energy has overall programmatic responsibility for achieving the goals and objectives of the Strategic Petroleum Reserve Program. This responsibility has been delegated to the Deputy Assistant Secretary for Petroleum Reserves, Richard D. Furiga and is exercised through offices located in Washington, D.C. Under the Deputy Assistant Secretary for Petroleum Reserves, the Director of the Office of Strategic Petroleum Reserve, John W. Bartholomew, establishes plans and performance specifications for the Reserve's development, fill, drawdown, and distribution.

Strategic Petroleum Reserve project management and implementation activities are assigned to the Manager, Oak Ridge Operations Office, Joe La Grone, who directs Strategic Petroleum Reserve activities through the Assistant Manager for the Strategic Petroleum Reserve. The Project Management Office, located in New Orleans, Louisiana, and headed by Paul J. Plaisance,

Jr., carries out day-to-day project activities as delegated by the Manager, Oak Ridge Operations Office. Figure 1 shows the project management structure for the program.

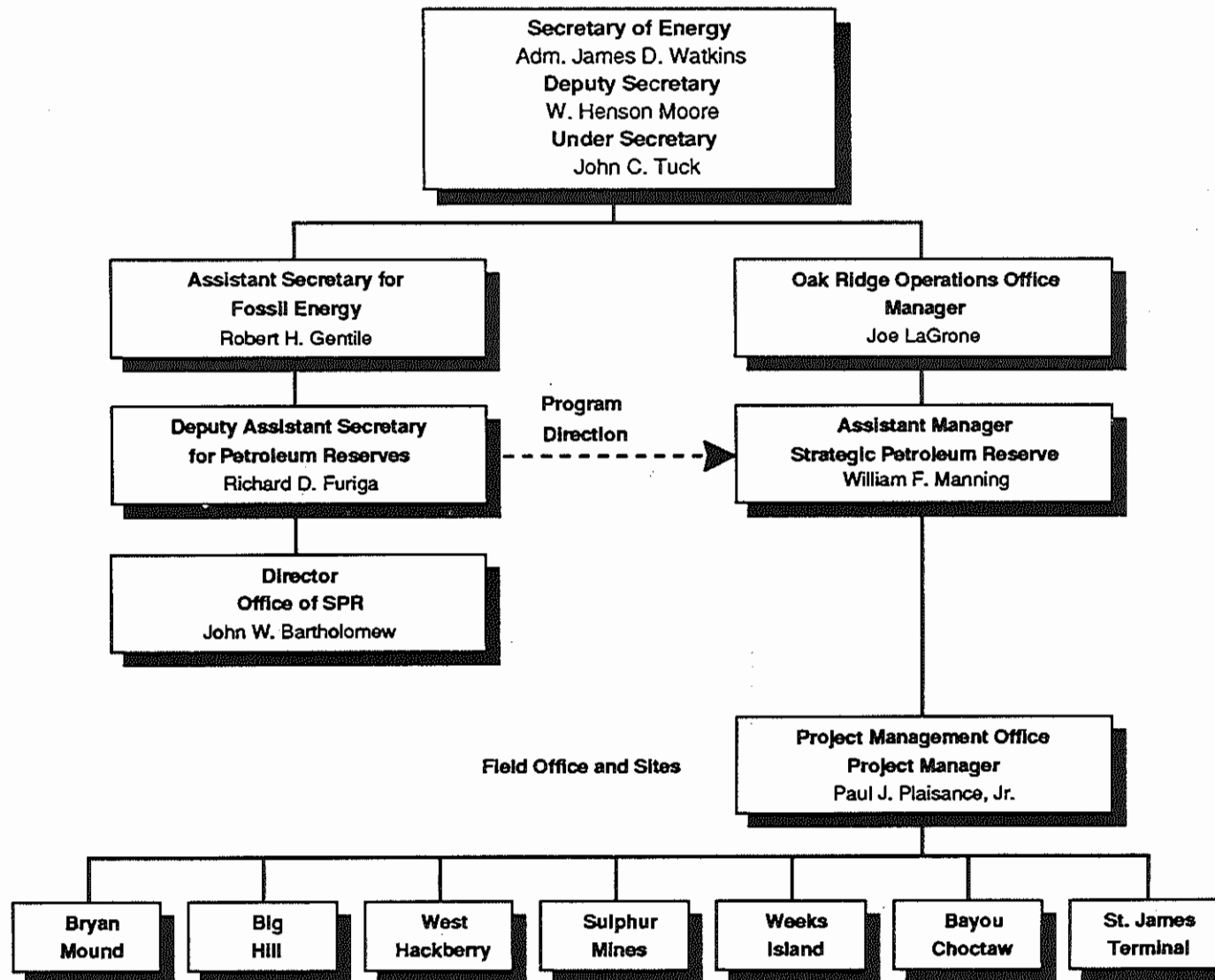
## **CHRONOLOGY OF PROGRAM LEGISLATION**

The Strategic Petroleum Reserve was authorized by Congress with the enactment on December 22, 1975, of the Energy Policy and Conservation Act, which declared it to be United States policy to establish a Strategic Petroleum Reserve of up to one billion barrels of petroleum products to reduce the impact of disruptions in petroleum supplies and to carry out the obligations of the United States under the International Energy Program.

The Energy Policy and Conservation Act provisions regarding the Strategic Petroleum Reserve were amended by title VIII of the Energy Security Act (Public Law No. 96-294), approved June 30, 1980. This Act established a minimum average daily fill rate of 100,000 barrels and precluded sale of Naval Petroleum Reserve Number 1 (Elk Hills, California) crude oil except to fill the Strategic Petroleum Reserve, unless the Strategic Petroleum Reserve was being filled at the minimum rate or had reached 500 million barrels in inventory.

The Energy Policy and Conservation Amendments Act of 1985 (Public Law No. 99-58), enacted on July 2, 1985, extended the provisions of title I, part B, of that Act relating to the Strategic Petroleum Reserve until June 30, 1989, and directed the Secretary of Energy to conduct a sale or exchange of 1.1 million barrels of Strategic Petroleum Reserve oil to test the drawdown and distribution capabilities of the Strategic Petroleum Reserve.

The Food Security Act (Public Law No. 99-198), enacted on December 23, 1985, allowed for the barter of agricultural commodities for crude oil to fill the Strategic Petroleum Reserve.



3

Figure 1

## Program/Project Management Structure



The Omnibus Budget Reconciliation Act of 1986 (Public Law No. 99-509), enacted on October 18, 1986, amended the Energy Policy and Conservation Act to require that the Strategic Petroleum Reserve be filled at a minimum rate of 75,000 barrels a day until at least 750 million barrels are in storage.

Public Law No. 100-531, signed by the President on October 28, 1988, authorizes protective force personnel who guard the Strategic Petroleum Reserve's storage and related facilities to carry firearms while performing official duties and to make arrests without warrants. The legislation also establishes trespass on Strategic Petroleum Reserve property as a Federal offense.

Public Law No. 101-46, enacted on June 30, 1989, extended the Strategic Petroleum Reserve authorities contained in the Energy Policy and Conservation Act until April 1, 1990. The bill also required the Secretary to submit a report to Congress by February 1, 1990, on alternative means of financing oil acquisition for the Strategic Petroleum Reserve.

On October 23, 1989, the President signed the fiscal year 1990 appropriations for the Department of Interior and Related Agencies (Public Law No. 101-121). This legislation provides \$192.5 million for the continued development, operations and management of the Strategic Petroleum Reserve and \$225.6 million for the acquisition and transportation of oil to fill the Reserve. Public Law No. 101-121 also requires that fiscal year 1990 receipts of Naval Petroleum Reserves Numbered 1 and 3 (NPR-1 and -3) in excess of \$510 million be deposited in the SPR Petroleum Account to acquire oil for the Strategic Petroleum Reserve. Total receipts for NPR-1 and -3 in fiscal year 1990 are estimated at \$630 million, which would provide \$120 million for deposit in the SPR Petroleum Account. Additionally, Public Law No. 101-121 provides an advance appropriation of \$108.5 million for fiscal year

1991 to acquire oil for delivery in the first quarter of fiscal year 1991.

On November 21, 1989, the President signed the Department of Transportation and Related Agencies Appropriations Act, 1990 (Public Law 101-164). This legislation sets a limit of \$147.1 million on the outlays that can be made in fiscal year 1990 from the \$225.6 million provided in Public Law No. 101-121 for the acquisition and transportation of oil for the Strategic Petroleum Reserve. This constraint precludes the full utilization of those funds to acquire oil for delivery to the Reserve in fiscal year 1990.

### SPR PLAN AND AMENDMENTS

The Energy Policy and Conservation Act required a Strategic Petroleum Reserve Plan. The Plan, addressing the development and implementation of the Strategic Petroleum Reserve, was submitted to Congress on February 16, 1977, and became effective on April 18, 1977.

Strategic Petroleum Reserve Plan Amendment No. 1 accelerated the planned schedule for filling the Reserve. This Amendment was submitted to the Congress on May 25, 1977, and became effective on June 20, 1977. The revised goal of 500 million barrels of crude oil to be in storage by December 22, 1980, advanced the original schedule by two years. Amendment No. 2 to the Strategic Petroleum Reserve Plan authorized an increase in the Strategic Petroleum Reserve size from 500 million barrels to one billion barrels. This amendment was transmitted to the Congress on May 18, 1978, and became effective on June 13, 1978. The Amendment described Department of Energy plans to store 750 million barrels of petroleum in underground storage facilities. Decisions were not made regarding the methods or timing for developing the final 250 million barrels of storage capacity.

On October 31, 1979, the Department of Energy submitted the Distribution Plan for the Strategic Petroleum Reserve (Amendment No. 3, Energy Action No. 5) to the Congress. In accordance with the provisions of the Energy Policy and Conservation Act in existence at that time, this Plan became effective on November 15, 1979. The Distribution Plan described the methods for drawdown and distribution of crude oil from the five existing Strategic Petroleum Reserve storage sites.

On December 1, 1982, President Reagan transmitted a new "Drawdown" (Distribution) Plan (Amendment No. 4) to the Congress for the use of the Strategic Petroleum Reserve. This Plan, required under the Energy Emergency Preparedness Act of 1982, which allowed it to go into effect immediately, provides procedures for the drawdown, sale, and distribution of crude oil from the Strategic Petroleum Reserve.

## **SPR REPORTS SUBMITTED TO CONGRESS**

### **REPORT TO CONGRESS ON EXPANSION OF THE STRATEGIC PETROLEUM RESERVE TO ONE BILLION BARRELS**

On April 1, 1989, the Department of Energy forwarded a report to Congress entitled "Report to Congress on Expansion of the Strategic Petroleum Reserve to One Billion Barrels". This report, prepared in response to the conference report accompanying the Department of the Interior and Related Agencies Appropriations for fiscal year 1989 (Public Law No. 100-446), addressed the likely expansion configuration, and the cost and schedule to achieve one billion barrels of storage capacity by the year 2000.

As a prerequisite, the Report re-examined key issues of Government versus private ownership, crude oil versus petroleum product storage, Gulf coast versus other storage locations, and drawdown rate requirements. The Report concluded that the preferable expansion configuration would be 250 million barrels of crude oil storage in the Gulf coast region due to its low development and operating cost. Specifically, the Report recommended a new 150 million-barrel site in the lower Mississippi River area (Capline Complex), and an additional 100 million-barrel site either on the Gulf Coast or in the vicinity of the major East Coast refining complex.

The Report provided a preliminary assessment of seven salt dome sites within the Gulf coast and one East coast site in the Delaware-New Jersey area as potential candidates for an expansion of the Strategic Petroleum Reserve. The Department estimated that an expansion of the Reserve to one billion barrels would require substantial

resources (approximately \$1.3 to 2.3 billion for storage and distribution facilities, and over \$6 billion including oil fill at current prices and today's dollars). Facility development following Congressional authorization would take 9 to 10 years to complete, and oil fill could be initiated within 6-7 years. The Report concluded that the issue of whether the Reserve should be expanded to one billion barrels would be the subject of a comprehensive interagency study that will be completed over the course of the next year.

### **ALTERNATIVE FINANCING STUDY**

In Public Law No. 101-46, the Congress required the Department of Energy to conduct a study on alternative ways to finance the Strategic Petroleum Reserve, with a final report on the study to be submitted by February 1, 1990. As part of the study, the Department obtained information on methods to finance the Reserve that would (1) reduce the total cost to the Federal Government or (2) reduce near-term effects on the Federal budget without significantly raising total costs. In conducting the study that was the basis for the financing report, the Department was required to assume storage of one billion barrels of oil.

The Administration decided to undertake the study of alternative SPR financing methods in conjunction with a parallel study of SPR size, assisted by an Interagency Steering Group, chaired by the DOE Deputy Under Secretary. Day-to-day involvement in the study was assigned to an Interagency Working Group comprised of representatives of interested Federal agencies.

The working group carried out a number of activities in compliance with the requirements of Public Law No. 101-46. An interim report on the alternative financing study, which was required no later than October 15, 1989, was submitted to the Congress. On October 2, 1989, the Department issued a notice of inquiry

requesting comments on alternative methods of financing crude oil acquisition and oil storage facilities for the SPR. Technical discussions were conducted with private firms which expressed interest in potentially leasing facilities for the SPR, and a panel discussion was held with members of the financial community on innovative financing methods. Preliminary draft solicitations for oil and facilities leasing were produced and forwarded to Congress as part of the main study report.

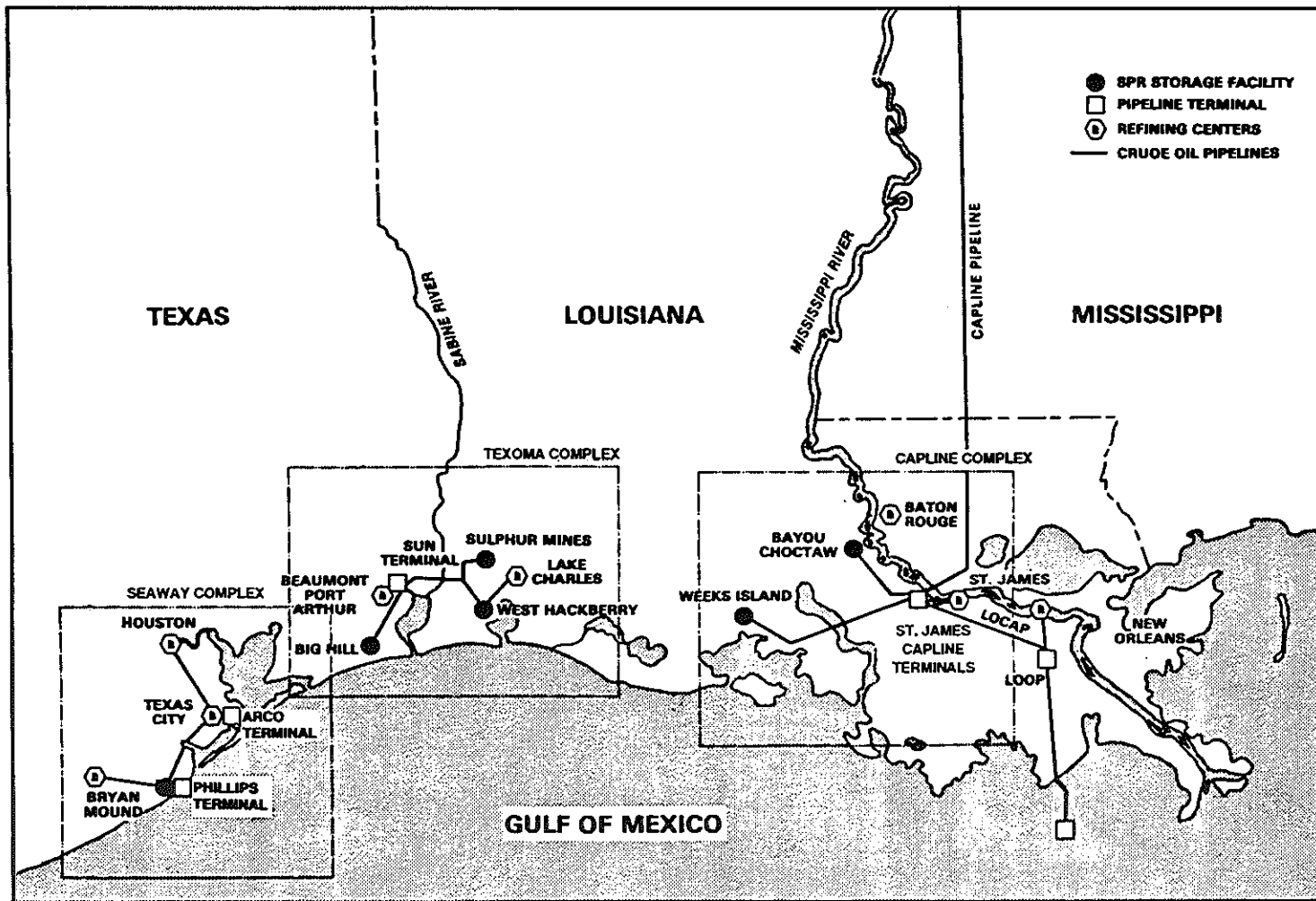
Working group members from the Departments of Energy and State held detailed technical discussions with representatives of the governments and/or state-owned oil companies of Kuwait, Mexico, Norway, Saudi Arabia, and the United Arab Emirates. Less detailed discussions were held with representatives of the United Kingdom, Nigeria, and Venezuela. In addition, the Department of Energy corresponded with members of the Governing Board of the International Energy Agency (IEA).

## **STORAGE FACILITIES DEVELOPMENT**

The Department of Energy has been involved in a major storage facilities development program to stockpile crude oil since 1976. Over the last 12 years, the Department has acquired and developed six underground crude oil storage facilities in salt domes along the Gulf coasts of Texas and Louisiana, and a marine terminal on the Mississippi River at St. James, Louisiana. The six storage sites are Bayou Choctaw, Weeks Island, West Hackberry and Sulphur Mines in Louisiana, and Bryan Mound and Big Hill in Texas. These six storage sites are organized into three distribution systems and connected by Department of Energy pipelines to commercial crude oil pipeline networks and to commercial and U.S. Government-

owned marine terminal distribution facilities. The Strategic Petroleum Reserve facilities development program is presently directed toward providing a total storage capacity of 750 million barrels and a drawdown/distribution capability of 4.5 million barrels per day. The locations of the current Strategic Petroleum Reserve storage sites and their associated distribution pipelines and terminals are shown in Figure 2.

A summary of facilities development plans and specifications for the Strategic Petroleum Reserve, including planned site storage capacities, storage configurations, and drawdown capabilities is presented in Table 1. Current plans provide for the decommissioning in fiscal year 1992 of the Sulphur Mines 26 million barrel storage facility, with replacement capacity to be developed by the enlargement of caverns at Big Hill and Bayou Choctaw.



**Figure 2. STRATEGIC PETROLEUM RESERVE COMPLEXES AND ASSOCIATED PIPELINES AND TERMINALS**

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**TABLE I**  
**STRATEGIC PETROLEUM RESERVE STORAGE AND DRAWDOWN CRITERIA**

<u>Storage Group</u>	<u>Storage Facilities</u>	<u>Storage Capacity (MMB)</u>	<u>Crude Mix (Sweet/Sour) (MMB)</u>	<u>Drawdown Capability (MB/D)</u>
Seaway Group	Bryan Mound	226	66/160	1,250
Texoma Group	West Hackberry	219	112/107	1,250
	Sulphur Mines <sup>1</sup>	—	—	—
	Big Hill	160	69/91	930
		<u>379</u>	<u>181/198</u>	<u>2,180</u>
Capline Group	Bayou Choctaw	72	34/38	480
	Weeks Island	73	0/73	590
		<u>145</u>	<u>34/111</u>	<u>1,070</u>
<b>Total</b>		<b>750</b>	<b>281/469</b> <b>37%/63%</b>	<b>4,500</b>

MMB: million barrels

MB/D: thousands of barrels per day

<sup>1</sup> To be decommissioned.

### FACILITIES DEVELOPMENT STATUS

#### Bryan Mound

The Bryan Mound site is located in Brazoria County, Texas, approximately three miles southwest of Freeport. The Department acquired this storage site in 1977 and converted four existing brine caverns with a total capacity of 66 million barrels to oil storage. Subsequently, site capacity was expanded to 226 million barrels through the solution mining of 16 additional 10 million-barrel caverns. The expansion was completed in 1986, and final oil fill is in progress. In 1989, 4.0 million barrels of oil were added to the site's inventory, which reached 221 million barrels.

In June, the Bryan Mound brine discharge pipeline, 14.6 miles long and

extending 13 miles offshore into the Gulf of Mexico, developed a leak in the onshore section. Approximately 8 acres of marsh vegetation were browned by the leaked brine.

A formal accident investigation was initiated promptly and a thorough examination of the entire onshore section revealed that the bottoms of certain pipe sections had suffered extensive erosion and corrosion. Steel plates were welded onto the damaged sections; this was followed by a pressure test of the entire pipeline, both onshore and offshore sections, to verify total pipeline integrity. The system was returned to service in September. Plans and options are being examined for repairing and mitigating further deterioration. The current condition of the pipeline has no impact on the Strategic Petroleum Reserve's drawdown capabilities, as the brine line is used only for fill or refill of the site.

## West Hackberry

The West Hackberry site is located in Cameron Parish, Louisiana, approximately 22 miles southwest of Lake Charles. The Department acquired this storage site in 1977 and converted five existing brine caverns with a capacity of 49 million barrels to oil storage. Subsequently, the Department expanded this storage site through solution mining of 17 additional 10 million-barrel storage caverns. Development of this site to the planned level of 219 million barrels was completed in September 1988. In 1989, 16 million barrels of oil were added to the site's inventory, which reached 206 million barrels.

During 1989, the West Hackberry site pumping systems were converted from the development or leaching configuration to a drawdown configuration. This conversion involved remanufacturing 7 pumps from brine service to crude service to achieve the site's required crude drawdown rate capability of 1.25 million barrels per day. In October, a site drawdown exercise was successfully performed that demonstrated the capability of this system to achieve the 1.25 million barrel per day rate.

As part of the West Hackberry distribution system, the Department completed construction of a 12-mile crude oil pipeline connecting the West Hackberry oil storage site to the Lake Charles, Louisiana junction with the Texaco 22-inch common carrier pipeline system in June. Construction of the custody metering station located at the Texaco pipeline junction was completed in November. Oil fill and flow testing of the meter station was initiated in December; oil fill of the pipeline is scheduled for early 1990 at which time the entire system will be fully operational. In the event of an SPR drawdown prior to certification of this meter station, backup oil measurement capability exists.

## Sulphur Mines

The Sulphur Mines site is located in Calcasieu Parish, Louisiana, approximately 12 miles west of Lake Charles. The Department acquired this storage site in 1979 and converted three existing brine caverns with a capacity of 26 million barrels to crude oil storage. Development and fill of this site were completed in 1983. The site is currently in an operational standby mode.

The Department's development plan for the SPR provides for consolidating the Sulphur Mines inventory into existing larger sites to increase the Reserve's cost effectiveness and drawdown capabilities. Specifically, the Department is expanding the Big Hill facility by 20 million barrels and the Bayou Choctaw facility by 6 million barrels; and is planning for the decommissioning of the Sulphur Mines facility by the end of 1992. During 1989, the Department completed and received approval of an environmental assessment of this project. The Department's study found that the decommissioning action would result in no significant environmental impacts (See Environmental Compliance and Permits section).

In March, the Department completed a market analysis to ascertain potential industrial uses of the facility and to assess the degree of interest of commercial companies. Subsequently, during June and July, the Department placed notices in the Federal Register, the Commerce Business Daily, and the Wall Street Journal, requesting expressions of interest from industry in acquiring the Sulphur Mines storage facility. Several expressions of interest were received, including interest in acquiring the stored oil through an oil-exchange agreement.

The Department anticipates issuing an Invitation for Offers in 1990 for the sale of the Sulphur Mines oil storage facility, with or without an exchange of the stored oil. A successful proposer offering to purchase the facility with the oil that is currently in storage might be required to provide oil to the



Strategic Petroleum Reserve in an equivalent amount and kind in exchange for the stored oil. If the successful proposer offers to purchase only the facility, the Department may transfer the Sulphur Mines oil inventory to the Big Hill storage site during 1991.

### **Big Hill**

The Big Hill storage site is located in Jefferson County, Texas, 20 miles southwest of Beaumont. The Department acquired this undeveloped site in 1982 and has been constructing a new storage facility with a planned storage capacity of 160 million barrels and a drawdown capability of 930,000 barrels per day. The site's planned total capacity includes 20 million barrels of storage capacity to replace a portion of that lost through the planned decommissioning of the Sulphur Mines site.

Construction of all major surface facilities at Big Hill has been completed. Cavern leaching continued on schedule at a gross leaching rate of approximately 1.4 million barrels per day, achieving 112 million barrels of total cavern volume at year's end or 62 percent completion. The first of the 14 caverns is scheduled to be completed and available for oil fill in May 1990. Development of the site to its total capacity of 160 million barrels is projected to be completed by September 1991.

In November 1989, the Department provided Government acceptance of the Big Hill crude pipeline tie-in to Sun Terminal at Nederland, Texas, and related terminal modifications required for Big Hill oil fill and drawdown. The Sun Terminal now has the capability to simultaneously receive and distribute crude from both the West Hackberry and the Big Hill sites, as well as to facilitate intersite movements of oil between the West Hackberry, Sulphur Mines and Big Hill storage sites.

### **Bayou Choctaw**

The Bayou Choctaw site is located in Iberville Parish, Louisiana, approximately 12

miles southwest of Baton Rouge. The Department acquired this storage site in 1977 and converted four existing brine caverns with a capacity of 46 million barrels to oil storage. Subsequently, the Department acquired a fifth existing cavern (No. 17) through an exchange agreement with Union Texas Petroleum. Also one new 10 million-barrel cavern (No. 101) is currently under development through solution mining.

During 1989, the gross volume of Cavern 101 reached 11.2 million barrels or 99 percent completion. Upon completion of Cavern 101, crude oil in Cavern 18 will be transferred to Cavern 101 and Cavern 18 will be expanded to 16 million barrels. This action will bring Bayou Choctaw to its total designed storage capacity of 72 million barrels by September 1991.

Plugging and abandonment of core holes drilled for site characterization by the Strategic Petroleum Reserve program, and unused pre-existing wells associated with industry-developed caverns which the Department inherited when the site was acquired, are over 80 percent complete; only 2 core holes remain to be plugged. These actions were completed in conformance with Louisiana Department of Natural Resource regulations.

### **Weeks Island**

The Weeks Island site is located in Iberia Parish, Louisiana, approximately 95 miles southwest of New Orleans. The Department acquired this storage site in 1977 and converted an existing conventional salt mine with a capacity of 73 million barrels to oil storage. Development and fill of this site was completed in 1982. The site is currently in an operational standby mode.

The Department awarded a contract for construction of an air drying system for the Weeks Island oil storage facility in October. This system will reduce water vapor condensation within the manways and shafts

of the mine area above the oil storage chamber, providing for early detection of incipient water leaks should any develop.

Design of an alternate drawdown system, whose primary components are two high capacity pumps, was completed in 1989. The system is designed to provide the site with back-up drawdown capability utilizing the oil-fill shafts. Contract award for the pumps and installation is anticipated in April and construction completion in 1991.

In-mine bulkheads for isolating the abandoned Morton International, Inc. Markel Mine from the underground Strategic Petroleum Reserve operations area are also planned to reduce the risk of any problems that may develop in the Markel Mine. Completion of design of these isolation bulkheads is anticipated in April 1990. Design of upgrades to other existing bulkheads continues.

In 1989, additional subsidence monitoring survey monuments were installed at the surface in cooperation with Morton International, Inc., to provide enhanced

subsidence analyses and predictions. In 1990, the Department also plans to complete subsurface convergence-measuring instrumentation which will provide data to further enhance analyses and predictions of subsidence.

### **STRATEGIC PETROLEUM RESERVE STORAGE CAPACITY DEVELOPMENT**

Storage capacity development is complete at 4 storage sites – Bryan Mound, West Hackberry, Sulphur Mines and Weeks Island; and storage capacity development is proceeding on schedule at the two remaining sites – Bayou Choctaw and Big Hill. Caverns at Bayou Choctaw and Big Hill are being solution mined to their final shape and capacity prior to storing any oil other than blanket oil required to protect the cavern roof during the leaching process. During 1989, gross cavern volume leached at Bayou Choctaw was 5.6 million barrels, and at Big Hill, 69.1 million barrels. Gross cavern volume is not shown in Table 2 as it is not considered as storage capacity available for oil fill.

**TABLE 2**  
**STORAGE CAPACITY DEVELOPMENT BY QUARTER**  
(In Millions Barrels)

<b><u>Storage Facility</u></b>	<b><u>1988 Year-End</u></b>	<b><u>1st Quarter</u></b>	<b><u>2nd Quarter</u></b>	<b><u>3rd Quarter</u></b>	<b><u>4th Quarter</u></b>	<b><u>1989 Year-End</u></b>
Bryan Mound	226.0					226.0*
West Hackberry	219.0					219.0*
Bayou Choctaw	56.0	0.0	0.0	0.0	0.0	56.0
Weeks Island	73.0					73.0*
Sulphur Mines	26.0					26.0*
Big Hill	0.0	0.0	0.0	0.0	0.0	0.0
<b>Total</b>	<b>600.0</b>	<b>0.0</b>	<b>0.0</b>	<b>0.0</b>	<b>0.0</b>	<b>600.0</b>

\* Capacity Development Complete.

## CAPITAL IMPROVEMENTS

Major capital improvement projects completed in 1989 included: Improved Risk fire protection projects at all Strategic Petroleum Reserve sites; installation of emergency shutdown valves on the crude oil pipelines at most cavern wellheads, except at West Hackberry and Bryan Mound where completion is anticipated in early 1990; and cathodic protection upgrades of site piping and well-casings at all sites. Security upgrades were completed at St. James with the relocation of the taut-wire sensor fence.

Construction of permanent office facilities at West Hackberry, Bayou Choctaw, Bryan Mound, Weeks Island, and St. James was completed in 1989.

## **OIL ACQUISITION AND TRANSPORTATION**

### **STATISTICS FOR FOURTH QUARTER, 1989**

The Strategic Petroleum Reserve was filled at an average rate of 29,638 barrels per day during the calendar quarter ending December 31, 1989. As of December 31, 1989, the Strategic Petroleum Reserve crude oil inventory was 579,857,245 barrels. Table 3 summarizes the Strategic Petroleum Reserve crude oil inventory and delivery statistics as of December 31, 1989, and includes projections for calendar year 1990.

During the period of October 1 through December 31, 1989, only high sulfur (sour) crude oil was delivered to the Strategic Petroleum Reserve terminals. The weighted

average price per barrel of the sour crude oil delivered to the Strategic Petroleum Reserve terminals during this period was \$18.54 per barrel, including costs for transportation, but excluding costs for customs duties, superfund taxes, terminal services and administration.

### **OIL FILL, CALENDAR YEAR 1989**

During 1989, the Strategic Petroleum Reserve crude oil inventory was increased by 20,342,359 barrels, representing an average fill rate of 55,732 barrels per day. This average daily fill rate was less than the 65,000 barrels per day fill rate projected in the February 1989 Strategic Petroleum Reserve Annual/Quarterly Report due primarily to higher than anticipated crude oil prices. Fiscal and calendar year inventories and average daily fill rates since 1977 are presented in Table 4. Strategic Petroleum Reserve crude oil fill is illustrated on both an annual and cumulative basis in Figures 3 and 4, respectively.

**TABLE 3**  
**STRATEGIC PETROLEUM RESERVE**  
**OIL INVENTORY AND DELIVERY STATISTICS**  
**1989 Inventory and Delivery Summary**  
**(Barrels)**

<u>Calendar Year 1989</u>	<u>Planned Average Daily Fill Rate</u>	<u>Actual</u>		
		<u>Average Daily Fill Rate</u>	<u>Quarter Oil Receipts</u>	<u>Ending Oil Inventory</u>
1st Quarter	88,000	74,545	6,709,045	566,233,931
2nd Quarter	75,000	60,441	5,490,117	571,724,048
3rd Quarter	75,000	58,766	5,406,499	577,130,547
4th Quarter	22,000	29,638	2,726,698	579,857,245
<b>TOTAL</b>	<b>65,000</b>	<b>55,732</b>	<b>20,342,359</b>	<b>579,857,245</b>
Total Crude Oil in Transit (December 31, 1989)				0
Crude Oil available under contract for delivery during CY 1990				1,934,000

**1990 Inventory and Delivery Projections\***

<u>Calendar Year 1990</u>	<u>Average Daily Fill Rate</u>	<u>Quarter Oil Receipts</u>
1st Quarter	33,000	3,000,000
2nd Quarter	57,000	5,190,000
3rd Quarter	36,000	3,318,000
4th Quarter	59,000	5,428,000
<b>TOTAL</b>	<b>46,000</b>	<b>16,936,000</b>

\* Based on anticipated contract awards, crude oil prices and FY 1991 budget assumptions.

**TABLE 4**  
**STRATEGIC PETROLEUM RESERVE OIL FILL HISTORY**

	<u>Fiscal Year</u>		<u>Calendar Year</u>	
	<u>Year-End Inventory (Million bbls)</u>	<u>Average Daily Fill Rate (Thousand bbls/d)</u>	<u>Year-End Inventory (Million bbls)</u>	<u>Average Daily Fill Rate (Thousand bbls/d)</u>
1977	1.1	3	7.2	20
1978	49.1	131	68.5	168
1979	91.2	115	91.7	64
1980	92.8	4	107.8	44
1981	199.2	292	230.3	336
1982	277.9	215	293.8	174
1983	361.0	228	379.1	234
1984	431.1	191	450.5	195
1985	489.3	159	493.3	119 *
1986	506.4	47*	511.6	51 *
1987	533.9	75	540.6	80
1988	554.7	57	559.5	52
1989	577.1	62	579.9	56

\* Fill rates unadjusted for oil deliveries under the 1985/86 test sale.

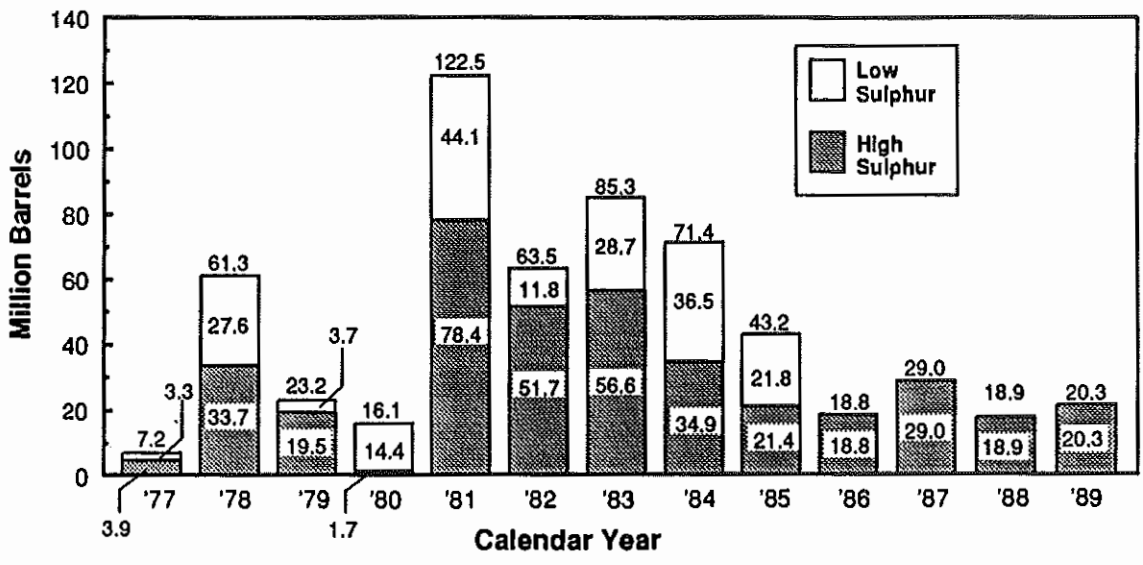


Figure 3

### Annual Strategic Petroleum Reserve Oil Fill

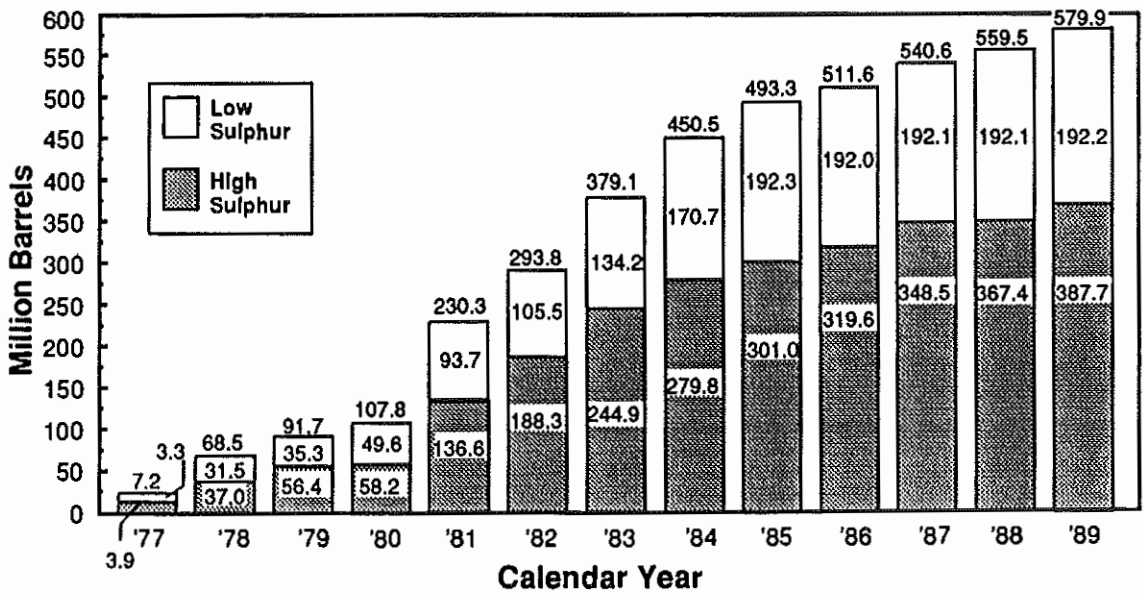


Figure 4

### Cumulative Strategic Petroleum Reserve Oil Fill

## **OIL ACQUISITION, CALENDAR YEAR 1989**

The 20.3 million barrels of crude oil delivered to the Strategic Petroleum Reserve during 1989 were acquired under the Department of Energy's November 1987 crude oil purchase agreement with Petroleos Mexicanos (PEMEX), Mexico's state-owned oil company. This agreement provided for PEMEX to deliver between 42.8 and 52.3 million barrels of crude oil to the Reserve during a 2 year period beginning December 1, 1987. However, inasmuch as the delivery of the minimum quantity was not completed by November 30, 1989, the end of the 2 year period, the delivery period was extended through May 1990. As of December 31, 1989, the remaining quantity to be delivered under this agreement was approximately 1.9 million barrels.

In addition to the PEMEX-related oil acquisition activities explained above, the Department of Defense's Defense Fuel Supply Center, acting as the Department of Energy's agent under an interagency agreement, issued on December 22, 1989, an open continuous solicitation for competitive offers to deliver approximately 11 million barrels of crude oil to the Strategic Petroleum Reserve prior to September 30, 1990.

Table 5 shows the crude oil quantities received during 1989 and since inception of the Strategic Petroleum Reserve program by

country of origin. Of the total oil in storage, 66.9 percent is high sulfur (sour) and 33.1 percent is low sulfur (sweet). Table 6 provides information on the location of this inventory by storage site. The applicable crude oil quality specifications used in acquiring Strategic Petroleum Reserve oil can be found in Appendix H of this report.

## **CARGO PREFERENCE ACT COMPLIANCE**

The Cargo Preference Act of 1954 requires that Federal agencies take such steps as may be necessary and practicable to assure that at least 50 percent of its cargo transported on ocean vessels in a calendar year is transported by privately-owned U.S.-flag vessels, to the extent they are available at fair and reasonable rates. By agreement between the Department of Energy and the Department of Transportation, the Strategic Petroleum Reserve's Cargo Preference Act compliance is measured in terms of long-ton miles, i.e., cargo tons multiplied by the distances transported.

During 1989, ten different U.S.-flag vessels, transporting a total of 10.8 million barrels on 33 voyages, were involved in delivering crude oil to the Strategic Petroleum Reserve. These deliveries equaled 1.1 billion long-ton miles or 56.2 percent of the total long-ton miles.



**TABLE 5**  
**CRUDE OIL RECEIVED THROUGH 1989**  
**(Million Barrels)**

<u>Source Country</u>	<u>Quantity During 1989</u>	<u>Cumulative</u>	<u>Percent Of Total</u>
Mexico	20.3	254.8	43.9
United Kingdom		136.1	23.4
United States:		38.4	6.6
Alaska		31.4	5.4
Other		7.0	1.2
Saudi Arabia		27.1	4.7
Libya		23.8	4.1
Iran		20.0	3.4
United Arab Emirates		18.4	3.2
Nigeria		15.2	2.6
Oman		9.0	1.5
Egypt		8.9	1.5
Norway		7.4	1.3
Ecuador		6.2	1.1
Algeria		6.2	1.1
Cameroon		3.5	0.6
Gabon		2.4	0.4
Qatar		2.3	0.4
Venezuela		0.9	0.2
Peru		0.4	0.1
<b>TOTAL RECEIPTS*</b>	<u>20.3</u>	<u>581.0</u>	<u>100.0</u>

\* Unadjusted for 1985/1986 test sale deliveries and operational gains and losses.

**TABLE 6**  
**STRATEGIC PETROLEUM RESERVE CRUDE OIL INVENTORY**  
**As of December 31, 1989**  
**(Million Barrels)**

<u>Storage Site</u>	<u>Location</u>	<u>1989 Cumulative Total</u>			<u>Total End of Year 1988</u>
		<u>Sour*</u>	<u>Sweet**</u>	<u>Total</u>	
Bryan Mound	Brazoria County, TX	156.0	64.4	220.4	216.9
Big Hill	Jefferson County, TX	***.6	0	.6	0.2
West Hackberry	Cameron Parish, LA	96.5	109.3	205.8	189.8
Bayou Choctaw	Iberville Parish, LA	34.0	18.4	52.4	52.9
Weeks Island	Iberia Parish, LA	72.6	0.0	72.6	71.8
Sulphur Mines	Calcasieu Parish, LA	25.0	0.0	25.0	25.0
Subtotal		384.7	192.1	576.8	556.6
Tanks and Pipelines		<u>3.0</u>	<u>.1</u>	<u>3.1</u>	<u>2.9</u>
<b>TOTAL</b>		<b>387.7</b>	<b>192.2</b>	<b>579.9</b>	<b>559.5</b>

\*Sulphur content greater than 0.5 percent.

\*\*Sulphur content not exceeding 0.5 percent.

\*\*\*Blanket oil for cavern development purposes.

## **OTHER PROJECT ACTIVITIES**

### **PROCUREMENT AND CONTRACTOR SUPPORT**

Obligations in fiscal year 1989 for Strategic Petroleum Reserve procurements totaled approximately \$418 million, including \$242 million for crude oil and associated transportation and other costs. Obligations for procurements for other than crude oil totaled \$176 million.

Boeing Petroleum Services, Incorporated, in the fifth year of a five year contract which began in April 1985, provided management and operating services for the crude oil storage facilities.

Other prime contractors that provided services to the Strategic Petroleum Reserve during 1989 included: Jacobs Engineering Group, Walk, Haydel & Associates, Inc., and Fluor Daniel, Inc., for architectural engineering; and Systematic Management Services, Inc., for support services.

### **REAL ESTATE**

There were no real estate actions during 1989.

### **ENVIRONMENTAL COMPLIANCE AND PERMITS**

The Department completed and the Secretary approved in December, 1989, an environmental assessment (DOE/EA-0401) of the planned decommissioning of the Strategic Petroleum Reserve's Sulphur Mines storage facility which is scheduled for decommissioning in FY 1992. Based on the analysis in the Environmental Assessment, the Department found that the proposed decommissioning action was not a Federal action significantly affecting the quality of the human environment within the meaning of the National Environmental Policy Act.

Consequently, an Environmental Impact Statement was not required and the Department issued a Finding of No Significant Impact.

During routine environmental monitoring in late 1988, higher than normal salinities were observed, through conductivity measurement, in the area immediately adjacent to the brine pits at Bryan Mound. Subsequent monitoring at West Hackberry revealed similar conditions. During 1989, several monitoring wells were drilled in the area surrounding the brine pits, at depths of 40 and 75 feet, to confirm conductivity observations. At both Bryan Mound and West Hackberry, the data from the monitoring wells confirmed the conductivity observations, indicating that brine was being, or had been, introduced into the subsurface. Mitigation currently consists of pumping out the higher salinity water, and expanding the investigation to better define the perimeter or plume and source of higher salinity water. The Department has taken positive measures, such as lining the pits, to prevent leaking of the brine during use of the brine system. Final definition of the extent of this problem, and recommendations for further mitigation, are anticipated in mid 1990.

A civilian Environmental Advisory Committee, consisting of three highly qualified environmentalists, a mining engineer, a pipeline specialist, a seafood processor, two representatives from the community at large, and the Strategic Petroleum Reserve's Management and Operating contractor was established in 1989 and is functioning effectively. The Committee meets quarterly and community involvement has resulted in improved public relations and an informed public.

### **SECURITY**

Since 1986, responsibility for most security service program elements has been borne by Boeing Petroleum Services, Inc., under its Management and Operating

contract. BPS administers the protection services program through a subcontract to Wackenhut Services, International.

A Master Security Agreement which formally establishes the appropriate level of protection for the Strategic Petroleum Reserve's facilities was completed during 1989. The Agreement provides for necessary and adequate protection of the Reserve's facilities against hostile acts which could affect national security and public safety. Final approval of the Agreement by DOE headquarters management is anticipated in early 1990.

To maintain security proficiency, the Strategic Petroleum Reserve continued to conduct comprehensive security training exercises at all of its sites during 1989. These exercises simulated responses to outside aggressors and incorporated participants from Federal, state, and local law enforcement agencies. In 1989, the Strategic Petroleum Reserve conducted regular tactical exercises each month utilizing blank ammunition and laser-weapons, to test

on-duty Wackenhut Services, International, protection officers' ability to respond to simulated aggressor actions.

On October 28, 1988, the President signed Public Law No. 100-531, which amends the Department of Energy Organization Act to authorize protective force personnel who guard the Strategic Petroleum Reserve to carry firearms while discharging their official duties and, in certain instances, to make arrests without warrant. The legislation also establishes a Federal offense of trespass on federally-owned Strategic Petroleum Reserve sites. Implementing guidelines and regulations associated with this legislation have been forwarded to the Department of Justice for approval.

The Strategic Petroleum Reserve currently has an armed protection force strength of 300 officers. All officers have received tactical training and 110 have been certified by the Department of Energy Central Training Academy at the advanced skill level as Special Response Team members.

## **BUDGET AND FINANCE**

### **APPROPRIATIONS**

A total of \$19.7 billion has been appropriated for the Strategic Petroleum Reserve. Included in this total are entitlement receipts for fiscal year 1981 under the authority of the Energy Security Act. Also included are an estimated \$120 million, to become available in late fiscal year 1990 from the receipts of the Naval Petroleum Reserves. The distribution of annual and total appropriations is shown in Table 7. Figure 5 illustrates annual and cumulative appropriations for storage facilities development and operations and petroleum acquisition and transportation.

### **MAJOR BUDGET AND FINANCING ACTIONS DURING 1989**

The Administration's fiscal year 1990 budget for the Strategic Petroleum Reserve, as amended in July 1989, requested appropriations of \$195.0 million for the continued development and operations and management of the Reserve and \$422.5 million for oil acquisition and transportation. This proposed funding was in addition to a \$91.6 million advance fiscal year 1990 appropriation for oil acquisition and transportation, enacted in Public Law No. 100-446. The Administration projected that total funding of \$514.1 million for oil acquisition and transportation in fiscal year 1990 would allow for filling the Reserve at an average rate of 75,000 barrels a day.

On October 23, 1989, the President signed into law the Department of the Interior and Related Agencies Appropriations for fiscal year 1990 (Public Law No. 101-121). Initially, this legislation provided \$195.0 million for the development, operations and management of the Reserve and \$227.8 million for oil acquisition and transportation. Subsequently, these appropriations were

reduced by sequestration to \$192.5 million and \$225.6 million, respectively. The advance fiscal year 1990 appropriation was also reduced from \$91.6 million to \$90.3 million. The Congress estimated that the oil acquisition funds initially provided in combination with the advance appropriation would allow for a fill rate of approximately 50,000 barrels a day in fiscal year 1990. Public Law 100-121 also requires that fiscal year 1990 receipts of Naval Petroleum Reserves Numbered 1 and 3 (NPR-1 and -3) in excess of \$510 million be deposited in the SPR Petroleum Account to acquire oil for the Strategic Petroleum Reserve. Total receipts for NPR-1 and -3 in fiscal year 1990 are estimated at \$630 million, which would provide \$120 million for deposit in the SPR Petroleum Account for oil acquisition. Additionally, Public Law No. 100-121 provides an advance appropriation of \$108.5 million for fiscal year 1991 to acquire oil for delivery in the first quarter of fiscal year 1991.

On November 21, 1989, the President signed the Department of Transportation and Related Agencies Appropriations Act, 1990 (Public Law No. 101-164). This legislation sets a limit of \$147.1 million on the outlays that can be made in fiscal year 1990 from the \$225.6 million provided in Public Law No. 101-121 for the acquisition and transportation of oil for the Strategic Petroleum Reserve. This constraint precludes the full utilization of those funds to acquire oil for delivery to the Reserve in fiscal year 1990.

### **STRATEGIC PETROLEUM RESERVE ACCOUNT TRANSACTIONS, LAST QUARTER OF 1989 (FIRST QUARTER OF FISCAL YEAR 1990)**

The Strategic Petroleum Reserve Account funds the development, operation and maintenance of Strategic Petroleum Reserve facilities; the salaries and expenses necessary to plan and manage the program,

including the operation of the Project Management Office in New Orleans, Louisiana; and the activities pertinent to major issues concerning the development and use of the Strategic Petroleum Reserve.

A total of \$31.4 million of Strategic Petroleum Reserve Account funds remained available for obligation at the end of fiscal year 1989. The appropriation for fiscal year 1990 increased these available funds by \$192.5 million, to a total of approximately \$223.9 million. Of this total, \$52.8 million were obligated in the quarter ended December 31, 1989 (first quarter of fiscal year 1990), leaving a balance of \$171.1 million available for future obligation. It is currently planned to obligate this balance by the end of fiscal year 1990.

#### **SPR PETROLEUM ACCOUNT TRANSACTIONS, LAST QUARTER OF 1989 (FIRST QUARTER OF FISCAL YEAR 1990)**

The SPR Petroleum Account funds the acquisition of oil for the Strategic Petroleum Reserve; the associated costs for transportation and terminalling; U.S. customs duties and Superfund taxes; and other miscellaneous costs, such as Defense Fuel Supply Center administration costs associated with acquiring and transporting oil. In the event of a drawdown and sale of Strategic Petroleum Reserve oil, the SPR Petroleum Account would also fund the costs of withdrawing oil from the storage caverns and transporting it to the point where the purchasers would take title. An amount equal to federal receipts from a drawdown and sale is deposited in the SPR Petroleum Account and creates additional budget authority for refilling the Reserve.

There were no unobligated funds in the SPR Petroleum Account at the end of fiscal year 1989. Of the \$435.9 million provided for the account in fiscal year 1990, \$56 million was obligated during the quarter ended

December 31, 1989 (first quarter of fiscal year 1990). The balance of \$379.9 million is planned for obligation by early fiscal year 1991. Outlays (payments) from the account during the quarter were \$73.2 million.

#### **OIL COSTS THROUGH FISCAL YEAR 1989**

A total of 577.1 million barrels of crude oil were delivered to the Strategic Petroleum Reserve through fiscal year 1989. The cumulative costs for this oil, including entitlement receipts, were \$15.784 billion, for an average of approximately \$27.35 per barrel. For the 22.5 million barrels delivered in fiscal year 1989, the average cost was \$17.19 per barrel.

#### **ESTIMATED COST TO COMPLETE THE STRATEGIC PETROLEUM RESERVE**

The cost to complete the Strategic Petroleum Reserve will depend on future decisions about the size of the Reserve, fill rates and financing alternatives, as well as future oil prices.

Based on the assumptions for the Department's fiscal year 1991 budget request, transmitted to the Congress on January , 1990, development of the facilities to the currently planned 750 million barrel storage system would be complete at the end of fiscal year 1991. Oil fill would be at an average rate of approximately 39,000 and 59,000 barrels a day, respectively, in fiscal years 1990 and 1991, and at a rate of 50,000 barrels a day in subsequent fiscal years, creating a total inventory of 750 million barrels in mid-fiscal year 1999. Using the oil price path assumed for the fiscal year 1991 request, the estimated total cost to completion of a 750 million barrel Reserve in this scenario is \$5.1 billion for the development, operation and management of the Reserve through fiscal year 1999 and \$19.5 billion for oil fill.

**TABLE 7**  
**STRATEGIC PETROLEUM RESERVE APPROPRIATIONS**  
(Thousands of Dollars)

<u>Fiscal Year</u>	<u>Petroleum Acquisition and Transportation</u>	<u>Storage Facilities Development and Operations</u>	<u>Management</u> <sup>1</sup>	<u>Total</u>
1976	\$ 0	\$ 300,000	\$ 13,975	\$ 313,975
1977	440,000	0	7,824	447,824
1978	2,703,469	463,933	14,704	3,182,106
1979	2,885,670	103,290	18,111	3,007,071
Reprogramming	<u>-529,214</u>	<u>529,214</u>	<u>0</u>	<u>0</u>
	2,356,456	632,504	18,111	3,007,071
1980	-2,000,000 <sup>2</sup>	0	0	-2,000,000
Reprogrammings:				
Number 1	- 20,391	0	20,391	0
Number 2	<u>- 1,881</u>	<u>0</u>	<u>1,881</u>	<u>0</u>
	- 2,022,272	0	22,272	- 2,000,000
1981	2,688,282 <sup>3</sup>	82,834	19,391	2,790,507
Entitlements	542,146	0	0	542,146
Reprogrammings:				
Number 1	- 18,000	18,000	0	0
Number 2	<u>- 7,334</u>	<u>7,334</u>	<u>0</u>	<u>0</u>
	3,205,094	108,168	19,391	3,332,653
1982	3,684,000	171,356	20,076	3,875,432
Reprogramming	<u>- 4,300</u>	<u>4,300</u>	<u>0</u>	<u>0</u>
	3,679,700	175,656	20,076	3,875,432
1983	2,074,060	222,528	19,590	2,316,178
1984	650,000	142,357	16,413	808,770
1985	2,049,550	441,300 <sup>4</sup>	417,890 <sup>4</sup>	2,508,740
1986	0	94,015	13,518	107,533
Reprogramming	<u>- 12,964</u>	<u>12,964</u>	<u>0</u>	<u>0</u>
	- 12,964	106,979	13,518	107,533
1987	0	134,021	13,412	147,433
1988	438,744	151,886	12,276	602,906
1989	242,000	160,021	13,400	415,421
1990	<u>435,865<sup>5</sup></u>	<u>179,530</u>	<u>12,953</u>	<u>628,348</u>
Total Appropriations	\$ 16,239,702	\$ 3,218,883	\$ 235,805	\$ 19,694,390

<sup>1</sup> Excludes funds appropriated to other DOE accounts but used to finance aspects of SPR program management.

<sup>2</sup> Rescission.

<sup>3</sup> Included supplemental appropriations of \$1,305,000,000.

<sup>4</sup> Included in FY 1984 second supplemental appropriations.

<sup>5</sup> Includes indefinite appropriation estimated at \$120,000,000.

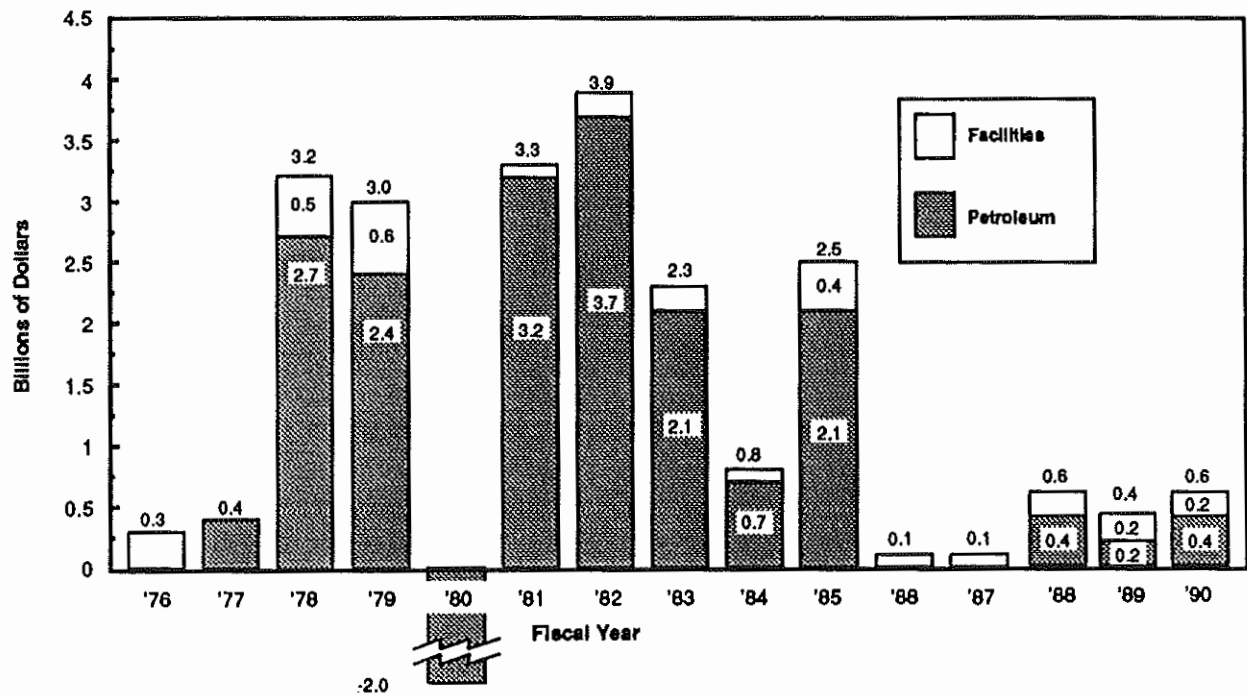


Figure 5

### Strategic Petroleum Reserve Annual Funding

Storage Facilities Development/Operations and  
Petroleum Acquisition/Transportation

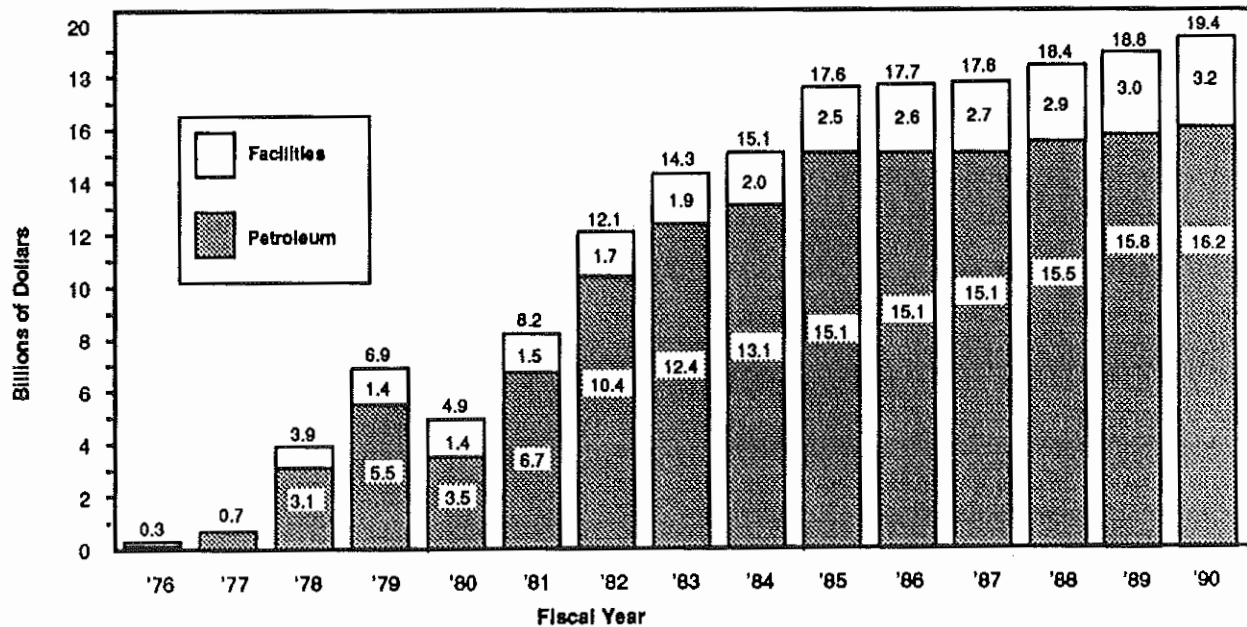


Figure 8

### Strategic Petroleum Reserve Cumulative Funding

Storage Facilities Development/Operations and  
Petroleum Acquisition/Transportation



## **DRAWDOWN AND DISTRIBUTION SYSTEM AND VULNERABILITY IMPACT**

### **DISTRIBUTION PLAN**

The current plan for distributing Strategic Petroleum Reserve petroleum, in the event that the Reserve is drawn down to respond to a severe energy supply interruption or to meet obligations of the United States under the Agreement on an International Energy Program, is provided in the "Strategic Petroleum Reserve Drawdown (Distribution) Plan", Amendment Number 4, of December 1, 1982. The Strategic Petroleum Reserve Distribution Plan provides that, pursuant to the President's decision to use the Strategic Petroleum Reserve, the principal method of distributing Strategic Petroleum Reserve oil will be by price competitive sale with the oil being sold and delivered to those offering the highest prices. The sale will be open to the largest possible universe of eligible buyers to ensure efficient distribution of Strategic Petroleum Reserve oil. The plan also provides that in any calendar month, the Secretary of Energy may direct the distribution of up to 10 percent of the volume of oil sold in that calendar month in a manner which the Secretary chooses. The price for such oil will be the average price of Strategic Petroleum Reserve oil sold at the contemporaneous competitive sale, or at the most recent competitive sale if no contemporaneous competitive sale is held.

### **COMPETITIVE SALES PROCEDURES**

Appendix A to the Department of Energy's final rule (10 CFR Part 625) governing price competitive sales of petroleum from the Strategic Petroleum Reserve provides for Standard Sales Provisions (SSPs) containing or

describing contract clauses, terms and conditions of sale, and performance and financial responsibility measures, which may be applicable to a particular sale of Strategic Petroleum Reserve oil. The latest revision of these provisions was published in the Federal Register on June 3, 1988.

Under the SSPs, the Strategic Petroleum Reserve sales process starts with the issuance of a Notice of Sale which would specify the amount, characteristics and location of the petroleum being sold, the delivery dates and the procedures for submitting offers, as well as providing other information pertinent to a particular sale. In addition, the Notice of Sale would specify what sales provisions and performance and financial responsibility measures were applicable.

Over the course of a Strategic Petroleum Reserve drawdown, a number of Notices of Sale may be issued, each covering a sales period of one to two months. Initially, Notices of Sale issued during a Strategic Petroleum Reserve drawdown could allow an extremely short lead time for offers and deliveries. Under the SSPs, it is contemplated that offerors might be given as little as 7 days from the issuance of the Notice of Sale until offers were due, and 30 days or less from the time of such issuance until the purchasers must take delivery of the oil, with a less compressed schedule becoming more feasible after the initial stages of drawdown. Because of the possible short lead time, the SSPs provide for the establishment of a list of prospective offerors, to whom the Department of Energy would furnish copies of all Notices of Sale.

The next step in the sales process is the preparation by prospective purchasers of their offers, which must be submitted before a time specified in the Notice of Sale. The SSPs require that the offerors unconditionally accept all terms and conditions made applicable to that sale by the Notice of Sale.

include an offer guarantee of up to \$10 million, and bid at least any minimum price that might be specified in the Notice of Sale.

Following the receipt of offers, the Department of Energy would evaluate the bids to select the "apparently successful" offerors. The evaluation process is structured so that the offerors bidding the highest prices can select the method by which the Strategic Petroleum Reserve petroleum is to be transported, up to the limits of the Strategic Petroleum Reserve distribution systems, with specific delivery schedules to be established later.

Under the SSPs, all apparently successful offerors are required, within as little as 5 days after being notified, to provide a letter of credit or a cash deposit in an amount equal to 100 percent of the contract value as a guarantee of performance and payment of amounts due under the contract.

Upon timely receipt of the financial guarantees, and upon a final determination by the Contracting Officer that the offers are responsive and that the offerors are responsible, the Department of Energy will issue the Notices of Award and commence deliveries of SPR oil when the purchasers have arranged their pipeline or marine vessel means of transportation. Such deliveries

could commence as soon as the 16th day after the commencement of the sales process, to the extent that the purchasers are able to provide their financial guarantees and arrange transportation expeditiously.

### DRAWDOWN AND DISTRIBUTION CAPABILITIES

Based on the Strategic Petroleum Reserve's December 31, 1989 crude oil inventory of 579.9 million barrels, assessments of the existing Strategic Petroleum Reserve drawdown systems, and distribution terminal throughput capabilities, as well as commercial distribution and refining capabilities, the Strategic Petroleum Reserve's current drawdown and distribution capabilities are as described in Table 8. The capabilities have increased from those shown in the February 1988 Strategic Petroleum Reserve Annual/Quarterly Report due primarily to the increase in crude oil inventory and potential refinery demands, and the availability, subject to final testing, of the new pipeline connection between the West Hackberry storage site and the Texaco 22-inch common carrier pipeline system. The Strategic Petroleum Reserve is currently capable of being initially drawn down and distributed at a maximum sustained rate of 3.5 million barrels per day for a 90-day period.

**TABLE 8**  
**CURRENT CAPABILITIES**  
(Thousands of Barrels Per Day)

	<u>Drawdown</u>	<u>Distribution</u>
Seaway Group	1,100	1,100
Texoma Group	1,350	1,350
Capline Group	<u>1,070</u>	<u>1,050</u>
<b>TOTAL</b>	<b>3,520</b>	<b>3,500</b>

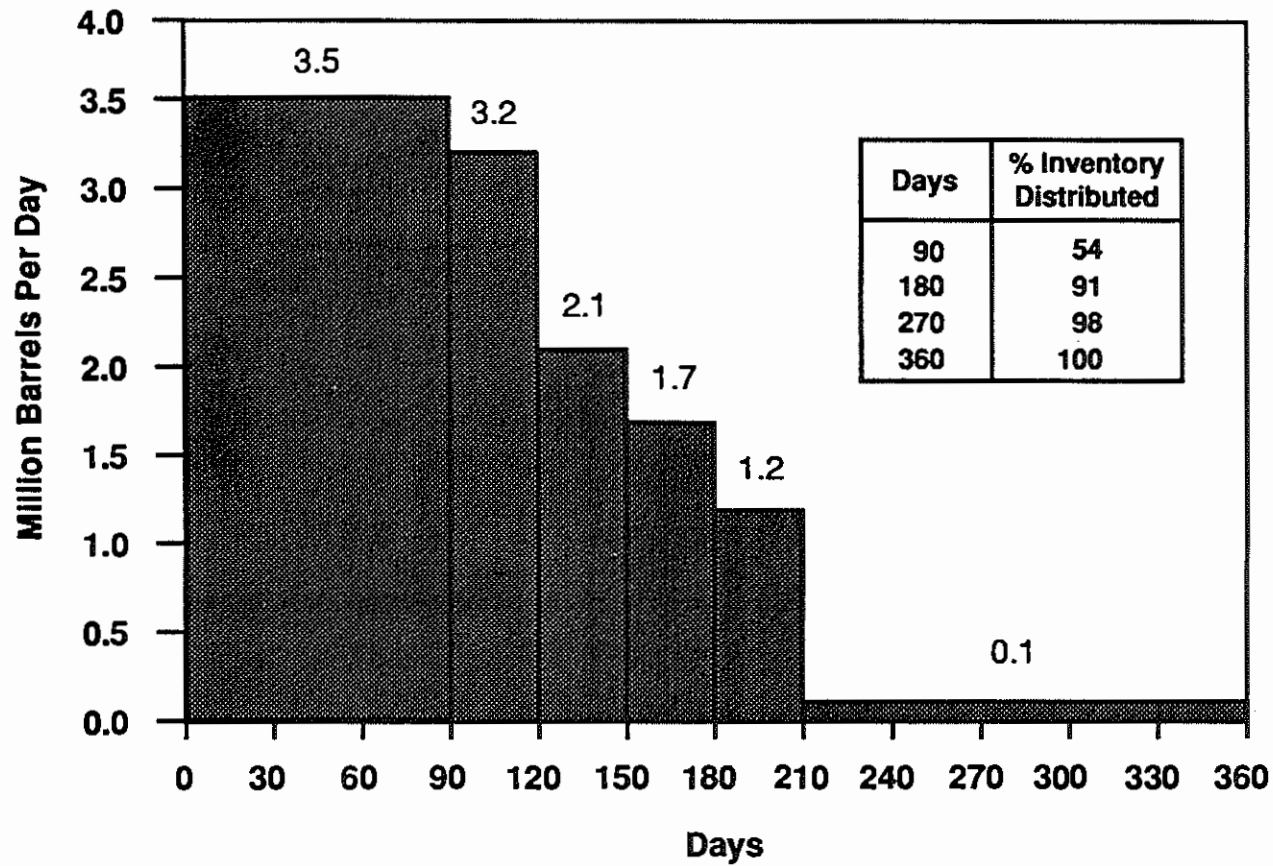


Figure 7

**Strategic Petroleum Reserve Drawdown/Distribution Capability  
Inventory as of 12/31/89**

After 90 days, the Strategic Petroleum Reserve drawdown/distribution rate would decrease gradually as the site inventories deplete and the declining number of remaining caverns containing crude oil become a constraint on the sites' drawdown rates. Figure 7 illustrates the Strategic Petroleum Reserve's current physical drawdown/distribution capability, which provides for a distribution of approximately 54 percent of the Reserve in 90 days, 91 percent of the Reserve in 180 days, and 100 percent of the Reserve in 360 days.

The Strategic Petroleum Reserve currently has a Distribution Enhancement Program underway to improve the Strategic Petroleum Reserve's distribution systems in order to achieve a higher drawdown/distribution capability. Details of the Distribution Enhancement Program are described later in this Chapter.

### **DRAWDOWN AND DISTRIBUTION TESTS**

During 1989, under the Strategic Petroleum Reserve's program for assuring readiness to meet a requirement to draw down and distribute crude oil, the Reserve performed two tests of its physical drawdown capabilities and a training exercise involving the procedures associated with conducting a drawdown and sale of oil.

On May 9, 123,000 barrels were drawn down from the Bayou Choctaw storage site and delivered to the St. James Terminal, demonstrating the site drawdown system's ability to achieve its design rate of 480,000 barrels per day.

On October 24, 663,170 barrels were drawn down from the West Hackberry storage site to the Sun Terminal, achieving a maximum rate of 1.44 million barrels per day which exceeded the system's performance criteria of 1.25 million barrels per day.

During the period from October 30 through December 8, a drawdown training exercise, SPRITE V, was conducted. This

exercise consisted of a simulated competitive sale of Strategic Petroleum Reserve crude oil and involved the Reserve's field organization performing the management, sales and financial functions associated with the drawdown and distribution of Strategic Petroleum Reserve oil. SPRITE V, designed to train and improve the readiness of the Strategic Petroleum Reserve personnel, as well as to test related automated data support systems and drawdown and sales procedures, provided additional assurance that the Reserve can respond effectively to a drawdown requirement.

### **DISTRIBUTION ENHANCEMENTS**

In late 1984, the Strategic Petroleum Reserve initiated a Distribution Enhancement Program to assure that Strategic Petroleum Reserve distribution capability will adequately support drawdown performance. This program was prompted by a major decline in foreign crude oil demands by the Mid-West refiners, resulting in the conversion to natural gas transmission of two major interstate pipelines to which the Strategic Petroleum Reserve was connected (Seaway and Texoma). The Distribution Enhancement Program objective is to increase distribution capability from the 1986 level of 2.3 million barrels per day to the planned 4.5 million barrels per day for the 750 million barrel Reserve.

#### **Seaway Group**

The Seaway distribution system was originally designed to access the U.S. refiners via the Seaway Interstate Pipeline and the Freeport marine facilities. After the Seaway Pipeline was converted to natural gas transmission in 1984, DOE proposed the construction of a new distribution pipeline from the Bryan Mound storage site to ARCO terminal in Texas City, Texas, capable of distributing one million barrels per day to the Houston/Texas City refining centers. In 1987 DOE completed construction of distribution

pipelines as well as modifications to two commercial marine facilities for waterborne distribution. In 1988, DOE initiated a further enhancement project to increase the Seaway drawdown/distribution rate from 1.1 million to 1.25 million barrels per day to reduce requirements and costs for commercial marine distribution services in the Texoma Group. Increasing the Seaway drawdown/distribution rate involves increasing only the Bryan Mound site drawdown capability.

During 1989, the Department completed design of the Bryan Mound drawdown enhancement project, and construction of a second pipeline from the raw water intake structure to the site's central pumping facilities. The Department has received construction proposals for modifications to on-site pumping and piping systems including incorporation of the site's oil tankage into the drawdown system. Contract award is expected in early 1990 and planned for completion by June 1990. This project will increase the site's sustainable capability from 1.1 to 1.25 million barrels per day.

### Texoma Group

The Texoma distribution system was originally designed to access U.S. refiners via the Texoma Interstate Pipeline and the Sun Marine Terminal in Nederland, Texas. After the Texoma Pipeline was converted to natural gas transmission in 1984, DOE proposed enhancements to the Texoma Group distribution system to include construction of a new distribution pipeline from the West Hackberry storage site to the Lake Charles junction of Texaco's 22-inch common carrier pipeline system, and acquisition of marine distribution services at commercial terminals in the Lake Charles and Beaumont/Port Arthur areas.

The Department completed construction of a 12-mile crude oil distribution pipeline from the West Hackberry oil storage site to

the Lake Charles junction of Texaco's 22-inch common carrier pipeline system in June 1989, and construction of a custody metering station at the Texaco pipeline junction was completed in November 1989. Oil fill and flow testing of the meter station is expected to be completed in early 1990. This pipeline provides the Strategic Petroleum Reserve with distribution capabilities to refineries in the Lake Charles, Louisiana and Port Arthur, Texas areas.

In May 1989, the Department issued a competitive solicitation for up to 600,000 barrels per day of additional marine distribution services at commercial terminals in the Beaumont/Port Arthur/Lake Charles areas. The Department is in the process of negotiations in an attempt to achieve an acceptable terminal services contract.

### Capline Group

Distribution enhancements previously planned for the Capline Group distribution system included the construction of a direct pipeline connection from the Department of Energy St. James Terminal to the adjacent Capline Pipeline Terminal, and the acquisition of additional marine distribution services at commercial terminals in the St. James, Louisiana area. The Department completed construction of the pipeline connection between the Department's St. James Terminal and the Capline Pipeline Terminal in 1988.

During 1989, the Department completed a reassessment of the Capline distribution capabilities. Capline distribution demands have increased significantly during 1989 due to the decline in Canadian imports and increasing non-Canadian imports via the Capline Pipeline to the mid-west refiners. Currently, the SPR projects that the Capline Group pipeline and marine distribution capabilities will exceed the Capline system drawdown rate.

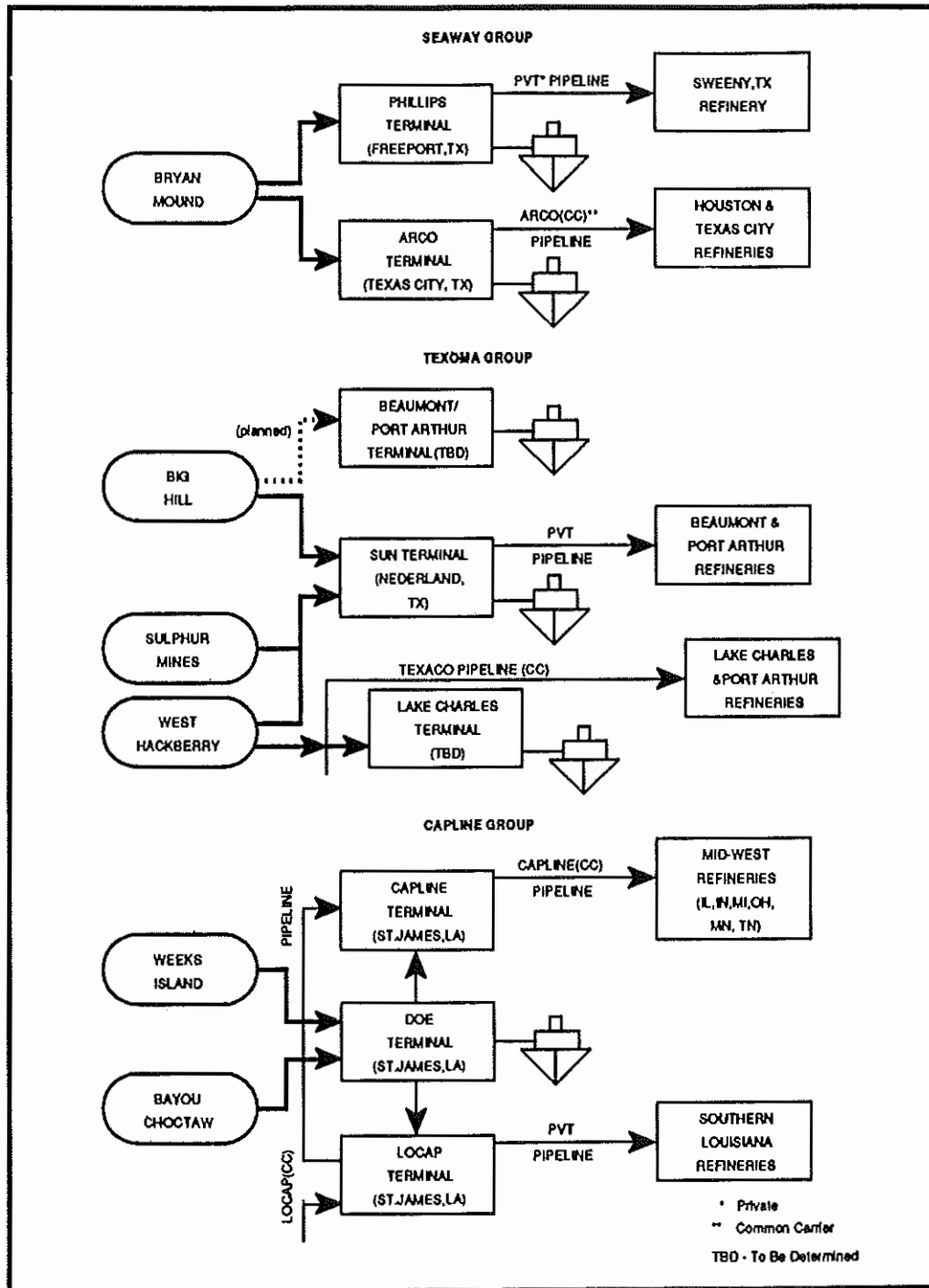


Figure 8

## Current and Planned Strategic Petroleum Reserve Distribution System for the Seaway, Texoma, and Capline Groups

## **VULNERABILITY IMPACT**

Overall, United States dependency on crude oil imports increased from 38.5% to 43.3% in 1989. U.S. domestic production declined by 493,000 barrels per day as U.S. crude imports (excluding SPR receipts) increased by 697,000 barrels per day (or 15%).

U.S. imports of crude and petroleum products totaled approximately 7,979,000 barrels per day of which over 51.67% was from OPEC sources. Saudi Arabia was the largest single source of imports (1,224 MBD); Canada was second (910 MBD); and Venezuela was third (867 MBD).

The Strategic Petroleum Reserve inventory at the end of 1989, which was 579.9 million barrels, provides an equivalent net import protection level of 81 days at the 1989 net import rate for crude and petroleum products. This is a decline of 5 days from the 1988 days of net import protection level as shown in Figure 9. The continued decline in days of net import protection is principally due to the growing U.S. dependency on imports.

Private sector stock levels at the end of 1989 totaled 335 million barrels in crude oil and 757 million barrels in refined products. According to the 1989 National Petroleum Council Study on U.S. Petroleum Storage and Transportation, U.S. industry "minimum

operating levels" are approximately 300 million barrels in crude and 492 million barrels in products. Minimum operating inventories are defined as the inventory levels below which operating problems and shortages would begin to appear in a defined distribution system. Much of the "minimum operating inventory" is classified as unavailable inventory, i.e. pipeline fill, refinery equipment fill, tank bottoms and inventory in transit to and from domestic sources by truck, tankcar, barge and tanker. Therefore, the private sector stocks over minimum operating inventories were approximately 35 million barrels in crude and 265 million in product, or roughly 42 days of supply based on the 1989 net import rate for crude oil and petroleum products.

The United States continued to lead the Organization for Economic Cooperation and Development nations in public and privately held stocks with 579.9 million barrels of oil stored in the Strategic Petroleum Reserve and 1,092 million barrels in private inventories at the end of 1989. Japan has the second largest supply, followed by West Germany and Sweden. Only the United States, West Germany, Sweden and Japan have large government owned strategic petroleum reserves. Other nations require individual companies to hold stocks of crude oil or product equal to a specific number of days of consumption.

# DAYS OF NET IMPORT PROTECTION

$$\frac{\text{SPR INVENTORY (YEAR END)}}{\text{NET PETROLEUM IMPORTS (YEAR AVG.)}}$$

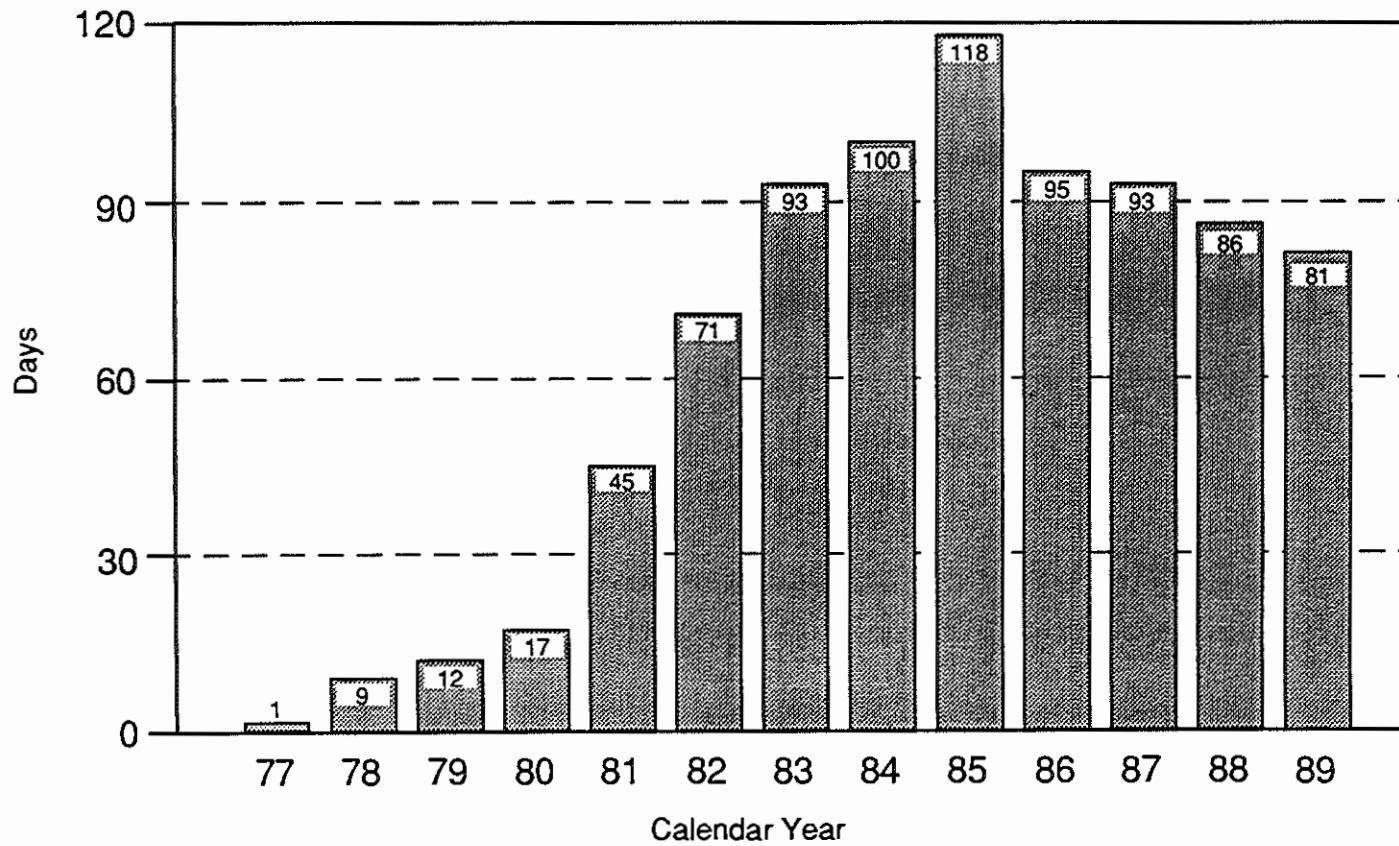


Figure 9





## **APPENDICES**

### **STRATEGIC PETROLEUM RESERVE SITE STATUS**

- A. Bayou Choctaw
- B. Weeks Island
- C. Bryan Mound
- D. Sulphur Mines
- E. West Hackberry
- F. Big Hill
- G. St. James Terminal
- H. Strategic Petroleum Reserve Crude Oil Specifications



## **A. BAYOU CHOCTAW**

### **LOCATION**

Iberville Parish, Louisiana (12 miles southwest of Baton Rouge, Louisiana)

### **ACQUISITION**

Acquired 355.95 acres fee simple, by condemnation April 1977, from numerous private owners. Union Texas Petroleum (a subsidiary of Allied Corporation) was the previous operator.

In 1985, the Department of Energy acquired an additional existing cavern through a cavern exchange agreement with Union Texas Petroleum. The transaction involved a 3.5 acre exchange with no net change in Government-owned acreage.

### **ENVIRONMENTAL/PERMITS**

Environmental Impact Statement published December 1976; supplement published May 1977.

Four major Federal and state permits related to pipeline, well pad, storage, and storm water runoff acquired in 1978, and updated in 1980 and 1981.

### **SITE DESCRIPTION**

A 72-million-barrel storage facility consisting of 62 million barrels in five existing caverns, plus 10 million barrels of storage capacity in a new Strategic Petroleum Reserve-developed cavern.

Oil, brine, and raw water piping distribution system connecting caverns with

central plant, a water intake structure, 12 brine disposal wells located 2.5 miles offsite, and a pipeline for supplying brine to Union Texas Petroleum, Inc. Oil and water distribution system consists of over 50,000 feet of piping and 18 pumps totaling over 20,000 horsepower. A 100,000 barrel brine pit and an oil/brine separator are also onsite.

Numerous permanent specialized buildings include: Control Center, Security Operations Center, Maintenance Shop and Laboratory, Electrical Switch Gear (5KV), Spare Parts Warehouse, Foam Storage, Instrument Shop, Documentation Storage and a Guard House.

### **SYSTEM PARAMETERS**

Oil fill via 36-inch-diameter, 37.2-mile pipeline from St. James Terminal. Sustained system rate - 110,000 bbl/d (brine disposal-constrained).

Raw water design pumping rate - 495,000 bbl/d.

Brine disposal design pumping rate - 110,000 bbl/d.

### **DRAWDOWN**

Drawdown via 36-inch-diameter, 37.2-mile pipeline to St. James Terminal and to Capline pipeline.

Design drawdown capability upon completion - 480,000 bbl/d.

### **MAJOR ACCOMPLISHMENTS**

Approximately 56 million barrels of oil are in storage.



## **B. WEEKS ISLAND**

### **LOCATION**

Iberia Parish, Louisiana (95 miles southwest of New Orleans).

### **ACQUISITION**

Acquired 382.92 acres fee simple subsurface and 6.63 acres fee simple surface, by condemnation September 1977, from Morton Salt Company.

### **ENVIRONMENTAL/PERMITS**

Environmental Impact Statement published January 1977; supplement published August 1977.

Major Federal permit related to oil pipeline to St. James Terminal acquired in 1978. Three major Federal and state permits related to oil storage, air emissions and storm water, and treated sewage effluent discharge acquired in 1979; EPA National Pollutant Discharge Elimination System permit updated in 1982.

### **SITE DESCRIPTION**

Conventional room and pillar salt mine containing 72 million barrels of storage capacity in two levels. Dedicated to sour crude oil storage.

Oil piping distribution system consists of 11 (10 operational and one reserve) submersible electric pumps in the mine to boost crude to the surface and twin main-line pumps (plus one reserve) to deliver crude to the St. James, Louisiana Terminal during drawdown. Pumps total 17,000 horsepower. Firewater system has a 500,000 gallon tank

with pumps, and mine inert gas and vapor recovery systems provide for safety.

Numerous permanent specialized buildings include: Administration and maintenance, Control Center, Security Operations Center, Spare Parts Warehouse, Electrical Substation, Laboratory and Sample, Inert Gas Generator, Foam Storage, Fire Water Pump House, Mainline Pump House, Headframe Production Shaft, Production Shaft Hoist, Headframe-Service Shaft, Service Shaft Hoist, Service Shaft Motor Control Center and a Guard House.

### **SYSTEM PARAMETERS**

Oil fill via 36-inch-diameter, 67.2 mile pipeline from St. James Terminal. Sustained system rate - 350,000 bbl/d (terminal throughput limited).

### **DRAWDOWN**

Drawdown via 36-inch-diameter 67.2-mile pipeline to St. James Terminal and to Capline pipeline.

Design drawdown capability - 590,000 bbl/d.

### **MAJOR ACCOMPLISHMENTS**

Approximately 72 million barrels of crude oil are in storage.

The Department contracted for construction of an air drying system to reduce water vapor condensation within the manways and shafts to provide for early detection of incipient water leaks should any develop.

Design was initiated on an alternate (redundant) drawdown system utilizing high capacity pumps to be installed in the oil-fill holes.



## **C. BRYAN MOUND**

### **LOCATION**

Brazoria County, Texas (three miles southwest of Freeport, Texas).

### **ACQUISITION**

Acquired 499.47 acres fee simple, by condemnation April 1977, from Freeport Mineral Company and other owners. Dow Chemical Company was the previous operator.

In 1986, Department of Energy acquired the pre-existing Brazoria County Road 242 within the site boundary through a relocation agreement with the county.

### **ENVIRONMENTAL/PERMITS**

Environmental Impact Statement published January 1977; supplement published December 1977. Phase III supplement published October 1981.

Five major Federal and state permits related to pipelines, water intake, and storage acquired in 1977 and 1978. National Pollution Discharge Elimination System updated 1981; renewed 1984. Seaway Environmental Impact Statement published June 1978. Supplement published October 1981.

Two major Federal permits related to brine disposal pipeline issued in 1978. Permit for brine discharge increased to 1.1 million bbl/d August 1981.

### **SITE DESCRIPTION**

226-million-barrel storage facility consisting of 66 million barrels of capacity in four caverns existing upon site acquisition, plus 160 million barrels of storage capacity in 16 Strategic Petroleum Reserve-developed caverns.

36-inch-diameter, 14.6-mile brine disposal pipeline extending 13 miles offshore in the Gulf of Mexico.

Oil, brine and raw water piping distribution system connecting caverns with central plant and water intake structure located on Brazos River and connected by a 36-inch pipeline. Oil/brine/water distribution system consists of over 101,000 feet of piping and 33 pumps totaling over 38,000 horsepower. Four 200,000-barrel oil storage tanks, two brine pits (15,000 and 150,000) and an oil-brine separator.

Numerous permanent specialized buildups include: Control Center, Security Operations Center, Maintenance, Spare Parts Warehouse, Foam Generator, Foam Storage (3), Electrical Switch Gear and a Guard House.

### **SYSTEM PARAMETERS**

Fill via 30-inch-diameter, 3.6-mile pipeline from Phillips 66 Freeport Marine Terminal. Design oil fill rate - 240,000 bbl/d. Sustained system rate - 180,000 bbl/d.

Raw water design pumping rate - 1,140,000 bbl/d.

Brine disposal design pumping rate - 980,000 bbl/d (permit limitation 1,100,000 bbl/d).

### **DRAWDOWN**

Drawdown via 30-inch diameter, 3.6 mile pipeline, to Phillips 66 Freeport Marine Terminal.

Drawdown via 40-inch diameter, 46-mile pipeline to ARCO Pipeline Company's Texas City Pipeline Terminal and Docks.

Design drawdown capability - 1,100,000 bbl/d.



## **MAJOR ACCOMPLISHMENTS**

Approximately 221 million barrels of crude oil in storage.

Completed construction of a second raw water pipeline, and initiated on-site piping and pumping improvements in conjunction with a major distribution enhancement project to increase drawdown capability to 1,250,000 bbl/day by mid 1990.

## **D. SULPHUR MINES**

### **LOCATION**

Calcasieu Parish, Louisiana (two miles south west of Sulphur, Louisiana, and 20 miles north of West Hackberry salt dome).

### **ACQUISITION**

Acquired 109.63 acres fee simple and 64.52 acres conditional fee, by condemnation February 1979, from Union Texas Petroleum Company.

### **ENVIRONMENTAL/PERMITS**

Environmental Impact Statement published March 1978.

Three major Federal and State permits for pipeline construction, oil storage, and air emissions acquired in 1978. Environmental Protection Agency discharge permits for storm water and sewage acquired in 1980.

### **SITE DESCRIPTION**

26-million-barrel storage facility consisting of three existing caverns.

Oil, brine, and raw water piping distribution system connecting caverns with central plant, water intake structure located 1.8 miles offsite on Sabine River Diversion Canal No. 5, connected by 12 and 16-inch pipelines, 4 brine disposal wells, and 2 100,000 barrels brine ponds. Consists of over 77,000 feet of piping and 18 pumps totaling over 8,000 horsepower.

Permanent specialized buildings include: Control & Maintenance Center, Security Operations Center and Foam Storage.

## **SYSTEM PARAMETERS**

Oil fill via 16-inch-diameter, 15.9-mile spur pipeline connecting to Department of Energy West Hackberry pipeline at Intracoastal Waterway. Sustained system rate - 80,000 bbl/d (brine disposal-constrained).

Raw water design pumping rate - 100,000 bbl/d.

Brine disposal design pumping rate - 80,000 bbl/d.

## **DRAWDOWN**

Drawdown via 16-inch-diameter, 15.9 mile spur pipeline to Intracoastal Waterway, which connects to the 42-inch-diameter West Hackberry line to Sun Terminal, Nederland, Texas.

Design drawdown capability - 100,000 bbl/d.

## **MAJOR ACCOMPLISHMENTS**

Twenty-six million barrels of oil are in storage.

The Department's Environmental Assessment and Finding of No Significant Impact for the decommissioning of the facility in 1992 was approved by the Secretary of Energy.

Completed connection to City of Sulphur potable water distribution system.

Received several letters of interest from industry in response to a solicitation requesting expressions of interest in the facility, which precipitated a decision to issue a Request for Proposals to purchase the facility in 1990.



## **E. WEST HACKBERRY**

### **LOCATION**

Cameron Parish, Louisiana (22) miles southwest of Lake Charles, Louisiana).

### **ACQUISITION**

Acquired 405.36 acres fee simple, by condemnation April 1977, from numerous private landowners. Olin Corporation was the previous site operator.

Acquired 160.0 additional acres fee simple by condemnation in two actions, July 1979 and March 1980.

### **ENVIRONMENTAL/PERMITS**

Environmental Impact Statement published January 1977; supplement published April 1977. Phase III supplement published October 1981.

Six major Federal and state permits related to pipelines, drilling pads, water intake, and storage acquired in 1977 and 1978; National Pollutant Discharge Elimination System permit renewed 1984.

Texoma Environmental Impact Statement published November 1978; supplement published in October 1981.

Two major Federal permits related to a brine pipeline acquired in 1980.

### **SITE DESCRIPTION**

219-million-barrel storage facility consisting of 49 million barrels in five caverns existing upon site acquisition, plus 170 million barrels of storage capacity in 17 Strategic Petroleum Reserve-developed caverns.

Oil, brine, and raw water piping distribution system connecting caverns with central plant, water intake structure located on Intracoastal waterway connected by a 42-inch diameter, 4.5 mile pipeline, and 10 brine disposal wells. Consists of over

160,000 feet of piping and 45 pumps totaling over 62,000 horsepower. 36-inch-diameter, 27-mile brine disposal pipeline extending nine miles offshore in the Gulf of Mexico, a 175,000-barrel brine pit and an oil-brine separator.

Numerous permanent specialized buildings include: Control Center, Security Operations Center, Maintenance, Spare Parts Warehouse, Covered Lay-Down, Film Storage, Foam Storage and a Guard House.

### **SYSTEM PARAMETERS**

Fill via 42-inch diameter, 42.8-mile pipeline from Sun Terminal, Nederland, Texas. Design oil fill rate - 225,000 bbl/d. Sustained system rate - 175,000 bbl/d.

Raw water design pumping rate - 1,450,000 bbl/d.

Brine disposal design pumping rate - 900,000 bbl/d (permit limitation 1,088,000 bbl/d) via 36-inch pipeline to the Gulf of Mexico.

### **DRAWDOWN**

Drawdown via 42-inch-diameter, 42.8-mile pipeline to Sun Terminal, Nederland, Texas.

Design drawdown capability - 1,400,000 bbl/d.

### **MAJOR ACCOMPLISHMENTS**

Approximately 206 million barrels of crude oil are in storage.

Completed construction of a 12-mile, 36 inch oil pipeline connecting to the Texas 22-inch common carrier pipeline near Lake Charles, Louisiana, and to refineries in Lake Charles, to enhance Strategic Petroleum Reserve distribution capability.

Completed construction and initiated testing and certification of the oil custody metering station at the Texaco 22-inch pipeline junction.



## **F. BIG HILL**

### **LOCATION**

Jefferson County, Texas (20 miles southwest of Beaumont, Texas).

### **ACQUISITION**

Acquired 271 acres fee simple, by condemnation November 1982 and July 1983, from three landowners, i.e., 238.48 acres from Amoco, 27.06 acres from the Pipkin estate, and 5.46 acres from the Patrick Henry Phelan estate.

### **ENVIRONMENTAL/PERMITS**

Environmental Impact Statement published October 1981.

State permits for drilling, underground hydrocarbon storage, pipeline operations, air quality, water appropriation, and water quality certifications were acquired in 1983. The EPA National Pollutant Discharge Elimination System permit was acquired in 1984.

### **SITE DESCRIPTION**

160-million-barrel storage facility consisting of fourteen Strategic Petroleum Reserve-developed 11.5 million barrel storage caverns.

Oil, brine, and raw water systems connecting caverns with central plant, water

intake structure located on the Intracoastal Waterway connected by a 48-inch diameter, and brine disposal pipeline extending 3 miles offshore in the Gulf of Mexico.

Numerous permanent specialized buildings include: Control Center, Administration, Security Operations Center, Communications, Guard House, Covered Lay-Down, Fire House, Sample Storage and a Maintenance.

### **SYSTEM PARAMETERS**

Fill via 36-inch-diameter, 25 mile pipeline from Sun Terminal, Nederland, Texas. Sustained system rate 280,000 bbl/d.

Raw water design pumping rate - 1,400,000 bbl/d.

Brine disposal design pumping rate - 1,400,000 bbl/d (permit limitation of 1,700,000 bbl/d).

### **DRAWDOWN**

Drawdown via 36-inch-diameter, 25 mile pipeline to Sun Terminal, Nederland, Texas.

Design Drawdown capability - 930,000 bbl/d.

### **MAJOR ACCOMPLISHMENTS**

Achieved 62 percent (112 million barrels) completion of planned capacity development.



## **G. ST. JAMES TERMINAL**

### **LOCATION**

St. James Parish, Louisiana (45 miles southeast of Baton Rouge, Louisiana, on the Mississippi River).

### **ACQUISITION**

Acquired 104.76 acres of fee simple for terminal by condemnation in May 1978.

Acquired 47.68 acres fee simple for docks by condemnation in July 1978.

### **ENVIRONMENTAL/PERMITS**

St. James' Terminal Environmental Impact Statement is a component of the Bayou Choctaw supplement, published May 1977, and the Weeks Island supplement, published August 1977.

Two major Federal and state permits related to dock construction were acquired in 1978. Environmental Protection Agency discharge permit for storm water and sewage acquired in 1980. Dock Construction Permit modified 1982.

### **SITE DESCRIPTION**

Terminal facilities include six storage tanks totaling two million barrels of capacity, tie-ins to Bayou Choctaw and Weeks Island sites, and to LOCAP and Capline pipeline terminals.

Oil distribution piping system connecting docks, tanks, and pump station consists of

over 35,000 feet of piping and five pumps totaling over 7,500 horsepower, metering systems, and maintenance and control buildings.

Two docks with one berth each, able to accommodate vessels of up to 123,000 long tons maximum loaded displacement. A 42-inch-diameter pipeline connects the docks to the storage tanks.

### **SYSTEM PARAMETERS**

Tanker unloading – design unloading capacity of 40,000 bbl/hr.

Distribution from terminal to:

Bayou Choctaw: design pumping rate – 240,000 bbl/d.

Weeks Island: design pumping rate – 480,000 bbl/d.

Terminal throughput: fill sustained system rate – 350,000 bbl/d;

Across docks – 435,000 bbl/d.

### **DRAWDOWN**

Crude oil from Bayou Choctaw and/or Weeks Island to be distributed across docks and to LOCAP and Capline Pipeline Terminal.

### **MAJOR ACCOMPLISHMENTS**

Completed security improvements at St. James terminal.





**APPENDIX H  
STRATEGIC PETROLEUM RESERVE  
CRUDE OIL SPECIFICATIONS (SPRO 1989 APR) <sup>a</sup>**

Characteristic	Sour <sup>b</sup>	Sweet <sup>c</sup>	Primary ASTM Test Method <sup>d</sup>
API Gravity [ API]	30 – 45	30 – 45	D 1298
Total Sulfur [Wt.%], Max.	1.99	0.50	D 1552
Pour Point [ °F( °C)], Max.	50 (10)	50 (10)	D 97
Salt Content [Lbs./1,000 Bbls.], Max.	50	50	D 3230
Viscosity			
[SUS @ 60°F (cSt @ 15.6°C)],Max.	150 (32)	150 (32)	D 445 & D 2161
[SUS @ 100°F (cSt @ 37.8°C)],Max.	70 (13)	70 (13)	
Reid Vapor Pressure			
[Psia @ 100°F (kPa @ 37.8°C)],Max.	11 (76)	11 (76)	D 323
Total Acid Number [mg KOH/g], Max.	0.40	0.40	D 664
Water and Sediment [Vol. %], Max.	1.0	1.0	D 473 & D 4006 or D 4928
Yields [Vol. %]			D 2892 or D 1160
Naphtha [375oF(<191° C)	24 – 30	21 – 42	
Distillate [375–620° F(191–327° C)]	17 – 31	19 – 45	
Gas Oil [620–1050° F(327–566° C)]	26 – 38	20 – 42	
Residuum [>1050 F(>566° C)]	10 – 19	14 Max.	

<sup>a</sup> Marketable virgin crude petroleum suitable for normal refinery processing and free of foreign contaminants or chemicals including, but no limited to, chlorinated and/or oxygenated hydrocarbons, and lead.

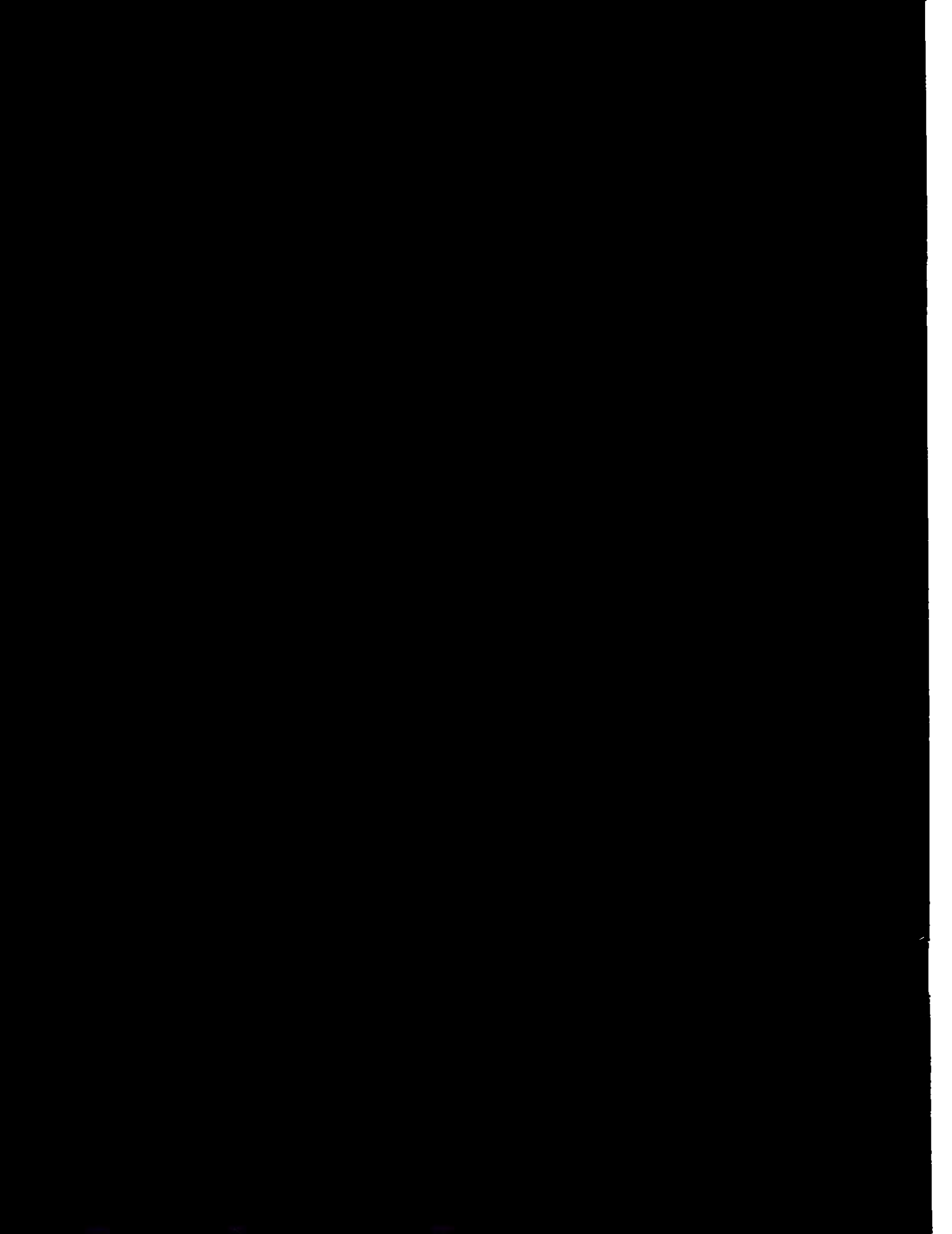
<sup>b</sup> Crude oils that meet these sour specifications include Arabian Berri, Arabian Light, Dubai (Fateh), Flotta, Isthmus, Lagomedio, Oman, Qatar Marine, Tia Juana Light, Upper Zakum, and West Texas Sour.

<sup>c</sup> Crude oil that meet these sweet specifications include Bonny Light, Brass River, Brent, Ekofisk, Escravos, Forties, Kole Marine, Ninian, Saharan Blend, Statfjord, West Texas Intermediate, and Zarzaitine.

NOTE: Crude oils other than those listed above may be acceptable. The acceptability of any crude oil is contingent upon an assay typical of current production quality of the stream.

<sup>d</sup> Alternate methods may be used if approved within the contract. Offerors shall submit requests to use alternate methods to the Contracting Officer for determination of acceptability. In case of disputes between origin and destination testing results, testing performed by the primary test method shall be used as the referee method on the custody transfer sample.





# Strategic Petroleum Reserve

## Annual/Quarterly and Test Sale Report



February 15, 1991

**U.S. Department of Energy**  
Assistant Secretary for Fossil Energy  
Office of Petroleum Reserves

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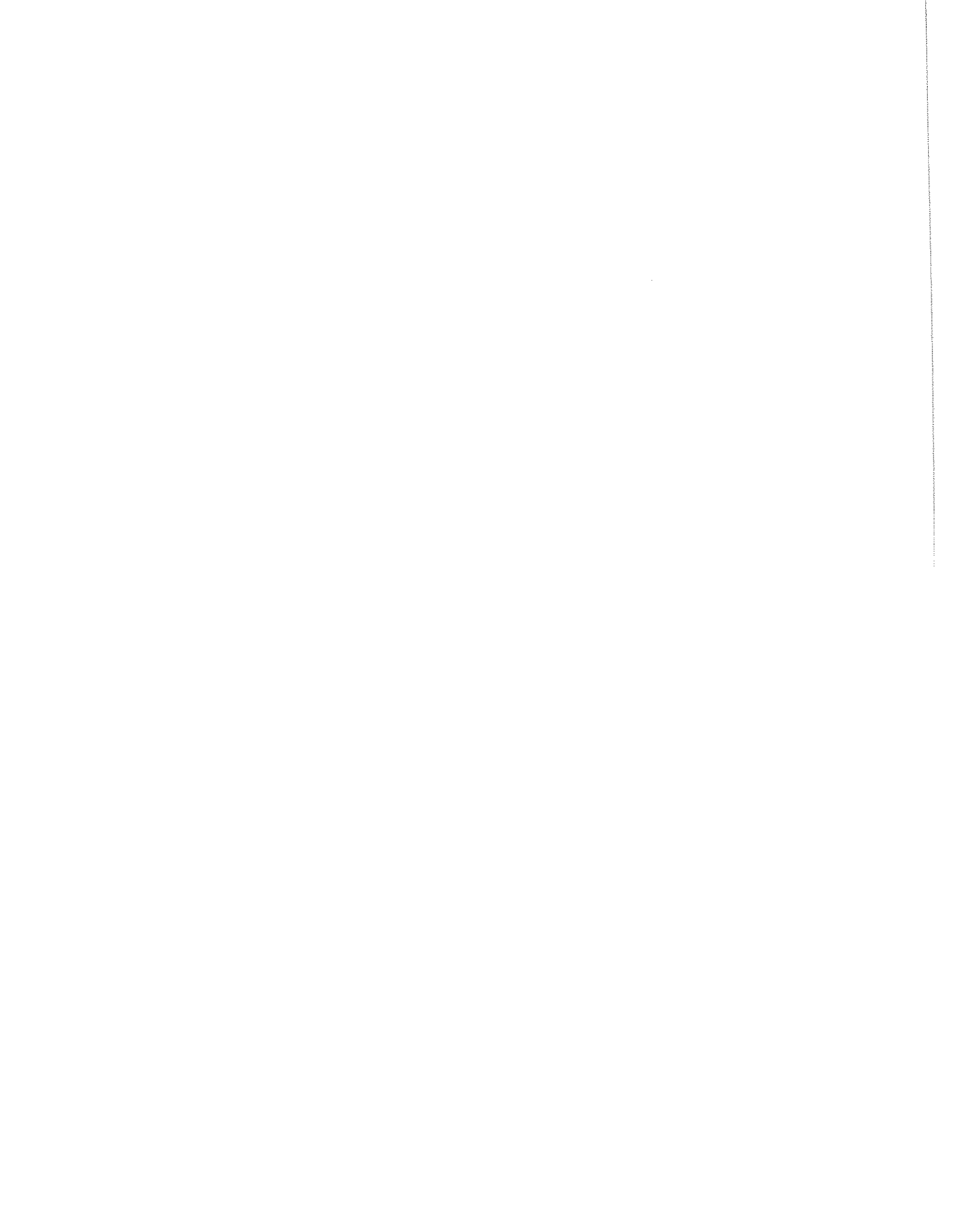
# Strategic Petroleum Reserve

## Annual/Quarterly and Test Sale Report



February 15, 1991

**U.S. Department of Energy**  
Assistant Secretary for Fossil Energy  
Office of Petroleum Reserves  
Washington, DC 20585





# TABLE OF CONTENTS

	Page
EXECUTIVE SUMMARY .....	3
PROGRAM DEFINITION .....	5
REPORT ON THE STRATEGIC PETROLEUM RESERVE 1990 TEST SALE .....	9
SPR REPORTS SUBMITTED TO CONGRESS .....	16
STORAGE FACILITIES DEVELOPMENT .....	17
Facilities Development Status .....	20
Strategic Petroleum Reserve Storage Capacity Development .....	23
OIL ACQUISITION AND TRANSPORTATION .....	25
OTHER PROJECT ACTIVITIES .....	32
Procurement and Contractor Support .....	32
Security .....	32
Environmental Compliance and Permits .....	33
Real Estate .....	34
BUDGET AND FINANCE .....	35
DRAWDOWN AND DISTRIBUTION .....	40
Distribution Plan .....	40
Competitive Sales Procedures .....	40
Drawdown and Distribution Capabilities .....	41
Distribution Enhancements .....	42
APPENDIX: STRATEGIC PETROLEUM RESERVE SITE STATUS	
A. Industry Responses to TEST SALE-90 Questionnaire .....	47
B. Strategic Petroleum Reserve Site Status .....	50
C. Strategic Petroleum Reserve Crude Oil Specifications .....	61

## LIST OF TABLES

	Page
Table 1 - Test Sale-90 Offering .....	10
Table 2 - Test Sale-90 Bids and Prices .....	12
Table 3 - Test Sale-90 Contracts and Deliveries .....	14
Table 4 - Strategic Petroleum Reserve Facility Design and Drawdown Criteria .....	19
Table 5 - Storage Capacity Development by Quarter .....	24
Table 6 - Strategic Petroleum Reserve Oil Inventory and Delivery Statistics .....	26
Table 7 - Strategic Petroleum Reserve Oil Fill History .....	27
Table 8 - Crude Oil Received through 1990 .....	29
Table 9 - Strategic Petroleum Reserve Crude Oil Inventory .....	30
Table 10 - Strategic Petroleum Reserve Appropriations .....	38
Table 11 - Current Drawdown and Distribution Capabilities .....	41

## LIST OF FIGURES

	Page
Figure 1 - Program/Project Management Structure .....	7
Figure 2 - Strategic Petroleum Reserve Complexes and Associated Pipelines and Terminals .....	18
Figure 3 - Annual Strategic Petroleum Reserve Oil Fill .....	28
Figure 4 - Cumulative Strategic Petroleum Reserve Oil Fill .....	28
Figure 5 - Strategic Petroleum Reserve Annual Funding .....	39
Figure 6 - Strategic Petroleum Reserve Cumulative Funding .....	39
Figure 7 - Strategic Petroleum Reserve Drawdown/Distribution Capability .....	43
Figure 8 - Current and Planned Strategic Petroleum Reserve Distribution System for the Seaway, Texoma, and Capline Groups .....	44

## EXECUTIVE SUMMARY

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### NEW LEGISLATION

On September 15, 1990, President Bush signed Public Law 101-383, which extends and amends the Energy Policy and Conservation Act until September 15, 1994. Among the amendments made by the law, the target size of the Strategic Petroleum Reserve is increased to 1 billion barrels, storage of oil not owned by the Federal Government is authorized, and the Reserve may be drawn down to alleviate an interruption in domestic supply. The new law also requires that the Department conduct a Refined Petroleum Product Reserve test during Fiscal Years 1992, 1993 and 1994.

During 1990, Congress appropriated \$200.6 million for Strategic Petroleum Reserve storage facilities development, operation, and management during FY 1991. No further appropriations were made for the SPR Petroleum Account for FY 1991, but an advance appropriation of \$196.2 million was made for FY 1992.

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### OIL ACQUISITION AND FILL RATES

During calendar year 1990, 9.8 million barrels of crude oil were acquired for the Strategic Petroleum Reserve. However, this quantity was offset by the sale of 3.9 million barrels during a test sale of the Reserve's oil in the fourth quarter. As of December 31, 1990, the Strategic Petroleum Reserve crude oil inventory was 585.7 million

barrels, a net increase of 5.8 million barrels over the 1989 year-end inventory of 579.9 million barrels. On August 2, 1990, fill of the Strategic Petroleum Reserve was suspended due to the invasion of Kuwait by Iraq, and the subsequent embargo of oil imports from those countries. Excluding adjustments for the 3.9 million barrels sold in the test sale, the Reserve was filled at a rate of approximately 27,000 barrels per day during calendar year 1990.

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### FACILITIES AND STORAGE DEVELOPMENT

The Department has completed all major surface construction at the six SPR facilities, and cavern development is in progress to achieve 750 million barrels of storage by the end of 1991. During calendar year 1990, the Strategic Petroleum Reserve's crude oil storage capacity increased by 115 million barrels with the completion of 10 caverns at the Big Hill site. The four remaining caverns at Big Hill will be completed in 1991. Also during 1990, the Department completed development of a new 10-million barrel cavern at Bayou Choctaw. This cavern was filled with oil from an existing cavern (Cavern 18) which is undergoing a 6-million barrel expansion.

Planning for decommissioning of the Sulphur Mines storage facility continued. Transfer of oil stored at Sulphur Mines to the Big Hill facility commenced in December 1990.

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### TEST SALE - 90

During 1990, the Department of Energy conducted a test sale of Strategic Petroleum Reserve crude oil (TEST SALE-90) to demonstrate the Reserve's drawdown and distribution capabilities. The test commenced on September 28, 1990, with the issuance of a Notice of Sale. Offers to purchase the oil were received on October 5, 1990 and contracts were awarded to eleven companies for a total of 3.925 million barrels by October 18, 1990. Deliveries of the oil to the purchasers commenced on October 19, 1990, and all deliveries were completed by December 2, 1990.

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### REPORTS SUBMITTED TO CONGRESS

In February 1990, the Department of Energy submitted reports to the Congress on alternative methods of financing Strategic Petroleum Reserve oil acquisition and on the appropriate target size of the Strategic Petroleum Reserve. The financing study was conducted as required by Public Law 101-46, the Strategic Petroleum Reserve Amendments Act of 1989, and the size study was conducted by an interagency group at the direction of President Bush.

## PROGRAM DEFINITION

Section 165 of the Energy Policy and Conservation Act (Public Law 94-163), as amended, requires the Secretary of Energy to submit annual and quarterly reports to the President and the Congress on activities to develop the Strategic Petroleum Reserve. Additional prospective information related to the development and fill of the Strategic Petroleum Reserve is required by the Omnibus Budget Reconciliation Act of 1986 (Public Law 99-509). Also, section 161 (g) (8) of the Energy Policy and Conservation Act requires a report to Congress on any SPR test sale. This report combines the fourth quarter, 1990 Quarterly Report with the 1990 Annual Report and the Test Sale report.

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### PROGRAM/PROJECT MANAGEMENT

The Strategic Petroleum Reserve Office was created under the Energy Policy and Conservation Act for the establishment, management, and maintenance of the Strategic Petroleum Reserve. The Assistant Secretary for Fossil Energy, Robert H. Gentile, has overall programmatic responsibility for achieving the goals and objectives of the Strategic Petroleum Reserve Program. This responsibility has been delegated to the Deputy Assistant Secretary for Petroleum Reserves, Richard D. Furiga and is exercised through offices located in Washington, D.C. Under the Deputy Assistant Secretary, the Director of the Office of Strategic Petroleum Reserve, John W. Bartholomew, establishes plans and performance specifications for the Reserve's development, fill, drawdown, and distribution.

During 1990, Strategic Petroleum Reserve project management and implementation activities were assigned to the Manager, Oak Ridge Operations Office, Joe La Grone, who directed Strategic Petroleum Reserve activities through the Assistant Manager for the Strategic Petroleum Reserve. However, a recent reorganization has transferred the functions of the Oak Ridge Operations Office to the Deputy Assistant Secretary for Petroleum Reserves beginning in 1991. The Project Management Office, located in New Orleans, Louisiana, and headed by Paul J. Plaisance, Jr., carries out day-to-day project activities. Figure 1 shows the 1990 program/project management structure for the Strategic Petroleum Reserve.

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### CHRONOLOGY OF PROGRAM LEGISLATION

The Strategic Petroleum Reserve was authorized by Congress with the enactment on December 22, 1975, of the Energy Policy and Conservation Act, which declared it to be United States policy to establish a Strategic Petroleum Reserve of up to one billion barrels of petroleum products to reduce the impact of an imminent or actual severe energy supply disruption and to carry out the obligations of the United States under the International Energy Program.

The Energy Policy and Conservation Act provisions regarding the Strategic Petroleum Reserve were amended by title VIII of the Energy Security Act (Public Law 96-294),

approved June 30, 1980. This Act established a minimum average daily fill rate of 100,000 barrels and precluded sale of Naval Petroleum Reserve Number 1 (Elk Hills, California) crude oil except to fill the Strategic Petroleum Reserve, unless the Strategic Petroleum Reserve was being filled at the minimum rate or had reached 500 million barrels in inventory.

The Energy Policy and Conservation Amendments Act of 1985 (Public Law 99-58), enacted on July 2, 1985, extended the provisions of title I, part B, of that Act relating to the Strategic Petroleum Reserve until June 30, 1989, and directed the Secretary of Energy to conduct a sale or exchange of 1.1 million barrels of Strategic Petroleum Reserve oil to test the drawdown and distribution capabilities of the Strategic Petroleum Reserve.

The Omnibus Budget Reconciliation Act of 1986 (Public Law 99-509), enacted on October 18, 1986, amended the Energy Policy and Conservation Act to require that the Strategic Petroleum Reserve be filled at a minimum rate of 75,000 barrels a day until at least 750 million barrels are in storage.

Public Law 100-531, signed by the President on October 28, 1988, authorizes protective force personnel who guard the Strategic Petroleum Reserve's storage and related facilities to carry firearms while performing official duties and to make arrests without warrants. The legislation also establishes trespass on Strategic Petroleum Reserve property as a Federal offense.

Public Law 101-46, enacted on June 30, 1989, extended the Strategic Petroleum Reserve authorities contained in the Energy Policy and Conservation Act until April 1, 1990. The bill also required the Secretary to submit a report to Congress by February 1, 1990, on alternative means of financing oil acquisition for the Strategic Petroleum Reserve.

Short term extensions of the Strategic Petroleum Reserve authorities contained in the Energy Policy and Conservation Act were enacted on April 1, 1990 (Public Law 101-262) and August 15, 1990 (Public Law 101-360).

On September 15, 1990, President Bush signed Public Law 101-383, the Energy Policy and Conservation Act Amendments of 1990, which extends the SPR authorities contained in the Energy Policy and Conservation Act until September 30, 1994. Public Law 101-383 also contains provisions which amend SPR drawdown authorities, expand the ultimate size of the Reserve to one billion barrels, authorize 5 million barrel test sales, provide for a 3 year pilot test refined petroleum product reserve and provide authority to contract for SPR petroleum and facilities owned by others.

On November 5, 1990, the President signed the Fiscal Year 1991 appropriations for the Department of Interior and Related Agencies (Public Law 101-512). Public Law 101-512 provides \$200.6 million for the continued development, operations and management of the Strategic Petroleum Reserve and provides an advance appropriation of \$196.2 million for the acquisition and transportation of oil to fill the Reserve in Fiscal Year

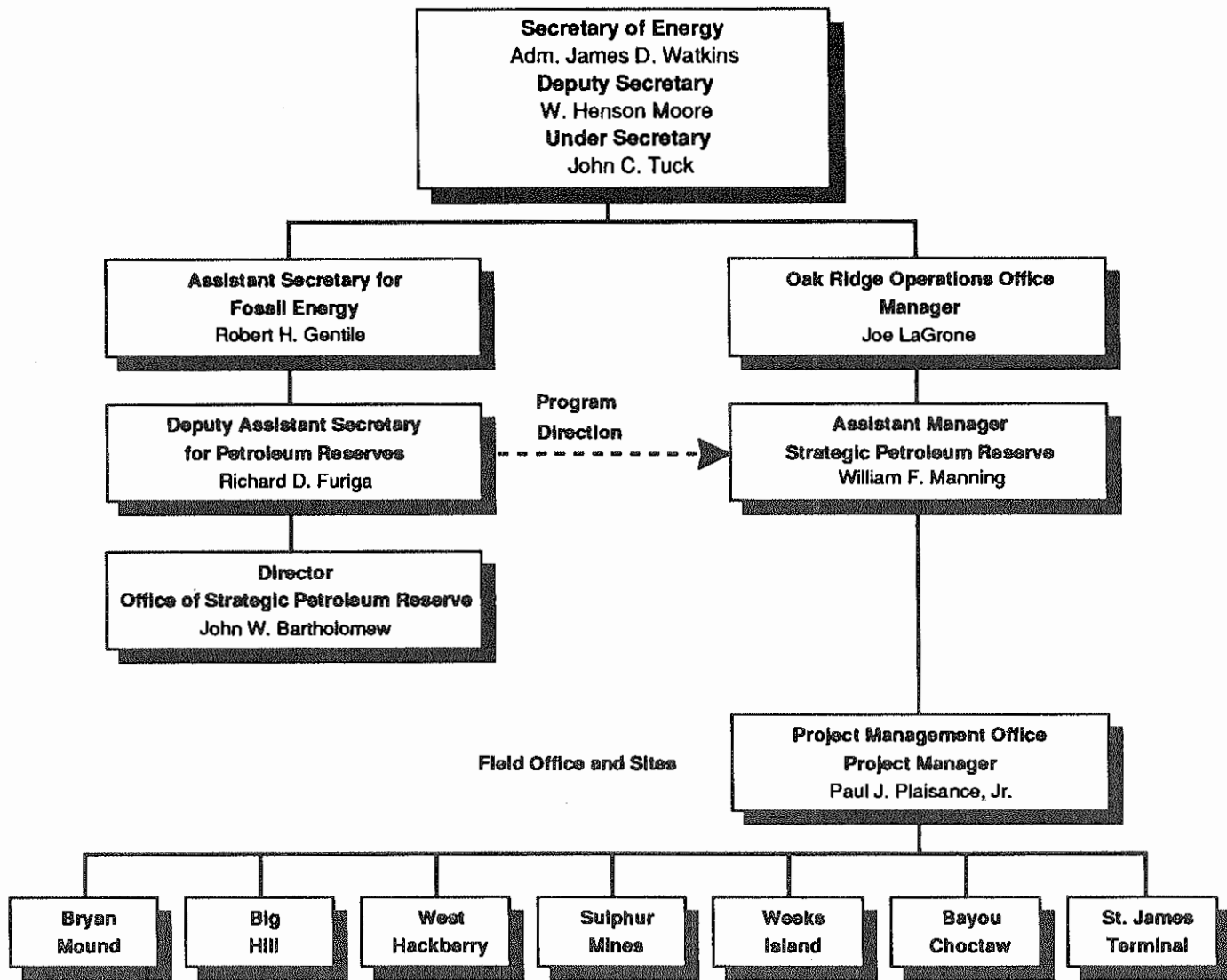


Figure 1  
Program/Project Management Structure

1992. Public Law 101-512 also requires that fiscal year 1991 receipts from use and operation of Naval Petroleum Reserves Numbered 1, 2 and 3 (NPR-1, -2 and -3) in excess of \$638 million be deposited in the SPR Petroleum Account to acquire oil for the Strategic Petroleum Reserve. Under this legislation, no funds from this or any other Act may be used for the "leasing" of crude oil from a foreign government, a foreign State-owned oil company or an agent of either, except by following procedures pursuant to the Energy Policy and Conservation Act, as amended. The outlays in fiscal year 1991 resulting from the use of funds in the SPR Petroleum Account, other than funds deposited as a result of an SPR drawdown, may not exceed \$378 million.

---

#### SPR PLAN AND AMENDMENTS

The Energy Policy and Conservation Act required a Strategic Petroleum Reserve Plan. The Plan, addressing the development and implementation of the Strategic Petroleum Reserve, was submitted to the Congress on February 16, 1977, and became effective on April 18, 1977.

Strategic Petroleum Reserve Plan Amendment No. 1 accelerated the planned schedule for filling the Reserve. This Amendment was submitted to the Congress on May 25, 1977, and became effective on June 20, 1977. The revised goal of 500 million barrels of crude oil to be in storage by December 22, 1980, advanced the original schedule by two years. Amendment No. 2 to the Strategic Petroleum Reserve Plan authorized an

increase in the Strategic Petroleum Reserve size from 500 million barrels to one billion barrels. This amendment was transmitted to the Congress on May 18, 1978, and became effective on June 13, 1978. The Amendment described Department of Energy plans to store 750 million barrels of petroleum in underground storage facilities. Decisions were not made regarding the methods or timing for developing the final 250 million barrels of storage capacity.

On October 31, 1979, the Department of Energy submitted a Distribution Plan for the Strategic Petroleum Reserve (Amendment No. 3, Energy Action No. 5) to the Congress. In accordance with the provisions of the Energy Policy and Conservation Act in existence at that time, this Plan became effective on November 15, 1979. The Distribution Plan described the methods for drawdown and distribution of crude oil from the five existing Strategic Petroleum Reserve storage sites.

On December 1, 1982, President Reagan transmitted a new "Drawdown" (Distribution) Plan (Amendment No. 4) to the Congress for the use of the Strategic Petroleum Reserve. This Plan, required under the Energy Emergency Preparedness Act of 1982, which allowed it to go into effect immediately, provides procedures for the drawdown, sale, and distribution of crude oil from the Strategic Petroleum Reserve.

Public Law 101-383 requires that an amendment to the Plan be submitted to the Congress by September 1992, which would provide for the storage of one billion barrels of oil in the Strategic Petroleum Reserve.



# REPORT ON THE STRATEGIC PETROLEUM RESERVE 1990 TEST SALE

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## INTRODUCTION

As authorized by Section 8 of the Energy Policy and Conservation Act Amendments of 1990 (Public Law 101-383), enacted September 15, 1990, the Department of Energy conducted a test sale of Strategic Petroleum Reserve crude oil (TEST SALE-90) between September 28 and December 2, 1990, to demonstrate the Reserve's drawdown and distribution capabilities. The salient provisions of the Energy Policy and Conservation Act, as amended, which governed the test sale of oil from the Strategic Petroleum Reserve included:

- The total quantity withdrawn from the Reserve was not to exceed 5 million barrels of oil;
- The oil was not to be sold at a price less than 90 percent of its market value; and
- The Secretary of Energy was authorized to cancel the sale if there were insufficient acceptable offers.

In addition to the above provisions for conducting TEST SALE-90, the Secretary is to provide Congress with a detailed explanation of the test. This section constitutes the required report.

---

## TEST SALE-90 ACTIVITIES

On September 27, 1990, the Secretary of Energy, pursuant to a September 26 directive by the President, ordered that a test drawdown and

distribution of approximately 5 million barrels of crude oil from the Strategic Petroleum Reserve be conducted. In response, TEST SALE-90 commenced the following day, September 28, when the Strategic Petroleum Reserve issued a Notice of Sale to 253 identified prospective offerors. Subsequently, prior to the date when offers were due, 28 additional interested firms and individuals requested and were provided the Notice of Sale.

The oil was offered for sale for delivery during November 1990 in a manner which would allow for delivery to purchasers of both Strategic Petroleum Reserve sweet and sour crude oil, utilizing tankers, barges or pipeline modes of transportation, from the three Strategic Petroleum Reserve storage and distribution complexes; i.e., Seaway, Texoma and Capline. Table 1 depicts the six crude oil streams and their quantities offered, as well as the available delivery locations and modes.

The issuance of the Notice of Sale and all subsequent sales procedures were conducted pursuant to the Department's published Standard Sales Provisions and consistent with the Strategic Petroleum Reserve competitive sales process which would be used during an energy emergency. The Department did, however, incorporate two new enhancements into the sales process to test their viability. One enhancement provided a personal computer program disk with the Notice of Sale for optional use by the offerors in preparing and submitting their offers. This method was developed to facilitate offer preparation by reducing the chances

**TABLE 1**  
**TEST SALE-90 OFFERING**

<u>Crude Oil Streams</u>	<u>Quantity<sup>1</sup></u>	<u>Delivery Locations<sup>2</sup></u>	<u>Delivery Modes</u>
Bryan Mound Sweet	600	Phillips or ARCO Terminals	Tanker or Pipeline
Bryan Mound Sour	1,000	Phillips or ARCO Terminals	Tanker or Pipeline
West Hackberry Sweet	1,000	Sun Terminal	Tanker, Barge or Pipeline
West Hackberry Sour	1,000	Sun Terminal or Texas-22 Junction	Tanker, Barge or Pipeline
Bayou Choctaw Sweet	600	St. James, Capline LOCAP Terminals	Tanker or Pipeline
Weeks Island Sour	<u>800</u>	St. James Terminal	Tanker
TOTAL	5,000		

<sup>1</sup> Thousands of barrels.

<sup>2</sup> Phillips Terminal is located in Freeport, Texas; ARCO Terminal in Texas City, Texas; Sun Terminal in Nederland, Texas; Texas-22 junction near Lake Charles, Louisiana, where the Department's pipeline from West Hackberry connects to Texaco Pipeline Inc.'s common carrier system; and the Department's St. James Terminal and the commercial Capline and LOCAP terminals are located in St. James, Louisiana.

for offeror errors and to expedite the use of the data in the Strategic Petroleum Reserve's offer evaluation process. The second enhancement provided for a price adjustment mechanism to assure that the prices paid for Strategic Petroleum Reserve crude oil reflected any changes in the market between the time offered prices were submitted and the time when physical delivery occurred. The key features of this price adjustment mechanism were:

- The Department established and published in the Notice of Sale a base reference price of \$37.03 applicable to all sweet crude streams and a base reference price of \$36.49 applicable to all sour crude streams. The base reference price for the sweet crude streams was an average of commercially published daily spot market price quotes during a 5-day period just prior to the Notice of Sale issuance for West Texas Intermediate, Louisiana Light Sweet and Alaska North Slope crude oils, and the reference price for the sour crude streams was the same 5-day average of spot market price quotes for West Texas Sour, Alaska North Slope and Louisiana Light Sweet crude oils.
- The offerors bid prices based on their assessment of the Reserve's crude oil stream values in conjunction with recognition of the base reference price and the price adjustment mechanism. For the successful purchasers, a price adjustment factor was computed which equated to the bid price less the applicable base reference price.

- Following completion of oil delivery to the successful purchasers, a delivery reference price was computed in the same manner as the base reference price, the 5-day period being the date of delivery and the preceding and subsequent 2 days, to which the price adjustment factor was added, or subtracted, thus yielding the adjusted contract price.

By October 5, 1990, the closing date for receipt of bids, 33 companies submitted 40 separate offers for a total of 10.39 million barrels. As required by the Standard Sales Provisions, these offers were accompanied by financial guarantees equivalent to 5 percent of the maximum potential contract value or \$10 million, whichever was less. Five of the offerors' bids were rejected inasmuch as they were below the minimum acceptable bid price established by the Department to meet the requirement that the oil not be sold at a price less than 90 percent of its market value. Table 2 summarizes the bid quantities and both bid and minimum acceptable prices for the six offered crude oil streams.

Following their receipt by the Strategic Petroleum Reserve, the test sale bids were evaluated, and 11 offerors were determined to be apparently successful and so notified on October 10, two business days after receipt of offers and seven business days after issuance of the Notice of Sale. These offerors were also advised to submit payment and performance guarantees for the full potential contract value (either letters of credit or cash wire deposits into the U.S. Treasury) by October 17 in order to obtain a purchase contract. The guarantees, all

**TABLE 2**  
**TEST SALE-90 BIDS AND PRICES**

<u>Crude Oil Streams</u>	<u>Total Bid<sup>1</sup> Quantities</u>	<u>Minimum Acceptable<sup>2</sup> Bid Price/Bbl.</u>	<u>Range of Bid Prices</u>
Bryan Mound Sweet	2,470	\$32.90	\$34.28 - \$39.06
Bryan Mound Sour	2,365	\$32.18	\$32.46 - \$35.84
West Hackberry Sweet	2,290	\$32.95	\$34.28 - \$38.40
West Hackberry Sour <sup>3</sup>	815	\$32.46 <sup>4</sup>	\$30.29 - \$34.51
Weeks Island Sour <sup>3</sup>	0	\$31.11	N/A
Bayou Choctaw Sweet	<u>2,450</u>	\$32.76 <sup>4</sup>	<u>\$27.85 - \$38.90</u>
<b>TOTAL</b>	10,390		\$27.85 - \$39.06

<sup>1</sup> Thousands of barrels.

<sup>2</sup> The minimum acceptable bid prices were established just prior to receipt of offers and were based on 90 percent of the Department's assessed market value of the crude oil streams for the preceding 2 week period.

<sup>3</sup> The limited commercial interest in purchasing these streams has been attributed partially to the existence of adequate supplies of similar quality crude oil in the U.S. gulf region such as Alaska North Slope crude oil, which is comparable to Weeks Island Sour.

<sup>4</sup> Two bids for West Hackberry Sour and three bids for Bayou Choctaw Sweet were below the minimum acceptable bid prices for those streams.

of which were letters of credit, were received by the deadline, and contracts for 3.925 million barrels were awarded on October 16, 17, and 18, 1990, within thirteen business days after issuance of the Notice of Sale.

Subsequent to the awarding of contracts, delivery schedules were arranged between the purchasers, terminals and the Strategic Petroleum Reserve. The first delivery occurred on October 19<sup>1</sup>, via the Reserve's recently completed connection between the West Hackberry site and the Texas-22 pipeline system, and all deliveries, consisting of 21 pipeline and 5 barge shipments, were completed by December 2. Table 3 summarizes the purchasers, contract quantities, prices and crude oil deliveries.

Following each crude oil delivery to a purchaser, the Strategic Petroleum Reserve transmitted a letter of credit draft and completed invoice to the purchaser's financial institution. This invoice reflected the payment due based on the calculated contract price under the price adjustment system plus additional price adjustments for any quality differentials (applicable when the delivered crude oil's API gravity varied by more than plus or minus a half of a degree from the API gravity specified for that particular crude oil stream in the Notice of Sale). The financial institution then wired the invoiced amount to the Federal Reserve Bank in New York for deposit to the U.S. Treasury. The receipts from the test sale totalled \$122,684,692 including \$157,736 for quality price adjustments and \$4,009 in interest for late delivery payment.

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### TEST SALE-90 COSTS

The Department of Energy's estimated costs for conducting TEST SALE-90, excluding the costs for acquiring and storing the crude oil to replace that sold, amount to \$1,988,280.

These costs consisted of:

- \$1,822,431 for accelerated equipment repair and maintenance and other drawdown readiness activities, contractor expenses, travel and printing and mailing the Notice of Sale;
- \$112,000 for electric power usage to draw down the crude oil; and
- \$53,849 for contracted terminal throughput charges at the Sun Terminal.

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### INDUSTRY COMMENTS

In order to obtain the oil industry's comments and recommendations concerning TEST SALE-90 and the overall sales and delivery process, the Department provided a questionnaire to the purchasers, the unsuccessful offerors and the prospective offerors who declined to bid. A summary of the comments received is provided in Appendix A. In general, the respondents indicated:

- The price adjustment mechanism is an improvement over a fixed price contract;

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<sup>1</sup>Notwithstanding that November was the contractually required delivery month, the sales process allows for earlier deliveries upon the request of the purchasers.

**TABLE 3**  
**TEST SALE-90 CONTRACTS AND DELIVERIES**

Purchaser (Contract Award Date)	Contract <sup>1</sup> Quantity	Crude Oil Stream (Distribution Mode)	Contract <sup>2</sup> Price/Bbl.	Delivered <sup>1</sup> Quantity	Delivery Completion Date
Amoco Oil (10/18/90)	600	Bryan Mound Sweet (Pipeline)	\$33.11 <sup>3</sup>	599.6	11/25/90
	120	West Hackberry Sweet (Barge)	\$33.29 <sup>3</sup>	119.6	11/24/90
	400	Bayou Choctaw Sweet (Pipeline)	\$34.84 <sup>3</sup>	404.8	11/06/90
BP Oil (10/18/90)	200	West Hackberry Sweet (Pipeline)	\$31.76 <sup>3</sup>	194.5	11/22/90
	100	West Hackberry Sweet (Barge)	\$31.01	93.8	11/20/90
	150	Bayou Choctaw Sweet (Pipeline)	\$32.66	151.6	11/21/90
Citgo Petroleum (10/17/90)	75	West Hackberry Sour (Pipeline)	\$27.07	74.8	10/19/90
Fina Oil (10/18/90)	75	West Hackberry Sour (Pipeline)	\$24.79	74.9	12/01/90
Marathon Petroleum (10/18/90)	40	West Hackberry Sweet (Barge)	\$33.76	40.2	11/12/90
	75	Bayou Choctaw Sweet (Pipeline)	\$34.71	75.0	11/03/90
Mobil Oil (10/17/90)	300	West Hackberry Sour (Pipeline)	\$29.26 <sup>3</sup>	298.5	11/24/90
Phibro Energy (10/18/90)	350	Bryan Mound Sour (Pipeline)	\$27.85	350.3	11/30/90
	250	West Hackberry Sour (Pipeline)	\$28.54	249.3	12/02/90
Shell Oil (10/17/90)	95	Bryan Mound Sour (Pipeline)	\$30.52	95.3	10/29/90
Sun Refining (10/16/90)	540	West Hackberry Sweet (Pipeline)	\$32.05	537.2	11/28/90
Transworld Oil (10/17/90)	480	Bryan Mound Sour (Pipeline)	\$30.70	478.9	11/08/90
Ultramar (10/18/90)	75	Bryan Mound Sour (Pipeline)	\$32.25	75.0	10/29/90
<b>TOTAL</b>	<b>3,925</b>			<b>3,913.6</b>	

1 Thousands of barrels. Variance between delivered quantities and contract quantities are inherent to crude oil operations; contracts allowed for plus/minus 10 percent variance.

2 Includes price and quality variation adjustments. The weighted average price per barrel was \$33.01 for sweet crude oil and \$29.18 for sour crude oil; the weighted average price per barrel for all crude oil deliveries was \$31.35.

3 Weighted average price for multiple deliveries; delivery completion date is for final delivery.

- There may be difficulty in locating qualified vessels and unfavorable transportation economics posed by U.S.-flag vessel shipping requirements of the Jones Act;
- There is no concern as to the ability to refine Strategic Petroleum Reserve crude oil;
- The Reserve's sales and delivery process requires no significant change;
- Participation in the test was largely to gain experience in purchasing Strategic Petroleum Reserve crude oil;
- There were some problems experienced in arranging for letters of credit which met the criteria prescribed in the Standard Sales Provisions;
- The offer disk was a beneficial aid in preparing an offer; and
- Industry would participate in future test sales or simulated sales exercises.

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#### TEST SALE-90 CONCLUSIONS

The test sale was successfully executed in a manner similar to that which would be used for a large Strategic Petroleum Reserve drawdown. While the market conditions and the small quantity of oil sold did not allow for the Reserve's sales procedures and physical drawdown and distribution capabilities to be fully stressed, TEST

SALE-90 did demonstrate that the process will function effectively. Furthermore, the test provided significant training benefits to personnel involved in the Strategic Petroleum Reserve program, and allowed potential offerors for the Reserve's crude oil at the time of an energy emergency to participate in and become more familiar with the Reserve's sale and delivery process. TEST SALE-90 also proved the viability of the newly developed offer disk and the price adjustment mechanism.

Finally, based on comments received from the purchasers and offerors, as well as those resulting from the Department's internal assessment, TEST SALE-90 proved useful in helping to identify enhancements to Strategic Petroleum Reserve procedures which might improve their effectiveness in responding to an energy emergency. Such enhancements include:

- Streamlining the process for reviewing and determining the adequacy of letters of credit;
- Modifying the Standard Sales Provisions to incorporate various technical changes; e.g., specifying the custody transfer points for deliveries via the Capline Terminal and the Texas-22 pipeline system, revising the standard letter of credit language, and clarifying aspects of the invoicing and payment process;
- Refining the price adjustment mechanism; and
- Improving drawdown readiness assurance activities.

## SPR REPORTS SUBMITTED TO CONGRESS

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### ALTERNATIVE FINANCING METHODS FOR THE STRATEGIC PETROLEUM RESERVE

During 1990, the Department completed a study on alternative methods of financing Strategic Petroleum Reserve oil acquisition. The financing study was conducted as required by Public Law 101-46, the Strategic Petroleum Reserve Amendments Act of 1989, and a report was issued in February. The report DOE/FE-0155, considered a number of potential alternative financing methods and concluded that "leasing" oil is the only option which might provide significant financial advantages relative to direct purchases of oil. The Department proposed that authorizing legislation be enacted to allow it to enter into contracts for storage of oil not owned by the Federal Government.

The study was conducted by an interagency team chaired by the Department. During the study, team

members met with officials of foreign oil producing nations and representatives of the U.S. petroleum industry and the financial community. In addition, the team received and reviewed responses to a notice of inquiry in the Federal Register.

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### ANALYSIS OF SIZE OPTIONS FOR THE STRATEGIC PETROLEUM RESERVE

Concurrent with the Alternative Financing Study, President Bush directed that an interagency group study the appropriate size of the Strategic Petroleum Reserve. The report on that study, DOE/IE-0016, also issued in February, concluded that an expansion of the Reserve beyond 750 million barrels was neither needed nor justified, but that a 750-million-barrel Strategic Petroleum Reserve is warranted to meet the Nation's commitments and to maintain the deterrence value of the Strategic Petroleum Reserve.

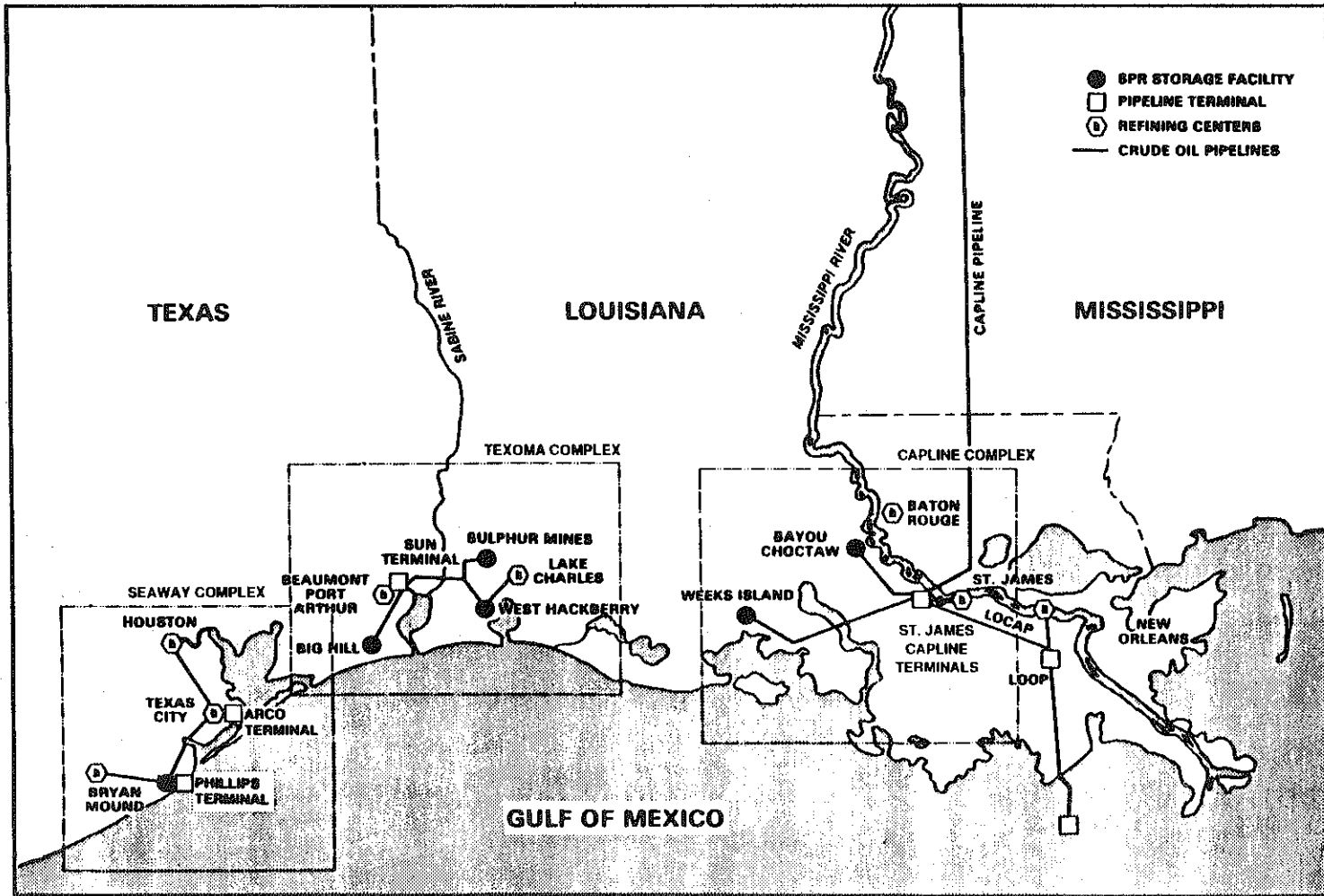


## STORAGE FACILITIES DEVELOPMENT

The Department of Energy has been involved since 1976 in a major storage facilities development program to stockpile crude oil. Over the last 12 years, the Department has acquired and developed six underground crude oil storage facilities in salt domes along the Gulf coasts of Texas and Louisiana, and a marine terminal on the Mississippi River at St. James, Louisiana. The six storage sites are Bayou Choctaw, Weeks Island, West Hackberry and Sulphur Mines in Louisiana, and Bryan Mound and Big Hill in Texas. These six storage sites are organized into three distribution systems and connected by Department of Energy pipelines to commercial crude oil pipeline networks and to commercial and U.S. Government-owned marine terminal distribution facilities. The Strategic Petroleum Reserve facilities development

program is presently directed toward providing a total storage capacity of 750 million barrels and a drawdown/distribution capability of 4.5 million barrels per day. The locations of the current Strategic Petroleum Reserve storage sites and their associated distribution pipelines and terminals are shown in Figure 2.

A summary of facility development plans and specifications for the Strategic Petroleum Reserve, including planned site storage capacities, storage configurations, and drawdown capabilities is presented in Table 4. Current plans provide for the decommissioning in fiscal year 1992 of the Sulphur Mines 26-million-barrel storage facility, with replacement capacity being developed by the enlargement of caverns at Big Hill and Bayou Choctaw.



**Figure 2 STRATEGIC PETROLEUM RESERVE COMPLEXES AND ASSOCIATED PIPELINES AND TERMINALS**

**TABLE 4**

**STRATEGIC PETROLEUM RESERVE  
FACILITY DESIGN AND DRAWDOWN CRITERIA**

<u>Storage Group</u>	<u>Storage Facilities</u>	<u>Storage Capacity (MMB)</u>	<u>Crude Mix (Sweet/Sour) (MMB)</u>	<u>Drawdown Capability (MB/D)</u>
Seaway Group	Bryan Mound	226	66/160	1,250
Texoma Group	West Hackberry	219	112/107	1,250
	Sulphur Mines <sup>1</sup>	-	-	-
	Big Hill	<u>160</u>	<u>69/91</u>	<u>930</u>
		379	181/198	2,180
Capline Group	BayouChoctaw	72	34/38	480
	Weeks Island	<u>73</u>	<u>0/73</u>	<u>590</u>
		145	34/111	1,070
Total		750	281/469 37%/63%	4,500

MMB: million barrels

MB/D: thousands of barrels per day

<sup>1</sup> To be decommissioned.

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## FACILITIES DEVELOPMENT STATUS

### BRYAN MOUND

The Bryan Mound site is located in Brazoria County, Texas, approximately three miles southwest of Freeport. The Department acquired this storage site in 1977 and converted four existing brine caverns with a total capacity of 66 million barrels to oil storage. Subsequently, the Department expanded this site to 226 million barrels through the solution mining of 16 additional 10 million-barrel caverns. The expansion was completed in 1986 and oil fill is near completion.

In 1989, the Bryan Mound brine discharge pipeline, which is 14.6 miles long and extends 12.5 miles offshore into the Gulf of Mexico, developed a leak in the onshore section. Temporary repairs were completed at that time and the pipeline was pressure tested and returned to service. In 1990, the pipeline developed additional leaks both onshore and 6 miles offshore which required additional repairs. During the year, the Department performed a comprehensive ultrasonic inspection of the onshore and offshore portions of the brine pipeline. The inspection indicated significant erosion and corrosion in both portions. A pipeline repair plan has been established to extend the operating life of the pipeline by 10 to 15 years. That plan provides for shortening the offshore length from 12.5 miles to 4.6 miles (which eliminates a majority of the thin sections) and repair or replacement of remaining thin sections of the pipeline. This plan has been submitted for approval to the Texas

Water Commission and the U.S. Environmental Protection Agency (See Environmental Compliance and Permits Section).

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### WEST HACKBERRY

The West Hackberry site is located in Cameron Parish, Louisiana, approximately 22 miles southwest of Lake Charles. The Department acquired this storage site in 1977 and converted five existing brine caverns with a capacity of 49 million barrels to oil storage. Subsequently, the Department expanded this storage site through solution mining of 17 additional 10 million-barrel storage caverns. Development of this site to the planned level of 219 million barrels was completed in September 1988.

Similar to Bryan Mound, the West Hackberry brine discharge pipeline has experienced significant corrosion and erosion due to cavern leaching activities. During 1990, the Department performed a comprehensive ultrasonic inspection of both the onshore and offshore portions of this pipeline. Engineering design has been initiated for the replacement of approximately 4.5 miles of the 17 mile onshore portion in 1991/92.

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### SULPHUR MINES

The Sulphur Mines site is located in Calcasieu Parish, Louisiana, approximately 12 miles west of Lake Charles. The Department acquired this storage site in 1979 and converted three existing brine caverns with a capacity of 26 million barrels to crude oil storage. Development and fill of

this site were completed in 1983. The site is currently in an operational standby mode.

The Department's development plan for the SPR provides for consolidating the Sulphur Mines inventory into existing larger sites to increase the Reserve's cost effectiveness and drawdown capabilities. Specifically, the Department is expanding the Big Hill facility by 20 million barrels and the Bayou Choctaw facility by 6 million barrels, and is planning for the decommissioning of the Sulphur Mines facility by the end of 1992.

During 1990, the Department conducted a site tour and briefing at the Sulphur Mines oil storage facility for the benefit of those interested in acquiring the facility. This briefing and tour, attended by 14 petroleum-related commercial firms, demonstrated significant interest of commercial firms in acquiring the facility.

The Department anticipates issuing a solicitation for the sale of the Sulphur Mines facility in early 1991; a sale of the facility will not include oil currently stored in the site's caverns. In December, the Department initiated transfer of the Sulphur Mines oil to the Reserve's Big Hill storage facility and expects to complete the oil movement in the fourth quarter of 1991.

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#### BIG HILL

The Big Hill storage site is located in Jefferson County, Texas, 20 miles southwest of Beaumont. The Department acquired this undeveloped

site in 1982 and has been constructing a new storage facility with a planned storage capacity of 160 million barrels and a drawdown capability of 930,000 barrels per day. The site's planned total capacity includes 20 million barrels of storage capacity to replace a portion of that lost through the planned decommissioning of the Sulphur Mines site.

Construction of all major surface facilities at Big Hill has been completed. Cavern development continues on schedule. Ten of the 14 caverns have been completed and the development of total planned capacity of 160 million barrels is projected to be completed in September 1991.

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#### BAYOU CHOCTAW

The Bayou Choctaw site is located in Iberville Parish, Louisiana, approximately 12 miles southwest of Baton Rouge. The Department acquired this storage site in 1977 and converted four existing brine caverns with a capacity of 46 million barrels to oil storage. Subsequently, the Department acquired a fifth existing cavern (No. 17) through an exchange agreement with Union Texas Petroleum.

During 1990, the Department completed development of Cavern 101, adding an additional 10 million barrels of new storage capacity to the site. The oil from Cavern 18 was transferred to Cavern 101, and Cavern 18 is currently being expanded to 17 million barrels, which will bring Bayou Choctaw to its total designed storage capacity of 72 million barrels by September 1991. During 1990, the gross volume of Cavern 18 reached 14.8 million barrels.

Plugging and abandonment of core holes drilled for site characterization by the Strategic Petroleum Reserve program, and of unused pre-existing wells associated with industry-developed caverns which the Department inherited when the site was acquired, have been completed. These actions were completed in conformance with Louisiana Department of Natural Resources regulations.

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### WEEKS ISLAND

The Weeks Island site is located in Iberia Parish, Louisiana, approximately 95 miles southwest of New Orleans. The Department acquired this storage site in 1977 and converted an existing conventional salt mine with a capacity of 73 million barrels to oil storage. Development and fill of this site were completed in 1982. The site is currently in an operational standby mode.

In 1987, the Department initiated a mine integrity assurance program in order to enhance the mine's safety and security against any surface water intrusion. This program consists of: a) installation of an air dryer system to reduce water vapor condensation within the shafts and manways of the mine above the oil chamber to, in turn, provide for early detection of incipient water leaks should they develop; b) isolation of Morton International Inc.'s Markel Mine from the Strategic Petroleum Reserve's operations area by constructing new bulkheads; c) installation of a backup or alternate drawdown capability to the existing 10-pump system located at the base of the service shaft; and d) upgrading of

existing bulkheads if required to meet potential hydrostatic pressures.

In December 1990, fabrication, installation, testing and acceptance of the air-dryer system, designed to reduce water vapor condensation within the manways and shafts of the mine area above the oil storage chamber, was completed and became operational.

In addition to the Department's initiation of pump-pad construction and other pumping system modifications to provide for a backup drawdown capability, the Department completed a design for the submersible pumps that would be inserted into the oil-fill holes in the event of temporary or permanent failure of the existing 10-submersible pump system or the service shaft in which the pumps are housed. A solicitation for the two pumps was issued in December and award is expected in February 1991.

In 1990, all the horizontal timbers in the production shaft were replaced, and installation of subsurface convergence-measuring instrumentation to provide data for subsidence and creep closure was initiated.

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### RECOVERY PROGRAM

Initiated in 1988 as part of the overall security program, the Strategic Petroleum Reserve's Recovery Program provides a reasonable level of assurance that the Strategic Petroleum Reserve can recover from a range of deliberate acts and natural events, and meet designed drawdown rates within a specified period of time following a drawdown interruption. Generally, the Recovery Program requires

restoration of 80 percent of an individual site's drawdown capability, and not less than 90 percent of the Reserve's full drawdown capability, within 30 days of a disabling event. The Department anticipates achieving all of the goals of the Recovery Program by December 1991.

Contracts were signed with several pipeline repair firms in 1989. In 1990, basic ordering agreements with barge and pump companies were renewed; recovery/security integration studies were completed; search for a site location for an all-Strategic Petroleum Reserve spare parts warehouse was initiated; a contract was let for 15 high capacity diesel recovery pumps which will be installed in-parallel with existing electrically driven oil and water pumps at all sites; and on-site modifications to piping and pumping systems at several sites were initiated to provide for installation of recovery systems.

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### STRATEGIC PETROLEUM RESERVE STORAGE CAPACITY DEVELOPMENT

Storage capacity development is complete at 4 storage sites - Bryan Mound, West Hackberry, Sulphur Mines and Weeks Island; and storage capacity development is proceeding on schedule at the two remaining sites - Bayou Choctaw and Big Hill. Caverns at Bayou Choctaw and Big Hill are being solution mined to their final shape and capacity prior to storing any oil other than blanket oil required to protect the cavern roof during the leaching process. During 1990, gross cavern volume leached at Bayou Choctaw was 3.4 million barrels, and at Big Hill, 92 million barrels. Gross cavern volume is not shown in Table 5 as it is not considered as storage capacity available for oil fill.

**TABLE 5**

**STORAGE CAPACITY DEVELOPMENT  
BY QUARTER**  
(In Million Barrels)

Storage Facility	1989 Year-End	1st Quarter	2nd Quarter	3rd Quarter	4th Quarter	1990 Year-End
Bryan Mound	226.0					226.0 *
West Hackberry	219.0					219.0 *
Bayou Choctaw	56.0	10.0 **	0.0	0.0	0.0	56.0
Weeks Island	73.0					73.0 *
Sulphur Mines	26.0					26.0 *
Big Hill	<u>0.0</u>	<u>0.0</u>	<u>46.0</u>	<u>23.0</u>	<u>46.0</u>	<u>115.0</u>
<b>Total</b>	<b>600.0</b>	<b>0.0</b>	<b>46.0</b>	<b>23.0</b>	<b>46.0</b>	<b>715.0</b>

\* Site Capacity Development Completed.

\*\* Cavern 101 Capacity Completed; No increase to site capacity until cavern 18 expansion is completed.



# OIL ACQUISITION AND TRANSPORTATION

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## STATISTICS FOR FOURTH QUARTER, 1990

Since August 2, 1990, due to the unstable crude oil market conditions caused by Iraq's invasion of Kuwait, the acquisition of crude oil to fill the Strategic Petroleum Reserve has been suspended. Accordingly, there were no crude oil deliveries to the Reserve during the calendar quarter ending December 31, 1990. As of the end of the quarter, the Strategic Petroleum Reserve inventory was 585,691,933 barrels. Table 6 summarizes the Strategic Petroleum Reserve crude oil inventory and delivery statistics as of December 31, 1990. Projections for calendar year 1991 are not included due to the uncertainty as to when the acquisition of crude oil will resume.

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## OIL FILL, CALENDAR YEAR 1990

During 1990, the Strategic Petroleum Reserve crude oil inventory was increased by 9,759,919 barrels. This quantity, however, was offset by the 3,913,608 barrels sold during TEST SALE-90; therefore, the net increase was 5,846,311 barrels. Exclusive of the amount sold, the average unadjusted annual fill rate for 1990 was 26,740 barrels per day. This average daily fill rate was less than the 46,000 barrels per day fill rate projected in the February 1990 Strategic Petroleum Reserve Annual/Quarterly Report due to the curtailment of crude oil acquisition activities on August 2, 1990. Fiscal and calendar year inventories and average daily fill rates since 1977 are presented in Table 7. Strategic

Petroleum Reserve crude oil fill is illustrated on both an annual and cumulative basis in Figures 3 and 4, respectively.

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## OIL ACQUISITION, CALENDAR YEAR 1990

During 1990, approximately 9.8 million barrels of crude oil were purchased and delivered to the Strategic Petroleum Reserve. Of this amount, 7.9 million barrels were acquired by the Department of Defense's Defense Fuel Supply Center acting as the Department of Energy's agent under an interagency agreement. The oil was purchased under an open continuous solicitation for competitive offers which were received and evaluated on a tri-weekly basis. The balance of the crude oil delivered to the Reserve, 1.9 million barrels, was acquired in completion of the Department of Energy's November 1987 purchase agreement with Petroleos Mexicanos (PEMEX), Mexico's state-owned oil company. Under this agreement, which was the fourth of four major agreements with PEMEX, PEMEX delivered a total of 42.8 million barrels of crude oil to the Reserve during the period December 1, 1987 through March 31, 1990, when the final delivery was completed.

Table 8 shows the crude oil quantities received during 1990 and since inception of the Strategic Petroleum Reserve program by country of origin. Of the total oil in storage, 66.9 percent is high sulfur (sour) and 33.1 percent is low sulfur (sweet). Table 9 provides information on the location of this inventory by storage site. The

**TABLE 6**

**STRATEGIC PETROLEUM RESERVE  
OIL INVENTORY AND DELIVERY STATISTICS**

**1990 Inventory and Delivery Summary  
(Barrels)**

Calendar Year 1990	Planned Average Daily Fill Rate	Actual		
		Average Daily Fill Rate	Quarter Oil Receipts	Ending Oil Inventory
1st Quarter	33,000	26,911	2,421,962	582,279,207
2nd Quarter	57,000	48,344	4,405,442	586,678,484
3rd Quarter	36,000	31,875	2,932,515	589,610,999
4th Quarter	59,000	0	0	585,691,993 *
<b>TOTAL</b>	<b>46,000</b>	<b>26,740</b>	<b>9,759,919</b>	<b>585,691,993</b>
Total Crude Oil in Transit (December 31, 1990)				0
Crude Oil Available under Contract for Delivery During CY 1991				0

\* Decrease from end of 3rd quarter due to TEST SALE-90 deliveries.

**TABLE 7**

**STRATEGIC PETROLEUM RESERVE  
OIL FILL HISTORY**

	Fiscal Year		Calendar Year	
	Year-End Inventory (Million bbls)	Average Daily Fill Rate (Thousand bbls/d)	Year-End Inventory (Million bbls)	Average Daily Fill Rate (Thousand bbls/d)
1977	1.1	3	7.2	20
1978	49.1	131	68.5	168
1979	91.2	115	91.7	64
1980	92.8	4	107.8	44
1981	199.2	292	230.3	336
1982	277.9	215	293.8	174
1983	361.0	228	379.1	234
1984	431.1	191	450.5	195
1985	489.3	159	493.3	119 *
1986	506.4	47 *	511.6	51 *
1987	533.9	75	540.6	80
1988	554.7	57	559.5	52
1989	577.1	62	579.9	56
1990	589.6	34	585.7	27 *

\* Fill rates unadjusted for oil deliveries under the 1985/86 and 1990 test sales.

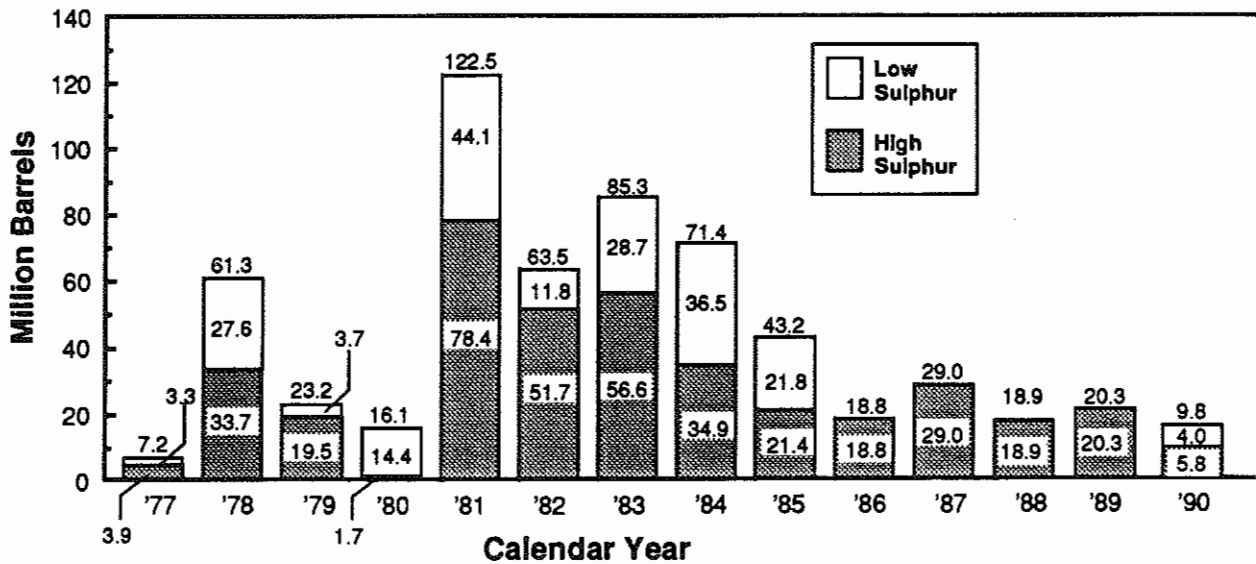


Figure 3

### Annual Strategic Petroleum Reserve Oil Fill

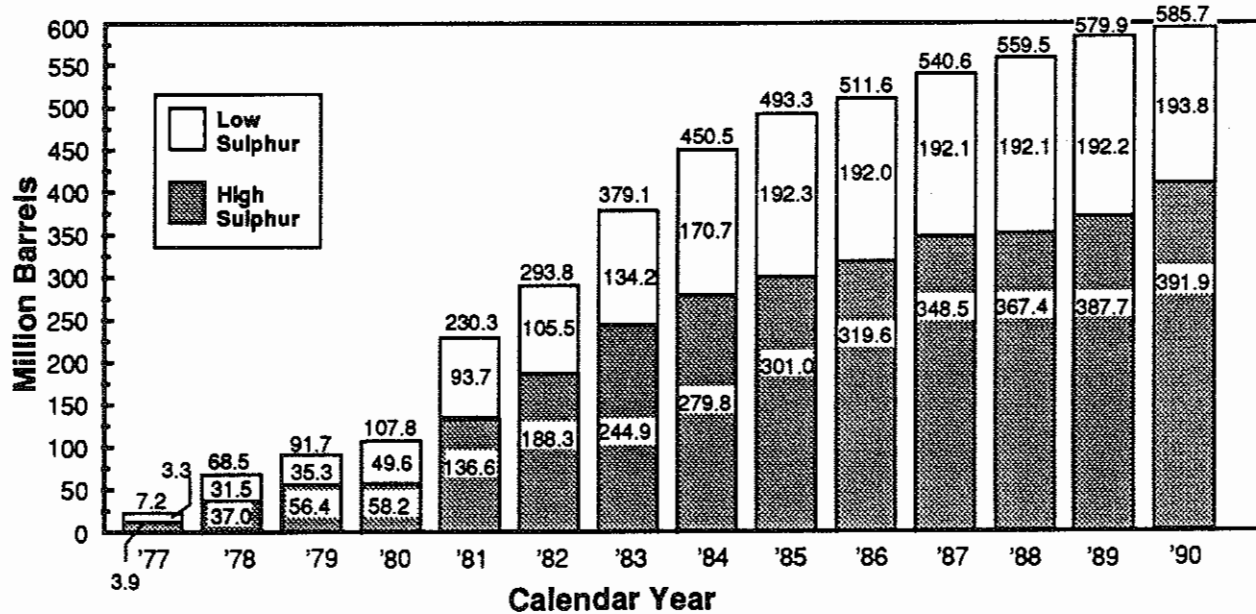


Figure 4

### Cumulative Strategic Petroleum Reserve Oil Fill

**TABLE 8**  
**CRUDE OIL RECEIVED THROUGH 1990**  
**(Million Barrels)**

Source Country	Quantity During 1990	Cumulative	Percent Of Total
Mexico	1.9	256.7	43.5
United Kingdom	3.0	139.1	23.5
United States:		38.4	6.5
Alaska		31.4	5.3
Other		7.0	1.2
Saudi Arabia		27.1	4.6
Libya		23.8	4.0
Iran		20.0	3.4
Iraq	3.4 *	3.4	0.6
United Arab Emirates		18.4	3.1
Nigeria		15.2	2.6
Oman		9.0	1.5
Egypt		8.9	1.5
Norway	1.5	8.9	1.5
Ecuador		6.2	1.1
Algeria		6.2	1.0
Cameroon		3.4	0.6
Gabon		2.4	0.4
Qatar		2.3	0.4
Venezuela		0.9	0.2
Peru		0.4	0.1
<b>TOTAL RECEIPTS**</b>	<b>9.8</b>	<b>590.8</b>	<b>100.0</b>

\* Received prior to Iraq's invasion of Kuwait.

\*\* Unadjusted for 1985/1986 and 1990 test sale deliveries and operational gains and losses.

**TABLE 9**

**STRATEGIC PETROLEUM RESERVE  
CRUDE OIL INVENTORY**  
As of December 31, 1990  
(Million Barrels)

Storage Site	Location	1990 Cumulative Total			Total End of Year 1989
		Sour*	Sweet**	Total	
Bryan Mound	Brazoria County, TX	156.9	63.8	220.7	220.4
Big Hill	Jefferson County, TX	2.4	1.5	3.9	0.6
West Hackberry	Cameron Parish, LA	99.0	110.2	209.2	205.8
Bayou Choctaw	Iberville Parish, LA	35.6	17.6	53.2	52.4
Weeks Island	Iberia Parish, LA	71.5	0.0	71.5	72.6
Sulphur Mines	Calcasieu Parish, LA	23.8 ***	0.0	23.8	25.0
<b>Subtotal</b>		<b>389.2</b>	<b>193.1</b>	<b>582.3</b>	<b>576.8</b>
Tanks and Pipelines		<u>2.7</u>	<u>0.7</u>	<u>3.4</u>	<u>3.1</u>
<b>TOTAL</b>		<b>391.9</b>	<b>193.8</b>	<b>585.7</b>	<b>579.9</b>

- \* Sulphur content greater than 0.5 percent.  
 \*\* Sulphur content not exceeding 0.5 percent.  
 \*\*\* Inventory being transferred to Big Hill.

specifications used in acquiring Strategic Petroleum Reserve oil can be found in Appendix I of this report.

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### CARGO PREFERENCE ACT COMPLIANCE

The Cargo Preference Act of 1954 requires that Federal agencies take such steps as may be necessary and practicable to assure that at least 50 percent of its cargo transported on ocean vessels in a calendar year is transported by privately-owned U.S.-flag vessels, to the extent they are available at fair and reasonable rates. By agreement between the Department of Energy and the Department of Transportation, the Strategic Petroleum Reserve's Cargo Preference Act compliance is measured in terms of long-ton miles, i.e., cargo tons multiplied by the distances transported.

During calendar year 1990, the 50 percent usage of U.S. -flag vessels in the transportation of Strategic Petroleum Reserve crude oil cargoes could not be achieved due to insufficient offers under the Defense Fuel Supply Center's solicitation for crude oil deliveries which allowed for use of U.S.-flag vessels; the unavailability of such vessels when the opportunity for their use did exist; and the August 2 suspension of the Reserve's oil procurement and transportation activities, which precluded the ability to employ additional U.S.-flag vessels and thereby correct the mid-year deficiency. During 1990, four U.S.-flag vessels, transporting a total of 4.06 million barrels on 9 voyages, were involved in delivering crude oil to the Strategic Petroleum Reserve. These deliveries equated to 2.02 billion long-ton miles or 31.5 percent of the total long-ton miles.

## OTHER PROJECT ACTIVITIES

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### PROCUREMENT AND CONTRACTOR SUPPORT

Obligations in fiscal year 1990 for Strategic Petroleum Reserve procurements totaled approximately \$433.4 million, including \$267.9 million for crude oil and associated transportation and other costs. Obligations for procurements for other than crude oil totaled \$165.5 million.

The contract for management and operating services with Boeing Petroleum Services, Incorporated, was extended for three years through March 1993. Tucker & Associates, Inc. was awarded a three year contract for approximately \$15.5 million for technical management and support services.

Other prime contractors that provided services to the Strategic Petroleum Reserve program during 1990 included: Jacobs Engineering Group, Fluor Daniels Inc. and Walk, Haydel & Associates, Inc. for architectural engineering services; Systematic Management Services for support services; ARCO Pipe Line Company, Phillips 66 Company, Sun Pipe Line Company, and Sun Marine Terminals for terminalling services; and AES Construction Company, M.A. Baheth & Company, Plaquemines Contracting Company, Ro-Bac Inc., Salazar Construction Company, Battle Investment Corporation, Young Enterprises, Inc., Hubco, Inc., R.M. Walker Construction Company, Atlantic Electric Service, Inc., and Big O Construction Company for construction.

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### SECURITY

Boeing Petroleum Services, Inc., under its Management and Operating contract, is responsible for implementing most Strategic Petroleum Reserve security program elements. Boeing administers the protection services program through a subcontract to Wackenhut Services, International.

A Master Security Agreement which formally establishes the appropriate level of protection for the Strategic Petroleum Reserve's facilities was approved in early 1990. The Agreement provides for necessary and adequate protection of the Reserve's facilities against hostile acts which could affect national security and public safety.

The Strategic Petroleum Reserve currently has an armed protection force strength of 300 officers. All officers have received tactical training and 150 have been certified, by the Department of Energy's Central Training Academy, at the advanced skill level as Special Response Team members. To maintain security proficiency, the Strategic Petroleum Reserve continued to conduct comprehensive security training exercises at all of its facilities during 1990. Exercise participants included on-duty Wackenhut personnel in addition to federal, state, and local law enforcement agencies, utilizing laser emission training devices mounted on weapons and firing blank ammunition. Many of the tactical exercises simulated responses to outside hostile aggressors to test the participants' ability to respond to such actions.



In support of the on-site protection force and state and local law enforcement personnel, who help protect the Strategic Petroleum Reserve facilities, the Louisiana National Guard has developed draft defense plans for Strategic Petroleum Reserve related assets and the Texas National Guard is developing defense plans for the Reserve's assets in Texas.

On October 28, 1988, the President signed Public Law 100-531, which amends the Department of Energy Organization Act to authorize protective force personnel who guard the Strategic Petroleum Reserve to carry firearms while discharging their official duties and, in certain instances, to make arrests without warrant. The legislation also establishes a federal offense of trespass on federally-owned Strategic Petroleum Reserve facilities. Implementing guidelines and regulations associated with this legislation were forwarded to the Department of Justice and were currently pending approval by the Attorney General as of the end of the reporting period.

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## ENVIRONMENTAL COMPLIANCE AND PERMITS

An extensive study of potential ground water contamination from the Bryan Mound and West Hackberry brine pond systems was conducted throughout 1990. Geophysical and hydrological techniques were used to identify the location and extent of brine contamination. Reports for both sites are being finalized and will be available in early 1991. Likely sources of contamination and recommended remediation will be identified in those reports.

The Bryan Mound brine disposal pipeline first experienced a leak in June 1989 and again in September and December 1990. The Department has developed a repair plan for the pipeline which involves shortening the offshore pipeline and diffuser. The Department has submitted an application to the Texas Water Commission and EPA Region VI to move the brine diffusers from about 12.5 miles (70 feet water depth) to 4.6 miles (30 feet water depth) offshore in the Gulf of Mexico.

The West Hackberry brine disposal pipeline also has several sections of advanced deterioration. The Department has plans to replace approximately five miles of pipeline located in coastal wetlands. Discussions regarding wetlands permitting and impact mitigation are underway with the Army Corps of Engineers, U.S. Fish and Wildlife Service, National Marine Fisheries Service, and the Louisiana Department of Natural Resources. An Environmental Assessment will also be required to address this action.

Renewal of all current Environmental Protection Agency (EPA) National Pollutant Discharge Elimination System (NPDES) permits, as well as approval of a new brine discharge location permit for Bryan Mound, had been held up pending resolution of the EPA's position that Management and Operations (M&O) contractors for the Government sign NPDES permits as co-operators, thereby accepting co-responsibility for operating within permit requirements. Inasmuch as it was not possible to modify the current M&O contract to include the contractor as co-operator on EPA NPDES permits, the Strategic Petroleum Reserve Project

Management Office negotiated an agreement with EPA Region VI for the M&O contractor to sign as a co-operator for contracts written after the present contract expires in March 1993, and for all current NPDES permits to be extended until March 1993.

A new Louisiana law requires a reduction by 90 percent of hydrocarbon emissions from marine crude oil terminals that emit more than 100 tons per year. This law affects the St. James Terminal where the annualized rate of full drawdown would exceed the 100 ton-threshold. Design and installation of appropriate emission controls are planned.

The Louisiana Department of Environmental Quality (LDEQ) has also ordered the installation of Maximum Achievable Control

Technology on all emission sources at St. James. The Department will present its compliance plan at an administrative hearing with LDEQ.

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#### REAL ESTATE

At the Weeks Island facility, the Department, through the Corps of Engineers, increased the level of the Government's interest in 0.13 acres, from a License Agreement with Southern Pacific Railroad Company to a perpetual easement with Prudential Insurance Company of America, purchaser of the property from Southern Pacific Railroad Company. Additionally, 0.13 acres was acquired from Morton International, Incorporated, for construction of a security fence at the Weeks Island facility.

## BUDGET AND FINANCE

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### APPROPRIATIONS

A total of \$20.1 billion has been appropriated for the Strategic Petroleum Reserve through FY 1991. Included in this total are entitlement receipts for fiscal year 1981 under the authority of the Energy Security Act. Also included are \$56.1 million which became available in late fiscal year 1990 from the receipts of the Naval Petroleum Reserves. The distribution of annual and total appropriations is shown in Table 10. Figure 5 illustrates annual and cumulative appropriations for storage facilities development and operations and petroleum acquisition and transportation.

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### MAJOR BUDGET AND FINANCING ACTIONS DURING 1990

The Administration's fiscal year 1991 budget for the Strategic Petroleum Reserve requested appropriations of \$195.6 million for the continued development and operations and management of the Reserve and \$228.4 million for oil acquisition and transportation. This proposed funding included \$108.5 million provided as an advance appropriation for fiscal year 1991 in the fiscal year 1990 appropriations act (P.L. 101-121). In addition, the fiscal year 1991 budget assumed that excess Naval Petroleum Reserve receipts authorized in P.L. 101-121 would provide another \$120 million for oil acquisition and transportation in fiscal year 1991 and complete

financing required to fill the Reserve at an average rate of 59,000 barrels a day.

On November 5, 1990, the President signed into law the Department of the Interior and Related Agencies Appropriations for fiscal year 1991 (Public Law No. 101-512) providing \$200.6 million for the development, operations and management of the Reserve and no new budget authority for oil acquisition and transportation beyond the advance appropriation of \$108.5 million provided by P.L. 101-121. Included in the appropriations for the development, operations, and management of the Reserve was an additional \$6 million for the development of a plan to expand the SPR from 750 million barrels to 1 billion barrels. Also included for oil acquisition and transportation was an advance appropriation for fiscal year 1992 of \$196.2 million. The Congress estimated that the unobligated balances carried over from fiscal year 1990, which included \$47.7 million not obligated after oil purchases were suspended on August 2, 1990, and \$56.1 million realized from Naval Petroleum Reserve receipts in excess of \$510 million, together with the advance appropriation for fiscal year 1991 and uncosted balances remaining after suspension of fill, would enable a second half fiscal year 1991 fill rate of approximately 57,000 barrels per day assuming oil prices of \$25 per barrel.

Additionally, Public Law 101-512 restricts fiscal year 1991 oil

acquisition and transportation outlays to \$378 million, excluding the use of funds deposited as a result of the sale of Reserve inventory, and provides for the deposit of receipts exceeding \$638 million from use and operation of the Naval Petroleum Reserves Numbered 1, 2, and 3 during fiscal year 1991.

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STRATEGIC PETROLEUM  
RESERVE ACCOUNT  
TRANSACTIONS, LAST QUARTER  
OF 1990 (FIRST QUARTER  
OF FISCAL YEAR 1991)

The Strategic Petroleum Reserve Account funds the development, operation and maintenance of Strategic Petroleum Reserve facilities; the salaries and expenses necessary to plan and manage the program, including the operation of the Project Management Office in New Orleans, Louisiana; and the activities pertinent to major issues concerning the development and use of the Strategic Petroleum Reserve.

A total of \$59.4 million of Strategic Petroleum Reserve Account funds remained available for obligation at the end of fiscal year 1990. The appropriation for fiscal year 1991 increased these available funds by \$200.6 million, to a total of approximately \$260 million. Of this total, \$43.1 million were obligated in the quarter ended December 31, 1990 (first quarter of fiscal year 1991), leaving a balance of \$216.9 million available for future obligation. It is currently planned to obligate this balance by the end of fiscal year 1991.

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SPR PETROLEUM ACCOUNT  
TRANSACTIONS, LAST QUARTER  
OF 1990 (FIRST QUARTER OF  
FISCAL YEAR 1991)

The SPR Petroleum Account funds the acquisition of oil for the Strategic Petroleum Reserve; the associated costs for transportation and terminalling; U.S. customs duties and Superfund taxes; and other miscellaneous costs, such as Defense Fuel Supply Center administration costs associated with acquiring and transporting oil. In the event of a drawdown and sale of Strategic Petroleum Reserve oil, the SPR Petroleum Account would also fund the costs of withdrawing oil from the storage caverns and transporting it to the point where the purchasers would take title. An amount equal to federal receipts from a drawdown and sale is deposited in the SPR Petroleum Account and creates additional budget authority for refilling the Reserve.

At the end of fiscal year 1990, \$103.8 million remained available for obligation in the SPR Petroleum Account, which included excess Naval Petroleum Reserve receipts of \$56.1 million. Of the \$371.9 million provided for the account in fiscal year 1990, \$268.1 million was obligated. Outlays (payments) from the account during the fiscal year were \$252.9 million.

During the quarter ending December 31, 1990, (first quarter of fiscal year 1991), in addition to the \$103.8 million carried over from fiscal year 1990, funds available included

\$108.5 million from the advance appropriation for fiscal year 1991 and \$122.7 million in test sale proceeds. In total, \$335 million was available for obligation. While no new oil purchases occurred during the first quarter, some \$1.9 million was obligated to finance the test sale. Outlays (payments) from the account during the quarter were \$9.8 million.

---

#### OIL COSTS THROUGH FISCAL YEAR 1990

A total of 589.6 million barrels of crude oil were delivered to the Strategic Petroleum Reserve through fiscal year 1990. The cumulative costs for this oil, including entitlement receipts, were \$16.018 billion, for an average of approximately \$27.17 per barrel. For the 12.5 million barrels delivered in fiscal year 1990, the average cost was \$18.81 per barrel.

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#### ESTIMATED COST TO COMPLETE THE STRATEGIC PETROLEUM RESERVE

The cost to complete the Strategic Petroleum Reserve will

depend on future decisions about the size of the Reserve, fill rates and financing alternatives, as well as future oil prices.

Based on the assumptions for the Department's fiscal year 1991 budget request, transmitted to the Congress on February 4, 1991, development of the facilities to the currently planned 750 million barrel storage system will be complete at the end of fiscal year 1991 and capability to fill to 750 million barrels will be achieved by the end of fiscal year 1992. The FY 1992 budget assumes that oil fill, suspended since the August 2, 1990, invasion of Kuwait by Iraq, will be resumed during fiscal year 1992 as oil market conditions return to normal. It is further assumed that the Department will seek alternatives to acquisition through direct purchase, possibly using authorities provided in Public Law 101-383. Because of the current situation in the Persian Gulf and the condition in world oil markets, no estimate for achieving an inventory of 750 million barrels of oil is provided. The estimated total cost to complete the capacity to store 750 million barrels is \$3.8 billion through FY 1992.

**TABLE 10**  
**STRATEGIC PETROLEUM**  
**RESERVE APPROPRIATIONS**  
(Thousands of Dollars)

Fiscal Year	Petroleum Acquisition and Transportation	Storage Facilities Development and Operations	Management <sup>1</sup>	Total
1976	\$0	\$ 300,000	\$ 13,975	\$313,975
1977	440,000	0	7,824	447,824
1978	2,703,469	463,933	14,704	3,182,106
1979	2,885,670	103,290	18,111	3,007,071
Reprogramming	<u>-529,214</u>	<u>529,214</u>	<u>0</u>	<u>0</u>
	2,356,456	632,504	18,111	3,007,071
1980	-2,000,000 <sup>2</sup>	0	0	-2,000,000
Reprogrammings:				
Number 1	- 20,391	0	20,391	0
Number 2	<u>- 1,881</u>	<u>0</u>	<u>1,881</u>	<u>0</u>
	-2,022,272	0	22,272	-2,000,000
1981	2,688,282 <sup>3</sup>	82,834	19,391	2,790,507
Entitlements	542,146	0	0	542,146
Reprogrammings:				
Number 1	- 18,000	18,000	0	0
Number 2	<u>- 7,334</u>	<u>7,334</u>	<u>0</u>	<u>0</u>
	3,205,094	108,168	19,391	3,332,653
1982	3,684,000	171,356	20,076	3,875,432
Reprogramming	<u>- 4,300</u>	<u>4,300</u>	<u>0</u>	<u>0</u>
	3,679,700	175,656	20,076	3,875,432
1983	2,074,060	222,528	19,590	2,316,178
1984	650,000	142,357	16,413	808,770
1985	2,049,550	441,300 <sup>4</sup>	17,890 <sup>4</sup>	2,508,740
1986	0	94,015	13,518	107,533
Reprogramming	<u>- 12,964</u>	<u>12,964</u>	<u>0</u>	<u>0</u>
	- 12,964	106,979	13,518	107,533
1987	0	134,021	13,412	147,433
1988	438,744	151,886	12,276	602,906
1989	242,000	160,021	13,400	415,421
1990	371,916 <sup>5</sup>	179,530	12,953	564,399
1991	<u>231,139<sup>6</sup></u>	<u>187,730</u>	<u>12,846</u>	<u>431,715</u>
Total				
Appropriations	\$16,406,892	\$3,406,613	\$248,651	\$20,062,156

<sup>1</sup> Excludes funds appropriated to other DOE accounts but used to finance aspects of SPR program management.

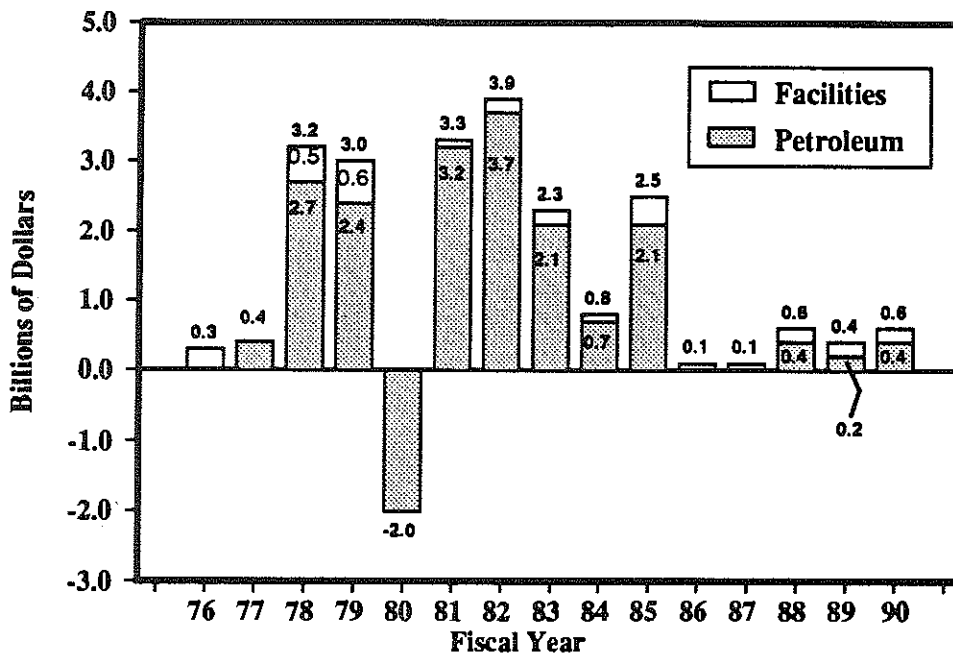
<sup>2</sup> Rescission.

<sup>3</sup> Included supplemental appropriations of \$1,305,000,000.

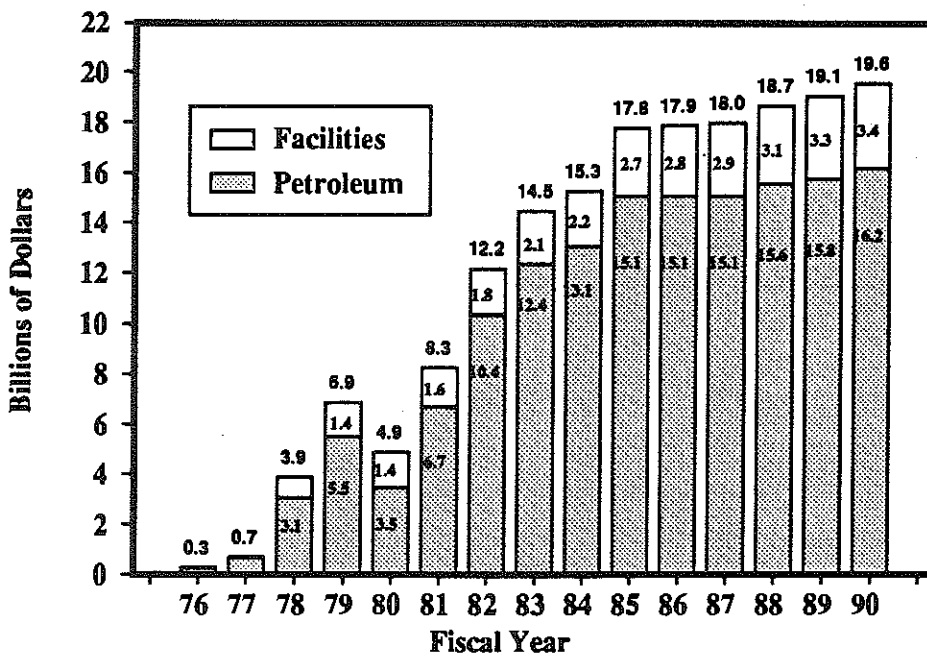
<sup>4</sup> Included in FY 1984 second supplemental appropriations.

<sup>5</sup> Includes indefinite appropriation for excess NPR receipts of \$56,050,529.

<sup>6</sup> Includes \$122,680,683 proceeds from the Test Sale carried out in the Fall of 1990.



**FIGURE 5**  
**STRATEGIC PETROLEUM RESERVE ANNUAL FUNDING**  
 Storage Facilities Development/Operations & Petroleum Acquisition/Transportation



F12069-3

**FIGURE 6**  
**STRATEGIC PETROLEUM RESERVE CUMULATIVE FUNDING**  
 Storage Facilities Development/Operations & Petroleum Acquisition/Transportation

# DRAWDOWN AND DISTRIBUTION

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## DISTRIBUTION PLAN

The current plan for distributing Strategic Petroleum Reserve petroleum, in the event that the Reserve is drawn down to respond to a severe energy supply interruption or to meet obligations of the United States under the Agreement on an International Energy Program, is provided in the "Strategic Petroleum Reserve Drawdown (Distribution) Plan", Amendment Number 4, of December 1, 1982. The Strategic Petroleum Reserve Distribution Plan provides that, pursuant to the President's decision to use the Strategic Petroleum Reserve, the principal method of distributing Strategic Petroleum Reserve oil will be by price competitive sale with the oil being sold and delivered to those offering the highest prices. The sale will be open to the largest possible universe of eligible buyers to ensure efficient distribution of Strategic Petroleum Reserve oil. The plan also provides that in any calendar month, the Secretary of Energy may direct the distribution of up to 10 percent of the volume of oil sold in that calendar month in a manner which the Secretary chooses. The price for such oil will be the average price of Strategic Petroleum Reserve oil sold at the contemporaneous competitive sale, or at the most recent competitive sale if no contemporaneous competitive sale is held.

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## COMPETITIVE SALES PROCEDURES

Appendix A to the Department of Energy's final rule (10 CFR Part 625) governing price competitive sales of

petroleum from the Strategic Petroleum Reserve provides for Standard Sales Provisions (SSPs) containing or describing contract clauses, terms and conditions of sale, and performance and financial responsibility measures, which may be applicable to a particular sale of Strategic Petroleum Reserve oil. The current edition of these provisions was published in the Federal Register on June 3, 1988.

Under the SSPs, the Strategic Petroleum Reserve sales process starts with the issuance of a Notice of Sale which would specify the amount, characteristics and location of the petroleum being sold, the delivery dates and the procedures for submitting offers, as well as providing other information pertinent to a particular sale. In addition, the Notice of Sale would specify what sales provisions and performance and financial responsibility measures were applicable.

Over the course of a Strategic Petroleum Reserve drawdown, a number of Notices of Sale may be issued, each covering a sales period of one to two months. Initially, Notices of Sale issued during a Strategic Petroleum Reserve drawdown could allow an extremely short lead time for offers and deliveries. Under the SSPs, it is contemplated that offerors might be given as little as 7 days from the issuance of the Notice of Sale until offers were due, and 30 days or less from the time of such issuance until the purchasers must accept delivery of the oil, with a less compressed schedule becoming more feasible after the initial stages of drawdown. Because of the possible short lead time, the SSPs



provide for the establishment of a list of prospective offerors, to whom the Department of Energy would furnish copies of all Notices of Sale.

The next step in the sales process is the preparation by prospective purchasers of their offers, which must be submitted before a time specified in the Notice of Sale. The SSPs require that the offerors unconditionally accept all terms and conditions made applicable to that sale by the Notice of Sale, include an offer guarantee of up to \$10 million, and offer at least the minimum price, if any, specified in the Notice of Sale.

Following the receipt of offers, the Department of Energy would evaluate the offers to select the "apparently successful" offerors. The evaluation process is structured so that the offerors bidding the highest prices can select the method by which the Strategic Petroleum Reserve petroleum is to be transported, up to the limits of the Strategic Petroleum Reserve distribution systems, with specific delivery arrangements to be negotiated later.

Under the SSPs, all apparently successful offerors are required, within as little as 5 business days after being notified, to provide a letter of credit or a cash deposit in an amount equal to 110 percent of the contract value as a guarantee of performance and payment of amounts due under the contract.

Upon timely receipt of the financial guarantees, and upon a final determination by the Contracting Officer that the offer was responsive and the offeror responsible, the Department of Energy will issue the Notice of Award and commence

deliveries of SPR oil upon the purchasers arranging their pipeline or marine vessel means of transportation. Such deliveries could commence as soon as the 16th day after the commencement of the sales process, to the extent that the purchasers are able to provide their financial guarantees and arrange transportation expeditiously.

---

### DRAWDOWN AND DISTRIBUTION CAPABILITIES

Based on the Strategic Petroleum Reserve's December 31, 1990 crude oil inventory of 585.7 million barrels and the existing Strategic Petroleum Reserve drawdown systems, the Strategic Petroleum Reserve's current drawdown and distribution capabilities are as shown in Table 11. The distribution capabilities have increased slightly from those shown in the February 1990 Strategic Petroleum Reserve Annual/Quarterly Report, due primarily to increased refinery demands in the Capline System.

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**TABLE 11**

### CURRENT DRAWDOWN AND DISTRIBUTION CAPABILITIES (Thousands of Barrels Per Day)

	Drawdown	Distribution	
Seaway Group	1,100	1,100	
Texoma Group	1,350	1,350	
Capline Group	<u>1,070</u>	<u>1,070</u>	
<b>TOTAL</b>	<b>3,520</b>	<b>3,520</b>	

---

The Strategic Petroleum Reserve is currently capable of initially being drawn down and distributed at a maximum sustained rate of 3.5 million barrels per day for a 90-day period. After 90 days, the Strategic Petroleum Reserve drawdown/distribution rate would decrease gradually as the site inventories deplete and the declining number of remaining caverns containing crude oil become a constraint on the sites' drawdown rates. Figure 7 illustrates the Strategic Petroleum Reserve's current physical drawdown/distribution capability, which provides for a distribution of approximately 54 percent of the Reserve in 90 days, 93 percent of the Reserve in 180 days, and 100 percent of the Reserve in 320 days.

The Strategic Petroleum Reserve currently has a Distribution Enhancement Program underway to improve the Strategic Petroleum Reserve's distribution systems in order to achieve a higher drawdown/distribution capability. Details of the Distribution Enhancement Program follow.

---

#### DISTRIBUTION ENHANCEMENTS

In late 1984, the Strategic Petroleum Reserve initiated a Distribution Enhancement Program to assure that Strategic Petroleum Reserve distribution capability will adequately support drawdown performance. This program was prompted by a major decline in foreign crude oil demands by Mid-West refiners, resulting in the conversion to natural gas transmission of two major interstate pipelines to which the Strategic Petroleum Reserve was connected (Seaway and Texoma).

The Distribution Enhancement Program objective is to increase distribution capability from the 1986 level of 2.3 million barrels per day to the planned 4.5 million barrels per day for the 750 million barrel Reserve. The current and planned Strategic Petroleum Reserve Distribution System is shown in Figure 8.

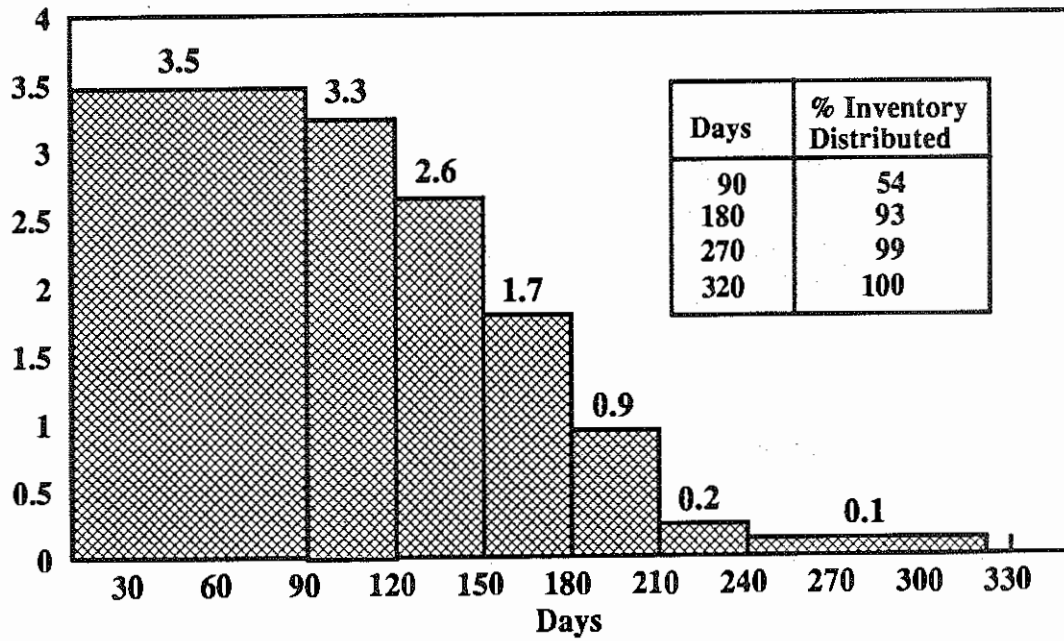
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#### SEAWAY GROUP

The Seaway distribution system was originally designed to access U.S. refiners via the Seaway Interstate Pipeline and the Freeport marine facilities. After the Seaway Pipeline was converted to natural gas transmission in 1984, DOE proposed the construction of a new distribution pipeline from the Bryan Mound storage site to the ARCO terminal in Texas City, Texas, capable of distributing one million barrels of crude oil per day to the Houston/Texas City refining centers. In 1987, DOE completed construction of the Texas City distribution pipeline and modifications to two commercial marine facilities for additional waterborne distribution.

In 1988, DOE initiated a further enhancement project to increase the Seaway drawdown/distribution rate from 1.1 million to 1.25 million barrels per day to reduce requirements and costs for commercial marine distribution services in the Texoma Group. This enhancement involves increasing only the Bryan Mound site drawdown capability. In 1989, the Department constructed a second pipeline from the raw water intake structure to the site's central pumping facilities. In 1990, the Department awarded a construction contract for modifications to on-site pumping and

Million Barrels Per Day



112058-4

FIGURE 7

STRATEGIC PETROLEUM RESERVE DRAWDOWN / DISTRIBUTION CAPABILITY  
Inventory as of 12/31/90

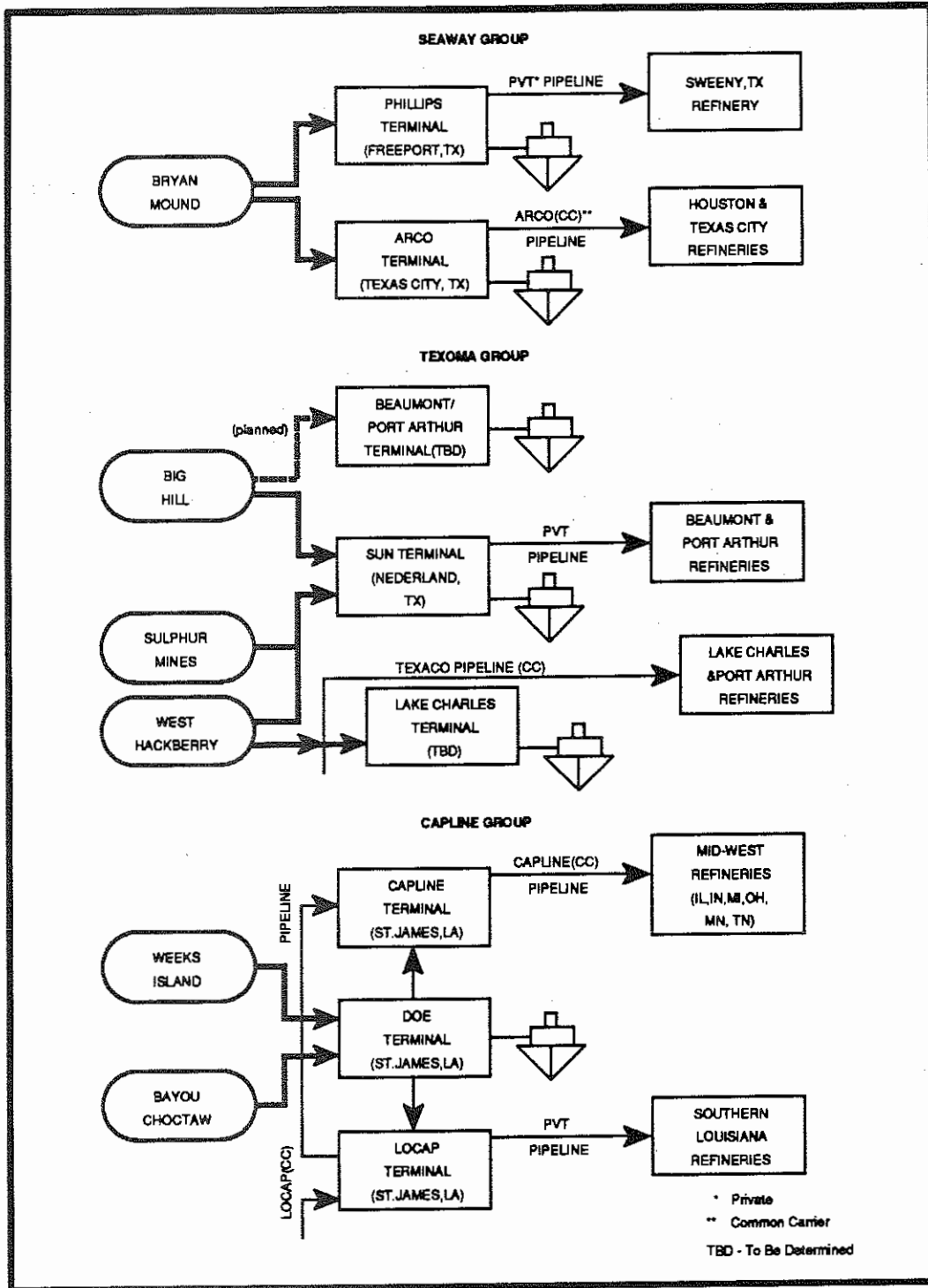


Figure 8

## Current and Planned Strategic Petroleum Reserve Distribution System for the Seaway, Texoma, and Capline Groups

pipng systems to increase the site's sustainable drawdown capability from 1.1 to 1.25 million barrels per day. Project completion is scheduled for June 1991.

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### TEXOMA GROUP

The Texoma distribution system was originally designed to access U.S. refiners via the Texoma Interstate Pipeline and the Sun Marine Terminal in Nederland, Texas. After the Texoma Pipeline was converted to natural gas transmission in 1984, DOE proposed enhancements to the Texoma Group distribution system to include construction of a new distribution pipeline from the West Hackberry storage site to the Lake Charles, Louisiana junction of Texaco's 22-inch common carrier pipeline system, and acquisition of marine distribution services at commercial terminals in the Lake Charles and Beaumont/Port Arthur areas.

The Department completed construction of the 12-mile Lake Charles crude oil distribution pipeline from the West Hackberry oil storage site and construction of a custody metering station at the Texaco pipeline junction in 1989. Oil fill and flow testing of the pipeline and meter station were successfully completed in 1990. This pipeline provides the Strategic Petroleum Reserve with distribution capabilities to two refineries in Lake Charles, Louisiana and one refinery in Port Arthur, Texas.

In 1989, the Department issued a competitive solicitation for marine distribution services at commercial terminals in the Texoma area. However, only one offer was received and because of the offeror's terms, the Department was forced to cancel the procurement. In December 1990, the Department issued a revised solicitation for up to 700,000 barrels per day of additional marine and pipeline distribution services within the Texoma Group; the solicitation response time and the types of services considered have been expanded over the initial solicitation in order to attract more offers.

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### CAPLINE GROUP

Distribution enhancements previously planned for the Capline Group distribution system included the construction of a direct pipeline connection from the Department of Energy's St. James, Louisiana Terminal to the adjacent Capline Pipeline Terminal, and the acquisition of additional marine distribution services at commercial terminals in the St. James area. The Department has completed construction of a pipeline connection between the Department's St. James Terminal and the Capline Pipeline Terminal which became operational in 1988. Capline Pipeline distribution demands have increased significantly since 1985 due to increasing refinery imports into the Mid-West; consequently, the Department no longer requires additional commercial marine distribution services in the St. James area.

## APPENDICES

- A. Industry Responses to TEST SALE-90 Questionnaire ..... 47
- B. Strategic Petroleum Reserve Site Status ..... 50
- C. Strategic Petroleum Reserve Crude Oil Specifications..... 61

## APPENDIX A

# INDUSTRY RESPONSES TO TEST SALE-90 QUESTIONNAIRE

In order to obtain feedback on TEST SALE-90 and the Strategic Petroleum Reserve's sales process in general, questionnaires were prepared and mailed to 267 entities that received the Notice of Sale for TEST SALE-90. The questionnaires were tailored separately for the successful offerors, the unsuccessful offerors, and those who declined to submit an offer. Ninety-three responses were received from:

- 10 of 11 purchasers;
- 14 of 22 unsuccessful offerors; and
- 69 of 248 who received the Notice of Sale but did not submit an offer.

Of the successful offerors and nonsuccessful offerors who responded to the questionnaire, all but two had attended an August 28, 1990, briefing on the sales process held by the Strategic Petroleum Reserve in Houston<sup>1</sup>. They indicated that the briefing contributed to their ability to participate in TEST SALE-90. Twenty-three of those who did not submit an offer responded that TEST SALE-90 stimulated their companies to undertake planning to purchase the Reserve's crude in the event of future supply shortages.

Of those who submitted successful offers, 9 of 10 were engaged in either crude oil refining or crude oil trading or both. Other types of business activities of the successful offerors included exploration and production, refined product retailing, crude oil pipeline ownership and/or operation,

crude oil terminal ownership and/or operation, crude oil tanker ownership/operation, and crude oil importation. Those who submitted unsuccessful offers or did not submit offers were primarily engaged in the same crude oil activities. Two trade associations and two state energy offices also responded to the questionnaire.

Of the successful and unsuccessful offerors, eighteen indicated they participated in TEST SALE-90 in order to gain experience in Strategic Petroleum Reserve crude oil sales, with six also expressing desire to buy at a price below other available crude oils as a motivation for participation. Three cited a need for crude oil supplies as their motive. Sixty-two respondents to the questionnaires expressed willingness to participate in future test sales and/or simulated sales exercises.

The "Jones Act" requirement to use U.S.-flag vessels was a major factor influencing offers. Fifteen companies cited unfavorable transportation economies or the uncertainty of being able to charter a coastwise-qualified vessel at all as being a determinant of either the quantitative size or price associated with their offer, or their decision not to offer on particular Master Line Items at all. Likewise, seven offerors expressed the lack of barge facilities at the Seaway and Capline complexes as a deterring factor associated with offers they might otherwise have submitted, because of the uncertainties and costs associated with U.S.-flag vessels and their lack of

<sup>1</sup>Briefing was held to prepare industry for a planned simulated sales training exercise which was canceled due to the direction to perform TEST SALE-90.

demand for tanker-sized quantities. For those respondents who commented on marine delivery capabilities, the most common recommendation submitted by both successful and unsuccessful offerors, as well as various companies who declined to bid, was to issue a blanket waiver of the "Jones Act" concurrent with the Notice of Sale.

Two reasons given by those who declined to offer were the inability of mid-continent or other smaller refiners to receive Strategic Petroleum Reserve crude oil because they were landlocked or they did not have the refinery sophistication to process Strategic Petroleum Reserve sour crudes. Four therefore suggested a longer period between the issuance of the Notice of Sale and the offer due date to enable them to arrange for an exchange of Strategic Petroleum Reserve crude with other suppliers. There were no comments, however, which indicated that the quality of Strategic Petroleum Reserve crude oil would not meet the needs of the U.S. refining industry.

The addition of a price index was roundly viewed as an improvement over a fixed price bid. Fifty respondents reported the index was an improvement. The most prevalent suggestion was to delete the sour Alaska North Slope factor from the index applicable to sweet crudes, and delete the Louisiana Light Sweet factor from the index applicable to sour crudes. Besides one suggestion to include North Sea Brent crude in the index, most respondents expressed comfort with the domestic crudes used in the indices as satisfactory "marker" crudes for the Strategic Petroleum Reserve crude oil. Ten expressed a preference to submit their offers as a bonus/discount to the index rather

than as a specific price. Their explanation was that a bonus/discount structure is simpler, more consistent with standard industry practices, and the price adjustment mechanism contained in the Notice of Sale was simply a more complicated methodology to yield the same result.

A new feature incorporated in TEST SALE-90 was the option to submit offers on personal computer disks. Most offers were submitted on these disks, with favorable comments on the ease of use of the disks and their error-checking capabilities. One error contained in the printout routine for the offer guarantee, in which one digit was truncated, has been corrected.

Some respondents commented that they had problems finding banks willing to issue letters of credit as offer guarantees or payment and performance guarantees consistent with the formats prescribed in the Standard Sales Provisions. Action has been taken to rewrite the letters of credit to more closely align with changes recommended by various financial institutions or experts. Several recommended that the payment and performance guarantees be waived for reputable businesses or at least only be a requirement until a company's "track record" with the Strategic Petroleum Reserve has been established.

Finally, several of the successful offerors commented on the volume of paperwork and communications involved in scheduling and receiving deliveries. They suggested that firm delivery schedules or delivery modes not be locked in until closer to the time of delivery. Most purchasers, however had no specific recommendation on improving the delivery scheduling



process and were generally complimentary of the Strategic Petroleum Reserve Project Management Office staff's competence and flexibility.

# APPENDIX B

## STRATEGIC PETROLEUM RESERVE SITE STATUS

### BAYOU CHOCTAW

#### LOCATION

Iberville Parish, Louisiana (12 miles southwest of Baton Rouge, Louisiana).

#### ACQUISITION

Acquired 355.95 acres fee simple, by condemnation April 1977, from numerous private owners. Union Texas Petroleum (a subsidiary of Allied Corporation) was the previous operator.

In 1985, the Department of Energy acquired an additional existing cavern through a cavern exchange agreement with Union Texas Petroleum. The transaction involved a 3.5 acre exchange with no net change in Government-owned acreage.

#### ENVIRONMENTAL/PERMITS

Environmental Impact Statement published December 1976; supplement published May 1977.

Four major Federal and state permits related to pipeline, well pad, storage, and storm water runoff acquired in 1978, and updated in 1980 and 1981.

#### SITE DESCRIPTION

A 72-million-barrel storage facility consisting of 62 million barrels in five existing caverns, plus 10 million barrels of storage capacity in a new Strategic Petroleum Reserve-developed cavern.

Oil, brine, and raw water piping distribution system connecting caverns with central plant, a water intake structure, 12 brine disposal wells located 2.5 miles offsite, and a pipeline for supplying brine to Union Texas Petroleum, Inc. Oil and water distribution system consists of over 50,000 feet of piping and 18 pumps totaling over 20,000 horsepower. A 100,000 barrel brine pit and an oil/brine separator are also onsite.

Numerous permanent specialized buildings include: Control Center, Security Operations Center, Maintenance Shop and Laboratory, Electrical Switch Gear (5KV), Spare Parts Warehouse, Foam Storage, Instrument Shop, Documentation Storage and a Guard House.

#### SYSTEM PARAMETERS

Oil fill via 36-inch-diameter, 37.2-mile pipeline from St. James Terminal. Sustained system rate - 110,000 bbl/d (brine disposal-constrained).

Raw water design pumping rate - 495,000 bbl/d.

Brine disposal design pumping rate - 110,000 bbl/d.

#### DRAWDOWN

Drawdown via 36-inch-diameter, 37.2-mile pipeline to St. James Terminal and to Capline pipeline.

Design drawdown capability  
upon completion - 480,000 bbl/d.

### **MAJOR ACCOMPLISHMENTS**

Approximately 56 million barrels  
of oil are in storage.

Completed development of a new  
10-million-barrel cavern and initiated  
a 6-million-barrel expansion of an  
existing cavern.

# WEEKS ISLAND

## LOCATION

Iberia Parish, Louisiana (95 miles southwest of New Orleans).

## ACQUISITION

Acquired 382.92 acres fee simple subsurface and 6.63 acres fee simple surface, by condemnation September 1977, from Morton Salt Company.

## ENVIRONMENTAL/PERMITS

Environmental Impact Statement published January 1977; supplement published August 1977.

Major Federal permit related to oil pipeline to St. James Terminal acquired in 1978. Three major Federal and state permits related to oil storage, air emissions and storm water, and treated sewage effluent discharge acquired in 1979; EPA National Pollutant Discharge Elimination System permit updated in 1982.

## SITE DESCRIPTION

Conventional room and pillar salt mine containing 72 million barrels of storage capacity in two levels. Dedicated to sour crude oil storage.

Oil piping distribution system consists of 11 (10 operational and one reserve) submersible electric pumps in the mine to boost crude to the surface and twin main-line pumps (plus one reserve) to deliver crude to the St. James, Louisiana Terminal during drawdown. Pumps total 17,000

horsepower. Firewater system has a 500,000 gallon tank with pumps, and mine inert gas and vapor recovery systems provide for safety.

Numerous permanent specialized buildings include: Administration and maintenance, Control Center, Security Operations Center, Spare Parts Warehouse, Electrical Substation, Laboratory and Sample, Inert Gas Generator, Foam Storage, Fire Water Pump House, Mainline Pump House, Headframe Production Shaft, Production Shaft Hoist, Headframe-Service Shaft, Service Shaft Hoist, Service Shaft Motor Control Center and a Guard House.

## SYSTEM PARAMETERS

Oil fill via 36-inch-diameter, 67.2 mile pipeline from St. James Terminal. Sustained system rate - 350,000 bbl/d (terminal throughput limited).

## DRAWDOWN

Drawdown via 36-inch-diameter 67.2-mile pipeline to St. James Terminal and to Capline pipeline.

Design drawdown capability - 590,000 bbl/d.

## MAJOR ACCOMPLISHMENTS

Approximately 72 million barrels of crude oil are in storage.

Completed construction of an air drying system to reduce water vapor condensation within the manways and

shafts providing for early detection of incipient water leaks should any develop.

Design was completed and a solicitation issued for an alternate (redundant) drawdown system utilizing high capacity submersible pumps to be installed in the oil-fill holes.

Installed subsurface convergence-measuring instrumentation in mine and service shafts to monitor salt creep and shaft stability.

# BRYAN MOUND

## LOCATION

Brazoria County, Texas (three miles southwest of Freeport, Texas).

## ACQUISITION

Acquired 499.47 acres fee simple, by condemnation April 1977, from Freeport Mineral Company and other owners. Dow Chemical Company was the previous operator.

In 1986, Department of Energy acquired the pre-existing Brazoria County Road 242 within the site boundary through a relocation agreement with the county.

## ENVIRONMENTAL/PERMITS

Environmental Impact Statement published January 1977; supplement published December 1977. Phase III supplement published October 1981.

Five major Federal and state permits related to pipelines, water intake, and storage acquired in 1977 and 1978. National Pollution Discharge Elimination System updated 1981; renewed 1984. Seaway Environmental Impact Statement published June 1978. Supplement published October 1981.

Two major Federal permits related to brine disposal pipeline issued in 1978. Permit for brine discharge increased to 1.1 million bbl/d August 1981.

## SITE DESCRIPTION

226-million-barrel storage facility consisting of 66 million barrels of

capacity in four caverns existing upon site acquisition, plus 160 million barrels of storage capacity in 16 Strategic Petroleum Reserve-developed caverns.

36-inch-diameter, 14.6-mile brine disposal pipeline extending 13 miles offshore in the Gulf of Mexico.

Oil, brine and raw water piping distribution system connecting caverns with central plant and water intake structure located on Brazos River and connected by a 36-inch pipeline. Oil/brine/water distribution system consists of over 101,000 feet of piping and 33 pumps totaling over 38,000 horsepower. Four 200,000-barrel oil storage tanks, two brine pits (15,000 and 150,000) and an oil-brine separator.

Numerous permanent specialized buildups include: Control Center, Security Operations Center, Maintenance, Spare Parts Warehouse, Foam Generator, Foam Storage (3), Electrical Switch Gear and a Guard House.

## SYSTEM PARAMETERS

Fill via 30-inch-diameter, 3.6-mile pipeline from Phillips 66 Freeport Marine Terminal. Design oil fill rate - 240,000 bbl/d. Sustained system rate - 180,000 bbl/d.

Raw water design pumping rate - 1,140,000 bbl/d.

Brine disposal design pumping rate - 980,000 bbl/d (permit limitation 1,100,000 bbl/d).

## **DRAWDOWN**

Drawdown via 30-inch diameter, 3.6 mile pipeline, to Phillips 66 Freeport Marine Terminal.

Drawdown via 40-inch diameter, 46-mile pipeline to ARCO Pipeline Company's Texas City Pipeline Terminal and Docks.

Design drawdown capability - 1,100,000 bbl/d.

## **MAJOR ACCOMPLISHMENTS**

Approximately 221 million barrels of crude oil are in storage.

Modifications to increase the site's drawdown/distribution capability to 1.25 million barrels per day are over 60 percent complete.

A comprehensive ultrasonic inspection was performed on the brine disposal pipeline and plans were established for its repair.

# SULPHUR MINES

## LOCATION

Calcasieu Parish, Louisiana (two miles south west of Sulphur, Louisiana, and 20 miles north of West Hackberry salt dome).

## ACQUISITION

Acquired 109.63 acres fee simple and 64.52 acres conditional fee, by condemnation February 1979, from Union Texas Petroleum Company.

## ENVIRONMENTAL/PERMITS

Environmental Impact Statement published March 1978.

Three major Federal and State permits for pipeline construction, oil storage, and air emissions acquired in 1978. Environmental Protection Agency discharge permits for storm water and sewage acquired in 1980.

Published Environmental Assessment and Finding of No Significant Impact in 1990 for decommissioning facility.

## SITE DESCRIPTION

26-million-barrel storage facility consisting of three existing caverns.

Oil, brine, and raw water piping distribution system connecting caverns with central plant, water intake structure located 1.8 miles offsite on Sabine River Diversion Canal No. 5, connected by 12 and 16-inch pipelines, 4 brine disposal wells, and two 100,000 barrel brine ponds. Consists of over

77,000 feet of piping and 18 pumps totaling over 8,000 horsepower.

Permanent specialized buildings include: Control & Maintenance Center, Security Operations Center and Foam Storage.

## SYSTEM PARAMETERS

Oil fill via 16-inch-diameter, 15.9-mile spur pipeline connecting to Department of Energy's 42-inch West Hackberry pipeline at Intracoastal Waterway. Sustained system rate - 80,000 bbl/d (brine disposal-constrained).

Raw water design pumping rate - 100,000 bbl/d.

Brine disposal design pumping rate - 80,000 bbl/d.

## DRAWDOWN

Drawdown via 16-inch-diameter, 15.9 mile spur pipeline to Intracoastal Waterway, which connects to the 42-inch-diameter West Hackberry line to Sun Terminal, Nederland, Texas.

Design drawdown capability - 100,000 bbl/d.

## MAJOR ACCOMPLISHMENTS

Twenty-five million barrels of oil are in storage.

Initiated transfer of Sulphur Mines' oil to the Strategic Petroleum Reserve's Big Hill facility in December 1990.



# WEST HACKBERRY

## LOCATION

Cameron Parish, Louisiana (22 miles southwest of Lake Charles, Louisiana).

## ACQUISITION

Acquired 405.36 acres fee simple, by condemnation April 1977, from numerous private landowners. Olin Corporation was the previous site operator.

Acquired 160.0 additional acres fee simple by condemnation in two actions, July 1979 and March 1980.

## ENVIRONMENTAL/PERMITS

Environmental Impact Statement published January 1977; supplement published April 1977. Phase III supplement published October 1981.

Six major Federal and state permits related to pipelines, drilling pads, water intake, and storage acquired in 1977 and 1978; National Pollutant Discharge Elimination System permit renewed 1984.

Texoma Environmental Impact Statement published November 1978; supplement published in October 1981.

Two major Federal permits related to a brine pipeline acquired in 1980.

## SITE DESCRIPTION

219-million-barrel storage facility consisting of 49 million barrels in five caverns existing upon site acquisition, plus 170 million barrels of storage

capacity in 17 Strategic Petroleum Reserve-developed caverns.

Oil, brine, and raw water piping distribution system connecting caverns with central plant, water intake structure located on Intracoastal waterway connected by a 42-inch diameter, 4.5 mile pipeline, and 10 brine disposal wells. Consists of over 160,000 feet of piping and 45 pumps totaling over 62,000 horsepower. 36-inch-diameter, 27-mile brine disposal pipeline extending nine miles offshore in the Gulf of Mexico, a 175,000-barrel brine pit and an oil-brine separator.

Numerous permanent specialized buildings include: Control Center, Security Operations Center, Maintenance, Spare Parts Warehouse, Covered Lay-Down, Film Storage, Foam Storage and a Guard House.

## SYSTEM PARAMETERS

Fill via 42-inch diameter, 42.8-mile pipeline from Sun Terminal, Nederland, Texas. Design oil fill rate - 225,000 bbl/d. Sustained system rate - 175,000 bbl/d.

Raw water design pumping rate - 1,450,000 bbl/d.

Brine disposal design pumping rate - 900,000 bbl/d (permit limitation 1,088,000 bbl/d) via 36-inch pipeline to the Gulf of Mexico.

## DRAWDOWN

Drawdown via a Department of Energy 42-inch-diameter, 42.8-mile pipeline to Sun Terminal, Nederland, Texas.

Drawdown via a 36-inch diameter, 12-mile oil pipeline (Department of Energy Lake Charles Pipeline) connecting to the Texas 22-inch common carrier pipeline and to refineries in Lake Charles, Louisiana.

Design drawdown capability - 1,400,000 bbl/d.

#### **MAJOR ACCOMPLISHMENTS**

Approximately 206 million barrels of crude oil are in storage.

Construction of a 12-mile, 36 inch oil pipeline connecting to the Texas 22-inch common carrier pipeline near Lake Charles, Louisiana, and to refineries in Lake Charles, to enhance Strategic Petroleum Reserve distribution capability.

Construction of an oil custody metering station at the Texaco 22-inch pipeline junction.

# BIG HILL

## LOCATION

Jefferson County, Texas (20 miles southwest of Beaumont, Texas).

## ACQUISITION

Acquired 271 acres fee simple, by condemnation November 1982 and July 1983, from three landowners, i.e., 238.48 acres from Amoco, 27.06 acres from the Pipkin estate, and 5.46 acres from the Patrick Henry Phelan estate.

## ENVIRONMENTAL/PERMITS

Environmental Impact Statement published October 1981.

State permits for drilling, underground hydrocarbon storage, pipeline operations, air quality, water appropriation, and water quality certifications were acquired in 1983. The EPA National Pollutant Discharge Elimination System permit was acquired in 1984.

## SITE DESCRIPTION

160-million-barrel storage facility consisting of fourteen Strategic Petroleum Reserve-developed 11.5 million barrel storage caverns.

Oil, brine, and raw water systems connecting caverns with central plant, water intake structure located on the Intracoastal Waterway connected by a 48-inch diameter, and brine disposal pipeline extending 3 miles offshore in the Gulf of Mexico.

Numerous permanent specialized buildings include: Control Center, Administration, Security Operations Center, Communications, Guard House, Covered Lay-Down, Fire House, Sample Storage and a Maintenance.

## SYSTEM PARAMETERS

Fill via 36-inch-diameter, 25 mile pipeline from Sun Terminal, Nederland, Texas. Sustained system rate 280,000 bbl/d.

Raw water design pumping rate - 1,400,000 bbl/d.

Brine disposal design pumping rate - 1,400,000 bbl/d (permit limitation of 1,700,000 bbl/d).

## DRAWDOWN

Drawdown via 36-inch-diameter, 25 mile pipeline to Sun Terminal, Nederland, Texas.

Design Drawdown capability - 930,000 bbl/d.

## MAJOR ACCOMPLISHMENTS

Achieved 70 percent (115 million barrels) completion of planned capacity development; 10 of 14 planned caverns have been completed.

Completed security system construction including a security operations center building on the main site as well as security control at raw water intake structure.

# ST. JAMES TERMINAL

## LOCATION

St. James Parish, Louisiana (45 miles southeast of Baton Rouge, Louisiana, on the Mississippi River).

## ACQUISITION

Acquired 104.76 acres of fee simple for terminal by condemnation in May 1978.

Acquired 47.68 acres fee simple for docks by condemnation in July 1978.

## ENVIRONMENTAL/PERMITS

St. James' Terminal Environmental Impact Statement is a component of the Bayou Choctaw supplement, published May 1977, and the Weeks Island supplement, published August 1977.

Two major Federal and state permits related to dock construction were acquired in 1978. Environmental Protection Agency discharge permit for storm water and sewage acquired in 1980. Dock Construction Permit modified 1982.

## SITE DESCRIPTION

Terminal facilities include six storage tanks totaling two million barrels of capacity, tie-ins to Bayou Choctaw and Weeks Island sites, and to LOCAP and Capline pipeline terminals.

Oil distribution piping system connecting docks, tanks, and pump station consists of over 35,000 feet of piping and five pumps totaling over 7,500 horsepower, metering systems, and maintenance and control buildings.

Two docks with one berth each, able to accommodate vessels of up to 123,000 long tons maximum loaded displacement. A 42-inch-diameter pipeline connects the docks to the storage tanks.

## SYSTEM PARAMETERS

Tanker unloading - design unloading capacity of 40,000 bbl/hr.

Distribution from terminal to:

Bayou Choctaw: design pumping rate - 240,000 bbl/d.

Weeks Island: design pumping rate - 480,000 bbl/d.

Terminal throughput: fill sustained system rate - 350,000 bbl/d;

Across docks - 435,000 bbl/d.

## DRAWDOWN

Crude oil from Bayou Choctaw and/or Weeks Island to be distributed across docks and to LOCAP and Capline Pipeline Terminal.

## MAJOR ACCOMPLISHMENTS

Completed security improvements at St. James terminal.

## APPENDIX C

### STRATEGIC PETROLEUM RESERVE CRUDE OIL SPECIFICATIONS (SPRO 1990 SEP)<sup>a</sup>

Characteristic	Sour <sup>b</sup>	Sweet <sup>c</sup>	Primary ASTM Test Method <sup>d</sup>
API Gravity [°API]	30 - 45	30 - 45	D 1298
Total Sulfur [Wt. %], Max.	1.99	0.50	D 1552
Pour Point [°F(°C)], Max.	50 (10)	50 (10)	D 97
Salt Content [Lbs./1,000 Bbls.], Max.	50	50	D 3230
Viscosity [SUS @ 60°F (cSt @ 15.6°C)], Max.	150 (32)	150 (32)	D445 & D 2161
[SUS @ 100°F (cSt @ 37.8°C)], Max.	70 (13)	70 (13)	
Reid Vapor Pressure [Psia @ 100°F (kPa @ 37.8°C)], Max.	11 (76)	11 (76)	D 323
Total Acid Number [mg KOH/g], Max.	0.40	0.40	D 664
Water and Sediment [Vol. %], Max.	1.0	1.0	D 473 & D 4006 or D 4928
Yields [Vol. %]			D 2892 & D 1160
Naphtha [<375°F(<191°C)]	24 - 30	21 - 42	
Distillate [375-620°F (191-327°C)]	17 - 31	19 - 45	
Gas Oil [620-1050°F (327-566°C)]	26 - 38	20 - 42	
Residuum [>1050°F(>566°C)]	10 - 19	14 Max.	

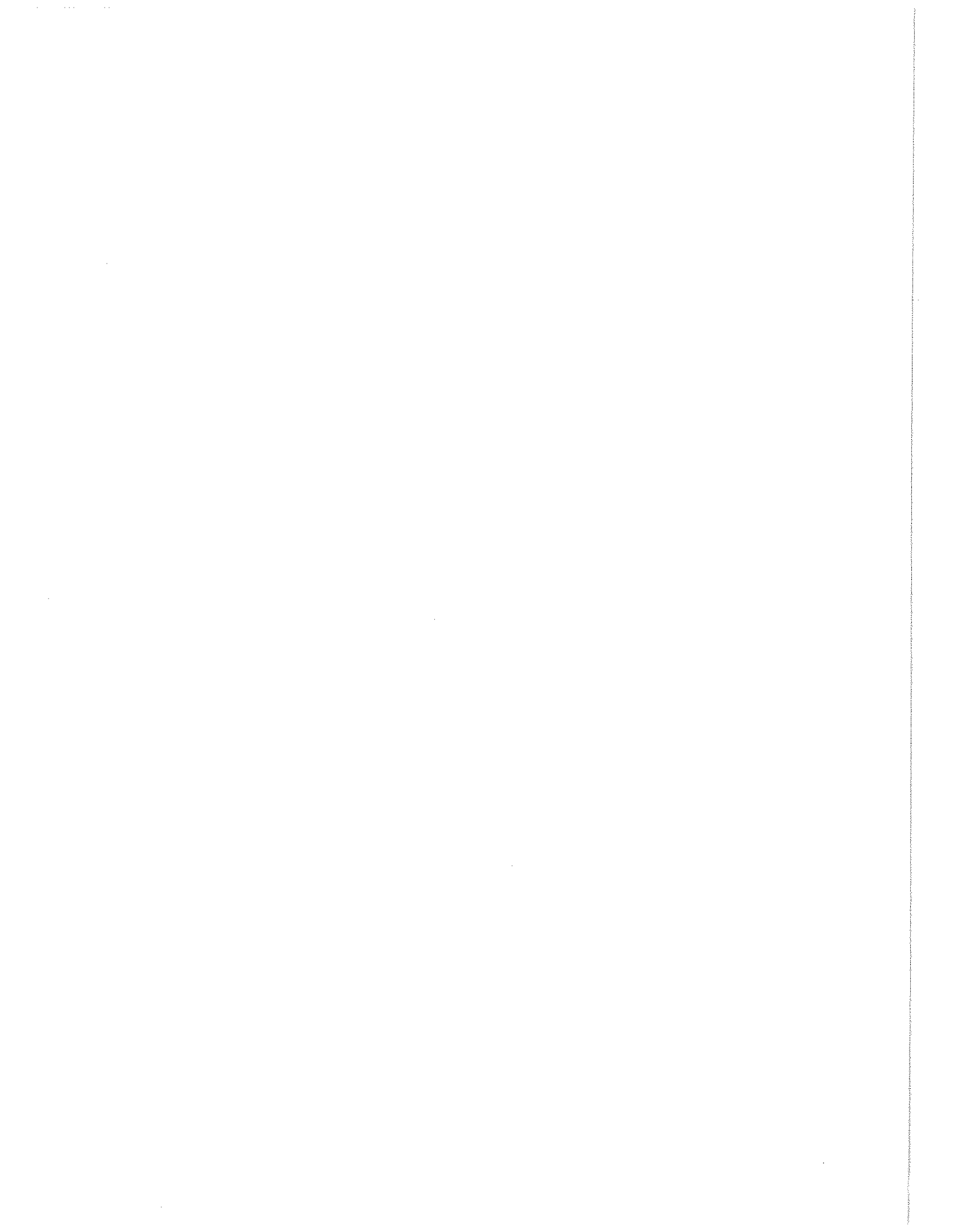
<sup>a</sup> Marketable virgin crude petroleum suitable for normal refinery processing and free of foreign contaminants or chemicals including, but not limited to, chlorinated and/or oxygenated hydrocarbons, and lead.

<sup>b</sup> Crude oils that meet these sour specifications include Arabian Berri, Arabian Light, Dubai (Fateh), Flotta, Isthmus, Lagomedio, Oman, Qatar Marine, Tia Juana Light, Upper Zakum, and West Texas Sour.

<sup>c</sup> Crude oil that meet these sweet specifications include Bonny Light, Brass River, Brent, Ekofisk, Escravos, Forties, Kole Marine, Marib Light, Ninian, Oseberg, Palanca, Saharan Blend, Statford, West Texas Intermediate, and Zarzaitine.

NOTE: Crude oils other than those listed above may be acceptable. The acceptability of any crude oil is contingent upon an assay typical of current production quality of the stream.

<sup>d</sup> Alternate methods may be used if approved within the contract. Offerors shall submit requests to use alternate methods to the Contracting Officer for determination of acceptability. In case of disputes between origin and destination testing results, testing performed by the primary test method shall be used as the referee method on the custody transfer sample. medio, Oman, Qatar Marine, Tia Juana Light, Upper Zakum, and West Texas Sour.





*Strategic Petroleum Reserve*  
*ANNUAL/QUARTERLY REPORT*



*February 16, 1993*

*U.S. Department of Energy*  
*Assistant Secretary for Fossil Energy*  
*Office of Strategic Petroleum Reserve*





# ***Strategic Petroleum Reserve***

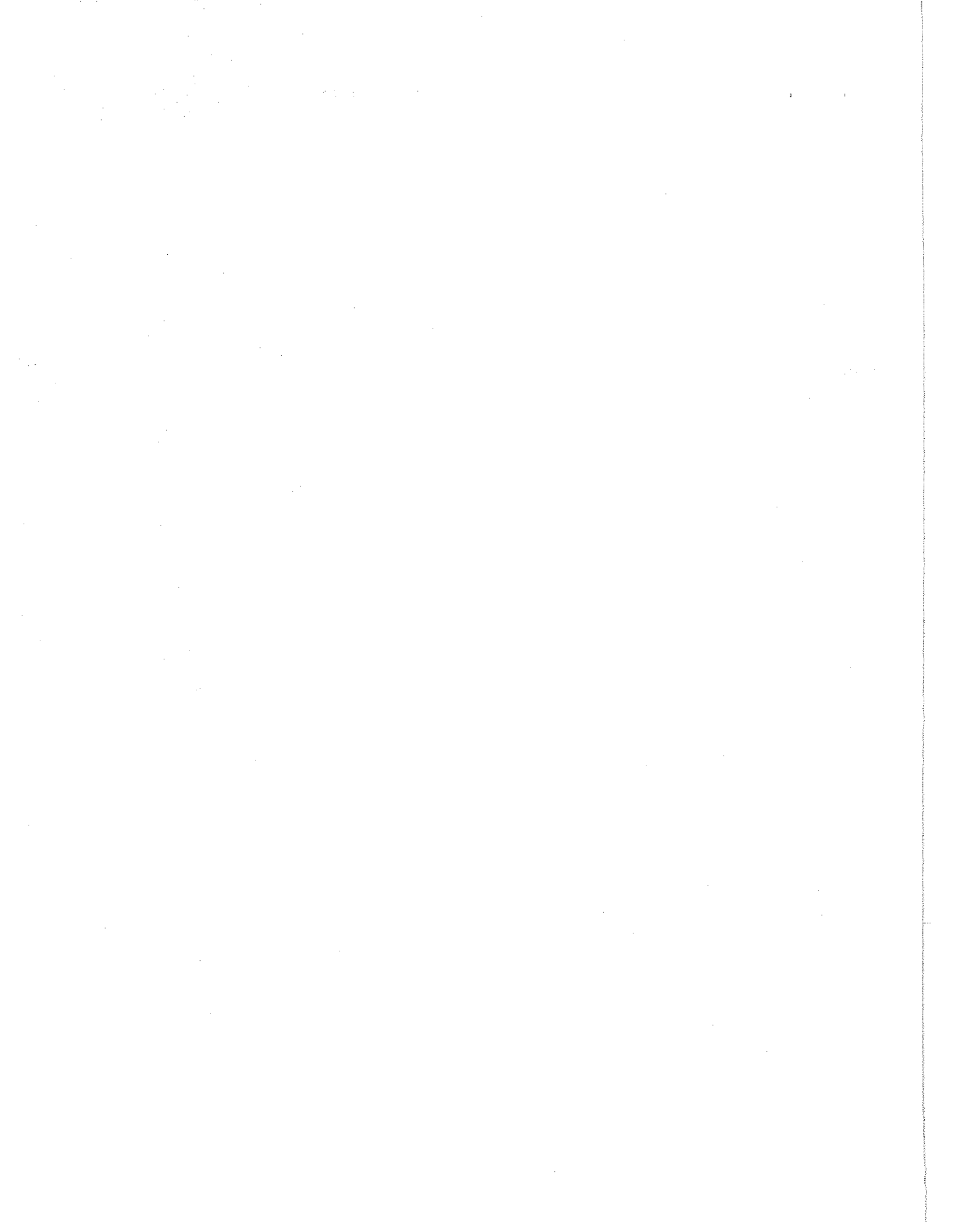
## ***ANNUAL/QUARTERLY REPORT***



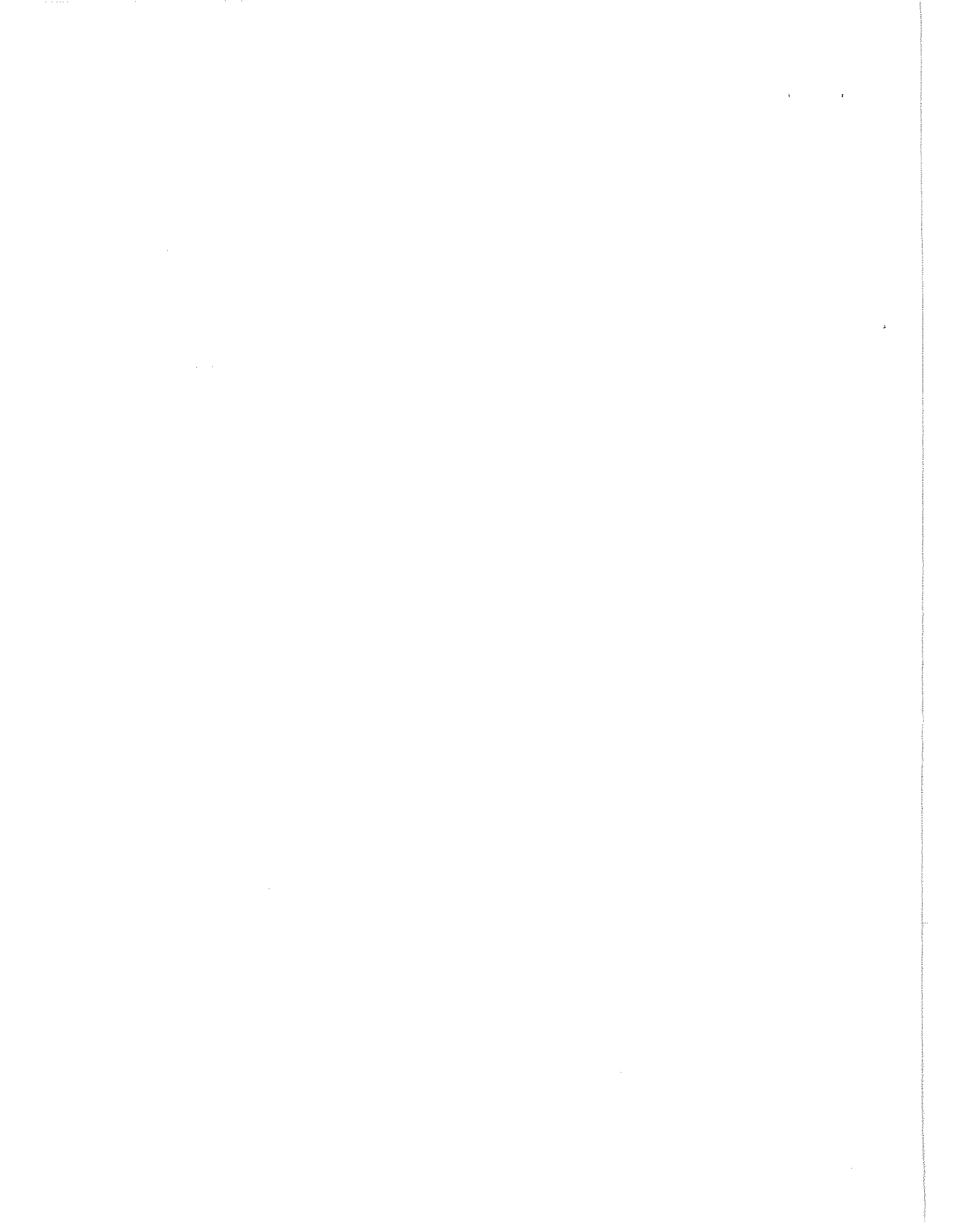
***February 16, 1993***

***U.S. Department of Energy  
Assistant Secretary for Fossil Energy  
Office of Strategic Petroleum Reserve  
Washington, DC 20585***





***This Strategic Petroleum Reserve  
Annual/Quarterly Report is dedicated to  
Robert L. Weller, the project manager of the  
Strategic Petroleum Reserve, who died on  
Sunday, November 1, 1992.***



# TABLE OF CONTENTS

	Page
EXECUTIVE SUMMARY .....	1
Key Activities .....	1
PROGRAM DEFINITION .....	3
Mission .....	3
Program Legislation .....	3
Strategic Petroleum Reserve Plan and Amendments .....	5
Program/Project Management .....	5
STORAGE FACILITY DEVELOPMENT PROGRAM .....	8
Development of the 750-Million Barrel Storage Program .....	8
Facilities Development Status .....	8
Recovery Program .....	13
Planning for 250-Million Barrel Expansion .....	13
OIL ACQUISITION AND FILL STATISTICS FOR THE FOURTH QUARTER 1992 ...	15
Oil Fill, Calendar Year 1992 .....	15
Oil Acquisition, Calendar Year 1992 .....	15
Cargo Preference Compliance .....	16
OTHER PROJECT ACTIVITIES .....	23
Strategic Petroleum Reserve Management and Operating Contractor .....	23
Procurement and Contractor Support .....	23
Security .....	23
Real Estate .....	24
ENVIRONMENT, SAFETY AND HEALTH .....	25
Environmental Compliance .....	25
Other Environmental, Safety and Health Actions .....	26
BUDGET AND FINANCE .....	27
Appropriations .....	27
Major Budget and Financing Actions During 1992 .....	27
DRAWDOWN AND DISTRIBUTION .....	32
Distribution Plan .....	32
Competitive Sales Procedures .....	32
Removal of Strategic Petroleum Reserve Crude Oil Allocation Regulations .....	33
Drawdown and Distribution Capabilities .....	33
1992 DRAWDOWN SYSTEMS TESTS .....	38

APPENDIX A Strategic Petroleum Reserve Site Status . . . . . 40 .  
APPENDIX B Strategic Petroleum Reserve Crude Oil Specifications . . . . . 50

# *LIST OF TABLES*

	<b>Page</b>
TABLE 1 Strategic Petroleum Reserve Oil Inventory and Delivery Statistics . . . . .	17
TABLE 2 Strategic Petroleum Reserve Oil Fill History . . . . .	18
TABLE 3 Crude Oil Received Through 1992 . . . . .	21
TABLE 4 Strategic Petroleum Reserve Crude Oil Inventory As of December 31, 1992 . .	22
TABLE 5 Strategic Petroleum Reserve Appropriations . . . . .	29
TABLE 6 Strategic Petroleum Reserve Crude Oil Streams . . . . .	35
TABLE 7 Current Drawdown and Distribution Capabilities . . . . .	36



# *LIST OF FIGURES*

	<b>Page</b>
FIGURE 1 Program/Project Management Structure . . . . .	7
FIGURE 2 Strategic Petroleum Reserve Complexes and Associated Pipelines and Terminals .	9
FIGURE 3 SPR Development to 750 Million Barrels . . . . .	10
FIGURE 4 Annual Strategic Petroleum Reserve Oil Fill . . . . .	19
FIGURE 5 Cumulative Strategic Petroleum Reserve Oil Fill . . . . .	20
FIGURE 6 Strategic Petroleum Reserve Annual Funding . . . . .	28
FIGURE 7 Strategic Petroleum Reserve Cumulative Funding . . . . .	28
FIGURE 8 Strategic Petroleum Reserve Drawdown/Distribution Capability . . . . .	36
FIGURE 9 Strategic Petroleum Reserve Pipeline and Marine Distribution Capabilities . .	37

# ***EXECUTIVE SUMMARY***

Section 165 of the Energy Policy and Conservation Act (Public Law 94-163), as amended, requires the Secretary of Energy to submit annual and quarterly reports to the President and the Congress on activities of the Strategic Petroleum Reserve (SPR). Additional prospective information related to the development and fill of the Strategic Petroleum Reserve is required by the Omnibus Budget Reconciliation Act of 1986 (Public Law 99-509). This report combines the fourth quarter 1992 Quarterly Report with the 1992 Annual Report.

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## ***KEY ACTIVITIES***

On October 24, 1992, the President signed the Energy Policy Act of 1992 (Public Law 102-486). The bill includes provisions relating to: (1) drawdown of the Strategic Petroleum Reserve, (2) enlargement of the Reserve to one billion barrels, (3) acquisition of stripper well oil to fill the Reserve, (4) eligibility of island states for regional storage, (5) study of insular areas' vulnerability to an oil disruption, and (6) evaluating the costs and benefits of employing futures and options contracts in the Strategic Petroleum Reserve Program to protect against unexpected price surges.

## **APPROPRIATIONS**

On October 5, 1992, the President signed the Department of Interior and Related Agencies Appropriations Act, 1993 (Public Law 102-381) which provided \$176.2 million for operations and management of the Reserve and includes an outlay cap of \$137 million on funds in the SPR Petroleum Account. Congress also provided \$125.6 million in the

Department of Defense Appropriations Act, 1993 (Public Law 102-396) for the Department of Energy to acquire crude oil for the Defense Department for storage in the Strategic Petroleum Reserve.

## **EXPANSION PLANNING**

During 1992 the Department continued planning activities for the expansion of the Strategic Petroleum Reserve to one billion barrels. A draft Environmental Impact Statement for the five candidate sites was completed in October 1992, and a series of public hearings was held during December 1992. Conceptual design engineering activities, life cycle cost estimates and geotechnical studies to support the technical requirements for an Strategic Petroleum Reserve Plan Amendment were essentially completed in December 1992.

## **STRATEGIC PETROLEUM RESERVE OIL ACQUISITION**

At the end of 1992, the Strategic Petroleum Reserve crude oil inventory was 574.7 million barrels and an additional 1.7 million barrels was in transit to the Reserve. During 1992 approximately 6.2 million barrels of crude oil were acquired for the Reserve. The crude oil was acquired under a continuous open solicitation for competitive offers and through the transfer of crude oil from the Naval Petroleum Reserves in California (NPR-1). Transfer of NPR-1 crude oil will continue at least until the end of March 1993, and acquisition of crude oil by the Defense Fuel Supply Center, the Department's purchasing agent, will resume in January 1993 and continue until available funds are expended.

## **TIGER TEAM**

A Department of Energy Tiger Team Environmental, Safety and Health (ES&H) Assessment was conducted at the Strategic Petroleum Reserve from March 9 through April 10, 1992. In general, the Tiger Team found that Strategic Petroleum Reserve activities do not pose undue environmental, safety or health risks. The Strategic Petroleum Reserve's Final Corrective Action Plan, prepared in response to the Tiger Team assessment, was submitted for Department approval in December 1992.

## **NEW MANAGEMENT AND OPERATING CONTRACTOR**

On November 18, 1992, the Assistant Secretary for Fossil Energy selected DynMcDermott Petroleum Operations Company to provide management and operating services for the Strategic Petroleum Reserve for a period of 5 years commencing April 1, 1993. DynMcDermott will succeed Boeing Petroleum Services, Inc.

# ***PROGRAM DEFINITION***

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## ***MISSION***

The Strategic Petroleum Reserve (SPR) is a large crude oil stockpile, under the control of the President of the United States. The Strategic Petroleum Reserve mission is to reduce vulnerability to economic, national security, and foreign policy consequences of supply interruptions by discouraging supply disruptions as a tool of other nations, and by adding to crude oil supplies in the United States, in the event of a disruption due either to political, military, or natural causes. The Strategic Petroleum Reserve is mandated by the Energy Policy and Conservation Act, as amended, and by the comprehensive energy plans of all Administrations since 1975 in recognition of the long term dependence of the United States on imported crude oil and petroleum products.

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## ***PROGRAM LEGISLATION***

The Strategic Petroleum Reserve was authorized by Congress with the enactment on December 22, 1975, of the Energy Policy and Conservation Act (Public Law 94-163), which declared it to be United States policy to establish a Strategic Petroleum Reserve of up to one billion barrels of petroleum products to reduce the impact of a severe energy supply interruption and to carry out the obligations of the United States under the International Energy Program.

The provisions of the Energy Policy and Conservation Act regarding the Strategic Petroleum Reserve were amended

by title VIII of the Energy Security Act (Public Law 96-294), enacted on June 30, 1980. This Act established a minimum average daily fill rate of 100,000 barrels and precluded sale of Naval Petroleum Reserve Number 1 (Elk Hills, California) crude oil except to fill the Strategic Petroleum Reserve, unless the Strategic Petroleum Reserve was being filled at the minimum rate or had an inventory of 500 million barrels.

The Energy Policy and Conservation Amendments Act of 1985 (Public Law 99-58), enacted on July 2, 1985, extended the provisions of title I, part B, of the Energy Policy and Conservation Act relating to the Strategic Petroleum Reserve until June 30, 1989, and directed the Secretary of Energy to conduct a sale or exchange of 1.1 million barrels of crude oil to test the drawdown and distribution capabilities of the Strategic Petroleum Reserve.

The Omnibus Budget Reconciliation Act of 1986 (Public Law 99-509), enacted on October 18, 1986, amended the Energy Policy and Conservation Act to require that the Strategic Petroleum Reserve be filled at a minimum rate of 75,000 barrels a day until at least 750 million barrels are in storage.

Public Law 100-531, an act amending the Department of Energy Organization Act (Public Law 95-91), enacted on October 25, 1988, authorizes protective force personnel who guard the Strategic Petroleum Reserve's storage and related facilities to carry firearms while performing official duties and to make arrests without warrants. The legislation also establishes trespass on Strategic Petroleum Reserve property as a Federal offense.

Public Law 101-46, an Act to extend Title I of the Energy Policy and Conservation Act, enacted on June 30, 1989, extended the Strategic Petroleum Reserve authorities contained in the Energy Policy and Conservation Act until April 1, 1990. The bill also required the Secretary to submit a report to Congress by February 1, 1990, on alternative means of financing oil acquisition for the Strategic Petroleum Reserve.

Short-term extensions of the Strategic Petroleum Reserve authorities contained in the Energy Policy and Conservation Act were enacted on March 31, 1990 (Public Law 101-262) and August 10, 1990 (Public Law 101-360).

On September 15, 1990, the President signed Public Law 101-383, the Energy Policy and Conservation Act Amendments of 1990, extending the Strategic Petroleum Reserve authorities contained in the Energy Policy and Conservation Act until September 30, 1994. Public Law 101-383 also contained provisions to amend Strategic Petroleum Reserve drawdown authorities, require a Strategic Petroleum Reserve Plan Amendment for completion of storage capacity for one billion barrels, authorize drawdown and distribution tests, provide for a 3-year test program of storage of refined petroleum products within the Reserve, and provide authority to contract for petroleum and facilities not owned by the United States.

On October 24, 1992, the President signed Public Law 102-486, the Energy Policy Act of 1992. The bill includes provisions to (1) add new conditions for Strategic Petroleum Reserve drawdown in emergency situations involving a supply reduction of significant scope and duration coupled with severe price increase likely to cause a major adverse impact on the

national economy, (2) enlarge the Strategic Petroleum Reserve to one billion barrels, (3) permit the Secretary to make payment in advance for delivery of petroleum product not owned by the United States for storage in otherwise unused Strategic Petroleum Reserve facilities, or for crude oil either owned or not owned by the United States for storage in non-Strategic Petroleum Reserve facilities, (4) give the President discretionary authority to acquire domestic stripper well oil at competitive prices to fill the Strategic Petroleum Reserve, (5) amend the eligibility criteria for a Regional Petroleum Reserve, (6) require a study within 9 months of enactment of the implications of the unique vulnerabilities of insular areas to an oil supply disruption, and (7) require a study within 12 months on the use of futures and options to protect against unexpected surges in the cost of purchasing petroleum by government and private entities, including the Strategic Petroleum Reserve.

On October 5, 1992, the President signed into law the Department of the Interior and Related Agencies Appropriations Act, 1993 (Public Law 102-381) providing \$176.2 million for operations and management of the Reserve. The \$176.2 million for operations and management of the Reserve will be financed in part by the transfer from the SPR Petroleum Account of \$125.6 million, derived from funds deposited from the Desert Storm sale. The appropriations act also includes an outlay cap of \$137 million on funds in the SPR Petroleum Account. Total funds available for obligation in the SPR Petroleum Account in fiscal year 1993, after the transfer of \$125.6 million, are \$532.5 million.

The Department of Defense Appropriation Act, 1993 (Public Law 102-396) provides \$125.6 million for Department of

Energy to acquire crude oil for the Department of Defense. The Act also allows the Department of Energy to transfer up to \$700,000 to the Strategic Petroleum Reserve Account to pay for costs of operations and maintenance associated with the extra crude oil acquisition and storage. Taken together, the outlay limit in Public Law 102-381 and the resources provided by Public Law 102-396 will permit up to \$262.6 million to be expended for Strategic Petroleum Reserve oil in FY 1993.

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### ***STRATEGIC PETROLEUM RESERVE PLAN AND AMENDMENTS***

Section 154 of the Energy Policy and Conservation Act required the preparation of a Strategic Petroleum Reserve Plan. The Plan, addressing the development and implementation of the Strategic Petroleum Reserve, was submitted to the Congress on February 16, 1977, and became effective on April 18, 1977.

Strategic Petroleum Reserve Plan Amendment No. 1 accelerated the planned schedule for filling the Reserve. This Amendment was submitted to the Congress on May 25, 1977, and became effective on June 20, 1977. The revised goal for 500 million barrels of crude oil in storage by December 22, 1980, advanced the original schedule by 2 years. Amendment No. 2 to the Strategic Petroleum Reserve Plan authorized an increase in the Strategic Petroleum Reserve size from 500 million barrels to one billion barrels. This amendment was transmitted to the Congress on May 18, 1978, and became effective on June 13, 1978. The Amendment described Department of Energy plans to store 750 million barrels of petroleum in underground storage facilities. Decisions were not made regarding the methods or timing for developing

the final 250 million barrels of storage capacity.

On October 31, 1979, the Department of Energy submitted Amendment No. 3, a Distribution Plan for the Strategic Petroleum Reserve, to the Congress. In accordance with the provisions of the Energy Policy and Conservation Act in existence at that time, this Plan became effective on November 15, 1979. The Distribution Plan described the methods for drawdown and distribution of petroleum from the five existing Strategic Petroleum Reserve storage sites.

On December 1, 1982, the President transmitted Amendment No. 4, a new Drawdown Plan, to the Congress for the use of the Strategic Petroleum Reserve. This Plan, required under the Energy Emergency Preparedness Act of 1982, went into effect immediately and provides procedures for the drawdown, sale, and distribution of petroleum from the Strategic Petroleum Reserve. The Drawdown Plan replaces the Distribution Plan established by Amendment No. 3.

The 1990 amendments to the Energy Policy and Conservation Act (Public Law 101-383) required the Department to amend the Strategic Petroleum Reserve Plan to prescribe plans for completion of one billion barrels of storage capacity.

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### ***PROGRAM/PROJECT MANAGEMENT***

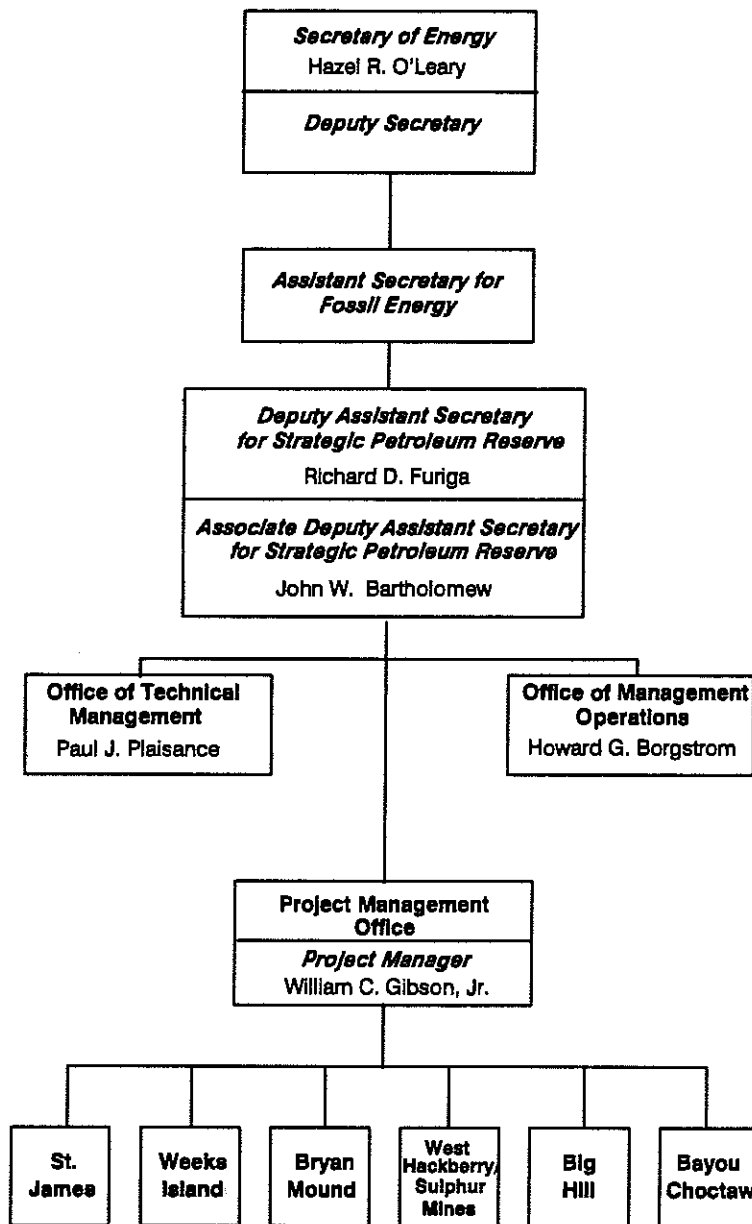
The Strategic Petroleum Reserve Office was created under the Energy Policy and Conservation Act for the establishment, management, and maintenance of the Strategic Petroleum Reserve. The Assistant Secretary for Fossil Energy has overall programmatic responsibility for achieving the goals and objectives of the

Strategic Petroleum Reserve Program. This responsibility has been delegated to the Deputy Assistant Secretary for Strategic Petroleum Reserve, Richard D. Furiga, and is exercised through offices located in Washington, D.C.

The Project Management Office, located in New Orleans, Louisiana, under the direction of the Project Manager, William C. Gibson, Jr., carries out day-to-day project activities including the management and operation of five oil storage sites and one marine terminal in Texas and Louisiana. On November 1, 1992, the previous Project Manager of the Strategic Petroleum Reserve, Robert L. Weller, died.

**FIGURE 1**  
**PROGRAM/PROJECT MANAGEMENT STRUCTURE**

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# ***STORAGE FACILITY DEVELOPMENT PROGRAM***

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## ***DEVELOPMENT OF THE 750-MILLION BARREL STORAGE PROGRAM***

The Strategic Petroleum Reserve facilities development for the authorized 750-million barrel program was completed in 1991. Over the last 16 years, the Department has acquired and developed underground crude oil storage facilities in salt domes along the Gulf Coast in Texas and Louisiana, and a marine terminal on the Mississippi River at St. James, Louisiana. The five storage sites comprising the 750 million barrel program are Bayou Choctaw, Weeks Island, and West Hackberry in Louisiana, and Bryan Mound and Big Hill in Texas. These storage sites are organized into three distribution systems — the Seaway, Texoma, and Capline — and connected by Department of Energy pipelines to commercial crude oil pipeline networks and to commercial and U.S. Government-owned marine terminal distribution facilities. A sixth site, Sulphur Mines, will be sold in early 1993. Replacement capacity was developed by the enlargement of caverns at Big Hill and Bayou Choctaw. Except for a small amount of residual crude oil, the transfer of all Sulphur Mines oil to the Big Hill facility was completed during the first quarter of 1992.

The locations of the current Strategic Petroleum Reserve storage sites and their associated distribution pipelines and terminals are shown in Figure 2. The chronology of the Strategic Petroleum Reserve's development to 750 million barrels over the last 16 years is illustrated in Figure 3.

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## ***FACILITIES DEVELOPMENT STATUS***

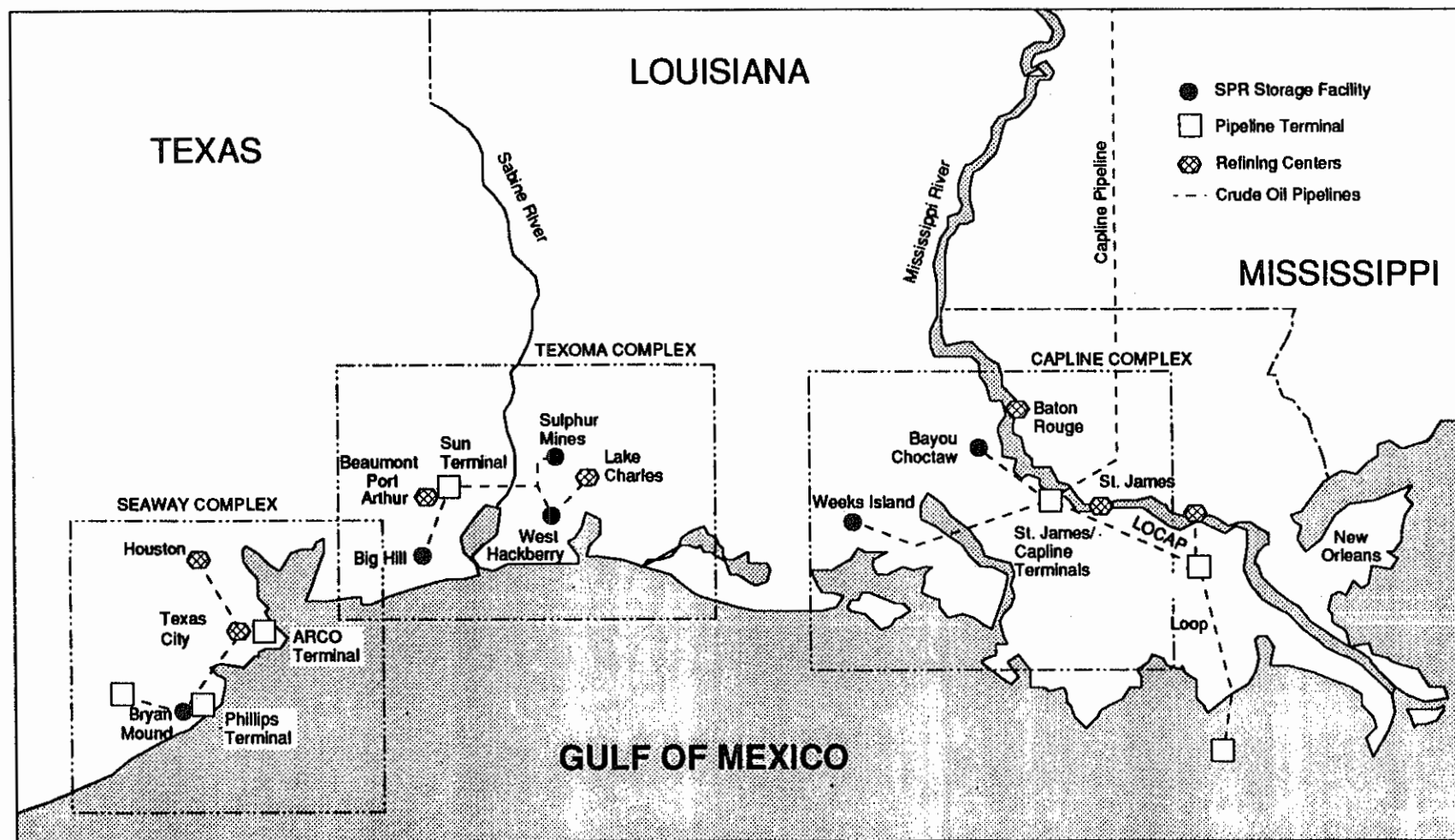
### **BRYAN MOUND**

The Bryan Mound site is located in Brazoria County, Texas, approximately three miles southwest of Freeport. The Department acquired this storage site in 1977 and converted four existing brine caverns with a total capacity of 66 million barrels to oil storage. Subsequently, the Department expanded this site to a capacity of 226 million barrels through the solution mining of 16 additional 10 million-barrel caverns. The expansion was completed in 1986 and oil fill is near completion.

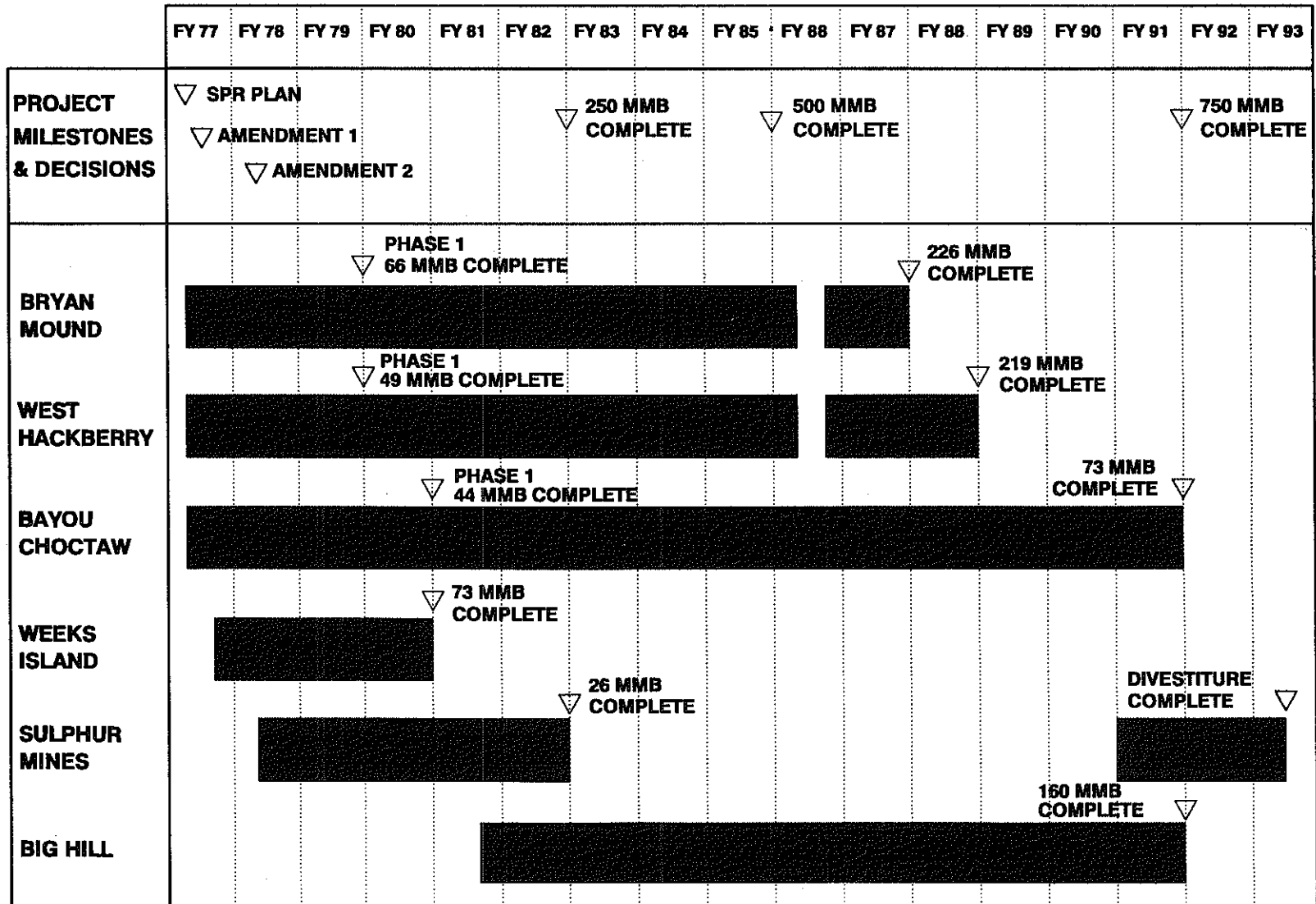
After being shut down for approximately a year to correct site maintenance deficiencies, the Bryan Mound site resumed normal operations in July 1992. The site's readiness and operability were successfully tested in September 1992.

Due to the extensive corrosion and erosion of the site's brine disposal pipeline from cavern development, the Department has experienced several pipeline leaks since 1989 in both the onshore and offshore sections of the pipeline which required emergency pipeline repair services. Again in November 1992, a new leak was detected approximately 1,000 feet from the site. The pipeline was repaired and returned to service in January 1993. The Department has initiated planning to replace the entire brine disposal pipeline and shorten the offshore section from 12.5 miles to 3.75 miles. An environmental assessment and engineering design effort are expected to be completed in February 1993. The Department plans to award a

**FIGURE 2**  
**STRATEGIC PETROLEUM RESERVE COMPLEXES AND ASSOCIATED PIPELINES AND TERMINALS**



**FIGURE 3**  
**SPR DEVELOPMENT TO 750 MILLION BARRELS**



contract for acquisition and construction of the new pipeline in June 1993; however, installation of the pipeline will not occur until September 1994, as a result of a construction restraint imposed by the U.S. Fisheries and Wildlife Service relating to the nesting periods of the Piping Plover, a threatened and endangered species. The condition of the brine disposal pipeline does not impact the site's ability to draw down; however, the pipeline is required for brine discharge associated with future oil fill and cavern pressure control.

#### **WEST HACKBERRY**

The West Hackberry site is located in Cameron Parish, Louisiana, approximately 22 miles southwest of Lake Charles. The Department acquired this storage site in 1977 and converted five existing brine caverns with a capacity of 49 million barrels to oil storage. Subsequently, the Department expanded this storage site through solution mining of 17 additional 10 million-barrel storage caverns. Development of this site to the planned level of 219 million barrels was completed in September 1988.

The West Hackberry brine disposal pipeline was taken out of service due to deterioration in 1991 and its ultimate disposition is being studied. In the interim, brine disposal is being accomplished using existing brine disposal wells. The initial brine disposal capability through these wells was approximately 30,000 barrels per day. In an effort to increase this capability, the Department has recompleted an existing brine disposal well in a new disposal zone. In late September, the Strategic Petroleum Reserve initiated brine disposal testing of the well and achieved initial brine flow rates of over 60,000 barrels per day. Additional testing and brine well recompletions are planned for fiscal year 1993. The state of the brine disposal

pipeline does not impact West Hackberry's oil drawdown or distribution capability.

#### **SULPHUR MINES**

The Sulphur Mines site is located in Calcasieu Parish, Louisiana, approximately 12 miles west of Lake Charles. The Department acquired this storage site in 1979 and converted three existing brine caverns with a capacity of 26 million barrels to crude oil storage. Development and fill of this site were completed in 1983. Due to its operational costs and limited distribution capabilities, the Department initiated a plan in 1986 to transfer the Sulphur Mines inventory to other existing sites and to decommission and sell the Sulphur Mines Facility. During 1992 the Department completed decommissioning of the Sulphur Mines oil storage facility with the removal of virtually all residual oil in the caverns, and by reducing site activities to a caretaker status. The facility was sold to Pittsburgh Plate Glass in January 1993.

#### **BIG HILL**

The Big Hill storage site is located in Jefferson County, Texas, 20 miles southwest of Beaumont. The Department acquired this undeveloped site in 1982 and completed development of the storage facility in 1991. The facility has a capacity of 160 million barrels and a draw-down capability of 930,000 barrels per day.

In July 1992, the Strategic Petroleum Reserve conducted a post-development system test exercise which demonstrated the site's capability to draw down oil at a rate of 400,000 barrels per day. This rate is less than the site's design drawdown rate of 930,000 barrels per day due to the limited site inventory available.

The site's year-end inventory was 26.9 million barrels of which approximately 24

million was crude oil transferred from the Sulphur Mines. In January 1993, the oil transferred from Sulphur Mines was sampled and found to contain trapped gas, primarily methane. This condition has received intensive technical review, and a remedial plan is being implemented starting in fiscal year 1993. In the interim, until this issue is resolved, the oil stored at Big Hill will not be identified as available for drawdown.

#### **BAYOU CHOCTAW**

The Bayou Choctaw site is located in Iberville Parish, Louisiana, approximately 12 miles southwest of Baton Rouge. The Department acquired this storage site in 1977 and converted four existing brine caverns with a capacity of 46 million barrels to oil storage. Subsequently, in 1985, the Department acquired a fifth existing cavern with a capacity of 10 million barrels, through an exchange agreement with Union Texas Petroleum, and, in 1987, initiated a site expansion program to create one new cavern of 10 million barrels and enlarge one existing cavern by 6 million barrels. Development of this site to its planned storage capacity of 72 million barrels was completed in September 1991, and the site has achieved full operational readiness status for fill or drawdown operations.

#### **WEEKS ISLAND**

The Weeks Island site is located in Iberia Parish, Louisiana, approximately 95 miles southwest of New Orleans. The Department acquired this storage site in 1977 and converted an existing conventional salt mine with a capacity of 73 million barrels to oil storage. Development and fill of this site were completed in 1982. The site is currently in an operational readiness mode.

In 1987, the Department initiated a mine integrity assurance program to

enhance the mine's safety and security against any surface water intrusion. This program consists of: a) installation of an air dryer system to reduce water vapor condensation in the shafts and manways of the mine above the oil chamber and to provide for early detection of water leaks; b) isolation of Morton International Inc.'s Markel Mine from the Strategic Petroleum Reserve's operations area by constructing new bulkheads; c) installation of a backup or alternate drawdown capability to the existing 11-pump system, located at the base of the service shaft; and d) upgrading of existing bulkheads as required to meet potential hydrostatic pressures.

The installation of the air-dryer system was completed and became operational in December 1990. During 1992 the Department completed the construction of the two new isolation bulkheads and the installation of the backup drawdown system. The in-mine bulkheads provide increased mine integrity by isolating Morton's Markel Mine, a temporary mining area developed during conversion of the main mine to oil storage. The backup drawdown system was completed and tested in September 1992 and is available to provide emergency capability. The backup system includes submersible pumps that can be inserted into the oil-fill holes in the event of temporary or permanent failure of the existing 11-submersible pump system or the service shaft in which the pumps are housed; and connecting electrical power and piping. The remaining construction on upgrading of the service shaft bulkhead and two raisebore bulkheads will be accomplished in 1993.

On August 25, 1992, Hurricane Andrew struck the Louisiana coast directly in the vicinity of the Weeks Island storage facility. Under emergency procedures the Department evacuated all personnel from

the site and reactivated the site once the eye of the hurricane passed. The site sustained some minimal damage to its buildings, fencing and access roads. The total damage was estimated at \$41,600.

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### **RECOVERY PROGRAM**

The Strategic Petroleum Reserve initiated a Recovery Program during 1988 to provide a reasonable level of assurance that the Strategic Petroleum Reserve could recover from a range of deliberate acts and natural events and meet designated draw-down rates within a specified period of time. Generally, the Recovery Program requires restoration of not less than 90 percent of the Reserve's full drawdown capability within 30 days of a disabling event.

Procurement and installation of all systems and equipment necessary for the Recovery Program have been completed. Full implementation was achieved in August 1992 and drawdown tests using the Recovery systems were performed at Weeks Island in September 1992 and Bayou Choctaw in December 1992 to demonstrate emergency capabilities.

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### **PLANNING FOR 250-MILLION BARREL EXPANSION**

#### **STRATEGIC PETROLEUM RESERVE EXPANSION PLANNING**

The Energy Policy and Conservation Act Amendments of 1990 (Public Law 101-383) directed the Department of Energy to submit an Strategic Petroleum Reserve Plan Amendment to Congress by September 15, 1992, providing detailed plans for the expansion of the storage facilities of the Reserve to one billion barrels. The Strategic Petroleum Reserve Plan

Amendment requires a comprehensive environmental assessment, conceptual engineering designs, and geotechnical studies in order to arrive at a site selection decision.

During 1991 the Department submitted a Report to Congress which identified eight candidate sites to be considered for the expansion of the Reserve. This list of candidate sites was subsequently narrowed to two Texas sites and two Louisiana sites during the scoping process; one new candidate in Mississippi was subsequently added. It is anticipated that only two of these sites will be selected for development.

During 1992 the Department prepared a Draft Environmental Impact Statement (EIS) addressing the five candidate sites: Big Hill and Stratton Ridge in Texas, Weeks Island and Cote Blanche in Louisiana, and Richton in Mississippi. The Draft EIS assessed all five candidate sites equally without stating a preferred alternative. The Department issued its Draft EIS in October 1992 and held a series of five public hearings during December 1992.

The public hearings, which were held in Hattiesburg and Pascagoula, Mississippi, Lake Jackson and Beaumont, Texas, and New Iberia, Louisiana, were announced November 17, 1992, in the *Federal Register* (57 FR 54227) and advertised in numerous local and regional newspapers and electronic media. In response to a request from the Environmental Protection Agency (EPA), the Department extended the public comment period by 15 days to January 13, 1993. Subsequently, the Department issued a notice on February 3, 1993 (58 FR 6953) reopening the comment period for an additional 30 days.

During 1992 the Department also prepared conceptual designs and cost estimates on all five candidate sites and associated distribution configurations being considered. The conceptual designs included optimal site locations and cavern layouts from geotechnical studies and analyses, real estate requirements, site process and mechanical/electrical system designs, off-site pipeline designs and commercial terminal and pipeline distribution requirements. The conceptual designs incorporated lessons learned from the 750 million barrel development program as well as some unique design features to minimize cost regarding brine filtration and pipeline intermediate pumping stations. The Department has also developed a life cycle cost model with which to compare the total cost of investment and ownership of the five sites and distribution configurations.

# ***OIL ACQUISITION AND FILL STATISTICS FOR THE FOURTH QUARTER 1992***

The Strategic Petroleum Reserve was filled at an average rate of 35,747 barrels per day during the calendar quarter ending December 31, 1992, and the crude oil inventory was 574,724,042 barrels. Table 1 summarizes the Reserve's crude oil inventory and delivery statistics as of December 31, 1992, and includes projections for calendar year 1993.

The weighted average price per barrel of the crude oil delivered to the Reserve during the fourth quarter was \$21.86, including costs for transportation, but excluding costs for customs duties, superfund taxes, terminal services and administration.

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## ***OIL FILL, CALENDAR YEAR 1992***

During 1992 the Strategic Petroleum Reserve crude oil inventory was increased by 6.2 million barrels, representing an average annual fill rate of approximately 17,000 barrels per day. In addition to the 6.2 million barrels already delivered as of December 31, 1992, approximately 1.7 million barrels were in the domestic commercial pipeline system en route from the Naval Petroleum Reserves in California to the Reserve. Fiscal and calendar year-end inventories and average daily fill rates since 1977 are presented in Table 2. Strategic Petroleum Reserve crude oil fill is illustrated on both an annual and cumulative basis in Figures 4 and 5, respectively.

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## ***OIL ACQUISITION, CALENDAR YEAR 1992***

During 1992 approximately 6.2 million barrels of crude oil were acquired and delivered to the Strategic Petroleum Reserve. These acquisitions followed a suspension of Reserve fill activities beginning on August 2, 1990, when Iraq invaded Kuwait. Of the quantity delivered to the Strategic Petroleum Reserve during 1992, 3.6 million barrels were acquired by the Department of Defense's Defense Fuel Supply Center, the Department of Energy's purchasing agent under an interagency agreement. The oil was purchased under an open continuous solicitation for competitive offers which were received and evaluated on a periodic basis. Additional crude oil for the Reserve will be purchased by this method during 1993.

The balance of crude oil delivered to the Strategic Petroleum Reserve, 2.6 million barrels, was received from the Naval Petroleum Reserve No. 1 (NPR-1) in California. Pursuant to the Naval Petroleum Reserve Production Act of 1976 (10 U.S.C. 7430(b)(2)), the Secretary may not sell NPR crude oil at a price less than the higher of 90 percent of the current sales price of comparable petroleum in the same area or the price of oil being purchased for the Strategic Petroleum Reserve minus the cost of transporting oil from the NPR to the Strategic Petroleum Reserve. In May 1992, the Department determined that some of the bid prices for



NPR oil did not meet the test, and transfer of NPR crude oil to the Strategic Petroleum Reserve was initiated. These deliveries commenced on June 1, 1992, and are shipped from California through a network of six commercial pipeline systems to the Sun Terminal in Nederland, Texas, for storage at Big Hill and West Hackberry at a rate of approximately 20,000 barrels per day. The current phase of shipments will continue through March 31, 1993. Decisions as to further deliveries beyond that date depend upon the bid prices of NPR-1 oil and the cost of transferring it to the Strategic Petroleum Reserve. During 1992 it is estimated that the Department achieved net savings of \$1.7 million over the expected cost of buying crude oil meeting Strategic Petroleum Reserve specifications on the open market.

Table 3 shows the crude oil quantities received since the inception of the Strategic Petroleum Reserve program through 1992 by country of origin. Of the total oil in storage, 67.7 percent is high sulfur (sour) and 32.3 percent is low sulfur (sweet). Table 4 provides information on the location of this inventory by storage site. The quality specifications used when

acquiring Strategic Petroleum Reserve crude oil can be found in Appendix B of this report.

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### ***CARGO PREFERENCE COMPLIANCE***

The Cargo Preference Act of 1954 (Public Law 83-664) requires Federal agencies to take such steps as may be necessary and practicable to assure that at least 50 percent of their cargo transported on ocean vessels in a calendar year is transported by privately-owned U.S.-flag vessels, to the extent they are available at fair and reasonable rates. By agreement between the Department of Energy and the Department of Transportation, the Strategic Petroleum Reserve's Cargo Preference Act compliance is measured in long-ton miles; i.e., cargo tons multiplied by the distances transported.

During 1992 three U.S.-flag vessels, transporting a total of 2.6 million barrels, were involved in delivering crude oil to the Strategic Petroleum Reserve. These deliveries equaled 1.36 billion long-ton miles or 55.3 percent of the total long-ton miles.

**TABLE 1**  
**STRATEGIC PETROLEUM RESERVE OIL INVENTORY**  
**AND DELIVERY STATISTICS**  
**1992 INVENTORY AND DELIVERY SUMMARY**  
**(BARRELS)**

Calendar Year 1992	Average Daily Fill Rate	Quarter Oil Receipts	Ending Oil Inventory
1st Quarter	0	0	568,510,754
2nd Quarter	11,094	1,009,530	569,520,284
3rd Quarter	20,850	1,918,211	571,438,495
4th Quarter	35,712	3,285,547	574,724,042
<b>TOTAL</b>	16,976	6,213,288	574,724,042
Amount of Oil in Transit (December 31, 1992)*			1,683,395
Contracted Quantity Available for Delivery during 1993**			1,800,000

\* NPR-1 oil en route via pipeline.

\*\* Additional NPR-1 oil shipments through March 31, 1993.

**1993 INVENTORY AND DELIVERY PROJECTIONS\***

Calendar Year 1993	Average Daily Fill Rate	Quarter Oil Receipts
1st Quarter	36,700	3,300,000
2nd Quarter	46,200	4,200,000
3rd Quarter	47,200	4,340,000
4th Quarter	13,300	1,223,600
<b>TOTAL</b>	35,790	13,063,600

\* Based on anticipated NPR-1 oil shipments, contract awards, crude oil prices and FY 1994 budget assumptions; includes crude oil acquired under the Department of Defense Appropriations Act, 1993.

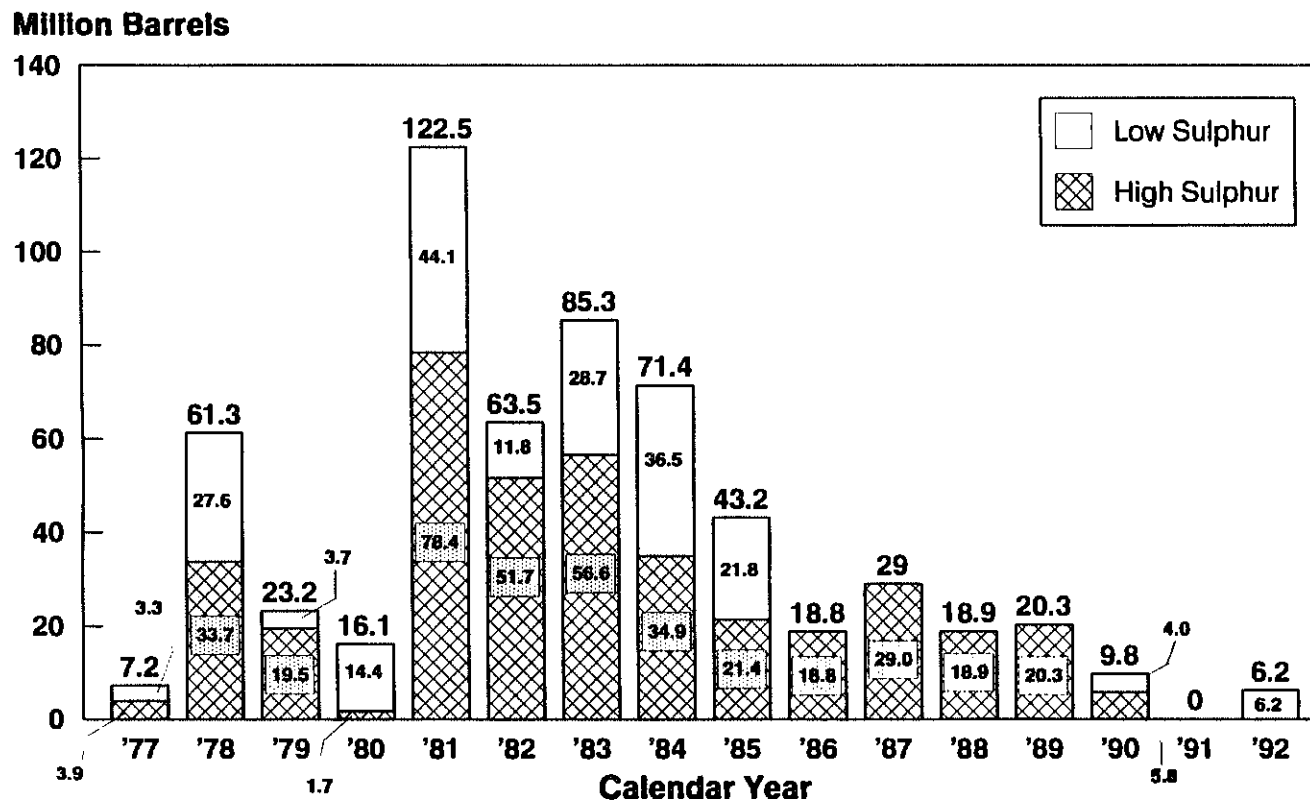
**TABLE 2**  
**STRATEGIC PETROLEUM RESERVE OIL FILL HISTORY**

	Fiscal Year		Calendar Year	
	Year-End Inventory (million bbls)	Average Daily Fill Rate (thousand bbl/d)	Year-End Inventory (million bbls)	Average Daily Fill Rate (thousand bbl/d)
1977	1.1	3	7.2	20
1978	49.1	131	68.5	168
1979	91.2	115	91.7	64
1980	92.8	4	107.8	44
1981	199.2	292	230.3	336
1982	277.9	215	293.8	174
1983	361.0	228	379.1	234
1984	431.1	191	450.5	195
1985	489.3	159	493.3	119*
1986	506.4	47*	511.6	51*
1987	533.9	75	540.6	80
1988	554.7	57	559.5	52
1989	577.1	62	579.9	56
1990	589.6	34	585.7	27*
1991	568.5	**	568.5	**
1992	571.4	8	574.7	17

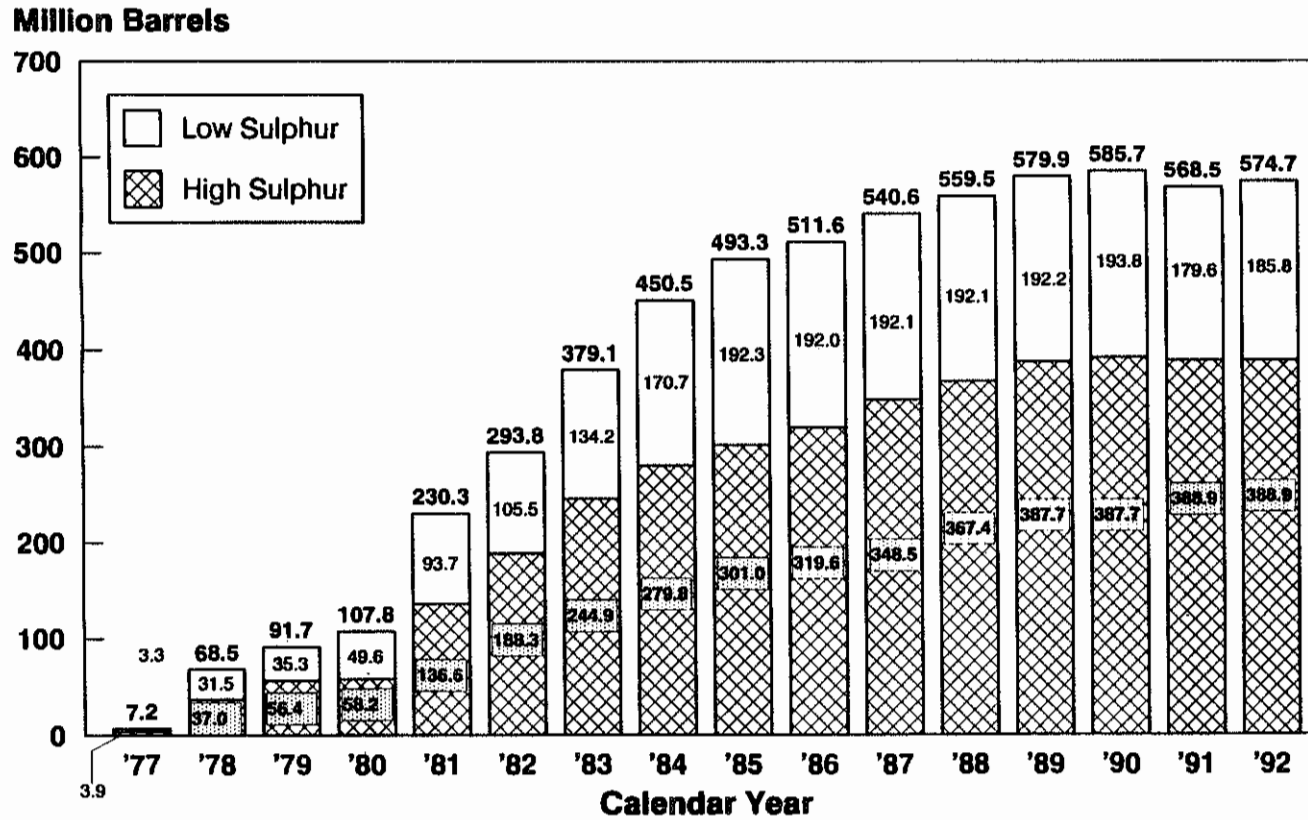
\* Fill rates unadjusted for oil deliveries under the 1985/86 and 1990 test sales.

\*\* Fill was suspended during both fiscal and calendar year 1991; a decrease in inventory resulted from drawdown in early calendar year 1991.

**FIGURE 4**  
**ANNUAL STRATEGIC PETROLEUM RESERVE OIL FILL**



**FIGURE 5**  
**CUMULATIVE STRATEGIC PETROLEUM RESERVE OIL FILL**



**TABLE 3**  
**CRUDE OIL RECEIVED THROUGH 1992**  
**(MILLION BARRELS)**

Source Country	1992	Cumulative	Percent of Total
Mexico		256.7	43.0
United Kingdom	1.6	140.8	23.6
United States:		41.0	6.9
Alaska		31.4	5.3
Other*	2.6	9.6	1.6
Saudi Arabia		27.1	4.5
Libya		23.7	4.0
Iran		20.0	3.4
United Arab Emirates		18.4	3.1
Nigeria		15.1	2.5
Norway	2.0	10.9	1.8
Oman		9.0	1.5
Egypt		8.9	1.5
Ecuador		6.2	1.0
Algeria		6.2	1.0
Cameroon		3.4	0.6
Iraq		3.4	0.6
Gabon		2.4	0.4
Qatar		2.3	0.4
Venezuela		0.9	0.2
Peru		0.4	0.1
<b>TOTAL RECEIPTS**</b>	<b>6.2</b>	<b>596.8</b>	<b>100.0</b>

\* Includes shipments from Naval Petroleum Reserves  
\*\* Unadjusted for deliveries during 1985/1986 and 1990 test sales and 1991 drawdown and for operational gains and losses.

**TABLE 4**  
**STRATEGIC PETROLEUM RESERVE CRUDE OIL INVENTORY**  
**AS OF DECEMBER 31, 1992**  
(MILLION BARRELS)

Storage Site	Location	1992 Cumulative Total			Total End of Year 1991
		Sour*	Sweet**	Total	
Bryan Mound	Brazoria County, TX	155.3	61.5	216.8	217.0
Big Hill	Jefferson County, TX	24.9	2.0	26.9	25.6
West Hackberry	Cameron Parish, LA	99.9	104.5	204.4	203.1
Bayou Choctaw	Iberville Parish, LA	35.6	15.2	50.8	47.2
Weeks Island	Iberia Parish, LA	71.9	0.0	71.9	71.9
Sulphur Mines	Calcasieu Parish, LA	0.1	0.0	0.1	.02
SUBTOTAL		387.7	183.3	571.0	565.0
Tanks and Pipelines		1.2	2.5	3.7	3.5
<b>TOTAL</b>		388.9	185.8	574.7	568.5
* Sulphur content greater than 0.5 percent.					
** Sulphur content not exceeding 0.5 percent.					

# ***OTHER PROJECT ACTIVITIES***

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## ***STRATEGIC PETROLEUM RESERVE MANAGEMENT AND OPERATING CONTRACTOR***

On November 18, 1992, following a 5-month evaluation of competitive proposals, the Department's Assistant Secretary for Fossil Energy selected DynMcDermott Petroleum Operations Company for a cost-plus award fee contract to provide management and operating services to the Strategic Petroleum Reserve for a period of 5 years commencing April 1, 1993. DynMcDermott will succeed Boeing Petroleum Services, Inc., the Reserve's current management and operating contractor, whose contract expires March 31, 1993. The Department will conduct final negotiations with DynMcDermott during early 1993 and a 2-month transition period will occur during February and March 1993.

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## ***PROCUREMENT AND CONTRACTOR SUPPORT***

Obligations in fiscal year 1992 for Strategic Petroleum Reserve procurements totaled approximately \$290.4 million. Obligations for ongoing Strategic Petroleum Reserve operations, maintenance, and management totaled \$200.5 million, and a further \$89.9 was obligated for the acquisition of crude oil during fiscal year 1992.

Boeing Petroleum Services, Inc., provided management and operating services and Tucker and Associates, Inc., provided technical management and support services.

Other prime contractors who provided services to the Strategic Petroleum Reserve program during fiscal year 1992 included: Tucker; Fluor Daniels, Inc., and Jacobs Engineering Group for architect engineering services; Mitre for Engineering Support Services; ARCO Pipe Line Company, Phillips 66 Company, Sun Pipe Line Company, and Sun Marine Terminals for transportation and terminalling services; Kaough & Jones Electric Company, Miners, Inc., Foley Company, Surface Prep & Coating Enterprises, Plaquemine Contracting Company, and Atlantic Electric Service Construction, Inc. for construction; and Timco Electric, Vindicator Corporation, and MJS Inc. for hardware.

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## ***SECURITY***

Boeing Petroleum Services, Inc., under its management and operating contract, has been assigned responsibility to implement the Department of Energy's Strategic Petroleum Reserve Security Program. Boeing administers the protection services program through a subcontract with Wackenhut Services, International. The Strategic Petroleum Reserve currently has a protection force of 249 armed officers.

A Master Security Agreement (MSA), prepared by Boeing and approved by the Department of Energy in 1990, defines the appropriate level of security necessary to provide reasonable assurance for protection of the Strategic Petroleum Reserve's facilities and personnel against hostile acts.

Due to recent changes in the world political climate, the Strategic Petroleum



Reserve conducted a Vulnerability Assessment of its facilities in 1992 with the assistance of the Department's Office of Safeguards and Security and Pacific Northwest Laboratory. The assessment was completed in October 1992 and recommended several cost-effective modifications to the Strategic Petroleum Reserve's security program. The recommendations are being evaluated and changes to the security program will be reflected in a revised Strategic Petroleum Reserve Security Plan that will be completed in 1993.

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### ***REAL ESTATE***

Subsequent to a 1991 announcement in the *Commerce Business Daily* of the Department's intent to conduct competitive negotiations for the sale of the Sulphur

Mines facility, the Department concluded a negotiated sale with Pittsburgh Plate Glass. At the request of the Department, the General Services Administration (GSA), using a contractor to the U.S. Army Corps of Engineers, evaluated Strategic Petroleum Reserve's official appraisal of the facility. GSA concluded that the appraisal value of the site was consistent with the offer and was acceptable. A contract to sell the facility to Pittsburgh Plate Glass was accepted by DOE in January 1993. The Department anticipates that Pittsburgh Plate Glass will take possession of the site in early 1993.

In December 1992 Strategic Petroleum Reserve exercised its first 5-year renewal option with Elmwood Office Park for 102,822 square feet of office space in New Orleans, Louisiana, for the Strategic Petroleum Reserve Project Management Office.

# *ENVIRONMENT, SAFETY AND HEALTH*

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## *ENVIRONMENTAL COMPLIANCE*

A contract to gather baseline ground water data at all Strategic Petroleum Reserve sites began in November 1992. This will be the basis for prioritizing future corrective action plans, as necessary, for brine pond systems at all Strategic Petroleum Reserve sites. Corrective actions have been initiated at the West Hackberry site based on brine contamination monitoring studies conducted in 1990 and 1991; these actions will continue for several years and quarterly progress reports will be submitted to the Louisiana Department of Environmental Quality (LDEQ).

The Department has developed a plan for total replacement of the Bryan Mound brine disposal pipeline and relocating the diffuser closer to shore. The Department has submitted applications to the cognizant state agencies and the Environmental Protection Agency (EPA) Region VI to move the brine diffuser from approximately 12.5 miles (70 foot water depth) to approximately 3.5 miles (38 foot water depth) offshore in the Gulf of Mexico. An environmental assessment has been prepared and is pending final review in early 1993.

Renewal of all current National Pollutant Discharge Elimination System (NPDES) permits has been delayed pending the transition phase from the current Management and Operating (M&O) contractor to a new M&O contractor to be completed in April 1993 in accordance

with an agreement with the Environmental Protection Agency (EPA). EPA had established a new policy requiring operating contractors of Governmental facilities to co-sign NPDES permits with the Government, thereby accepting shared responsibility for compliance with permit conditions. However, the Department was unsuccessful in achieving a modification to the current M&O contract to include the contractor as co-operator on NPDES permits. Subsequently, the Strategic Petroleum Reserve Project Management Office negotiated an agreement with EPA Region VI to extend all current NPDES permits through the performance period of the current M&O contract in return for a promise to include a requirement in future contracts that the M&O contractor jointly sign permits as co-operator. This agreement is consistent with Departmental policy promulgated by SEN-22-90, "DOE Policy on Signatures of RCRA Permit Applications."

In September 1990 the Louisiana Department of Environmental Quality issued an order for the installation of Maximum Achievable Control Technology (MACT) at all permitted facilities in the Baton Rouge non-attainment area which are major emitters (more than 100 tons per year) of volatile organic compounds. The applicability of this order to St. James was at issue because the terminal would exceed the threshold annualized rate of 100 tons per year only during a complete drawdown at the design rate. The Department requested a hearing with LEDQ regarding implementation of this order. Subsequently, however, in a related action,

the Department applied to LDEQ for an amendment to its existing permit to reflect actual experience which shows that St. James emissions have averaged only 21 tons per year over the past 8 years. This application was considered and approved by LDEQ. The new permit exempts the Strategic Petroleum Reserve from having to meet the same regulatory requirements as a major polluter and resolves the issue concerning MACT.

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### ***OTHER ENVIRONMENTAL, SAFETY AND HEALTH ACTIONS***

#### **TIGER TEAM ES&H ASSESSMENT**

A Department of Energy Tiger Team Environment, Safety and Health (ES&H) Assessment was conducted at the Strategic Petroleum Reserve from March 9 through April 10, 1992. The scope of the assessment included the six operational sites used for crude oil storage and handling, the Project Management Office, the decommissioned crude oil storage site at Sulphur Mines and the Strategic Petroleum Reserve Program Office in Washington, D.C.

The Strategic Petroleum Reserve's Final Corrective Action Plan, prepared in response to the Tiger Team assessment, was submitted for Departmental approval in December 1992. Strategic Petroleum Reserve personnel have made substantial progress in implementing both the Tiger Team corrective actions and correction of deficiencies identified through a formal self-evaluation conducted in 1991.

Approximately 90 percent (194) of the 218 Occupational Safety and Health Administration (OSHA) non-compliances identified by the Tiger Team have been

corrected. The remaining non-compliances will be resolved in the near future. Corrective action plans have been prepared for an additional 250 non-OSHA-related findings involving regulatory non-compliance, programmatic and procedural deficiencies in the project implementation of environmental, safety and health activities. Approximately 10 percent of these findings have been corrected.

The Tiger Team found that Strategic Petroleum Reserve activities do not pose an undue environmental, safety and health risk; that employees are motivated to work safely and perform their jobs correctly; and that an environmental, safety and health awareness has taken hold.

#### **ENVIRONMENT, SAFETY AND HEALTH MANUAL**

The Strategic Petroleum Reserve Project Management Office Environmental, Safety and Health Manual, an operating requirements document, was revised and expanded in 1992 to incorporate changes in DOE and Federal Environment, Safety and Health standards, and to incorporate lessons learned from past operations and experiences. The Manual also sets forth Environment, Safety and Health criteria for the Strategic Petroleum Reserve in areas not covered by the Department or other Federal regulatory programs. Organizational responsibilities have been defined to provide guidance for establishing procedures to protect Strategic Petroleum Reserve Federal employees, contractor employees, and the general public from potential ES&H hazards.

During 1992 there were no accidents that involved the convening of a Class A or B Accident Investigation Board at the Strategic Petroleum Reserve.

# ***BUDGET AND FINANCE***

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## ***APPROPRIATIONS***

A total of \$20.7 billion has been appropriated for the Strategic Petroleum Reserve through FY 1993. Included in this total are the distribution of annual and total appropriations as shown in Table 6. Figures 6 and 7 illustrate annual and cumulative appropriations for storage facilities operations and management and petroleum acquisition and transportation.

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## ***MAJOR BUDGET AND FINANCING ACTIONS DURING 1992***

The previous Administration's fiscal year 1993 budget for the Strategic Petroleum Reserve requested appropriations of \$176.6 million for continued operation and management of the Reserve, which includes \$1.0 million to continue planning activities for the development of storage for a one billion barrel Reserve. The budget also proposed to transfer \$125.6 million from the SPR Petroleum Account to finance part of the Strategic Petroleum Reserve facilities appropriation request. This transfer was proposed from the proceeds of oil sales in support of Operation Desert Storm in January 1991. The previous Administration's fiscal year 1993 budget also proposed to acquire crude oil, using prior year balances, at a rate of 25,000 barrels per day.

On October 5, 1992, the President signed into law the Department of Interior and Related Agencies Appropriations Act, 1993 (Public Law 102-381) providing \$176.2 million for operations and manage-

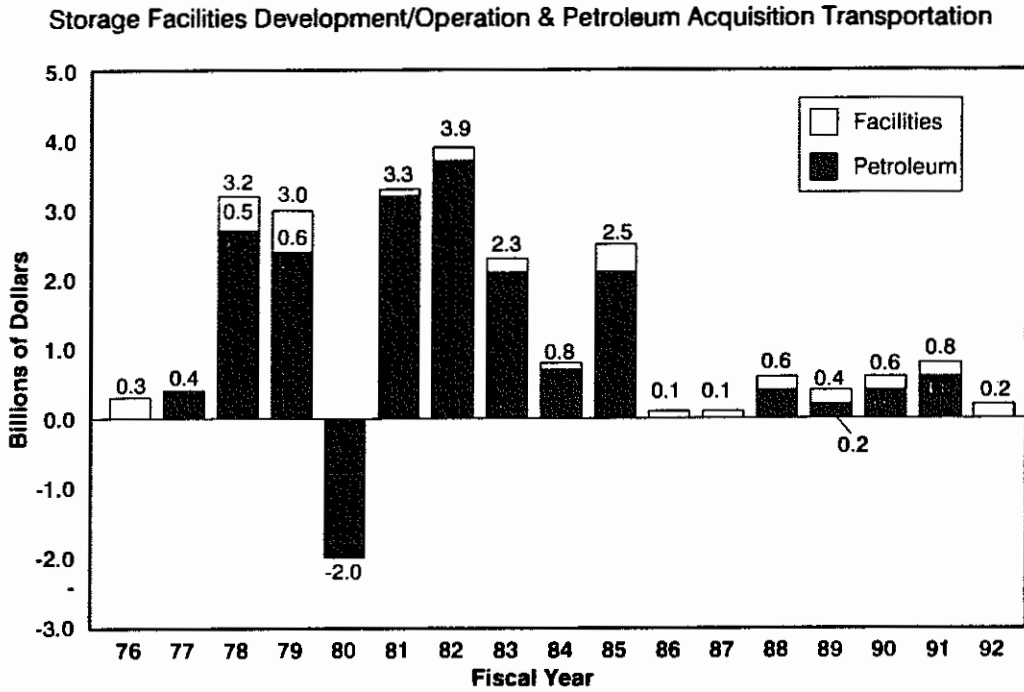
ment of the Reserve. The \$176.2 million for operations and management was financed in part by the requested transfer from the SPR Petroleum Account of \$125.6 million derived from funds deposited from the Desert Storm sale. The appropriations act also included an outlay cap of \$137 million on funds in the SPR Petroleum Account. Total funds available for obligation in the SPR Petroleum Account in fiscal year 1993 after the transfer of \$125.6 million are \$532.5 million.

Also for fiscal year 1993, the Congress provided \$125.6 million through the Department of Defense Appropriations Act, 1993 (Public Law 102-396) for the Department of Energy to acquire crude oil for the Department of Defense for storage in the Strategic Petroleum Reserve. The appropriation act also allows the Department of Energy to transfer up to \$700,000 to the Strategic Petroleum Reserve Account to pay for costs of operations and maintenance associated with the extra oil acquisition and storage.

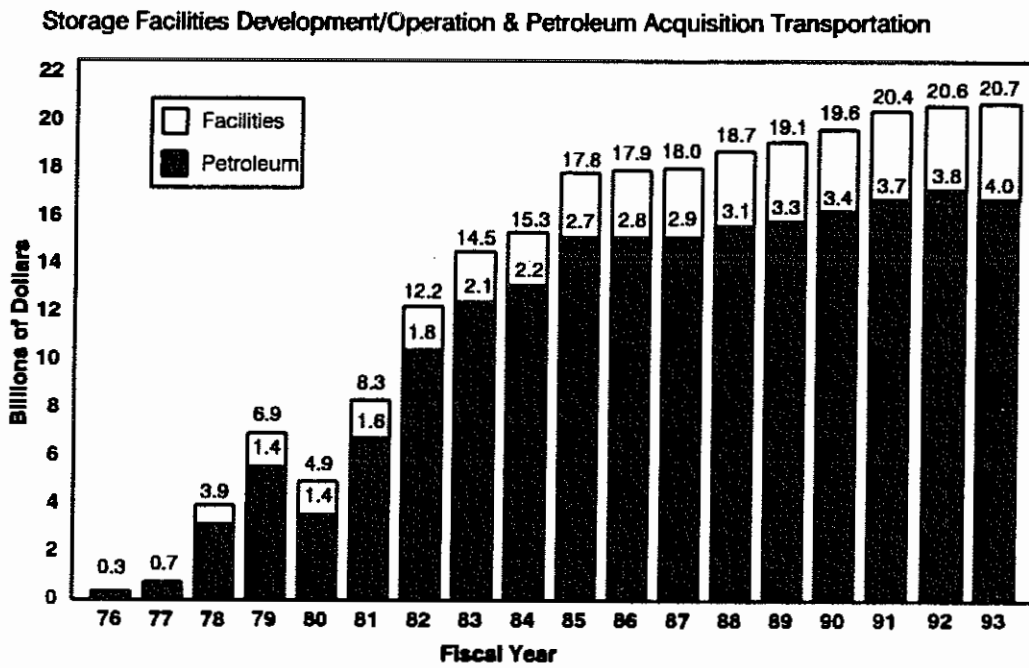
## ***STRATEGIC PETROLEUM RESERVE ACCOUNT TRANSACTIONS, LAST QUARTER OF 1992 (FIRST QUARTER OF FISCAL YEAR 1993)***

The Strategic Petroleum Reserve Account funds the development, operation, and maintenance of Reserve facilities; the salaries and expenses necessary to plan and manage the program, including the operation of the Project Management Office in New Orleans, Louisiana; and the activities pertinent to major issues concerning the development and use of the Strategic Petroleum Reserve.

**FIGURE 6**  
**STRATEGIC PETROLEUM RESERVE ANNUAL FUNDING**



**FIGURE 7**  
**STRATEGIC PETROLEUM RESERVE CUMULATIVE FUNDING**



**TABLE 5**  
**Strategic Petroleum Reserve Appropriations**  
**(thousands of dollars)**

Fiscal Year	Petroleum Acquisition and Transportation	Storage Facilities Development and Operations	Management <sup>1</sup>	Total
1976	\$ 0	\$ 300,000	\$ 13,975	\$ 313,975
1977	440,000	0	7,824	447,824
1978	2,703,469	463,933	14,704	3,182,106
1979	2,885,670	103,290	18,111	3,007,071
Reprogramming	<u>-529,214</u>	<u>529,214</u>	<u>0</u>	<u>0</u>
	2,356,456	632,504	18,111	3,007,071
1980	-2,000,000 <sup>2</sup>	0	0	-2,000,000
Reprogrammings:				
Number 1	-20,391	0	20,391	0
Number 2	<u>-1,881</u>	<u>0</u>	<u>1,881</u>	<u>0</u>
	-2,022,272	0	22,272	-2,000,000
1981	2,688,282 <sup>3</sup>	82,834	19,391	2,790,507
Entitlements	542,146	0	0	542,146
Reprogrammings:				
Number 1	-18,000	18,000	0	0
Number 2	<u>-7,334</u>	<u>7,334</u>	<u>0</u>	<u>0</u>
	3,205,094	108,168	19,391	3,332,653
1982	3,684,000	171,356	20,076	3,875,432
Reprogramming	<u>-4,300</u>	<u>4,300</u>	<u>0</u>	<u>0</u>
	3,679,700	175,656	20,076	3,875,432
1983	2,074,060	222,528	19,590	2,316,178
1984	650,000	142,357	16,413	808,770
1985	2,049,550	441,300 <sup>4</sup>	17,890 <sup>4</sup>	2,508,740
1986	0	94,015	13,518	107,533
Reprogramming	<u>-12,964</u>	<u>12,964</u>	<u>0</u>	<u>0</u>
	-12,964	106,979	13,518	107,533
1987	0	134,021	13,412	147,433
1988	438,744	151,886	12,276	602,906
1989	242,000	160,021	13,400	415,421
1990	371,916 <sup>5</sup>	179,530	12,953	564,399
1991	566,318 <sup>6</sup>	187,728	12,846	766,892
1992	88,413 <sup>7</sup>	171,678	13,384	273,475
1993	-125,625 <sup>8</sup>	161,542 <sup>8</sup>	14,192	50,109
DOD Transfer	<u>124,925<sup>9</sup></u>	<u>700<sup>9</sup></u>	<u>0</u>	<u>125,625<sup>9</sup></u>
<b>TOTAL</b>	<b>\$16,704,859<sup>9</sup></b>	<b>3,739,831<sup>9</sup></b>	<b>276,227</b>	<b>20,720,917<sup>9</sup></b>

<sup>1</sup> Excludes funds appropriated to other DOE accounts but used to finance aspects of Strategic Petroleum Reserve program management.

<sup>2</sup> Rescission.

<sup>3</sup> Included supplemental appropriations of \$1,305,000,000.

<sup>4</sup> Included in FY 1984 second supplemental appropriations.

<sup>5</sup> Includes indefinite appropriation for excess NPR receipts of \$56,050,529.

<sup>6</sup> Includes \$122,680,683 proceeds from the Test Sale carried out in the Fall of 1990, proceeds from the Desert Storm drawdown of \$315,424,985 and \$19,755,064 in FY 1991 excess NPR receipts plus the FY 1991 advance appropriation of \$108,457,000.

<sup>7</sup> Net of an FY 1992 advance appropriation of \$196,188,000 and the FY 1992 appropriation of \$14,910,000 less the \$122,685,000 transferred to the Strategic Petroleum Reserve appropriation (89X0218.91).

<sup>8</sup> Transferred \$125,625 from the SPR Petroleum Account to the Strategic Petroleum Reserve Account.

<sup>9</sup> DOD transferred a total of \$125,625,000 to DOE for oil acquisition and storage costs for the DOD-Strategic Petroleum Reserve. Neither the oil acquired nor the cost of acquisition or storage is counted in the total of Strategic Petroleum Reserve inventory or appropriations.

A total of \$53.3 million of the Strategic Petroleum Reserve Account funds remained available for obligation at the end of fiscal year 1992.

The appropriation for fiscal year 1993, which included the transfer of \$125.6 million from the SPR Petroleum Account, increased available funds by \$176.2 million to a total of approximately \$229.4 million. Additionally, from a Department of Defense appropriation (which was transferred to the Strategic Petroleum Reserve Account during the first quarter of fiscal year 1993), \$0.7 million was added to the Strategic Petroleum Reserve Account for operational activities in support of the Defense Strategic Petroleum Reserve oil acquisition program, for a total of \$230.1 million. Of this total, \$42.1 million were obligated in the quarter ended December 31, 1992 (first quarter of fiscal year 1993), leaving a balance of \$188 million available for future obligation.

#### **SPR PETROLEUM ACCOUNT TRANSACTIONS, LAST QUARTER OF 1992 (FIRST QUARTER OF FISCAL YEAR 1993)**

The SPR Petroleum Account funds the acquisition of oil for the Strategic Petroleum Reserve; the associated costs for transportation and terminalling; U.S customs duties and Superfund and Oil Spill Liability Trust Fund taxes; and other miscellaneous costs, such as Defense Fuel Supply Center administration costs, associated with acquiring and transporting oil. In the event of a drawdown and sale of Strategic Petroleum Reserve oil, the SPR Petroleum Account also funds the costs of withdrawing oil from the storage caverns and transporting it to the point where the purchasers take title. An amount equal to Federal receipts from a drawdown and sale is deposited in the SPR Petroleum Account and creates additional budget authority for refilling the Reserve.

At the end of fiscal year 1992, \$658.1 million remained available for obligation in the SPR Petroleum Account. Outlays (payments) from the account during the fiscal year were \$131.7 million.

During the quarter ending December 31, 1992 (first quarter of fiscal year 1993), the funds available in the SPR Petroleum Account were increased by the appropriation of \$125.6 million from the Department of Defense and decreased by the transfer of \$0.7 million from the Defense funds to the Strategic Petroleum Reserve Account. The SPR Petroleum Account funds were further decreased by a transfer of \$125.6 million from ending fiscal year 1992 balances to the Strategic Petroleum Account, leaving a balance of \$657.4 million for future obligation.

In addition to the appropriations for fiscal year 1993, an outlay ceiling of \$137 million was enacted limiting the use of funds carried over from fiscal year 1992.

During the first quarter of fiscal year 1993, \$109.6 million was obligated and outlays (payments) from the account during the quarter were \$36.1 million.

#### **OIL COSTS THROUGH FISCAL YEAR 1992**

During fiscal year 1992, 2.9 million barrels were delivered to the Strategic Petroleum Reserve. Cumulative cost for the oil in the Strategic Petroleum Reserve at the end of fiscal year 1992 was \$15.7 billion for an average cost of approximately \$27.39. An additional 3.3 million barrels of oil acquired during fiscal year 1992 were in transit and scheduled for delivery during the first quarter of fiscal year 1993.

**ESTIMATED COST TO COMPLETE THE STRATEGIC PETROLEUM RESERVE**

The cost to complete fill from the present inventory level of 574.7 million barrels (MMB) to the storage capacity of 750 MMB will depend on acquisition approach, price, and timing. At \$20 per barrel, acquisition of 175.3 MMB could cost \$3.5 billion. At 25,000 barrels per day, fill would be completed by the year 2012; at 50,000 barrels per day, fill would be completed by the year 2002; at 100,000 barrels per day, fill would be completed by 1997.



# ***DRAWDOWN AND DISTRIBUTION***

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## ***DISTRIBUTION PLAN***

The current plan for distributing Strategic Petroleum Reserve petroleum, in the event that the Reserve is drawn down to respond to a severe energy supply interruption or to meet obligations of the United States under the Agreement on an International Energy Program, is provided in the "Strategic Petroleum Reserve Drawdown (Distribution) Plan," Amendment Number 4 to the Strategic Petroleum Reserve Plan submitted on December 1, 1982. The Strategic Petroleum Reserve Distribution Plan provides that, pursuant to the President's decision to use the Strategic Petroleum Reserve, the principal method of distributing Strategic Petroleum Reserve oil will be by price competitive sale with the oil being sold and delivered to those offering the highest prices. The sale will be open to the largest possible universe of eligible buyers to ensure efficient distribution of Strategic Petroleum Reserve oil. The plan also provides that in any calendar month, the Secretary of Energy may direct the distribution of up to 10 percent of the volume of oil sold in that calendar month. The price for such oil will be the average price of Strategic Petroleum Reserve oil sold at the contemporaneous competitive sale or at the most recent competitive sale if no contemporaneous competitive sale is held.

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## ***COMPETITIVE SALES PROCEDURES***

Appendix A to the Department of Energy's final rule (10 CFR Part 625) governing price competitive sales of

petroleum from the Strategic Petroleum Reserve provides for Standard Sales Provisions containing or describing contract clauses, terms and conditions of sale, and performance and financial responsibility measures, which may be applicable to a particular sale of Strategic Petroleum Reserve oil. The most recent edition of the Standard Sales Provisions was published in the *Federal Register* on December 11, 1992. This version revised the previous edition of the Standard Sales Provisions, published in June 1988, to reflect improvements identified during the Reserve's 1990 test sale and 1991 drawdown.

Under the Standard Sales Provisions, the Strategic Petroleum Reserve sales process starts with the issuance of a Notice of Sale which specifies the amount, characteristics, and location of the petroleum being sold; the delivery dates and the procedures for submitting offers and other information pertinent to a particular sale. In addition, the Notice of Sale specifies which sales provisions and performance and financial responsibility measures are applicable.

During the course of a Strategic Petroleum Reserve drawdown, a number of Notices of Sale may be issued, each covering a sales period of one to two months. Initially, Notices of Sale issued during a Strategic Petroleum Reserve drawdown could allow an extremely short lead time for offers and deliveries. Under the Standard Sales Provisions, it is contemplated that offerors might be given as little as 7 days from the issuance of the Notice of Sale until offers are due, and 30 days or less from the time of such issuance, until

the purchasers must accept delivery of the oil, with a less compressed schedule becoming more feasible after the initial stages of drawdown. Because of the possible short lead time, the Standard Sales Provisions provide for the establishment of a list of prospective offerors who will receive all Notices of Sale.

The next step in the sales process is the preparation by prospective purchasers of their offers, which must be submitted before a time specified in the Notice of Sale. The Standard Sales Provisions require that the offerors unconditionally accept all terms and conditions made applicable to that sale by the Notice of Sale, include an offer guarantee of \$10 million or 5 percent of the maximum potential contract amount, whichever is less, and offer at least the minimum price, if any, specified in the Notice of Sale.

Following the receipt of offers, the Department of Energy would evaluate the offers to select the "apparently successful" offerors. The evaluation process is structured so that the offerors bidding the highest prices can select the method by which the Strategic Petroleum Reserve petroleum is to be transported, up to the limits of the Strategic Petroleum Reserve distribution systems, with specific delivery arrangements to be negotiated later.

Under the Standard Sales Provisions, all apparently successful offerors are required, within as little as 5 business days after being notified, to provide a letter of credit to equal 100 percent of the contract amount or a cash deposit in an amount equal to 110 percent of the contract value as a guarantee of performance and payment of amounts due under the contract.

Upon timely receipt of the financial guarantees, and upon a final determination

by the Contracting Officer that the offers were responsive and the offerors responsible, the Department of Energy will publicly announce the results of the sale, issue the Notices of Award and commence deliveries of oil from the Reserve to the purchasers consistent with their arrangement of commercial pipeline or marine vessel means of transportation. Such deliveries could commence as soon as the 16th day after the commencement of the sales process, to the extent that the purchasers are able to provide their financial guarantees and arrange transportation expeditiously.

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### ***REMOVAL OF STRATEGIC PETROLEUM RESERVE CRUDE OIL ALLOCATION REGULATIONS***

During the quarter, the Department eliminated regulations codified at 10 CFR, part 200, entitled "Strategic Petroleum Reserve Crude Oil Allocation." These regulations were proposed for elimination because they refer to options for allocating crude oil which are no longer available, due to the expiration of the Emergency Petroleum Allocation Act. Also, in 1982 Strategic Petroleum Reserve Plan Amendment Number 4 added a number of terms and conditions that would apply to the use of a directed or allocated sales method to distribute Strategic Petroleum Reserve crude oil.

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### ***DRAWDOWN AND DISTRIBUTION CAPABILITIES***

The crude oil acquired for the Strategic Petroleum Reserve has been commingled in storage in a manner that allows for eight distinct crude oil streams to be made available for sale in the event of a drawdown.

Table 6 depicts these streams and their inventories as of December 31, 1992, as well as their typical characteristics and available delivery modes and locations.

Ongoing analysis suggests that up to a total of 200 million barrels of crude oil at Strategic Petroleum Reserve sites may contain excess gas. The Department is performing additional tests and developing an aggressive mitigation plan. An update will be provided in the Strategic Petroleum Reserve Quarterly Report.

Based on the Strategic Petroleum Reserve's December 31, 1992, crude oil stream inventories, excluding the small quantity stored at the Big Hill site, and the existing Strategic Petroleum Reserve draw-down systems and commercial distribution capabilities, the Reserve's current drawdown and distribution capabilities are as shown in Table 7.

The Strategic Petroleum Reserve is currently capable of initially being drawn down and distributed at a maximum sustained rate of 3.5 million barrels per day for a 90-day period. After 90 days, the drawdown/distribution rate would decrease gradually as site inventories are depleted and the declining number of caverns containing crude oil becomes a constraint. Figure 8 illustrates the Strategic Petroleum Reserve's current physical drawdown/distribution capability, which provides for a distribution of approximately 57 percent of the Reserve in 90 days, 92 percent of the Reserve in 180 days and 100 percent of the Reserve in 210 days.

#### **COMMERCIAL CAPABILITIES AND ENHANCEMENTS**

The distribution capabilities of the Strategic Petroleum Reserve are estimated to be approximately 3.9 million barrels per day through commercial pipelines and

marine terminals, as shown in Figure 9. The Reserve is currently accessible to 56 refiners through commercial pipelines. These refiners accounted for approximately 49 percent of the U.S. 1992 refining capacity and processed over 57 percent of non-Canadian crude imports during 1992. The Reserve is further connected to four marine terminals for water borne distribution: ARCO, Phillips, Sun and DOE's St. James Terminal. These terminals have a total of 12 tanker berths and 3 barge berths and have a capability of outloading over 2 million barrels of Strategic Petroleum Reserve crude oil per day.

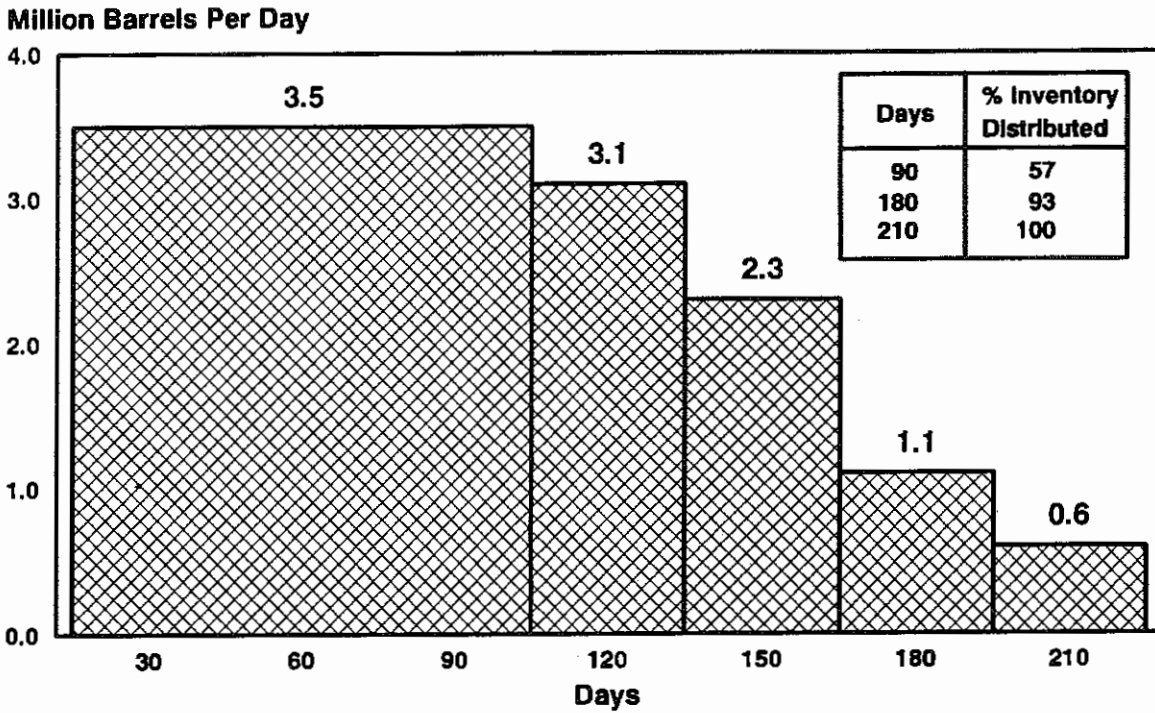
The SPR's distribution capability will increase from 3.9 to 4.3 million barrels per day by October 1993. This increase is due to a contract award to Unocal Corporation for marine distribution at its Nederland, Texas, Terminal in April 1992 and a contract award to Texaco Pipeline Incorporated for pipeline distribution to Houston, Texas, in June 1992. Construction required for these services will be completed in 18 months and 12 months respectively. Enhancements to increase the SPR's distribution capability beyond 4.3 million will require further analysis to determine cost effective ways to add distribution capability without major pipeline or terminal construction.

**TABLE 6**  
**STRATEGIC PETROLEUM RESERVE CRUDE OIL STREAMS\***

<b>CRUDE OIL STREAM</b>	<b>INVENTORY (MMB)</b>	<b>TYPICAL API GRAVITY</b>	<b>TYPICAL SULFUR CONTENT</b>	<b>DELIVERY MODE AND LOCATION</b>
<b>SEAWAY GROUP:</b>				
Bryan Mound Sweet	61.5	36.0°	0.34%	Pipeline or tankship at Phillips Terminal, Freeport, TX or Arco Terminal, Texas City, TX
Bryan Mound Sour	144.2	33.1°	1.51%	Terminal, Texas City, TX
Bryan Mound Maya	11.1	22.8°	3.28%	Tankship at Phillips Terminal
<b>TEXOMA GROUP:</b>				
West Hackberry Sweet	106.5	36.9°	0.31%	Pipeline, tankship or barge at Sun Terminal, Nederland, TX; Pipeline at Texaco-22/DOE connection, Lake Charles, LA
West Hackberry Sour	99.9	33.7°	1.44%	
<b>CAPLINE GROUP:</b>				
Weeks Island Sour	71.9	28.9°	1.41%	Pipeline at Capline or LOCAP Terminals, St. James, LA; Tankship at DOE's terminal, St. James, LA
Bayou Choctaw Sweet	15.2	36.1°	0.39%	
Bayou Choctaw Sour	35.6	33.2°	1.47%	

\* Data as of December 31, 1992.

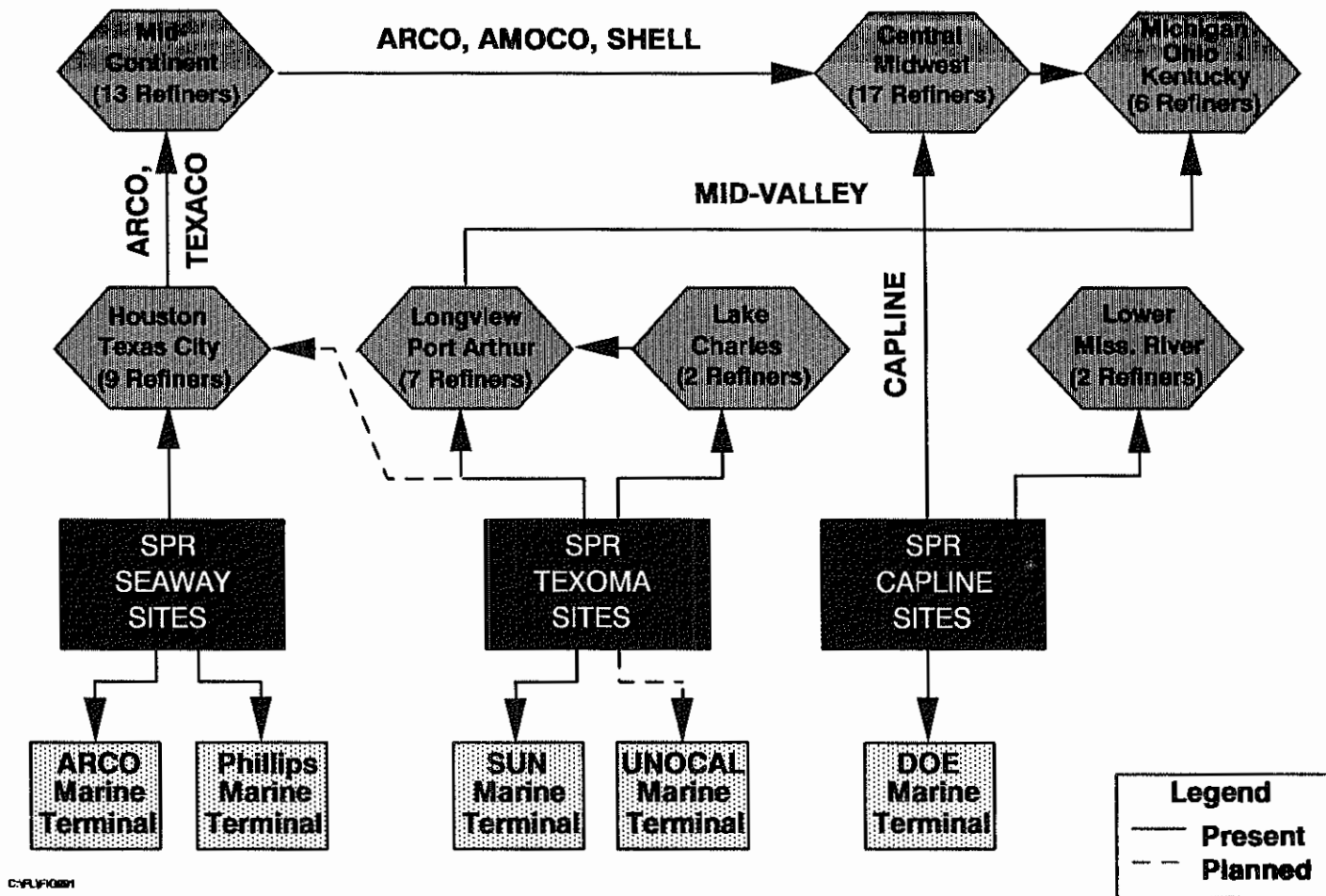
**FIGURE 8**  
**STRATEGIC PETROLEUM RESERVE DRAWDOWN/DISTRIBUTION**  
**CAPABILITY**  
**INVENTORY AS OF 12/31/92**



**TABLE 7**  
**CURRENT DRAWDOWN AND DISTRIBUTION CAPABILITIES**  
**(THOUSANDS OF BARRELS PER DAY)**

	Drawdown	Distribution
Seaway Group	1,250	1,250
Texoma Group	1,250	1,540
Capline Group	1,070	1,070
<b>TOTAL</b>	<b>3,570</b>	<b>3,860</b>

**FIGURE 9**  
**STRATEGIC PETROLEUM RESERVE PIPELINE AND MARINE DISTRIBUTION CAPABILITIES**



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# ***1992 DRAWDOWN SYSTEMS TESTS***

During calendar year 1992 the Department of Energy conducted five tests of the Strategic Petroleum Reserve storage site drawdown system capabilities. These tests are summarized as follows:

- On June 30, 128,000 barrels were drawn down from the Big Hill site and delivered to Sun Terminal, demonstrating a sustained rate capability of 408,000 barrels per day.
- On September 3, 223,000 barrels were drawn down from the Bryan Mound site and delivered simultaneously to ARCO and Phillips terminals, demonstrating a combined rate capability of 1.16 million barrels per day.
- On September 19, 77,000 barrels were drawn down from the Weeks Island site, using the site's recovery drawdown system, and delivered to the Department's St. James Terminal, demonstrating a sustained rate capability of 643,000 barrels per day.
- On November 6-8, 703,000 barrels were again drawn down from Weeks Island and delivered to St. James Terminal achieving a maximum instantaneous rate of 427,000 barrels per day.
- On December 11, 64,000 barrels were drawn down from the Bayou Choctaw site, using its recovery drawdown system, and delivered to St. James Terminal, demonstrating a rate capability of 480,000 barrels per day.

## ***APPENDICES***

***A. Strategic Petroleum Reserve Site Status***

***B. Strategic Petroleum Reserve Crude Oil Specifications***



# **APPENDIX A**

## ***Strategic Petroleum Reserve Site Status***

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### **BAYOU CHOCTAW**

#### **LOCATION**

Iberville Parish, Louisiana (12 miles southwest of Baton Rouge, Louisiana).

#### **ACQUISITION**

Acquired 355.95 acres fee simple, by condemnation April 1977, from numerous private owners. Union Texas Petroleum (a subsidiary of Allied Corporation) was the previous operator.

In 1985 the Department of Energy acquired an additional existing cavern through a cavern exchange agreement with Union Texas Petroleum. The transaction involved a 3.5 acre exchange with no net change in Government-owned acreage.

#### **ENVIRONMENTAL/PERMITS**

Environmental Impact Statement published December 1976; supplement published May 1977.

Four major Federal and State permits related to pipeline, well pad, storage, and storm water runoff acquired in 1978, and updated in 1980 and 1981.

#### **SITE DESCRIPTION**

A 72-million-barrel storage facility consisting of 62 million barrels in five existing caverns, plus 10 million barrels of storage capacity in a new Strategic Petroleum Reserve-developed cavern.

Oil, brine, and raw water piping distribution system connecting caverns with central plant, a water intake structure, 12 brine disposal wells located 2.5 miles offsite, and a pipeline for supplying brine to Union Texas Petroleum, Inc. Oil and water distribution system consists of over 50,000 feet of piping and 16 pumps totaling 22,000 horsepower. A 100,000 barrel brine pond and an oil/brine separator are also onsite.

Numerous permanent specialized buildings include: Control Center, Security Operations Center, Maintenance Shop and Laboratory, Electrical Switch Gear (5KV), Spare Parts Warehouse, Foam Storage, Instrument Shop, Documentation Storage and a Guard House.

#### **SYSTEM PARAMETERS**

Oil fill via 36-inch-diameter, 37.2-mile pipeline from St. James Terminal. Sustained system rate - 110,000 bbl/d (brine disposal-constrained).

Raw water design pumping rate - 495,000 bbl/d.

Brine disposal design pumping rate - 110,000 bbl/d.

#### **DRAWDOWN**

Drawdown via 36-inch-diameter, 37.2-mile pipeline to St. James Terminal and to Capline pipeline.

Design drawdown capability upon completion - 480,000 bbl/d.

### **MAJOR ACCOMPLISHMENTS**

Approximately 56 million barrels of oil are in storage.

Completed designed capacity of 72 million barrels in 1991 with a 6-million-barrel expansion of an existing cavern.

# WEEKS ISLAND

## LOCATION

Iberia Parish, Louisiana (95 miles southwest of New Orleans).

## ACQUISITION

Acquired 382.92 acres fee simple subsurface and 6.63 acres fee simple surface, by condemnation September 1977, from Morton Salt Company.

## ENVIRONMENTAL/PERMITS

Environmental Impact Statement published January 1977; supplement published August 1977.

Major Federal permit related to oil pipeline to St. James Terminal acquired in 1978. Three major Federal and State permits related to oil storage, air emissions and storm water, and treated sewage effluent discharge acquired in 1979; EPA National Pollutant Discharge Elimination System permit updated in 1982.

## SITE DESCRIPTION

Conventional room and pillar salt mine containing 72 million barrels of storage capacity in two levels. Dedicated to sour crude oil storage.

Oil piping distribution system consists of 11 (10 operational and one reserve) submersible electric pumps in the mine to boost crude to the surface and twin main-line pumps (plus one reserve) to deliver crude to the St. James, Louisiana Terminal during drawdown. Pumps total 17,000 horsepower. Firewater system has a 500,000 gallon tank with pumps, and mine

inert gas and vapor recovery systems provide for safety.

Numerous permanent specialized buildings include: Administration and Maintenance, Control Center, Security Operations Center, Spare Parts Warehouse, Electrical Substation, Laboratory and Sample, Inert Gas Generator, Foam Storage, Fire Water Pump House, Mainline Pump House, Production Shaft Headframe, Production Shaft Hoist, Service Shaft Headframe, Service Shaft Hoist, Service Shaft Motor Control Center, and a Guard House.

## SYSTEM PARAMETERS

Oil fill via 36-inch-diameter, 67.2 mile pipeline from St. James Terminal. Sustained system rate - 350,000 bbl/d (terminal throughput limited).

## DRAWDOWN

Drawdown via 36-inch-diameter 67.2-mile pipeline to St. James Terminal and to Capline pipeline.

Design drawdown capability - 590,000 bbl/d.

## MAJOR ACCOMPLISHMENTS

Approximately 72 million barrels of crude oil are in storage.

Installed an alternate (redundant) draw-down system utilizing high capacity submersible pumps to be installed in the oil-fill holes.

Constructed two new bulkheads as part of the mine integrity assurance program.

# BRYAN MOUND

## LOCATION

Brazoria County, Texas (three miles southwest of Freeport, Texas).

## ACQUISITION

Acquired 499.47 acres fee simple, by condemnation April 1977, from Freeport Mineral Company and other owners. Dow Chemical Company was the previous operator.

In 1986 Department of Energy acquired the pre-existing Brazoria County Road 242 within the site boundary through a relocation agreement with the county.

## ENVIRONMENTAL/PERMITS

Environmental Impact Statement published January 1977; supplement published December 1977. Phase III supplement published October 1981.

Five major Federal and State permits related to pipelines, water intake, and storage acquired in 1977 and 1978. National Pollution Discharge Elimination System updated 1981; renewed 1984. Seaway Environmental Impact Statement published June 1978. Supplement published October 1981.

Two major Federal permits related to brine disposal pipeline issued in 1978. Permit for brine discharge increased to 1.1 million bbl/d August 1981.

## SITE DESCRIPTION

226-million-barrel storage facility consisting of 66 million barrels of capacity in four caverns existing upon site

acquisition, plus 160 million barrels of storage capacity in 16 Strategic Petroleum Reserve-developed caverns.

36-inch-diameter, 14.6-mile brine disposal pipeline extending 13 miles offshore in the Gulf of Mexico.

Oil, brine and raw water piping distribution system connecting caverns with central plant and water intake structure located on Brazos River and connected by a 36-inch pipeline. Oil/brine/water distribution system consists of over 101,000 feet of piping and 33 pumps totaling over 43,000 horsepower. Four 200,000-barrel oil storage tanks, two brine ponds (15,000 and 150,000), and an oil-brine separator.

Numerous permanent specialized buildups include: Control Center, Security Operations Center, Maintenance, Spare Parts Warehouse, Foam Generator, Foam Storage (3), Electrical Switch Gear, and a Guard House.

## SYSTEM PARAMETERS

Fill via 30-inch-diameter, 3.6-mile pipeline from Phillips 66 Freeport Marine Terminal. Design oil fill rate - 240,000 bbl/d. Sustained system rate - 180,000 bbl/d.

Raw water design pumping rate - 1,140,000 bbl/d.

Brine disposal design pumping rate - 980,000 bbl/d (permit limitation 1,100,000 bbl/d).

## DRAWDOWN

Drawdown via 30-inch diameter, 3.6 mile pipeline, to Phillips 66 Freeport Marine Terminal.

Drawdown via 40-inch diameter, 46-mile pipeline to ARCO Pipeline Company's Texas City Pipeline Terminal and Docks.

Design drawdown capability - 1,250,000 bbl/d.

#### **MAJOR ACCOMPLISHMENTS**

Approximately 217 million barrels of crude oil are in storage.

Modifications to increase the site's drawdown/distribution capability to 1.25 million barrels per day have been completed.

Plans have been completed for commencing construction of a new brine disposal pipeline in June 1993 to replace the existing worn-out pipeline.

# **SULPHUR MINES**

## **LOCATION**

Calcasieu Parish, Louisiana (two miles south west of Sulphur, Louisiana, and 12 miles west of Lake Charles).

## **ACQUISITION**

Acquired 109.63 acres fee simple and 64.52 acres conditional fee, by condemnation February 1979, from Union Texas Petroleum Company.

## **ENVIRONMENTAL/PERMITS**

Environmental Impact Statement published March 1978.

Three major Federal and State permits for pipeline construction, oil storage, and air emissions acquired in 1978. Environmental Protection Agency discharge permits for storm water and sewage acquired in 1980.

Published Environmental Assessment and Finding of No Significant Impact in 1990 for decommissioning facility.

## **SITE DESCRIPTION**

26-million-barrel storage facility consisting of three existing caverns.

Oil, brine, and raw water piping distribution system connecting caverns with central plant, water intake structure located 1.8 miles offsite on Sabine River Diversion Canal No. 5, connected by 12 and 16-inch pipelines, four brine disposal wells, and two 100,000 barrels brine ponds. Includes over 77,000 feet of piping and 18 pumps totaling over 8,000 horsepower.

Permanent specialized buildings include: Control & Maintenance Center, Security Operations Center and Foam Storage.

## **SYSTEM PARAMETERS**

Oil fill via 16-inch-diameter, 15.9-mile spur pipeline connecting to Department of Energy's 42-inch West Hackberry pipeline at Intra-coastal Waterway. Sustained system rate - 80,000 bbl/d (brine disposal-constrained).

Raw water design pumping rate - 100,000 bbl/d.

Brine disposal design pumping rate - 80,000 bbl/d.

## **DRAWDOWN**

Drawdown via 16-inch-diameter, 15.9 mile spur pipeline, which connects to the 42-inch-diameter West Hackberry line to Sun Terminal, Nederland, Texas.

Design drawdown capability - 100,000 bbl/d.

## **MAJOR ACCOMPLISHMENTS**

Completed transfer of Sulphur Mines oil to the Strategic Petroleum Reserve Big Hill facility in December 1991.

Conducted negotiations with potential buyers to sell Sulphur Mines.

# WEST HACKBERRY

## LOCATION

Cameron Parish, Louisiana (22 miles southwest of Lake Charles, Louisiana).

## ACQUISITION

Acquired 405.36 acres fee simple, by condemnation April 1977, from numerous private landowners. Olin Corporation was the previous site operator.

Acquired 160.0 additional acres fee simple by condemnation in two actions, July 1979 and March 1980.

## ENVIRONMENTAL/PERMITS

Environmental Impact Statement published January 1977; supplement published April 1977. Phase III supplement published October 1981.

Six major Federal and State permits related to pipelines, drilling pads, water intake, and storage acquired in 1977 and 1978; National Pollutant Discharge Elimination System permit renewed 1984.

Texoma Environmental Impact Statement published November 1978; supplement published in October 1981.

Two major Federal permits related to a brine pipeline acquired in 1980.

## SITE DESCRIPTION

219-million-barrel storage facility consisting of 49 million barrels in five caverns existing upon site acquisition, plus 170 million barrels of storage capacity in 17 Strategic Petroleum Reserve-developed caverns.

Oil, brine, and raw water piping distribution system connecting caverns with central plant, water intake structure located on Intracoastal waterway connected by a 42-inch diameter, 4.5 mile pipeline, and 10 brine disposal wells. Consists of over 160,000 feet of piping and 45 pumps totaling over 82,000 horsepower. Thirty-six-inch-diameter, 27-mile brine disposal pipeline extending nine miles offshore in the Gulf of Mexico, a 175,000-barrel brine pond and an oil-brine separator.

Numerous permanent specialized buildings include: Control Center, Security Operations Center, Maintenance, Spare Parts Warehouse, Covered Lay-Down, Film Storage, Foam Storage, and a Guard House.

## SYSTEM PARAMETERS

Fill via 42-inch diameter, 42.8-mile pipeline from Sun Terminal, Nederland, Texas. Design oil fill rate - 225,000 bbl/d. Sustained system rate - 175,000 bbl/d.

Raw water design pumping rate - 1,450,000 bbl/d.

Brine disposal design pumping rate - 900,000 bbl/d (permit limitation 1,088,000 bbl/d) via 36-inch pipeline to the Gulf of Mexico.

## DRAWDOWN

Drawdown via a Department of Energy 42-inch-diameter, 42.8-mile pipeline to Sun Terminal, Nederland, Texas.

Drawdown via a 36-inch diameter, 12-mile oil pipeline (Department of Energy Lake Charles Pipeline) connecting to the Texas 22-inch common carrier pipeline and to refineries in Lake Charles, Louisiana.

Design drawdown capability - 1,250,000  
bbl/d.

### **MAJOR ACCOMPLISHMENTS**

Planned capacity development of 219 million  
barrels completed.

Initiated recompletion of existing brine  
disposal wells to provide subsurface disposal  
capability while brine disposal pipeline to the  
Gulf of Mexico remains shut down for  
evaluation.



# ***BIG HILL***

## **LOCATION**

Jefferson County, Texas (20 miles southwest of Beaumont, Texas).

## **ACQUISITION**

Acquired 271 acres fee simple, by condemnation November 1982 and July 1983, from three landowners, i.e., 238.48 acres from Amoco, 27.06 acres from the Pipkin estate, and 5.46 acres from the Patrick Henry Phelan estate.

## **ENVIRONMENTAL/PERMITS**

Environmental Impact Statement published October 1981.

State permits for drilling, underground hydrocarbon storage, pipeline operations, air quality, water appropriation, and water quality certifications were acquired in 1983. The EPA National Pollutant Discharge Elimination System permit was acquired in 1984.

## **SITE DESCRIPTION**

160-million-barrel storage facility consisting of fourteen Strategic Petroleum Reserve-developed 11.5-million-barrel storage caverns.

Oil, brine, and raw water systems connecting caverns with central plant, water intake structure located on the Intracoastal Waterway connected by a 48-inch diameter, and brine disposal pipeline extending 3 miles offshore in the Gulf of Mexico. Oil and water distribution system consists of over 29 miles of piping and 15 pumps totaling 32,000 horsepower.

Numerous permanent specialized buildings include: Control Center, Administration,

Security Operations Center, Communications, Guard House, Covered Lay-Down, Fire House, Sample Storage, and Maintenance.

## **SYSTEM PARAMETERS**

Fill via 36-inch-diameter, 25 mile pipeline from Sun Terminal, Nederland, Texas.  
Sustained system rate 280,000 bbl/d.

Raw water design pumping rate - 1,400,000 bbl/d.

Brine disposal design pumping rate - 1,400,000 bbl/d (permit limitation of 1,700,000 bbl/d).

## **DRAWDOWN**

Drawdown via 36-inch-diameter, 25 mile pipeline to Sun Terminal, Nederland, Texas.

Design Drawdown capability - 930,000 bbl/d.

## **MAJOR ACCOMPLISHMENTS**

Completed planned 160-million-barrel capacity development.

Conducted system test/exercise to establish drawdown capability of 400,000 barrels per day which will increase to 930,000 barrels per day as oil inventory increases.

# **ST. JAMES TERMINAL**

## **LOCATION**

St. James Parish, Louisiana (45 miles south-east of Baton Rouge, Louisiana, on the Mississippi River).

## **ACQUISITION**

Acquired 104.76 acres of fee simple for terminal by condemnation in May 1978.

Acquired 47.68 acres fee simple for docks by condemnation in July 1978.

## **ENVIRONMENTAL/PERMITS**

St. James' Terminal Environmental Impact Statement is a component of the Bayou Choctaw supplement, published May 1977, and the Weeks Island supplement, published August 1977.

Two major Federal and State permits related to dock construction were acquired in 1978. Environmental Protection Agency discharge permit for storm water and sewage acquired in 1980. Dock Construction Permit modified 1982.

## **SITE DESCRIPTION**

Terminal facilities include six storage tanks totaling two million barrels of capacity, tie-ins to Bayou Choctaw and Weeks Island sites, and to LOCAP and Capline pipeline terminals.

Oil distribution piping system connecting docks, tanks, and pump station consists of over 35,000 feet of piping and five pumps totaling over 7,500 horsepower, metering systems, and maintenance and control buildings.

Two docks with one berth each, able to accommodate vessels of up to 123,000 long tons maximum loaded displacement. A 42-inch-diameter pipeline connects the docks to the storage tanks.

## **SYSTEM PARAMETERS**

Tanker unloading - design unloading capacity of 40,000 bbl/hr.

Fill capabilities from terminal to:

Bayou Choctaw: design pumping rate - 240,000 bbl/d.

Weeks Island: design pumping rate - 480,000 bbl/d.

Terminal sustained system fill rate: 350,000 bbl/d.

## **DRAWDOWN**

Crude oil from Bayou Choctaw and/or Weeks Island to be distributed across docks and to LOCAP and Capline Pipeline Terminal.

**SUSTAINED TANKER LOADING RATE:**  
435,000 bbl/d.

## **MAJOR ACCOMPLISHMENTS**

Completed security improvements at St. James terminal.

# APPENDIX B

## Strategic Petroleum Reserve Crude Oil Specifications

Characteristic	Sour <sup>b</sup>	Sweet <sup>c</sup>	Primary ASTM Test Method <sup>d</sup>
API Gravity [°API]	30 - 45	30 - 45	D 1298
Total Sulfur [Wt.%], Max.	1.99	0.50	D 1552
Pour Point [°F(°C)], Max.	50 (10)	50 (10)	D 97
Salt Content [Lbs./1,000 Bbls.], Max.	50	50	D 3230
Viscosity [SUS @ 60°F (cSt @ 15.6°C)], Max.	150 (32)	150 (32)	D 445 & D 2161
[SUS @ 100°F (cSt @ 37.8°C)], Max.	70 (13)	70 (13)	
Reid Vapor Pressure [Psia @ 100°F (kPa @ 37.8°C)], Max.	11 (76)	11 (76)	D 323
Total Acid Number [mg KOH/g], Max.	0.40	0.40	D 664
Water and Sediment [Vol. %], Max.	1.0	1.0	D 473 & D 4006 or D 4928
Yields [Vol. %]			
Naphtha [82-375°F (28-191°C)]	24 - 30	21 - 42	D 2892 & D1160
Distillate [375-620°F (191-327°C)]	17 - 31	19 - 45	
Gas Oil [620-1050°F (327-566°C)]	26 - 38	20 - 42	
Residuum [>1050°F(>566°C)]	10 - 19	14 Max.	

<sup>a</sup> Marketable virgin crude petroleum suitable for normal refinery processing and free of foreign contaminants or chemicals including, but not limited to, chlorinated and/or oxygenated hydrocarbons, and lead.

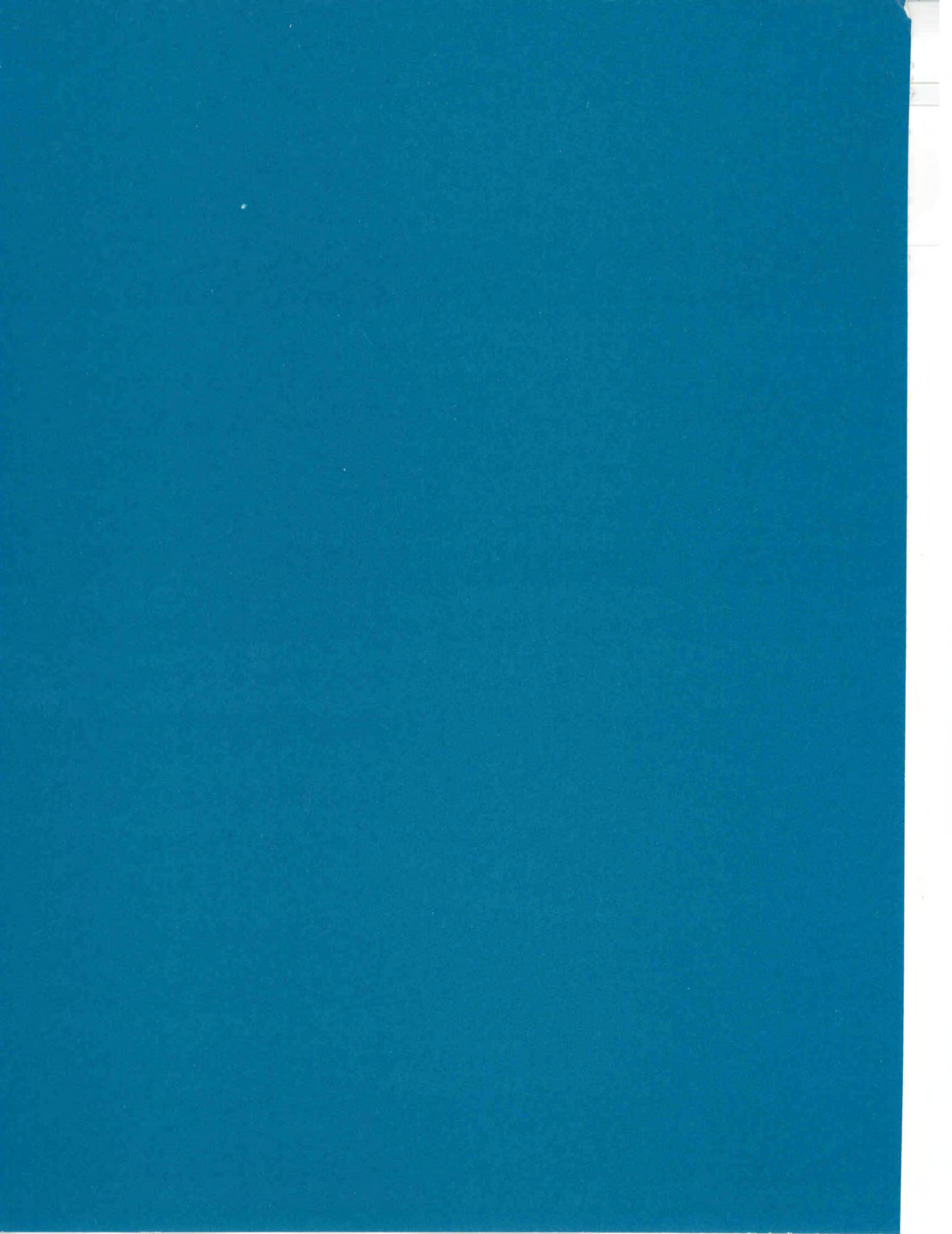
<sup>b</sup> Crude oils that meet these sour specifications include Arabian Berri, Arabian Light, Dubai (Fateh), Flotta, Isthmus, Lagomedio, Oman, Qatar Marine, Tia Juana Light, Upper Zakum, and West Texas Sour.

<sup>c</sup> Crude oil that meet these sweet specifications include Bonny Light, Brass River, Brent Blend, Ekofisk, Escravos, Forties, Kole Marine, Oseberg, Palanca, Sabaran Blend, Statfjord, West Texas Intermediate, and Zarzaitine.

NOTE: Crude oils other than those listed above may be acceptable. The acceptability of any crude oil depends upon an assay typical of current production quality of the stream.

<sup>d</sup> Alternate methods may be used if approved within the contract. Offerors shall submit requests to use alternate methods to the Contracting Officer for determination of acceptability. In case of disputes arising from a difference between origin and destination test results, results from testing of the custody transfer sample using the primary test method shall be binding.





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# Strategic Petroleum Reserve

## Annual/Quarterly Report

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**February 15, 1995**

**U.S. Department of Energy**  
Assistant Secretary for Fossil Energy  
Office of Strategic Petroleum Reserve

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# Strategic Petroleum Reserve

## Annual/Quarterly Report

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**February 15, 1995**

**U.S. Department of Energy**  
Assistant Secretary for Fossil Energy  
Office of Strategic Petroleum Reserve  
Washington, DC 20585



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# TABLE OF CONTENTS

	Page
EXECUTIVE SUMMARY .....	1
Key Activities .....	1
PROGRAM DEFINITION .....	3
Mission .....	3
Program Legislation .....	3
Strategic Petroleum Reserve Plan and Amendments .....	4
Program/Project Management .....	5
STORAGE FACILITY DEVELOPMENT PROGRAM .....	8
Development of the 750-Million Barrel Storage Program .....	8
Storage Facilities Status .....	10
Storage Facilities Life Extension Program .....	13
Expansion of the Reserve to One Billion Barrels .....	14
OIL ACQUISITION AND FILL STATISTICS FOR THE FOURTH QUARTER 1994 ..	15
Oil Fill, Calendar Year 1994 .....	15
Oil Acquisition, Calendar Year 1994 .....	15
Cargo Preference Compliance .....	16
OTHER PROJECT ACTIVITIES .....	23
Oil Stabilization Program .....	23
Commercialization of SPR Distribution Facilities .....	24
Procurement and Contractor Support .....	25
Real Estate .....	25
Security .....	26
ENVIRONMENT, SAFETY AND HEALTH .....	27
Environmental Compliance .....	27
Other Environmental, Safety and Health Actions .....	28
BUDGET AND FINANCE .....	30
Appropriations .....	30
Major Budget and Financing Actions During 1994 .....	30
DRAWDOWN AND DISTRIBUTION .....	36
Distribution Plan .....	36
Competitive Sales Procedures .....	36
Drawdown and Distribution Capabilities .....	37
1994 Drawdown Readiness Activities .....	42

<b>CUSTOMER SERVICE TO THE NATION AND U.S. REFINERS</b> .....	<b>43</b>
<b>SPR Protection for the Nation</b> .....	<b>43</b>
<b>U.S. Refining Industry Access to SPR Oil</b> .....	<b>43</b>
<b>APPENDIX A Strategic Petroleum Reserve Site Status</b> .....	<b>48</b>
<b>APPENDIX B Strategic Petroleum Reserve Crude Oil Specifications</b> .....	<b>60</b>

# *LIST OF TABLES*

	<b>Page</b>
TABLE 1 Strategic Petroleum Reserve Oil Fill Inventory . . . . .	17
TABLE 2 Strategic Petroleum Reserve Oil Fill History . . . . .	18
TABLE 3 Crude Oil Received Through 1994 . . . . .	21
TABLE 4 Strategic Petroleum Reserve Crude Oil Inventory As of December 31, 1994 . . . . .	22
TABLE 5 Strategic Petroleum Reserve Appropriations . . . . .	35
TABLE 6 Strategic Petroleum Reserve Crude Oil Streams . . . . .	38
TABLE 7 Current Drawdown and Distribution Capabilities . . . . .	39

## ***LIST OF FIGURES***

	<b>Page</b>
FIGURE 1 Program/Project Management Structure .....	7
FIGURE 2 Strategic Petroleum Reserve Complexes and Associated Pipelines and Terminals .....	9
FIGURE 3 Annual Strategic Petroleum Reserve Oil Fill .....	19
FIGURE 4 Cumulative Strategic Petroleum Reserve Oil Fill .....	20
FIGURE 5 Strategic Petroleum Reserve Annual Funding .....	33
FIGURE 6 Strategic Petroleum Reserve Cumulative Funding .....	34
FIGURE 7 Strategic Petroleum Reserve Drawdown/Distribution Capability .....	40
FIGURE 8 Days of Net Import Protection .....	45
FIGURE 9 Strategic Petroleum Reserve Pipeline and Marine Distribution Capabilities ..	46

# EXECUTIVE SUMMARY

Section 165 of the Energy Policy and Conservation Act (Public Law 94-163), as amended, requires the Secretary of Energy to submit annual and quarterly reports to the President and the Congress on activities of the Strategic Petroleum Reserve (SPR). Additional prospective information related to the development and fill of the Strategic Petroleum Reserve is required by the Omnibus Budget Reconciliation Act of 1986 (Public Law 99-509). This report describes activities for the year ending December 31, 1994 and includes specifically required information for the fourth calendar quarter of 1994.

## KEY ACTIVITIES

### APPROPRIATIONS

On September 30, 1994, the President signed the Department of Interior and Related Agencies Appropriations Act, 1995 (Public Law 103-332) which provided \$244.0 million for operations and management of the Reserve and includes an outlay cap of \$9 million on funds in the SPR Petroleum Account.

### STRATEGIC PETROLEUM RESERVE OIL ACQUISITION

During 1994, the Strategic Petroleum Reserve crude oil inventory was increased by 4.6 million barrels. As of the end of the year, the Reserve's inventory was 591.7 million barrels.

### OIL STABILIZATION PROGRAM

In 1994, the Department continued its efforts to correct two problems that have temporarily reduced the availability of a portion of the Reserve's oil inventory for drawdown. These problems are a higher than normal gas content in some crude oil, apparently from years of intrusion of methane from the enclosing domal salt, and an elevated temperature of some crude oil due to natural geothermal heating. These phenomena have resulted in an increase in the vapor pressure of the oil which could result in emissions that exceed environmental and safe operating limits during a drawdown.

A contract for oil degasification services was awarded on September 12, 1994. Degasification is scheduled to commence in July 1995 and be completed in April 1998. The Department also awarded contracts for the construction and installation of heat exchangers to cool the oil during drawdown operations; installation has begun and is scheduled for

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completion in March 1995. With installation of heat exchangers, the Strategic Petroleum Reserve's sustainable drawdown rate will increase gradually to 3.1 million barrels per day, and will further increase to 3.9 million barrels per day as the affected gassy oil inventory is degassed.

#### **WEEKS ISLAND**

In December 1994, the Department announced its intent to decommission the Weeks Island storage facility due to geotechnical problems which pose a significant risk of environmental damage and potential oil loss. 1994 investigative studies into the cause of a surface sinkhole have concluded that water from the surface aquifers is seeping into the Strategic Petroleum Reserve's underground oil storage chamber at the Weeks Island site. As a result, the Department plans to transfer the Weeks Island oil to other Strategic Petroleum Reserve storage facilities in Louisiana and Texas during 1995 and 1996, and to decommission the Weeks Island site during 1997 and 1998.

#### **COMMERCIALIZATION OF STRATEGIC PETROLEUM RESERVE DISTRIBUTION FACILITIES**

In 1994, the Department initiated a project to permit commercial use of the Strategic Petroleum Reserve distribution facilities (i.e., the St James marine terminal and crude oil pipelines). With fill of the Reserve approximately 80 percent complete and drawdown only required in the event of a national energy emergency, these distribution facilities are underutilized. Under the authority granted in the Energy Policy and Conservation Act, the Department issued a solicitation in September 1994, inviting industry to submit offers for the leasing of the Strategic Petroleum Reserve St. James marine terminal. By making this facility available for commercial use, the Department expects to: (1) reduce the operational cost of the Reserve, (2) generate revenue from the Government's investment, and (3) support industry in meeting the Nation's needs for crude oil distribution.

#### **LIFE EXTENSION PROGRAM**

During 1994, the Strategic Petroleum Reserve executed design, procurement and construction activities associated with the implementation of the Strategic Petroleum Reserve's Life Extension Program. The Life Extension Program was conceived to address the aging and obsolescence of Strategic Petroleum Reserve storage facilities and systems. The goal of the Life Extension Program is that by the year 2000, all major systems will have been upgraded or replaced to extend the useful life of the Reserves facilities and drawdown systems to the year 2025. Major activities which occurred in 1994 included the procurement and construction activities associated with site heat exchangers and modernization of site control systems.

# ***PROGRAM DEFINITION***

## **MISSION**

The Strategic Petroleum Reserve (SPR) is a large crude oil stockpile, under the control of the President of the United States. The Strategic Petroleum Reserve mission is to reduce vulnerability to economic, national security, and foreign policy consequences of supply interruptions by discouraging supply disruptions as a tool of other nations, and by adding to crude oil supplies in the United States, in the event of a disruption due either to political, military, or natural causes. The Strategic Petroleum Reserve is mandated by the Energy Policy and Conservation Act, as amended, and by the comprehensive energy plans of all Administrations since 1975 in recognition of the long term dependence of the United States on imported crude oil and petroleum products.

## **PROGRAM LEGISLATION**

The Strategic Petroleum Reserve was authorized by Congress with the enactment on December 22, 1975, of the Energy Policy and Conservation Act (Public Law 94-163), which declared it to be United States policy to establish a Strategic Petroleum Reserve of up to one billion barrels of petroleum products to reduce the impact of a severe energy supply interruption and to carry out the obligations of the United States under the International Energy Program.

The provisions of the Energy Policy and Conservation Act regarding the Strategic Petroleum Reserve were amended by title VIII of the Energy Security Act (Public Law 96-294), enacted on June 30, 1980. This Act established a minimum average daily fill rate of 100,000 barrels and precluded sale of Naval Petroleum Reserve Number 1 (Elk Hills, California) crude oil except to fill the Strategic Petroleum Reserve, unless the Strategic Petroleum Reserve was being filled at the minimum rate or had an inventory of 500 million barrels.

The Energy Policy and Conservation Amendments Act of 1985 (Public Law 99-58), enacted on July 2, 1985, extended the provisions of title I, part B, of the Energy Policy and Conservation Act relating to the Strategic Petroleum Reserve until June 30, 1989, and directed the Secretary of Energy to conduct a sale or exchange of 1.1 million barrels of crude oil to test the drawdown and distribution capabilities of the Strategic Petroleum Reserve.

The Omnibus Budget Reconciliation Act of 1986 (Public Law 99-509), enacted on October 18, 1986, amended the Energy Policy and Conservation Act to require that the

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Strategic Petroleum Reserve be filled at a minimum rate of 75,000 barrels a day until at least 750 million barrels are in storage.

Public Law 100-531, an act amending the Department of Energy Organization Act (Public Law 95-91), enacted on October 25, 1988, authorizes protective force personnel who guard the Strategic Petroleum Reserve's storage and related facilities to carry firearms while performing official duties and to make arrests without warrants. The legislation also establishes trespass on Strategic Petroleum Reserve property as a Federal offense.

Public Law 101-46, an Act to extend Title I of the Energy Policy and Conservation Act, enacted on June 30, 1989, extended the Strategic Petroleum Reserve authorities contained in the Energy Policy and Conservation Act until April 1, 1990. The bill also required the Secretary to submit a report to Congress by February 1, 1990, on alternative means of financing oil acquisition for the Strategic Petroleum Reserve.

Short-term extensions of the Strategic Petroleum Reserve authorities contained in the Energy Policy and Conservation Act were enacted on March 31, 1990 (Public Law 101-262) and August 10, 1990 (Public Law 101-360).

On September 15, 1990, the President signed Public Law 101-383, the Energy Policy and Conservation Act Amendments of 1990, extending the Strategic Petroleum Reserve authorities contained in the Energy Policy and Conservation Act until September 30, 1994. Public Law 101-383 also contained provisions to amend Strategic Petroleum Reserve drawdown authorities, require a Strategic Petroleum Reserve Plan Amendment for completion of storage capacity for one billion barrels, authorize drawdown and distribution tests, and provide for a 3-year (fiscal years 1992, 1993 and 1994) test program of storage of refined petroleum products.

On October 24, 1992, the President signed Public Law 102-486, the Energy Policy Act of 1992. The bill included provisions to (1) add new conditions for Strategic Petroleum Reserve drawdown in emergency situations involving a supply reduction of significant scope and duration coupled with a severe price increase likely to cause a major adverse impact on the national economy, (2) enlarge the Strategic Petroleum Reserve to one billion barrels, (3) permit the Secretary to make payment in advance for delivery of petroleum product either owned or not owned by the United States for storage in the Strategic Petroleum Reserve or non-Strategic Petroleum Reserve facilities, (4) give the President discretionary authority to acquire domestic stripper well oil at competitive prices to fill the Strategic Petroleum Reserve and (5) amend the eligibility criteria for a Regional Petroleum Reserve.

On September 30, 1994, the President signed into law the Department of the Interior and Related Agencies Appropriations Act, 1994 (Public Law 103-332) providing \$244.0

million for operation and management of the Reserve. The appropriations act also includes an outlay cap of \$9 million on funds in the SPR Petroleum Account.

On October 22, 1994, the President signed into law the Energy Policy and Conservation Act Amendments Act of 1994 (Public Law 103-406), which extended Strategic Petroleum Reserve authorities to June 30, 1996.

## **STRATEGIC PETROLEUM RESERVE PLAN AND AMENDMENTS**

Section 154 of the Energy Policy and Conservation Act required the preparation of a Strategic Petroleum Reserve Plan. The Plan, addressing the development and implementation of the Strategic Petroleum Reserve, was submitted to the Congress on February 16, 1977, and became effective on April 18, 1977.

Strategic Petroleum Reserve Plan Amendment No. 1 accelerated the planned schedule for filling the Reserve. This Amendment was submitted to the Congress on May 25, 1977, and became effective on June 20, 1977. The revised goal for 500 million barrels of crude oil in storage by December 22, 1980, advanced the original schedule by 2 years. Amendment No. 2 to the Strategic Petroleum Reserve Plan authorized an increase in the Strategic Petroleum Reserve size from 500 million barrels to one billion barrels. This amendment was transmitted to the Congress on May 18, 1978, and became effective on June 13, 1978. The Amendment described Department of Energy plans to store 750 million barrels of petroleum in underground storage facilities. Decisions were not made regarding the methods or timing for developing the final 250 million barrels of storage capacity.

On October 31, 1979, the Department of Energy submitted Amendment No. 3, a Distribution Plan for the Strategic Petroleum Reserve, to the Congress. In accordance with the provisions of the Energy Policy and Conservation Act in existence at that time, this Plan became effective on November 15, 1979. The Distribution Plan described the methods for drawdown and distribution of petroleum from the five existing Strategic Petroleum Reserve storage sites.

On December 1, 1982, the President transmitted Amendment No. 4, a new Drawdown Plan, to the Congress for the use of the Strategic Petroleum Reserve. This Plan, required under the Energy Emergency Preparedness Act of 1982, went into effect immediately and provides procedures for the drawdown, sale, and distribution of petroleum from the Strategic Petroleum Reserve. The Drawdown Plan replaces the Distribution Plan established by Amendment No. 3.

The 1990 amendments to the Energy Policy and Conservation Act (Public Law 101-383) required the Department to amend the Strategic Petroleum Reserve Plan to prescribe plans for completion of one billion barrels of storage capacity.

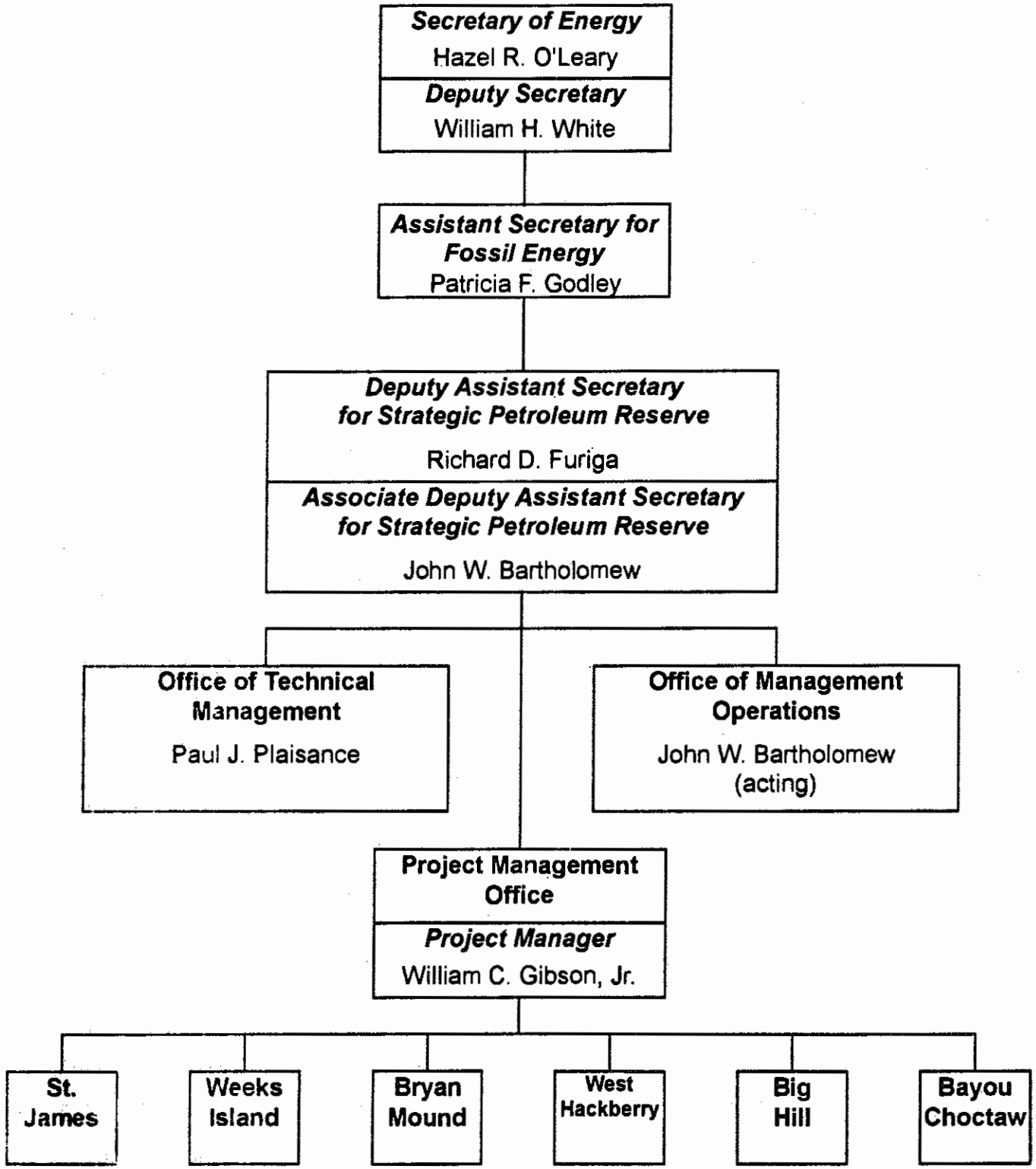
### **PROGRAM/PROJECT MANAGEMENT**

The Strategic Petroleum Reserve Office was created under the Energy Policy and Conservation Act for the establishment, management, and maintenance of the Strategic Petroleum Reserve. The Assistant Secretary for Fossil Energy has overall programmatic responsibility for achieving the goals and objectives of the Strategic Petroleum Reserve Program. This responsibility has been delegated to the Deputy Assistant Secretary for Strategic Petroleum Reserve, Richard D. Furiga, and is exercised through offices located in Washington, D.C.

The Project Management Office is located in New Orleans, Louisiana, and is under the direction of the Project Manager, William C. Gibson, Jr. It carries out day-to-day project activities, including the management and operation of five oil storage sites and one marine terminal.

**FIGURE 1**  
**Program/Project Management Structure**

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# ***STORAGE FACILITY DEVELOPMENT PROGRAM***

## **DEVELOPMENT OF THE 750-MILLION BARREL STORAGE PROGRAM**

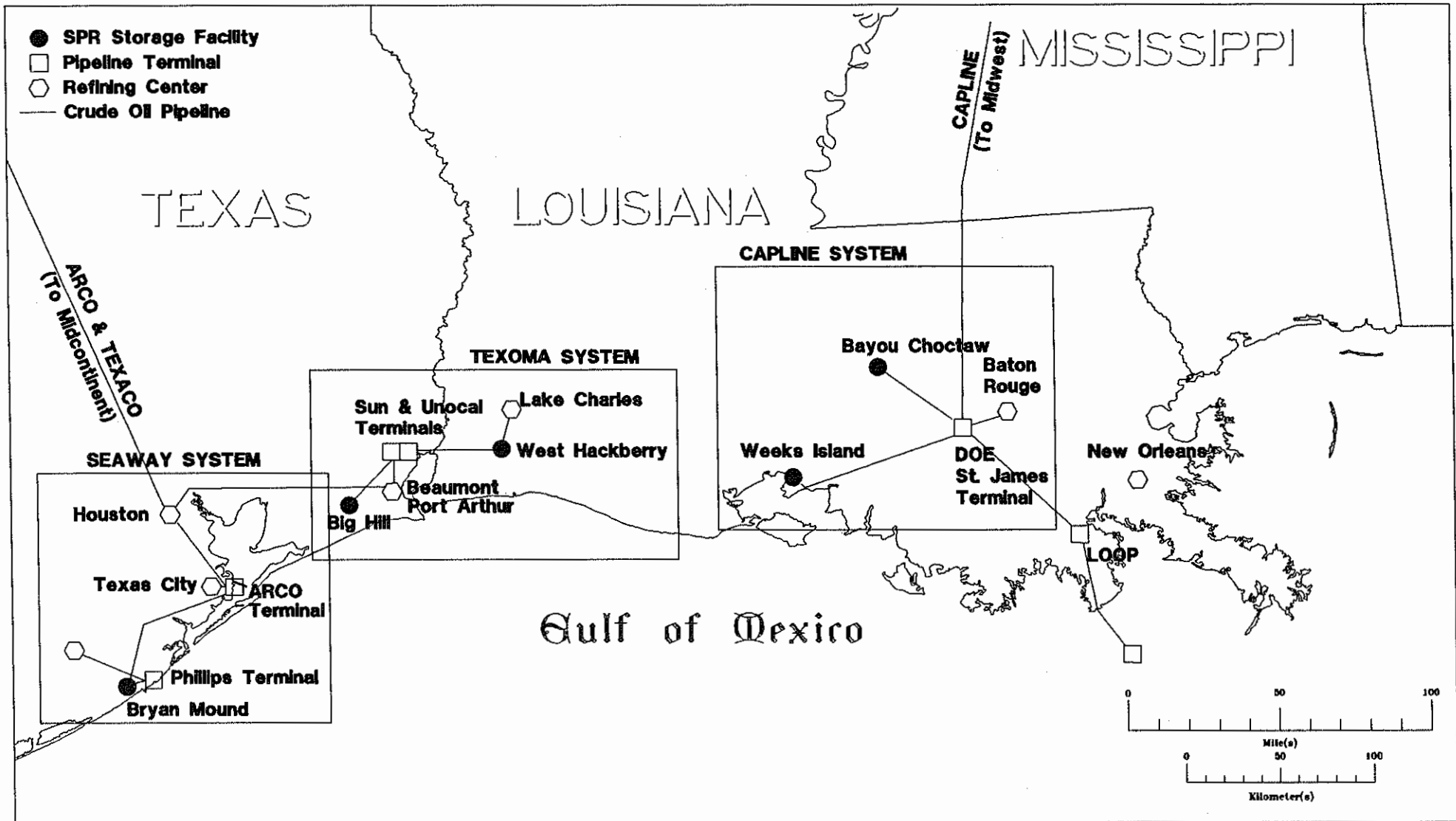
The Strategic Petroleum Reserve Facilities Development Program is presently designed and constructed to provide a cumulative storage capacity of 750-million barrels and a drawdown/distribution capability of 4.5 million barrels per day.

The Department has developed five large underground crude oil storage facilities in salt domes along the Gulf Coast of Texas and Louisiana to stockpile 750 million barrels of crude oil. The five storage sites, comprising the 750-million barrel program, are West Hackberry, Bayou Choctaw, and Weeks Island in Louisiana, and Bryan Mound and Big Hill in Texas. These storage sites are organized into three distribution systems--the Seaway, Texoma and Capline--and connected by Department of Energy pipelines to commercial crude oil pipeline networks and to commercial and Government-owned marine terminal distribution facilities. The locations of the current Strategic Petroleum Reserve storage sites and their distribution pipelines and terminals are shown in Figure 2.

In December 1994, the Department announced its intent to decommission the Weeks Island storage facility due to geotechnical problems which pose a significant risk of potential oil loss and environmental damage. This situation is discussed further below. However, decommissioning of the Weeks Island site will reduce the overall storage capacity of the Reserve from 750 million to 680 million barrels, and the maximum drawdown and distribution rate of the Reserve from 4.5 to 3.9 million barrels per day.

**FIGURE 2**

**STRATEGIC PETROLEUM RESERVE STORAGE SITES AND DISTRIBUTION SYSTEM**



## STORAGE FACILITIES STATUS

### **BRYAN MOUND**

The Bryan Mound storage facility is located in Brazoria County, Texas, approximately three miles southwest of Freeport. The site has twenty storage caverns with a combined storage capacity of 226 million barrels and an inventory of 217 million barrels. The site is available for both fill and drawdown operations; however, the site's drawdown capability is currently limited due to problems associated with excessive vapor pressures and temperatures of the current inventory.

In 1994, the Department awarded contracts for degasification of approximately 91 million barrels of Bryan Mound crude and the installation of 20 site heat exchangers which will cool the crude during drawdown. Eight of the 20 heat exchangers were delivered to the site in 1994, and the remaining 12 are scheduled for delivery in January 1995. Installation of the heat exchangers is in progress and scheduled to be completed by March 1995.

In 1991, the Department initiated a major project to replace the site's brine disposal pipeline to the Gulf of Mexico which had deteriorated from brine disposal operations during cavern leaching and oil fill. A contract for construction of a new cement-lined brine disposal pipeline was awarded in September 1993. Construction of the new pipeline was initiated in May 1994 and was 90 percent complete as of December 31, 1994. The pipeline construction schedule has been delayed by both internal contractor management problems and weather conditions. However, the new pipeline will be completed and fully operational in February 1995.

### **WEST HACKBERRY**

The West Hackberry storage facility is located in Cameron Parish, Louisiana, approximately 22 miles southwest of Lake Charles. The site has 22 storage caverns with a combined storage capacity of 219 million barrels and an inventory of 205 million barrels. The site is available for both fill and drawdown operations; however, the site's drawdown capability is limited due to problems associated with excessive vapor pressures and temperatures of the current inventory.

In 1994, the Department awarded contracts for degasification of approximately 18 million barrels of West Hackberry crude and the installation of six site heat exchangers which will cool the crude during drawdown. All six heat exchangers were delivered in 1994 and their installation is in progress and scheduled to be completed by March 1995.

After the West Hackberry brine disposal pipeline to the Gulf of Mexico was taken out of service in 1991 due to severe deterioration, the site has reverted to using its existing brine disposal wells. These existing brine disposal wells were constructed in 1977 and had an extremely limited disposal capacity. Over the past two years, the Department has pursued a program to recomplate some of the existing brine disposal wells, using newer disposal well completion techniques and new injection zones, to increase the site's current brine disposal capacity to 100,000 barrels per day and to instill confidence in using wells for long term brine disposal rather than replacing the deteriorated pipeline to the Gulf of Mexico. Three wells have been recompleted, and have demonstrated a combined brine disposal rate of over 120,000 barrels per day. These three wells provide sufficient near-term capacity for site operations and have proven the success of the newer brine disposal techniques for increasing the site's brine disposal capacity. The rehabilitation of the remaining five existing brine disposal wells has been deferred until such time additional brine disposal capacity is required.

### **BIG HILL**

The Big Hill storage facility is located in Jefferson County, Texas, 20 miles southwest of Beaumont. The site has 14 storage caverns with a combined storage capacity of 160 million barrels and an inventory of 42 million barrels. The site is available for both fill and drawdown operations; however, the site's drawdown capability is limited due to problems associated with excessive vapor pressures of the current inventory. In 1994, the Department awarded contracts for degasification of approximately 26 million barrels of Big Hill crude.

During 1994, the Department completed an expansion of the Big Hill site laboratory for crude oil testing and analysis, and the extension of the Trinity Bay Conservation District water main to provide potable water service to the Big Hill site.

### **BAYOU CHOCTAW**

The Bayou Choctaw storage facility is located in Iberville Parish, Louisiana, approximately 12 miles southwest of Baton Rouge. The site has six storage caverns with a combined storage capacity of 75 million barrels and an inventory of 52 million barrels. The site is available for both fill and drawdown operations; however, the site's drawdown capability is limited due to problems associated with excessive vapor pressures of the current inventory.

In 1994, the Department awarded contracts for degasification of approximately 9 million barrels of Bayou Choctaw crude and the installation of two site heat exchangers which will cool the crude during drawdown. The Department initiated the installation of the heat exchangers in September 1994 and completed their installation in late December 1994.



During 1994, the Department also installed a thermal relief system on the site's main oil header, initiates repairs to the site's raw water injection header and awarded contracts for upgrading the site's roads.

## **WEEKS ISLAND**

The Weeks Island storage facility is located in Iberia Parish, Louisiana, approximately 95 miles southwest of New Orleans. The Department acquired this storage site in 1977 and converted an existing conventional salt mine to oil storage with a capacity of 70 million barrels. Development and oil fill of this site was completed in 1982.

During 1994, the Department rigorously pursued investigative activities to determine the cause of a sinkhole which was discovered in 1992, and its relationship to an increasing water accumulation in the Strategic Petroleum Reserve's oil storage chamber. A Weeks Island Mine Integrity Management Group consisting of Department of Energy personnel, geologists from Sandia National Laboratories, and engineering contractors was formed. This team of experts has conducted surface seismics, cross-well tomographic seismics, exploratory drilling and injection of tracer dyes into the region below the sinkhole. As a result, the Department has discovered a sediment crevasse extending 70+ feet below the top of the salt formation directly beneath the sinkhole. Further, the Department has measured a downward movement of fluids and sediments within the crevasse, which correlates with measurements of brine accumulation in the mine and sediment loss at the surface. This information has led the Weeks Island Mine Integrity Management Group to conclude that water from the surface is entering the Weeks Island oil storage chamber.

The continuous inflow of subsurface water aquifers into the mine creates a high risk for uncontrolled water inflow and the potential displacement of oil to the sediments above the salt, which would cause environmental damage and oil loss. As an immediate emergency mitigative measure, the Department has pressurized the oil storage chamber to reduce inflow and initiated the injection of saturated brine within the crevasse to minimize any further leaching of the flow path into the mine. The Department has also investigated the feasibility of other mitigative measures such as grouting and ground freezing; however, the probability of success is highly questionable and likely to be temporary and expensive due to mine inaccessibility. There is no known method to eliminate future occurrences of water intrusion or assure the integrity of the mine for oil containment.

On December 15, 1994, the Secretary of Energy announced that the Department had concluded that continued storage of Strategic Petroleum Reserve crude oil at its Weeks Island site poses too great of an environmental risk to the surrounding ecosystems and that the Weeks Island site should be decommissioned. Plans and preparations are being made to relocate the Weeks Island oil to other Strategic Petroleum Reserve storage facilities in Louisiana and Texas during 1995 and 1996, and to decommission the Weeks Island site as a

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Strategic Petroleum Reserve storage facility during 1997 and 1998. The Department's plans and procedures for decommissioning the Weeks Island site will be developed in concert with the National Environmental Policy Act (NEPA) compliance review process. The Department hopes to minimize the economic impacts on the employees and the community through personnel reassignments, severance benefits and locating possible alternative uses of the facility.

## **STORAGE FACILITIES LIFE EXTENSION PROGRAM**

The Strategic Petroleum Reserve's storage facilities were originally designed for an operational life of 20 years. Construction at four sites, Bryan Mound, West Hackberry, Bayou Choctaw and Weeks Island, was completed in the early 1980s, and most of these systems will reach the end of their design life around the year 2000. Many of the systems and equipment at these sites (i.e., raw water, brine disposal, electrical, instrumentation) are experiencing an increasing number of failures and increasing maintenance costs associated with the later stages of design life.

During 1993, a Life Extension Program was initiated to ensure that the Strategic Petroleum Reserve can continue to meet its mission readiness and system availability, through the year 2025. The goal of the Life Extension Program is that by the year 2000, all major systems will have been upgraded or replaced to extend the useful life of the Reserve's facilities and drawdown systems to the year 2025.

During 1994, the Mitre Corporation, which provides Systems Engineering Support to the Strategic Petroleum Reserve, completed a Comprehensive Life Extension Plan for replacing and modernizing all of the mechanical, civil, electrical and instrumentation systems that are nearing the end of their operational lives. The Comprehensive Life Extension Plan focuses on (a) the simplification of site/system configurations by reducing the numbers of motors, pumps and valves by 30 to 60 percent, (b) improving logistics through standardization of systems and equipment among all of the sites, (c) achieving higher systems availability through the application of more modern, reliable technology, and (d) reducing the annual operating and maintenance cost of facilities by 10 to 20 percent.

Following completion of the Comprehensive Life Extension Plan, the Mitre Corporation initiated the development of conceptual designs for the Life Extension Program at each site. The conceptual designs are in progress and are expected to be completed in early 1995.

The Life Extension Program is being implemented over the six-year period from 1994 to 2000. During 1994, under the Life Extension Program, the Strategic Petroleum Reserve procured heat exchangers for oil cooling at Bryan Mound, West Hackberry and Bayou

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Choctaw; replaced raw water and brine header piping at four caverns and a brine return line at West Hackberry; and constructed a thermal relief system in the main oil header at Bayou Choctaw.

## **EXPANSION OF RESERVE TO ONE BILLION BARRELS**

### **STRATEGIC PETROLEUM RESERVE EXPANSION PLANNING**

The Energy Policy and Conservation Act Amendments of 1990 (Public Law 101-383) directed the Department of Energy to submit a Strategic Petroleum Reserve Plan Amendment to Congress by September 15, 1992, containing detailed plans for the expansion of the storage facilities of the Reserve to one billion barrels.

At this time, the site selection process and plans to issue a Strategic Petroleum Reserve Plan Amendment have been suspended due to lack of funding to complete fill of the existing 750 million barrels of capacity. The ultimate size of the Reserve is currently under review and will be addressed with the Congress during the Energy Policy and Conservation Act reauthorization process.

## ***OIL ACQUISITION AND FILL STATISTICS FOR THE FOURTH QUARTER 1994***

Due to the lack of available funding, there were no Strategic Petroleum Reserve oil acquisition and fill activities during the calendar quarter ending December 31, 1994. As of the end of the quarter, the Reserve's crude oil inventory was 591,670,021 barrels. Table 1 summarizes the Reserve's crude oil inventory and delivery statistics as of December 31, 1994. Projections for 1995 are not included due to the current plans for no oil purchases during that year.

### **OIL FILL, CALENDAR YEAR 1994**

During 1994, the Strategic Petroleum Reserve crude oil inventory was increased by 4.6 million barrels, representing an average annual fill rate of approximately 12,600 barrels per day. This fill rate exceeded the 11,500 barrel per day fill rate projected in the Reserve's Annual Report for 1993 due to favorable oil market conditions. Fiscal and calendar year-end inventories and average daily fill rates since 1977 are presented in Table 2. Strategic Petroleum Reserve crude oil fill is illustrated on both an annual and cumulative basis in Figures 4 and 5, respectively.

### **OIL ACQUISITION, CALENDAR YEAR 1994**

During 1994, approximately 4.6 million barrels of crude oil were acquired and delivered to the Strategic Petroleum Reserve. This oil was primarily acquired under three contracts awarded by the Department of Defense's Defense Fuel Supply Center, acting as the Department of Energy's purchasing agent under an interagency agreement. The oil was purchased under an open continuous solicitation for competitive offers which were received and evaluated on a periodic basis.

In addition to the above deliveries, the Reserve also received 111,044 barrels that were the final commercial pipeline shipments of Stevens Zone crude oil from the Naval Petroleum Reserve No. 1 in California. These pipeline shipments began June 1, 1992, and the total quantity transferred from California to the Strategic Petroleum Reserve by this means amounted to 9,667,951 barrels.

Table 3 shows the crude oil quantities received since the inception of the Strategic Petroleum Reserve program through 1994 by country of origin. Of the total oil in storage, 65.7 percent is high sulfur (sour) and 34.3 percent is low sulfur (sweet). Table 4 provides

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information on the location of this inventory by storage site. The quality specifications used when acquiring Strategic Petroleum Reserve crude oil can be found in Appendix B of this report.

### ***CARGO PREFERENCE COMPLIANCE***

The Cargo Preference Act of 1954 (Public Law 83-664) requires Federal agencies to take such steps as may be necessary and practicable to assure that at least 50 percent of their cargo transported on ocean vessels in a calendar year is transported by privately-owned U.S.-flag vessels, to the extent they are available at fair and reasonable rates. By agreement between the Department of Energy and the Department of Transportation, the Strategic Petroleum Reserve's Cargo Preference Act compliance is measured in long-ton miles; i.e., cargo tons multiplied by the distances transported.

During 1994, two U.S.-flag vessels, transporting 3 million barrels on four voyages, were involved in delivering crude oil to the Strategic Petroleum Reserve. These deliveries equaled 1.6 million long-ton miles, or 57.5 percent of the total long-ton miles involved in marine deliveries to the Reserve.

**TABLE 1**  
**STRATEGIC PETROLEUM RESERVE OIL INVENTORY**  
**AND DELIVERY STATISTICS**  
**1994 INVENTORY AND DELIVERY SUMMARY**  
**(BARRELS)**

<b>Calendar Year 1994</b>	<b>Average Daily Fill Rate</b>	<b>Quarter Oil Receipts</b>	<b>Ending Oil Inventory*</b>
1st Quarter	35,290	3,176,100	590,256,115
2nd Quarter	15,410	1,414,198	591,670,313
3rd Quarter	0	0	591,674,690
4th Quarter	0	0	591,670,021
<b>TOTAL</b>	12,576	4,590,298	591,670,021
Amount of Oil in Transit as of December 31, 1994			0

\* Differences between ending inventories of 2nd, 3rd and 4th quarters due to inherent measurement variances

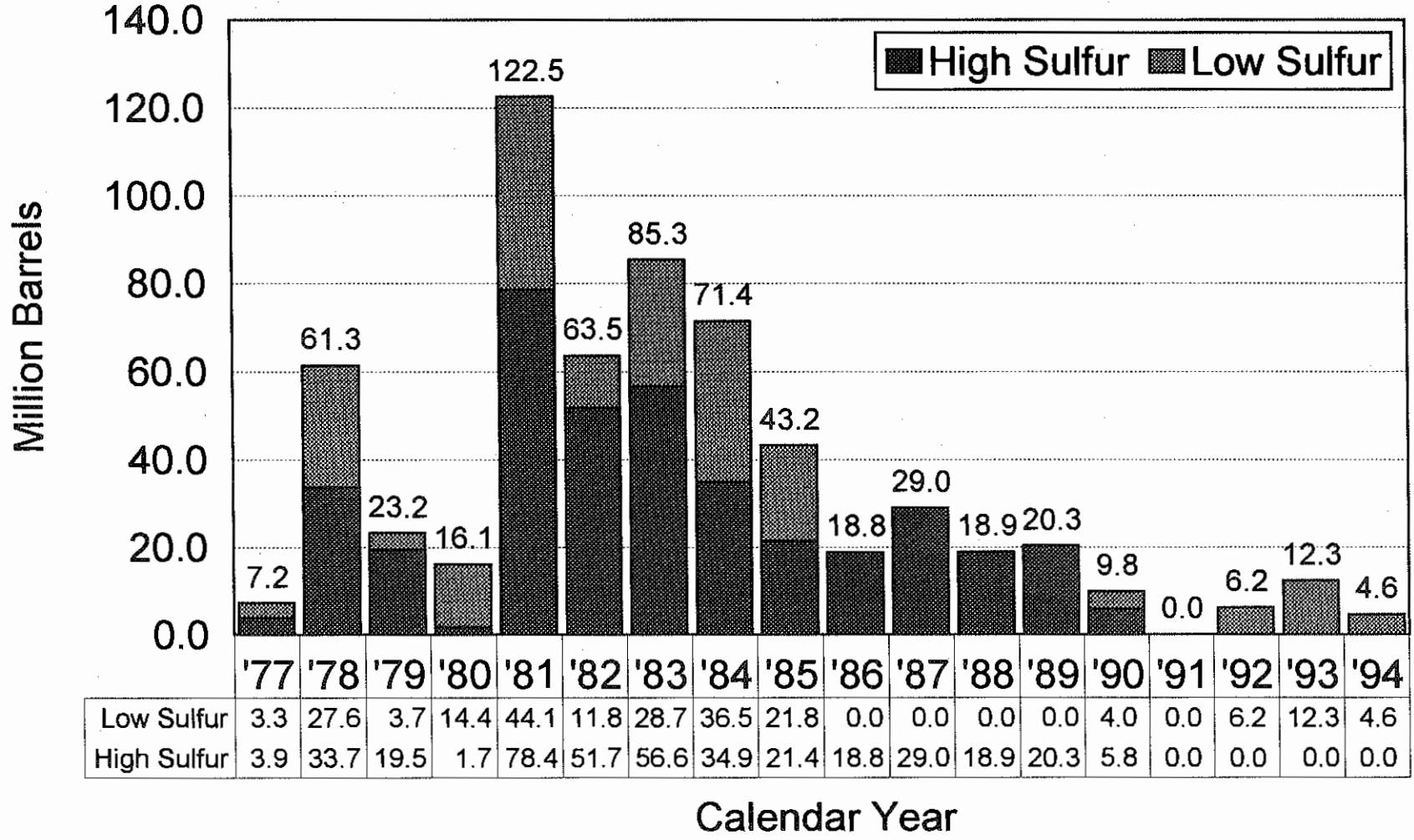
**TABLE 2**  
**STRATEGIC PETROLEUM RESERVE OIL FILL HISTORY**

	Fiscal Year		Calendar Year	
	Year-End Inventory (million bbls)	Average Daily Fill Rate (thousand bbls/d)	Year-End Inventory (million bbls)	Average Daily Fill Rate (thousand bbls/d)
1977	1.1	3	7.2	20
1978	49.1	131	68.5	168
1979	91.2	115	91.7	64
1980	92.8	4	107.8	44
1981	199.2	292	230.3	336
1982	277.9	215	293.8	174
1983	361.0	228	379.1	234
1984	431.1	191	450.5	195
1985	489.3	159	493.3	119*
1986	506.4	47*	511.6	51*
1987	533.9	75	540.6	80
1988	554.7	57	559.5	52
1989	577.1	62	579.9	56
1990	589.6	34	585.7	27*
1991	568.5	**	568.5	**
1992	571.4	8	574.7	17
1993	585.7	39	587.1	34
1994	591.7	16	591.7	13

\* Fill rates unadjusted for oil deliveries under the 1985/86 and 1990 test sales.  
 \*\* Fill was suspended during both fiscal and calendar year 1991; a decrease in inventory resulted from drawdown in early calendar year 1991.

Figure 3

ANNUAL STRATEGIC PETROLEUM RESERVE OIL FILL

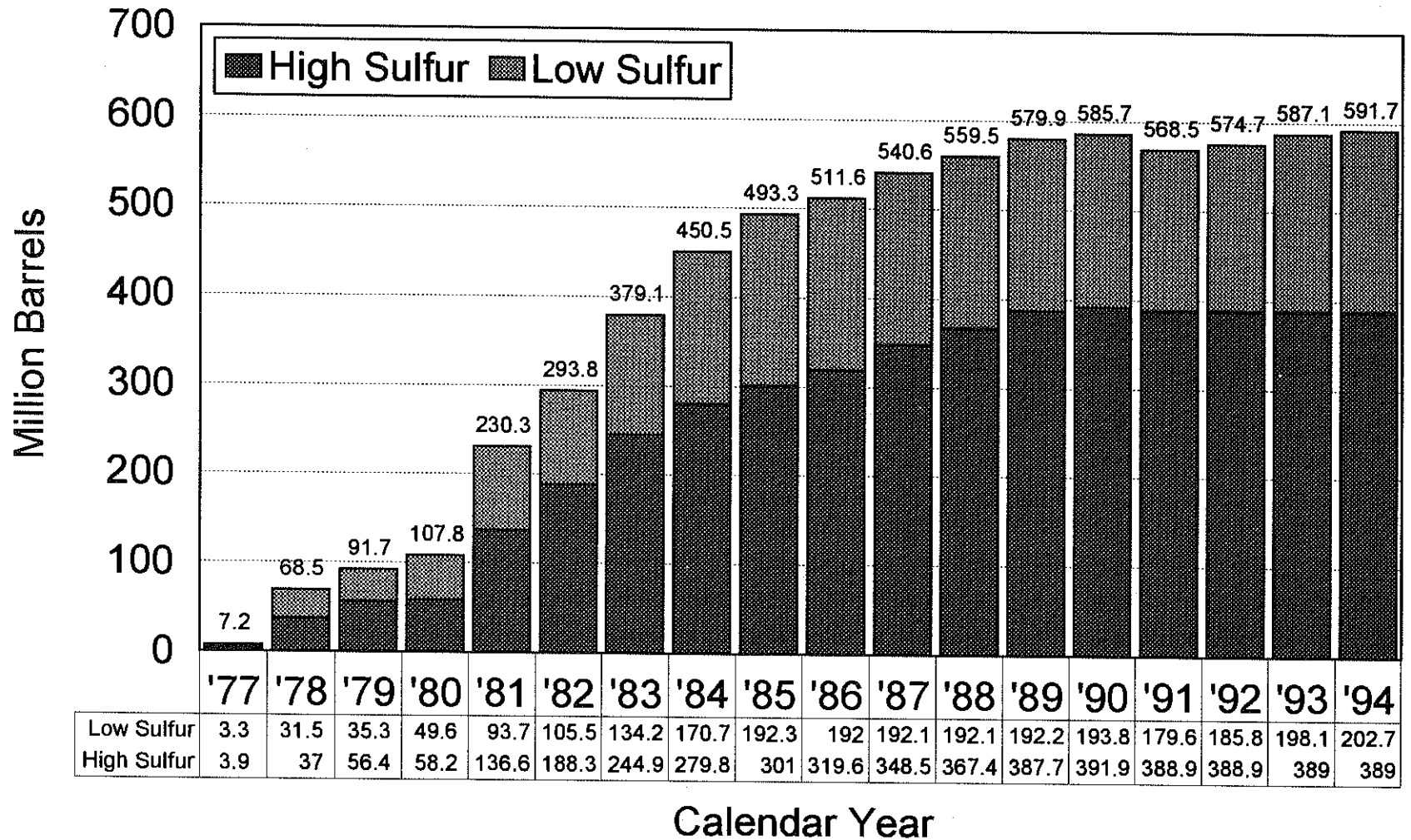


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Figure 4

CUMULATIVE STRATEGIC PETROLEUM RESERVE OIL FILL



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**TABLE 3**  
**CRUDE OIL RECEIVED THROUGH 1994**  
**(MILLION BARRELS)**

Source Country	1994	Cumulative	Percent of Total
Mexico		256.7	41.9
United Kingdom	4.5	147.3	24.0
United States:		48.1	7.8
Alaska		31.4	5.1
Other*	0.1	16.7	2.7
Saudi Arabia		27.1	4.4
Libya		23.7	3.9
Iran		20.0	3.3
United Arab Emirates		18.4	3.0
Nigeria		15.1	2.5
Norway		11.9	1.9
Oman		9.0	1.5
Egypt		8.9	1.5
Ecuador		6.2	1.0
Algeria		6.2	1.0
Cameroon		3.4	0.6
Iraq		3.4	0.6
Gabon		2.4	0.4
Qatar		2.3	0.4
Angola		1.0	0.2
Venezuela		0.9	0.1
Peru		0.4	0.1
Argentina		0.4	0.1
<b>TOTAL RECEIPTS**</b>	<b>4.6</b>	<b>612.8</b>	<b>100.0</b>
* Includes shipments from Naval Petroleum Reserves			
** Unadjusted for deliveries during 1985/1986 and 1990 test sales and 1991 drawdown and for operational gains and losses.			

**TABLE 4**  
**STRATEGIC PETROLEUM RESERVE CRUDE OIL INVENTORY**

**AS OF DECEMBER 31, 1994**  
**(MILLION BARRELS)**

<i>Storage Site</i>	<i>Location</i>	<i>1994 Cumulative Total</i>			<i>Total End of Year 1993</i>
		<i>Sour*</i>	<i>Sweet**</i>	<i>Total</i>	
<i>Bryan Mound</i>	<i>Brazoria County, TX</i>	<i>155.5</i>	<i>61.7</i>	<i>217.2</i>	<i>217.2</i>
<i>Big Hill</i>	<i>Jefferson County, TX</i>	<i>25.0</i>	<i>17.8</i>	<i>42.8</i>	<i>38.1</i>
<i>West Hackberry</i>	<i>Cameron Parish, LA</i>	<i>100.0</i>	<i>104.5</i>	<i>204.5</i>	<i>204.5</i>
<i>Bayou Choctaw</i>	<i>Iberville Parish, LA</i>	<i>34.5</i>	<i>17.4</i>	<i>51.9</i>	<i>52.2</i>
<i>Weeks Island</i>	<i>Iberia Parish, LA</i>	<i>72.5</i>	<i>0.0</i>	<i>72.5</i>	<i>71.8</i>
<i>SUBTOTAL</i>		<i>387.5</i>	<i>201.4</i>	<i>588.9</i>	<i>583.8</i>
<i>Tanks and Pipelines</i>		<i>1.5</i>	<i>1.3</i>	<i>2.8</i>	<i>3.3</i>
<i>TOTAL</i>		<i>389.0</i>	<i>202.7</i>	<i>591.7</i>	<i>587.1</i>
* <i>Sulphur content greater than 0.5 percent.</i>					
** <i>Sulphur content not exceeding 0.5 percent.</i>					

## ***OTHER PROJECT ACTIVITIES***

### **OIL STABILIZATION PROGRAM**

In 1994, the Department continued its progress in correcting the two related but distinct problems that have temporarily reduced the availability of some Strategic Petroleum Reserve crude oil inventory for drawdown in the near term. The first of these problems is a higher-than-normal gas content in some of the crude oil, apparently from years of intrusion of natural gas from the domal salt, and the second is an elevated temperature of some of the crude oil due to natural geothermal heating. These phenomena have produced an increase in the true vapor pressure of the crude oil that could result in emissions that exceed environmental and safe operating limits during a drawdown.

To assess the extent to which gas intrusion is impacting the availability of oil for drawdown, pilot plant testing and gas analyses have been conducted on the inventory at each underground storage cavern. Data from these and other tests were used to design a plant to degas the crude oil.

The Department completed the National Environmental Policy Act compliance process on September 1, 1994, with the approval of the Environmental Assessment of Oil Gasification at four Strategic Petroleum Reserve facilities in Texas and Louisiana (DOE/EA-0954) and the signing of a Finding of No Significant Impact.

On September 12, 1994, a contract for the degasification services was awarded to Delta Hudson Government Services, Inc. Site modifications for the degasification are under way. Current plans are to degas, beginning in July 1995, approximately 144 million barrels of crude oil using two 100,000 barrels-per-day plants and blending this degassed oil with the remaining gassy oil at the time of drawdown. To mitigate the effects of geothermal heating of the crude oil in the near-term, drawdown and distribution scenarios based on pipeline cooling, cavern selection, and flow rate have been developed. Additionally, heat exchangers are currently being constructed and installed at Bryan Mound, West Hackberry and Bayou Choctaw, and eventually at Big Hill, as a long-term means of cooling the crude oil and reducing its vapor pressure to below regulatory limits. Installation of the heat exchangers has been completed at Bayou Choctaw and is expected to be completed at West Hackberry and Bryan Mound by March 31, 1995.

The proposed cooling of the oil is categorically excluded from the requirement to prepare an Environmental Impact Statement (Categorical Exclusion Determination SPR-A03, October 18, 1993) pursuant to the Department of Energy's National Environmental Policy Act Implementing Procedures (10 CFR Part 1021).

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## COMMERCIALIZATION OF SPR DISTRIBUTION FACILITIES

The design of the Strategic Petroleum Reserve's crude oil distribution system has been based on a strategy of making maximum use of commercial crude oil distribution facilities and minimizing the development and operations of facilities to be used exclusively by the Strategic Petroleum Reserve. However, in its development, the Department has constructed over 240 miles of crude oil pipelines and one marine terminal to connect its facilities to the commercial infrastructure. With the fill of the Reserve being 80 percent complete and drawdown of the Reserve only required in the event of a national energy emergency, these facilities are significantly underutilized.

In 1994, the Department initiated a project to lease or outgrant use of its distribution facilities, i.e., the St James marine terminal and crude oil pipelines within the Capline, Texoma and Seaway complexes, for commercial crude oil distribution. Under Section 159(f)(D) of the Energy Policy and Conservation Act, the Secretary of Energy has statutory authority to "use, lease, maintain, sell or otherwise dispose of storage and related facilities." By making these facilities available for commercial use, the Department expects to: (1) reduce the operational cost of the Reserve, (2) generate revenue from the Government's investment, and (3) support industry in meeting the Nation's needs for crude oil distribution.

In March 1994, the Department issued a Press Release and *Commerce Business Daily* notice, requesting the private sector to submit "Expressions of Interest" in using the Strategic Petroleum Reserve distribution facilities. The Department received over 15 "Expressions of Interest" for the use or lease of the Strategic Petroleum Reserve pipelines and marine terminal for commercial crude oil operations.

In September 1994, the Department issued a solicitation inviting industry to submit offers for the leasing of the St. James marine terminal and the two (2) Strategic Petroleum Reserve pipelines in the Capline system. Lease provisions contained in the Invitation for Offers provide for:

- (1) The Federal Government to have priority use of the terminal and pipelines to distribute Strategic Petroleum Reserve crude oil in the event of a national emergency,
- (2) Full maintenance responsibilities by the lessee, and
- (3) Common carrier operation by the lessee as either a State or Federal common carrier, allowing all companies access to transport crude.

Industry offers for leasing the St. James marine terminal are due February 15, 1995. Due to expressions by industry to allow more time for developing business ventures as well

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as to, define any Strategic Petroleum Reserve pipeline movement requirements associated with the Weeks Island decommissioning, the leasing actions for the two Capline pipelines were cancelled. The Department plans to reissue the lease solicitation on the two Capline pipelines as well as lease solicitations for the remaining Strategic Petroleum Reserve pipelines during 1995.

In compliance with the National Environmental Policy Act environmental review requirements, the Department has prepared an Environmental Assessment addressing anticipated commercial operations for the St. James marine terminal and anticipates issuing "A Finding of No Significant Impact" in early 1995. With respect to the leasing of the pipelines, the Department intends to conduct its environmental review in accordance with the competitive procurement provisions of DOE's NEPA Implementation Procedures, 10 CFR 1021.216.

### **PROCUREMENT AND CONTRACTOR SUPPORT**

Obligations in fiscal year 1994 for Strategic Petroleum Reserve procurement totaled approximately \$ 299.4 million. Obligations for ongoing Strategic Petroleum Reserve operations, maintenance, and management totaled \$225.5 million, and a further \$73.9 million was obligated for the acquisition of crude oil during fiscal year 1994.

The Strategic Petroleum Reserve's two prime contractors during 1994 were Dyn McDermott Petroleum Operations Company, the Management and Operating (M&O) contractor, and Tucker and Associates, Inc., the management and technical support services contractor.

Other prime contractors who provided services to the Strategic Petroleum Reserve during 1994 included: Walk, Haydel and Associates for architect-engineering services; Mitre for Systems Engineering Support Services; ARCO Pipe Line Company, Phillips 66 Company, Sun Pipe Line Company, and Sun Marine Terminals for transportation and terminalling services; Maitland Brothers for construction; and Vindicator Corporation for security systems, Government Technology Services, Inc. for ADP hardware and Fisher-Rosemount Systems for control systems.

### **REAL ESTATE ACTIONS**

On February 3, 1994, the Department of Energy, through the U.S. Army Corps of Engineers, acquired 159 acres of perpetual easement (tract 500E-1) from the State of Texas for the Bryan Mound brine line repair project.

On May 5, 1994, Morton International issued the Department of Energy a right of entry for Phase II of the Weeks Island sinkhole project. On July 2, 1994, another right of entry was granted by Morton for placement of survey monuments and grouting of the Weeks Island sinkhole project.

### ***SECURITY***

DynMcDermott Petroleum Operations Company, under its management and operating contract, is assigned responsibility to implement and administer the Department of Energy's Strategic Petroleum Reserve Security Program. DynMcDermott secures protection services through a subcontract with Wackenhut Services, International. The Strategic Petroleum Reserve currently has a protection force of 224 armed officers.

During 1994, Acceptance and Validation Field Test Exercises were conducted at each Strategic Petroleum Reserve site and all had satisfactory results. These exercises are generally conducted on an annual basis.

The Department's Office of Security Evaluations conducted a Safeguards and Security Readiness Review of the Strategic Petroleum Reserve Project Management Office from October 24 to November 3, 1994. The inspection was conducted to assess the effectiveness of management activities in assuring mission accomplishment by providing sufficient protection of Strategic Petroleum Reserve interests under the full range of potential threats. The Reserve received the maximum "Satisfactory" rating, and the Office of Security Evaluations recommended that the Reserve's current security posture be more thoroughly analyzed and validated. This will be accomplished through a series of performance tests and a consequence analysis during 1995.

# ENVIRONMENT, SAFETY AND HEALTH

## ENVIRONMENTAL COMPLIANCE

In June 1994, the Secretary of Energy promulgated a new policy that directed a number of actions to streamline the process for complying with the National Environmental Policy Act (NEPA), to minimize cost and review time, and to make the process more useful to decision makers and the public. A major element of this reform was an initiative to delegate document approval authority to the field for actions within the field's purview.

The Strategic Petroleum Reserve took the actions necessary to attain approval authority for environmental assessments, findings of no significant impact, and associated floodplain and wetland action documentation. A NEPA Compliance Officer was named, legal resources were verified, and plans and procedures were promulgated for internal scoping, public participation, and quality assurance. In August, full authority for approving these documents was delegated by the Assistant Secretary for Environment, Safety and Health to the Strategic Petroleum Reserve Project Manager.

NEPA review of the degasification project was completed in September with the Department's approval of the Environmental Assessment of Oil Degasification at Four Strategic Petroleum Reserve Facilities in Texas and Louisiana and issuance of a Finding of No Significant Impact (DOE/EA-0954). It was determined that in all cases, air emissions of the degasification project would not affect local areas' air quality attainment status and would be far below thresholds that would trigger air quality regulatory programs. The project would substantially reduce the potential to emit large quantities of volatile organic compounds and hydrogen sulfide during a drawdown. The risk of oil and brine spills would not be measurably different from a drawdown event.

The State of Texas deferred action on the Department's application to amend Bryan Mound's air permit until it could process an air quality operating permit for the site's degasification plant. The Department will submit applications for air quality operating permits for each of the degasification plants when the detailed designs are available. Air permits are expected for Bryan Mound and West Hackberry in time to enable a July 1995 startup of degasification operations.

In 1994, the Strategic Petroleum Reserve proceeded with NEPA review of its plan to commercialize its distribution facilities. In July, the Strategic Petroleum Reserve determined to prepare an environmental assessment of leasing St. James Terminal for common carrier operation. NEPA review of leasing pipelines, however, could not proceed prior to a



competitive solicitation because a meaningful assessment would require such project-specific information as construction of new connections, other material modification, and new facilities.

A draft Environmental Assessment on the Leasing of the Strategic Petroleum Reserve St. James Terminal, St. James Parish, Louisiana (DOE/EA-1003) was provided to the State of Louisiana and the public for review. Responses were prepared to comments received, the draft assessment was revised, and a Finding of No Significant Impact was drafted. At year's end, approval of the finding was pending.

## **OTHER ENVIRONMENTAL, SAFETY AND HEALTH ACTIONS**

### **EMERGENCY RESPONSE PLANNING**

Under the Oil Pollution Act of 1990, the Strategic Petroleum Reserve's facilities fall into three different categories and require the development of facility response plans in accordance with guidance from the U.S. Coast Guard for the St James Terminal, the Environmental Protection Agency Region VI for the five crude oil storage sites, and from the Department of Transportation for the Reserve's off-site crude oil pipelines. During 1993, the Strategic Petroleum Reserve had prepared and submitted several facility response plans to these agencies in order to meet the requirements of the Act. In 1994, the Coast Guard approved the St James Facility Response Plan for use during the next five years. The Environmental Protection Agency and Department of Transportation, however, both provided additional guidance concerning their desired plan formats. Accordingly, the Reserve has initiated revisions to these plans to meet the new guidance and the revised plans are expected to be resubmitted in February 1995. Also during 1994, the Reserve revised its drills and exercise program to encompass the requirements of the Act.

In addition to the above activities, the Texas General Land Office inspected and certified the Reserve's Bryan Mound site in March 1994 pursuant to the Texas Oil Spill Prevention and Response Act of 1991. This certification was based on the site's emergency response plan and equipment, and continued compliance requires the site to maintain a high level of response capability and readiness. The Big Hill site received a similar certificate from the State in 1993.

### **EMERGENCY MANAGEMENT EXERCISE**

On September 14, 1994, the Strategic Petroleum Reserve conducted its annual emergency management exercise (EMEX 10). This exercise was performed to demonstrate the Reserve's ability to respond to an oil spill and mitigate its impact on an environmentally sensitive area.

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EMEX 10 involved the Reserve's emergency response teams responding to a simulated spill into the Atchafalya River from a break in the crude oil pipeline which runs from the Weeks Island storage site to the Department's St. James Terminal on the Mississippi River. The exercise tested the rapid deployment of boom on the river to contain the spill, as well as various aspects of emergency control and communications. EMEX 10 also included the participation of the U.S. Coast Guard, Environmental Protection Agency, Fish and Wildlife Service, and State of Louisiana and local parish emergency management organizations.

# ***BUDGET AND FINANCE***

## **APPROPRIATIONS**

A total of \$21 billion has been appropriated for the Strategic Petroleum Reserve through fiscal year 1995. Included in this total are the distribution of annual and total appropriations as shown in Table 5. Figures 6 and 7 illustrate annual and cumulative appropriations for storage facilities operations and management and petroleum acquisition and transportation.

### ***MAJOR BUDGET AND FINANCING ACTIONS DURING 1994***

The budget request for the Strategic Petroleum Reserve for fiscal year 1994 was initially \$173.1 million for continued operation and management. The Department also presented information regarding two problems which, although correctable, reduced the availability of some of the oil inventory for drawdown. These problems included a higher-than-normal gas content in some of the crude oil from intrusion of methane gas from the surrounding salt formations, and absorption of nitrogen used in cavern integrity pressure tests, and elevated temperatures of some of the crude oil due to geothermal heating. After reducing the initial request by \$.4 million to reflect savings from a one year freeze of the operating contractor's pay scale, Congress added \$34.1 million to the fiscal year 1993 budget to continue the remediation of these problems.

On September 30, 1994, the President signed into law the Department of Interior and Related Agencies Appropriations Act, 1995 (Public Law 103-332) providing \$244.0 million for operations and management of the Reserve. The appropriations act also included an outlay cap of \$9 million on the use of prior year balances in the SPR Petroleum Reserve. Total funds remaining available for obligation in the SPR Petroleum Account at the end of fiscal year 1994 were \$330.1 million from Department of Energy appropriations, and sales. Of these remaining funds, \$90.8 million was proposed to be transferred to the Strategic Petroleum Reserve and \$17 million to Fossil Research and Development in fiscal year 1995.

**STRATEGIC PETROLEUM RESERVE ACCOUNT TRANSACTIONS, LAST QUARTER OF 1994 (FIRST QUARTER OF FISCAL YEAR 1995)**

The Strategic Petroleum Reserve Account funds the development, operation, and maintenance of Reserve facilities; the salaries and expenses necessary to plan and manage the program, including the operation of the Project Management Office in New Orleans, Louisiana; and the activities pertinent to major issues concerning the development and use of the Strategic Petroleum Reserve.

A total of \$20 million of the Strategic Petroleum Reserve Account funds remained available for obligation at the end of fiscal year 1994.

The appropriation for fiscal year 1995 increased available funds by \$243.7 million to a total of \$263.7 million. Of this total, \$54.6 million were obligated in the quarter ended December 31, 1994 (first quarter of fiscal year 1995), leaving a balance of \$209.1 million available for future obligation.

**SPR PETROLEUM ACCOUNT TRANSACTIONS, LAST QUARTER OF 1994 (FIRST QUARTER OF FISCAL YEAR 1995)**

The SPR Petroleum Account funds the acquisition of oil for the Strategic Petroleum Reserve; the associated costs for transportation and terminalling; U.S customs duties, Superfund and Oil Spill Liability Trust Fund taxes; and other miscellaneous costs, such as Defense Fuel Supply Center administration costs associated with acquiring and transporting oil. In the event of a drawdown and sale of Strategic Petroleum Reserve oil, the SPR Petroleum Account also funds the costs of withdrawing oil from the storage caverns and transporting it to the point where the purchasers take title. An amount equal to Federal receipts from a drawdown and sale is deposited in the SPR Petroleum Account and creates additional budget authority for refilling the Reserve.

At the end of fiscal year 1994, \$330.1 million remained available for obligation in the SPR Petroleum Account. Outlays (payments) from the account during the fiscal year were \$73.9 million for oil acquisition and \$8.4 million for the Department of Defense inventory. No new funds were appropriated for the SPR Petroleum Account for fiscal year 1995, but \$107.8 million were transferred out of the SPR Petroleum Account to finance Fossil Energy Research and Development (\$17 million) and the Strategic Petroleum Reserve Account (\$90.8 million). Funds remaining in the SPR Petroleum Account after the fiscal year 1995 transfers were \$222.3 million.

During the quarter ending December 31, 1994 (first quarter of fiscal year 1995), \$.7 million was obligated and outlays (payments) from the account during the quarter were \$.9 million.

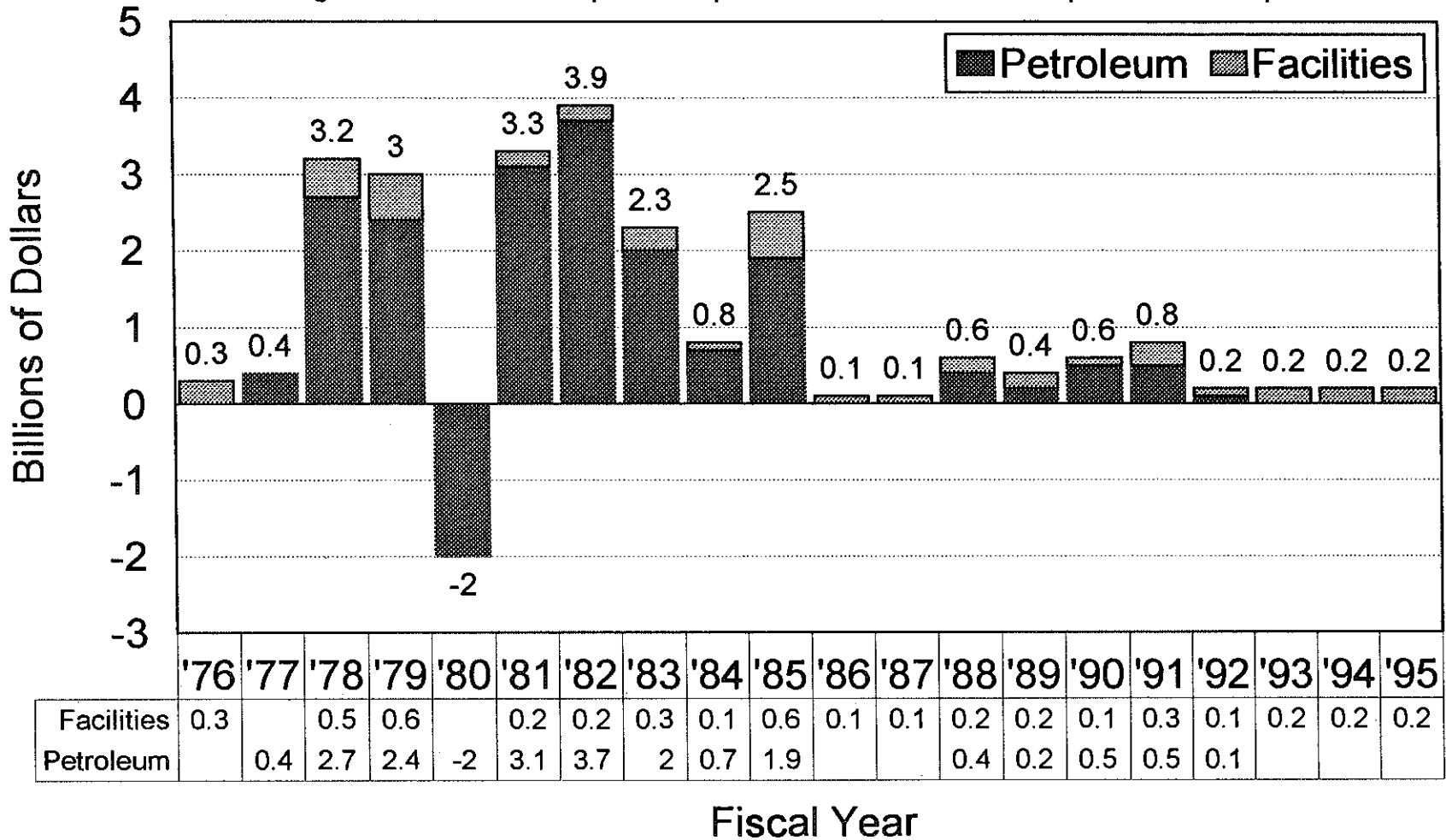
## **OIL COSTS THROUGH FISCAL YEAR 1994**

During fiscal year 1994, 4.6 million barrels were acquired for the Strategic Petroleum Reserve. Cumulative cost for the oil in the Strategic Petroleum Reserve at the end of fiscal year 1994 was \$16 billion for an average cost of approximately \$ 27.14. Cumulative oil cost for the Department of Defense inventory at the end of fiscal year 1994 was \$125 million for an average cost of \$19.32

FIGURE 5

STRATEGIC PETROLEUM RESERVE ANNUAL FUNDING

Storage Facilities Development/Operation & Petroleum Acquisition Transportation

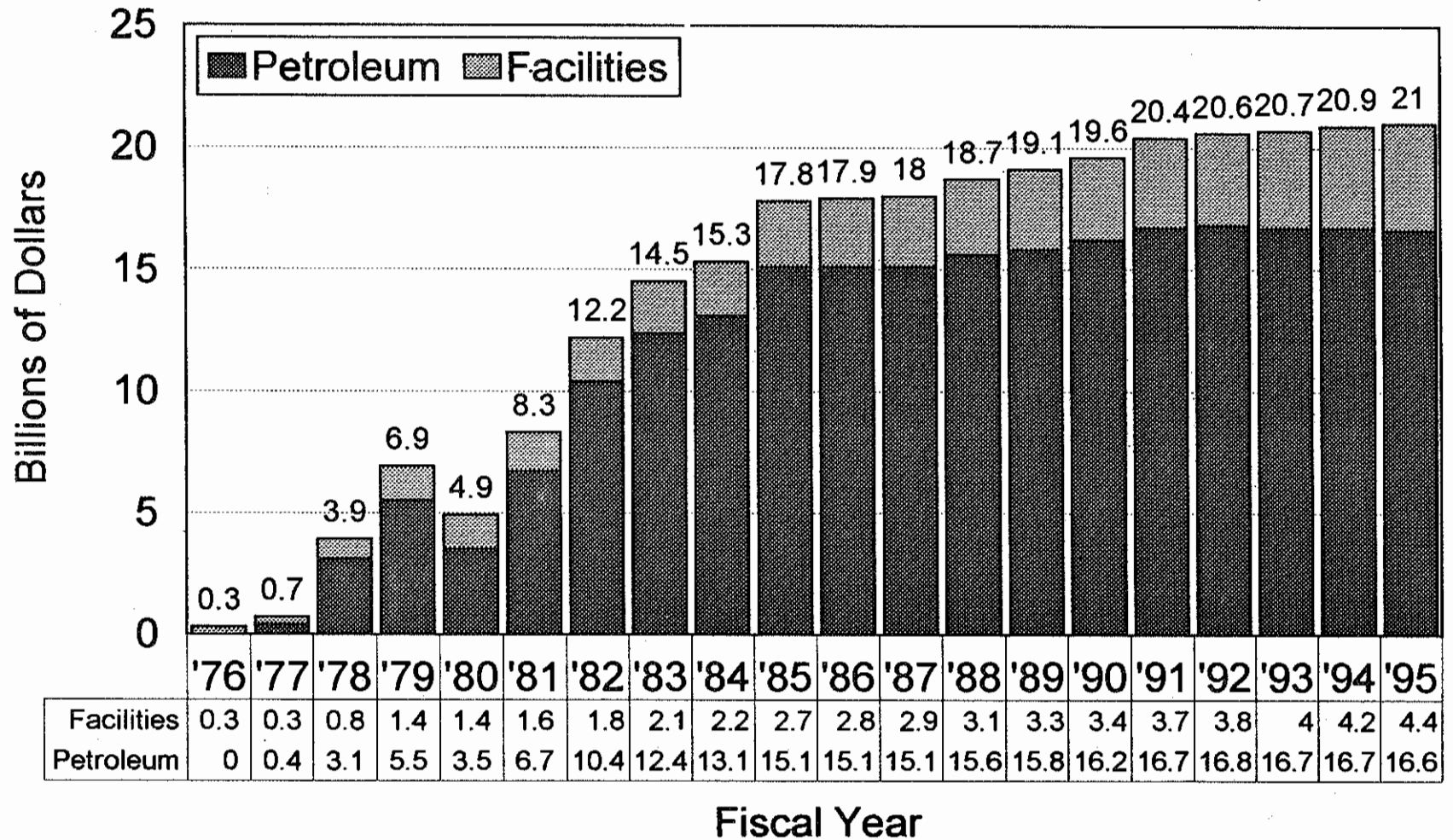


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FIGURE 6

STRATEGIC PETROLEUM RESERVE CUMULATIVE FUNDING

Storage Facilities Development/Operation & Petroleum Acquisition Transportation



**TABLE 5  
STRATEGIC PETROLEUM RESERVE APPROPRIATIONS**

<b>FY</b>	<b>Oil Account</b>	<b>Facilities</b>	<b>Management</b>	<b>Total</b>
1976	0	300,000	13,975	313,975
1977	440,000	0	7,824	447,824
1978	2,703,469	463,933	14,704	3,182,106
1979 New BA	2,885,670	103,290	18,111	3,007,071
Reprogrammings	<u>(529,214)</u>	<u>529,214</u>	<u>0</u>	<u>0</u>
Total 1979 Appropriations	2,356,456	632,504	18,111	3,007,071
1980 Rescission	(2,000,000)			(2,000,000)
1980 Reprogrammings				
No 1	(20,391)	0	20,391	0
No 2	(1,881)	0	<u>1,881</u>	<u>0</u>
Total 1980 Appropriations	(2,022,272)	0	22,272	(2,000,000)
1981	2,688,282	82,834	19,391	2,790,507
Entitlements	542,146	0	0	542,146
Reprogrammings				
No 1	(18,000)	18,000	0	0
No 2	(7,334)	<u>7,334</u>		<u>0</u>
Total 1981 Appropriations	3,205,094	108,168	19,391	3,332,653
1982	3,684,000	171,356	20,076	3,875,432
Reprogrammings	(4,300)	<u>4,300</u>		<u>0</u>
Total 1982 Appropriations	3,679,700	175,656	20,076	3,875,432
1983	2,074,060	222,528	19,590	2,316,178
1984	650,000	142,357	16,413	808,770
1985	2,049,550	441,300	17,890	2,508,740
1986	0	94,015	13,518	107,533
Reprogrammings	<u>(12,964)</u>	<u>12,964</u>	<u>0</u>	<u>0</u>
Total 1986	(12,964)	106,979	13,518	107,533
1987	0	134,021	13,412	147,433
1988	438,744	151,886	12,276	602,906
1989	242,000	160,021	13,400	415,421
1990	371,916	179,530	12,953	564,399
1991	566,318	187,728	12,846	766,892
1992	88,413	171,678	13,384	273,475
1993	(125,625)	161,940	14,227	50,542
DOD Transfer (non add)	124,925	700	0	125,625
1994	0	191,035	15,775	206,810
1995	<u>(107,764)</u>	<u>226,938</u>	<u>16,780</u>	<u>135,954</u>
<b>Totals</b>	<b>16,597,095</b>	<b>4,158,202</b>	<b>308,817</b>	<b>21,064,114</b>



# **DRAWDOWN AND DISTRIBUTION**

## **DISTRIBUTION PLAN**

In the event of a drawdown to respond to a severe energy supply interruption, or to meet obligations of the United States under the Agreement on an International Energy Program, the current plan for distributing crude oil is provided in the "Strategic Petroleum Reserve Drawdown (Distribution) Plan," Amendment Number 4 to the Strategic Petroleum Reserve Plan submitted on December 1, 1982. The Strategic Petroleum Reserve Distribution Plan provides that, pursuant to the President's decision to use the Strategic Petroleum Reserve, the principal method of distributing Strategic Petroleum Reserve oil will be by price competitive sale and the oil is sold and delivered to those offering the highest prices. The sale is open to the largest possible universe of eligible buyers to ensure efficient distribution of Strategic Petroleum Reserve oil. The plan also provides that, in any calendar month, the Secretary of Energy may direct the distribution of up to 10 percent of the volume of oil sold in that calendar month. The price for such oil will be the average price of Strategic Petroleum Reserve oil sold at the contemporaneous competitive sale or at the most recent competitive sale if no contemporaneous competitive sale is held.

## **COMPETITIVE SALES PROCEDURES**

Appendix A to the Department of Energy's final rule (10 CFR Part 625) governing price competitive sales of petroleum from the Strategic Petroleum Reserve provides for Standard Sales Provisions containing or describing contract clauses, terms and conditions of sale, and performance and financial responsibility measures, which may be applicable to a particular sale of Strategic Petroleum Reserve oil. The most recent edition of the Standard Sales Provisions was published in the *Federal Register* on December 11, 1992.

Under the Standard Sales Provisions, the Strategic Petroleum Reserve sales process begins with the issuance of a Notice of Sale specifying the amount, characteristics, and location of the petroleum being sold as well as the delivery dates and the procedures for submitting offers and other information pertinent to a particular sale. In addition, the Notice of Sale specifies which sales provisions and performance and financial responsibility measures apply.

During the course of a Strategic Petroleum Reserve drawdown, several Notices of Sale may be issued, each covering a sales period of one to two months. Initially, Notices of Sale could allow an extremely short lead time for offers and deliveries. Under the Standard Sales

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Provisions, it is contemplated that offerors might be given as little as seven days from the date of issuance, until offers are due, and 30 days or less from the time of such issuance, until the purchasers must accept delivery of the oil, with a less compressed schedule becoming more feasible after the initial stages of drawdown. Because of the possible short lead time, the Standard Sales Provisions provide for establishing a list of prospective offerors who will receive all Notices of Sale.

The next step in the sales process is the submission of offers by prospective purchasers at a time specified in the Notice of Sale. The Standard Sales Provisions require that the offerors unconditionally accept all terms and conditions in the Notice of Sale, including an offer guarantee of \$10 million, or 5 percent of the maximum potential contract amount, whichever is less, and an offer of at least the minimum price, if any, specified in the Notice of Sale.

When offers are received, they are evaluated to select the "apparently successful" offerors. The evaluation process is structured so that the offerors bidding the highest prices can select a method of transportation, up to the limits of the Strategic Petroleum Reserve distribution systems, with specific delivery arrangements negotiated later in the process.

Under the Standard Sales Provisions, all "apparently successful offerors" are required, within five business days after being notified, to provide a Letter of Credit equal to 100 percent of the contract amount, or a cash deposit in an amount equal to 110 percent of the contract value, as a guarantee of performance and payment of amounts due under the contract.

Upon timely receipt of the financial guarantees, and upon a final determination by the Contracting Officer that the offers were responsive and the offerors responsible, the Department of Energy issues the Notices of Award and commences deliveries of oil from the Reserve to the purchasers, consistent with their arrangements for commercial pipeline or marine vessel transportation. Such deliveries can begin as soon as the 16th day after the commencement of the sales process, to the extent that the purchasers can submit their financial guarantees and arrange transportation expeditiously.

### ***DRAWDOWN AND DISTRIBUTION CAPABILITIES***

The crude oil in the Strategic Petroleum Reserve is commingled in storage to allow for eight distinct crude oil streams to be sold in the event of a drawdown. Table 6 describes these streams and their inventories, as of December 31, 1994, their typical characteristics and available delivery modes and locations.

Because of the existing problems associated with an increase in temperature and gas in the crude oil inventory, the Reserve's initial drawdown rate was constrained to 2.5 million

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barrels per day during 1994. However, with the completion of installation of heat exchangers, the drawdown rate will substantially increase.

The Reserve's drawdown and distribution capabilities are shown in Table 7. These capabilities are based on the current crude oil stream inventories, excluding oil inventory with excess gas content; the existing drawdown systems and commercial distribution capabilities; and the successful completion of the heat exchanger installations. These capabilities provide for the drawdown and distribution of 530 million barrels of crude oil at an initial sustainable rate of 3.1 million barrels per day for a period of 90 days. After this initial period, the drawdown/distribution rate would decrease gradually as site inventories are depleted and the declining number of caverns containing crude oil becomes a constraint. Figure 7 illustrates the Strategic Petroleum Reserve's physical drawdown/distribution capability which provides for a distribution of 279 million barrels in 90 days, 404 million in 180 days, 500 million in 270 days, and the total available inventory in 360 days.

Over the next few years as the excess gas problem is corrected by means of the degasification project, the Reserve's capability to drawdown will gradually increase to a rate of 3.9 million barrels per day by April 1998.

**TABLE 6  
STRATEGIC PETROLEUM RESERVE CRUDE OIL STREAMS\***

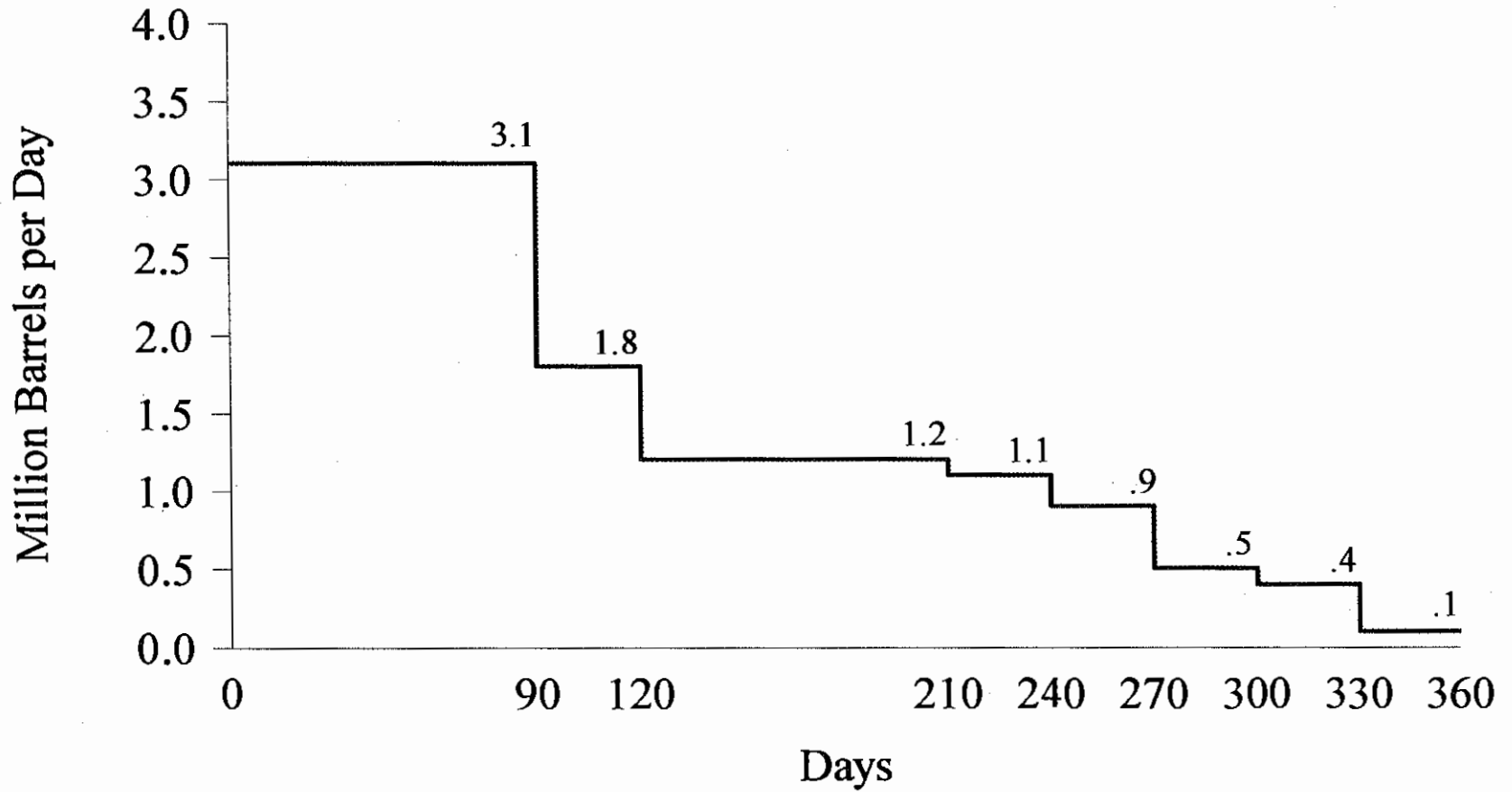
<b>CRUDE OIL STREAM</b>	<b>INVENTORY (MMB)</b>	<b>TYPICAL API GRAVITY</b>	<b>TYPICAL SULFUR CONTENT</b>	<b>DELIVERY MODE AND LOCATION</b>
<b>SEAWAY GROUP:</b>				
Bryan Mound Sweet	61.7	36.0°	0.34%	Pipeline or tankship at Phillips Terminal, Freeport, TX or Arco Terminal, Texas City TX
Bryan Mound Sour	144.4	33.1°	1.51%	
Bryan Mound Maya	11.1	22.8°	3.28%	Tankship at Phillips Terminal
<b>TEXOMA GROUP:</b>				
West Hackberry Sweet**	122.3	36.9°	0.31%	Pipeline , tankship or barge at Sun Terminal, Nederland, TX; Tankship at Unocal Terminal, Nederland, TX; Pipeline at Texaco-22/DOE connection, Lake Charles, LA; Pipeline at Texaco-20/DOE connection, Houston, TX
West Hackberry Sour**	125.0	33.7°	1.44%	
<b>CAPLINE GROUP:</b>				
Weeks Island Sour	72.5	28.9°	1.41%	Pipeline at Capline or LOCAP Terminals, St. James, LA; Tankship at DOE's Terminal, St. James, LA
Bayou Choctaw Sweet	17.4	36.1°	0.39%	
Bayou Choctaw Sour	34.5	33.2°	1.47%	
* Data as of December 31 1994.				
** Includes crude oil stored at Big Hill.				

**TABLE 7**  
**SPR DRAWDOWN AND DISTRIBUTION CAPABILITIES**  
**(THOUSANDS OF BARRELS PER DAY)**

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	Drawdown	Distribution
Seaway Group	528	1250
Texoma Group	1587	1940
Capline	985	1070
<b>TOTAL</b>	<b>3100</b>	<b>4260</b>

**FIGURE 7**  
**DRAWDOWN/DISTRIBUTION CAPABILITY**  
**(INVENTORY AS OF 12/31/94)**



## 1994 DRAWDOWN READINESS ACTIVITIES

During 1994, the Strategic Petroleum Reserve continued to perform various activities under its drawdown readiness assurance program which is designed to maintain the Reserve in a state of readiness to conduct a drawdown and distribution of the Reserve's inventory in the event of a requirement. These activities included:

- o Conducting Quarterly Drawdown Readiness Reviews, encompassing each function and system associated with a drawdown;
- o Executing a Memorandum of Understanding with the Department of Defense to define the respective responsibilities and procedures of the Departments of Energy and Defense for drawing down and distributing the crude oil acquired and stored in the Reserve for national defense purposes;
- o Initiating improvements to various computer models used in assessing drawdown capabilities and supporting drawdown operations;
- o Updating internal Strategic Petroleum Reserve management, administrative and operational procedures for performing a drawdown and sale of crude oil; and
- o Analyzing the Reserve's drawdown capabilities based on the constraints imposed by the excessive gas and temperature problems.

## ***CUSTOMER SERVICE TO THE NATION AND TO U.S. REFINERS***

The Strategic Petroleum Reserve serves both the Nation and U.S. refiners by providing energy security against potential disruptions in petroleum supplies, and by providing refiners maximum accessibility to the Nation's stockpile in the event of a disruption.

### **STRATEGIC PETROLEUM RESERVE PROTECTION FOR THE NATION**

In the Energy Policy and Conservation Act, the Strategic Petroleum Reserve was established to reduce the impact of disruptions in petroleum supplies, and to meet U.S. obligations under the International Energy Program. Congress also specified that the size of the Reserve should be based on the largest 90-day period of petroleum imports over the prior two years (i.e., 1974-75). This 90-day stockpile was not a requirement for subsequent years, but has continued to be a benchmark measure of import protection.

As of December 31, 1994, the inventory of crude oil in the Reserve amounted to 592 million barrels, providing a net import protection level of 74 days, based on the 1994 net import rate for crude and petroleum products. As shown in Figure 8, the level of net import protection has continued to decline over the last two years, due to increasing dependency on oil imports. Over the last ten years, U.S. crude oil imports have doubled increasing from 25.6 percent of the total crude oil processed in 1984, to 51 percent of the total crude oil processed in 1994.

Under the International Energy Program agreement, member nations agree to maintain stocks of crude and product in reserves "sufficient to sustain consumption for at least 90 days with no net oil imports." For the International Energy Program computation, member stocks are based on both public and privately-held stocks, and net oil imports are defined to be average daily level in the previous year. The last IEA computation for the United States was in October 1994 and credits the United States with 187 days of emergency reserves.

### **U.S. REFINING INDUSTRY ACCESS TO SPR OIL**

The Strategic Petroleum Reserve is designed to distribute crude oil to U.S. refiners through commercial pipelines and marine terminals. The Reserve is currently accessible to 51 active refiners by commercial pipelines. In 1994, these 51 refiners comprised approximately



48 percent of U.S. refining capacity, and processed approximately 48 percent of all non-Canadian crude oil imports.

The Reserve is also connected to five marine terminals for waterborne distribution: Phillips in Freeport, Texas, ARCO in Texas City, Texas, Sun and Unocal in Nederland, Texas, and the Department of Energy's St. James Terminal in St. James, Louisiana. These terminals have a total of 13 tanker berths and three barge berths, with a combined shipping capacity of 2.4 million barrels of crude oil per day. Figure 9 shows the Reserve's pipeline and marine distribution capabilities.

**FIGURE 8**  
**DAYS OF NET IMPORT PROTECTION**

**$\frac{\text{SPR INVENTORY (YEAR END)}}{\text{NET PETROLEUM IMPORTS (YEAR AVG.)}}$**

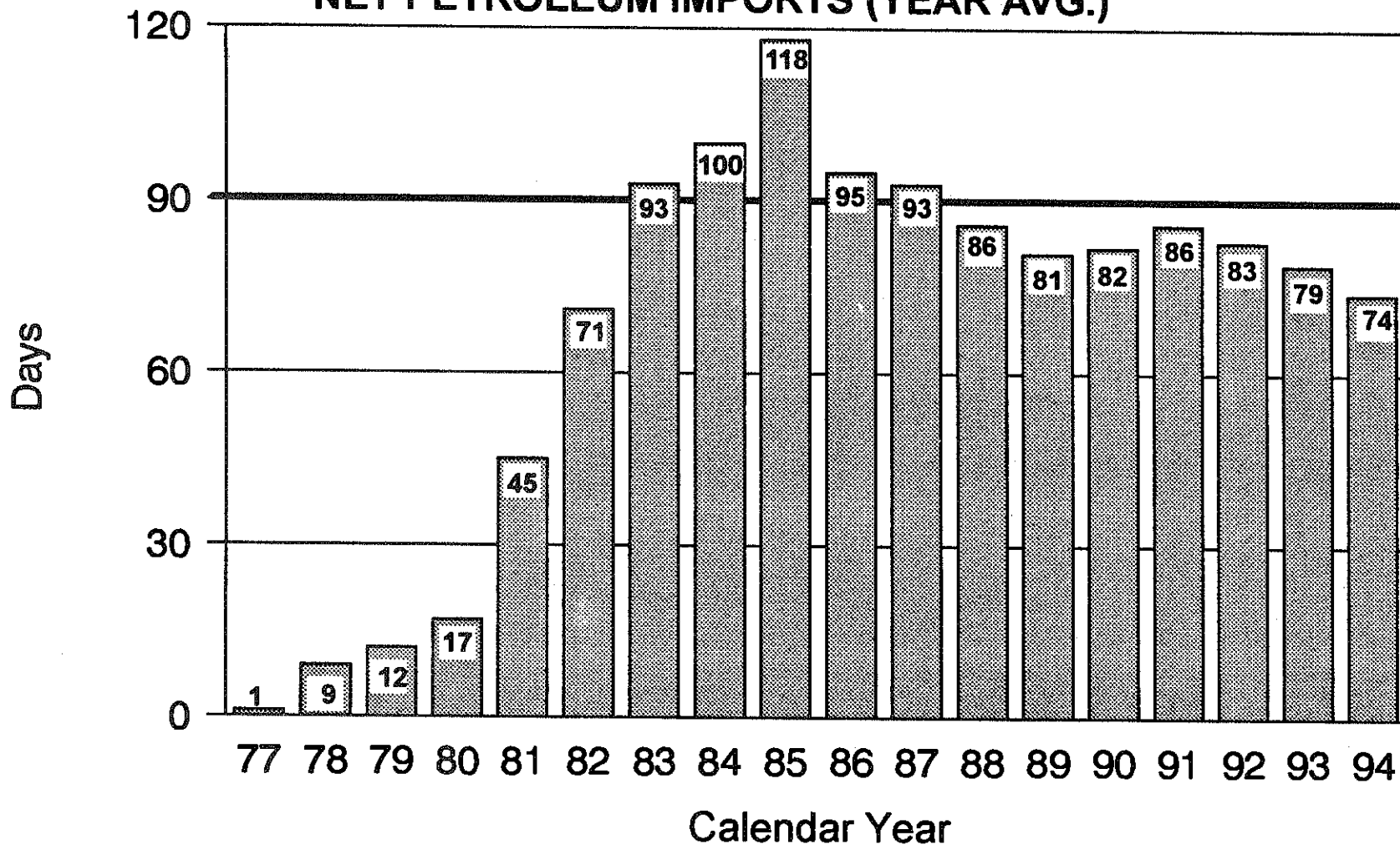
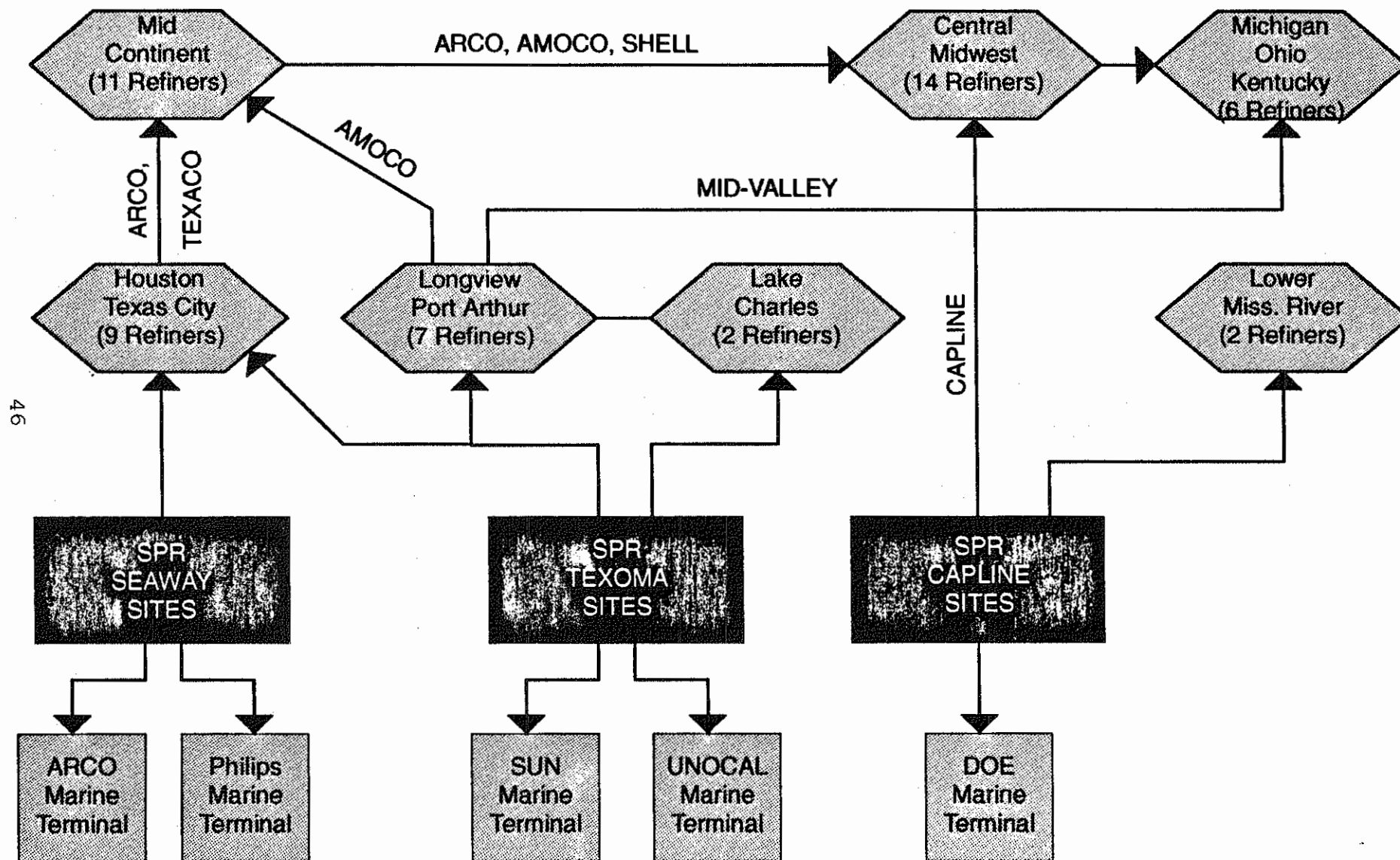


Figure 9

**STRATEGIC PETROLEUM RESERVE PIPELINE AND MARINE DISTRIBUTION CAPABILITIES**



46

## ***APPENDICES***

***A. Strategic Petroleum Reserve Site Status***

***B. Strategic Petroleum Reserve Crude Oil Specifications***

# ***APPENDIX A***

## ***Strategic Petroleum Reserve Site Status***

### ***BAYOU CHOCTAW***

#### **LOCATION**

Iberville Parish, Louisiana (12 miles southwest of Baton Rouge, Louisiana).

#### **ACQUISITION**

Acquired 355.95 acres fee simple, by condemnation April 1977, from numerous private owners. Union Texas Petroleum (a subsidiary of Allied Corporation) was the previous operator.

In 1985 the Department of Energy acquired an additional existing cavern through a cavern exchange agreement with Union Texas Petroleum. The transaction involved a 3.5 acre exchange with no net change in Government-owned acreage.

#### **ENVIRONMENTAL/PERMITS**

Environmental Impact Statement published December 1976; supplement published May 1977.

Four major Federal and State permits related to pipeline, well pad, storage, and storm water runoff acquired in 1978, and updated in 1980 and 1981.

#### **SITE DESCRIPTION**

A 75-million-barrel storage facility consisting of 65 million barrels in five existing caverns, plus 10 million barrels of storage capacity in a new Strategic Petroleum Reserve-developed cavern.

Oil, brine, and raw water piping distribution system connecting caverns with central plant, a water intake structure, 12 brine disposal wells located 2.5 miles offsite, and a pipeline for supplying brine to Union Texas Petroleum, Inc. Oil and water distribution system consists of over 50,000 feet of piping and 16 pumps totaling 22,000 horsepower. A 100,000 barrel brine pond and an oil/brine separator are also onsite.

Numerous permanent specialized buildings include: Control Center, Administration Building, Security Operations Center, Maintenance Shop and Laboratory, Electrical Switch Gear (5KV), Spare Parts Warehouse, Foam Storage, Instrument Shop, Documentation Storage and a Guard House.

#### **SYSTEM PARAMETERS**

Oil fill via 36-inch-diameter, 37.2-mile pipeline from St. James Terminal. Sustained system rate - 110,000 bbl/d (brine disposal-constrained).

Raw water design pumping rate - 514,000 bbl/d.

Brine disposal design pumping rate - 110,000 bbl/d.

#### **DRAWDOWN**

Drawdown via 36-inch-diameter, 37.2-mile pipeline to St. James Terminal and to Capline pipeline.

Design drawdown capability - 480,000 bbl/d.

#### **MAJOR ACCOMPLISHMENTS**

Approximately 52 million barrels of oil are in storage.

Installed a thermal relief system in the main oil header.

Awarded contract for the degasification of approximately 9 million barrels of crude oil.

Completed installation of two heat exchangers for oil cooling during drawdown.

Awarded contracts to upgrade site roads.

# **WEEKS ISLAND**

## **LOCATION**

Iberia Parish, Louisiana (95 miles southwest of New Orleans).

## **ACQUISITION**

Acquired 382.92 acres fee simple subsurface and 6.63 acres fee simple surface, by condemnation September 1977, from Morton Salt Company.

## **ENVIRONMENTAL/PERMITS**

Environmental Impact Statement published January 1977; supplement published August 1977.

Major Federal permit related to oil pipeline to St. James Terminal acquired in 1978. Three major Federal and State permits related to oil storage, air emissions and storm water, and treated sewage effluent discharge acquired in 1979; EPA National Pollutant Discharge Elimination System permit updated in 1982.

## **SITE DESCRIPTION**

Conventional room and pillar salt mine containing 70 million barrels of storage capacity in two levels. Dedicated to sour crude oil storage.

Oil piping distribution system consists of 11 (10 operational and one reserve) submersible electric pumps in the mine to boost crude to the surface and twin main-line pumps (plus one reserve) to deliver crude to the St. James, Louisiana Terminal during drawdown. Pumps total 17,000 horsepower. Firewater system has a 500,000 gallon tank with pumps, and mine inert gas and vapor recovery systems provide for safety.

Numerous permanent specialized buildings include: Administration and Maintenance, Control Center, Security Operations Center, Spare Parts Warehouse, Electrical Substation, Laboratory and Sample, Inert Gas Generator, Foam Storage, Fire Water Pump House, Mainline Pump House, Production Shaft Headframe, Production Shaft Hoist, Service Shaft Headframe, Service Shaft Hoist, Service Shaft Motor Control Center, and a Guard House.

## **SYSTEM PARAMETERS**

Oil fill via 36-inch-diameter, 67.2 mile pipeline from St. James Terminal. Sustained system rate - 350,000 bbl/d (terminal throughput limited).

## **DRAWDOWN**

Drawdown via 36-inch-diameter 67.2-mile pipeline to St. James Terminal and to Capline pipeline.

Design drawdown capability - 590,000 bbl/d.

## **MAJOR ACCOMPLISHMENTS**

Approximately 72 million barrels of crude oil are in storage.



# ***BRYAN MOUND***

## **LOCATION**

Brazoria County, Texas (three miles southwest of Freeport, Texas).

## **ACQUISITION**

Acquired 499.47 acres fee simple, by condemnation April 1977, from Freeport Mineral Company and other owners. Dow Chemical Company was the previous operator.

In 1986 Department of Energy acquired the pre-existing Brazoria County Road 242 within the site boundary through a relocation agreement with the county.

## **ENVIRONMENTAL/PERMITS**

Environmental Impact Statement published January 1977; supplement published December 1977. Phase III supplement published October 1981.

Five major Federal and State permits related to pipelines, water intake, and storage acquired in 1977 and 1978. National Pollution Discharge Elimination System updated 1981; renewed 1984. Seaway Environmental Impact Statement published June 1978. Supplement published October 1981.

Two major Federal permits related to brine disposal pipeline issued in 1978. Permit for brine discharge increased to 1.1 million bbl/d August 1981.

## **SITE DESCRIPTION**

226-million-barrel storage facility consisting of 66 million barrels of capacity in four caverns existing upon site acquisition, plus 160 million barrels of storage capacity in 16 Strategic Petroleum Reserve-developed caverns.

36-inch-diameter, 14.6-mile brine disposal pipeline extending 13 miles offshore in the Gulf of Mexico.

Oil, brine and raw water piping distribution system connecting caverns with central plant and water intake structure located on Brazos River and connected by a 36-inch pipeline. Oil/brine/water distribution system consists of over 101,000 feet of piping and 33 pumps totaling over 43,000 horsepower. Four 200,000-barrel oil storage tanks, two brine ponds (15,000 and 150,000), and an oil-brine separator.

Numerous permanent specialized buildups include: Control Center, Administration Building, Security Operations Center, Maintenance, Spare Parts Warehouse, Foam Generator, Foam Storage (3), Electrical Switch Gear, and a Guard House.

#### **SYSTEM PARAMETERS**

Fill via 30-inch-diameter, 3.6-mile pipeline from Phillips Freeport Marine Terminal. Design oil fill rate - 240,000 bbl/d. Sustained system rate - 180,000 bbl/d.

Raw water design pumping rate - 1,355,000 bbl/d.

Brine disposal design pumping rate - 980,000 bbl/d (permit limitation - 1,100,000 bbl/d).

#### **DRAWDOWN**

Drawdown via 30-inch diameter, 3.6 mile pipeline, to Phillips Freeport Marine Terminal.

Drawdown via 40-inch diameter, 46-mile pipeline to ARCO Pipeline Company's Texas City Pipeline Terminal and Docks.

Design drawdown capability - 1,250,000 bbl/d.

#### **MAJOR ACCOMPLISHMENTS**

Approximately 217 million barrels of crude oil are in storage.

Completed construction of the onshore segment of a new cement coated brine disposal pipeline to the Gulf to replace the existing worn-out pipeline.

Awarded contracts for degasification of approximately 91 million barrels of crude oil and the installation of 20 heat exchangers for oil cooling during drawdown.

# **WEST HACKBERRY**

## **LOCATION**

Cameron Parish, Louisiana (22 miles southwest of Lake Charles, Louisiana).

## **ACQUISITION**

Acquired 405.36 acres fee simple, by condemnation April 1977, from numerous private landowners. Olin Corporation was the previous site operator.

Acquired 160.0 additional acres fee simple by condemnation in two actions, July 1979 and March 1980.

## **ENVIRONMENTAL/PERMITS**

Environmental Impact Statement published January 1977; supplement published April 1977. Phase III supplement published October 1981.

Six major Federal and State permits related to pipelines, drilling pads, water intake, and storage acquired in 1977 and 1978; National Pollutant Discharge Elimination System permit renewed 1984.

Texoma Environmental Impact Statement published November 1978; supplement published in October 1981.

Two major Federal permits related to a brine pipeline acquired in 1980.

## **SITE DESCRIPTION**

219-million-barrel storage facility consisting of 49 million barrels in five caverns existing upon site acquisition, plus 170 million barrels of storage capacity in 17 Strategic Petroleum Reserve-developed caverns.

Oil, brine, and raw water piping distribution system connecting caverns with central plant, water intake structure located on Intracoastal waterway connected by a 42-inch diameter, 4.5 mile pipeline, and 10 brine disposal wells. Consists of over 160,000 feet of piping and 45 pumps totaling over 82,000 horsepower. Brine disposal is via injection wells due to the decommissioning of the 27 mile brine line to the Gulf, a 175,000-barrel brine pond and an oil-brine separator.

Numerous permanent specialized buildings include: Control Center, Administration Building, Security Operations Center, Maintenance, Spare Parts Warehouse, Covered Lay-Down, Film Storage, Foam Storage, and a Guard House.

#### **SYSTEM PARAMETERS**

Fill via 42-inch diameter, 42.8-mile pipeline from Sun Terminal, Nederland, Texas. Design oil fill rate - 225,000 bbl/d. Sustained system rate - 175,000 bbl/d.

Raw water design pumping rate - 1,450,000 bbl/d.

Brine disposal design pumping rate - 900,000 bbl/d

#### **DRAWDOWN**

Drawdown via a Department of Energy 42-inch-diameter, 42.8-mile pipeline to Sun Terminal, Nederland, Texas.

Drawdown via a 36-inch diameter, 12-mile oil pipeline (Department of Energy Lake Charles Pipeline) connecting to the Texas 22-inch common carrier pipeline and to refineries in Lake Charles, Louisiana.

Design drawdown capability - 1,250,000 bbl/d.

#### **MAJOR ACCOMPLISHMENTS**

Approximately 205 million barrels of crude oil are in storage.

Completed recompletion of existing brine disposal wells to provide subsurface disposal capability in place of the decommissioned brine disposal pipeline to the Gulf of Mexico.

Awarded contracts for the degasification of approximately 18 million barrels of crude oil and the installation of six heat exchangers for oil cooling during drawdown.

# ***BIG HILL***

## **LOCATION**

Jefferson County, Texas (20 miles southwest of Beaumont, Texas).

## **ACQUISITION**

Acquired 271 acres fee simple, by condemnation November 1982 and July 1983, from three landowners, i.e., 238.48 acres from Amoco, 27.06 acres from the Pipkin estate, and 5.46 acres from the Patrick Henry Phelan estate.

## **ENVIRONMENTAL/PERMITS**

Environmental Impact Statement published October 1981.

State permits for drilling, underground hydrocarbon storage, pipeline operations, air quality, water appropriation, and water quality certifications were acquired in 1983. The EPA National Pollutant Discharge Elimination System permit was acquired in 1984.

## **SITE DESCRIPTION**

160-million-barrel storage facility consisting of fourteen Strategic Petroleum Reserve-developed 11.5-million-barrel storage caverns.

Oil, brine, and raw water systems connecting caverns with central plant, water intake structure located on the Intracoastal Waterway connected by a 48-inch diameter, and brine disposal pipeline extending 3 miles offshore in the Gulf of Mexico. Oil and water distribution system consists of over 29 miles of piping and 15 pumps totaling 32,000 horsepower.

Numerous permanent specialized buildings include: Control Center, Administration, Security Operations Center, Communications, Guard House, Covered Lay-Down, Fire House, Sample Storage, and Maintenance.

#### **SYSTEM PARAMETERS**

Fill via 36-inch-diameter, 25 mile pipeline from Sun Terminal, Nederland, Texas. Sustained system rate 280,000 bbl/d.

Raw water design pumping rate - 1,400,000 bbl/d.

Brine disposal design pumping rate - 1,400,000 bbl/d (permit limitation of 1,700,000 bbl/d).

#### **DRAWDOWN**

Drawdown via 36-inch-diameter, 25 mile pipeline to Sun Terminal, Nederland, Texas.

Design Drawdown capability - 930,000 bbl/d.

#### **MAJOR ACCOMPLISHMENTS**

Approximately 42 million barrels of crude oil are in storage.

Awarded contract for the degasification of approximately 26 million barrels of crude oil.

Completed extension of the municipal potable water supply pipeline from Winnie, Texas.

Completed expansion of the site laboratory for crude oil testing and analysis.

# ***ST. JAMES TERMINAL***

## **LOCATION**

St. James Parish, Louisiana (45 miles southeast of Baton Rouge, Louisiana, on the Mississippi River).

## **ACQUISITION**

Acquired 104.76 acres of fee simple for terminal by condemnation in May 1978.

Acquired 47.68 acres fee simple for docks by condemnation in July 1978.

## **ENVIRONMENTAL/PERMITS**

St. James' Terminal Environmental Impact Statement is a component of the Bayou Choctaw supplement, published May 1977, and the Weeks Island supplement, published August 1977.

Two major Federal and State permits related to dock construction were acquired in 1978. Environmental Protection Agency discharge permit for storm water and sewage acquired in 1980. Dock Construction Permit modified 1982.

## **SITE DESCRIPTION**

Terminal facilities include six storage tanks totaling two million barrels of capacity, tie-ins to Bayou Choctaw and Weeks Island sites, and to LOCAP and Capline pipeline terminals.

Oil distribution piping system connecting docks, tanks, and pump station consists of over 35,000 feet of piping and five pumps totaling over 7,500 horsepower, metering systems, and maintenance and control buildings.

Two docks with one berth each, able to accommodate vessels of up to 123,000 long tons maximum loaded displacement. A 42-inch-diameter pipeline connects the docks to the storage tanks.

## **SYSTEM PARAMETERS**

Tanker unloading - design unloading capacity of 40,000 bbl/hr.

Fill capabilities from terminal to:

Bayou Choctaw: design pumping rate - 240,000 bbl/d.

Weeks Island: design pumping rate - 480,000 bbl/d.  
Terminal sustained system fill rate: 350,000 bbl/d.

**DRAWDOWN**

Crude oil from Bayou Choctaw and/or Weeks Island to be distributed across docks and to LOCAP and Capline Pipeline Terminal.

**SUSTAINED TANKER LOADING RATE:** 435,000 bbl/d.

**MAJOR ACCOMPLISHMENTS**

Issued a request for proposals to lease the terminal.



**APPENDIX B**  
**Strategic Petroleum Reserve Crude Oil Specifications**

Characteristic	Sour <sup>b</sup>	Sweet <sup>c</sup>	Primary ASTM Test Method <sup>d</sup>
API Gravity [°API]	30 - 45	30 - 45	D 1298
Total Sulfur [Wt.%], Max.	1.99	0.50	D 1552
Pour Point [°F(°C)], Max.	50 (10)	50 (10)	D 97
Salt Content [Lbs./1,000 Bbls.], Max.	50	50	D 3230
Viscosity [SUS @ 60°F (cSt @15.6°C)], Max. [SUS @ 100°F (cSt @ 37.8°C)], Max.	150 (32)  70 (13)	150 (32)  70 (13)	D 445 & D 2161
Reid Vapor Pressure [Psia @ 100°F (kPa @ 37.8°C)], Max.	11 (76)	11 (76)	D 323
Total Acid Number [mg KOH/g], Max.	0.40	0.40	D 664
Water and Sediment [Vol. %], Max.	1.0	1.0	D 473 & D 4006 or D 4928
Yields [Vol. %] Naphtha [82-375°F (28-191°C)] Distillate [375-620°F (191- 327°C)] Gas Oil [620-1050°F (327- 566°C)] Residuum [>1050°F(>566°C)]	24 - 30 17 - 31 26 - 38 10 - 19	21 - 42 19 - 45 20 - 42 14 Max.	D 2892 & D1160

- a Marketable virgin crude petroleum suitable for normal refinery processing and free of foreign contaminants or chemicals including, but not limited to, chlorinated and/or oxygenated hydrocarbons, and lead.
  - b Crude oils that meet these sour specifications include Arabian Berri, Arabian Light, Dubai (Fateh), Flotta, Isthmus, Lagomedio, Oman, Qatar Marine, Tia Juana Light, Upper Zakum, and West Texas Sour.
  - c Crude oil that meet these sweet specifications include Bonny Light, Brass River, Brent Blend, Ekofisk, Escravos, Forties, Kole Marine, Oseberg, Palanca, Saharan Blend, Statfjord, West Texas Intermediate, and Zarzaitine.
- NOTE: Crude oils other than those listed above may be acceptable. The acceptability of any crude oil depends upon an assay typical of current production quality of the stream.
- d Alternate methods may be used if approved within the contract. Offerors shall submit requests to use alternate methods to the Contracting Officer for determination of acceptability. In case of disputes arising from a difference between origin and destination test results, results from testing of the custody transfer sample using the primary test method shall be binding.





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# Strategic Petroleum Reserve Annual Report

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**February 15, 1996**

**U.S. Department of Energy**  
Assistant Secretary for Fossil Energy  
Office of Strategic Petroleum Reserve

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# Strategic Petroleum Reserve Annual Report

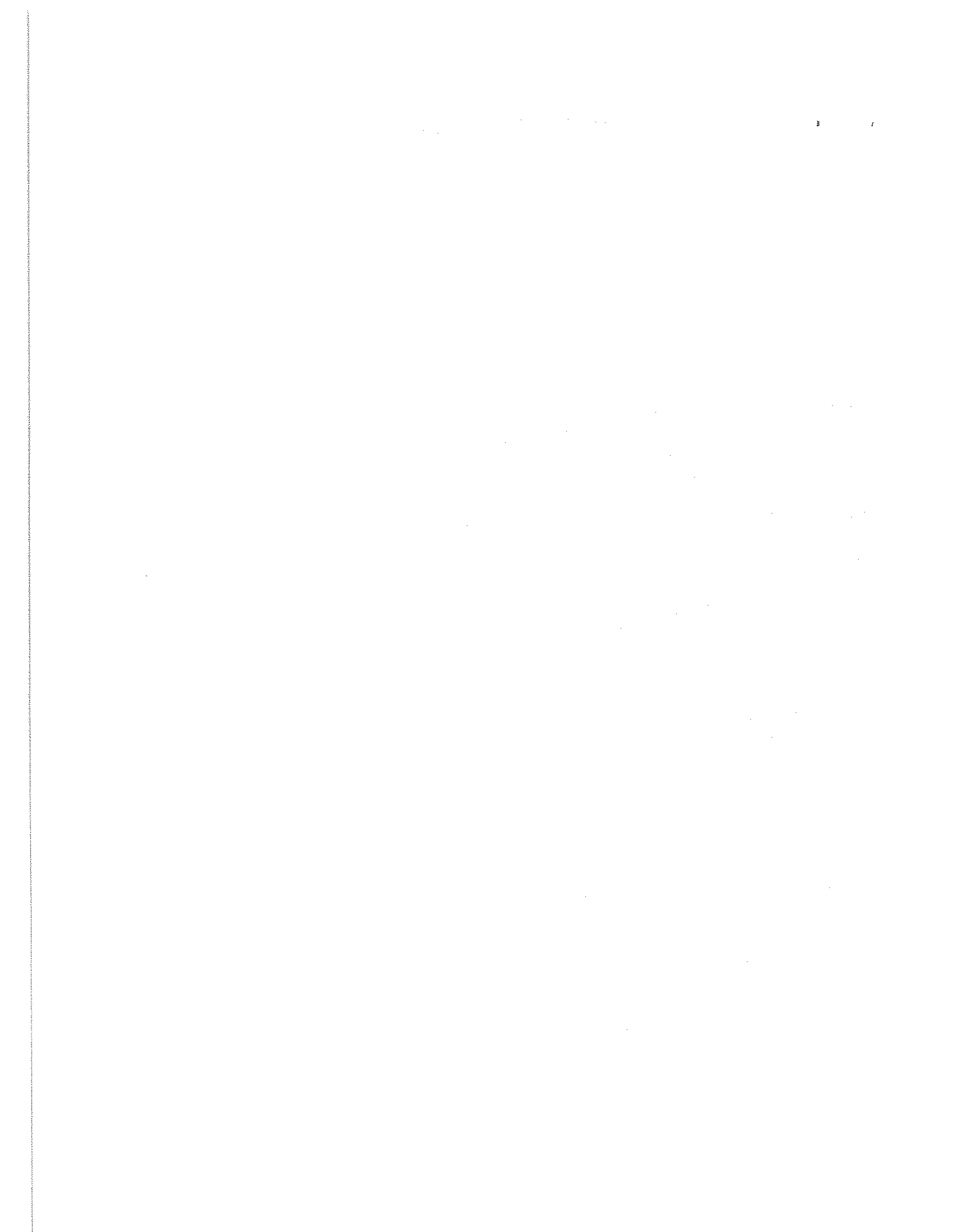
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**February 15, 1996**

**U.S. Department of Energy**  
Assistant Secretary for Fossil Energy  
Office of Strategic Petroleum Reserve  
Washington, DC 20585







# TABLE OF CONTENTS

	Page
EXECUTIVE SUMMARY .....	1
Key Activities .....	1
1996 Activities .....	2
PROGRAM DEFINITION .....	4
Mission .....	4
Program Legislation .....	4
Program/Project Management .....	5
STORAGE FACILITY DEVELOPMENT PROGRAM .....	6
Development of the 750-Million Barrel Storage Program .....	6
Storage Facilities Status .....	6
Storage Facilities Life Extension Program .....	11
OIL ACQUISITION AND FILL, CALENDAR YEAR 1995 .....	13
OTHER PROJECT ACTIVITIES .....	19
Oil Stabilization Program .....	19
Commercialization of SPR Distribution Facilities .....	19
Procurement and Contractor Support .....	21
Real Estate .....	21
Security .....	22
ENVIRONMENT, SAFETY AND HEALTH .....	23
Environmental Compliance .....	23
Other Environmental, Safety and Health Actions .....	24
BUDGET AND FINANCE .....	25
Major Budget and Financing Actions During 1995 .....	25
Appropriations .....	26
DRAWDOWN AND DISTRIBUTION .....	30
Distribution Plan .....	30
Competitive Sales Procedures .....	30
Drawdown and Distribution Capabilities .....	31
1995 Drawdown Readiness Activities .....	36
CUSTOMER SERVICE TO THE NATION AND U.S. REFINERS .....	37
CONTINUOUS QUALITY IMPROVEMENT .....	39

LOOKING AHEAD TO 1996 .....	41
APPENDIX A Strategic Petroleum Reserve Site Status .....	42
APPENDIX B Strategic Petroleum Reserve Crude Oil Specifications .....	55

## ***LIST OF TABLES***

	<b>Page</b>
TABLE 1 Strategic Petroleum Reserve Oil Fill History . . . . .	14
TABLE 2 Crude Oil Received Through 1995 . . . . .	15
TABLE 3 Strategic Petroleum Reserve Crude Oil Inventory As of December 31, 1995 . . . . .	18
TABLE 4 Strategic Petroleum Reserve Appropriations . . . . .	29
TABLE 5 Strategic Petroleum Reserve Crude Oil Streams . . . . .	33
TABLE 6 Current Drawdown and Distribution Capabilities . . . . .	34

## ***LIST OF FIGURES***

	<b>Page</b>
FIGURE 1 Strategic Petroleum Reserve Complexes and Associated Pipelines and Terminals . . . . .	7
FIGURE 2 Annual Strategic Petroleum Reserve Oil Fill . . . . .	16
FIGURE 3 Cumulative Strategic Petroleum Reserve Oil Fill . . . . .	17
FIGURE 4 Strategic Petroleum Reserve Annual Funding . . . . .	27
FIGURE 5 Strategic Petroleum Reserve Cumulative Funding . . . . .	28
FIGURE 6 Strategic Petroleum Reserve Drawdown/Distribution Capability . . . . .	35
FIGURE 7 Strategic Petroleum Reserve Pipeline and Marine Distribution Capabilities . . . . .	38

## ***EXECUTIVE SUMMARY***

Section 165 of the Energy Policy and Conservation Act (Public Law 94-163), as amended, requires the Secretary of Energy to submit annual reports to the President and the Congress on activities of the Strategic Petroleum Reserve (SPR). This report describes activities for the year ending December 31, 1995.

### **KEY ACTIVITIES**

#### **STRATEGIC PETROLEUM RESERVE OIL ACQUISITION**

During 1995, there were no increases to the Strategic Petroleum Reserve crude oil inventory due to a lack of funding for additional purchases. As of the end of the year, the Reserve's inventory was 591.6 million barrels.

#### **OIL STABILIZATION PROGRAM**

During 1995, the Department continued to correct the Reserve's crude oil inventory problems associated with a higher than normal gas content and elevated temperatures. Heat exchangers were installed at the Bryan Mound, West Hackberry and Bayou Choctaw sites. The Reserve commenced degassing oil at Bryan Mound and West Hackberry. As of December 31, 1995, a total of 30 million barrels had been degassed.

#### **WEEKS ISLAND**

During 1995 the Department pursued a number of activities to implement its 1994 decision to decommission the Weeks Island facility. These activities included mitigation measures to prevent further geological problems and commencement of the relocation of 72 million barrels of crude oil to other Strategic Petroleum Reserve storage facilities. Mitigation measures in 1995 included monitoring of brine accumulation in the mine reservoir, continuous introduction of saturated brine into crevassed areas, and construction of a 60-foot diameter by 210-foot deep freeze wall around the sinkhole to control the groundwater inflow during drawdown.

Freeze wall construction, using chilled liquid calcium chloride, was completed in late October 1995, thereby providing for mine structural stability during crude oil relocation to Big Hill and Bayou Choctaw which began on November 8, 1995. Relocation of the crude oil

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inventory, except for approximately 2 million barrels of residual fuel oil, is scheduled to be completed by November 1996. Completion of decommissioning activities, including removal of residual oil, and final closure of the mine storage facility is expected by mid-1999.

#### **COMMERCIALIZATION OF STRATEGIC PETROLEUM RESERVE DISTRIBUTION FACILITIES**

In 1995, the Department continued its activities to permit commercial use of Strategic Petroleum Reserve distribution facilities (i.e., the St. James marine terminal and crude oil pipelines). With fill of the Reserve approximately 80 percent complete and drawdown only required in the event of a national energy emergency, these facilities are underutilized. Under the authority granted in the Energy Policy and Conservation Act, the Department issued a solicitation in September 1994 inviting industry to submit offers for the leasing of the Strategic Petroleum Reserve St. James marine terminal. By making this facility available for commercial use, the Department expects to: (1) reduce the operational cost of the Reserve, (2) generate revenue from the Government's investment, and (3) support industry in meeting the Nation's needs for crude oil distribution.

In 1995, after receiving no response to the St. James marine terminal solicitation, the Strategic Petroleum Reserve revised its leasing strategy inviting industry to submit proposed business ventures which would maximize return of revenue while meeting the Strategic Petroleum Reserve's mission requirements. Due to the Weeks Island oil relocation, the St. James solicitation has been rescheduled. However, plans were accelerated to issue a solicitation inviting industry to submit offers by the end of December 1995 to lease the Department-owned pipelines withing the Seaway complex. Award is scheduled for March 31, 1996.

#### **LIFE EXTENSION PROGRAM**

The Life Extension Program was initiated in 1994 to replace or upgrade aging and obsolete Strategic Petroleum Reserve storage facilities and systems. The goal of the Life Extension Program is that by the year 2000, all major systems will have been upgraded or replaced to extend the useful life of the Reserve's facilities and drawdown systems to the year 2025. During 1995 the Strategic Petroleum Reserve completed conceptual designs for the Life Extension Program and awarded contracts for the acquisition of standardized pumps, motors and cavern instrumentation, installation of new distributive control systems, modification of cavern piping configurations and internal lining of two deteriorated brine disposal pipelines.

#### **1996 ACTIVITIES**

During 1996, the Department will be involved in two major activities-the sale of up to seven million barrels of crude oil from the Strategic Petroleum Reserve and an initiative to store foreign-owned oil in the Reserve. On January 26, 1996, the Balanced Budget Downpayment Act

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authorized the sale of up to 7 million barrels of Weeks Island oil to obtain \$100 million in proceeds to fund the decommissioning of the Weeks Island sites and other Reserve facilities requirements. The Department also has offered to store foreign-owned oil in the underutilized Reserve caverns to generate revenues for the U.S. Treasury and promote global stockpiling.

# ***PROGRAM DEFINITION***

## **MISSION**

The Strategic Petroleum Reserve (SPR) is a large crude oil stockpile, under the control of the President of the United States. The Strategic Petroleum Reserve mission is to reduce vulnerability to economic, national security, and foreign policy consequences of supply interruptions by discouraging supply disruptions as a tool of other nations, and by adding to crude oil supplies in the United States, in the event of a disruption due either to political, military, or natural causes. The Strategic Petroleum Reserve is mandated by the Energy Policy and Conservation Act, as amended, and by the comprehensive energy plans of all Administrations since 1975 in recognition of the long term dependence of the United States on imported crude oil and petroleum products.

## **PROGRAM LEGISLATION**

The Strategic Petroleum Reserve was authorized by Congress with the enactment on December 22, 1975, of the Energy Policy and Conservation Act (Public Law 94-163), which declared it to be United States policy to establish a Strategic Petroleum Reserve of up to one billion barrels of petroleum products to reduce the impact of a severe energy supply interruption and to carry out the obligations of the United States under the International Energy Program.

Section 154 of the Energy Policy and Conservation Act required the preparation of a Strategic Petroleum Reserve Plan. The Plan, addressing the development and implementation of the Strategic Petroleum Reserve, was submitted to the Congress on February 16, 1977, and became effective on April 18, 1977.

Strategic Petroleum Reserve Plan Amendment No. 1 accelerated the planned schedule for filling the Reserve. Amendment No. 2 to the Strategic Petroleum Reserve Plan authorized an increase in the Strategic Petroleum Reserve size from 500 million barrels to one billion barrels. The Amendment described Department of Energy plans to store 750 million barrels of petroleum in underground storage facilities.

On October 31, 1979, the Department of Energy submitted Amendment No. 3, a Distribution Plan for the Strategic Petroleum Reserve, to the Congress. The Distribution Plan described the methods for drawdown and distribution of petroleum from the five existing Strategic Petroleum Reserve storage sites.

On December 1, 1982, the President transmitted Amendment No. 4, a new Drawdown Plan, to the Congress for the use of the Strategic Petroleum Reserve. This Plan, required under

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the Energy Emergency Preparedness Act of 1982, went into effect immediately and provides procedures for the drawdown, sale, and distribution of petroleum from the Strategic Petroleum Reserve. The Drawdown Plan replaces the Distribution Plan established by Amendment No. 3.

The 1990 amendments to the Energy Policy and Conservation Act (Public Law 101-383) required the Department to amend the Strategic Petroleum Reserve Plan to prescribe plans for completion of one billion barrels of storage capacity.

### **PROGRAM/PROJECT MANAGEMENT**

The Strategic Petroleum Reserve Office was created under the Energy Policy and Conservation Act for the establishment, management, and maintenance of the Strategic Petroleum Reserve. The Assistant Secretary for Fossil Energy has overall programmatic responsibility for achieving the goals and objectives of the Strategic Petroleum Reserve Program. This responsibility has been delegated to the Deputy Assistant Secretary for Strategic Petroleum Reserve, Richard D. Furiga, and is exercised through offices located in Washington, D.C.

The Project Management Office is located in New Orleans, Louisiana, and is under the direction of the Project Manager, William C. Gibson, Jr. It carries out day-to-day project activities, including the management and operation of five oil storage sites and one marine terminal.

# ***STORAGE FACILITY DEVELOPMENT PROGRAM***

## **DEVELOPMENT OF THE 750-MILLION BARREL STORAGE PROGRAM**

The Department has developed five large underground crude oil storage facilities in salt domes along the Gulf Coast of Texas and Louisiana to stockpile 750 million barrels of crude oil. The five storage sites, comprising the 750-million barrel program, are Bryan Mound and Big Hill in Texas, and West Hackberry, Bayou Choctaw, and Weeks Island in Louisiana. The five storage sites are grouped into three distribution systems--Seaway, Texoma and Capline. Each distribution system is connected by Department of Energy pipelines to commercial crude oil pipeline networks and to one or more commercial or Government-owned marine terminals. The locations of the current Strategic Petroleum Reserve storage sites and their distribution pipelines and terminals are shown in Figure 1.

During 1995, the Department initiated actions to draw down and decommission the Weeks Island storage facility due to geotechnical problems which pose a significant risk of potential oil loss and environmental damage. This situation is discussed further under the Weeks Island site status. This action will reduce the overall storage capacity of the Reserve from 750 million to 680 million barrels, and the maximum drawdown and distribution rate of the Reserve from 4.5 to 3.9 million barrels per day.

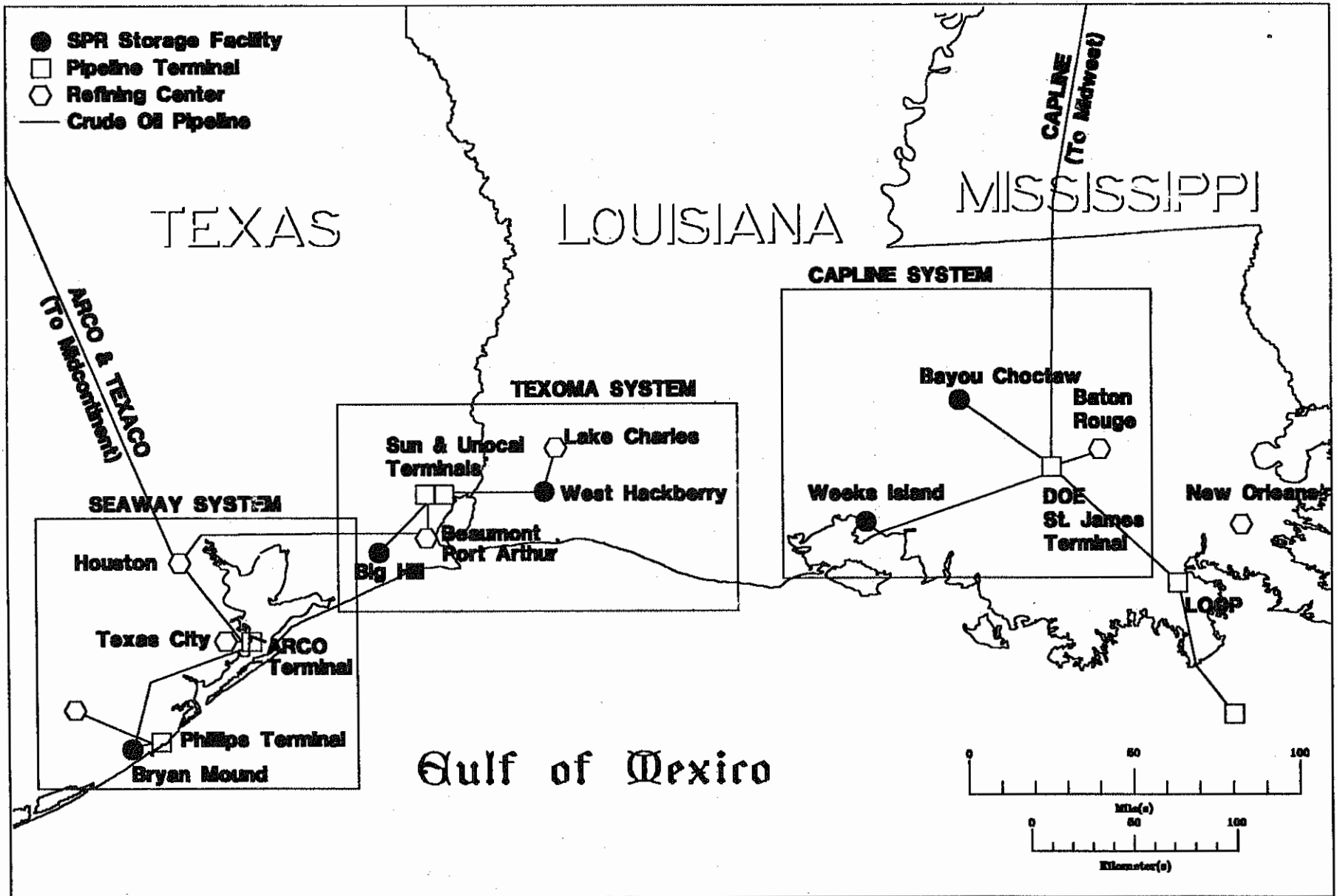
### **STORAGE FACILITIES STATUS**

#### **BRYAN MOUND**

The Bryan Mound storage facility is located in Brazoria County, Texas, approximately three miles southwest of Freeport. The site has twenty storage caverns with a combined storage capacity of 226 million barrels and an inventory of 217 million barrels. The site is available for both fill and drawdown operations at this time; however, there is a reduction in the crude available for drawdown due to the higher than normal vapor pressure for a portion of the site's inventory.

To resolve the current crude vapor pressure problems at Bryan Mound, the Department has contracted for the degasification of approximately 91 million barrels of Bryan Mound crude oil. Degasification of the crude was started in August 1995 and is scheduled for completion in April 1998. At the end of 1995, approximately 11.4 million barrels (12.5%) of the affected crude oil were degassed.

**FIGURE 1**  
**STRATEGIC PETROLEUM RESERVE STORAGE SITES AND DISTRIBUTION SYSTEM**



A major project to replace the site's brine disposal pipeline to the Gulf of Mexico which had deteriorated from brine disposal operations during cavern leaching and oil fill was completed and hydro tested, and became fully operational in November 1995.

During 1995, the Department pursued several construction projects in the implementation of the overall Life Extension Program at the Bryan Mound site. In March 1995, the Department completed the installation of the heat exchangers to mitigate geothermal heating of the crude oil. In September, the Department award contracts to acquire new water pumps and motors, install a new distributive control system, and reconfigure the site's pipe racks and cavern piping configurations.

### **WEST HACKBERRY**

The West Hackberry storage facility is located in Cameron Parish, Louisiana, approximately 22 miles southwest of Lake Charles. The site has 22 storage caverns with a combined storage capacity of 219 million barrels and an inventory of 204 million barrels. The site is available for both fill and drawdown operations.

To resolve the crude vapor pressure problems at West Hackberry, the Department contracted for degasification of approximately 19.1 million barrels of West Hackberry crude oil. Degasification of the crude started in July 1995 and was completed on January 4, 1996.

During 1995, the Department pursued several construction projects in the implementation of the overall Life Extension Program at the West Hackberry site. In March 1995, the Department completed the installation of the heat exchangers to mitigate geothermal heating of the crude oil. The Department completed a contract to install an internal lining in the deteriorated pipeline to the brine disposal wells. In September, the Department awarded contracts to acquire new water pumps and motors, install a new distributive control system, and reconfigure the site's pipe racks and cavern piping configurations.

### **BAYOU CHOCTAW**

The Bayou Choctaw storage facility is located in Iberville Parish, Louisiana, approximately 12 miles southwest of Baton Rouge. The site has six storage caverns with a combined storage capacity of 75 million barrels. During 1995, the Bayou Choctaw site received 7 million barrels of sour crude oil from Weeks Island, increasing the site's total inventory to 59 million barrels. In order to accommodate the maximum transfer of Weeks Island oil to Bayou Choctaw, the Department converted one of the site's three sweet crude caverns to sour crude service. As a result, the site's sour crude capacity was increased from 38.6 to 51.0 million barrels and the site's sweet crude capacity was decreased from 36.4 to 24.0 million barrels.

The site is available for drawdown operations; however, there is a reduction in the crude available for drawdown due to the higher than normal vapor pressure of a portion of the site's inventory. To resolve the current crude vapor pressure problems at Bayou Choctaw, the Department's contract for the degasification provides for degasifying approximately 9 million barrels of Bayou Choctaw crude, utilizing the degasification unit from West Hackberry upon completion of operations at that site. Degassification of the affected Bayou Choctaw crude is scheduled to commence in April 1996 and be completed in July 1996.

During 1995, the Department pursued several construction projects in the implementation of the overall Life Extension Program at the Bayou Choctaw site. The Department installed an internal lining in the deteriorated pipeline to the brine disposal wells, and completed a contract to replace deteriorated onsite piping. In addition, the Department initiated the installation and replacement of electrical cable trays and duct banks, and completed the installation of the two heat exchangers in late December 1994 to mitigate geothermal heating of crude oil.

### **BIG HILL**

The Big Hill storage facility is located in Jefferson County, Texas, 20 miles southwest of Beaumont. The site has 14 storage caverns with a combined storage capacity of 160 million barrels. During 1995, the Big Hill site received 6 million barrels of sour crude from Weeks Island, increasing the site's total inventory to 49 million barrels.

The site is available for drawdown operations; however, there is a reduction in the crude available for drawdown due to the higher than normal vapor pressure of a portion of the site's inventory. To resolve the current crude vapor pressure problems at Big Hill, the Department's contract for the degasification provides for the degasifying of approximately 26 million barrels of Big Hill crude, utilizing the degasification unit from Bayou Choctaw upon completion of operations at that site. Degasification of the affected Big Hill crude is scheduled to commence in August 1996 and be completed in May 1997.

### **WEEKS ISLAND**

The Weeks Island storage facility is located in Iberia Parish, Louisiana, approximately 95 miles southwest of New Orleans. The Department acquired this storage site in 1977 and converted an existing conventional salt mine to oil storage with a capacity of 70 million barrels. Development and oil fill of this site was completed in 1982.

On December 15, 1994, the Secretary of Energy announced that the Department plans to decommission the Weeks Island storage facility due to geotechnical problems which pose a significant risk to continued use as an oil storage facility, i.e. surface water from above the salt dome is entering the Weeks Island storage chamber. The continuous inflow of subsurface water

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aquifers into the mine continues to pose a high risk for uncontrolled water inflow and the potential displacement of oil to the sediments above the salt, which could cause environmental damage and oil loss.

During 1994 and 1995, the Department undertook a number of mitigative measures to control the water inflow and ensure there is no loss of crude oil or damage to the surrounding ecosystems. Initial measures included the injection of saturated brine within the crevassed area at the top of salt to minimize further leaching of the flow path into the mine and pressurizing the oil storage chamber to slow the inflow rate into the storage chamber. During 1995, the Department initiated the construction of a large freeze wall around the sinkhole as a further precautionary measure. This freeze wall will control ground water access to the sinkhole and prevent water intrusion into the storage chamber during drawdown. The construction of the freeze wall was initiated in June 1995 and completed in October 1995. The freeze wall is a 60-foot frozen ring of ground surrounding the sinkhole. The freeze wall was constructed by circulating chilled liquid calcium chloride at -35 degrees Fahrenheit through three concentric rings of wells drilled into the top of the salt formation.

On November 8, 1995, the Strategic Petroleum Reserve initiated the drawdown of the Weeks Island mine and relocation of the 72 million barrels of Weeks Island sour crude oil inventory to other Strategic Petroleum Reserve storage sites. Approximately 15.5 million barrels are being transferred to the Bayou Choctaw site via the Reserve's pipeline system and St James Terminal and the balance, excluding that amount which may be sold pursuant to the Balanced Budget Downpayment Act, is being shipped through the Texaco gulf coast pipeline system to the Big Hill site in Texas. As of December 31, 1995, approximately 13 million barrels had been removed from Weeks Island. Of that quantity, 6.7 million barrels had been transferred to Bayou Choctaw, 5.3 million barrels had been delivered to Big Hill and the remainder was in transit. The transfer rate is averaging approximately 235,000 barrels a day and it is expected that the relocation of the Weeks Island inventory, except for a residual amount, will be completed by the end of 1996.

The Department developed plans for decommissioning the Weeks Island site once the oil is removed. To comply with the National Environmental Policy Act (NEPA), the Department has held public hearings and prepared and issued an Environmental Assessment on the proposed decommissioning plans. After the Weeks Island storage chamber is emptied, the Department plans to backfill the mine with saturated brine and recover as much residual crude remaining in the mine as possible through oil skimming methods. Afterwards the mine will be sealed and the site will be decommissioned.

In an effort to minimize the economic impacts on the current employees and the community, the Department held a public meeting in New Iberia, Louisiana, on March 2, 1995, for the purposes of gathering input from members of the community on possible commercial

uses for the Weeks Island facility. In general, the major interest expressed at this hearing was for salt dome geological research studies. The Department plans to minimize the impacts on the current employees through personnel reassignments, severance benefits and out placement assistance.

## **STORAGE FACILITIES LIFE EXTENSION PROGRAM**

The Strategic Petroleum Reserve's storage facilities were originally designed for an operational life of 20 years. Construction at four sites, Bryan Mound, West Hackberry, Bayou Choctaw and Weeks Island, was completed in the early 1980s, and most of these systems will reach the end of their design life around the year 2000. Many of the systems and equipment at these sites (i.e., raw water, brine disposal, electrical, instrumentation) are experiencing an increasing number of failures and increasing maintenance costs associated with the later stages of design life.

During 1993, a Life Extension Program was initiated to ensure that the Strategic Petroleum Reserve can continue to meet its mission readiness and system availability, through the year 2025. The goal of the Life Extension Program is that by the year 2000, all major systems will have been upgraded or replaced to extend the useful life of the Reserve's facilities and drawdown systems to the year 2025.

A Comprehensive Life Extension Plan has been developed, which provides for replacing and modernizing all of the mechanical, civil, electrical and instrumentation systems that are nearing the end of their operational lives. The Comprehensive Life Extension Plan focuses on (a) the simplification of site/system configurations by reducing the numbers of motors, pumps and valves by 30 to 60 percent, (b) improving logistics through standardization of systems and equipment among all of the sites, (c) achieving higher systems availability through the application of more modern, reliable technology, and (d) reducing the annual operating and maintenance cost of facilities by 10 to 20 percent. Following completion of the Comprehensive Life Extension Plan, conceptual designs were developed for the Life Extension Program at each site. Life extension projects previously proposed for Weeks Island and the St. James Terminal have been deleted due to their respective decommissioning and commercialization plans.

During 1995, the Department of Energy awarded contracts totaling over \$77.3 million towards engineering design, equipment procurement, and site construction in the implementation of the Life Extension Program. Procurement and construction contracts during 1995 include:

- Procurement of standardized pumps, motors, valves and cavern instrumentation for Bryan Mound and West Hackberry.
- Procurement of new flow control valves for the Big Hill site.

- Installation of a new distributive control system and reconfiguration of cavern piping systems and site pipe racks at Bryan Mound and West Hackberry.
- Internal lining of deteriorated brine disposal pipelines at West Hackberry and Bayou Choctaw.
- Construction of electrical cable trays and duct banks at Bayou Choctaw.



## OIL ACQUISITION AND FILL

Due to the lack of available funding, there were no Strategic Petroleum Reserve oil acquisition and fill activities during calendar year 1995. As of December 31, 1995, the Reserve's crude oil inventory was 591,640,401 barrels. Projections for fill of the Reserve during 1996 are not included due to the current plans for no oil purchases during that year.

Fiscal and calendar year-end inventories and average daily fill rates since 1977 are presented in Table 1. Strategic Petroleum Reserve crude oil fill is illustrated on both an annual and cumulative basis in Figures 2 and 3, respectively.

Table 2 shows the crude oil quantities received since the inception of the Strategic Petroleum Reserve program through 1995 by country of origin. Of the total oil in storage, 65.7 percent is high sulfur (sour) and 34.3 percent is low sulfur (sweet). Table 3 provides information on the location of this inventory by storage site. The quality specifications used when acquiring Strategic Petroleum Reserve crude oil can be found in Appendix B of this report.

**TABLE 1**  
**STRATEGIC PETROLEUM RESERVE OIL FILL HISTORY**

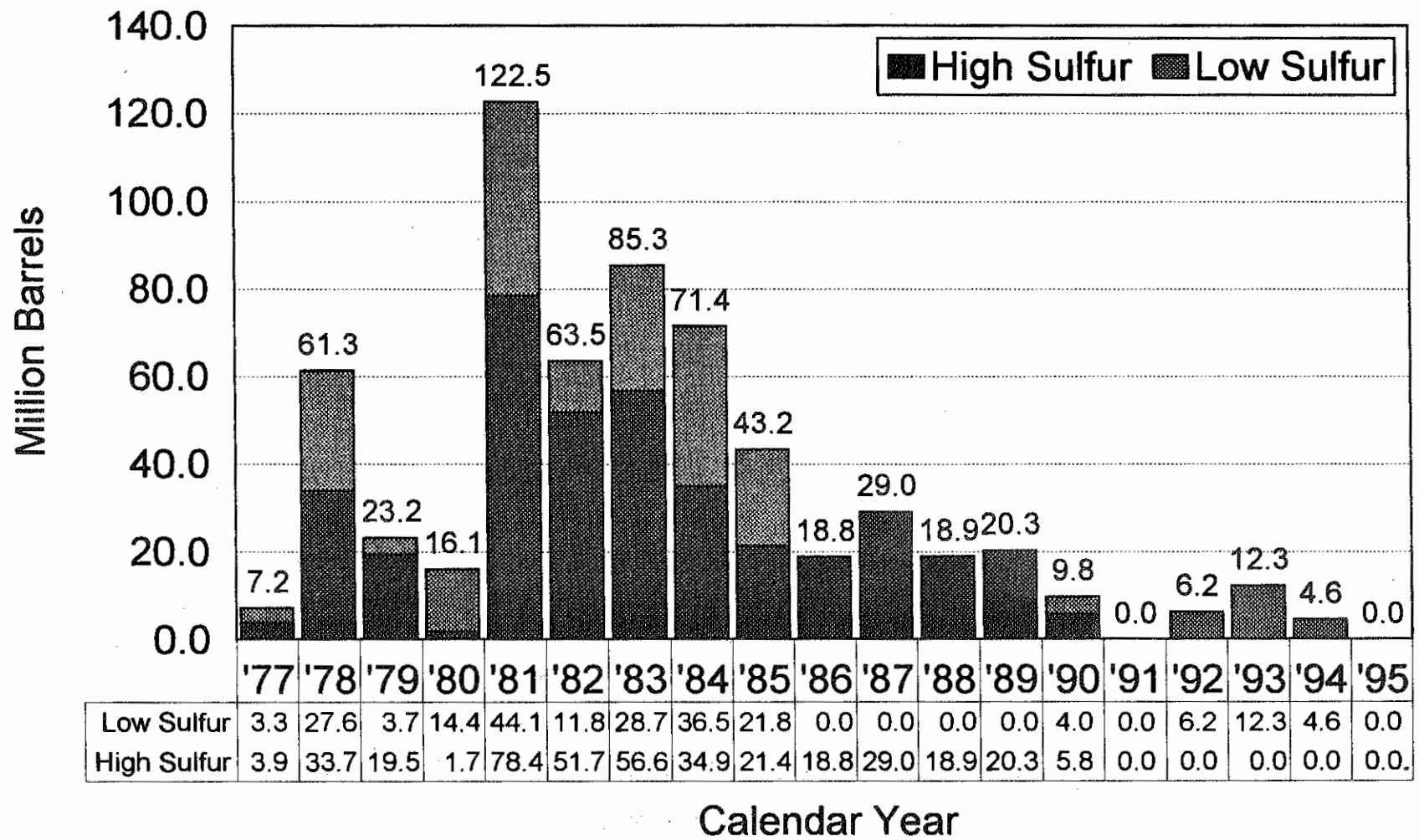
	Fiscal Year		Calendar Year	
	Year-End Inventory (million bbls)	Average Daily Fill Rate (thousand bbls/d)	Year-End Inventory (million bbls)	Average Daily Fill Rate (thousand bbls/d)
1977	1.1	3	7.2	20
1978	49.1	131	68.5	168
1979	91.2	115	91.7	64
1980	92.8	4	107.8	44
1981	199.2	292	230.3	336
1982	277.9	215	293.8	174
1983	361.0	228	379.1	234
1984	431.1	191	450.5	195
1985	489.3	159	493.3	119*
1986	506.4	47*	511.6	51*
1987	533.9	75	540.6	80
1988	554.7	57	559.5	52
1989	577.1	62	579.9	56
1990	589.6	34	585.7	27*
1991	568.5	**	568.5	**
1992	571.4	8	574.7	17
1993	585.7	39	587.1	34
1994	591.7	16	591.7	13
1995	591.7	***	591.6	***

\* Fill rates unadjusted for oil deliveries under the 1985/86 and 1990 test sales.  
 \*\* Fill was suspended during both fiscal and calendar year 1991; a decrease in inventory resulted from drawdown in early calendar year 1991.  
 \*\*\* Fill was suspended during both fiscal and calendar year 1995 due to lack of funds for oil purchases; inventory decrease to 591.6 due to shrinkage from degassing and rounding.

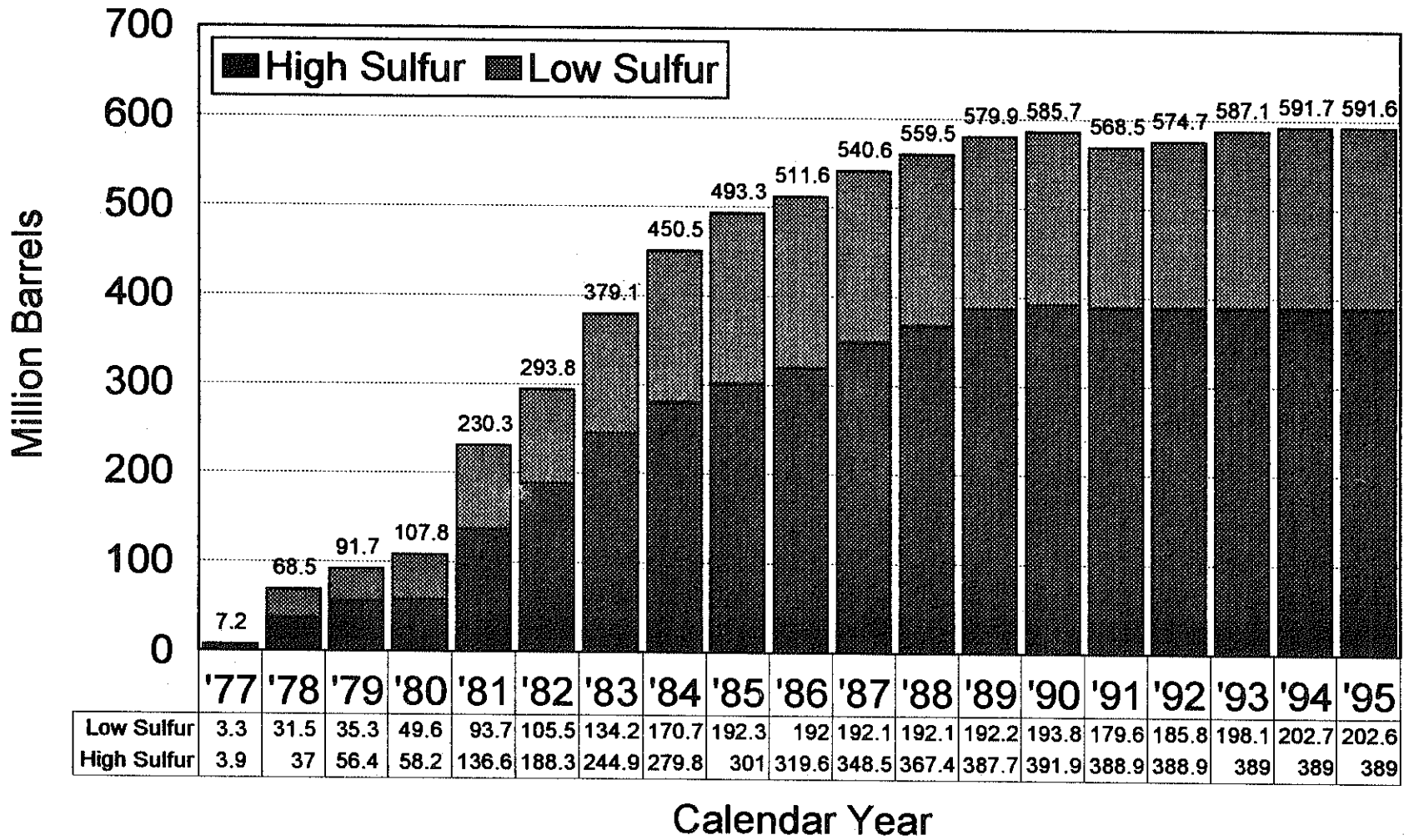
**TABLE 2**  
**CRUDE OIL RECEIVED THROUGH 1995**  
**(MILLION BARRELS)**

Source Country	1995	Cumulative	Percent of Total
Mexico		256.7	41.9
United Kingdom		147.3	24.0
United States:		48.1	7.8
Alaska		31.4	5.1
Other*		16.7	2.7
Saudi Arabia		27.1	4.4
Libya		23.7	3.9
Iran		20.0	3.3
United Arab Emirates		18.4	3.0
Nigeria		15.1	2.5
Norway		11.9	1.9
Oman		9.0	1.5
Egypt		8.9	1.5
Ecuador		6.2	1.0
Algeria		6.2	1.0
Cameroon		3.4	0.6
Iraq		3.4	0.6
Gabon		2.4	0.4
Qatar		2.3	0.4
Angola		1.0	0.2
Venezuela		0.9	0.1
Peru		0.4	0.1
Argentina		0.4	0.1
<b>TOTAL RECEIPTS**</b>	<b>0</b>	<b>612.8</b>	<b>100.0</b>
<p>* Includes shipments from Naval Petroleum Reserves</p> <p>** Unadjusted for deliveries during 1985/1986 and 1990 test sales and 1991 drawdown and for operational gains and losses.</p>			

**FIGURE 2**  
**ANNUAL STRATEGIC PETROLEUM RESERVE OIL FILL**



**FIGURE 3**  
**CUMULATIVE STRATEGIC PETROLEUM RESERVE OIL FILL**



**TABLE 3**  
**Strategic Petroleum Reserve Crude Oil Inventory**

As of December 31, 1995  
(Million Barrels)

Storage Site	Location	1995 Cumulative Total			Total End of Year 1994
		Sour*	Sweet**	Total	
Bryan Mound	Brazoria County, TX	155.5	61.7	217.2	217.2
Big Hill	Jefferson County, TX	30.1	18.8	48.9	42.8
West Hackberry	Cameron Parish, LA	100.0	103.8	203.8	204.5
Bayou Choctaw	Iberville Parish, LA	41.5	17.3	58.8	51.9
Weeks Island***	Iberia Parish, LA	59.6	0.0	59.6	72.5
SUBTOTAL		386.7	201.6	588.3	588.9
Tanks and Pipelines		2.3	1.0	3.3	2.8
TOTAL****		389.0	202.6	591.6	591.7
<p>* Sulphur content greater than 0.5 percent.  ** Sulphur content not exceeding 0.5 percent.  *** Inventory being transferred to Bayou Choctaw and Big Hill  **** Decrease from 1994 due to shrinkage from degassing and rounding</p>					

## ***OTHER PROJECT ACTIVITIES***

### **OIL STABILIZATION PROGRAM**

During 1995, the Department continued to correct the two related but distinct problems that have temporarily reduced the availability of some Strategic Petroleum Reserve crude oil inventory for drawdown in the near term. The first of these problems is a higher-than-normal gas content in some of the crude oil, apparently from years of intrusion of natural gas from the domal salt, and the second is an elevated temperature of some of the crude oil due to natural geothermal heating. These phenomena have produced an increase in the vapor pressure of the crude oil that could result in emissions that exceed environmental and safe operating limits during a drawdown.

In March 1995, the Department completed its installation of heat exchangers at West Hackberry and Bryan Mound. This will allow for cooling of the crude oil, thereby reducing its vapor pressure at the time of a drawdown. Heat exchangers were previously installed at Bayou Choctaw in late 1994.

During 1995, the Reserve's contractor, Delta Hudson Government Services, Inc., began degassing the approximately 144 million barrels of affected crude oil using two 100,000 barrels-per-day plants. The degassing of 19.1 million barrels at West Hackberry commenced in July and was completed on January 4, 1996. The degassing plant at West Hackberry will be moved to Bayou Choctaw for the degassing of approximately 9 million barrels and then to Big Hill where 26 million barrels will be degassed. Operations at Bryan Mound, involving the degassing of 91 million barrels, began in August and are scheduled to be complete by April 1998. As of December 31, 1995, the quantity degassed at Bryan Mound was 11.4 million barrels.

### **COMMERCIALIZATION OF SPR DISTRIBUTION FACILITIES**

The design of the Strategic Petroleum Reserve's crude oil distribution system has been based on a strategy of making maximum use of commercial crude oil distribution facilities and minimizing the development and operations of facilities to be used exclusively by the Strategic Petroleum Reserve. However, in its development, the Strategic Petroleum Reserve has constructed over 240 miles of crude oil pipelines and one marine terminal to connect its facilities to the commercial infrastructure. With the fill of the Reserve being 80 percent complete and drawdown of the Reserve only required in the event of a national energy emergency, these facilities are largely underutilized. Therefore, in 1994, the Department initiated a "commercialization program" to lease or out grant use of these distribution facilities, i.e. the St. James marine terminal and crude oil pipelines within the Capline, Texoma and Seaway complexes for commercial crude oil distribution.

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The Department issued its first commercialization solicitation in September 1994, inviting industry to submit offers for leasing the St. James Marine Terminal within the Capline complex. Although significant industry interest was expressed in the St. James Terminal, the Department did not receive any lease bids for the terminal when the solicitation closed on February 15, 1995.

In response to receiving no offers for leasing the St. James Terminal, a Strategic Petroleum Reserve Leasing Business Strategy Group met with several firms who previously expressed interest in leasing the facilities in order to understand why no bids were forthcoming. The Business Strategy Group found that the primary reason for industry's nonresponse was (a) a real concern over the Government's lease "terms and conditions" which significantly increased the commercial operating costs and (b) an uncertainty of adequate business revenues.

In August 1995, the Strategic Petroleum Reserve completely restructured its commercialization program. The solicitation for Strategic Petroleum Reserve distribution facilities has been changed to request that offerors submit a proposal outlining under what terms and conditions they would like to lease the facilities. Following receipt of industry's proposals, the Government will enter into competitive negotiations with the offerors in order to arrive at a lease that is in the best interest of the Government.

Under this new approach, the Department issued a commercialization solicitation on October 24, 1995, inviting industry to submit proposals for leasing two of the Bryan Mound crude oil pipelines within the Seaway complex. Industry proposals for leasing the Bryan Mound crude oil pipelines were due on December 29, 1995 and award is planned for March 1996. The Department plans to issue a similar commercialization solicitation for its distribution facilities in the Capline system, i.e., the St. James Terminal, the Bayou Choctaw pipeline and the Weeks Island pipeline, in early 1996. With the planned decommissioning of the Weeks Island storage facility, the Department plans to consider sale as well as lease offers for the Weeks Island pipeline and the St. James Terminal. If the Department is not able to commercialize or sell the St. James Terminal, it will pursue mothballing the facility.



## **PROCUREMENT AND CONTRACTOR SUPPORT**

Obligations in fiscal year 1995 for Strategic Petroleum Reserve program activities totaled approximately \$ 214.5 million. Of this amount, \$10.6 million was obligated for Federal program management salaries and benefits and \$203.9 million was obligated for contractual goods and services to operate and maintain the Strategic Petroleum Reserve.

The Strategic Petroleum Reserve's two prime contractors during 1995 were DynMcDermott Petroleum Operations Company, the management and operating contractor; Walk Haydel and Associates, the architect-engineering services contractor; Mitre Corporation, the systems engineering services contractor; and Tucker and Associates, Inc., the management and technical support services contractor.

Other prime contractors who provided services to the Strategic Petroleum Reserve during 1995 included: Arco Pipe Line Company, Phillips Petroleum Company, Sun Pipe Line Company, Sun Marine Terminals, Texaco Pipeline, Inc., and Union Oil Company of California for crude oil transportation and terminalling services; River Valley Services, Inc., L.S. Womack, Inc., and Maitland Brothers for construction; Vindicator Corporation for security systems; Fisher-Rosemont Systems for control systems; and Gulf States Utilities Company and Houston Lighting and Power Company electrical power.

## **REAL ESTATE ACTIONS**

The Department of Energy obtained, through the U.S. Army Corps of Engineers on February 6, 1995, a 20-year permit to use a portion of the Port Allen radio station at Port Allen Lock, West Baton Rouge Parish, Louisiana.

On February 15, 1995, no proposals were received from any of the 37 companies solicited in leasing the St. James Terminal.

On April 21, 1995, the Department of Energy obtained a right of entry from Morton International, Inc., to construct a freeze wall and clear vegetation on their property for the Weeks Island oil movement project.

The Department of Energy issued a license agreement to Amoco to conduct seismic operations across the West Hackberry facility on May 17, 1995.

In October 1995, the U.S. Army Corps of Engineers acquired 1.39 acres of property for the West Hackberry brine relining project and 4.72 acres on the Weeks Island facility.

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## SECURITY

DynMcDermott Petroleum Operations Company, under its management and operating contract, is assigned responsibility to implement and administer the Department of Energy's Strategic Petroleum Reserve Security Program. DynMcDermott secures protection services through a subcontract with Wackenhut Services, International. The Strategic Petroleum Reserve currently has a protection force of 199 armed officers, a reduction of about 10 percent from 1994 as a result of the Reserve's continuing streamlining effort.

The Strategic Petroleum Reserve enhanced vigilance of all security protection officers and implemented increased security protective measures as a result of the April 19, 1995, Oklahoma City Federal building bombing. These security enhancements continue as part of the Strategic Petroleum Reserve Security Program.

During 1995, following a recommendation from the Department of Energy's Office of Security Evaluations, the Strategic Petroleum Reserve conducted a Consequence Analysis to determine and validate Strategic Petroleum Reserve Security Program capabilities. The Consequence Analysis was conducted at each Strategic Petroleum Reserve site under the full range of potential threats, utilizing Field Training Exercises, which included multiple integrated laser engagement system (MILES) evaluation of the security systems, and protective force capabilities. All exercises had satisfactory results. As a continuing part of the Strategic Petroleum Reserve security training program, Acceptance and Validation Field Test Exercises will continue to be conducted on an annual basis.

# ***ENVIRONMENT, SAFETY AND HEALTH***

## **ENVIRONMENTAL COMPLIANCE**

During the year, the Strategic Petroleum Reserve completed environmental reviews pursuant to the National Environmental Policy Act (NEPA) for leasing St. James Terminal and for decommissioning Weeks Island. The Environmental Assessment on the Leasing of the Strategic Petroleum Reserve St. James Terminal (DOE/EA-1003) was approved and a Finding of No Significant Impact was issued in January 1995. It was determined that increased crude oil throughput at St. James under a commercial lease would result in minor impacts to air quality; oil spill risk would not change substantially. For other potential commercialization actions, such as leasing pipelines, NEPA review would be conducted in conjunction with the competitive procurement process.

The Reserve approved the Environmental Assessment for Decommissioning the Strategic Petroleum Reserve Weeks Island Facility, Iberia Parish, Louisiana (DOE/EA-1051) and issued a Finding of No Significant Impact in December 1995. Decommissioning activities are not expected to result in any short-term, long-term, or cumulative impacts. Based on a risk analysis comprising probability and consequence, it was concluded that the principal concerns associated with decommissioning actions-- a release of oil to groundwater or surface waters and worsening subsidence-- were either unlikely or highly unlikely. Significant risks would be associated, however, with doing nothing (the no action alternative).

In July, the Reserve received a National Pollutant Discharge Elimination System permit from the Environmental Protection Agency for Bryan Mound's replacement brine disposal pipeline and diffuser. The unit is now in operation. Other permits obtained during the year were air operating permits for degasification units at Bryan Mound, West Hackberry, and Bayou Choctaw. A variance was obtained from Louisiana for the St. James air permit to allow for the possible sale of 7 million barrels of crude oil in the absence of a declared emergency.

Emergency Planning and Community Right-to-Know Act Section 312 reports were prepared and provided to State and local authorities as required. In recognition of the sites' continuing status as small quantity generators of hazardous waste, however, the Department exempted the Reserve from the requirement for the Annual Report on Waste Generation and Waste Minimization, thereby saving an estimated 280 man-hours.

## **OTHER ENVIRONMENTAL, SAFETY AND HEALTH ACTIONS**

### **EMERGENCY MANAGEMENT EXERCISE**

On November 15 and 16, the Strategic Petroleum Reserve conducted its annual emergency management exercise, EMEX 11. This exercise was performed to demonstrate the Reserve's ability to respond to a major oil spill, as well as test the management of a spill clean-up operation after the initial response. EMEX 11 involved emergency response teams from the Reserve's Bryan Mound, Big Hill and West Hackberry storage sites responding to a simulated commercial pipeline spill into Highland Bayou at LaMarque, Texas, and included the participation of the U.S. Coast Guard, Environmental Protection Agency, and various State of Texas regulatory agencies. EMEX 11 was the first Strategic Petroleum Reserve exercise involving three sites and utilized the Incident Command System developed by the National Interagency Fire Center. The exercise also satisfied the requirement of the National Preparedness for Response Exercise Program guidelines for compliance with the Oil Pollution Act of 1990.

# **BUDGET AND FINANCE**

## **MAJOR BUDGET AND FINANCING ACTIONS DURING 1995**

As of December 31, 1995, the Interior and Related Agencies Appropriations, FY 1996, had not been enacted. Funding for the Strategic Petroleum Reserve was provided through the use of carryover funds from fiscal year 1995 and through a series of short-term continuing resolutions.

H.R. 1977, the Department of Interior and Related Agencies Appropriations Bill, FY 1996, as approved by the Senate and the House, would provide \$287 million for Strategic Petroleum Reserve facilities operations and management through the transfer of \$187.0 million from prior year balances in the SPR Petroleum Account and use of \$100.0 million from a proposed sale of crude oil associated with the Weeks Island decommissioning. The bill also included an outlay limitation of \$5 million for the Strategic Petroleum Reserve Account. The bill was vetoed by the President and the veto was sustained by the Congress.

### **STRATEGIC PETROLEUM RESERVE ACCOUNT**

The Strategic Petroleum Reserve Account funds the development, operation, and maintenance of Reserve facilities; the salaries and expenses necessary to plan and manage the program, including the operation of the Project Management Office in New Orleans, Louisiana; and the activities pertinent to major issues concerning the development and use of the Strategic Petroleum Reserve. Appropriations of \$244 million were enacted for fiscal year 1995; of which \$49 million remained available for obligation at the end of fiscal year 1995. These balances are associated with workload carried into fiscal year 1996.

### **SPR PETROLEUM ACCOUNT**

The SPR Petroleum Account funds the acquisition of oil for the Strategic Petroleum Reserve; the associated costs for transportation and terminalling; U.S. customs duties, Superfund and Oil Spill Liabilities Trust Fund taxes; and other miscellaneous costs, such as Defense Fuel Supply Center administration costs associated with acquiring and transporting oil. In the event of a drawdown and sale of Strategic Petroleum Reserve oil, the SPR Petroleum Account also funds the costs of withdrawing oil from the storage caverns and transporting it to the point where the purchasers take title. An amount equal to Federal receipts from a drawdown and sale is deposited in the SPR Petroleum Account and creates additional budget authority for refilling the Reserve. At the end of fiscal year 1995, \$220 million remained available for obligation in the SPR Petroleum Account, of which \$187 million is proposed for transfer to the Strategic Petroleum Reserve Account. No additional funds were appropriated during 1995.

## **APPROPRIATIONS THROUGH FY 1995**

A total of \$21 billion has been appropriated for the Strategic Petroleum Reserve through fiscal year 1995. Included in this total are the distribution of annual and total appropriations as shown in Table 4. Figures 4 and 5 illustrate annual and cumulative appropriations for storage facilities operations and management and petroleum acquisition and transportation.

### **OIL COSTS THROUGH FISCAL YEAR 1995**

The cumulative cost for the oil in the Strategic Petroleum Reserve at the end of fiscal year 1995 was \$16 billion for an average cost of approximately \$ 27.14 per barrel. Cumulative oil cost for the Department of Defense inventory at the end of fiscal year 1995 was \$125 million for an average cost of \$19.32 per barrel.

FIGURE 4

STRATEGIC PETROLEUM RESERVE ANNUAL FUNDING

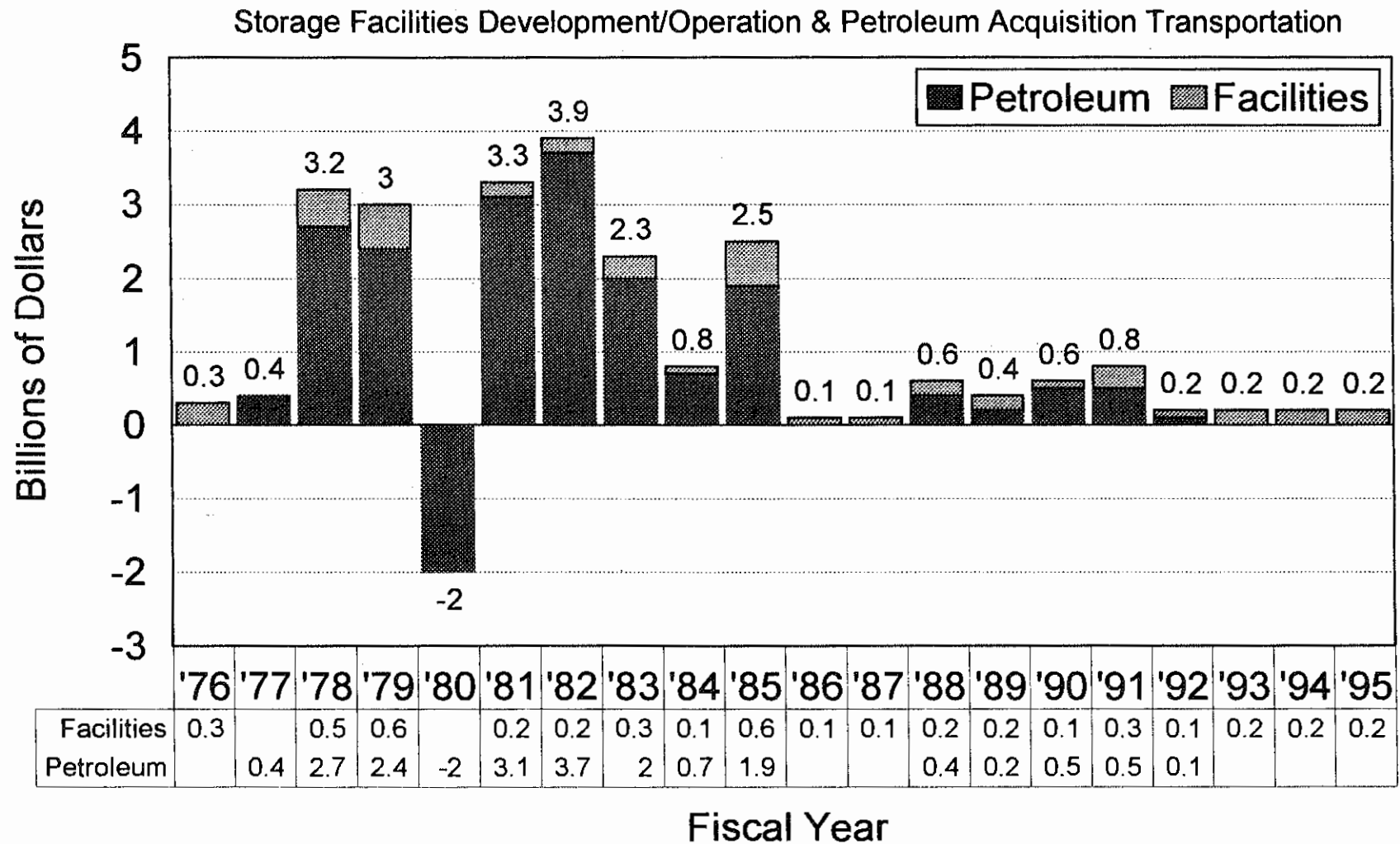
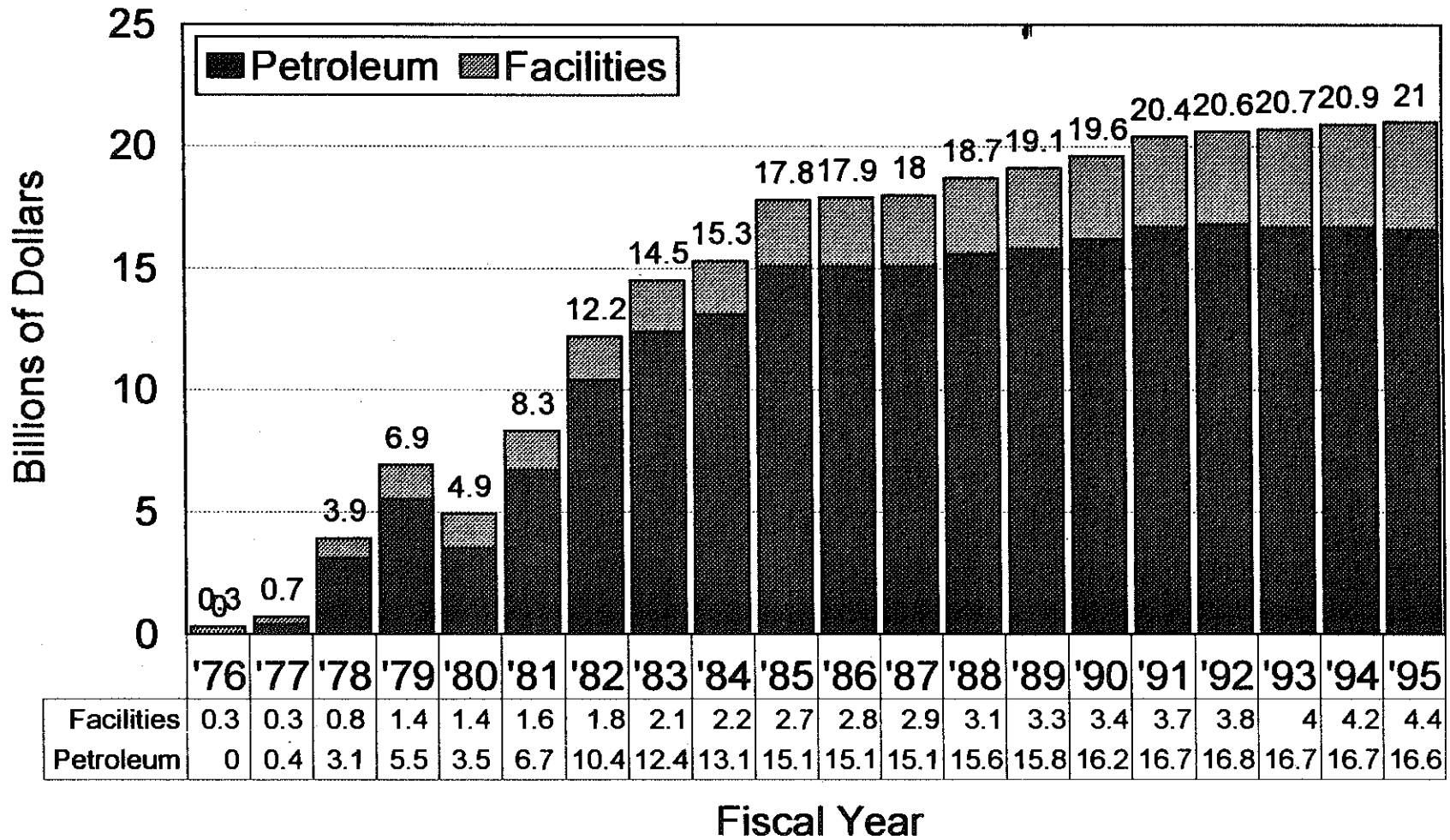


FIGURE 5

STRATEGIC PETROLEUM RESERVE CUMULATIVE FUNDING

Storage Facilities Development/Operation & Petroleum Acquisition Transportation





**TABLE 4  
STRATEGIC PETROLEUM RESERVE APPROPRIATIONS**

<b>FY</b>	<b>Oil Account</b>	<b>Facilities</b>	<b>Management</b>	<b>Total</b>	<b>Defense SPR</b>
1976	0	300,000	13,975	313,975	
1977	440,000	0	7,824	447,824	
1978	2,703,469	463,933	14,704	3,182,106	
1979 New BA	2,885,670	103,290	18,111	3,007,071	
Reprogrammings	(529,214)	529,214	0	0	
Total 1979 Appropriations	2,356,456	632,504	18,111	3,007,071	
1980 Rescission	(2,000,000)			(2,000,000)	
1980 Reprogrammings					
No 1	(20,391)	0	20,391	0	
No 2	(1,881)	0	1,881	0	
Total 1980 Appropriations	(2,022,272)	0	22,272	(2,000,000)	
1981	2,688,282	82,834	19,391	2,790,507	
Entitlements	542,146	0	0	542,146	
Reprogrammings					
No 1	(18,000)	18,000	0	0	
No 2	(7,334)	7,334	0	0	
Total 1981 Appropriations	3,205,094	108,168	19,391	3,332,653	
1982	3,684,000	171,356	20,076	3,875,432	
Reprogrammings	(4,300)	4,300	0	0	
Total 1982 Appropriations	3,679,700	175,656	20,076	3,875,432	
1983	2,074,060	222,528	19,590	2,316,178	
1984	650,000	142,357	16,413	808,770	
1985	2,049,550	441,300	17,890	2,508,740	
1986	0	94,015	13,518	107,533	
Reprogrammings	(12,964)	12,964	0	0	
Total 1986	(12,964)	106,979	13,518	107,533	
1987	0	134,021	13,412	147,433	
1988	438,744	151,886	12,276	602,906	
1989	242,000	160,021	13,400	415,421	
	371,916	179,530	12,953	564,399	
1991	566,318	187,728	12,846	766,892	
1992	88,413	171,678	13,384	273,475	
1993	(125,625)	161,940	14,227	50,542	
DOD Transfer (non add)	124,925	700	0	125,625	125,625
1994	0	191,035	15,775	206,810	
1995	(107,764)	226,938	16,780	135,954	
<b>Total Thru FY 1995</b>	<b>16,597,095</b>	<b>4,158,202</b>	<b>308,817</b>	<b>21,064,114</b>	<b>125,625</b>
1996 (House/Senate; transfer)	(187,000)	170,173	16,827	0	
1996 (House/Senate; sell 7 mmb)	(100,000)	100,000	0	0	
1996 (Total House/Senate)	(287,000)	270,173	16,827	0	
<b>Total Incl FY 1996 Req.</b>	<b>16,310,095</b>	<b>4,428,375</b>	<b>325,644</b>	<b>21,064,114</b>	<b>125,625</b>

Note: FY 1991 SPR Petroleum Account of \$566,318 includes proceeds of \$122,681 from the Test Sale authorized by the President on September 26, 1990, pursuant to the EPCA authorities enacted September 15, 1990, in P.L. 101-383. These proceeds are recorded as additional budget authority rather than reductions to obligations, costs, and outlays. It also includes \$315,424,985 in Desert Storm Drawdown proceeds and \$19,755,064 from FY 1991 NPR excess receipts. Thus the cumulative budget authority is "gross" and not related directly to the inventory of oil on hand.

Defense SPR (FY 93) includes \$700,000 for M&O activities

Facilities FY 94 includes \$34,100 for the hot/gassy oil remediation program.

FY 1996 Appropriation not passed as of February 15, 1996.

# ***DRAWDOWN AND DISTRIBUTION***

## **DISTRIBUTION PLAN**

In the event of a drawdown to respond to a severe energy supply interruption, or to meet obligations of the United States under the Agreement on an International Energy Program, the current plan for distributing crude oil is provided in the "Strategic Petroleum Reserve Drawdown (Distribution) Plan," Amendment Number 4 to the Strategic Petroleum Reserve Plan submitted on December 1, 1982. The Strategic Petroleum Reserve Distribution Plan provides that, pursuant to the President's decision to use the Strategic Petroleum Reserve, the principal method of distributing Strategic Petroleum Reserve oil will be by price competitive sale and the oil is sold and delivered to those offering the highest prices. The sale is open to the largest possible universe of eligible buyers to ensure efficient distribution of Strategic Petroleum Reserve oil. The plan also provides that, in any calendar month, the Secretary of Energy may direct the distribution of up to 10 percent of the volume of oil sold in that calendar month. The price for such oil will be the average price of Strategic Petroleum Reserve oil sold at the contemporaneous competitive sale or at the most recent competitive sale if no contemporaneous competitive sale is held.

## **COMPETITIVE SALES PROCEDURES**

Appendix A to the Department of Energy's final rule (10 CFR Part 625) governing price competitive sales of petroleum from the Strategic Petroleum Reserve provides for Standard Sales Provisions containing or describing contract clauses, terms and conditions of sale, and performance and financial responsibility measures, which may be applicable to a particular sale of Strategic Petroleum Reserve oil. The most recent edition of the Standard Sales Provisions was published in the Federal Register on December 11, 1992.

Under the Standard Sales Provisions, the Strategic Petroleum Reserve sales process begins with the issuance of a Notice of Sale specifying the amount, characteristics, and location of the petroleum being sold as well as the delivery dates and the procedures for submitting offers and other information pertinent to a particular sale. In addition, the Notice of Sale specifies which sales provisions and performance and financial responsibility measures apply.

During the course of a Strategic Petroleum Reserve drawdown, several Notices of Sale may be issued, each covering a sales period of one to two months. Initially, Notices of Sale could allow an extremely short lead time for offers and deliveries. Under the Standard Sales Provisions, it is contemplated that offerors might be given as little as seven days from the date of issuance until offers are due, and 30 days or less from the time of such issuance until the purchasers must accept delivery of the oil, with a less compressed schedule becoming more feasible after the initial stages of drawdown. Because of the possible short lead time, the

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Standard Sales Provisions provide for establishing a list of prospective offerors who will receive all Notices of Sale.

The next step in the sales process is the submission of offers by prospective purchasers at a time specified in the Notice of Sale. The Standard Sales Provisions require that the offerors unconditionally accept all terms and conditions in the Notice of Sale, including an offer guarantee of \$10 million, or 5 percent of the maximum potential contract amount, whichever is less, and an offer of at least the minimum price, if any, specified in the Notice of Sale.

When offers are received, they are evaluated to select the "apparently successful" offerors. The evaluation process is structured so that the offerors bidding the highest prices can select a method of transportation, up to the limits of the Strategic Petroleum Reserve distribution systems, with specific delivery arrangements negotiated later in the process.

Under the Standard Sales Provisions, all "apparently successful offerors" are required, within five business days after being notified, to provide a Letter of Credit equal to 100 percent of the contract amount, or a cash deposit in an amount equal to 110 percent of the contract value, as a guarantee of performance and payment of amounts due under the contract.

Upon timely receipt of the financial guarantees, and upon a final determination by the Contracting Officer that the offers were responsive and the offerors responsible, the Department of Energy issues the Notices of Award and commences deliveries of oil from the Reserve to the purchasers, consistent with their arrangements for commercial pipeline or marine vessel transportation. Such deliveries can begin as soon as the 16th day after the commencement of the sales process, to the extent that the purchasers can submit their financial guarantees and arrange transportation expeditiously.

## **DRAWDOWN AND DISTRIBUTION CAPABILITIES**

The crude oil in the Strategic Petroleum Reserve is commingled in storage to allow for eight distinct crude oil streams to be sold in the event of a drawdown. Table 5 describes these streams and their inventories, as of December 31, 1995, their typical characteristics and available delivery modes and locations.

The Reserve's drawdown and distribution capabilities are shown in Table 6. These capabilities are based on the current crude oil stream inventories, excluding oil inventory that is unavailable for drawdown due to excess gas content, and the existing drawdown systems and commercial distribution capabilities. These capabilities provide for the drawdown and distribution of Strategic Petroleum Reserve crude oil at an initial sustainable rate of 3.4 million barrels per day for a period of 90 days. After this initial period, the drawdown/distribution rate would decrease gradually as site inventories are depleted and the declining number of caverns

containing crude oil becomes a constraint. Figure 6 illustrates the Strategic Petroleum Reserve's physical drawdown/distribution capability which provides for a distribution of 305 million barrels in 90 days and 453 million in 180 days. The Reserve is also capable of increasing the total amount of inventory drawn down if it is drawn at a lesser initial rate since slower rates allow for greater cooling in distribution pipelines, thereby lowering the vapor pressure of the oil.

Over the next two years as the excess gas problem is corrected by means of the degasification project, the Reserve's capability to drawdown its total inventory will gradually increase to a rate of 3.9 million barrels per day by April 1998.

**TABLE 5  
STRATEGIC PETROLEUM RESERVE CRUDE OIL STREAMS\***

<b>CRUDE OIL STREAM</b>	<b>INVENTORY (MMB)</b>	<b>TYPICAL API GRAVITY</b>	<b>TYPICAL SULFUR CONTENT</b>	<b>DELIVERY MODE AND LOCATION</b>
<b>SEAWAY GROUP:</b>				
Bryan Mound Sweet	61.7	36.0°	0.34%	Pipeline or tankship at Phillips Terminal, Freeport, TX or Arco Terminal, Texas City TX
Bryan Mound Sour	144.4	33.1°	1.51%	
Bryan Mound Maya	11.1	22.8°	3.28%	Tankship at Phillips Terminal
<b>TEXOMA GROUP:</b>				
West Hackberry Sweet**	122.3	36.9°	0.31%	Pipeline , tankship or barge at Sun Terminal, Nederland, TX; Tankship at Unocal Terminal, Nederland, TX; Pipeline at Texaco-22/DOE connection, Lake Charles, LA; Pipeline at Texaco-20/DOE connection, Houston, TX
West Hackberry Sour**	125.0	33.7°	1.44%	
<b>CAPLINE GROUP:</b>				
Weeks Island Sour	72.5	28.9°	1.41%	Pipeline at Capline or LOCAP Terminals, St. James, LA; Tankship at DOE's Terminal, St. James, LA
Bayou Choctaw Sweet	17.4	36.1°	0.39%	
Bayou Choctaw Sour	34.5	33.2°	1.47%	
* Data as of December 31 1994.				
** Includes crude oil stored at Big Hill.				

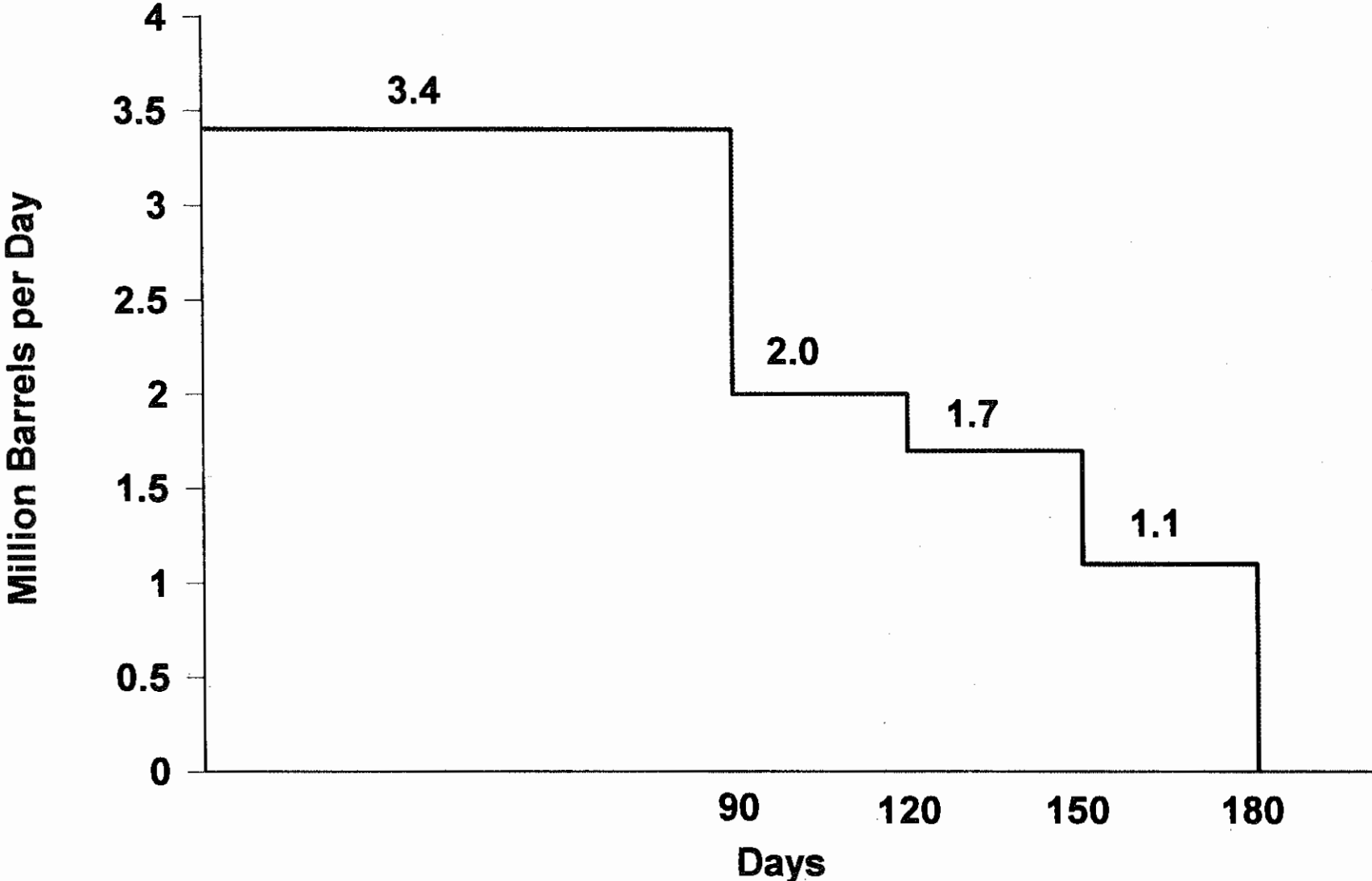
**TABLE 6**  
**SPR DRAWDOWN AND DISTRIBUTION CAPABILITIES**  
**(THOUSANDS OF BARRELS PER DAY)**

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	Drawdown	Distribution
Seaway Group	525	1250
Texoma Group	1587	1940
Capline Group	985	1070
<b>TOTAL</b>	<b>3100</b>	<b>4260</b>

**FIGURE 6**

**DRAWDOWN/DISTRIBUTION CAPABILITY**  
(Inventory as 12/31/95)



## 1995 DRAWDOWN READINESS ACTIVITIES

During 1995, the Strategic Petroleum Reserve continued to perform various activities under its drawdown readiness assurance program which is designed to maintain the Reserve in a state of readiness to conduct a drawdown and distribution of the Reserve's inventory in the event of a requirement. These activities included:

- Conducting Quarterly Drawdown Readiness Reviews, encompassing each function and system associated with a drawdown;
- Enhancing the drawdown readiness program through initiating plans for periodically conducting tabletop exercises at each site, mini-administrative exercises of the sales process and unannounced physical drawdown tests, as well as developing a graphical readiness integrated drawdown system that will use a computer-based system to assist in evaluating the Reserve's readiness;
- Conducting physical testing of various site equipment and systems and performing administrative exercises of the drawdown process;
- Conducting assessments of the distribution terminals' readiness to support a drawdown;
- Developing improvements to various computer models used in assessing drawdown capabilities and supporting drawdown operations;
- Initiating a performance-based training program for all drawdown-critical positions in both the Reserve and contractor organizations; and
- Analyzing the Reserve's drawdown capabilities based on the constraints imposed by various problems or physical conditions/limitations, such as excessive gas and temperature conditions, equipment failures and distribution terminal changes.



## ***CUSTOMER SERVICE TO THE NATION AND TO U.S. REFINERS***

The Strategic Petroleum Reserve serves both the Nation and U.S. refiners by providing energy security against potential disruptions in petroleum supplies, and by providing refiners maximum accessibility to the Nation's stockpile in the event of a disruption. As of December 31, 1995, the inventory of crude oil in the Reserve amounted to 592 million barrels, providing a net import protection level of 72 days, based on the 1995 net import rate for crude and petroleum products.

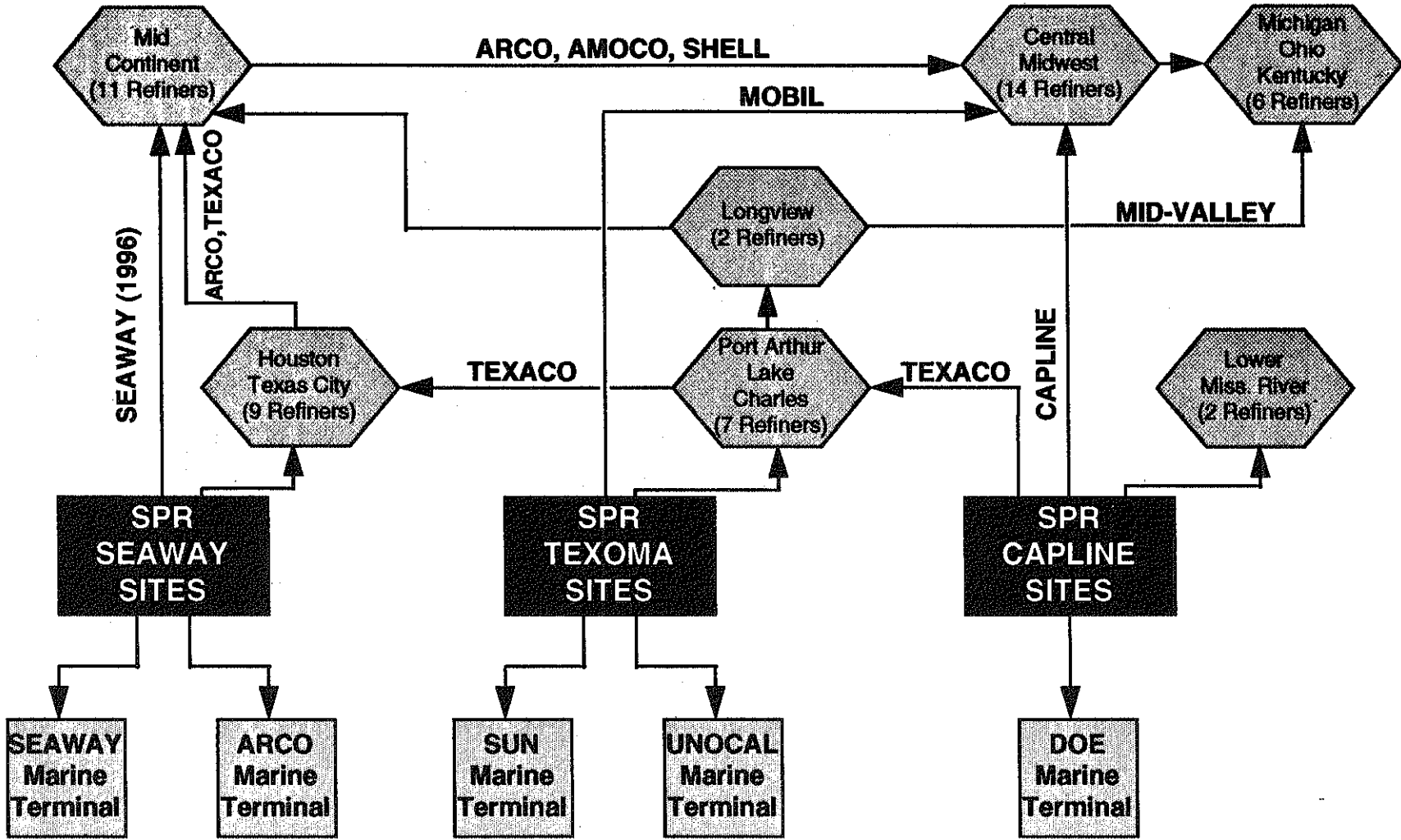
The Strategic Petroleum Reserve is designed to distribute crude oil to U.S. refiners through local and interstate commercial pipelines systems and marine terminals. The Reserve is currently accessible to 51 active refiners by commercial pipelines. In 1995, these 51 refiners comprised approximately 50 percent of U.S. refining capacity, and processed approximately 48 percent of all non-Canadian crude oil imports.

During 1995, two major commercial pipeline projects were initiated which enhance the SPR's pipeline distribution capabilities to Midwest and midcontinent refineries. In April 1995, Mobil completed the reversal of its 20-inch pipeline from Nederland, Texas to Corsicana, Texas. This pipeline now provides the capability to transport SPR oil from Sun Terminal in Nederland, Texas to Patoka, Illinois in the Midwest at a rate of 200,000 barrels per day. Also during early 1995, ARCO and Phillips Petroleum Co. formed a pipeline partnership to reconvert the Seaway 30-inch pipeline from natural gas to crude oil service. This pipeline will provide the capability to transport SPR oil from Freeport, Texas to Cushing, Oklahoma at an initial rate of 270,000 barrels per day in early 1996. These two projects aimed at satisfying industry's growing demand for imported crude in the Midwest and midcontinent, add flexibility to the SPR's distribution capabilities.

The Reserve is also connected to five marine terminals for waterborne distribution: Phillips in Freeport, Texas, ARCO in Texas City, Texas, Sun and Unocal in Nederland, Texas, and the Department of Energy's St. James Terminal in St. James, Louisiana. These terminals have a total of 13 tanker berths and three barge berths, with a combined shipping capacity of 2.4 million barrels of crude oil per day. Figure 7 shows the Reserve's pipeline and marine distribution capabilities.

FIGURE 7

STRATEGIC PETROLEUM RESERVE PIPELINE AND MARINE DISTRIBUTION CAPABILITIES



## ***CONTINUOUS QUALITY IMPROVEMENT***

The Strategic Petroleum Reserve's continuous quality improvement program matured significantly in 1995. The Program Office, Project Management Office, DynMcDermott, and sites all have active quality councils and are conducting process improvement projects. DynMcDermott, the SPR's management and operations contractor, won a 1995 Department of Energy Quality Commendation Award, which is based on the Malcolm Baldrige National Quality Award criteria.

The SPR has seen increasing savings of time and money, elimination of unnecessary or low value work, and simplification of processes as employees have become more sophisticated in using continuous quality improvement methods. These improvements have been celebrated at the SPR's annual Quality Expo in New Orleans since 1994. The Quality Expo publicly recognizes SPR employees, promotes replication of successful quality improvements throughout the SPR, and promotes further use of continuous quality improvement methods. Annual competitions among the best SPR quality improvement projects are held at each expo.

One winning team from the 1994 Quality Expo, along with SPR management and quality improvement staff, briefed the Secretary of Energy at her senior staff meeting on January 23, 1995. That team, from West Hackberry, created a statistical testing and tracking program that eliminated noncompliant water samples and enabled the SPR to cancel a planned and budgeted \$100,000 plant modification that was designed to accomplish the same purpose.

Examples of 1995 project results follow. Some process improvement teams are comprised of personnel located at single sites, while teams that deal with broader improvement topics may have members from several sites or organizations. Several teams include Federal employees, contractors, and even subcontractors as members.

- One winning Bryan Mound team at the 1995 Quality Expo used quality improvement methods to study and eliminate an inspection requirement that did not add value, saving 1,090 man-hours annually.
- An engineering design review team reduced the time to complete reviews by 22 percent, reduced resources requirements by 18 percent, and improved the completeness of packages by 18 percent.
- \$361,000 in labor costs were saved annually by streamlining the requirements for escorting vendors for security purposes.

- West Hackberry site teams have significantly reduced negative findings in internal assessments of fire extinguisher compliance (from 51 findings in 1994 to no findings in 1995) and audits of accounting for hazardous materials and chemical inventories (reduction of 80 percent in findings).
- Annual savings of \$383,000 in labor and \$60,000 in contractor costs were achieved by improving performance standards and training materials in environment, safety and health and in heavy equipment refresher training.

In 1996, the SPR will continue its improvement efforts and will further develop its employees' capabilities in continuous quality improvement. Joint process improvement efforts involving headquarters (Program Office) and field (Project Management Office) personnel are planned, as are efforts that will focus more on the SPR's customers. DynMcDermott is working on a major reengineering project, that will completely redesign inventory management, warehousing, property control, purchasing, and financial forms processing, including developing new supporting information systems.

## ***LOOKING AHEAD TO 1996***

The Department will be involved in the following significant activities in the year 1996.

### **CRUDE OIL SALE**

In late 1995, pursuant to the pending Department of Interior and Related Agencies Appropriations Act, the Department commenced planning for the sale of up to 7 million barrels of Weeks Island sour crude oil in order to obtain \$100 million in proceeds to fund the decommissioning of the Weeks Island site and other Reserve facilities requirements. Subsequently, on January 26, 1996, the Balanced Budget Downpayment Act was enacted which, in part, authorized the sale.

On January 29, 1996, the Department of Defense's Defense Fuel Supply Center, acting as the Reserve's contracting agent for this non-emergency oil sale, issued a solicitation for competitive offers to purchase the crude oil. Offers are due February 20 and, assuming receipt of offered prices at reasonable prices, contracts are expected to be awarded on or about February 28. As necessary, additional offers will be sought thereafter on a 1 to 2 week basis.

The oil is available for delivery at the Department's St James Terminal and adjacent commercial pipeline systems. Following each delivery, the purchaser will be invoiced and payment will be made to the SPR Petroleum Account for subsequent use by the Reserve.

### **PROPOSAL TO STORE FOREIGN-OWNED OIL IN THE RESERVE**

The Department of Energy is pursuing an initiative to store foreign-owned oil in the Strategic Petroleum Reserves. Following the transfer of Weeks Island oil to other sites, the Strategic Petroleum Reserve will have approximately 80 million barrels of available and usable capacity. The Department proposes to store foreign-owned oil in underutilized SPR caverns through a mutually beneficial agreement with another stockpiling country. In addition to generating revenues for the United States, such an arrangement could prove advantageous both to other stockpiling nations and the U.S. by: providing economical storage to other countries, promoting global stockpiling, and preserving storage caverns for future use.

The Strategic Petroleum Reserve has capacity to store 60 to 80 million barrels of foreign stocks on a segregated or commingled basis. On August 22, 1995, a State Department making the proposal was sent to all International Energy Agency (IEA) countries and candidates for IEA membership. To exempt foreign oil from customs duties and taxes, the Department is applying to have Foreign Trade Zone status extend to several sites. The Department will continue its discussion and negotiations with interest countries in 1996.

## ***APPENDICES***

### ***A. Strategic Petroleum Reserve Site Status***

### ***B. Strategic Petroleum Reserve Crude Oil Specifications***

**APPENDIX A**  
***Strategic Petroleum Reserve Site Status***

**BAYOU CHOCTAW**

**LOCATION**

Iberville Parish, Louisiana (12 miles southwest of Baton Rouge, Louisiana).

**ACQUISITION**

Acquired 355.95 acres fee simple, by condemnation April 1977, from numerous private owners. Union Texas Petroleum (a subsidiary of Allied Corporation) was the previous operator.

In 1985 the Department of Energy acquired an additional existing cavern through a cavern exchange agreement with Union Texas Petroleum. The transaction involved a 3.5 acre exchange with no net change in Government-owned acreage.

**ENVIRONMENTAL/PERMITS**

Environmental Impact Statement published December 1976; supplement published May 1977.

Four major Federal and State permits related to pipeline, well pad, storage, and storm water runoff acquired in 1978, and updated in 1980 and 1981.

**SITE DESCRIPTION**

A 75-million-barrel storage facility consisting of 65 million barrels in five existing caverns, plus 10 million barrels of storage capacity in a new Strategic Petroleum Reserve-developed cavern.

Oil, brine, and raw water piping distribution system connecting caverns with central plant, a water intake structure, 12 brine disposal wells located 2.5 miles offsite, and a pipeline for supplying brine to Union Texas Petroleum, Inc. Oil and water distribution system consists of over 50,000 feet of piping and 16 pumps totaling 22,000 horsepower. A 100,000 barrel brine pond and an oil/brine separator are also onsite.

Numerous permanent specialized buildings include: Control Center, Administration Building, Security Operations Center, Maintenance Shop and Laboratory, Electrical Switch Gear (5KV),

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Spare Parts Warehouse, Foam Storage, Instrument Shop, Documentation Storage and a Guard House.

#### **SYSTEM PARAMETERS**

Oil fill via 36-inch-diameter, 37.2-mile pipeline from St. James Terminal. Sustained system rate - 110,000 bbl/d (brine disposal-constrained).

Raw water design pumping rate - 514,000 bbl/d.

Brine disposal design pumping rate - 110,000 bbl/d.

#### **DRAWDOWN**

Drawdown via 36-inch-diameter, 37.2-mile pipeline to St. James Terminal and to Capline pipeline.

Design drawdown capability - 480,000 bbl/d.

#### **MAJOR ACCOMPLISHMENTS**

Repositioned 5 million barrels of crude inventory to accommodate transfer of Weeks Island crude to the Bayou Choctaw site.

Initiated receipt and storage of crude oil transferred from the Weeks Island site

Completed installation and performance testing of crude oil heat exchangers

Replaced deteriorated sections of on-site piping.

Completed internal lining of raw water and brine headers.

Completed internal lining of the brine pipeline to disposal wells.

Initiated the construction of electrical cable trays and duct bank system.



# **WEEKS ISLAND**

## **LOCATION**

Iberia Parish, Louisiana (95 miles southwest of New Orleans).

## **ACQUISITION**

Acquired 382.92 acres fee simple subsurface and 6.63 acres fee simple surface, by condemnation September 1977, from Morton Salt Company.

## **ENVIRONMENTAL/PERMITS**

Environmental Impact Statement published January 1977; supplement published August 1977.

Major Federal permit related to oil pipeline to St. James Terminal acquired in 1978. Three major Federal and State permits related to oil storage, air emissions and storm water, and treated sewage effluent discharge acquired in 1979; EPA National Pollutant Discharge Elimination System permit updated in 1982.

## **SITE DESCRIPTION**

Conventional room and pillar salt mine containing 70 million barrels of storage capacity in two levels. Dedicated to sour crude oil storage.

Oil piping distribution system consists of 11 (10 operational and one reserve) submersible electric pumps in the mine to boost crude to the surface and twin main-line pumps (plus one reserve) to deliver crude to the St. James, Louisiana Terminal during drawdown. Pumps total 17,000 horsepower. Firewater system has a 500,000 gallon tank with pumps, and mine inert gas and vapor recovery systems provide for safety.

Numerous permanent specialized buildings include: Administration and Maintenance, Control Center, Security Operations Center, Spare Parts Warehouse, Electrical Substation, Laboratory and Sample, Inert Gas Generator, Foam Storage, Fire Water Pump House, Mainline Pump House, Production Shaft Headframe, Production Shaft Hoist, Service Shaft Headframe, Service Shaft Hoist, Service Shaft Motor Control Center, and a Guard House.

## **SYSTEM PARAMETERS**

Oil fill via 36-inch-diameter, 67.2 mile pipeline from St. James Terminal. Sustained system rate - 350,000 bbl/d (terminal throughput limited).

## **DRAWDOWN**

Drawdown via 36-inch-diameter 67.2-mile pipeline to St. James Terminal and to Capline pipeline.

Design drawdown capability - 590,000 bbl/d.

## **MAJOR ACCOMPLISHMENTS**

Completed construction of an underground freeze wall surrounding the sinkhole to control ground water inflow during oil drawdown.

Commenced the transfer of Weeks Island inventory to Bayou Choctaw and Big Hill storage sites.

Conducted public hearings to gather inputs from the members of the community and industry on potential future site uses and on environmental issues to consider in the proposed decommissioning of the Weeks Island site.

Completed Environmental Assessment for decommissioning the Strategic Petroleum Reserve Weeks Island storage facility.

# ***BRYAN MOUND***

## **LOCATION**

Brazoria County, Texas (three miles southwest of Freeport, Texas).

## **ACQUISITION**

Acquired 499.47 acres fee simple, by condemnation April 1977, from Freeport Mineral Company and other owners. Dow Chemical Company was the previous operator.

In 1986 Department of Energy acquired the pre-existing Brazoria County Road 242 within the site boundary through a relocation agreement with the county.

## **ENVIRONMENTAL/PERMITS**

Environmental Impact Statement published January 1977; supplement published December 1977. Phase III supplement published October 1981.

Five major Federal and State permits related to pipelines, water intake, and storage acquired in 1977 and 1978. National Pollution Discharge Elimination System updated 1981; renewed 1984. Seaway Environmental Impact Statement published June 1978. Supplement published October 1981.

Two major Federal permits related to brine disposal pipeline issued in 1978. Permit for brine discharge increased to 1.1 million bbl/d August 1981.

## **SITE DESCRIPTION**

226-million-barrel storage facility consisting of 66 million barrels of capacity in four caverns existing upon site acquisition, plus 160 million barrels of storage capacity in 16 Strategic Petroleum Reserve-developed caverns.

36-inch-diameter, 14.6-mile brine disposal pipeline extending 13 miles offshore in the Gulf of Mexico.

Oil, brine and raw water piping distribution system connecting caverns with central plant and water intake structure located on Brazos River and connected by a 36-inch pipeline. Oil/brine/water distribution system consists of over 101,000 feet of piping and 33 pumps totaling over 43,000 horsepower. Four 200,000-barrel oil storage tanks, two brine ponds (15,000 and 150,000), and an oil-brine separator.

Numerous permanent specialized buildups include: Control Center, Administration Building, Security Operations Center, Maintenance, Spare Parts Warehouse, Foam Generator, Foam Storage (3), Electrical Switch Gear, and a Guard House.

#### **SYSTEM PARAMETERS**

Fill via 30-inch-diameter, 3.6-mile pipeline from Phillips Freeport Marine Terminal. Design oil fill rate - 240,000 bbl/d. Sustained system rate - 180,000 bbl/d.

Raw water design pumping rate - 1,355,000 bbl/d.

Brine disposal design pumping rate - 980,000 bbl/d (permit limitation - 1,100,000 bbl/d).

#### **DRAWDOWN**

Drawdown via 30-inch diameter, 3.6 mile pipeline, to Phillips Freeport Marine Terminal.

Drawdown via 40-inch diameter, 46-mile pipeline to ARCO Pipeline Company's Texas City Pipeline Terminal and Docks.

Design drawdown capability - 1,250,000 bbl/d.

#### **MAJOR ACCOMPLISHMENTS**

Completed degasification of approximately 11.4 million barrels of crude oil.

Installed 20 heat exchangers for cooling crude oil during drawdown.

Completed construction of new 24-inch brine disposal pipeline to the Gulf of Mexico.

Initiated major construction under the Life Extension Program, including a new distributed control system, new piping and instrumentation in cavern areas, and reconfiguration of site pipe racks.

# ***WEST HACKBERRY***

## **LOCATION**

Cameron Parish, Louisiana (22 miles southwest of Lake Charles, Louisiana).

## **ACQUISITION**

Acquired 405.36 acres fee simple, by condemnation April 1977, from numerous private landowners. Olin Corporation was the previous site operator.

Acquired 160.0 additional acres fee simple by condemnation in two actions, July 1979 and March 1980.

## **ENVIRONMENTAL/PERMITS**

Environmental Impact Statement published January 1977; supplement published April 1977. Phase III supplement published October 1981.

Six major Federal and State permits related to pipelines, drilling pads, water intake, and storage acquired in 1977 and 1978; National Pollutant Discharge Elimination System permit renewed 1984.

Texoma Environmental Impact Statement published November 1978; supplement published in October 1981.

Two major Federal permits related to a brine pipeline acquired in 1980.

## **SITE DESCRIPTION**

219-million-barrel storage facility consisting of 49 million barrels in five caverns existing upon site acquisition, plus 170 million barrels of storage capacity in 17 Strategic Petroleum Reserve-developed caverns.

Oil, brine, and raw water piping distribution system connecting caverns with central plant, water intake structure located on Intracoastal waterway connected by a 42-inch diameter, 4.5 mile pipeline, and 10 brine disposal wells. Consists of over 160,000 feet of piping and 45 pumps totaling over 82,000 horsepower. Brine disposal is via injection wells due to the decommissioning of the 27 mile brine line to the Gulf, a 175,000-barrel brine pond and an oil-brine separator.

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Numerous permanent specialized buildings include: Control Center, Administration Building, Security Operations Center, Maintenance, Spare Parts Warehouse, Covered Lay-Down, Film Storage, Foam Storage, and a Guard House.

### **SYSTEM PARAMETERS**

Fill via 42-inch diameter, 42.8-mile pipeline from Sun Terminal, Nederland, Texas. Design oil fill rate - 225,000 bbl/d. Sustained system rate - 175,000 bbl/d.

Raw water design pumping rate - 1,450,000 bbl/d.

Brine disposal design pumping rate - 900,000 bbl/d

### **DRAWDOWN**

Drawdown via a Department of Energy 42-inch-diameter, 42.8-mile pipeline to Sun Terminal, Nederland, Texas.

Drawdown via a 36-inch diameter, 12-mile oil pipeline (Department of Energy Lake Charles Pipeline) connecting to the Texas 22-inch common carrier pipeline and to refineries in Lake Charles, Louisiana.

Design drawdown capability - 1,250,000 bbl/d.

### **MAJOR ACCOMPLISHMENTS**

Completed degasification of approximately 19 million barrels of crude oil.

Installed six heat exchangers for cooling crude oil during drawdown.

Completed internal lining of brine pipeline to disposal wells.

Initiated major construction under the Life Extension Program, including a new distributed control system, new piping and instrumentation in cavern areas, and reconfiguration of site pipe racks.

# ***BIG HILL***

## **LOCATION**

Jefferson County, Texas (20 miles southwest of Beaumont, Texas).

## **ACQUISITION**

Acquired 271 acres fee simple, by condemnation November 1982 and July 1983, from three landowners, i.e., 238.48 acres from Amoco, 27.06 acres from the Pipkin estate, and 5.46 acres from the Patrick Henry Phelan estate.

## **ENVIRONMENTAL/PERMITS**

Environmental Impact Statement published October 1981.

State permits for drilling, underground hydrocarbon storage, pipeline operations, air quality, water appropriation, and water quality certifications were acquired in 1983. The EPA National Pollutant Discharge Elimination System permit was acquired in 1984.

## **SITE DESCRIPTION**

160-million-barrel storage facility consisting of fourteen Strategic Petroleum Reserve-developed 11.5-million-barrel storage caverns.

Oil, brine, and raw water systems connecting caverns with central plant, water intake structure located on the Intracoastal Waterway connected by a 48-inch diameter, and brine disposal pipeline extending 3 miles offshore in the Gulf of Mexico. Oil and water distribution system consists of over 29 miles of piping and 15 pumps totaling 32,000 horsepower.

Numerous permanent specialized buildings include: Control Center, Administration, Security Operations Center, Communications, Guard House, Covered Lay-Down, Fire House, Sample Storage, and Maintenance.

#### **SYSTEM PARAMETERS**

Fill via 36-inch-diameter, 25 mile pipeline from Sun Terminal, Nederland, Texas. Sustained system rate 280,000 bbl/d.

Raw water design pumping rate - 1,400,000 bbl/d.

Brine disposal design pumping rate - 1,400,000 bbl/d (permit limitation of 1,700,000 bbl/d).

#### **DRAWDOWN**

Drawdown via 36-inch-diameter, 25 mile pipeline to Sun Terminal, Nederland, Texas.

Design Drawdown capability - 930,000 bbl/d.

#### **MAJOR ACCOMPLISHMENTS**

Repositioned 6.9 million barrels of crude inventory to accommodate transfer of Weeks Island crude to the Big Hill site.

Initiated receipt and storage of crude oil transferred from the Weeks Island site

Completed construction and certification of potable water service line from Winnie, Texas

Awarded contract for new flow control valves to be installed under the Life Extension Program.



# ***ST. JAMES TERMINAL***

## **LOCATION**

St. James Parish, Louisiana (45 miles southeast of Baton Rouge, Louisiana, on the Mississippi River).

## **ACQUISITION**

Acquired 104.76 acres of fee simple for terminal by condemnation in May 1978.

Acquired 47.68 acres fee simple for docks by condemnation in July 1978.

## **ENVIRONMENTAL/PERMITS**

St. James' Terminal Environmental Impact Statement is a component of the Bayou Choctaw supplement, published May 1977, and the Weeks Island supplement, published August 1977.

Two major Federal and State permits related to dock construction were acquired in 1978. Environmental Protection Agency discharge permit for storm water and sewage acquired in 1980. Dock Construction Permit modified 1982.

## **SITE DESCRIPTION**

Terminal facilities include six storage tanks totaling two million barrels of capacity, tie-ins to Bayou Choctaw and Weeks Island sites, and to LOCAP and Capline pipeline terminals.

Oil distribution piping system connecting docks, tanks, and pump station consists of over 35,000 feet of piping and five pumps totaling over 7,500 horsepower, metering systems, and maintenance and control buildings.

Two docks with one berth each, able to accommodate vessels of up to 123,000 long tons maximum loaded displacement. A 42-inch-diameter pipeline connects the docks to the storage tanks.

## **SYSTEM PARAMETERS**

Tanker unloading - design unloading capacity of 40,000 bbl/hr.

Fill capabilities from terminal to:

Bayou Choctaw: design pumping rate - 240,000 bbl/d.  
Weeks Island: design pumping rate - 480,000 bbl/d.  
Terminal sustained system fill rate: 350,000 bbl/d.

**DRAWDOWN**

Crude oil from Bayou Choctaw and/or Weeks Island to be distributed across docks and to  
LOCAP and Capline Pipeline Terminal.

**SUSTAINED TANKER LOADING RATE:** 435,000 bbl/d.

**MAJOR ACCOMPLISHMENTS**

Completed the cleaning and inspection of two 400,000-barrel oil storage tanks.

**APPENDIX B**  
**Strategic Petroleum Reserve Crude Oil Specifications**

Characteristic	Sour <sup>b</sup>	Sweet <sup>c</sup>	Primary ASTM Test Method <sup>d</sup>
API Gravity [° API]	30 - 45	30 - 45	D 1298
Total Sulfur [Wt.%], Max.	1.99	0.50	D 1552
Pour Point [°F(°C)], Max.	50 (10)	50 (10)	D 97
Salt Content [Lbs./1,000 Bbls.], Max.	50	50	D 3230
Viscosity [SUS @ 60°F (cSt @15.6°c)], Max. [SUS @ 100°F (cSt @ 37.8°C)], Max.	150 (32)  70 (13)	150 (32)  70 (13)	D 445 & D 2161
Reid Vapor Pressure [Psia @ 100°F (kPa @ 37.8°C)], Max.	11 (76)	11 (76)	D 323
Total Acid Number [mg KOH/g], Max.	0.40	0.40	D 664
Water and Sediment [Vol. %], Max.	1.0	1.0	D 473 & D 4006 or D 4928.

Yields [Vol. %]			
Naphtha [82-375°F (28-191°C)]	24 - 30	21 - 42	D 2892 & D1160
Distillate [375-620°F (191-327°C)]	17 - 31	19 - 45	
Gas Oil [620-1050°F (327-566°C)]	26 - 38	20 - 42	
Residuum [>1050°F(>566°C)]	10 - 19	14 Max.	

- <sup>a</sup> Marketable virgin crude petroleum suitable for normal refinery processing and free of foreign contaminants or chemicals including, but not limited to, chlorinated and/or oxygenated hydrocarbons, and lead.
- <sup>b</sup> Crude oils that meet these sour specifications include Arabian Berri, Arabian Light, Dubai (Fateh), Flotta, Isthmus, Lagomedio, Oman, Qatar Marine, Tia Juana Light, Upper Zakum, and West Texas Sour.
- <sup>c</sup> Crude oil that meet these sweet specifications include Bonny Light, Brass River, Brent Blend, Ekofisk, Escravos, Forties, Kole Marine, Oseberg, Palanca, Saharan Blend, Statford, West Texas Intermediate, and Zarzaitine.
- NOTE: Crude oils other than those listed above may be acceptable. The acceptability of any crude oil depends upon an assay typical of current production quality of the stream.
- <sup>d</sup> Alternate methods may be used if approved within the contract. Offerors shall submit requests to use alternate methods to the Contracting Officer for determination of acceptability. In case of disputes arising from a difference between origin and destination test results, results from testing of the custody transfer sample using the primary test method shall be binding.





# Strategic Petroleum Reserve

Annual Report for Calendar  
Year 1997

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U.S. Department of Energy  
Assistant Secretary for Fossil Energy  
Office of Strategic Petroleum Reserve

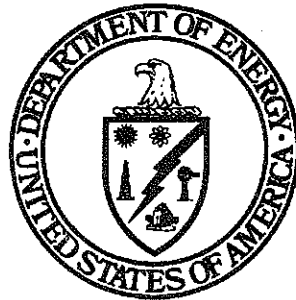




# Strategic Petroleum Reserve

Annual Report for Calendar  
Year 1997

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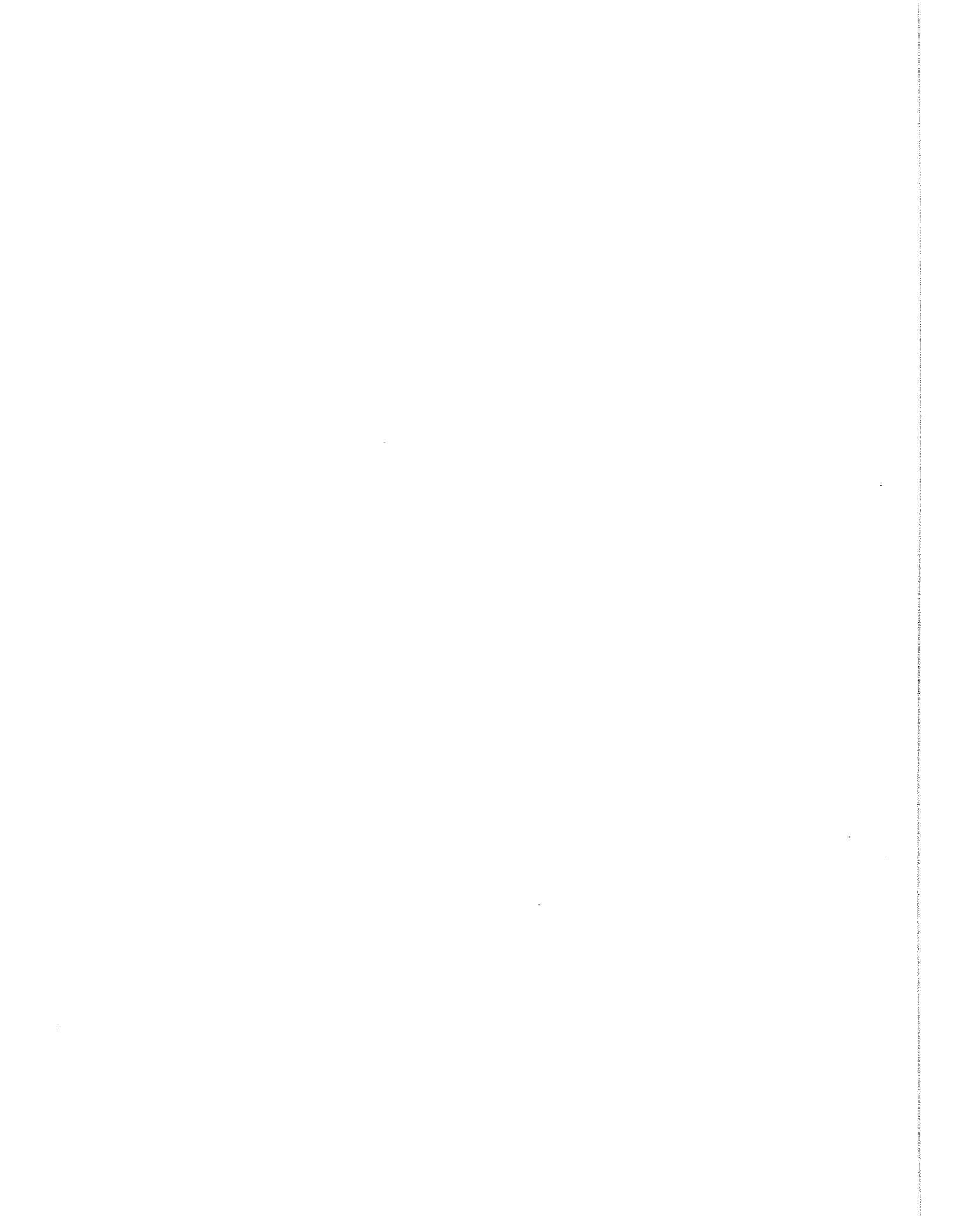


U.S. Department of Energy  
Assistant Secretary for Fossil Energy  
Office of Strategic Petroleum Reserve  
Washington, D.C. 20585

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## *TABLE OF CONTENTS*

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<b>EXECUTIVE SUMMARY.....</b>	<b>1</b>
<b>Introduction.....</b>	<b>1</b>
<b>Life Extension.....</b>	<b>1</b>
<b>Weeks Island Decommissioning.....</b>	<b>1</b>
<b>Crude Oil Inventory.....</b>	<b>1</b>
<b>Oil Stabilization.....</b>	<b>1</b>
<b>Commercialization of Distribution Facilities.....</b>	<b>1</b>
<b>Foreign Oil Storage.....</b>	<b>1</b>
 <b>PROGRAM MISSION.....</b>	 <b>2</b>
<b>Background.....</b>	<b>2</b>
<b>Legislative History.....</b>	<b>2-3</b>
<b>Strategic Petroleum Reserve Plan and Amendments.....</b>	<b>3</b>
 <b>PROGRAM DESCRIPTION.....</b>	 <b>4</b>
<b>Program Management.....</b>	<b>4</b>
<b>Strategic Petroleum Reserve Storage Facilities.....</b>	<b>4</b>
<b>Facilities Life Extension Program.....</b>	<b>7</b>
<b>Storage Facilities Status.....</b>	<b>7-9</b>
<b>Drawdown and Distribution Methods.....</b>	<b>10-11</b>
<b>Drawdown Readiness Activities.....</b>	<b>13</b>
<b>Current and Past Crude Inventories.....</b>	<b>13</b>
<b>1998 Crude Oil Sale.....</b>	<b>18</b>
<b>Customer Service to the Nation and to U.S. Refineries.....</b>	<b>19-20</b>
 <b>BUDGET AND FINANCE.....</b>	 <b>22</b>
<b>Appropriations through Fiscal Year 1997.....</b>	<b>22</b>
<b>Strategic Petroleum Reserve Account.....</b>	<b>22</b>
<b>SPR Petroleum Account.....</b>	<b>22</b>
<b>Commercialization Revenues.....</b>	<b>23</b>
 <b>OTHER ACTIVITIES.....</b>	 <b>26</b>
<b>Oil Stabilization.....</b>	<b>26-27</b>
<b>Foreign Oil Storage Initiative.....</b>	<b>29</b>
<b>Commercialization of Distribution Facilities.....</b>	<b>29-30</b>
<b>Environment, Safety, and Health.....</b>	<b>30-31</b>

---

Emergency Management Exercise.....	31
Continuous Quality Improvement.....	31-33
Procurement and Contractor Support.....	33
Real Estate Actions.....	34
Security.....	34

<b>APPENDIX A Strategic Petroleum Reserve Site Information.....</b>	<b>35</b>
Bryan Mound.....	35
West Hackberry.....	36
Big Hill.....	37
Bayou Choctaw.....	38
Weeks Island.....	39
St. James Terminal.....	40

**LIST OF FIGURES**

Figure 1. Storage Sites and Distribution System.....	5
Figure 2. Drawdown/Distribution Capability.....	12
Figure 3. Cumulative Oil Fill.....	17
Figure 4. Days of Net Import Protection.....	21
Figure 5. Strategic Petroleum Reserve Pipeline and Marine Distribution Capabilities.....	21
Figure 6. Cumulative Funding.....	25
Figure 7. Strategic Petroleum Reserve Crude Oil Degassing Summary.....	28

**LIST OF TABLES**

Table 1. Storage and Drawdown Plan.....	6
Table 2. Crude Oil Streams.....	11
Table 3. Drawdown and Distribution Capabilities .....	12
Table 4. Year-End Inventories and Oil Fill History.....	14
Table 5. Crude Oil Receipts Through 1997.....	15
Table 6. Location of Crude Oil Inventory.....	16
Table 7. Annual Appropriations for Storage Facilities Operations and Management Petroleum Acquisition and Transportation.....	24

**PHOTOGRAPHS**

Heat Exchangers at Bryan Mound.....	26
Big Hill Degas Plant.....	27

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## **EXECUTIVE SUMMARY**

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### **INTRODUCTION**

The Strategic Petroleum Reserve authorities in the Energy Policy and Conservation Act expired on September 30, 1997. Although several bills for extension of the authorities were introduced in 1997, House and Senate action on the legislation was not completed before the end of the first session of the 105<sup>th</sup> Congress. As a result, there was a lapse of authority at the end of 1997. Further action to extend Strategic Petroleum Reserve authorities is expected in 1998.

The Department of the Interior and Related Agencies Appropriations Act, 1998 (Public Law 105-83) was enacted on November 14, 1997, and appropriated \$207.5 million for the Strategic Petroleum Reserve in fiscal year 1998 to be financed through the sale of Reserve oil.

### **LIFE EXTENSION**

During 1997, the Strategic Petroleum Reserve continued engineering and construction activities associated with the Life Extension Program. The goal of this program is to upgrade or replace major systems that are aging or obsolete and to extend the useful life of the Reserve's facilities and drawdown systems to the year 2025. To date, major construction has been concentrated at the Reserve's two largest sites, Bryan Mound in Texas and West Hackberry in Louisiana. As of December 31, 1997, these sites had approximately 87 percent of their projects either in progress or completed, based on contract obligations made, and Bayou Choctaw, Louisiana, and Big Hill, Texas, had approximately 70 percent of their life extension projects completed.

### **WEEKS ISLAND DECOMMISSIONING**

In 1997, decommissioning activities continued on or near schedule. The Department held mediation talks with the Morton Salt Company, but these talks ended in August 1997 without completely resolving the issues surrounding Morton's concerns about potential decommissioning impacts on their adjacent facility.

### **CRUDE OIL INVENTORY**

There were no oil acquisition activities during the calendar year 1997. As of December 31, 1997, the Reserve's crude oil inventory was 563,429,462 barrels.

### **OIL STABILIZATION**

The process of "oil degassing" at all sites was completed in 1997, four months ahead of schedule. Approximately 172 million barrels of inventory were processed. The remaining inventory was restored to drawdown service.

### **COMMERCIALIZATION OF DISTRIBUTION FACILITIES**

Commercialization activities during 1997 included the following:

- Finalization of lease agreements with Shell Pipe Line Corporation for the St. James Terminal and the Bayou Choctaw pipeline, on January 31, 1997, and May 1, 1997, respectively.
- Sale of the Weeks Island pipeline to the Louisiana Intrastate Gas Company.
- Execution of a three year lease in October 1997 with Texaco Pipeline Incorporated for a 75 percent capacity lease of the 7.5-mile segment of the Reserve's 24-mile, 36-inch crude pipeline from Big Hill to the Sun Terminal in Nederland, Texas.
- Re-issue of the Request for Offers in August 1997 for leasing three Bryan Mound pipeline segments.

### **FOREIGN OIL STORAGE INITIATIVE**

On June 10, 1997, the Department of Commerce Foreign Trade Zones Board approved the application for authority to establish a special-purpose subzone status for the Big Hill storage site.

## ***PROGRAM MISSION***

---

### ***BACKGROUND***

The Strategic Petroleum Reserve was established in 1975 as an emergency response tool in the wake of the 1973 Arab oil embargo. Since then, the Reserve has grown as large as 592 million barrels - a peak reached in 1994 - but since 1996, nearly 28 million barrels of oil inventory have been sold to raise Government revenues, leaving a current inventory of 563 million barrels. The Government's investment in the Reserve currently totals more than \$20 billion, approximately \$17 billion of that spent to acquire crude oil.

The Reserve's current oil supply equates to about 63 days of net oil imports, and the United States now relies on a combination of both the Reserve and private stocks to meet its International Energy Agency oil storage obligations. The oil is stored in huge caverns created in the salt domes of the Texas and Louisiana Gulf Coast region.

The Reserve is authorized by the Energy Policy and Conservation Act and by the comprehensive energy plans of all Administrations since 1975 in recognition of the long term dependence of the United States on imported crude oil and petroleum products. Section 165 of the Act requires the Secretary of Energy to submit Annual Reports to the President and the Congress.

### ***LEGISLATIVE HISTORY***

The Strategic Petroleum Reserve was authorized on December 22, 1975, when Congress enacted the Energy Policy and Conservation Act (Public Law 94-163), to reduce the impact of a severe energy supply interruption, and to carry out the obligations of the United States under the International Energy Program.

Provisions of the Energy Policy and Conservation Act were amended by Title VIII of the Energy Security Act (Public Law 96-294), enacted on June 30, 1980. This Act established a minimum average daily fill rate of 100,000 barrels and precluded the sale of Naval

Petroleum Reserve Number 1 (Elk Hills, California) crude oil except to fill the Strategic Petroleum Reserve, unless the Reserve was being filled at the minimum rate or had an inventory of 500 million barrels.

The Energy Policy and Conservation Amendments Act of 1985 (Public Law 99-58), enacted on July 2, 1985, extended the provisions of Title I, Part B, of the Energy Policy and Conservation Act relating to the Strategic Petroleum Reserve until June 30, 1989, and directed the Secretary of Energy to conduct a sale or exchange of 1.1 million barrels of crude oil to test the drawdown and distribution capabilities of the Strategic Petroleum Reserve.

The Omnibus Budget Reconciliation Act of 1986 (Public Law 99-509), enacted on October 21, 1986, amended the Energy Policy and Conservation Act to require that the Strategic Petroleum Reserve be filled to 750 million barrels, and increased the minimum rate under the Naval Petroleum Reserve limitation to 75,000 barrels a day.

Public Law 101-46, an Act to extend Title I of the Energy Policy and Conservation Act, enacted on June 30, 1989, extended Strategic Petroleum Reserve authorities contained in the Energy Policy and Conservation Act until April 1, 1990. The bill also required the Secretary to submit a report to Congress by February 1, 1990, on alternative means of financing oil acquisition for the Strategic Petroleum Reserve. Short term extensions of the Strategic Petroleum Reserve authorities contained in the Energy Policy and Conservation Act were enacted on March 31, 1990, (Public Law 101-262) and August 10, 1990, (Public Law 101-360).

On September 15, 1990, the President signed the Energy Policy and Conservation Act Amendments of 1990 (Public Law 101-383) extending authorities until September 30, 1994. This legislation also contained provisions to amend drawdown authorities, require a Strategic Petroleum Reserve Plan Amendment for

completion of storage capacity for one billion barrels, authorize drawdown and distribution tests, and provide for a refined petroleum product reserve test program.

On October 24, 1992, the President signed the Energy Policy Act of 1992 (Public Law 102-486). The bill included provisions to (1) add new conditions for drawdown in emergency situations involving a supply reduction of significant scope and duration, coupled with a severe price increase likely to cause a major adverse impact on the nation's economy, (2) enlarge the Reserve to one billion barrels, (3) permit the Secretary to make payment in advance for delivery of petroleum product either owned or not owned by the United States for storage in the Strategic Petroleum Reserve or non-Strategic Petroleum Reserve facilities, (4) give the President discretionary authority to acquire domestic stripper well oil at competitive prices to fill the Reserve and (5) amend the eligibility criteria for a Regional Petroleum Reserve.

On October 22, 1994, the President signed into law the Energy Policy and Conservation Act Amendments Act of 1994 (Public Law 103-406) which extended authorities to June 30, 1996.

The Balanced Budget Downpayment Act (Public Law 104-99) was enacted on January 26, 1996, and required the sale of up to \$100 million of Weeks Island oil to fund decommissioning activities.

The Omnibus Consolidated Rescissions and Appropriations Act of 1996 (Public Law 104-134) was enacted on April 26, 1996, and required the sale of \$227 million of Weeks Island oil for deficit reduction.

The Omnibus Consolidated Appropriations Act (Public Law 104-208) was enacted on September 30, 1996, and appropriated \$220 million for the Strategic Petroleum Reserve in fiscal year 1997 to be financed through the sale of Reserve oil.

The Strategic Petroleum Reserve authorities expired on June 30, 1996, and then on October 14, 1996, Public Law 104-306 extended the Strategic Petroleum Reserve authorities until September 30, 1997. Although several bills were introduced to extend the Strategic Petroleum

Reserve authorities, reauthorization legislation was not enacted during 1997 after the expiration of these authorities on September 30, 1997.

The Department of the Interior and Related Agencies Appropriations, 1998, (Public Law 105-83) was enacted on November 14, 1997, and appropriated \$207.5 million for the Strategic Petroleum Reserve in fiscal year 1998 to be financed through the sale of Reserve oil.

### ***STRATEGIC PETROLEUM RESERVE PLAN AND AMENDMENTS***

The Energy Policy and Conservation Act, section 154, required the preparation of a Strategic Petroleum Reserve Plan to address the development and implementation of the Strategic Petroleum Reserve. A Plan was submitted to the Congress on February 16, 1977, and became effective on April 18, 1977. The Plan had subsequent Amendments.

Strategic Petroleum Reserve Plan, Amendment No. 1 accelerated the planned schedule for filling the Reserve. Amendment No. 2 to the Strategic Petroleum Reserve Plan authorized an increase in the Strategic Petroleum Reserve size from 500 million barrels to one billion barrels. The Amendment described Department of Energy plans to store 750 million barrels of petroleum in underground storage facilities.

On October 31, 1979, the Department of Energy submitted Amendment No. 3, a Distribution Plan for the Strategic Petroleum Reserve, to the Congress. The Distribution Plan described the methods for drawdown and distribution of petroleum from the five existing Strategic Petroleum Reserve storage sites.

On December 1, 1982, the President transmitted Amendment No. 4, a new Drawdown Plan, to the Congress for the use of the Strategic Petroleum Reserve. This Plan, required under the Energy Emergency Preparedness Act of 1982, went into effect immediately and provides procedures for the drawdown, sale, and distribution of petroleum from the Strategic Petroleum Reserve. The Drawdown Plan replaces the Distribution Plan established by Amendment 3.

## **PROGRAM DESCRIPTION**

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### **PROGRAM MANAGEMENT**

The Strategic Petroleum Reserve Office was created under the Energy Policy and Conservation Act, for the establishment, management, and maintenance of the Strategic Petroleum Reserve. The Assistant Secretary for Fossil Energy has overall programmatic responsibility for achieving the goals and objectives of the Strategic Petroleum Reserve Program. This responsibility has been delegated to the Deputy Assistant Secretary for the Strategic Petroleum Reserve, Richard D. Furiga, and is exercised through its headquarters office in Washington, D.C., and its field office located in New Orleans, Louisiana.

The Strategic Petroleum Reserve Project Management Office in New Orleans, Louisiana, is under the direction of the Project Manager, William C. Gibson, Jr., and is responsible for project management and implementation activities associated with design, development, and operation and maintenance of the Strategic Petroleum Reserve. To execute its responsibilities, the Project Management Office employs the services of a management and operating contractor, DynMcDermott Petroleum Operations Company, to provide the operations, maintenance, and ancillary services associated with the operation of the Reserve's oil storage and distribution facilities.

### **STRATEGIC PETROLEUM RESERVE STORAGE FACILITIES**

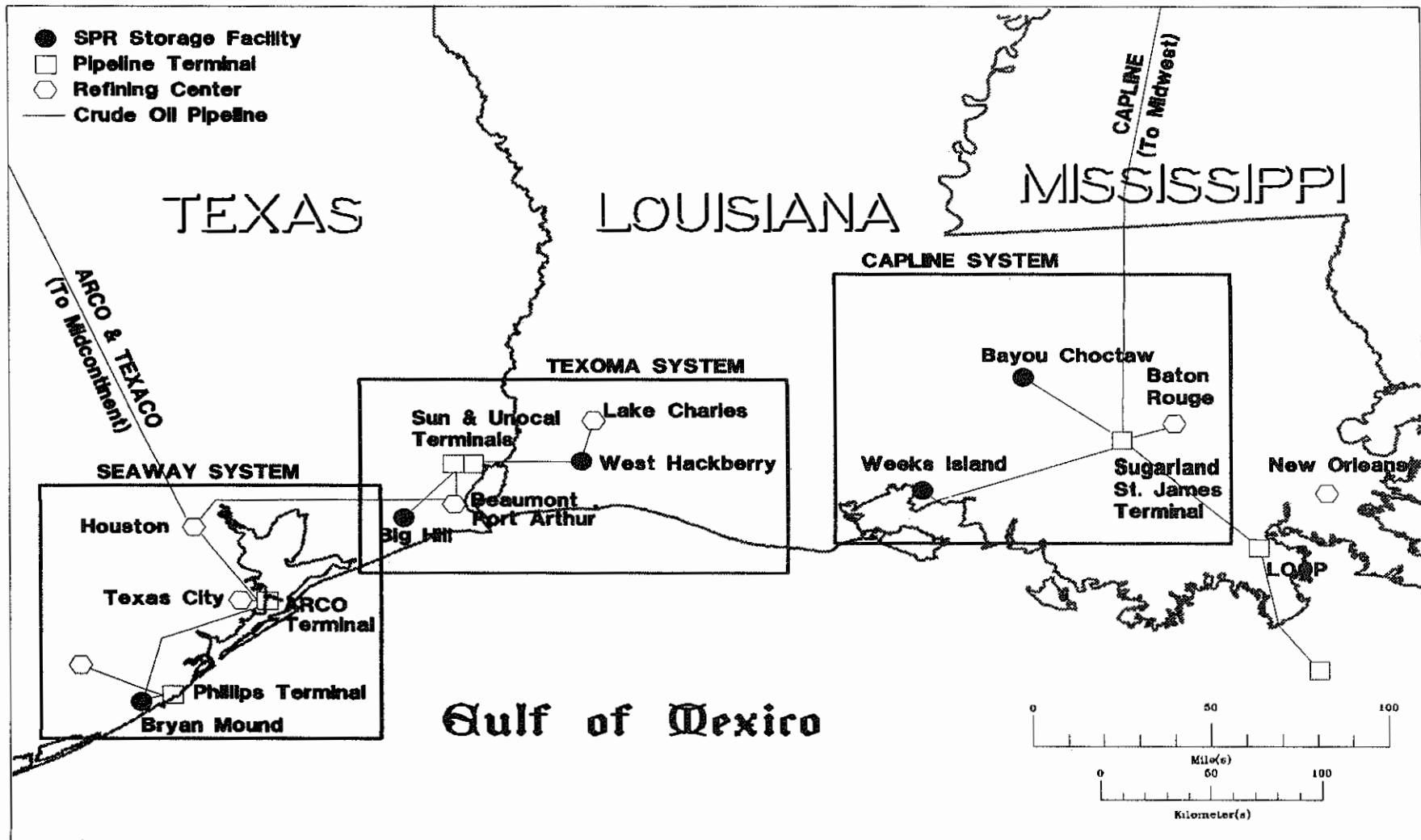
The Strategic Petroleum Reserve developed six underground storage facilities between 1976 and 1991. One site, Sulphur Mines, was decommissioned in 1992. The remaining five sites are: Bryan Mound and Big Hill in Texas, and West Hackberry, Bayou Choctaw, and Weeks Island in Louisiana.

The five storage sites are organized into three distribution systems - Seaway, Texoma and Capline. Each system is connected by Department of Energy pipelines to commercial crude oil pipeline networks, and to one or more commercial or Government-owned marine terminals. (See Figure 1).

In 1994, the Department proposed decommissioning Weeks Island because of geotechnical problems. This would reduce the storage capacity of the Reserve from 750 million barrels to 680 million barrels, as well as the maximum drawdown and distribution rate from 4.5 to 3.7 million barrels per day. However, in 1996 the Department initiated a reconfiguration of the Reserve to recover the lost drawdown and distribution capability to 4.4 million barrels per day by increasing the drawdown rates at the other sites. The current reconfiguration of the Reserve is shown in Table 1.



# FIGURE 1 STORAGE SITES AND DISTRIBUTION SYSTEM



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**TABLE 1  
STORAGE AND DRAWDOWN PLAN**

Storage Facility	PREVIOUS CONFIGURATION*			CURRENT RECONFIGURATION		
	Storage Capacity (MMB)	Crude Mix Sweet/Sour (MMB)	Drawdown Capability (MB/D)	Storage Capacity (MMB)	Crude Mix Sweet/Sour (MMB)	Drawdown Capability** (MB/D)
Bryan Mound	226	66/160	1,250	226	66/160	1,500 (11/98)
West Hackberry	219	113/106	1,250	219	113/106	1,300 (12/98)
Big Hill	160	69/91	930	160	69/91	1,100 (9/00)
Bayou Choctaw	75	37/38	480	75	24/51	515 (9/00)
Weeks Island	70	0/70	590	-	-	-
<b>Total</b>	<b>750</b>	<b>285/465 38%/62%</b>	<b>4,500</b>	<b>680</b>	<b>272/408 40%/60%</b>	<b>4,415</b>

\* Prior to Weeks Island Decommissioning

\*\* Drawdown Capabilities To Be Achieved By (Month/Year)

Data as of December 31, 1997

## **FACILITIES LIFE EXTENSION PROGRAM**

Three storage sites, Bryan Mound, West Hackberry and Bayou Choctaw were completed in the early 1980's and designed for an operational life of 20 years. Most systems will reach the end of their design life around the year 2000. Some systems, such as raw water, brine disposal, electrical, and control and instrumentation, are experiencing failures and increased maintenance costs.

To ensure continued mission readiness through the year 2025, a Life Extension Program was initiated in 1994. Its goal is to upgrade or replace major systems by the year 2000, and to extend the useful life of the facilities and drawdown systems to the year 2025. Its objective includes:

- Reducing the numbers of motors, pumps and valves by 30 to 60 percent;
- Improving logistics by standardizing systems and equipment at all of the sites;
- Achieving higher systems availability by applying modern, reliable technology; and
- Reducing annual operation and maintenance costs.

During 1997, contracts were awarded for engineering design, equipment procurement, and site construction. To date, major construction has been concentrated at the Reserve's two largest storage sites, Bryan Mound and West Hackberry. During this past year, construction contracts were awarded at Big Hill and Bayou Choctaw, initiating major construction activities at those sites. Also, over 20 contracts to purchase equipment for four storage sites, such as valves, pumps, instrumentation, and electrical equipment, were awarded with a total value exceeding \$15 million. As of December 31, 1997, Bryan Mound and West Hackberry had approximately 87 percent of their projects in progress or completed, based on contract obligations made, and Bayou Choctaw and Big Hill had approximately 70 percent of their projects in progress or completed. Since 1994, the Department has obligated approximately \$262 million toward the Facilities Life Extension Program.

## **STORAGE FACILITIES STATUS**

### **BRYAN MOUND**

The Bryan Mound storage facility, located in Brazoria County, is approximately three miles southwest of Freeport, Texas. The site has twenty storage caverns, a combined storage capacity of 226 million barrels, and an inventory of 217 million barrels.

The site is available for both fill and drawdown operations now that degassing is complete. This process began in August 1995, and was completed ahead of schedule on December 13, 1997. Approximately 91 million barrels of affected sweet, sour, and Maya crude oil were degassed.

Installation of the new control system was completed in February 1997 and cavern piping reconfiguration was completed in March 1997. Construction is underway to install new water injection pumps and header piping, upgrade the site's electrical system, and replace the existing brine pond, and this work is approximately 62 percent complete.

In September 1997, a contract was awarded to upgrade the crude oil refill and metering systems.

### **WEST HACKBERRY**

The West Hackberry storage facility is located in Cameron Parish, approximately 22 miles southwest of Lake Charles, Louisiana. The site has twenty-two storage caverns, a combined storage capacity of 219 million barrels and an inventory of 194 million barrels. It is available for both fill and drawdown operations.

During 1997, construction activities continued at West Hackberry as part of the overall Life Extension Program. The installation of a new control system and lining for the brine line to the brine disposal wells were completed in February 1997. The reconfiguration of the site's cavern piping was completed in September 1997. Construction is underway to install new water injection pumps and site header piping, upgrade the electrical system, and replace the brine pond and flush the water system, and this work is approximately 76

percent complete.

In August 1997, a contract was awarded to upgrade the raw water intake structure, and in September 1997, a contract was awarded to upgrade the crude oil refill and metering systems.

#### **BAYOU CHOCTAW**

The Bayou Choctaw storage facility is located in Iberville Parish, approximately 12 miles southwest of Baton Rouge, Louisiana. The site has six storage caverns, a combined storage capacity of 75 million barrels and an inventory of 68 million barrels.

The site is currently available for both fill and drawdown operations.

In October 1997, as part of the overall Life Extension Program, a construction contract was awarded to upgrade all major systems at Bayou Choctaw including instrumentation and controls, piping reconfiguration, electrical system, valves and pumps.

#### **BIG HILL**

The Big Hill storage facility is located in Jefferson County, 20 miles southwest of Beaumont, Texas. The site has fourteen storage caverns, and a combined storage capacity of 160 million barrels and an inventory of 81 million barrels.

The site is currently available for both fill and drawdown operations.

The degassing operation commenced on November 6, 1996, and was completed on November 11, 1997, five months ahead of schedule. Approximately 43.5 million barrels of crude oil were degassed.

During 1997, as part of the overall Life Extension Program, new heat exchangers were purchased and delivered, and in September 1997, a construction contract was awarded to upgrade all the major systems at Big Hill including instrumentation and controls, piping configuration, electrical system, valves and pumps, and installation of the heat exchangers.

#### **WEEKS ISLAND**

The Weeks Island storage facility is located in Iberia Parish, approximately 95 miles southwest of New Orleans, Louisiana. This site was acquired in 1977 as a conventional salt mine. It was converted to an oil storage facility with a capacity of 70 million barrels.

On December 15, 1994, the Secretary of Energy announced the decommissioning of Weeks Island due to geotechnical problems. The continuous inflow of fresh aquifer water through the salt into the oil storage chamber posed a high risk for uncontrolled water inflow, as well as the potential for a displacement of oil to the sediments above the salt, causing environmental damage and oil loss.

Drawdown of oil from the Weeks Island site began in November 1995, and 69 million barrels of the site's approximately 72 million barrel inventory was sold or relocated to other sites during 1996. Much of the remaining approximately 3 million barrels of crude oil was recovered in a multi-phase oil skimming operation that began in 1997, as the mine began being filled with brine. Skimming will continue during 1998. Oil removed during skimming operations is being barged to the Sun Marine Terminal and then transferred to the Big Hill site by pipeline.

In accordance with the Weeks Island decommissioning plan, brine was injected into the mine in November 1996. As the brine raised the oil off the floor, the first phase of skimming recovered 600,000 barrels of oil in December 1996, and 1,146,000 barrels in February and March 1997. Further injection of brine into the mine raised the brine to within a few feet of the roof of the lower storage chamber. At this point, a second phase of skimming was initiated to minimize the amount of oil which could become trapped in roof pockets. During this phase, an additional 355,000 barrels of oil was recovered, but there were problems with the heater-treater unit which separates the oil from the brine, and oil skimming operations were halted in November 1997. When it is repaired, and the planned skimming at this level is completed, brine injection into the mine to backfill and skim oil from the upper storage level will resume.

The final oil skimming will be undertaken through the vent hole, located at the high point of the upper roof, facilitating maximum oil removal. Brine is being supplied to the Department under a service contract. Over 70 million barrels of brine will be needed to completely fill the storage chamber.

In 1997, the decommissioning plan, approved by the State of Louisiana in 1996, continued on or near schedule. The man ways and the production shaft of the Markel Mine, which is owned by the Morton Salt Company, are open for access. By June 1998, the service shaft, monitoring wells and the vent hole will be plugged, as required by the State of Louisiana. The surface facilities will be salvaged, removed, abandoned in place, or transferred to the General Services Administration for sale.

In early 1997, the Department entered into mediation talks with the Morton Salt Company over the decommission plans for Weeks Island, as well as issues concerning the Operating Agreement, as amended, between the Strategic Petroleum Reserve and Morton Salt. Formal mediation talks ended in August 1997, without completely resolving the issues. Discussions are continuing

## **DRAWDOWN AND DISTRIBUTION METHODS**

The current method for distributing crude oil is described in the "Strategic Petroleum Reserve Drawdown (Distribution) Plan," Amendment Number 4 to the Strategic Petroleum Reserve Plan. The principal method for selling oil is by price competitive sale to bidders offering the highest prices. The sale is open to the largest possible universe of eligible buyers to ensure efficient distribution.

The Plan also provides for the Secretary of Energy to direct (in any calendar month) the distribution of up to 10 percent of the volume of oil sold in that calendar month. The price for such oil will be the average price of oil sold at the contemporaneous competitive sale, or at the most recent competitive sale if no contemporaneous competitive sale is held.

### **Competitive Sales Procedures**

The Department's Standard Sales Provisions\* govern the competitive sales process. The first step in the process is the issuance of a Notice of Sale which lists the volume, characteristics, and location of the petroleum for sale, delivery dates and procedures for submitting offers, as well as measures for assuring performance and financial responsibility.

Over the course of a drawdown, several Notices of Sale may be issued, each covering a sales period of one to two months. Under the Standard Sales Provisions, offerors may have only seven days from the date of issuance until offers are due, and thirty days or less until purchasers must begin accepting delivery of the oil, with a less compressed schedule becoming more feasible after the initial stages of drawdown. Because of the possible short lead time, the Department maintains a list of prospective offerors who will receive all Notices of Sale.

The next step in the sales process is for prospective purchasers to submit offers, as specified in the Notice of Sale. Offerors must unconditionally accept all terms

\* Department of Energy's Sales Regulations 10 CFR, Part 625 (Appendix A). The most recent edition of the Standard Sales Provisions was published in the Federal Register, December 11, 1992. A new edition will be published in 1998.

and conditions in the Notice of Sale, including submission of an offer guarantee of \$10 million or 5 percent of the maximum potential contract amount, whichever is less, and an offer of at least the minimum price, if any is specified in the Notice of Sale. The offer evaluation process is structured so that the offerors bidding the highest prices determine the methods of transportation, up to the limits of the distribution system, with specific delivery arrangements negotiated later in the process. All "apparently successful offerors" are required, within five business days of being notified, to provide a Letter of Credit equal to 100 percent of the contract amount, or a cash deposit equal to 110 percent of the contract value, as a guarantee of performance and payment of amounts due under the contract.

Upon timely receipt of the financial guarantees, and a final determination by the Contracting Officer that offers were responsive and offerors responsible, the Department of Energy issues the Notices of Award. Deliveries then commence to the purchasers, consistent with their arrangements for commercial pipeline or marine vessel transportation. Such deliveries may begin as soon as the 16th day after commencement of the sales process, to the extent that the purchasers can submit their financial guarantees and arrange transportation expeditiously.

### **Drawdown and Distribution Capabilities**

The crude oil acquired for the Strategic Petroleum Reserve has been commingled in storage at the storage sites, creating various distinct crude oil streams to be made available for sale in the event of a drawdown. Table 2 identifies these streams, delivery modes and locations, as of December 31, 1997.

The Reserve's drawdown and distribution capabilities are shown in Table 3. These capabilities are based on the current crude oil stream inventories, the existing site drawdown systems and commercial distribution capabilities. The Reserve is capable of being drawn down at an initial sustainable rate of 3.7 million barrels per day for a period of 90 days. This rate is higher than the 3.2 million barrels per day sustainable rate in 1996, due to the completion of degassing operations at all sites. After the initial 90-day period, the

drawdown/distribution rate will decrease gradually as site inventories are depleted and the declining number of caverns containing crude oil becomes a constraint.

Figure 2 illustrates the physical drawdown/distribution capability which provides for a distribution of 332

million barrels in 90 days, and 548 million barrels in 180 days. The installation of heat exchangers at the Big Hill site in 1998, and Life Extension Program activities, will ultimately stabilize the initial sustainable drawdown capability for the current total inventory at 4.1 million barrels per/day .

**TABLE 2  
CRUDE OIL STREAMS**

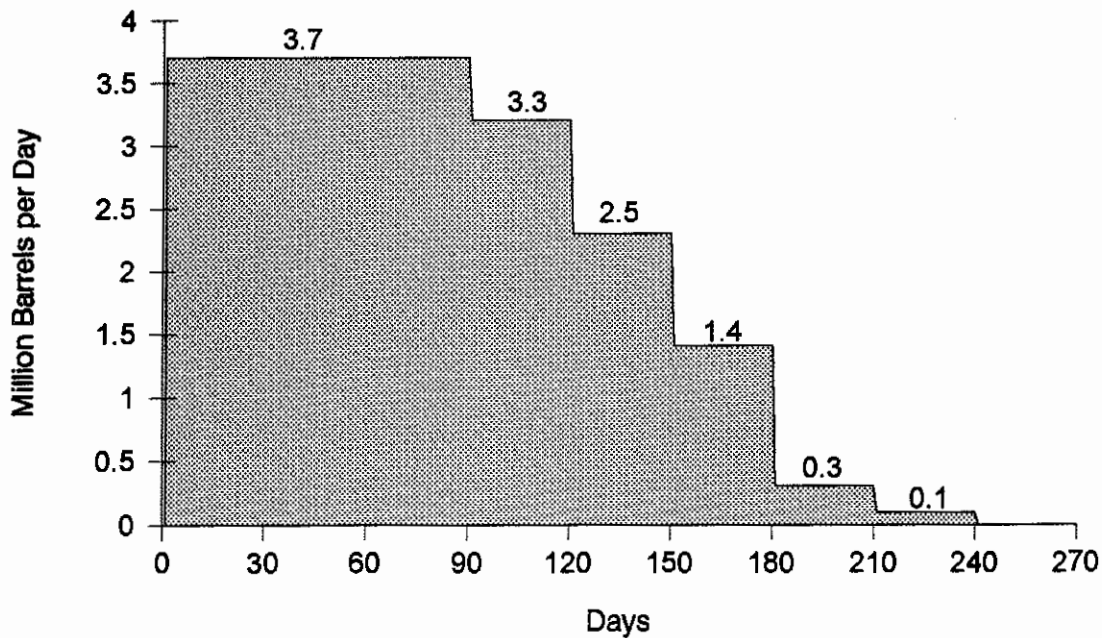
Crude Oil Stream	Delivery Mode and Location
<b>SEAWAY GROUP:</b>	
Bryan Mound Sweet	Pipeline or tankship at Seaway Terminal, Freeport, Texas; or Seaway Terminal, Texas City, Texas
Bryan Mound Sour	
Bryan Mound Maya	
<b>TEXOMA GROUP:</b>	
West Hackberry Sweet	Pipeline, tankship or barge at Sun Terminal, Nederland Texas; Pipeline at Texaco-22/DOE connection, Lake Charles, Louisiana
West Hackberry Sour	
Big Hill Sweet	Pipeline, tankship or barge at Sun Terminal, Nederland, Texas; Pipeline or tankship at Unocal Terminal, Nederland, Texas; Pipeline at Texaco-20 connection, Winnie, Texas
Big Hill Sour	
<b>CAPLINE GROUP:</b>	
Bayou Choctaw Sweet	Pipeline at Capline or LOCAP Terminals, St. James, Louisiana; Tankship at Sugarland St. James Terminal, St. James, Louisiana
Bayou Choctaw Sour	

**TABLE 3**  
**DRAWDOWN AND DISTRIBUTION CAPABILITIES**  
**(THOUSANDS OF BARRELS PER DAY)**

	Drawdown	Distribution
Seaway Group	1,250	1,690
Texoma Group	1,986	2,345
Capline Group	480	1,065
<b>TOTAL</b>	<b>3,716</b>	<b>5,100</b>

Data as of December 31, 1997

**FIGURE 2**  
**DRAWDOWN/DISTRIBUTION CAPABILITY**



Data as of December 31, 1997

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### ***DRAWDOWN READINESS ACTIVITIES***

During 1997, the Strategic Petroleum Reserve performed various activities under its program for ensuring a sufficient level of readiness for drawing down and selling crude oil in the event of a requirement. These activities included:

- Conducting periodic assessments of the readiness and availability of all functions and systems associated with a drawdown.
- Performing tabletop exercises of site-specific drawdown procedures at each storage site.
- Testing site drawdown system capabilities through physical oil movements.
- Assessing the capability and readiness of the distribution terminals to support a drawdown.
- Testing and updating various computer models used in assessing drawdown capabilities and supporting drawdown operations.
- Providing performance-based training for drawdown-related positions within the Reserve and contractor organizations.
- Analyzing and updating the Reserve's drawdown and distribution capabilities to reflect the mitigation of the vapor pressure problem, changes in distribution points, and facility life extension activities.
- Initiating a comprehensive flowchart of the various activities performed during the Strategic Petroleum Reserve drawdown and sale process which will provide a basis for training, future exercises, and possible process re-engineering.
- Drafting a revision to the Department's Standard Sales Provisions for the sale of Strategic Petroleum Reserve petroleum, for public comment in 1998.

- Renewing the Reserve's agreement with the U.S. Army Corps of Engineers for providing emergency support in the event of a raw water intake structure failure during a drawdown.

### ***CURRENT AND PAST CRUDE OIL INVENTORIES***

There were no oil acquisition activities during the calendar year 1997. As of December 31, 1997, the Reserve's crude oil inventory was 563,429,462 barrels. This fill level is a decrease of 2.4 million barrels from the inventory held at the end of calendar year 1996, due to the final deliveries under the fiscal year 1997 sale which were completed January 30, 1997. The oil inventory will decrease again in 1998 as a result of further sales as described on page 18. The current mix of crude oil is 64 percent high sulfur (sour) and 36 percent low sulfur (sweet).

The fiscal year 1998 appropriation included the sale of crude oil to provide \$207.5 million as financing for fiscal year 1998 program operations. Although that oil sale had not been carried out as of December 31, 1997, it could reduce SPR inventory by approximately 16 million barrels. The Administration's budget for fiscal year 1999 assumes no further oil sales.

Table 4 illustrates year-end inventories and average daily fill rates from 1977 through 1997 (by fiscal and calendar year); Table 5 illustrates crude oil receipts by country of origin since 1977; Table 6 provides information on the location of this inventory by storage site; and Figure 3 illustrates the Reserve's cumulative oil fill.

**TABLE 4**  
**YEAR-END INVENTORIES AND OIL FILL HISTORY**

	FISCAL YEAR		CALENDAR YEAR	
	Year-End Inventory (MMB)	Average Daily Fill Rate* (MB/D)	Year-End Inventory (MB/D)	Average Daily Fill Rate* (MB/D)
1977	1.1	3	7.2	20
1978	49.1	131	68.5	168
1979	91.2	115	91.7	64
1980	92.8	4	107.8	44
1981	199.2	292	230.3	336
1982	277.9	215	293.8	174
1983	361.0	228	379.1	234
1984	431.1	191	450.5	195
1985	489.3	159	493.3	119
1986	506.4	47	511.6	51
1987	533.9	75	540.6	80
1988	554.7	57	559.5	52
1989	577.1	62	579.9	56
1990	589.6	34	585.7	27
1991	568.5	**	568.5	**
1992	571.4	8	574.7	17
1993	585.7	39	587.1	34
1994	591.7	16	591.7	13
1995	591.7	**	591.6	**
1996	573.6	**	565.8	**
1997	563.4	**	563.4	**

\* Fill rates unadjusted for oil drawdowns and sales.

\*\* Fill suspended during this period.

Data as of December 31, 1997

**TABLE 5**  
**CRUDE OIL RECEIPTS THROUGH 1997**  
**(MILLION BARRELS)**

Source Country	1997	Cumulative	Percent of Total
Mexico		256.7	41.9
United Kingdom		147.3	24.0
United States:		48.1	7.8
Alaska		31.4	5.1
Other*		16.7	2.7
Saudi Arabia		27.1	4.4
Libya		23.7	3.9
Iran		20.0	3.3
United Arab Emirates		18.4	3.0
Nigeria		15.1	2.5
Norway		11.9	1.9
Oman		9.0	1.5
Egypt		8.9	1.5
Ecuador		6.2	1.0
Algeria		6.2	1.0
Cameroon		3.4	0.6
Iraq		3.4	0.6
Gabon		2.4	0.4
Qatar		2.3	0.4
Angola		1.0	0.2
Venezuela		0.9	0.1
Peru		0.4	0.1
Argentina		0.4	0.1
<b>TOTAL RECEIPTS**</b>	<b>0</b>	<b>612.8</b>	<b>100.0</b>

\* Includes shipments from Naval Petroleum Reserves in California.

\*\* Unadjusted for deliveries under drawdowns and sales and for operational gains and losses.

Data as of December 31, 1997

**TABLE 6  
LOCATION OF CRUDE OIL INVENTORY  
(MILLION BARRELS)**

Storage Site	Location	Inventory		
		Sour*	Sweet**	Total
Bryan Mound	Brazoria County, Texas	155.4	61.6	217.0
Big Hill	Jefferson County, Texas	62.6	18.8	81.4
West Hackberry	Cameron Parish, Louisiana	89.8	103.9	193.7
Bayou Choctaw	Iberville Parish, Louisiana	50.3	17.3	67.6
Weeks Island***	Iberia Parish, Louisiana	1.6	0.0	1.6
SUBTOTAL		359.7	201.6	561.3
Tanks and Pipelines		1.5	0.6	2.1
TOTAL		361.2	202.2	563.4

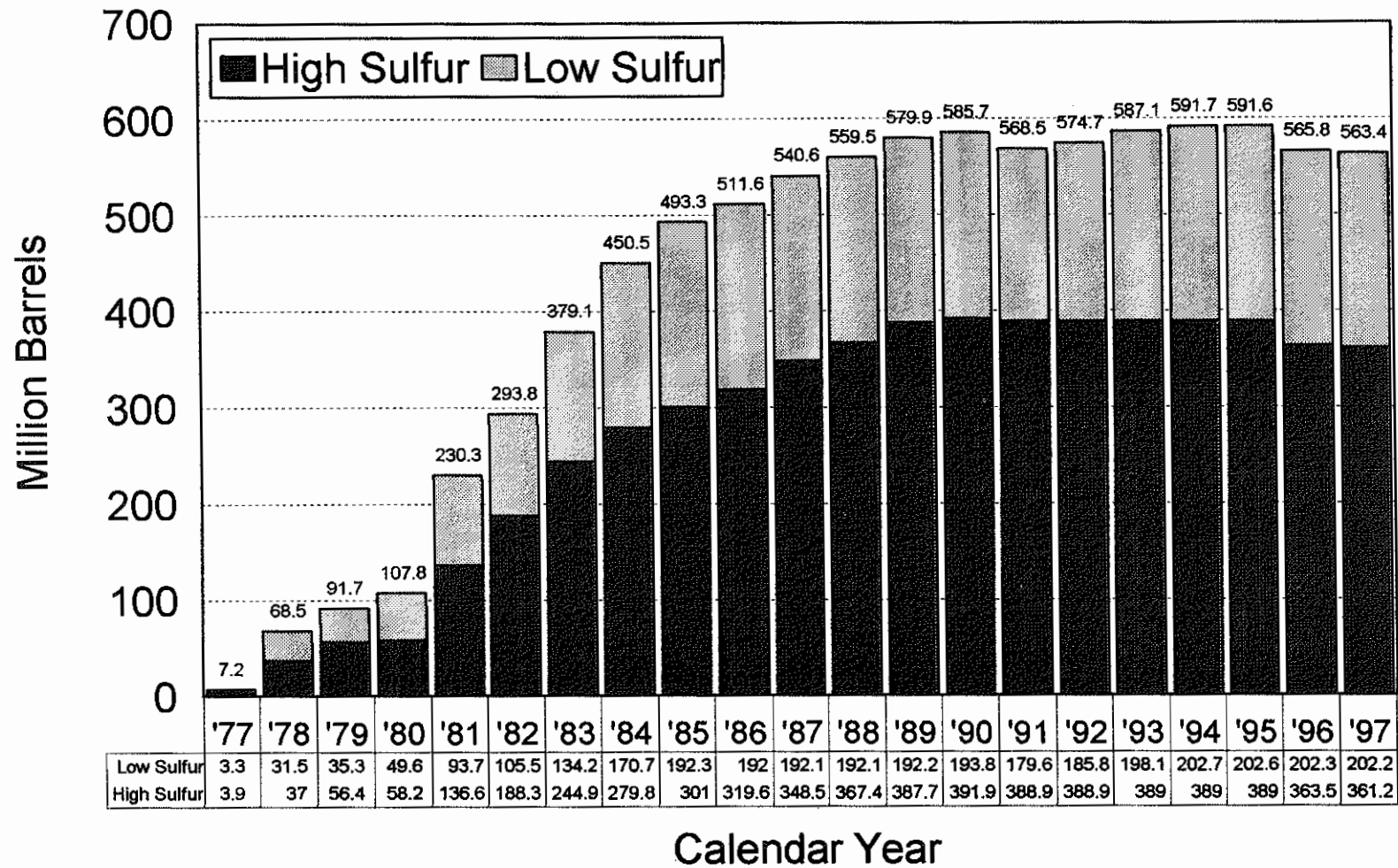
\* Sulfur content greater than 0.5 percent

\*\* Sulfur content not exceeding 0.5 percent

\*\*\* Remaining inventory being transferred to Big Hill

Data as of December 31, 1997

**FIGURE 3  
CUMULATIVE OIL FILL**



Data as of December 31, 1997

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## **1998 CRUDE OIL SALE**

On November 14, 1997, the Department of the Interior and Related Agencies Appropriations Act, 1998, was enacted which requires the Department of Energy to sell an additional \$207.5 million worth of Strategic Petroleum Reserve crude oil to offset the 1998 funding for the Reserve's activities. Based on current market oil prices, approximately 16 million barrels will have to be sold. However, if crude oil prices continue to decline, this amount will increase.

Current plans are for the Strategic Petroleum Reserve Project Management Office in New Orleans to conduct the sale beginning in the Spring of 1998.

The sale will involve a solicitation to the crude oil industry requesting competitive offers every two weeks. The offers will be evaluated and, if market conditions are favorable and offered prices reasonable, contracts will be awarded during each two-week cycle.

This process will continue until sufficient contracts are awarded for meeting the revenue goal, or September 30, 1998, whichever comes first. Following each oil delivery from the Reserve, the Department will invoice the purchaser who then will be required to make payment by wire transfer to the U.S. Treasury by the 20<sup>th</sup> day of the month following delivery.

The specific crude oil stream(s) available for purchase will be identified in the Department's 1998 announcement of the sale's details.

**CUSTOMER SERVICE TO THE NATION AND TO U.S. REFINERS**

The Strategic Petroleum Reserve serves both the Nation and the U.S. refiners by providing energy security against potential disruptions in petroleum supplies, and by providing refiners maximum accessibility to the Nation's petroleum stockpile in the event of a disruption.

**Protection for the Nation**

The Strategic Petroleum Reserve was established by the Energy Policy and Conservation Act to reduce the impact of disruptions in petroleum supplies, and to meet U.S. obligations under the International Energy Program. In the Act, Congress specified an initial storage objective equal to 90 days of net petroleum imports, which equated to a 500 million barrel Reserve in 1976. This objective of a 90-day stockpile of petroleum imports is no longer a requirement, but has continued to be a benchmark measure of import protection.

As of December 31, 1997, the inventory of crude oil in the Reserve was 563.4 million barrels. This stockpile provides an import protection level of 63 days based on the U.S. net import rate for crude and petroleum products during 1997. As shown in Figure 4, the level of net import protection provided by the Reserve has continued in a declining trend over the last twelve years, due to the U.S.'s increasing dependence on oil imports, as well as sales of crude oil to fund budget deficits.

The United States, as a member nation of the International Energy Program, is obligated to maintain stocks of crude and products in reserves "sufficient to sustain consumption for at least 90 days with no net oil imports." For the International Energy Program computation, member stocks are based on both public and privately-held stocks, and net imports are defined to be the average daily level in the previous year. The most recent International Energy Program computation for the United States credits the United States with 156 days of emergency reserves, including both Reserve and privately held stocks.

**U.S. Refining Industry Accessibility**

The Strategic Petroleum Reserve is connected to both commercial pipeline systems and marine terminals for crude oil distribution to U.S. refiners in the event of an energy emergency.

The Reserve is currently accessible to 19 refiners in the Gulf Coast and 28 refiners in the midcontinent/midwest through local and interstate pipelines, respectively. These 47 refiners comprise approximately 49 percent of the total U.S. refining capacity, and in 1997, they processed over 57 percent of the U.S.'s crude oil imports.

The Reserve is also connected to five marine terminals for waterborne distribution: Seaway (Phillips) Terminal in Freeport, Texas; Seaway (ARCO) Terminal in Texas City, Texas; Sun and Unocal Terminals in Nederland, Texas; and Sugarland St. James Terminal in St. James, Louisiana. These terminals have a total of 13 tanker berths and three barge berths, and a combined distribution capacity of approximately 2.5 million barrels per day. Figure 5 shows the Reserve's pipeline and marine distribution capabilities.

**Customer Opinions on the Future of the Strategic Petroleum Reserve**

On April 30, 1997, the Department of Energy published a Federal Register notice soliciting public comments on the long-term needs and policies of the Strategic Petroleum Reserve. These public comments along with in-house analyses and other studies, would be used to develop a formal Administration "Statement of Policy" on the Strategic Petroleum Reserve.

The Department asked for public responses to the following seven questions:

1. Should the United States continue to maintain the Strategic Petroleum Reserve?
2. What should be the size and composition of the Reserve facilities and oil inventory?
3. How should the Reserve be distributed?

4. What should be the drawdown and distribution capability for the Reserve?
5. What is the appropriate policy for revenue raising sales from the Reserve?
6. Should the Reserve's facilities be available for alternative uses?
7. Should the Reserve attempt to raise funds through alternative financing, innovative financial instruments, or buying and selling inventory?

and meetings. In 1997, the Strategic Petroleum Reserve sponsored a booth at the American Petroleum Institute Energy Week/PetroSafe conference in Houston and attended annual meetings of the National Petroleum Refiners Association and the American Petroleum Institute. Additional information concerning the Strategic Petroleum Reserve was also made available on internet home pages. These addresses appear on the title page of this publication.

The Department received approximately 100 responses from petroleum companies, industry associations, state offices and associations and the general public.

The petroleum industry and public unanimously endorsed the continuing need for a Strategic Petroleum Reserve. As to the size of the Reserve, the major oil companies, the American Petroleum Institute, and the International Energy Agency, strongly supported maintaining a 90-day stockpile. There was a complete consensus that, in an emergency, the Reserve should be distributed through the current competitive sales process, and that future non-emergency oil sales for revenue generation purposes be prohibited. There was also strong support for permitting commercial use of the Reserve facilities, as long as the Strategic Petroleum Reserve capabilities were not compromised. Finally, the majority of respondents were strongly opposed to any Departmental involvement in financial markets and buying and selling inventory as a means of financing the Strategic Petroleum Reserve Program.

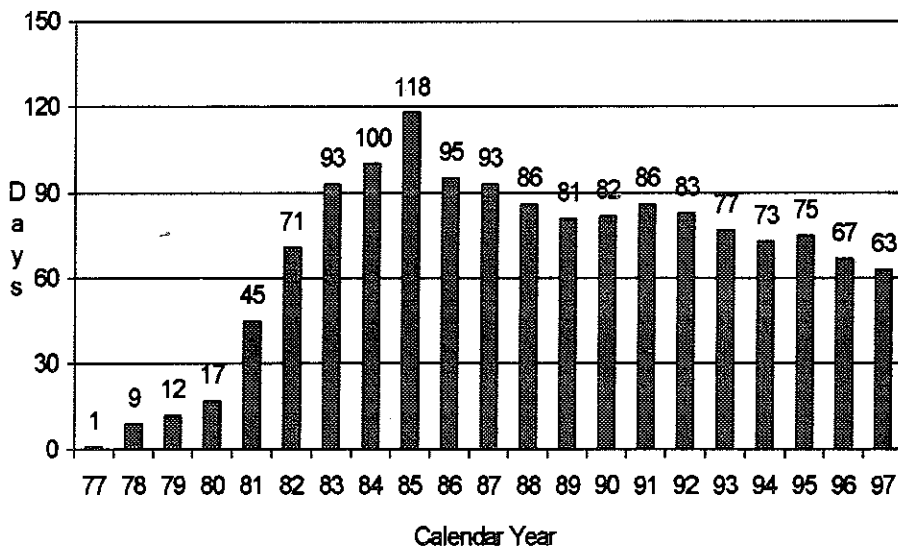
#### **Customer Relations Initiatives**

The Strategic Petroleum Reserve has a Primary Customer Team, comprised of representatives from the Program Office, the Project Management Office and the Management and Operating contractor. One of the functions of this team is to disseminate information on the Reserve to the petroleum industry and develop better customer relationships through active participation in petroleum industry conferences



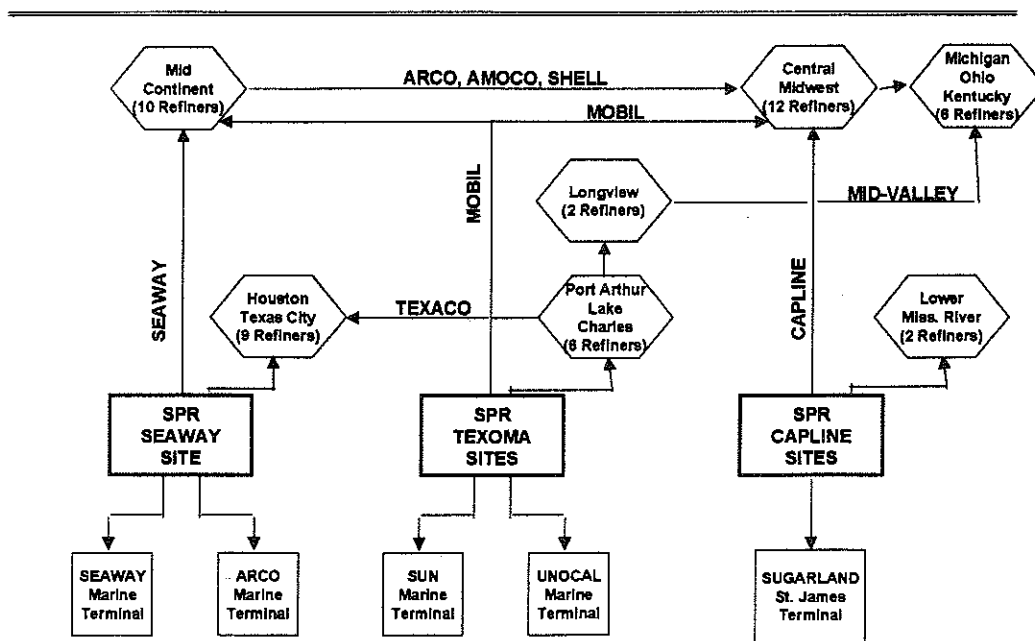
**FIGURE 4**  
**DAYS OF NET IMPORT PROTECTION**

**INVENTORY (YEAR END)**  
**U.S. NET PETROLEUM IMPORTS/DAY (YEAR AVG.)**



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**FIGURE 5**  
**STRATEGIC PETROLEUM RESERVE PIPELINE AND MARINE DISTRIBUTION CAPABILITIES**



Data as of December 31, 1997

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## **BUDGET AND FINANCE**

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The Department of the Interior and Related Agencies Appropriations Act, 1997, provided \$220 million for Strategic Petroleum facilities operations and management. It further provided that this budget authority be financed by the sale of SPR crude oil. This sale was completed in 1997 and reduced the crude oil inventory from 573.7 million barrels to 563.4 million barrels. Subsequently, a rescission of \$11 million was approved by Congress, bringing the net budget authority for fiscal year 1997 to \$209 million.

For fiscal year 1998, the Department of the Interior and Related Agencies Appropriations Act provided \$207.5 million for Strategic Petroleum Reserve facilities operations and management and again directed a crude oil inventory sale to finance the appropriation. The sale is planned for the Spring of 1998 and could reduce the inventory by 16 million barrels to 547.4 million barrels.

### **APPROPRIATIONS THROUGH FISCAL YEAR 1997**

A total of \$20.8 billion, net of sales and transfers, has been appropriated for the Strategic Petroleum Reserve through fiscal year 1997. Included in this total are the distribution of annual and total appropriations described in Table 7. Figure 6 illustrates the cumulative appropriations for storage facilities operations and management, as well as petroleum acquisition and transportation.

### **STRATEGIC PETROLEUM RESERVE ACCOUNT**

The Strategic Petroleum Reserve Account funds the development, operation, and maintenance of Reserve facilities; the salaries and expenses necessary to plan and manage the program, including the operation of the Project Management Office in New Orleans, Louisiana; and the activities pertinent to major issues concerning the development and use of the Strategic Petroleum Reserve. Of the appropriations carried over

into fiscal year 1997, \$77.3 million, and the new budget authority of \$209 million, after the \$11 million rescission, approximately \$42 million remained available for obligation at the end of fiscal year 1997.

These balances are associated with several large Life Extension program awards slipped to early fiscal year 1998 in addition to other workload carried over into fiscal year 1998. Also included in these carryover balances is approximately \$1 million associated with the SPR Expansion Study which was suspended in 1993. These funds have been reported available for rescission after Congress rescinds the requirement to complete the Plan to expand SPR storage capability to 1 billion barrels.

### **SPR PETROLEUM ACCOUNT**

The SPR Petroleum Account funds the acquisition of oil for the Strategic Petroleum Reserve; the associated costs for transportation and terminaling; U.S. customs duties, Superfunds and Oil Spill Liabilities Trust Fund taxes; and other miscellaneous costs, such as Defense Energy Support Center administration costs associated with non-emergency sales, as well as oil acquisition, and transportation support. During an emergency drawdown and sale, the SPR Petroleum Account is the source of funding for the incremental costs of withdrawing oil from the storage caverns and transporting it to the point where purchasers take title.

During an emergency drawdown and sale, an amount equal to Federal receipts realized is deposited in the SPR Petroleum Account to create additional budget authority for filling the Reserve. At the end of fiscal year 1997, approximately \$33 million remained available for obligation in the Account; an amount sufficient to finance approximately 75% of the incremental costs of a six month emergency drawdown.

The capitalized cost for the oil in the Strategic Petroleum Reserve at the end of fiscal year 1997 was \$15.1 billion, for an average cost of approximately \$26.78 per barrel. The cost for the Department of Defense inventory was \$125 million for an average cost of \$19.32 per barrel.

**COMMERCIALIZATION REVENUES**

During calendar year 1997, the Strategic Petroleum Reserve generated \$563,124 in lease revenues for the U.S. Treasury, as follows:

•	St. James Terminal	\$133,300
•	Bayou Choctaw Pipeline	\$0
•	Big Hill Pipeline	\$429,824
•	Bryan Mound Pipelines	\$0
	Total	\$563,124

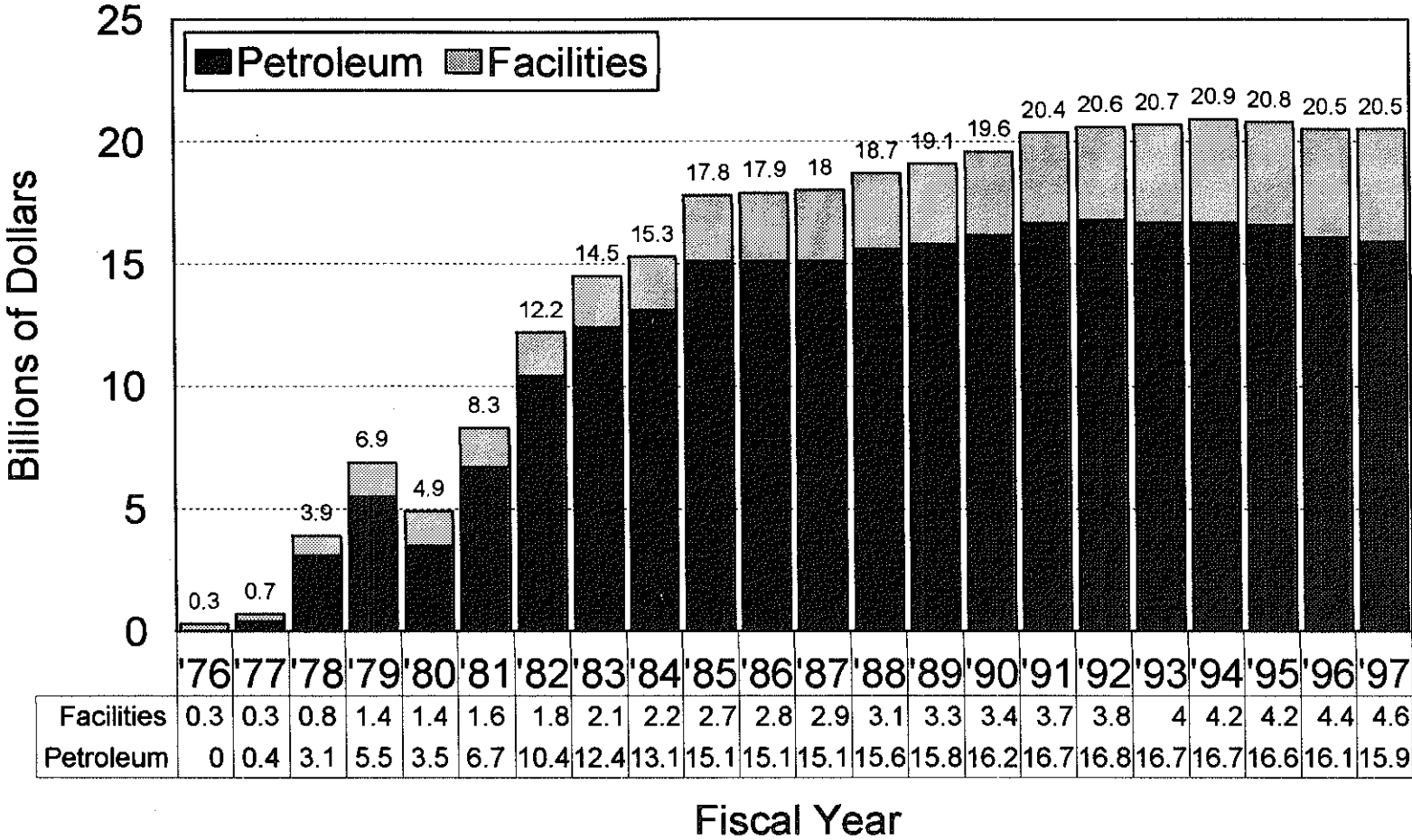
**TABLE 7**  
**ANNUAL APPROPRIATIONS FOR STORAGE FACILITIES OPERATIONS AND MANAGEMENT AND**  
**PETROLEUM ACQUISITION AND TRANSPORTATION**

Fiscal Year	Oil Account	Facilities	Management	Total	Defense SPR
1976	0	300,000	13,975	313,975	
1977	440,000	0	7,824	447,824	
1978	2,703,469	463,933	14,704	3,182,106	
1979 New BA	2,885,670	103,290	18,111	3,007,071	
Reprogramming	(529,214)	529,214	0	0	
Total 1979 Appropriations	2,356,456	632,504	18,111	3,007,071	
1980 Rescission	(2,000,000)			(2,000,000)	
1980 Reprogrammings					
No 1	(20,391)	0	20,391	0	
No 2	(1,881)	0	1,881	0	
Total 1980 Appropriations	(2,022,272)	0	22,272	(2,000,000)	
1981	2,688,282	82,834	19,391	2,790,507	
Entitlements	542,146	0	0	542,146	
Reprogrammings					
No 1	(18,000)	18,000	0	0	
No 2	(7,334)	7,334		0	
Total 1981 Appropriations	3,205,094	108,168	19,391	3,332,653	
1982	3,684,000	171,356	20,076	3,875,432	
Reprogrammings	(4,300)	4,300		0	
Total 1982 Appropriations	3,679,700	175,656	20,076	3,875,432	
1983	2,074,060	222,528	19,590	2,316,178	
1984	650,000	142,357	16,413	808,770	
1985	2,049,550	441,300	17,890	2,508,740	
1986	0	94,015	13,518	107,533	
Reprogrammings	(12,964)	12,964	0	0	
Total 1986	(12,964)	106,979	13,518	107,533	
1987	0	134,021	13,412	147,433	
1988	438,744	151,886	12,276	602,906	
1989	242,000	160,021	13,400	415,421	
1990	371,916	179,530	12,953	564,399	
1991	566,318	187,728	12,846	766,892	
1992	88,413	171,678	13,384	273,475	
1993	(125,625)	161,940	14,227	50,542	
DOD Transfer (non add)	124,925	700	0	125,625	125,625
1994	0	191,035	15,775	206,810	
1995	(107,764)	226,938	16,780	135,954	
<b>Total Thru FY 1995</b>	<b>16,597,095</b>	<b>4,158,202</b>	<b>308,817</b>	<b>21,064,114</b>	<b>125,625</b>
1996 transfer from SPR Petroleum Account	(187,000)	170,173	16,827	0	
1996 Weeks Is. Oil Sale	(97,114)	97,114	0		
1996 deficit reduction oil sale	(227,000)	0	0	(227,000)	
1996 Total	(511,114)	267,287	16,827	(227,000)	
<b>Total thru FY 1996</b>	<b>16,085,981</b>	<b>4,425,489</b>	<b>325,644</b>	<b>20,837,114</b>	<b>125,625</b>
1997	(220,000)	203,411	16,589	0	
1997 rescission	0	(10,411)	(589)	(11,000)	
1997 Total	(220,000)	193,000	16,000	(11,000)	
<b>Total Thru FY 1997</b>	<b>15,865,981</b>	<b>4,618,489</b>	<b>341,644</b>	<b>20,826,114</b>	<b>125,625</b>
1998	(207,500)	191,500	16,000	0	

*Note: FY 1991 SPR Petroleum Account of \$566,318 includes proceeds of \$122,681 from the Test Sale authorized by the President on September 26, 1990, pursuant to the EPCA authorities enacted September 15, 1990, in P.L. 101-383. These proceeds are recorded as additional budget authority rather than reductions to obligations, costs, and outlays. It also includes \$315,424,985 in Desert Storm Drawdown proceeds and \$19,755,064 from FY 1991 NPR excess receipts. Thus the cumulative budget authority is "gross" and not related directly to the inventory of oil on hand.*

**FIGURE 6  
CUMULATIVE FUNDING**

Storage Facilities Development/Operation & Petroleum Acquisition Transportation



Data as of December 31, 1997

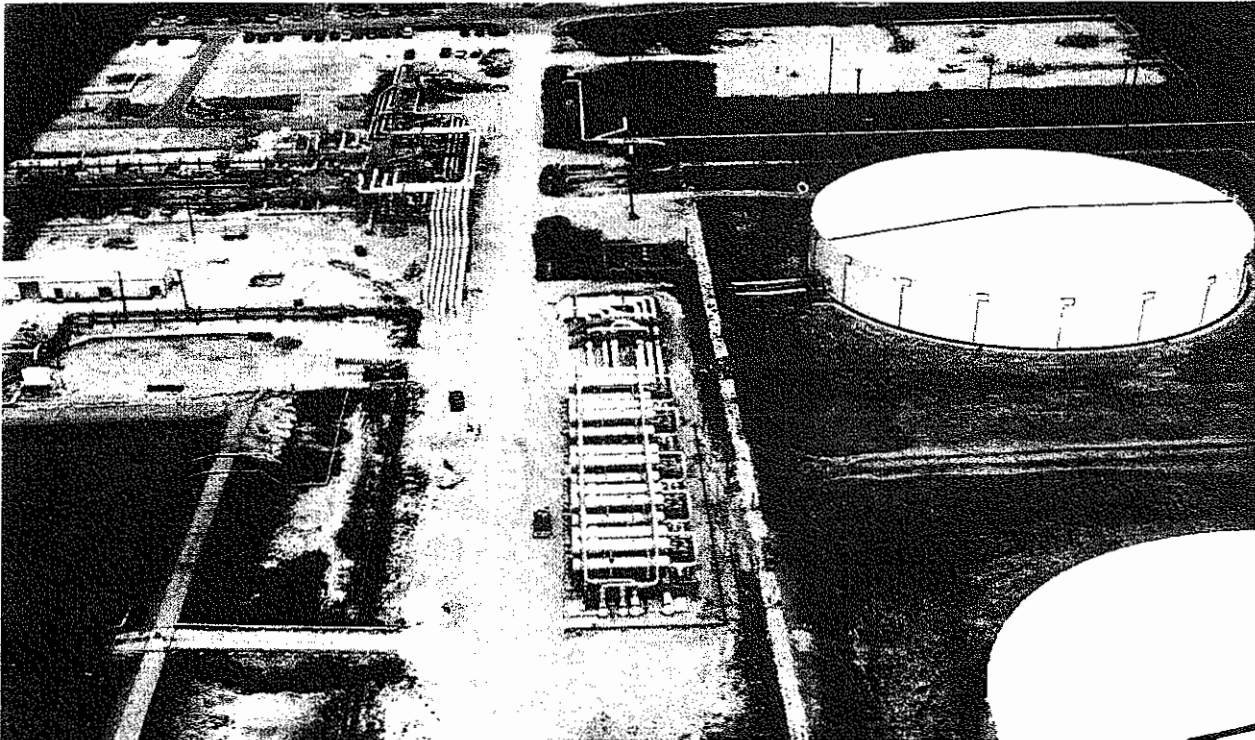
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## OTHER ACTIVITIES

### OIL STABILIZATION

During 1997, the two naturally occurring problems that had temporarily reduced the availability of some crude oil inventory for drawdown in the near term continued to be corrected. One problem was a higher-than-normal gas content in some of the crude oil, apparently from years of intrusion of natural gas from the domal salt. The second problem, associated with an elevated temperature of some of the crude oil due to natural geothermal heating, was largely corrected in 1994 and 1995 by the installation of heat exchangers at the Bayou Choctaw, West Hackberry and Bryan Mound storage sites. Heat exchangers will also be installed at Big Hill in early 1998, completing oil stabilization activity. These heat exchangers will allow for cooling of the crude oil, at the time of a drawdown, thereby reducing its vapor pressure to acceptable limits.

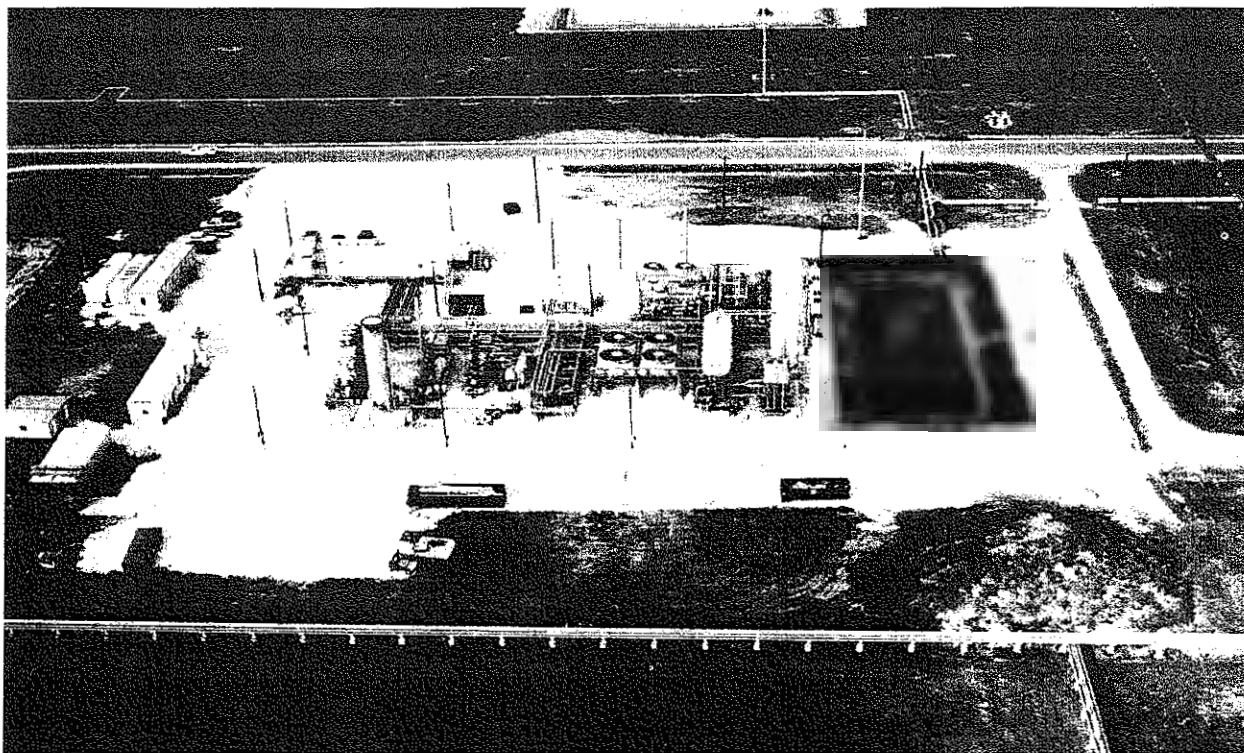
In 1996, it was determined that the amount of crude oil to be degassed had increased from a previously planned quantity of 144 million barrels to about 170 million barrels. This resulted from a determination that the Weeks Island oil being relocated from the mine's relatively cool temperature to caverns at Bayou Choctaw and Big Hill would be subject to geothermal heating and a concomitant increase in vapor pressure, and gas regain. Consequently, in order to meet the Reserve's objective of being able to deliver oil with an acceptable vapor pressure and gas content until at least the year 2005, an additional 26 million barrels needs to be degassed to mitigate this operational constraint affecting its availability.



Heat Exchangers at Bryan Mound

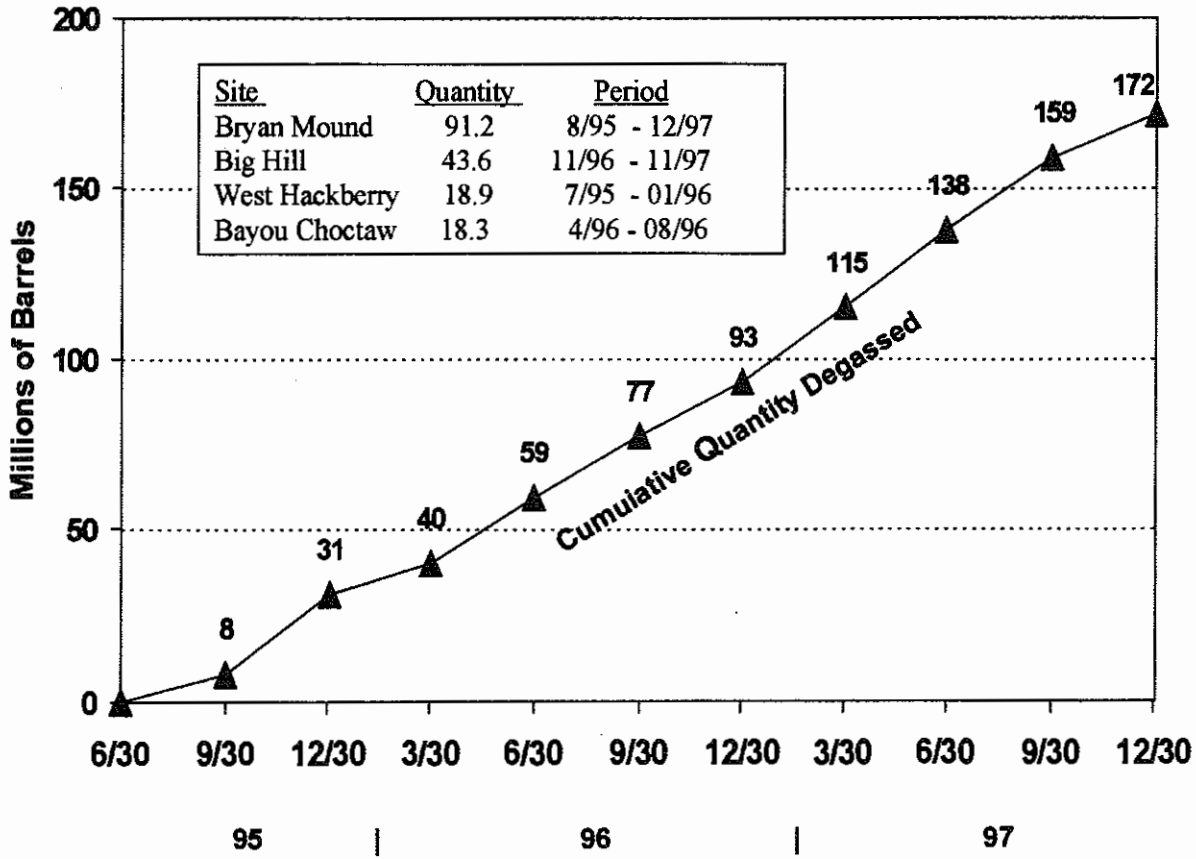
During 1997, Delta Hudson Government Services, Inc., continued degassing the affected crude oil using two 100,000 barrels-per-day plants. The degassing of 19.1 million barrels at West Hackberry was completed in January 1996, and the degassing of 18.3 million barrels at Bayou Choctaw was completed later the same year. Both of these degassing operations were completed ahead of schedule. The degas plant was next moved to Big Hill where processing of approximately 43.5 million barrels began on November 6, 1996, and was completed on November 11, 1997, five months ahead of schedule.

Early completion of degassing at these sites allowed other work to commence ahead of schedule. Operations at Bryan Mound, involving the degassing of 91 million barrels, were also completed ahead of schedule on December 13, 1997. This completed degassing operations for all of the Reserve's sites. A summary of the degassing operations is illustrated in Figure 7.



**Big Hill Degas Plant**

**Figure 7**  
**Strategic Petroleum Reserve Crude Oil Degassing Summary**



Data as of December 31, 1997

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### **FOREIGN OIL STORAGE INITIATIVE**

During 1997, the Department received approval of its application for foreign trade zone status at the Big Hill site and specific authority to store foreign-owned oil in the Strategic Petroleum Reserve. These authorities had been sought as part of the Department's foreign oil storage initiative. The Department has offered to store foreign-owned oil in underutilized Strategic Petroleum Reserve caverns to promote world oil stockpiling and generate revenue for the U.S. Treasury.

On June 10, 1997, the Department of Commerce Foreign Trade Zones Board approved the application for authority to establish special-purpose subzone status for the Big Hill storage site. Upon activation, foreign oil stored at Big Hill will be exempt from customs fees and certain taxes. A foreign trade zone procedures manual is required prior to activation of the subzone and will be submitted for Customs Office approval.

The Balanced Budget Act of 1997 (Public Law 105-33), which was enacted on August 5, 1997, provides specific authority to store petroleum product owned by another country, or its representative, in the Strategic Petroleum Reserve, provided that the U.S. is fully compensated for all related costs of storage and that the ability to draw down U.S. oil is not impaired. The legislation provides authority for the Secretary of Energy to use leasing proceeds for the purchase of petroleum products for the Reserve.

### **COMMERCIALIZATION OF DISTRIBUTION FACILITIES**

In 1994, activities were initiated to lease or outgrant the use of designated distribution facilities, including the St. James Terminal and approximately 240 miles of crude oil pipelines. The purpose of commercialization is to reduce the operational costs and generate revenues, while retaining the capability to use these facilities during a national energy emergency.

In 1997, the Department of Energy finalized its lease agreements with Shell Pipe Line Corporation for the

St. James Terminal and the Bayou Choctaw pipeline. Operations and maintenance of the St. James Terminal were transferred on January 31, 1997 and operations and maintenance of the Bayou Choctaw pipeline were transferred on May 1, 1997.

The terminal has been renamed Sugarland St. James Terminal, and minor modifications have been made to increase its commercial operational capabilities. Both of the facilities were leased on a revenue sharing basis. During 1997, the Government received \$133,300 in lease revenue from the terminal and no lease revenue from the pipeline.

Also in 1997, the Department of Energy closed on the sale of the Weeks Island pipeline with Louisiana Intrastate Gas Company. The sale was delayed from May until August to enable the company to acquire pipeline easements. The Government received \$272,500 in interest during the delay, and \$22 million from the sale on August 22, 1997. The pipeline was successfully hydrotested and converted to natural gas in September 1997.

In October 1997, the Department of Energy signed a three year lease with Texaco Pipeline Inc. for a 75 percent capacity lease of the 7.5-mile segment of the Reserve's 24-mile, 36-inch crude pipeline from Big Hill to the Sun Terminal in Nederland, Texas. This pipeline segment was previously leased to Texaco under a short-term (6-month) capacity lease in 1996. This pipeline is being used by Texaco to deliver crude oil from its 20-inch Gulf Coast pipeline system to Sun's Nederland Terminal. The 1996 short-term capacity lease terminated on October 15, 1997, and generated a total of \$819,232 for the U.S. Treasury.

The Department's attempt to lease the three Bryan Mound pipeline segments (Texas City, Jones Creek, and Freeport), offered in its 1995 Request for Offers, was canceled in 1996 because no worthy responses were received. In August 1997, the Department reissued its Request for Offers for leasing the three Bryan Mound pipeline segments. The Department is currently evaluating the offers received, and is scheduled to complete its negotiations and award in 1998.

Commercialization (Lease) Revenues:

	<u>1996</u>	<u>1997</u>
• St. James Terminal	\$0	\$133,300
• Bayou Choctaw Pipeline	\$0	\$0
• Big Hill Pipeline	\$472,809	\$429,824
• Bryan Mound Pipelines	\$102,606	\$0
Total	\$575,415	\$563,124

**ENVIRONMENT, SAFETY, AND HEALTH**

The Strategic Petroleum Reserve continued to make progress throughout 1997 in refining its goals, improving its procedures, and achieving greater cost effectiveness. A major effort was invested in revisiting policies and streamlining written procedures using new field manuals and training packages to ensure the smooth flow of requirements from all elements of the Project Management Office, through the Management, and Operating Contractor, down to the subcontractors, without redundancy.

The Reserve revised its implementing procedures for the National Environmental Policy Act, rewrote its safety management policy, and incorporated both in a revision of its Environment, Safety, and Health Manual (July 1997). The effort to ensure consistency of the Reserve's safety management with the Department's new Safety Management System was extended to participating in the development and implementation in 1997 of the Headquarters' policy statement, "Office of Fossil Energy Commitment to Environment, Safety, and Health."

Further, in response to a 1996 mandate from the Environmental Protection Agency and the Department of Transportation to consolidate numerous and overlapping plans for oil spill contingency, spill prevention, control, and countermeasures, and emergency response, into a single document of integrated procedures, the Reserve prepared an Emergency Response Procedures document for each site. Finally, in accordance with Department of Energy Order 5400.1, the Reserve prepared updated editions of its Pollution Prevention Plan, Environmental Monitoring Plan, and Groundwater

Protection Management Program Plan, and issued its Annual Site Environmental Report for 1996.

Pollution prevention is an integral part of routine activities, such as inventory management, maintenance, procurement, warehousing, property management, finance, budgeting, scheduling, and cost reporting. Since 1994, hazardous waste generation has been reduced by 75 percent to 2 tons. For 1996, the most recent year for which data are available, the Reserve recycled more than 50 tons of paper and 2 tons of cardboard and more than 10 tons of used oil burned for energy. In 1997, the Pollution Prevention Program continued to contribute substantial savings to the Reserve's operating costs and received recognition in two areas:

- The degasification project received the 1997 Louisiana Governor's Award for Outstanding Achievement in Pollution Prevention for avoiding 8,200 tons of air emissions through reduction of vapor pressure in stored crude oil.
- A crude oil tank bottoms reclamation and recycling project received a 1997 Department of Energy Pollution Prevention Award for Hazardous Waste Recycling.

In December, the Reserve issued the third edition of its Groundwater Protection Management Program Plan, the first update since 1993. Groundwater is monitored for salinity and hydrocarbons at Bayou Choctaw, Big Hill, Bryan Mound, and West Hackberry. At West Hackberry, a groundwater corrective action program is in place to correct contamination from a leaking brine pond. Interim repairs were made to the pond which will be replaced by aboveground tanks in 1998. After more than four years of continuous groundwater recovery operations at West Hackberry, the shape and extent of the saline plume continues to be stable and within site boundaries. No substantial salinity increase has been observed in any well during the corrective action period and a salinity decrease has been observed in four of the recovery wells. Further, there continued to be no hydrocarbon contamination at any site.

In 1997, the Reserve began compliance with the Toxic

Release Inventory reporting requirements of Section 313 of the Emergency Planning and Community Right-to-Know Act. Reporting thresholds were exceeded for Report Year 1996 for two crude oil constituents, benzene and n-hexane, at West Hackberry, Weeks Island, and Bryan Mound, as a consequence of offsite crude oil transfers associated with Weeks Island decommissioning and the non-emergency oil sale. The necessary Form R reports for each of the two crude oil constituents at each site were submitted to the Environmental Protection Agency.

Operating permits for St. James Terminal were transferred to Shell Pipe Line Corporation with the facility lease. During a due diligence study for the transfer, the ground around two areas, the booster pump station and the pig trap, was found to be contaminated with oil. Pursuant to a Louisiana-approved remediation plan, the Reserve recovered less than one barrel of free oil from three recovery wells, and excavated and replaced 500 cubic yards of contaminated soil. Louisiana certified a clean closure for the pig trap and determined no further action was needed there. At the end of 1997, work continued at the booster pump station.

Ongoing Life Extension construction, degasification operations, Weeks Island decommissioning activities, and commercialization initiatives necessitated numerous actions to renew, extend, modify, and/or update various environmental permits. At year end, the Reserve was still working with Louisiana to affect more cost-effective environmental sampling, analysis, and reporting associated with the State's receiving primacy from the Environmental Protection Agency in 1996 to administer the NPDES program in Louisiana. There were four reportable occurrences for the year--one oil spill of less than two barrels and three minor permit noncompliances.

Throughout the year, planned activities, such as routine operations, facility or equipment repairs, replacements, or upgrades were reviewed for environmental consequences to determine any requirements for complying with the National Environmental Policy Act. There were none that required an Environmental Impact Statement or Environmental Assessment.

The Reserve's environmental outreach activities include sponsorship of an Environmental Advisory Committee (EAC) and participation as a member of the Louisiana Environmental Leadership Program (LELP). The mission of the EAC is to provide independent assessments, evaluation, advice and impartial information to the operating management, the public, and the media. The LELP is a pollution prevention partnership of Federal and State agencies and private companies.

### ***EMERGENCY MANAGEMENT EXERCISE***

During May 1997, the Strategic Petroleum Reserve organization conducted its annual emergency management exercise, EMEX 13. This exercise was performed in two phases to test the Reserve's ability to respond to and mitigate an off-site oil spill into the Inter-Coastal Waterway, resulting from a pipeline failure between West Hackberry and Sun Terminal at Nederland, Texas.

EMEX 13 involved the West Hackberry site emergency response team, the Project Management Office staff in New Orleans, and the Program Office staff at the Department's Emergency Operations Center in Washington, D.C. It also included the participation of the U.S. Coast Guard, the U.S. Departments of Commerce and Interior, and the State of Louisiana Department of Environmental Quality. EMEX 13 utilized the Incident Command System and Unified Command structure and was conducted at the site from May 13 through 15 and in New Orleans on May 28. The exercise satisfied the requirement of the National Preparedness for Response Exercise Program guidelines for compliance with the Oil Pollution Act of 1990, and it provided training in developing an incident action plan and effectively communicating with the news media. EMEX 13 was a complex emergency management exercise, and its results are being used to further enhance the Reserve's emergency management program.

### ***CONTINUOUS QUALITY IMPROVEMENT***

The Strategic Petroleum Reserve had an excellent year in continuous quality improvement. Headquarters, field activities, and contractors built impressively on

their earlier work to spread continuous quality improvement methods and principles and extraordinary customer service throughout the organization. Parts of the Strategic Petroleum Reserve organization won prestigious quality awards in 1997, and other organizations began to benchmark against us, comparing themselves against our successful processes.

### **Awards**

The Project Management Office won the Department of Energy Commendation Award in the 1997 Energy Quality Award competition. The Project Management Office also received the Department's Quality Improvement Award for improving the most since last year's award process and was the only organization to win two 1997 Department quality awards.

DynMcDermott won the Department's Champion Award in the 1997 Energy Quality Award competition.

The West Hackberry site won the Southwest Louisiana Quality Award. This award was based on the Malcolm Baldrige National Quality Award criteria, as were the Department of Energy Awards.

The West Hackberry Groundwater Recovery Continuous Quality Improvement Team was one of the 68 semi-finalists for the USA Today Quality Cup out of 286 applicants from across the nation. The team nearly doubled its recovery from 10.4 to 17.5 gallons/minute, cut its run times roughly in half, and saved \$58,020 by repairing pumps themselves.

### **Partnerships and Assistance**

Four Project Management Office and DynMcDermott employees were quality award examiners, either for the Department of Energy or for the State of Louisiana. These examiners were trained in the Baldrige process and conducted site evaluations at DOE and Louisiana organizations. Employees also attended Malcolm Baldrige training given by the Louisiana National Guard.

DynMcDermott has established partnerships with

local organizations such as the Army Corps of Engineers and the Louisiana National Guard to share information about Quality Improvement.

DynMcDermott's Quality Improvement Administrator participates in the Crescent City Quality Network, which holds monthly meetings on quality initiatives in the metropolitan New Orleans area. Within the Reserve, a community of quality professionals formed a group (the QABAL) to advance quality improvement. It includes personnel from the Department of Energy, DynMcDermott, and Defense Contract Management Command personnel. Monthly meetings are well attended, and members are encouraged to be open, honest, and positive.

### **Benchmarking**

DynCorp Hanford, DynCorp White Sands, Halliburton and Army Corps of Engineers of New Orleans have benchmarked themselves against DynMcDermott's continuous quality improvement system. The SPR has also become a member of the International Benchmarking Clearinghouse. This clearinghouse provides the SPR with a best practice database to help choose the best process to implement. Several organizations have visited the Project Management Office to benchmark themselves against our safeguards and security organization and learn how to improve their security functions. They include the U.S. Customs Drug Interdiction Unit and Army and Police Squads in Texas and Louisiana.

### **Improvement Projects**

The Big Hill Nuisance Alarms Team reduced the number of nuisance alarms at the raw water intake structure from over 1300 per month to fewer than ten per month by extending a fence protection system and reconditioning and extending infrared security zones.

The Mainframe Nightly Processing Continuous Quality Improvement Team eliminated a third shift operator by reducing the number of magnetic tape reels that had to be handled from 1280 to 105 per night; reducing the number of magnetic cartridges that had to be handled from 45 to ten per night; and improving nightly run time from 700 to 383 minutes by installing a new computer.

## **Reengineering**

The Service Enterprise Resource Planning (SERP) project will reengineer processes for material management, acquisition, property management, finance and accounting, payroll, human resources administration, maintenance, project control, and cost management. The project will implement best practices and/or process changes designed by reengineering teams so that administrative, control, and financial systems will be state of the art and make maximum use of modern technology.

During 1997, DynMcDermott completed the SERP project management plan; subcontracted for software licenses, implementation services, and systems integration to provide necessary information technology; and implemented new processes for property management, activity-based management, electronic commerce, systems contracts and business systems. A net return of \$15,445,883 on the project is estimated over a ten-year life cycle. Business systems reengineering will be completed March 31, 1999, and all process changes will be finished by the end of calendar year 2000.

## **Quality Assurance**

Procurement Quality Assurance performed a record number of source inspections (contractor oversight production inspections) due to increased Life Extension activity. Procurement Quality Assurance extensively inspected Life Extension suppliers, performing 50,407 source inspections in fiscal year 1997, compared to 12,739 in fiscal year 1996.

Procurement Quality Assurance's increased involvement in Life Extension also resulted in the cancellation of one contract for the contractor's failure to provide a quality product and the issuance of a "cure notice" to another contractor to increase quality or lose the contract. Procurement Quality Assurance's oversight, including random surveillance of construction, helped avoid delays and reduce downtime.

## **PROCUREMENT AND CONTRACTOR SUPPORT**

Fiscal year 1997 obligations for the Strategic Petroleum Reserve totaled approximately \$256.8 million. From this amount, \$10.4 million was obligated for federal program management salaries and benefits, and \$246.4 million was obligated for contractual goods and services to operate and maintain the Reserve.

The Strategic Petroleum Reserve's three major contractors are:

- DynMcDermott Petroleum Operations Company, Management and Operating Contractor
- Walk Haydel and Associates, Architect-Engineering Services
- Critique, Inc., Management/Technical Support Services

Other prime contractors include:

- Seaway Pipeline Inc., Sun Pipe Line Company, Sun Marine Terminals, Texaco Pipeline Inc., Union Oil of California, and Shell Pipe Line Corporation, distribution and terminaling services
- River Valley Services, Inc., L.S. Womack, Inc., Kaough and Jones Electric Company, Grady Crawford Construction Corp. Inc. and MPA Modular LLL for construction
- Fisher-Rosemont Systems, control systems
- Houston Lighting and Power Company, electrical power
- SERNA and Company (auditing services)

## **REAL ESTATE ACTIONS**

In 1997, the Department continued its activities to commercialize the Strategic Petroleum Reserve's distribution facilities (i.e., the St. James Terminal and crude oil pipelines). On August 1, 1997, the Department issued a solicitation for its distribution facilities in the Seaway complex offering for lease the three Bryan Mound crude oil pipelines.

The Department of Energy executed a twenty-year outgrant on January 1, 1997, with Shell Pipe Line Corporation for use of the St. James Terminal. The total rental payments of \$133,300 were deposited into the U.S. Treasury.

The Department of Energy executed another twenty-year outgrant on May 1, 1997, with Shell Pipe Line Corporation for use of the St. James Terminal and Docks. Revenues will not be collected until Shell develops a business use for this pipeline.

The capacity lease with Texaco Pipeline, Inc. for use of a 7-mile portion of the Big Hill crude oil pipeline expired on October 15, 1997 with total rental payments of \$819,232 deposited into the U.S. Treasury.

The Department of Energy sold the 67-mile-long, 36-inch diameter Weeks Island crude oil pipeline along with the perpetual easements to Louisiana Intrastate Gas Company LLC for \$22 million on August 22, 1997.

## **SECURITY**

Borg-Warner Protective Services Corporation provides protection services through a subcontract with the Reserve's Management and Operating contractor, DynMcDermott Petroleum Operations Company.

The current protection force includes 145 armed officers who provide protection for four Strategic Petroleum Reserve sites and a central Project Management Office complex. The overall protective force staff, including armed officers and office personnel, has been reduced by 46 percent since 1994 as part of the Reserve's streamlining efforts.

**APPENDIX A**  
***Strategic Petroleum Reserve Site Information***

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**BRYAN MOUND**

**Location**

Brazoria County, Texas (three miles southwest of Freeport, Texas).

**Site Description**

226-million-barrel storage facility consisting of 20 caverns.

24-inch-diameter, 6-mile brine disposal pipeline extending 4 miles offshore in the Gulf of Mexico.

Oil, brine and raw water piping distribution system connecting caverns with central plant and water intake structure located on Brazos River. Over 101,000 feet of piping and 33 pumps totaling over 43,000 horsepower.

**System Parameters**

Drawdown via 30-inch diameter, 3.6 mile pipeline, to Phillips Freeport Marine Terminal, and via 40-inch diameter, 46-mile pipeline to ARCO Pipeline Company's Texas City Pipeline Terminal and Docks at up to 1,250,000 bbl/d.

Fill via 30-inch pipeline from Phillips Freeport Marine Terminal at 180,000 bbl/d.

Raw water design pumping rate - 1,355,000 bbl/d.

Brine disposal design pumping rate - 980,000 bbl/d (permit limitation - 1,100,000 bbl/d).

**Acquisition**

Acquired 499.47 acres fee simple, by condemnation April 1977, from Freeport Mineral Company and other owners. Dow Chemical Company was the previous operator.

**Environmental/Permits**

The Environmental Impact Statement was published in January 1977; a supplement was published in December 1977. A Phase III supplement was published in October 1981.

Five major Federal and State permits were issued in 1977 and 1978 for pipelines, water intake, and storage. The National Pollution Discharge Elimination System was renewed in 1984. The Seaway Environmental Impact Statement was published in June 1978. A supplement was published in October 1981.

Federal permits were issued in 1978 for construction and operation of a brine disposal pipeline. The permitted brine discharge rate was increased to 1.1 million bbl/d in August 1981.

**WEST HACKBERRY**

**Location**

Cameron Parish, Louisiana (22 miles southwest of Lake Charles, Louisiana).

**Site Description**

219-million-barrel storage facility consisting of 22 caverns.

Oil, brine, and raw water piping distribution system connecting caverns with central plant, water intake structure located on Intracoastal waterway and 10 brine disposal wells. Over 160,000 feet of piping and 45 pumps totaling over 82,000 horsepower.

**System Parameters**

Drawdown via a 42-inch-diameter, 42.8-mile pipeline to Sun Terminal, Nederland, Texas, and via a 36-inch diameter, 12-mile oil pipeline connecting to the Texas 22-inch common carrier pipeline and to refineries in Lake Charles, Louisiana, at up to 1,250,000 bbl/d.

Fill via 42-inch pipeline from Sun Terminal at 175,000 bbl/d.

Raw water design pumping rate - 1,450,000 bbl/d.

Brine disposal design pumping rate - 900,000 bbl/d

**Acquisition**

Acquired 405.36 acres fee simple, by condemnation April 1977, from numerous private landowners. Olin Corporation was the previous site operator. Acquired 160.0 additional acres fee simple by condemnation in two actions, July 1979 and March 1980.

**Environmental/Permits**

The Environmental Impact Statement was published in January 1977; a supplement was published in April 1977. A Phase III supplement was published in October 1981.

Six major Federal and State permits were issued in 1977 and 1978 for drilling pads, water intake, and storage. A National Pollutant Discharge Elimination System permit was renewed in 1984.

The Texoma Environmental Impact Statement was published in November 1978; a supplement was published in October 1981. Two major Federal permits related to a brine pipeline were issued in 1980.



**BIG HILL**

**Location**

Jefferson County, Texas (20 miles southwest of Beaumont, Texas).

**Site Description**

160-million-barrel storage facility consisting of fourteen caverns.

Oil, brine, and raw water systems connecting caverns with central plant, water intake structure located on the Intracoastal Waterway, and brine disposal pipeline extending 3 miles offshore in the Gulf of Mexico. Over 29 miles of piping and 15 pumps totaling 32,000 horsepower.

**System Parameters**

Drawdown via 36-inch diameter, 25 mile pipeline to Sun Terminal, Nederland, Texas, at up to 930,000 bbl/d.

Fill via 36-inch-diameter pipeline from Sun Terminal at 280,000 bbl/d.

Raw water design pumping rate - 1,400,000 bbl/d.

Brine disposal design pumping rate - 1,400,000 bbl/d.

**Acquisition**

Acquired 271 acres fee simple, by condemnation November 1982 and July 1983, from three landowners, i.e., 238.48 acres from Amoco, 27.06 acres from the Pipkin estate, and 5.46 acres from the Patrick Henry Phelan estate.

**Environmental/Permits**

The Environmental Impact Statement was published in October 1981.

State permits were issued in 1983 for drilling, underground hydrocarbon storage, pipeline operations, air quality, water appropriation, and water quality certifications. The Environmental Protection Agency National Pollutant Discharge Elimination System permit was issued in 1984.

**BAYOU CHOCTAW**

**Location**

Iberville Parish, Louisiana (12 miles southwest of Baton Rouge, Louisiana).

**Site Description**

75-million-barrel storage facility consisting of six caverns.

Oil, brine, and raw water piping distribution system connecting caverns with central plant, a water intake structure, 12 brine disposal wells, and a pipeline for supplying brine to Union Texas Petroleum, Inc. Over 50,000 feet of piping and 16 pumps totaling 22,000 horsepower.

**System Parameters**

Drawdown via 36-inch-diameter, 37.2-mile pipeline to St. James Terminal and to Capline pipeline at up to 480,000 bbl/d.

Oil fill via 36-inch pipeline from St. James Marine Terminal at 110,000 bbl/d.

Raw water design pumping rate - 514,000 bbl/d.

Brine disposal design pumping rate - 110,000 bbl/d.

**Acquisition**

Acquired 355.95 acres fee simple, by condemnation April 1977, from numerous private owners. Union Texas Petroleum (a subsidiary of Allied Corporation) was the previous operator.

In 1985 the Department of Energy acquired an additional existing cavern through a cavern exchange agreement with Union Texas Petroleum. The transaction involved a 3.5 acre exchange with no net change in Government-owned acreage.

**Environmental/Permits**

The Environmental Impact Statement was published in December 1976; a supplement was published in May 1977.

Four major Federal and State permits were issued in 1978 for pipeline, well pad, storage and storm water runoff, and were updated in 1980 and 1981.

**WEEKS ISLAND**

**Location**

Iberia Parish, Louisiana (95 miles southwest of New Orleans).

**Site Description**

Conventional room and pillar salt mine containing 70 million barrels of storage capacity in two levels. Site contains minimal inventory and is to be decommissioned.

**Acquisition**

Acquired 382.92 acres fee simple subsurface and 6.63 acres fee simple surface, by condemnation September 1977, from Morton Salt Company.

**Environmental/Permits**

The Environmental Impact Statement was published in January 1977; a supplement was published in August 1977.

A major Federal permit was issued in 1978 for an oil pipeline to St. James Terminal. Three major Federal and State permits were issued in 1979 for oil storage, air emissions and storm water, and treated sewage effluent discharge. An Environmental Protection Agency National Pollutant Discharge Elimination System Permit was updated in 1982.

## **ST. JAMES TERMINAL**

### **Location**

St. James Parish, Louisiana (45 miles southeast of Baton Rouge, Louisiana, on the Mississippi River).

### **Site Description**

Terminal facilities include six storage tanks totaling two million barrels of capacity, tie-ins to Bayou Choctaw and Weeks Island sites, and to LOCAP and Capline pipeline terminals.

Oil distribution piping system connecting docks, tanks, and pump station consists of over 35,000 feet of piping and five pumps totaling over 7,500 horsepower, metering systems, and maintenance and control buildings.

Two docks with one berth each, able to accommodate vessels of up to 123,000 long tons maximum loaded displacement. A 42-inch-diameter pipeline connects the docks to the storage tanks.

### **System Parameters**

Crude oil from Bayou Choctaw to be distributed across docks and to LOCAP and Capline Pipeline Terminal.

Sustained tanker loading rate: 435,000 b/d.

Tanker unloading at up to 40,000 bbl/hr.

Fill capabilities from terminal to Bayou Choctaw at up to 240,000 b/d.

### **Acquisition**

Acquired 104.76 acres fee simple for terminal by condemnation in May 1978 and 47.68 acres fee simple for docks by condemnation in July 1978.

### **Environmental/Permits**

St. James' Terminal Environmental Impact Statement is a component of the Bayou Choctaw supplement, published in May 1977, and the Weeks Island supplement, published in August 1977.

Two major Federal and State permits related to dock construction were acquired in 1978. The Environmental Protection Agency discharge permit for storm water and sewage acquired in 1980. Dock Construction Permit modified 1982.

### **Current Status**

Leased to Shell Pipe Line Corporation on June 30, 1997. This is no longer a government-operated facility.





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# **Strategic Petroleum Reserve**

## **Annual Report for Calendar Year 1999**

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**U.S. Department of Energy**  
**Assistant Secretary for Fossil Energy**  
**Office of Strategic Petroleum Reserve**





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# Strategic Petroleum Reserve

## Annual Report for Calendar Year 1999

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**U.S. Department of Energy**  
**Assistant Secretary for Fossil Energy**  
**Office of Strategic Petroleum Reserve**  
**Washington, D.C. 20585**

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## TABLE OF CONTENTS

---

<b>EXECUTIVE SUMMARY.....</b>	<b>1</b>
<b>Royalty-In-Kind Oil.....</b>	<b>1</b>
<b>Legislation.....</b>	<b>1</b>
<b>Facilities Life Extension.....</b>	<b>1</b>
<b>Weeks Island Decommissioning.....</b>	<b>1</b>
<b>Crude Oil Inventory.....</b>	<b>1</b>
<b>PROGRAM MISSION.....</b>	<b>2</b>
<b>Introduction.....</b>	<b>2</b>
<b>Legislative History.....</b>	<b>2</b>
<b>Strategic Petroleum Reserve Plan and Amendments.....</b>	<b>5</b>
<b>PROGRAM MANAGEMENT.....</b>	<b>6</b>
<b>Organization.....</b>	<b>6</b>
<b>Strategic Plan.....</b>	<b>6</b>
<b>Performance Measurement System.....</b>	<b>6</b>
<b>Organizational and Quality Improvement.....</b>	<b>6</b>
<b>STORAGE PROGRAM.....</b>	<b>7</b>
<b>Storage Program Description and Drawdown Goals.....</b>	<b>7</b>
<b>Storage Facilities Life Extension Program.....</b>	<b>9</b>
<b>Status Of Life Extension Projects.....</b>	<b>9</b>
<b>Status Of Weeks Island Decommissioning.....</b>	<b>10</b>
<b>Crude Oil Acquisition, Sales and Exchange.....</b>	<b>14</b>
<b>Crude Oil Inventory Status.....</b>	<b>14</b>
<b>EMERGENCY RESPONSE CAPABILITIES.....</b>	<b>19</b>
<b>Drawdown and Distribution Plan.....</b>	<b>19</b>
<b>Competitive Sales Procedures.....</b>	<b>19</b>
<b>Hawaii Purchases of Strategic Petroleum Reserve Crude Oil.....</b>	<b>20</b>
<b>Drawdown Capabilities.....</b>	<b>21</b>
<b>Drawdown Readiness Activities.....</b>	<b>23</b>
<b>Distribution Plan and Capabilities.....</b>	<b>23</b>
<b>Distribution Assessment.....</b>	<b>24</b>
<b>Emergency Response Capabilities.....</b>	<b>26</b>
<b>COMMERCIALIZATION ACTIVITIES.....</b>	<b>28</b>
<b>Department Policy and Objectives.....</b>	<b>28</b>
<b>Commercial Leases of Distribution Facilities.....</b>	<b>28</b>
<b>Foreign Oil Storage .....</b>	<b>29</b>

---

<b>BUDGET AND FINANCE.....</b>	<b>30</b>
Appropriations through Fiscal Year 1999.....	30
Strategic Petroleum Reserve Account.....	30
SPR Petroleum Account.....	30
Commercialization Revenues.....	33
Performance Measurement.....	34
<b>OTHER ACTIVITIES.....</b>	<b>36</b>
Organizational Improvement Activities.....	36
Environment, Safety, and Health.....	38
Security.....	40
Real Estate Actions.....	40
<b>APPENDIX A Strategic Petroleum Reserve Site Information.....</b>	<b>41</b>
Bryan Mound.....	41
West Hackberry.....	41
Big Hill.....	42
Bayou Choctaw.....	42
<b>LIST OF FIGURES</b>	
Figure 1. Storage Sites and Distribution System.....	8
Figure 2. 1999 Life Extension Program Cost Status.....	11
Figure 3. Cumulative Oil Fill.....	18
Figure 4. Strategic Petroleum Reserve Maximum Drawdown Capability.....	22
Figure 5. Pipeline and Marine Distribution Capabilities.....	25
Figure 6. Days of Import Protection (1977 -1999).....	26
Figure 7. U.S. Net Crude and Product Imports (1977-1999).....	26
Figure 8. Cumulative Funding.....	32
<b>LIST OF TABLES</b>	
Table 1. Storage Capacity and Drawdown Objectives.....	7
Table 2. Year-End Inventories and Oil Fill History.....	15
Table 3. Crude Oil Receipts Through 1999.....	16
Table 4. Strategic Petroleum Reserve Crude Oil Inventory.....	17
Table 5. Crude Oil Streams.....	21
Table 6. Drawdown and Distribution Capabilities.....	23
Table 7. Annual Appropriations for Storage Facilities Operations and Management Petroleum Acquisition and Transportation.....	31
Table 8. Summary of Commercialization Revenues.....	33

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## ***EXECUTIVE SUMMARY***

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### ***ROYALTY-IN-KIND OIL***

The Secretary of Energy, Bill Richardson, announced on March 31, 1999, that the Department of Energy and the Department of the Interior completed arrangements with Texaco, Shell and BP-Amoco for the shipment of approximately 38,000 barrels per day of royalty-in-kind oil to the Strategic Petroleum Reserve. This was the initial phase of a program announced February 11, 1999, to replace approximately 28 million barrels of oil sold from the Strategic Petroleum Reserve. The second phase involved a competitive bid process to transfer additional quantities of royalty oil in satisfaction of the 28 million-barrel target.

### ***LEGISLATION***

On October 5, 1999, the President signed Public Law 106-64 to extend authorities in the Energy Policy and Conservation Act for the Strategic Petroleum Reserve and United States participation in the International Energy Agency program until March 31, 2000.

Appendix C of the Consolidated Appropriations Act, 2000 (Public Law 106-113) was enacted on November 29, 1999, and includes \$159 million for the Strategic Petroleum Reserve.

### ***FACILITIES LIFE EXTENSION***

A Life Extension Program to ensure continued mission readiness through 2025 was initiated in 1994. Most major systems will be upgraded or replaced by 2000, and newer technologies will increase reliability and reduce operating and maintenance costs. Major construction is near completion at Bryan Mound and West Hackberry and is in a final stage at Big Hill and Bayou Choctaw.

### ***WEEKS ISLAND DECOMMISSIONING***

The State of Louisiana agreed to the closing of Weeks Island on September 3, 1999, and the Environmental Protection Agency concurred on November 2, 1999. The surface facilities will be salvaged, removed or abandoned in place, and the site will be transferred to the General Services Administration for disposition.

### ***CRUDE OIL INVENTORY***

As of December 31, 1999, the crude oil inventory in the Strategic Petroleum Reserve was 567 million barrels.

## **PROGRAM MISSION**

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### **INTRODUCTION**

The Strategic Petroleum Reserve was established in 1975 in response to the 1973 Arab oil embargo. It is authorized by the Energy Policy and Conservation Act (EPCA) (Public Law 94-163), and by the comprehensive energy plans of all Administrations since 1975, in recognition of the long-term dependence of the United States on imported crude oil and petroleum product. Section 165 of EPCA requires the Secretary of Energy to submit an Annual Report to the President and the Congress.

As of December 31, 1999, the crude oil inventory in the Strategic Petroleum Reserve was 567 million barrels. The current inventory amounted to 58 days of net imports in 1999, and is down from a peak of 592 million barrels in 1994. The United States relies on a combination of oil in the Strategic Petroleum Reserve and private stocks to meet its oil storage obligations to the International Energy Agency.

### **LEGISLATIVE HISTORY**

The Strategic Petroleum Reserve was authorized on December 22, 1975, when Congress enacted the EPCA (Public Law 94-163), to reduce the impact of a severe energy supply interruption, and to carry out the obligations of the United States under the International Energy Program.

EPCA was amended by Title VIII of the Energy Security Act (Public Law 96-294), enacted on June 30, 1980. The Act established a minimum average daily fill rate of 100,000 barrels and precluded the sale of Naval Petroleum Reserve Numbered 1 (Elk Hills, California) crude oil except to fill the Strategic Petroleum Reserve, unless the Reserve was being filled at the minimum rate or had an inventory of 500 million barrels.

The Energy Policy and Conservation Amendments Act of 1985 (Public Law 99-58), enacted on July 2, 1985, extended the provisions of Title I, Part B, of the EPCA relating to the Strategic Petroleum Reserve until June 30, 1989, and directed the Secretary of Energy to conduct a sale or exchange of 1.1 million barrels of crude oil to test the drawdown and distribution capabilities of the Strategic Petroleum Reserve.

The Omnibus Budget Reconciliation Act of 1986 (Public Law 99-509), enacted on October 21, 1986, amended EPCA to require that the Strategic Petroleum Reserve be filled to 750 million barrels, and increased the minimum rate under the Naval Petroleum Reserve limitation to 75,000 barrels a day.

Public Law 101-46, an Act to extend Title I of EPCA, enacted on June 30, 1989, extended Strategic Petroleum Reserve authorities contained in EPCA until April 1, 1990. The Act also required the Secretary to submit a report to Congress by February 1, 1990, on alternative means of financing oil acquisition for the Strategic Petroleum Reserve. Short term extensions of the Strategic Petroleum Reserve authorities contained in EPCA were enacted on March 31, 1990 (Public Law 101-262), and August 10, 1990 (Public Law 101-360).

On September 15, 1990, the President signed the Energy Policy and Conservation Act Amendments of 1990 (Public Law 101-383) extending authorities until September 30, 1994. This legislation also contained provisions to amend drawdown authorities, require a Strategic Petroleum Reserve Plan Amendment for completion of storage capacity for one billion barrels, authorize drawdown and distribution tests, and provide for a refined petroleum product reserve test program.

On October 24, 1992, the President signed the Energy Policy Act of 1992 (Public Law 102-486). The bill included provisions to (1) add new conditions for drawdown in emergency situations involving a supply reduction of significant scope and duration, coupled with a severe price increase likely to cause a major adverse impact on the nation's economy, (2) enlarge the Reserve to one billion barrels, (3) permit the Secretary to make payment in advance for delivery of petroleum product either owned or not owned by the United States for storage in the Strategic Petroleum Reserve or non-Strategic Petroleum Reserve facilities, (4) give the President discretionary authority to acquire domestic stripper well oil at competitive prices to fill the Reserve, and (5) amend the eligibility criteria for a Regional Petroleum Reserve.

On October 22, 1994, the President signed into law the Energy Policy and Conservation Act Amendments Act of 1994 (Public Law 103-406) which extended authorities to June 30, 1996.

The Balanced Budget Downpayment Act (Public Law 104-99) was enacted on January 26, 1996, and required the sale of up to \$100 million of Weeks Island oil to fund decommissioning activities.

The Omnibus Consolidated Rescissions and Appropriations Act of 1996 (Public Law 104-134) was enacted on April 26, 1996, and required the sale of \$227 million of Weeks Island oil for deficit reduction.

The Omnibus Consolidated Appropriations Act (Public Law 104-208) was enacted on September 30, 1996, and appropriated \$220 million for the Strategic Petroleum Reserve in fiscal year 1997 to be financed through the sale of oil. The Strategic Petroleum Reserve authorities expired on June 30, 1996. On October 14, 1996, Public Law 104-306 extended the Strategic Petroleum Reserve authorities until September 30, 1997. After the expiration of Strategic Petroleum Reserve

authorities on September 30, 1997, these authorities were not reauthorized until June 1998. The Balanced Budget Act of 1997 (Public Law 105-33), enacted August 5, 1997, added a new section 168 to EPCA, authorizing the leasing of underutilized Strategic Petroleum Reserve facilities for the storage of oil owned by a foreign government or its representatives.

The Department of the Interior and Related Agencies Appropriations Act, 1998 (Public Law 105-83) was enacted on November 14, 1997, and appropriated \$207.5 million for the Strategic Petroleum Reserve in fiscal year 1998 to be financed through the sale of Reserve oil.

The 1998 Supplemental Appropriations and Rescissions Act (Public Law 105-174) was enacted on May 1, 1998 and included a provision which prohibited the sale of Strategic Petroleum Reserve oil, contingent upon a Presidential determination that a sale would be imprudent in light of current market conditions and a designation of the \$207.5 million in foregone revenue as an emergency requirement under the Balanced Budget Act of 1985. The President made the requisite determination and declaration on May 8, 1998.

On June 1, 1998, the President signed Public Law 105-177 to extend certain EPCA programs. The Act extended authorities for the Strategic Petroleum Reserve and participation in the International Energy Program through September 30, 1999, and expanded the antitrust protection for U.S. companies participating in International Energy Agency activities. The Act also authorized the drawdown and distribution of the Strategic Petroleum Reserve only for the purposes described in the Act and required that the Secretary of Energy request funds for acquisition, transportation and injection of petroleum products for storage in the Reserve or provide a written explanation if no request for funds is made. The Omnibus Consolidated and Emergency Supplemental Appropriations Act, 1999 (Public Law 105-277)

was enacted on October 21, 1998, and included \$160.1 million for the Strategic Petroleum Reserve.

On November 13, 1998, the President signed Public Law 105-388, an Act to extend energy conservation programs under the Energy Policy and Conservation Act and the Energy Conservation and Production Act, and for other purposes. The Act provides that, during a drawdown of the Strategic Petroleum Reserve, the State of Hawaii may submit a binding offer for Strategic Petroleum Reserve oil and be entitled to purchase the oil at a price equal to the weighted average price of the successful competitive bids for oil in the applicable category. Tankers destined for Hawaii would receive priority scheduling during a Strategic Petroleum Reserve drawdown.

The Strategic Petroleum Reserve authorities expired on September 30, 1999. On October 5, 1999, the President signed Public Law 106-64, extending these and the EPCA authorities for United States participation in the International Energy Agency program until March 31, 2000.

Appendix C of the Consolidated Appropriations Act, 2000 (Public Law 106-113), enacted on November 29, 1999, includes \$159 million for the Strategic Petroleum Reserve. The Act also allows the Secretary to use other Departmental funds to finance a drawdown of the Strategic Petroleum Reserve.



***STRATEGIC PETROLEUM RESERVE PLAN  
AND AMENDMENTS***

Section 154 of EPCA required the preparation of a Strategic Petroleum Reserve Plan to address the development and implementation of the Strategic Petroleum Reserve. A Plan was submitted to the Congress on February 16, 1977, and became effective on April 18, 1977. The Plan has been amended five times, and was last amended on February 11, 1999.

Strategic Petroleum Reserve Plan Amendment No. 1 accelerated the planned schedule for filling the Reserve. Amendment No. 2 to the Strategic Petroleum Reserve Plan authorized an increase in the Strategic Petroleum Reserve size from 500 million barrels to one billion barrels. The Amendment described Department of Energy plans to store 750 million barrels of petroleum in underground storage facilities.

On October 31, 1979, the Department of Energy submitted Amendment No. 3, a Distribution Plan for the Strategic Petroleum Reserve, to the

Congress. The Distribution Plan described the methods for drawdown and distribution of petroleum from the five existing Strategic Petroleum Reserve storage sites.

On December 1, 1982, the President transmitted Amendment No. 4, a new Drawdown Plan, to the Congress for the use of the Strategic Petroleum Reserve. This Plan, required under the Energy Emergency Preparedness Act of 1982, went into effect immediately and provides procedures for the drawdown, sale, and distribution of petroleum from the Strategic Petroleum Reserve. The Drawdown Plan replaces the Distribution Plan established by Amendment 3.

Finally, Amendment No. 5 provides specifically for the Strategic Petroleum Reserve to acquire crude oil that the United States is entitled to receive in-kind as royalties from production on Federal lands under subsection 160(a)(2) of EPCA. Plan Amendment No. 5 was transmitted by the Secretary to Congress on February 11, 1999, and became effective on April 12, 1999.

## **PROGRAM MANAGEMENT**

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### **ORGANIZATION**

The Assistant Secretary for the Office of Fossil Energy in Washington D.C. has overall program responsibility for achieving the goals and objectives of the Strategic Petroleum Reserve. This responsibility is delegated to the Deputy Assistant Secretary for the Petroleum Reserves, Mr. Richard D. Furiga, and is exercised through the Strategic Petroleum Reserve headquarters in Washington, D.C., and the Project Management Office, located in New Orleans, Louisiana.

The Project Management office is under the direction of Mr. William C. Gibson, Jr., the Project Manager, and is responsible for project management and implementation activities associated with the design, development, operation and maintenance of the Strategic Petroleum Reserve.

The Project Management Office executes its responsibilities by employing a Management and Operating contractor, DynMcDermott Petroleum Operations Company, to provide the operations, maintenance, and ancillary services associated with the operation of the Strategic Petroleum Reserve's oil storage and distribution facilities.

Other major contractors include: Walk, Haydel & Associates, for architect-engineering services;

Critique, Inc. for management-technical support services; Entergy Services Inc. and Houston Lighting & Power Company for electrical power; Seaway Pipeline Company, Sun Pipe Line Company, and Union Oil Co. of California for terminalling and distribution services; and D.L.Meacham for construction; Fisher-Rosemount Systems for control systems; and SERNA & Company for auditing services.

### **STRATEGIC PLAN**

The Strategic Plan for the Strategic Petroleum Reserve is updated annually. A strategic planning working group consists of the Program Office in Washington, D.C. and the Project Management Office in New Orleans.

### **PERFORMANCE MEASUREMENT SYSTEM**

The Strategic Petroleum Reserve has incorporated all of the mandates of the Government Performance and Results Act (GPRA) of 1993 into its performance management system. Results for 1999 are detailed on page 34.

### **ORGANIZATIONAL AND QUALITY IMPROVEMENT**

These activities are an integral part of our drive for total quality management and are described in more detail on page 36.

## **STORAGE PROGRAM**

### **STORAGE PROGRAM AND DRAWDOWN GOAL**

The Strategic Petroleum Reserve developed six underground storage facilities, between 1976 and 1991. The Sulphur Mines site in Louisiana was decommissioned in 1992 for cost savings, and the Weeks Island site, also in Louisiana, was decommissioned in 1999 as a result of geotechnical problems. The remaining four sites are Bryan Mound and Big Hill, Texas, and West

Hackberry and Bayou Choctaw, Louisiana. Table 1 summarizes storage capacity and drawdown capability of the sites as of December 31, 1999.

The four sites are organized into three distribution systems: Seaway, Texoma and Capline. Within each system, the storage facilities can access the Gulf Coast refining centers, interstate crude oil pipelines, and one or more marine terminals for distribution of crude oil. Figure 1 shows this distribution configuration.

**TABLE 1  
STORAGE CAPACITY AND DRAWDOWN GOAL  
(December 31, 1999)**

Storage Facility	Storage Capacity (MMB)	Crude Mix Sweet/Sour (MMB)	Drawdown Capability (MB/D)
Bryan Mound	232	75/157	1,500
West Hackberry	222	114/108	1,300
Big Hill	170	72/98	1,100*
Bayou Choctaw	76	24/52	515
<b>Total</b>	<b>700</b>	<b>285/415 40%/60%</b>	<b>4,415</b>

\* Drawdown capability to be achieved by March 2000.

Legend:  
MMB = Million Barrels  
MB/D = Thousands Barrels Per Day

**FIGURE 1  
STORAGE SITES AND DISTRIBUTION SYSTEM**



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Decommissioning Weeks Island resulted in a loss of 70 million barrels of capacity, reducing overall storage capacity to 680 million barrels. However, the Department reassessed the capacities of the remaining storage sites and estimated them to be currently capable of storing 700 million barrels because of fresh water leaching in the caverns during the drawdown of oil in previous years (Desert Storm drawdown activities, 1995 oil sales, 1996 and 1997 oil degassing and various site drawdown tests). As reported in the past two years, the Department minimized the loss of Weeks Island drawdown capability by increasing the capabilities of the remaining sites under the current Life Extension Program.

### ***STORAGE FACILITIES LIFE EXTENSION PROGRAM***

A Life Extension Program was initiated in 1994 to upgrade or replace major systems by 2000, and ensure mission readiness through 2025. The program uses new technologies to increase reliability and reduce operating and maintenance costs.

As of December 31, 1999, approximately 96 percent of life extension projects were completed, based upon contract obligations. Major construction was essentially completed at Bryan Mound and West Hackberry, and was in the final stages at Big Hill and Bayou Choctaw. Contracts were awarded in the amount of \$2.7 million for site work and clean-up at Big Hill and Bayou Choctaw. Testing of oil, water, and brine systems continued at all sites.

The total estimated cost of the Life Extension Program is \$328 million, \$42 million less than the original estimate of \$370 million. The cancellation of planned projects for Weeks Island and St. James Terminal (leased to Equilon Pipeline Corporation), and comprehensive value engineering efforts, resulted in the cost reductions. Approximately

\$316 million has been obligated for life extension projects since 1994.

Figure 2 graphs the history of the Life Extension Program, including total estimated cost, annual budgets, and total obligations from 1994 to date.

### ***STATUS OF LIFE EXTENSION PROJECTS***

#### **BRYAN MOUND**

The Bryan Mound storage facility in Brazoria County, is approximately three miles southwest of Freeport, Texas. The site has 20 storage caverns, a combined storage capacity of 232 million barrels, and an inventory of 215 million barrels. The site is available for both fill and drawdown operations.

The following projects were completed in 1999:

- ▶ Construction to upgrade the site's crude oil refill and metering systems.
- ▶ Replacement of the slop oil system and closing of the existing brine pond.

Construction is essentially complete. Remaining work includes site clean-up and system testing.

#### **WEST HACKBERRY**

The West Hackberry storage facility in Cameron Parish is approximately 22 miles southwest of Lake Charles, Louisiana. The site has 22 storage caverns, a combined storage capacity of 222 million barrels and an inventory of 193 million barrels. It is available for both fill and drawdown operations.

The following projects were completed in 1999:

- ▶ Replacement of the brine handling system and brine pond.

- ▶ Upgrading of the crude oil refill and metering systems, and closing of the existing brine pond.

Construction is essentially complete. Remaining work includes site clean-up and system testing.

### **BAYOU CHOCTAW**

The Bayou Choctaw storage facility in Iberville Parish is approximately 12 miles southwest of Baton Rouge, Louisiana. The site has six storage caverns, a combined storage capacity of 76 million barrels, and an inventory of 72 million barrels. The site is currently available for both fill and drawdown operations.

Construction to upgrade most of the major systems at Bayou Choctaw, including instrumentation and controls, piping reconfiguration, electrical system, valves and new water intake pumps, was completed in May 1999.

The crude oil system is being modified to tie it into a new Equilon pipeline connected to refineries at Baton Rouge. When completed in early 2000, offsite distribution will improve. Other remaining work includes site clean-up and system testing.

### **BIG HILL**

The Big Hill storage facility in Jefferson County is 20 miles southwest of Beaumont, Texas. The site has 14 storage caverns, a combined storage capacity of 170 million barrels, and an inventory of 85 million barrels. The site is currently available for both fill and drawdown operations.

Construction to upgrade most of the major systems at Big Hill, including instrumentation and controls, piping configuration, electrical system, valves and oil pumps, was completed in September 1999. Demolition of obsolete equipment is scheduled for completion during the early part of 2000. Other remaining work includes site clean-up and system testing.

### **STATUS OF WEEKS ISLAND DECOMMISSIONING**

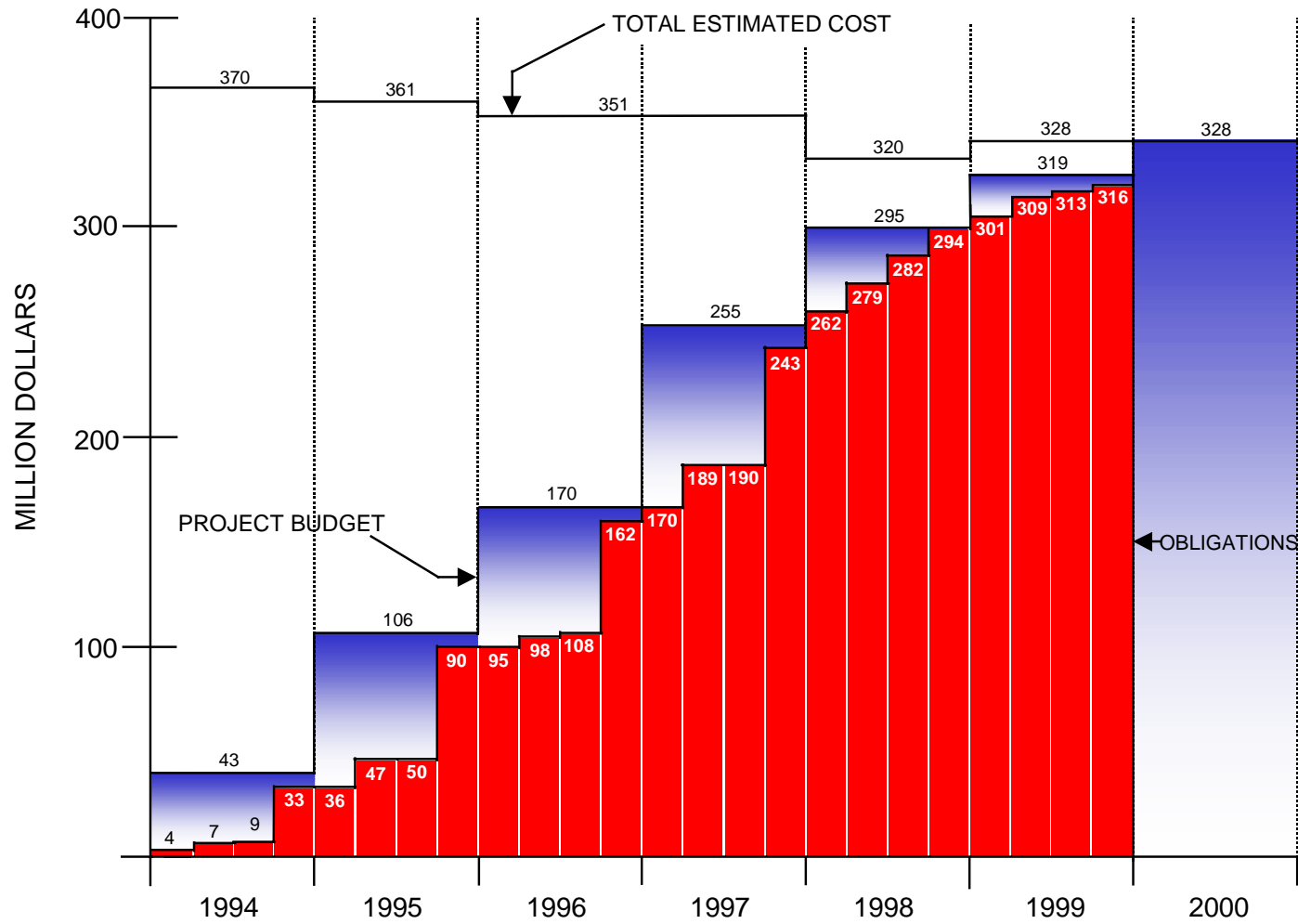
The Weeks Island site is located in Iberia Parish, approximately 95 miles southwest of New Orleans, Louisiana. This site was acquired in 1977 as a conventional salt mine and converted to an oil storage facility with a capacity of over 70 million barrels.

In December 1994, the Secretary of Energy announced the site's decommissioning. Technical problems posed a high risk of environmental damage and oil loss. This process began during 1995 and 1996 when most of the site's approximately 72 million barrel inventory was sold, or transferred to other sites. It involved removing the stored oil, filling the mine with brine to maintain stability, and skimming the remaining oil from the surface of the brine.

The 1997 oil skimming operation recovered over two million barrels of oil, leaving only oil that could not be recovered because of entrapment in the large volume of crushed salt residing on the mine floor, and in traps along the roof.

Major decommissioning activities ended on November 4, 1999, when the service and production shaft was demolished. The State of Louisiana agreed to the mine closure on September 3, 1999, and the Environmental Protection Agency concurred on November 2, 1999. The surface facilities will be salvaged, removed or abandoned in place, and the site will be transferred to the General Services Administration for disposition. Morton Salt Company owns the surrounding property and continues to mine salt. Formal mediation talks were successfully completed in 1998 and the Department agreed to assist Morton with the cost of mitigating risk in their operating shafts and safeguarding future mining operations.

**FIGURE 2**  
**1999 LIFE EXTENSION PROGRAM COST STATUS**



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**Life Extension: New Brine Tanks at West Hackberry Replace the Brine Pond**



**Life Extension: New Heat Exchangers at Big Hill Cool the Oil During Drawdown**





**Life Extension: New Brine Disposal Pumps at Bryan Mound Deliver Brine to the Gulf of Mexico During Oil Fill**



**Life Extension: New Water Injection Pumps at West Hackberry “Push” Oil from Storage Caverns During Drawdown**

### **CRUDE OIL ROYALTY-IN-KIND TRANSFER**

In February 1999, the Department of Energy and the Department of the Interior initiated a plan to increase the Strategic Petroleum Reserve inventory with crude oil royalties for production from leases of Federal land in the Gulf of Mexico.

Under this plan, various leaseholders are directed to pay a portion of their royalties in crude oil instead of cash payments to the United States Treasury (royalty-in-kind). The Department of Energy contracts with commercial entities to receive this oil at offshore production facilities and transfer it to the Strategic Petroleum Reserve, either directly or in exchange for other crude oil delivered.

The goal of the royalty-in-kind plan is to replace the 28 million barrels of oil that Congress directed the Department to sell in 1996 and 1997. However, since the transfer of the royalty oil involves contractor costs for transportation to the storage sites, and considers the differences in quality of the royalty oil and the oil delivered to the Strategic Petroleum Reserve, the total amount is expected to be approximately 26-27 million barrels.

Phase I of the royalty oil transfer plan began in April 1999, with the negotiation and execution of agreements with Equiva Trading Co., BP Oil Supply Co., and Exxon Co., USA, for the transfer or exchange, of about nine million barrels. Deliveries under this phase will be made by August 2000.

Phase II began on April 28, 1999, with a competitive solicitation to industry for exchange of additional quantities of Federal royalty oil for crude oil delivered to the Strategic Petroleum Reserve's storage sites. Offers were received on

May 25, 1999, and contracts were awarded on June 15, 1999 to Equiva Trading Co., Vastar Resources, Inc., Vitol S.A., Inc., and Mobil Supply, Trading and Transportation, for the delivery of 9.5 million barrels to the Bayou Choctaw and Big Hill storage sites from August 1, 1999, through February 29, 2000.

On November 4, 1999, the Strategic Petroleum Reserve issued another competitive solicitation to complete the contracting phase. On November 30, 1999, offers were received and on December 9, 1999, contracts awarded to Equiva Trading, Vitol and Koch Petroleum Group, L.P. for the delivery of 12.7 million barrels between February 1, 2000, and November 30, 2000.

As of December 31, 1999, contracts were awarded to assure the transfer of a total of 28 million barrels of royalty-in-kind oil to the Department of Energy's exchange partners.

### **CRUDE OIL INVENTORY STATUS**

As of December 31, 1999, the crude oil inventory was 567 million barrels. This fill level is an increase of six million barrels from the inventory held at the end of calendar year 1998, as a result of the Department resuming fill through an exchange of Federal royalty-in kind crude oil as explained above.

The current mix of crude oil is 64 percent high sulfur (sour) and 36 percent low sulfur (sweet).

Table 2 lists year-end inventories and average daily fill rates from 1977 through 1999 (by fiscal and calendar year). Table 3 lists crude oil receipts by country of origin since 1977. Table 4 identifies the location of the inventory by storage site, and Figure 3 illustrates the cumulative oil fill.

**TABLE 2**  
**YEAR-END INVENTORIES AND OIL FILL HISTORY**

	FISCAL YEAR		CALENDAR YEAR	
	Year-End Inventory (MMB)	Average Daily Fill Rate* (MB/D)	Year-End Inventory (MMB)	Average Daily Fill Rate* (MB/D)
1977	1.1	3	7.2	20
1978	49.1	131	68.5	168
1979	91.2	115	91.7	64
1980	92.8	4	107.8	44
1981	199.2	292	230.3	336
1982	277.9	215	293.8	174
1983	361.0	228	379.1	234
1984	431.1	191	450.5	195
1985	489.3	159	493.3	119
1986	506.4	47	511.6	51
1987	533.9	75	540.6	80
1988	554.7	57	559.5	52
1989	577.1	62	579.9	56
1990	589.6	34	585.7	27
1991	568.5	(58)	568.5	(47)
1992	571.4	8	574.7	17
1993	585.7	39	587.1	34
1994	591.7	16	591.7	13
1995	591.7	**	591.6	**
1996	573.6	(49)	565.8	(70)
1997	563.4	(28)	563.4	(7)
1998	563.4	**	561.1	***
1999	564.9	4	567.0	16

\* Fill rates adjusted for oil sales.

\*\* Fill suspended during this period

\*\*\* Decrease due to Maya exchange

**TABLE 3**  
**CRUDE OIL RECEIPTS THROUGH 1999**  
**(MILLION BARRELS)**

Source Country	1999	Cumulative	Percent of Total
Mexico	1.0	265.7	42.2
United Kingdom	1.3	149.5	23.7
United States*	1.4	49.5	7.9
Saudi Arabia		27.1	4.3
Libya		23.8	3.8
Iran		20.0	3.2
United Arab Emirates		18.4	2.9
Nigeria	0.5	15.7	2.5
Norway		11.9	1.9
Oman		9.0	1.4
Egypt		8.9	1.5
Ecuador		6.2	1.0
Algeria		6.2	1.0
Cameroon		3.4	0.5
Iraq		3.4	0.5
Gabon		2.4	0.4
Qatar		2.3	0.4
Columbia	1.2	1.2	0.2
Angola		1.0	0.2
Venezuela	2.5	3.5	0.6
Peru		0.4	0.1
Argentina		0.4	0.1
<b>TOTAL RECEIPTS**</b>	<b>8.1</b>	<b>629.9</b>	<b>100.0</b>

\* Includes receipts from offshore Gulf of Mexico.

\*\* Cumulative total receipts unadjusted for sales, exchanges and operational gains and losses.

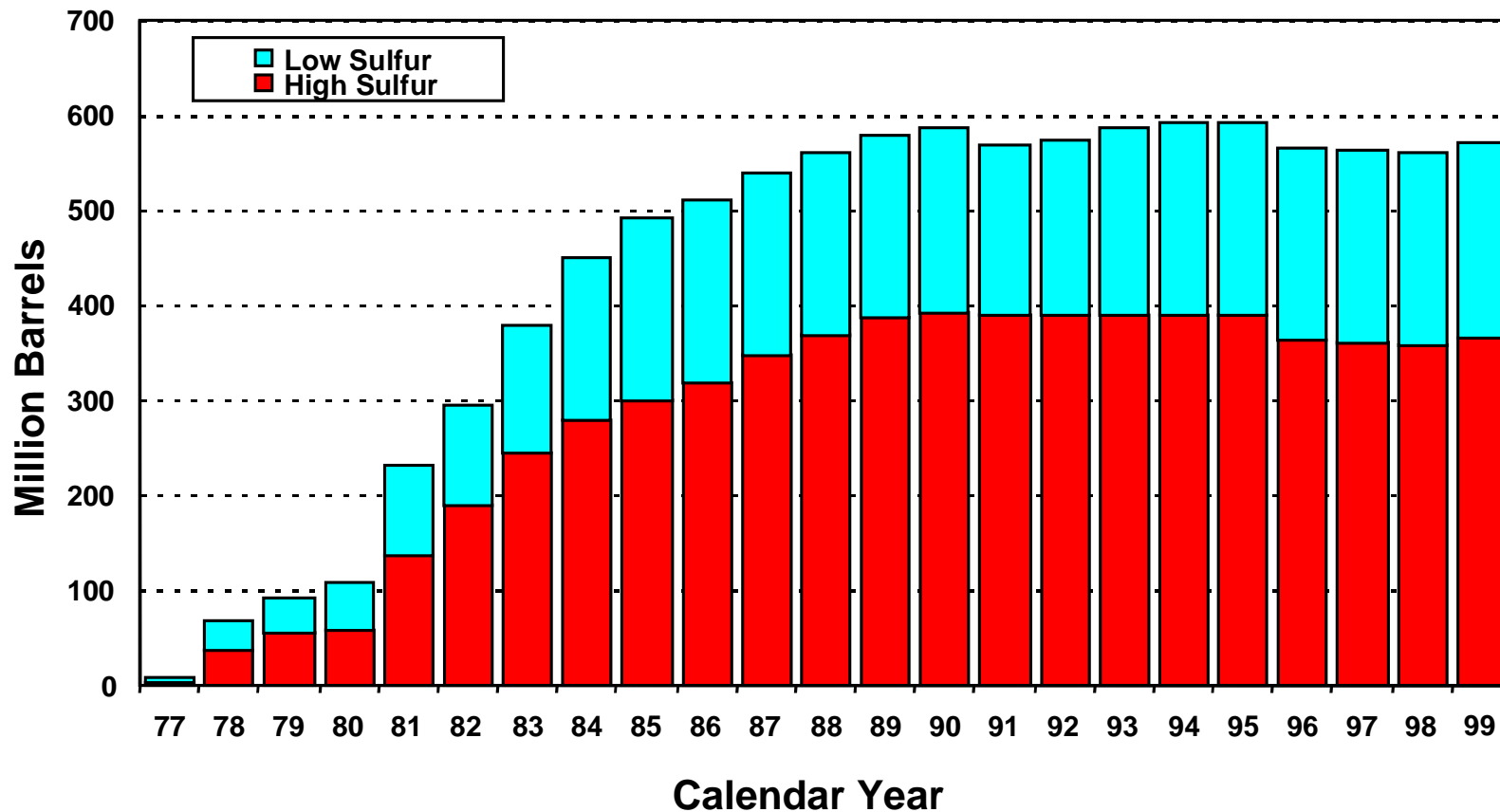
**TABLE 4**  
**STRATEGIC PETROLEUM RESERVE**  
**CRUDE OIL INVENTORY**  
**( December 31, 1999)**

Storage Site	Inventory (Millions of Barrels)			Cubic Meters (Millions)
	Sweet*	Sour**	Total	
Bryan Mound Brazoria County, Texas	62.2	152.2	214.4	34.1
Big Hill Jefferson County, Texas	18.8	66.5	85.3	13.6
West Hackberry Cameron Parish, Louisiana	103.9	89.4	193.3	30.7
Bayou Choctaw Iberville Parish, Louisiana	21.2	50.6	71.8	11.4
Subtotal Underground Inventory	206.0	358.7	564.7	89.8
Tanks and Pipelines	0.1	2.2	2.3	0.4
Total Inventory	206.110	360.9	567.0	90.1

\* Sulfur content not exceeding 0.5 percent

\*\* Sulfur content greater than 0.5 percent

**FIGURE 3  
CUMULATIVE OIL FILL**



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## **EMERGENCY RESPONSE CAPABILITIES**

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### **DRAWDOWN AND DISTRIBUTION PLAN**

The current method for distributing crude oil is described in the "Strategic Petroleum Reserve Drawdown (Distribution) Plan," Amendment Number 4 to the Strategic Petroleum Reserve Plan. The principal method for distributing oil is by price competitive sale. The sale is open to the largest possible universe of eligible buyers to ensure economically and operationally efficient distribution.

The Plan also provides for the Secretary of Energy to direct, in any calendar month, the distribution of up to 10 percent of the volume of oil sold in that calendar month. The price for such oil will be the average price of oil sold at the contemporaneous competitive sale, or at the most recent competitive sale if no contemporaneous competitive sale is held.

### **COMPETITIVE SALES PROCEDURES**

The Department's Standard Sales Provisions\* govern the competitive sales process. The first step in the process is the issuance of a Notice of Sale which identifies the volume, characteristics, and location of the petroleum for sale, delivery dates, and procedures for submitting offers. Measures required for assuring performance and financial responsibility are also described in the Notice of Sale.

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\* Department of Energy, 10 CFR Part 625, Price Competitive Sale of Strategic Petroleum Reserve Petroleum; Standard Sales Provisions. The most recent edition of the Standard Sales Provisions was published in the *Federal Register* on October 8, 1998 (63 FR 54196).

Over the course of a drawdown, several Notices of Sale may be issued, each covering a sales period of one to two months. Offerors may have only seven days from the date a Notice of Sale is issued until offers are due, and thirty days or less until purchasers must begin accepting delivery of the oil. A less compressed schedule may become more feasible in subsequent sales periods. Because of the possible short initial lead time, the Department maintains a list of prospective offerors who will receive all Notices of Sale and intends to make maximum use of electronic communication for Notice of Sale distribution.

The next step in the sales process is for prospective purchasers to submit offers, as specified in the Notice of Sale. Offerors must accept, unconditionally, all terms and conditions in the Notice of Sale, and offer at least the minimum price, if any is specified in the Notice of Sale, and submit an offer guarantee of 5 percent of the maximum potential contract amount, or \$10 million, whichever is less, and offer at least the minimum price if any is specified in the Notice of Sale. The offer evaluation process is structured so that the offerors bidding the highest prices determine the transportation methods, up to the limits of the distribution system. Specific delivery arrangements are negotiated later in the process.

All "apparently successful offerors" are required, within five business days of being notified, to provide a Letter of Credit equal to 100 percent of the contract amount as a guarantee of performance and payment of amounts due under the contract. Upon timely receipt of the financial guarantees, and a final determination by the Contracting Officer that offers are responsive and offerors responsible, Notices of Award are issued. Deliveries to the purchasers may then begin, consistent with their arrangements for commercial

pipeline or marine vessel transportation. Such deliveries may begin as soon as the 16th day of the sales process, to the extent that the purchasers submit their financial guarantees and can arrange timely transportation.

***HAWAII PURCHASES OF STRATEGIC PETROLEUM RESERVE CRUDE OIL***

On September 27, 1999, the Department entered into a memorandum of understanding with the State of Hawaii concerning the state's purchases of Strategic Petroleum Reserve crude oil at the time of a drawdown and sale. This agreement implements the provisions of the Energy Conservation Reauthorization Act of 1998, which amended the Energy Policy and Conservation Act to improve the State's ability to acquire oil from the Strategic Petroleum Reserve during a drawdown.

The agreement provides that:

- ▶ In addition to submitting a competitive bid, Hawaii, or its designated eligible entity, may submit a "binding offer" for Strategic Petroleum Reserve crude oil in the event of a Strategic Petroleum Reserve drawdown and sale. A "binding offer" is an offer that obligates the offeror to take title to the petroleum without further negotiation or recourse to withdraw the offer.
- ▶ The price for oil purchased by Hawaii through a binding offer will be the volumetrically weighted average price of the successful competitive offers for the applicable category of oil;
- ▶ At the request of the Governor of Hawaii, Strategic Petroleum Reserve oil purchased by Hawaii at a competitive sale or through a binding offer shall have priority in Strategic Petroleum Reserve scheduling of deliveries; and
- ▶ Hawaii may enter into exchange or processing agreements to permit delivery to other locations, if a petroleum product of similar value or quantity is delivered to the State.



**DRAWDOWN CAPABILITIES**

The crude oil acquired for the Strategic Petroleum Reserve is commingled in caverns at the storage sites, creating various distinct crude oil streams available for sale during a drawdown. Table 5 identifies these streams, delivery modes, and locations, as of December 31, 1999.

The Strategic Petroleum Reserve can be drawn down at an initial sustainable rate of 4.1 million barrels per day for a period of 90 days. After this period, the drawdown rate will decrease gradually as site inventories are depleted and the declining number of caverns containing crude oil becomes a constraint.

**TABLE 5  
CRUDE OIL STREAMS**

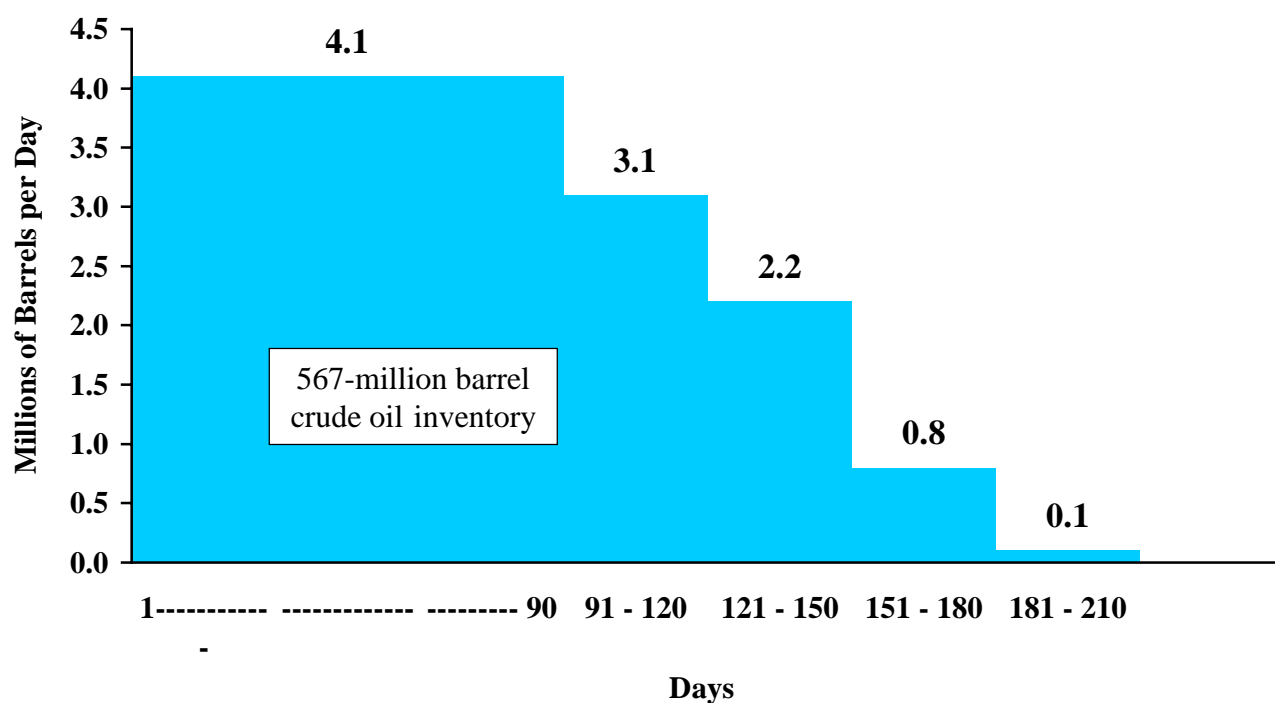
Crude Oil Stream	API Gravity	Sulfur Content	Delivery Mode and Location
<b>SEAWAY GROUP:</b>			
Bryan Mound Sweet	35.9	0.33	Pipeline or tankship at Seaway Terminal, Freeport, Texas; or Seaway Terminal, Texas City, Texas
Bryan Mound Sour	33.4	1.38	
<b>TEXOMA GROUP:</b>			
West Hackberry Sweet	37.0	0.29	Pipeline, tankship or barge at Sunoco Terminal, Nederland Texas;
West Hackberry Sour	33.5	1.41	Pipeline at Equilon-22"/DOE connection, Lake Charles, Louisiana
Big Hill Sweet	35.9	0.48	Pipeline, tankship or barge at Sunoco Terminal, Nederland, Texas;
Big Hill Sour	30.3	1.38	Pipeline or tankship at Unocal Terminal, Nederland, Texas; Pipeline at Equilon-20"/DOE connection, Winnie, Texas
<b>CAPLINE GROUP:</b>			
Bayou Choctaw Sweet	36.0	0.36	Pipeline at Capline or LOCAP Terminals, St. James, Louisiana;
Bayou Choctaw Sour	32.2	1.43	Tankship at Sugarland St. James Terminal, St. James, Louisiana Site Connection to Red Stick Pipeline, Iberville Parish, Louisiana

Figure 4 illustrates the physical drawdown capability, which provides for a distribution of 373 million barrels in 90 days, and 557 million barrels in 180 days.

The 1999 initial sustainable drawdown rate is 4.1 million barrels per day. This is higher than

the 1998 rate of 4.05 million barrels per day, and is attributable to the finalization of life extension activities at Bayou Choctaw, and the increased inventory resulting from royalty-in-kind receipts. The initial sustainable drawdown capability will ultimately stabilize at 4.42 million barrels per day, when the currently available capacity is filled.

**FIGURE 4  
STRATEGIC PETROLEUM RESERVE  
MAXIMUM DRAWDOWN CAPABILITY  
(December 31, 1999)**



Note: Rates after 90 days are based on cavern-use assumptions. Actual rates are contingent on the specific caverns drawn down during a previous drawdown period.

**DRAWDOWN READINESS ACTIVITIES**

Drawdown readiness assurance activities during 1999, included:

- ▶ Developing plans for Eagle I, an exercise involving the entire Strategic Petroleum Reserve organization in the performance of all the functions associated with drawdown and sales procedures.
- ▶ Analyzing and updating the drawdown and distribution capabilities to reflect improvements from completed life extension activities.
- ▶ Demonstrating Bryan Mound’s improved drawdown system capability, resulting from the Life Extension Program, by testing a physical oil movement.
- ▶ Conducting periodic assessments of the readiness and availability of all functions, facilities, and systems associated with a drawdown.

**DISTRIBUTION PLAN AND CAPABILITIES**

The Strategic Petroleum Reserve is connected to both commercial pipeline systems and marine terminals for crude oil distribution to U.S. refiners in the event of an energy emergency. The drawdown and distribution capabilities are summarized in Table 6. These capabilities are based on the current crude oil stream inventories, the existing site drawdown systems, and commercial distribution capabilities.

The Strategic Petroleum Reserve can access 21 refiners on the Gulf Coast and 28 refiners in the Midcontinent and Midwest, respectively, via local and interstate pipelines. These 49 refiners comprise approximately 50 percent of the total United States refining capacity, and 55 percent of oil imports.

**TABLE 6  
DRAWDOWN AND DISTRIBUTION CAPABILITIES  
(THOUSANDS OF BARRELS PER DAY)**

	Drawdown	Distribution
Seaway Group	1,500	2,243
Texoma Group	2,085	3,197
Capline Group	515	1,480
<b>TOTAL</b>	<b>4,100</b>	<b>6,921</b>

The Strategic Petroleum Reserve is also connected to five marine terminals for waterborne distribution: Seaway (Phillips) Terminal in Freeport, Texas; Seaway (ARCO) Terminal in Texas City, Texas; Sunoco and Unocal Terminals in Nederland, Texas; and Sugarland the St. James Terminal in St. James, Louisiana. These terminals have a total of 13 tanker berths and three barge berths, and a combined distribution capacity of approximately 2.5 million barrels per day. Figure 5 illustrates the Strategic Petroleum Reserve's pipeline and marine distribution capabilities

### ***DISTRIBUTION ASSESSMENT***

A comprehensive annual assessment is made of the present and projected capabilities of the commercial pipeline distribution systems to distribute the Strategic Petroleum Reserve's crude oil to the refining industry in the event of a drawdown. It verifies that there are adequate connections to the commercial distribution systems, and identifies any remedial plans, if appropriate.

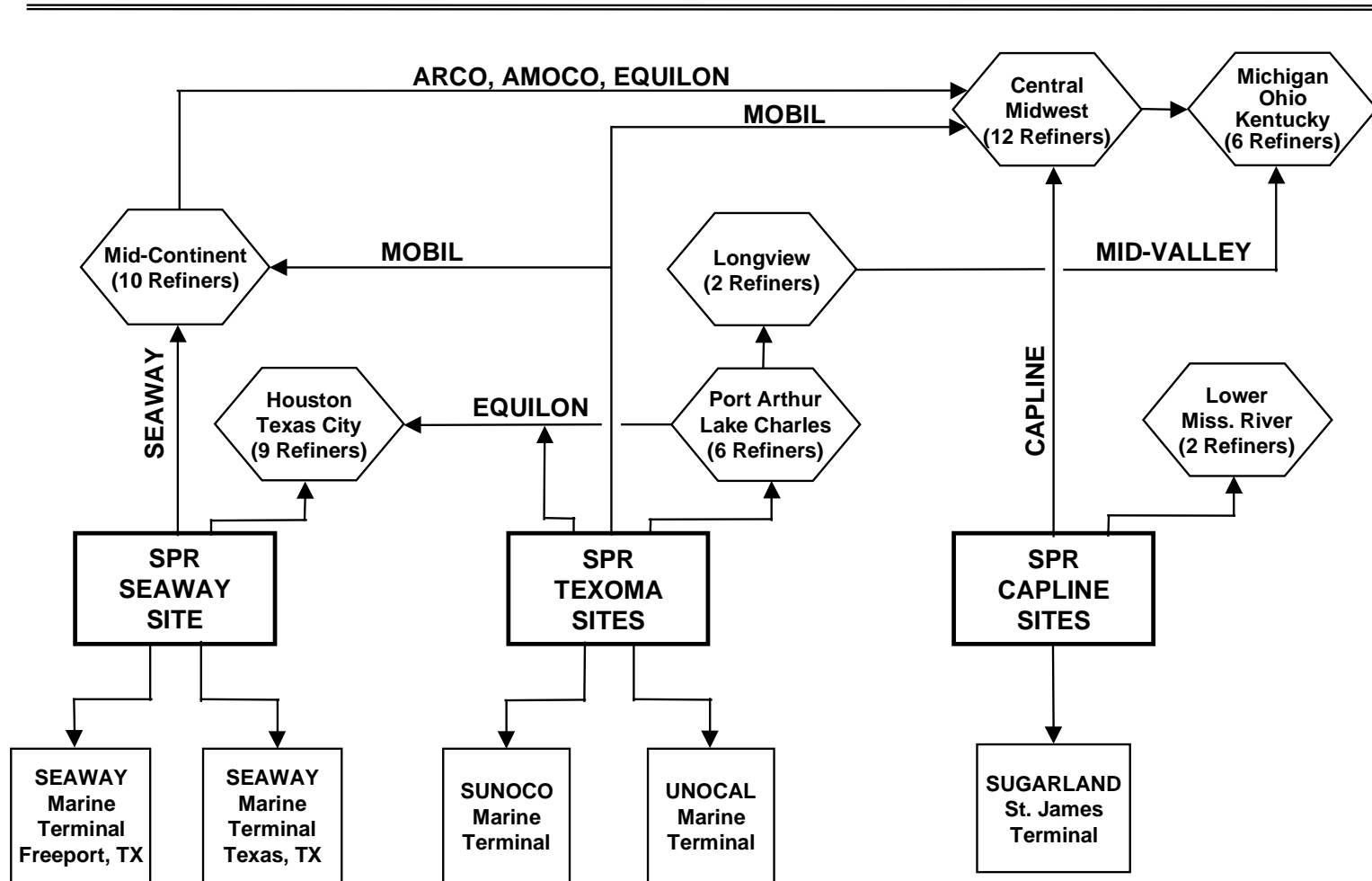
The assessment evaluates the Strategic Petroleum Reserve's capability to sustain its maximum drawdown rate in 1998, 2000, 2005 and 2010, based on future U.S. petroleum refining demands as forecasted in EIA's *Annual Energy Outlook, 1999*.

The analysis incorporates numerous changes made in the last few years to commercial pipeline distribution systems. Several pipeline systems increased pipeline capacity and/or announced plans to increase crude transmission capacity. The Seaway pipeline (to Cushing, Oklahoma), the Mobil 20-inch pipeline system, the Exxon pipeline system to its Baton Rouge, Louisiana, refinery, and the Equilon 22-inch pipeline across southern Louisiana, have increased system capacity.

A new pipeline from Sugarland Terminal on the Mississippi River to Texas City, Texas, is proposed and, similar to several of the previously mentioned systems, is in response to the potential for large increases in production of offshore oil currently being discovered in the deep water trends.

Finally, the assessment confirms that the Strategic Petroleum Reserve has sufficient offsite distribution capabilities (defined as 120 percent of the maximum drawdown rate) to achieve the current, and year 2000, drawdown rates.

**FIGURE 5  
PIPELINE AND MARINE DISTRIBUTION CAPABILITIES**



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**EMERGENCY RESPONSE CAPABILITIES**

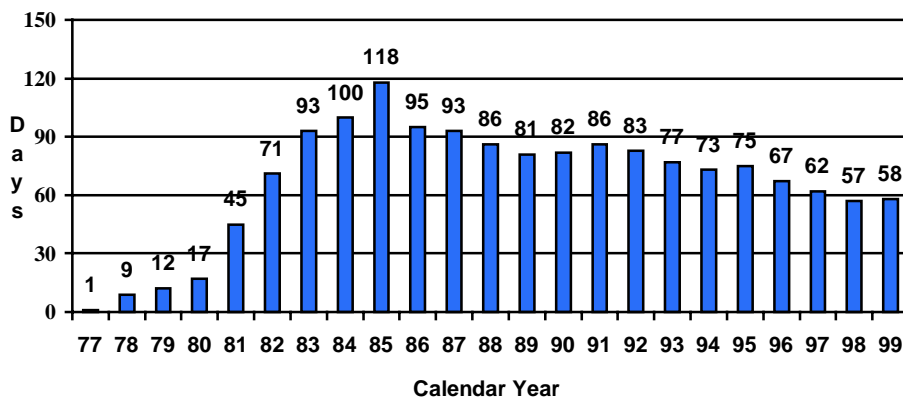
In EPCA, Congress specified an initial storage objective equal to 90 days of net petroleum imports. In 1976, this equated to a 500 million barrel Strategic Petroleum Reserve.

As of December 31, 1999, the inventory of crude oil was approximately 567 million barrels. This

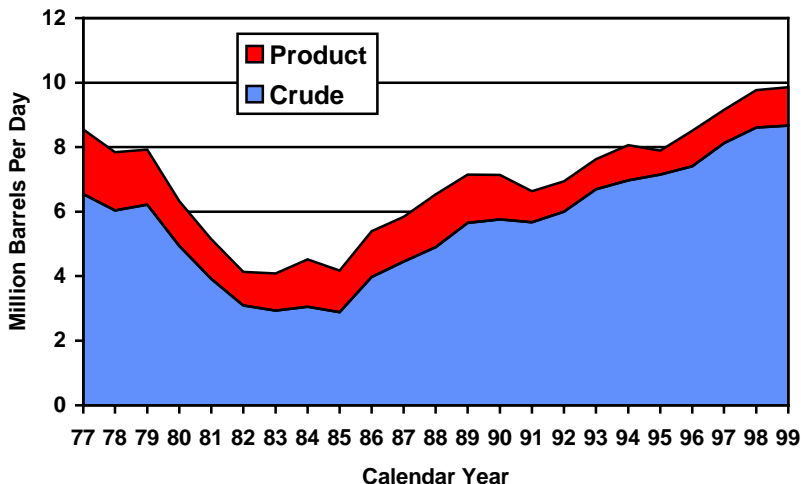
stockpile provides an import protection level of 58 days, based on the U.S. net import rate for crude and petroleum products during 1999.

As shown in Figure 6, the level of net import protection has continued to decline over the last thirteen years, due to the increasing U.S. dependence on oil imports, depicted in Figure 7.

**FIGURE 6  
DAYS OF NET IMPORT PROTECTION (1977 - 1999)**



**FIGURE 7  
U.S. NET CRUDE AND PRODUCT IMPORTS (1977 - 1999)**



The United States, as a member nation of the International Energy Agency, is committed to maintaining stocks of crude and products in reserves sufficient to sustain consumption for at least 90 days with no net oil imports. Computations of member stocks are based on both public and privately-held stocks, and net imports are defined as the average daily level in the previous year. The most recent International Energy Agency computation credits the United States with 143 days of emergency reserves, including both the Strategic Petroleum Reserve and privately held stocks.

## **COMMERCIALIZATION ACTIVITIES**

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### **DEPARTMENT POLICY AND OBJECTIVES**

Section 159 (f)(D) of EPCA gives the Secretary of Energy statutory authority to “use, lease, maintain, sell or otherwise dispose of storage and related facilities.” EPCA was amended by the Balanced Budget Act of 1997 (Public Law 105-33) to provide the Secretary with the explicit authority to lease unused storage capacity within the Strategic Petroleum Reserve to foreign governments. The leasing authority for the storage of either foreign or commercial customers promotes world oil stockpiling, contributing to both the United States and world energy security.

Underutilized distribution facilities have been leased or outgranted since 1995. The government contracts for the leases require that the facilities be maintained in good condition, and give it priority for the emergency drawdown of oil from the Strategic Petroleum Reserve on fifteen (15) days’ notice.

### **COMMERCIAL LEASES OF DISTRIBUTION FACILITIES**

Over the last four years, the Strategic Petroleum Reserve leased the St. James Marine Terminal and three of its five major crude oil pipelines to industry for commercial crude oil operations.

#### **ST. JAMES TERMINAL**

Constructed in 1980, the St. James Terminal has six storage tanks and two tanker docks located on the west bank of the Mississippi River at St. James, Louisiana.

The St. James Terminal was leased to Shell Pipe Line Corporation (now Equilon Pipeline Company) on January 31, 1997, on a revenue-sharing basis. The leasing of this facility provided an annual operational cost savings of \$6-\$7 million per year. The United States Treasury received \$550,264 in lease revenues from the terminal.

#### **BAYOU CHOCTAW PIPELINE**

The Bayou Choctaw pipeline is a 37-mile, 36-inch pipeline extending from the Bayou Choctaw storage facility in Plaquemine, Louisiana to marine facilities in St. James.

The pipeline was leased to Shell Pipe Line Corporation (now Equilon Pipeline Company) on May 1, 1997, on a revenue-sharing basis. In 1998, the Department modified the lease from a year-to-year to a 10-year lease, and Equilon initiated the construction of a 17-mile extension to the pipeline for crude movements to the Baton Rouge area. The United States Treasury received \$160,707 in lease revenues from the pipeline.

#### **BIG HILL PIPELINE**

The Big Hill pipeline is a 24.4-mile, 36-inch pipeline extending from the Big Hill storage facility near Winnie, Texas, to marine facilities in Nederland, Texas.

A 7.5 mile segment of this pipeline was leased to Texaco Pipe Line Incorporated (now Equilon Pipeline Company) on October 15, 1997, under a 75 percent capacity lease contract. The United States Treasury received \$400,000 in lease revenues from the pipeline.



## **BRYAN MOUND PIPELINES**

The Bryan Mound storage site has three connecting pipelines: a 46-mile, 40-inch pipeline to Texas City; a 4-mile, 30-inch pipeline to Seaway's Jones Creek Tank Farm; and a 3.9-mile, 30-inch pipeline to Seaway's marine docks at Freeport, Texas.

During the first six months of 1999, the Bryan Mound pipelines were leased to the Seaway Pipeline Company and used to move crude oil from Seaway's Texas City facility to its Jones Creek facility while its storage tanks were out of service for maintenance.

A long-term lease (10+ year) was also awarded to Exxon Pipeline Company to use the Texas City and Jones Creek pipeline segments, starting in July 2000, as part of its onshore distribution system for Exxon's Diana-Hoover production in the Gulf of Mexico. Lease revenues of \$674,172 were received from the pipeline. The United States Treasury received \$150,000, and \$524,172 was paid in oil.

## **WEST HACKBERRY PIPELINES**

The West Hackberry storage site has two connecting pipelines: a 42.8-mile, 42-inch pipeline from the West Hackberry storage site to Nederland, Texas, and a 13.6-mile, 36-inch pipeline from the West Hackberry storage site to Lake Charles, Louisiana. Neither pipeline is leased due to lack of industry interest in these facilities.

## **FOREIGN OIL STORAGE**

The Big Hill storage site obtained foreign trade zone subzone status on September 28, 1998. A foreign trade zone is a site within the United States, in or near a United States Customs port of entry, where foreign and domestic merchandise is considered to be in international commerce. The designation permits customers to store oil without paying customs fees and certain taxes, and is expected to enhance the Department's offer to store oil for foreign governments, or their representatives. The Department of Energy is the first government entity to receive foreign trade zone status for one of its facilities.

The Big Hill storage facility has the capacity to store 170 million barrels of crude oil and currently contains 85 million barrels of oil. The unused storage space could generate revenue for the U.S. Treasury, add oil to the Strategic Petroleum Reserve (in lieu of a fee), and increase world oil stockpiling.

In 1999, the Department pursued foreign and commercial storage initiatives to acquire oil in lieu of payment. On February 17, 1999, the Department issued a solicitation for commercial oil storage, offering to store up to 70 million barrels at the Big Hill site in exchange for payment in crude oil. The Department received several offers and conducted discussions with each offeror, however, storage proposals were not acceptable, and in March 1999, the Department suspended its solicitation and rejected all offers for commercial storage.

## **BUDGET AND FINANCE**

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The Department of the Interior and Related Agencies Appropriations Act, 1999, provided \$160.1 million for Strategic Petroleum Reserve facilities operations and Management. Appendix C of the Consolidated Appropriations Act, 2000, included \$159 million for Strategic Petroleum Reserve facilities, operation and Management.

### **APPROPRIATIONS THROUGH FISCAL YEAR 1999**

A total amount of \$21.3 billion, net of sales and transfers, has been appropriated for the Strategic Petroleum Reserve through fiscal year 1999. Included in this total is the distribution of annual and total appropriations described in Table 7. Figure 8 illustrates the cumulative appropriations for storage facilities operations and management, as well as petroleum acquisition and transportation.

### **STRATEGIC PETROLEUM RESERVE ACCOUNT**

The Strategic Petroleum Reserve Account funds the development, operation, and maintenance of Reserve facilities; the salaries and expenses necessary to plan and manage the program, including the operation of the Project Management Office in New Orleans, Louisiana; and the activities pertinent to major issues concerning the development and use of the Strategic Petroleum Reserve.

Obligations for the Strategic Petroleum Reserve in fiscal year 1999 totaled approximately \$177.7 million. From this amount, \$15.3 million was

obligated for federal program management salaries and benefits, and \$162.4 million was obligated for contractual goods and services to operate and maintain the Strategic Petroleum Reserve.

### **SPR PETROLEUM ACCOUNT**

The SPR Petroleum Account funds the acquisition of oil for the Strategic Petroleum Reserve; the associated costs for transportation and terminalling; United States customs duties, Superfund and Oil Spill Liabilities Trust Fund taxes; and other miscellaneous costs, such as Defense Energy Support Center administration costs associated with non-emergency sales, as well as oil acquisition, and transportation support. During an emergency drawdown and sale, the SPR Petroleum Account is the source of funding for the incremental costs of withdrawing oil from the storage caverns and transporting it to the point where purchasers take title. During an emergency drawdown and sale, an amount equal to Federal receipts realized is deposited in the SPR Petroleum Account to create additional budget authority for filling the Reserve. At the end of fiscal year 1999, approximately \$32 million remained available for obligation in the Account, an amount sufficient to finance approximately 60% of the incremental costs of a six-month emergency drawdown.

The capitalized cost for the oil in the Strategic Petroleum Reserve at the end of fiscal year 1999 was \$15 billion, for an average cost per barrel of approximately \$27. The cost for the Department of Defense inventory was \$125 million, for an average cost per barrel of \$19.32.

**TABLE 7**  
**ANNUAL APPROPRIATIONS FOR STORAGE FACILITIES OPERATIONS AND**  
**MANAGEMENT AND PETROLEUM ACQUISITION AND TRANSPORTATION**

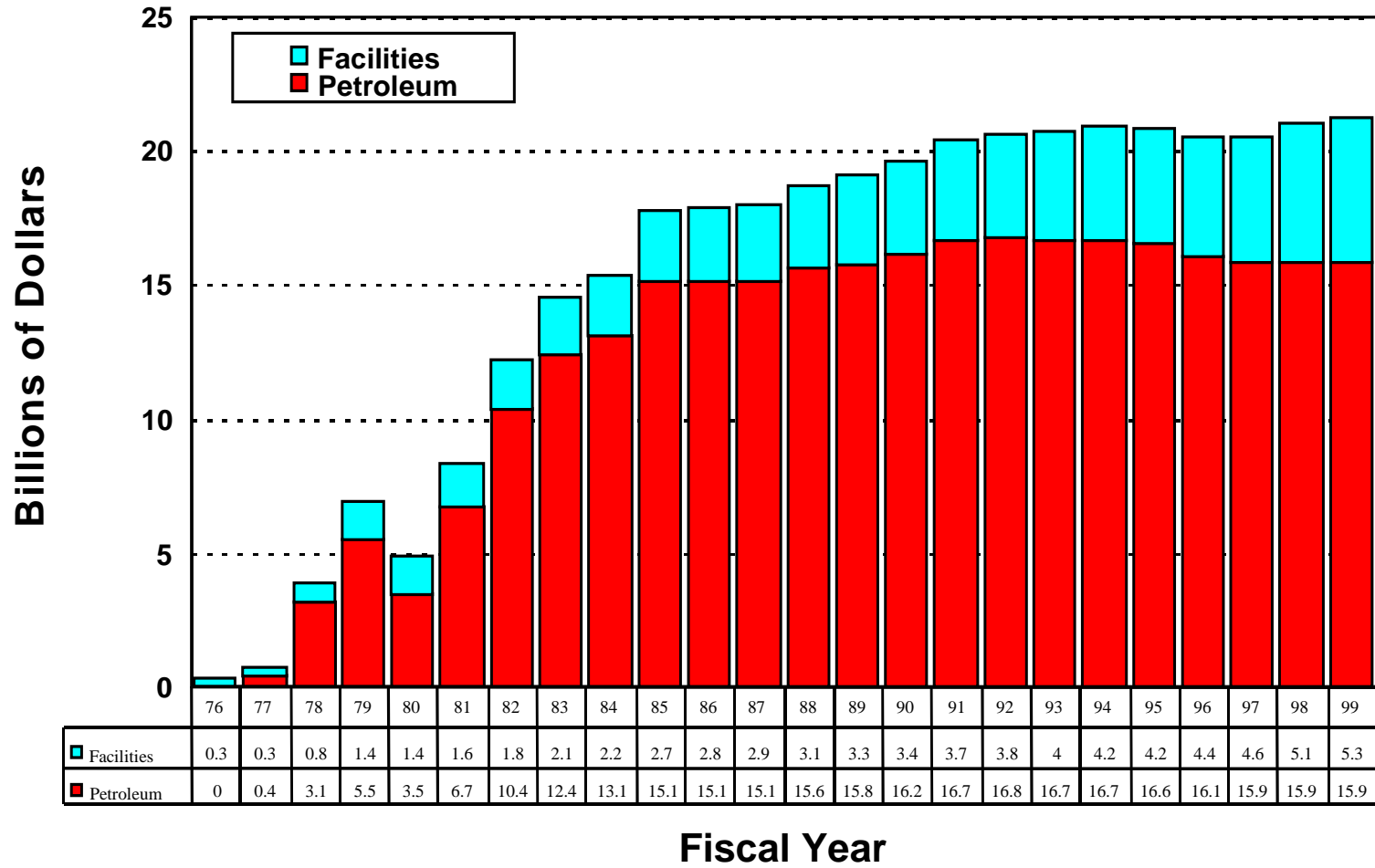
Fiscal Year	Oil Account	Facilities	Management	Total	Defense SPR
1976	0	300,000	13,975	313,975	
1977	440,000	0	7,824	447,824	
1978	2,703,469	463,933	14,704	3,182,106	
Total 1979 Appropriations*	2,356,456	632,504	18,111	3,007,071	
Total 1980 Appropriations*	(2,022,272)	0	22,272	(2,000,000)	
Total 1981 Appropriations*	3,205,094	108,168	19,391	3,332,653	
Total 1982 Appropriations*	3,679,700	175,656	20,076	3,875,432	
1983	2,074,060	222,528	19,590	2,316,178	
1984	650,000	142,357	16,413	808,770	
1985	2,049,550	441,300	17,890	2,508,740	
Total 1986*	(12,964)	106,979	13,518	107,533	
1987	0	134,021	13,412	147,433	
1988	438,744	151,886	12,276	602,906	
1989	242,000	160,021	13,400	415,421	
1990	371,916	179,530	12,953	564,399	
1991	566,318	187,728	12,846	766,892	
1992	88,413	171,678	13,384	273,475	
1993	(125,625)	161,940	14,227	50,542	
DOD Transfer (non add)	124,925	700	0	125,625	125,625
1994	0	191,035	15,775	206,810	
1995	<u>(107,764)</u>	<u>226,938</u>	<u>16,780</u>	<u>135,954</u>	
1996 transfer from SPR Petroleum Account	(187,000)	170,173	16,827	0	
1996 Weeks Is. Oil Sale	(97,114)	97,114	0		
1996 deficit reduction oil sale	<u>(227,000)</u>	<u>0</u>		<u>(227,000)</u>	
1996 Total	<u>(511,114)</u>	<u>267,287</u>	16,827	<u>(227,000)</u>	
1997 Total*	(220,000)	(193,000)	(16,000)	(11,000)	
1998	0	191,500	16,000	207,500	
1999	0	145,120	14,805	159,925	

\* Includes reprogramming and rescission actions.

Note: FY 1991 SPR Petroleum Account of \$566,318 includes proceeds of \$122,681 from the Test Sale authorized by the President on September 26, 1990, pursuant to the EPCA authorities enacted September 15, 1990, in P.L. 101-383. These proceeds are recorded as additional budget authority rather than reductions to obligations, costs, and outlays. It also includes \$315,424,985 in Desert Storm Drawdown proceeds and \$19,755,064 from FY 1991 NPR excess receipts. Thus the cumulative budget authority is "gross" and not related directly to the inventory of oil on hand.

Data as of December 31, 1999

**FIGURE 8  
CUMULATIVE FUNDING**



**COMMERCIALIZATION REVENUES**

The Strategic Petroleum Reserve generated \$1,785,143 in revenues for the United States Treasury from leases of distribution facilities. See Table 8 below.

**TABLE 8  
SUMMARY OF COMMERCIALIZATION REVENUES  
(December 31, 1999)**

FACILITY OR ASSET	1996	1997	1998	1999
St. James Terminal	No Lease	\$133,300	\$481,010	\$550,264
Bayou Choctaw Pipeline	No Lease	0	0	\$160,707
Big Hill Pipeline	\$472,809	\$429,824	\$402,525	\$400,000
Bryan Mound Pipelines	\$102,606	No Lease	No Lease	\$674,172
Total Revenue	\$575,415	\$563,124	\$883,535	\$1,785,143

Notes:

Bryan Mound crude pipelines were first leased to Seaway Pipeline Company in May 1996, and again in December 1998 (short term); leased to Exxon in January 1999.

Big Hill crude pipeline was leased to Texaco Pipe Line Inc. on May 15, 1996.

St. James Terminal was leased to Shell Pipeline Company on January 31, 1997.

Bayou Choctaw crude pipeline was leased to Shell Pipeline Co. on May 1, 1997.

Big Hill crude pipeline was released to Texaco Pipe Line Inc. on October 15, 1997.

**PERFORMANCE MEASUREMENT**

Federal agencies are required to prepare annual performance plans (Government Performance and Results Act of 1993). The Strategic Petroleum

Reserve incorporated its mandates into its performance management system, and successfully met or exceeded 19 of the 21 targets for performance measurement.

PERFORMANCE MEASURE	FY 1999 TARGET	FY 1999 ACTUAL	COMMENTS
Total capacity at four sites.	700 MMB	700 MMB	Met target
Distribution Rate	≥ 120% of drawdown rate	158%	Exceeded target
Percent of Life Extension Program under contract	96%	96%	Obligated an additional \$21M of the \$328M Total Estimated Cost. Brings cumulative obligations for the program to \$316M
Drawdown Rate	4.01 MMB/Day	4.1 MMB/Day	With completion of LEP projects at Bayou Choctaw, and initial receipt of Royalty in Kind oil, increased initial 90-day drawdown rate from 4.05 to 4.1 MMB/Day
Calculated predicted site availability	> 95%	96%	Met target
Weighted annual average of the quality of Preventive Maintenance, Maintenance Support, Engineered Maintenance Standards, Scheduling Effectiveness, Productivity, Preventive Maintenance completion and Corrective Maintenance backlog	≥ 95% of possible points on Maintenance Performance Appraisal Report	95.7%	Met target
Weighted annual average of the performance elements of Material Performance Appraisal Compilation.	≥ 95 Points	96.1 Points	Met target
Recovery equipment testing	95% Test Objectives	Not Applicable	No recovery tests were conducted this fiscal year.
Percent of: - Trained Emergency Response Team members at each site. - Operational spill response equipment available. Primary or secondary fire response equipment available.	95% 95% 95%	108% 99.8% 96.6%	Exceeded targets
Percent of site security survey ratings that are satisfactory.	100%	100%	Met target

PERFORMANCE MEASURE	FY 1999 TARGET	FY 1999 ACTUAL	COMMENTS
Oil inventory available	561 MMB	564.9 MMB	Subsequent to the exchange of Maya crude oil and decommissioning of Weeks Island, the inventory was increased by 4.9 MMB due to addition of Royalty in Kind oil.
Variance between oil sent and oil received during oil movements (accountability)	≤ 0.4%	0.2 %	Met target
Percentage of crude oil samples meeting specifications	≥ 95%	99.89%	Met target
Number of Notice of violations received.	≤ 5-year moving average (Numeric target < 1)	0	Met target
Number of reportable oil & brine spills.	≤ 5-year moving average (Numeric target < 5.2)	3	Met target
Hazardous waste volume	4,000 LBS	6,678 LBS	In FY 1999, 39.5% (2,637 lbs.) of generated hazardous waste was a result of Life Extension activities. Also, a one-time disposal of old paint (792 lbs.) contributed to the excess of the established target.
Lost workday case rate for M&O contractor	≤ 1.5 cases per 200,000 worker hours	1.2 cases	Met target.
Lost workdays per case for M&O contractor (accountability)	≤ 39 days per 200,000 worker hours	76.4 days	There were nine injuries during FY99 that accounted for this anomaly in lost workdays per case.
Documented accomplishments in the Business Management Oversight Program, M&O Award Fee Evaluation Process and Annual Assurance Memorandum	Able to achieve economies and efficiencies in project planning and control, procurement, information technology, financial management, internal audits, human resources and quality management.	Economies/ efficiencies achieved.	No major issues surfaced in the Business Management Oversight Program. M&O contractor's overall performance rated Very Good. The management review conducted as part of the FY 1999 Assurance Memorandum reflected management controls working effectively.

## **OTHER ACTIVITIES**

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### **ORGANIZATIONAL IMPROVEMENT ACTIVITIES**

The Strategic Petroleum Reserve continued to build on its previous accomplishments in organization and continuous quality improvement.

The Program Office won a Department of Energy Performance Excellence Award in the Champion category. The award is based on the Malcolm Baldrige National Quality Award Criteria. All levels of the organization worked on improvement projects, many of which originated from feedback reports from quality award applications.

The Customer Service Team began an initiative to focus on oil customers in order to improve working relations with them.

### **MAJOR IMPROVEMENT INITIATIVES**

The Energy Performance Excellence Award application afforded an opportunity to make improvements in processes.

Similarly, the Project Management Office identified ten processes for improvement based on feedback from the Energy and Louisiana Quality Awards. Seven were completed 1999.

The Project Management Office issued a quality policy statement:

*“The Strategic Petroleum Reserve is committed to demonstrating and promoting excellence and continually improving processes, products, and services to better satisfy our customers’ needs and requirements.”*

The Malcolm Baldrige National Quality Award Criteria and the International Organization for

Standardization's (ISO) 9001 standards for Quality Management Systems are the bases for continuously improving organizational effectiveness,

DynMcDermott implemented ISO 9001 (Quality Management Systems) and ISO 14001 (Environmental Management Systems) and plans to obtain certification by a third-party registrar for both ISO 9001 and ISO 14001 in 2000.

### **CUSTOMER SERVICE INITIATIVES**

The Strategic Petroleum Reserve continued to expand customer outreach efforts. The Project Management Office developed two drawdown and distribution models that have drawn much interest at conferences, trade shows, and Department headquarters, and exhibited the models at the Offshore Technology Conference in Houston in May 1999.

The Customer Service Team is identifying customers that are most likely to purchase oil in an energy emergency. Small teams will visit potential customers to establish relations with them and explore how they can best be served.

### **SIXTH ANNUAL QUALITY EXPO**

The Strategic Petroleum Reserve sponsored its Sixth Annual Quality EXPO on November 9-10, 1999, in New Orleans -- "Continuous Quality Improvement - Leading Change into the New Millennium.”

The Strategic Petroleum Reserve, DynMcDermott, Defense Contract Management Command, and Sandia National Laboratories, exhibited thirty-two improvement projects.



DynMcDermott and the four sites submitted applications for internal awards based on the Malcolm Baldrige National Quality Award Criteria. These were evaluated by DynMcDermott personnel who have experience as quality award examiners. Different levels of awards were presented to each directorate and site, and to the winners of quality improvement team competitions held at the EXPO.

#### **QUALITY ASSURANCE**

The Project Management Office completed a Contractor Performance Award Evaluation Implementation Plan and revised its internal order for site management appraisals. It then conducted a management appraisal of the Bayou Choctaw site.

The quality assurance group also oversaw independent audits of construction management, unclassified computer security, architect and engineering services, and the operation and maintenance of crude oil vapor pressure measurement during the year.

#### **QUALITY AWARD EXAMINERS**

Employees of the Strategic Petroleum Reserve and DynMcDermott were quality award examiners again in 1999. Two employees were examiners for the Presidential Quality Award, the federal government's equivalent of the Malcolm Baldrige National Quality Award, and several served as examiners for the Energy Performance Excellence Awards and the Louisiana Quality Award.

## **ENVIRONMENT, SAFETY, AND HEALTH**

The Strategic Petroleum Reserve verified and strengthened the Integrated Safety Management (ISM) System, implemented in 1998. This system addresses how work is managed and performed and its objectives are to weave environmental, safety, and health considerations into management and work practices at all levels. Verification involved adapting a pre-existing on-site management appraisal process.

Teams of Federal personnel conducted intensive week-long appraisals of DynMcDermott, the Management and Operating contractor, at its New Orleans headquarters and at each storage site. DynMcDermott reported its first annual verification in September 1999, after conducting its own site-by-site assessments. Based on a review of its annual verification report, and its on-site assessments against the Department's ISM implementation criteria. Department of Energy line management concluded that it is managing the Strategic Petroleum Reserve in accordance with all ISM guiding principles and core functions.

The Strategic Petroleum Reserve's Behavioral Safety Program is the foundation for ISM implementation. In the second full year of this program, contractor personnel at the sites exhibited safe behaviors 95 percent of the time as determined by observations by fellow workers. There was only one serious injury out of 25,000 permitted work activities. This was a non-fatal electrical accident at Big Hill where a subcontractor employee was hurt. An Expanded Type C accident investigation was performed and a report was issued in July. All corrective actions are complete.

During the year, the Strategic Petroleum Reserve achieved a significant milestone in its ergonomic program with the completion of an ergonomic assessment. This effort grew out of an Occupational Safety and Health Administration

finding that 43.1 percent of on-the-job injuries, between 1991-1997, were ergonomic. Outside experts analyzed field and office workstations at all sites, job-specific findings were ranked by risk, and recommendations were made. All critical and marginal risks will be addressed in fiscal year 2000, and other lower risks in fiscal year 2001.

Routine operations and facility and equipment repairs, replacements, or upgrades planned for 1999 were reviewed throughout the year for environmental consequences to determine if they required further review under the National Environmental Policy Act (NEPA). One proposed action required an Environmental Assessment (EA). In March 1999, an EA was prepared for Big Hill Facility Storage of Commercial Crude Oil Project (DOE/EA-1289) and a Finding of No Significant Impact was issued. This EA supported a proposed action to lease up to 70 million barrels of unused Big Hill storage capacity to other parties for crude oil storage.

The EA concluded that impacts would not be materially different in nature or degree from those currently experienced under permitted operations, and were already covered under existing NEPA documentation. The proposed action, however, was withdrawn until such time when market conditions become favorable.

The Environmental Protection Agency (EPA) reviewed the environmental management system during visits to New Orleans, Bryan Mound, and Bayou Choctaw, against the disciplines and requirements of ISO 14001. EPA concluded that the Strategic Petroleum Reserve has a formalized system that works well.

Pollution prevention is an integral part of routine activities, including inventory management, maintenance, procurement, warehousing, property management, finance, budgeting, and engineering.

An important element of the environmental management system is its pollution prevention program, including waste minimization, and recycling. A significant achievement in 1999 was the bioremediation of an area of oil-contaminated soil at West Hackberry. The contaminated soil was excavated and placed in a pit and treated with a suspension of microorganisms, enzymes, and surfactants. In about a month, the oil was reduced to carbon dioxide and water. Based on this experience, Louisiana approved using the same approach on oil-contaminated soil at St. James Terminal.

For the year, the Strategic Petroleum Reserve reported a total of 9,072 pounds of hazardous waste, exceeding its hazardous waste reduction goals. This was due primarily to the quantity of solvent-based paints used in life extension construction and maintenance which accounted for more than 80 percent of reported wastes. In contrast, paper recycling continued to be successful, surpassing targets, and pollution prevention continued to contribute savings to operating costs.

Groundwater has been monitored for salinity and hydrocarbons at Bayou Choctaw, Big Hill, Bryan Mound, and West Hackberry for many years. Groundwater monitoring for hydrocarbons was added at Weeks Island as part of decommissioning and will continue for five years. To date, there has been no detectable hydrocarbon contamination in the groundwater at any site.

At West Hackberry, groundwater remediation has been ongoing since 1995 to correct contamination from a leaking brine pond. For the four-year period, 1995–1998, groundwater recovery operations stabilized the shape and extent of the salinity plume within site boundaries. In 1999, the brine pond was replaced by aboveground tanks as part of life extension. This eliminated the source of contamination. For this action, the Office of Fossil Energy recognized the Strategic Petroleum Reserve with an Environment, Safety and Health Achievement Award.

There was one oil spill, less than one-half pint, that produced a sheen on an irrigation ditch; three brine spills, the largest of which was 30 barrels; and 11 self-reported permit non-compliances, but none resulted in environmental damage.

Life extension construction, Weeks Island decommissioning activities, and commercialization initiatives required numerous actions to renew, extend, modify, and/or update various environmental permits.

## ***SECURITY***

The Strategic Petroleum Reserve has formal liaison relationships with other Federal, state and local law enforcement agencies for emergency responses at its facilities. Periodic tactical exercises with outside law enforcement agencies, and continued intensive training, ensure the proficiency of the protective force.

In November 1999, the Strategic Petroleum Reserve's Security Police Officers competed in an international police competition in Orlando, Florida. The five-person team placed 11 out of 75 U.S. and international teams. The officers demonstrated their ability to operate under stress, meet severe physical challenges, and compete and win in competition with some of the world's best tactical police teams.

The Borg-Warner Protective Services Corporation provides protection services through a subcontract

with DynMcDermott. The current protection force includes 151 Security Police Officers and provides protection for the four storage sites and the Project Management Office complex. Since November 1998, they have been on enhanced vigilance status in response to tensions in the Middle East.

Site physical security systems, such as intrusion detection equipment and alarm displays, were upgraded as part of the life extension program, enhancing their reliability.

## ***REAL ESTATE ACTIONS***

In September 1999, the Department of Energy requested the General Services Administration to sell the 431-acre Weeks Island facility. The Weeks Island decommissioning was completed in November 1999.

## **APPENDIX A**

### **Strategic Petroleum Reserve Site Information**

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#### **BRYAN MOUND**

##### **Location**

Brazoria County, Texas (three miles southwest of Freeport, Texas).

##### **Site Description**

232-million-barrel storage facility consisting of 20 caverns.

24-inch diameter, 6-mile brine disposal pipeline extending 4 miles offshore in the Gulf of Mexico.

Oil, brine and raw water piping distribution system connecting caverns with central plant and water intake structure located on Brazos River. Twenty-seven (27) pumps totaling approximately 47,750 horsepower.

##### **System Parameters**

Drawdown Rate:	1,500,000 bbl/d
Raw Water Pumping Rate:	1,545,000 bbl/d
Oil Fill Rate:	225,000 bbl/d
Brine Disposal Rate:	260,000 bbl/d

##### **Distribution Facilities**

DOE 3.9 mile, 30-inch pipeline to Seaway Freeport Marine Terminal, DOE 4.0 mile, 30-inch pipeline to Seaway Jones Creek Tank Farm and Pipeline and DOE 46 mile, 40-inch pipeline to Seaway Texas City Terminal and Docks.

##### **Acquisition**

Acquired 499.47 acres fee simple, by condemnation April 1977, from Freeport Mineral Company and other owners. Dow Chemical Company was the previous operator.

#### **WEST HACKBERRY**

##### **Location**

Cameron Parish, Louisiana (25 miles southwest of Lake Charles, Louisiana).

##### **Site Description**

222-million-barrel storage facility consisting of 22 caverns.

Oil, brine, and raw water piping distribution system connecting caverns with central plant, water intake structure located on Intra-coastal waterway and 10 brine disposal wells. Twenty-one (21) pumps totaling over 40,850 horsepower.

##### **System Parameters**

Drawdown rate:	1,300,000 bbl/d
Raw Water Pumping Rate:	1,339,000 bbl/d
Oil Fill Rate:	225,000 bbl/d
Brine Disposal Rate:	275,000 bbl/d

##### **Distribution Facilities**

DOE 42.8 mile, 42-inch pipeline to Sunoco Nederland Terminal.

DOE 13.6 mile, 36-inch pipeline to Equilon common carrier pipeline system at Lake Charles.

##### **Acquisition**

Acquired 405.36 acres fee simple by condemnation, April 1977, from numerous private landowners. Olin Corporation was the previous site operator. Acquired 160.0 additional acres fee simple by condemnation in two actions, July 1979 and March 1980.

## **BIG HILL**

### **Location**

Jefferson County, Texas (20 miles southwest of Beaumont, Texas).

### **Site Description**

170-million-barrel storage facility consisting of fourteen caverns.

Oil, brine, and raw water systems connecting caverns with central plant, water intake structure located on the Intracoastal Waterway, and a 48-inch diameter, 14-mile brine disposal pipeline extending 5 miles offshore in the Gulf of Mexico. Twenty-six (26) pumps totaling 42,800 horsepower.

### **System Parameters**

Drawdown Rate: 930,000 bbl/d  
(Will increase to 1,100,000 bbl/d in 2000)  
Raw Water Pumping Rate: 1,400,000 bbl/d  
Oil Fill Rate: 225,000 bbl/d  
Brine Disposal Rate: 432,000 bbl/d

### **Distribution Facilities**

DOE 24.5 mile, 36-inch pipeline to Sunoco Nederland Terminal  
Unocal 2 mile, 36-inch pipeline to Unocal Docks  
Equilon 20-inch pipeline system to East Houston.

### **Acquisition**

Acquired 271 acres fee simple, by condemnation November 1982 and July 1983, from three landowners, i.e., 238.48 acres from Amoco, 27.06 acres from the Pipkin estate, and 5.46 acres from the Patrick Henry Phelan estate.

## **BAYOU CHOCTAW**

### **Location**

Iberville Parish, Louisiana (12 miles southwest of Baton Rouge, Louisiana).

### **Site Description**

76-million-barrel storage facility consisting of six caverns.

Oil, brine, and raw water piping distribution system connecting caverns with central plant, a water intake structure, 12 brine disposal wells, and a pipeline for disposing of brine to Union Texas Petroleum, Inc. Sixteen(16) pumps totaling over 18,000 horsepower.

### **System Parameters**

Drawdown Rate: 515,000 bbl/d  
Raw Water Pumping Rate: 515,000 bbl/d  
Oil Fill Rate: 110,000 bbl/d  
Brine Disposal Rate: 110,000 bbl/d

### **Distribution Facilities**

DOE 37.2 mile, 36-inch pipeline to Equilon's Sugarland Terminal and Capline Pipeline. DOE 16 mile, 24 inch pipeline to Baton Rouge.

### **Acquisition**

Acquired 355.95 acres fee simple, by condemnation April 1977, from numerous private owners. Union Texas Petroleum (a subsidiary of Allied Corporation) was the previous operator.

In 1985 the Department of Energy acquired an additional existing cavern through a cavern exchange agreement with Union Texas Petroleum. The transaction involved a 3.5 acre exchange with no net change in Government-owned acreage.







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# Strategic Petroleum Reserve

## Annual Report for Calendar Year 2000

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**U.S. Department of Energy**  
**Assistant Secretary for Fossil Energy**  
**Office of Strategic Petroleum Reserve**



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# Strategic Petroleum Reserve

## Annual Report for Calendar Year 2000

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**U.S. Department of Energy**  
**Assistant Secretary for Fossil Energy**  
**Office of Strategic Petroleum Reserve**  
**Washington, D.C. 20585**

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## TABLE OF CONTENTS

---

EXECUTIVE SUMMARY.....	1
PROGRAM MISSION .....	2
Introduction.....	2
Legislative History .....	2
Strategic Petroleum Reserve Plan and Amendments .....	4
PROGRAM MANAGEMENT .....	6
Organization.....	6
Contractual Support.....	7
CRUDE OIL STORAGE PROGRAM .....	8
Storage Facilities and Capabilities .....	8
Status of Storage Sites .....	10
Life Extension Program .....	10
Major Maintenance Program .....	11
Operational Limitations And Issues.....	13
PETROLEUM ACQUISITION AND SALES .....	14
Crude Oil Inventory Status.....	14
Royalty-in-Kind Crude Oil Transfer .....	19
Crude Oil Time Exchange.....	20
Exchanges of Crude Oil for Regional Distillate Reserve .....	21
Emergency Crude Oil Exchange for Ship Channel Incident .....	21
EMERGENCY RESPONSE CAPABILITIES.....	22
Drawdown and Distribution of Oil.....	22
Competitive Sales Procedures.....	22
Drawdown Capabilities .....	23
Drawdown Readiness Activities.....	25
Distribution Plan and Capabilities .....	25
Distribution Assessment .....	26
Import Protection Levels .....	28
COMMERCIALIZATION ACTIVITIES.....	30
Commercial Leases .....	30
Foreign Oil Storage.....	30
BUDGET AND FINANCE .....	31
Appropriations through Fiscal Year 2000.....	31
Strategic Petroleum Reserve Account.....	31
SPR Petroleum Account.....	31
Summary of Commercialization Revenues .....	34
Performance Measurement.....	35

<b>OTHER ACTIVITIES .....</b>	<b>36</b>
<b>Environment, Safety, and Health.....</b>	<b>36</b>
<b>Security.....</b>	<b>36</b>
<b>Real Estate Actions.....</b>	<b>37</b>
<b>Organizational Improvement Activities .....</b>	<b>37</b>
<b>Major Improvement Initiatives.....</b>	<b>37</b>
<b>Customer Service Initiatives.....</b>	<b>37</b>

<b>APPENDIX A Strategic Petroleum Reserve Site Information .....</b>	<b>38</b>
<b>Bryan Mound.....</b>	<b>38</b>
<b>West Hackberry.....</b>	<b>38</b>
<b>Big Hill.....</b>	<b>39</b>
<b>Bayou Choctaw.....</b>	<b>39</b>

<b>APPENDIX B Regional Distillate Reserve in the Northeast .....</b>	<b>40</b>
<b>Creation of Reserve .....</b>	<b>40</b>
<b>Product and Storage Acquisition .....</b>	<b>40</b>
<b>Sales Plan and Procedures.....</b>	<b>43</b>

**LIST OF FIGURES**

<b>Figure 1. Storage Sites and Distribution System.....</b>	<b>9</b>
<b>Figure 2. 2000 Life Extension Program Cost Status.....</b>	<b>12</b>
<b>Figure 3. Cumulative Oil Fill.....</b>	<b>18</b>
<b>Figure 4. Projected Maximum Drawdown Capability .....</b>	<b>24</b>
<b>Figure 5. Pipeline and Marine Distribution Capabilities .....</b>	<b>27</b>
<b>Figure 6. Days of Net Import Protection (1977 -2000) .....</b>	<b>28</b>
<b>Figure 7. U.S. Crude Oil Import Dependence (1977-2000).....</b>	<b>28</b>
<b>Figure 8. Cumulative Funding .....</b>	<b>33</b>
<b>Figure 9. Regional Distillate Reserve and Storage Facilities.....</b>	<b>42</b>

**LIST OF TABLES**

<b>Table 1. Storage Capacity and Drawdown Objectives.....</b>	<b>8</b>
<b>Table 2. Summary of SPR Acquisitions and Exchanges in 2000.....</b>	<b>14</b>
<b>Table 3. Year-End Inventories and Oil Fill History .....</b>	<b>15</b>
<b>Table 4. Crude Oil Receipts through 2000 .....</b>	<b>16</b>
<b>Table 5. Crude Oil Inventory through 2000.....</b>	<b>17</b>
<b>Table 6. Crude Oil Time Exchange Contracts .....</b>	<b>20</b>
<b>Table 7. Crude Oil Streams .....</b>	<b>23</b>
<b>Table 8. Drawdown and Distribution Capabilities.....</b>	<b>26</b>
<b>Table 9. Annual Appropriations for Storage Facilities Operations and Management,             and Petroleum Acquisition and Transportation .....</b>	<b>32</b>
<b>Table 10. Summary of Commercialization Revenues.....</b>	<b>34</b>

## ***EXECUTIVE SUMMARY***

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### ***Strategic Petroleum Reserve Status***

The Strategic Petroleum Reserve's storage facilities in Louisiana and Texas are capable of storing 700 million barrels of crude oil. As of December 31, 2000, the crude oil inventory was 540.7 million barrels and the drawdown rate was 4.2 million barrels a day. In addition, the Strategic Petroleum Reserve has a Regional Distillate Reserve in the Northeast and two million barrels of heating oil stored in commercial facilities. All storage sites are operational and ready for fill or drawdown in the event of an energy emergency.

### ***Regional Distillate Reserve***

In July 2000, the President directed the Department of Energy to establish a home heating oil reserve in the U.S. Northeast to avoid a possible recurrence of the heating oil problems experienced during the winter of 1999. The Strategic Petroleum Reserve acquired storage services at three terminals and heating oil for the Regional Distillate Reserve through the exchange of crude oil from the Strategic Petroleum Reserve. The storage contracts and heating oil were in place by October 13, 2000. A description of the Regional Distillate Reserve is contained in Appendix B.

### ***Oil Acquisitions and Exchanges***

The Strategic Petroleum Reserve received an additional 6.3 million barrels through royalty oil exchange contracts under a Royalty-In-Kind crude oil transfer agreement with the Department of the Interior. Because of high crude prices and tight markets during 2000, the Strategic Petroleum Reserve negotiated delayed deliveries of 19.2 million barrels, for a net gain of 2.2 million barrels to the inventory.

The Strategic Petroleum Reserve conducted three oil exchanges during the year:

- In September 2000, the President directed the Secretary of Energy to execute a time exchange of 30 million barrels of oil, for a period of one year, to address low inventories of heating oil and distillate fuel;
- The Strategic Petroleum Reserve exchanged 2.8 million barrels of crude oil for storage services and heating oil for the Regional Distillate Reserve; and
- In June 2000, the Strategic Petroleum Reserve executed two emergency agreements for 500,000 barrels each, for 30 days, to address supply problems in Lake Charles due to a blockage of the Calcasieu ship channel.

### ***Commercialization Activities***

The Strategic Petroleum Reserve received \$2,112,064 in revenues, the equivalent of \$1,556,205 in crude oil and \$555,859 in cash, from commercial leases of its distribution facilities and pipelines.

### ***Drawdown Readiness***

The Strategic Petroleum Reserve conducted Eagle I, a full-scale simulated drawdown exercise, from January 11 through March 4, 2000, to test program readiness. The exercise involved the simulation of a world oil disruption that would result in a Presidential decision to draw down the Strategic Petroleum Reserve.

### ***Facilities Life Extension Program***

In March 2000, the Strategic Petroleum Reserve completed a seven-year Life Extension Program, which modernized the storage facilities to increase reliability and assure mission capability through 2025.

## ***PROGRAM MISSION***

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### ***Introduction***

The Strategic Petroleum Reserve was established in 1975 in response to the 1973 Arab oil embargo. It is authorized by the Energy Policy and Conservation Act (EPCA)(Public Law 94-163), and by the comprehensive energy plans of all Administrations since 1975, in recognition of the long-term dependence of the United States on imported crude oil and petroleum product. Section 165 of EPCA requires the Secretary of Energy to submit an Annual Report to the President and the Congress.

As of December 31, 2000, the inventory in the Strategic Petroleum Reserve included 540.7 million barrels of crude oil and two million barrels of heating oil in the Regional Distillate Reserve in the U.S. Northeast, down from a peak of 592 million barrels in 1994. The current inventory amounted to 53 days of net imports in 2000. The United States relies on a combination of oil in the Strategic Petroleum Reserve and private stocks to meet its oil storage obligations to the International Energy Agency.

### ***Legislative History***

EPCA, enacted on December 22, 1975, authorized the establishment of the Strategic Petroleum Reserve to reduce the impact of a severe energy supply interruption, and to carry out the obligations of the United States under the International Energy Program.

EPCA was amended by Title VIII of the Energy Security Act (Public Law 96-294), enacted on June 30, 1980. The Act established a minimum average daily fill rate of 100,000 barrels and precluded sale of Naval Petroleum Reserve Numbered 1 (Elk Hills, California) crude oil, except to fill the Strategic Petroleum Reserve,

unless the Strategic Petroleum Reserve was being filled at the minimum rate or had an inventory of 500 million barrels.

The Energy Policy and Conservation Amendments Act of 1985 (Public Law 99-58), enacted on July 2, 1985, extended the provisions of Title I, Part B, of the EPCA relating to the Strategic Petroleum Reserve until June 30, 1989, and directed the Secretary of Energy to conduct a sale or exchange of 1.1 million barrels of crude oil to test the drawdown and distribution capabilities of the Strategic Petroleum Reserve.

The Omnibus Budget Reconciliation Act of 1986 (Public Law 99-509), enacted on October 18, 1986, amended EPCA to require that the Strategic Petroleum Reserve be filled at a minimum rate of 75,000 barrels a day until at least 750 million barrels are in storage.

Public Law 101-46, an Act to extend Title I of EPCA, enacted on June 30, 1989, extended Strategic Petroleum Reserve authorities contained in EPCA until April 1, 1990. The Act also required the Secretary to submit a report to Congress by February 1, 1990, on alternative means of financing oil acquisition for the Strategic Petroleum Reserve. Short-term extensions of the Strategic Petroleum Reserve authorities contained in EPCA were enacted on March 31, 1990 (Public Law 101-262), and August 10, 1990 (Public Law 101-360).

On September 15, 1990, the President signed the Energy Policy and Conservation Act Amendments of 1990 (Public Law 101-383) extending authorities until September 30, 1994. This legislation also contained provisions to amend drawdown authorities, require a Strategic Petroleum Reserve Plan Amendment for comple-



tion of storage capacity for one billion barrels, authorize drawdown and distribution tests, and provide for a refined petroleum product reserve test program.

On October 24, 1992, the President signed the Energy Policy Act of 1992 (Public Law 102-486). The bill included provisions to (1) add new conditions for drawdown in emergency situations involving a supply reduction of significant scope and duration, coupled with a severe price increase likely to cause a major adverse impact on the nation's economy, (2) enlarge the Reserve to one billion barrels, (3) permit the Secretary to make payment in advance for delivery of petroleum product either owned or not owned by the United States for storage in the Strategic Petroleum Reserve or non-Strategic Petroleum Reserve facilities, (4) give the President discretionary authority to acquire domestic stripper well oil at competitive prices to fill the Reserve, and (5) amend the eligibility criteria for a Regional Petroleum Reserve.

On October 22, 1994, the President signed into law the Energy Policy and Conservation Act Amendments Act of 1994 (Public Law 103-406), extending authorities to June 30, 1996.

The Balanced Budget Downpayment Act (Public Law 104-99), enacted on January 26, 1996, required the sale of up to \$100 million of Weeks Island oil to fund decommissioning activities.

The Omnibus Consolidated Rescissions and Appropriations Act of 1996 (Public Law 104-134), enacted on April 26, 1996, required the sale of \$227 million of Weeks Island oil for deficit reduction.

The Omnibus Consolidated Appropriations Act (Public Law 104-208), enacted on September 30, 1996, appropriated \$220 million for the Strategic Petroleum Reserve in fiscal year 1997 to be financed through the sale of oil. The Strategic

Petroleum Reserve authorities expired on June 30, 1996. On October 14, 1996, Public Law 104-306 extended the Strategic Petroleum Reserve authorities until September 30, 1997. After the expiration of Strategic Petroleum Reserve authorities on September 30, 1997, these authorities were not reauthorized until June 1998.

The Balanced Budget Act of 1997 (Public Law 105-33), enacted August 5, 1997, added a new section 168 to EPCA, authorizing the leasing of underutilized Strategic Petroleum Reserve facilities for the storage of oil owned by a foreign government or its representatives.

The Department of the Interior and Related Agencies Appropriations Act, 1998 (Public Law 105-83), enacted on November 14, 1997, appropriated \$207.5 million for the Strategic Petroleum Reserve in fiscal year 1998 to be financed through the sale of Reserve oil.

The 1998 Supplemental Appropriations and Rescissions Act (Public Law 105-174), enacted on May 1, 1998, included a provision which prohibited the sale of Strategic Petroleum Reserve oil, contingent upon a Presidential determination that a sale would be imprudent in light of current market conditions and a designation of the \$207.5 million in foregone revenue as an emergency requirement under the Balanced Budget Act of 1985. The President made the requisite determination and designation on May 8, 1998.

On June 1, 1998, the President signed Public Law 105-177 to extend certain EPCA programs. The Act extended authorities for the Strategic Petroleum Reserve and participation in the International Energy Program through September 30, 1999, and expanded the antitrust protection for U.S. companies participating in International Energy Agency activities. The Act also authorized the drawdown and distribution of the Strategic Petroleum Reserve only for the purposes described in the Act, and required that the

Secretary of Energy request funds for acquisition, transportation and injection of petroleum products for storage in the Reserve or provide a written explanation if no request for funds is made. The Omnibus Consolidated and Emergency Supplemental Appropriations Act, 1999 (Public Law 105-277), enacted on October 21, 1998, included \$160.1 million for the Strategic Petroleum Reserve.

On November 13, 1998, the President signed Public Law 105-388, an Act to extend energy conservation programs under the Energy Policy and Conservation Act and the Energy Conservation and Production Act, and for other purposes. The Act provides that, during a drawdown of the Strategic Petroleum Reserve, the State of Hawaii may submit a binding offer for Strategic Petroleum Reserve oil and be entitled to purchase the oil at a price equal to the weighted average price of the successful competitive bids for oil in the applicable category. Tankers destined for Hawaii would receive priority scheduling during a Strategic Petroleum Reserve drawdown.

The Strategic Petroleum Reserve authorities expired on September 30, 1999. On October 5, 1999, the President signed Public Law 106-64, extending these and the EPCA authorities for United States participation in the International Energy Agency program until March 31, 2000.

Appendix C of the Consolidated Appropriations Act, 2000 (Public Law 106-113), enacted on November 29, 1999, included \$159 million for the Strategic Petroleum Reserve. The Act also allows the Secretary to use other Departmental funds to finance a drawdown of the Strategic Petroleum Reserve.

The Department of the Interior and Related Agencies Appropriations Act, 2001 (Public Law 106-291), signed on October 11, 2000, included \$165 million for the development, operation, and management activities of the Strategic Petroleum

Reserve under EPCA, \$4,000,000 to be derived from the transfer of unobligated funds in the “SPR Petroleum Account,” and “of (the \$165 million), \$8,000,000 shall be available for maintenance of a Northeast Home Heating Oil Reserve” (see below).

On November 9, 2000, the President signed Public Law 106-469. Title I of The Energy Act of 2000 reauthorizes titles I and II of EPCA through fiscal year 2003, and updates or deletes the EPCA title I SPR authorities. Title II of Public Law 106-469 amends title I of EPCA to insert a new part D authorizing the Secretary “to establish, maintain, and operate a Northeast Home Heating Oil Reserve,” containing no more than two million barrels of petroleum distillate and located in the Northeast. The new part D Reserve is not a component of the SPR established under part B of title I of EPCA. Title II also sets forth conditions for release of products from the new part D Reserve, requires transmittal to the President and Congress of a plan describing the Reserve, and upon establishment, requires the Secretary of the Treasury to establish a “Northeast Home Heating Oil Reserve” account at Treasury.

### ***Strategic Petroleum Reserve Plan and Amendments***

In compliance with Section 154 of EPCA, the Strategic Petroleum Reserve submitted a Plan to Congress on February 16, 1977, addressing the development and implementation of the Strategic Petroleum Reserve. The Plan became effective on April 18, 1977 and has six amendments, as follows:

Strategic Petroleum Reserve Plan Amendment No. 1 accelerated the schedule for filling the Reserve. The Amendment was submitted to Congress on May 25, 1977, and became effective on June 20, 1977.

Strategic Petroleum Reserve Plan Amendment No. 2 authorized an increase in the size of the Strategic Petroleum Reserve from 500 million barrels to one billion barrels, and described plans to store 750 million barrels of petroleum in underground storage facilities. This Amendment was submitted to Congress on May 18, 1978, and became effective on June 13, 1978.

Strategic Petroleum Reserve Plan Amendment No. 3 contained a Distribution Plan describing the methods for drawdown and distribution of petroleum from five existing storage sites. This Amendment was submitted to Congress on October 31, 1979, and became effective on November 15, 1979.

Strategic Petroleum Reserve Plan Amendment No. 4 contained a new Drawdown Plan with procedures for the drawdown, sale, and distribution of petroleum from the Strategic Petroleum Reserve. The Amendment was submitted on December 1, 1982, and went into effect immediately. The Drawdown Plan, required by the Energy Emergency Preparedness Act of 1982, replaced the Distribution Plan in Amendment No. 3.

Strategic Petroleum Reserve Plan Amendment No. 5, submitted February 11, 1999, provides for the acquisition of crude oil that the United States is entitled to receive in-kind as royalties from production on Federal lands under subsection 160(a)(2) of EPCA. Plan Amendment No. 5 became effective April 12, 1999.

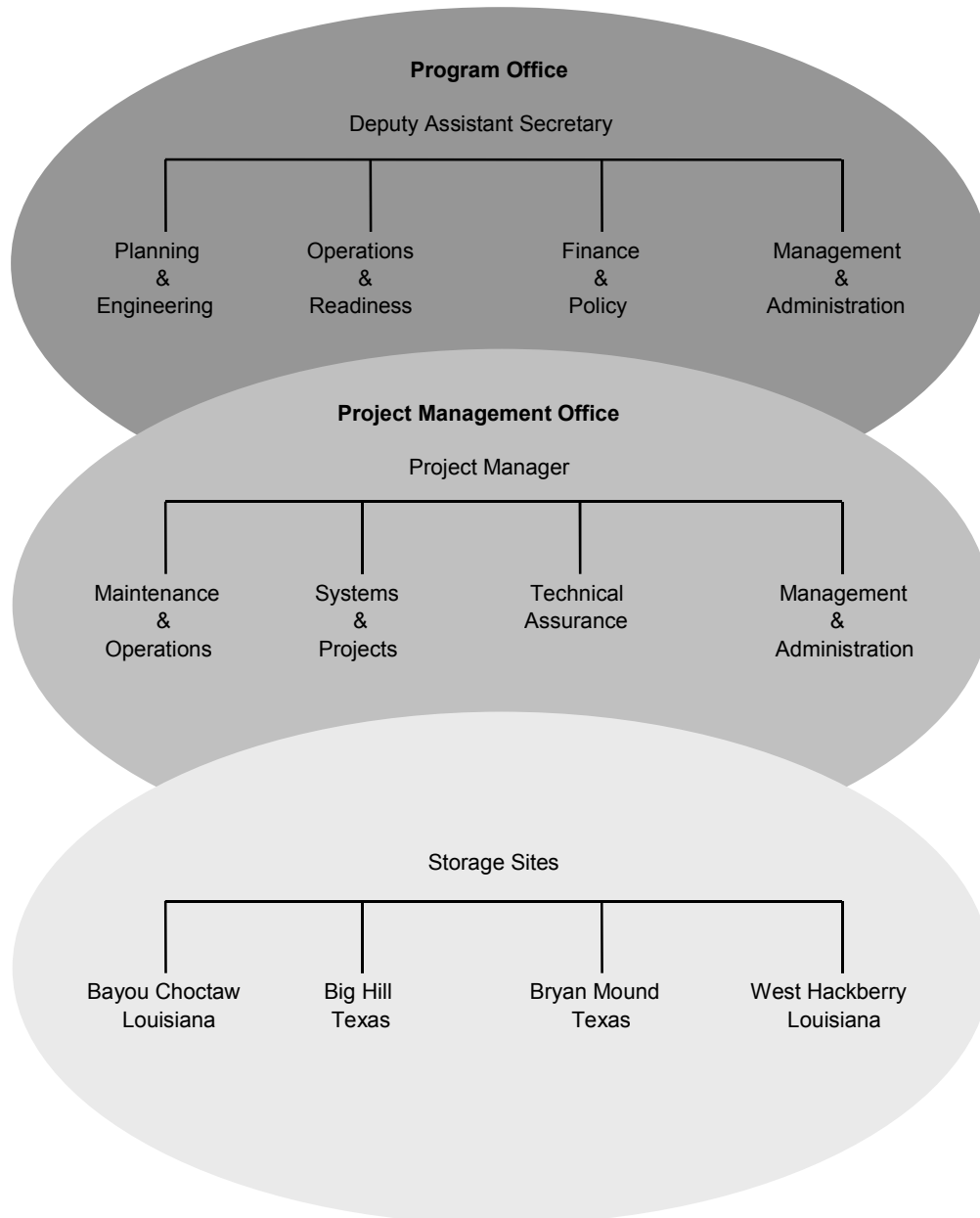
Strategic Petroleum Reserve Plan Amendment No. 6, submitted July 10, 2000, established a Regional Distillate Reserve in the Northeast to store up to two million barrels of product. Plan Amendment No. 6 became effective September 8, 2000, and made permanent an interim heating oil reserve established in July 2000, at the direction of the President.

## PROGRAM MANAGEMENT

### Organization

The Assistant Secretary for the Office of Fossil Energy in Washington, D.C. has overall program responsibility for achieving the goals and objectives of the Strategic Petroleum Reserve. This responsibility is delegated to the Deputy Assistant Secretary for Petroleum Reserves,

Mr. Richard D. Furiga, and is exercised through the Strategic Petroleum Reserve Headquarters Office in Washington, D.C. and the Project Management Office in New Orleans, Louisiana. Total staffing is 128 Federal fulltime equivalent employees and 1,036 contractor employees.



### ***Contractual Support***

The Project Management Office is responsible for the design, development, operation and maintenance of the Strategic Petroleum Reserve and employs a Management and Operating (M&O) contractor, DynMcDermott Petroleum Operations Company, to provide management and manpower to operate and maintain four storage facilities and certain related pipeline systems. The initial five-year M&O contract was awarded on April 1, 1993, and extended under an option for a second five-year period that began on April 1, 1998.

An Architect/Engineering (A&E) firm, S&B Infrastructure, Ltd., provides the design and inspection services for four storage facilities under a two-year contract awarded on March 9, 2000, with three one-year renewal options. Geotechnical support is provided by Sandia National Laboratory. Several construction contractors perform site modifications or major maintenance activities and most of these contracts are specific

to a certain discipline, fixed price, and less than one year in duration.

A number of support services contracts exist for management, technical, and computer support. The largest is Critique Incorporated, providing management and technical support services to the Project Management Office since 1996. Other support services contractors are ICF Consulting Inc., PB-KBB Inc. and Cyborg Inc.

Electrical power is provided to four storage facilities by Reliant Energy (formerly Houston Power & Light), and Entergy (formerly Gulf States Utilities).

Four companies, Seaway Pipeline Company, Sun Pipe Line Company, Unocal Corporation and Equilon Pipeline Company, provide commercial terminalling services for fill, drawdown and storage of crude oil. Most of these contracts are for five years, with options to extend the contracts up to 20 years.

## **CRUDE OIL STORAGE PROGRAM**

### ***Storage Facilities and Capabilities***

Originally, the Strategic Petroleum Reserve developed four sites in Louisiana and two sites in Texas. Subsequently, two sites in Louisiana were decommissioned, the Sulphur Mines site in 1992, for cost savings, and the Weeks Island site in 1999, for geotechnical problems. The remaining sites are West Hackberry and Bayou Choctaw in Louisiana, and Bryan Mound and Big Hill in Texas. Their combined storage capacity is 700 million barrels.

The four storage sites are grouped into three geographical distribution systems on the Gulf Coast: Seaway, Texoma and Capline. Each system has access to one or more major refining centers, interstate crude oil pipelines, and marine terminals for crude oil distribution. The locations of the Strategic Petroleum Reserve storage sites, and their respective distribution systems, are shown in Figure 1.

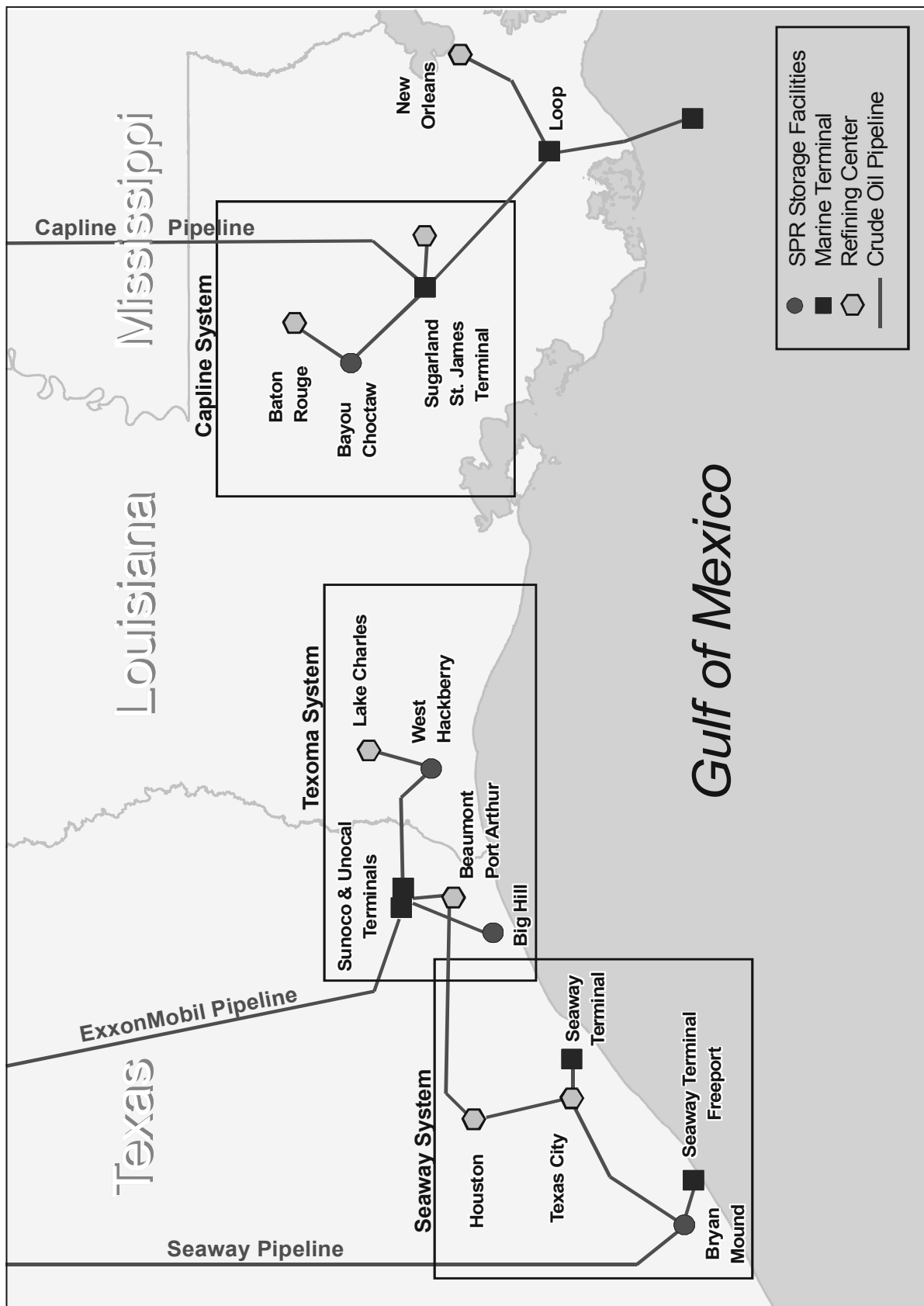
The current storage capacities and drawdown capabilities of the four Strategic Petroleum Reserve storage sites are summarized in Table 1.

**Table 1**  
**Storage Capacities and Drawdown Capabilities - (December 31, 2000)**

Storage Facility	Storage Capacity (MMB)	Crude Mix Sweet/Sour (MMB)	Drawdown Capability (MB/D) *
Bryan Mound, Texas	232	75/157	1,500
West Hackberry, Louisiana	222	114/108	1,300
Big Hill, Texas	170	72/98	1,100
Bayou Choctaw, Louisiana	76	24/52	515
<b>Total</b>	700	285/415 40%/60%	4,415

\* Represents design rate. Actual rate may be lower due to current inventory levels (see Table 5).  
Legend: MMB = Million Barrels; MB/D = Thousands Barrels Per Day

**Figure 1**  
Storage Sites and Distribution System



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## ***Status of Storage Sites***

### **Bryan Mound**

The Bryan Mound storage facility in Brazoria County, is approximately three miles southwest of Freeport, Texas. The site has 20 storage caverns, a combined storage capacity of 232 million barrels, and an inventory of 212 million barrels. The site is available for both fill and drawdown operations.

The site completed all life extension testing activities during March 2000. Under major maintenance, a contract was awarded to L.S. Womack for the construction of a new covered storage and laydown area to protect stored equipment and materials, and a contract was also awarded to Waukeshaw Electric to replace transformers at the main substation. These projects will be completed in 2001.

### **West Hackberry**

The West Hackberry storage facility in Cameron Parish is approximately 25 miles southwest of Lake Charles, Louisiana. The site has 22 storage caverns, a combined storage capacity of 222 million barrels and an inventory of 166 million barrels. It is available for both fill and drawdown operations.

The site completed all life extension testing activities during March 2000. Under major maintenance, the site completed the installation of an emergency notification system, and a new contract was awarded for replacement sections of the raw water and crude oil header piping, which will be installed next year.

### **Bayou Choctaw**

The Bayou Choctaw storage facility in Iberville Parish is approximately 12 miles southwest of Baton Rouge, Louisiana. The site has six storage caverns, a combined storage capacity of 76 million barrels, and an inventory of 71 million

barrels. The site is currently available for both fill and drawdown operations.

The site completed the modification of its crude oil distribution system, the final project of its life extension construction, and completed all life extension testing activities in March 2000. Under major maintenance, the site completed repairs to the high-pressure pump pad foundations.

### **Big Hill**

The Big Hill storage facility in Jefferson County is 26 miles southwest of Beaumont, Texas. The site has 14 storage caverns, a combined storage capacity of 170 million barrels, and an inventory of 90 million barrels. The site is currently available for both fill and drawdown operations.

The site completed the installation of a terminal data monitoring system, the final project of its life extension construction, and completed all life extension testing in March 2000. Under major maintenance, the site completed the installation of a brine booster pump for cavern re-pressurization, and replacement of an 1130-foot section of its 48-inch diameter brine disposal pipeline. New contracts were awarded to Tandem Company to replace a building which houses high-voltage motor control centers at the raw intake structure, and to Sunoco to install crude oil meters at Sun Terminal to improve oil accountability. These projects will be completed in 2001.

### ***Life Extension Program***

The Strategic Petroleum Reserve completed a seven-year Life Extension Program in March 2000. This program was initiated in 1994, as a major rebuilding program, to meet its mission readiness through the year 2025. Under this program, the Strategic Petroleum Reserve upgraded or replaced major systems with newer technologies, streamlined process configurations, standardized equipment to increase reliability and reduce operating and maintenance costs.



Life extension construction activities at two sites, Bryan Mound and West Hackberry, were completed in 1999. The remaining construction activities at Big Hill were completed in March 2000, with the demolition of obsolete equipment, and at Bayou Choctaw in March 2000, with the modification of the crude oil system. As each site completed life extension construction projects, the Strategic Petroleum Reserve performed a full rate drawdown test to verify operational performance and capabilities. All of the sites demonstrated full design capabilities with no problems.

The original total estimated cost for the Life Extension Program in 1994 was \$370 million. The total estimated cost was reduced over the years by \$42 million to \$328 million, due to the cancellation of planned projects at St. James Terminal (leased to Equilon Pipeline Company), Weeks Island (decommissioned), and comprehensive value engineering efforts. The final cost of the Life Extension Program is expected to be less than \$328 million, assuming a favorable resolution of outstanding contractor claims. See Figure 2 for the Total Estimated Cost, Annual Budgets, and Total Obligations of the Life Extension Program from 1994 to 2000.

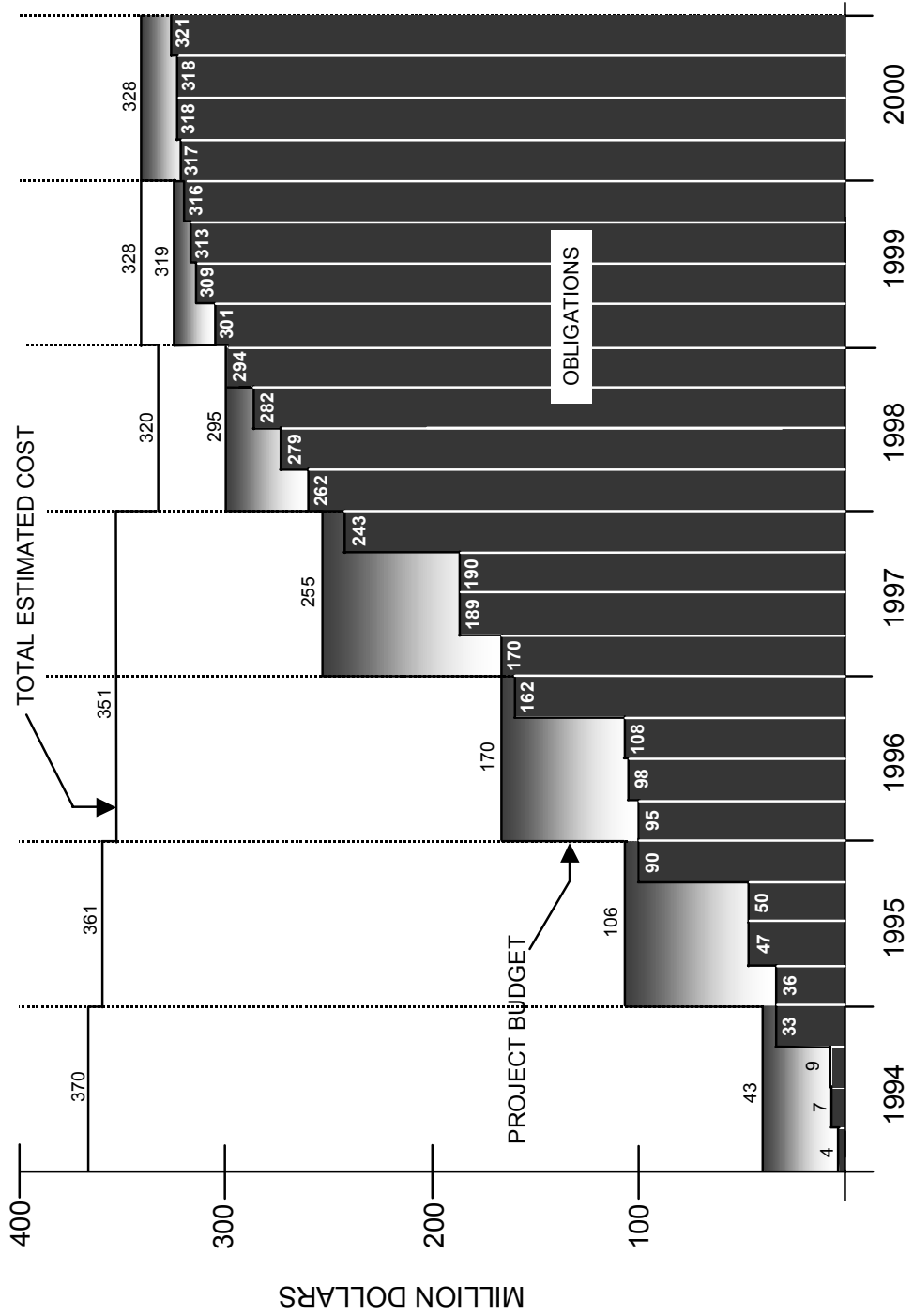
The Life Extension Program will result in a significant reduction in annual operations and maintenance costs due to a 38 percent reduction in the number of pumps, a 50 percent reduction in the number of valves, and a 23 percent reduction in spare parts inventories.

### ***Major Maintenance Program***

The Strategic Petroleum Reserve's Major Maintenance Program typically provides for site construction projects over \$100,000 that are required to maintain the storage facilities and systems in an efficient operating condition. Examples are building maintenance, piping replacements, and road paving.

With the completion of the Life Extension Program, the Major Maintenance Program will provide for the future upgrades and replacements of equipment, as necessary, to maintain the required system reliability and to preclude the necessity for any future major rebuilding program.

**Figure 2**  
**2000 Life Extension Program Cost Status**



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## ***Operational Limitations and Issues***

### **Long Term Vapor Pressure Mitigation**

Long-term storage of crude oil in underground solution-mined caverns results in elevated oil temperatures and increased crude vapor pressure due to gradual geothermal heating and methane gas intrusion from the salt formation. Consequently, when oil is drawn down, or removed from the caverns, increased vapor pressure results in gas being released in amounts that are unacceptable, posing environmental, safety, and health risks.

This phenomenon was first discovered in 1992, after fifteen years of storage. Following an extensive analysis of the problem, a degasification program was initiated and conducted on 177 million barrels of crude oil from 1995 until 1998. This brought the Strategic Petroleum Reserve's oil inventory within acceptable vapor pressure levels.

Since 1998, with support from Sandia National Laboratories, the Strategic Petroleum Reserve has maintained a comprehensive monitoring program to ascertain the level of gas regain and the need for future degasification. During 2000, the monitoring program revealed a much higher level of

gas regain than anticipated, and the need for a long-term vapor pressure control program to maintain the Reserve's oil inventory within acceptable vapor pressure levels. Projections indicate that, by 2003, some caverns will not be available for drawdown due to excessive vapor pressure. As a consequence, the Strategic Petroleum Reserve's maximum rate drawdown capability will be reduced.

The Strategic Petroleum Reserve assessed numerous concepts and alternatives to provide a long-term solution to the problem during 2000, and concluded that the most cost effective solution was the acquisition of two portable degasification plants, which could be moved from site to site, as needed.

In November 2000, an acquisition plan was developed for the Management and Operating contractor to procure the degasification plants under a competitive firm-fixed-price turnkey contract, and make site modifications, as needed, to accommodate the plants, using one or more firm-fixed-price contracts. A performance specification for the degasification plants is being developed.

## **PETROLEUM ACQUISITION AND SALES**

### **Crude Oil Inventory Status**

On December 31, 2000, the Strategic Petroleum Reserve's crude oil inventory was 540,678,341 barrels, a decrease of 26.3 million barrels from calendar year 1999. The decrease is due to the net

effect of receipts from the royalty-in-kind transfer oil, deliveries under the time and heating oil exchanges and the emergency exchange in the ship channel incident (see Table 2).

**Table 2**  
**Summary of Acquisitions and Exchanges in 2000**  
**(Million Barrels)**

Acquisition/ Exchange	Oil Released in 2000	Oil Received in 2000	Oil Scheduled for 2001	Net Gain (Loss) To Inventory
RIK Exchange Acquisition		6.266	13.272	19.538
RIK Delivery Deferrals			2.228	2.228
Time Exchange 2000	29.823		31.172	1.349
Heating Oil Exchange	2.836	2.000-D		(2.836) 2.000-D
Ship Channel Incident Exchange	0.996	1.026		0.030
Maya Exchange Reconciliation	0.198			(0.198)
Total	33.853	7.292 2.000-D	46.672	20.111 2.000-D

\* D: Distillate

The current mix of crude oil is 67 percent high sulfur (sour) and 33 percent low sulfur (sweet). Table 3 lists year-end inventories and average daily fill rates from 1977 through 2000 (by fiscal

and calendar year). Table 4 lists crude oil receipts by country of origin since 1977. Table 5 identifies the location of the inventory by storage site, and Figure 3 illustrates the cumulative oil fill.

**Table 3**  
**Year-end Inventories and Oil Fill History**

	FISCAL YEAR		CALENDAR YEAR	
	Year-End Inventory (MMB)	Average Daily Fill Rate* (MB/D)	Year-End Inventory (MMB)	Average Daily Fill Rate* (MB/D)
1977	1.1	3	7.2	20
1978	49.1	131	68.5	168
1979	91.2	115	91.7	64
1980	92.8	4	107.8	44
1981	199.2	292	230.3	336
1982	277.9	215	293.8	174
1983	361.0	228	379.1	234
1984	431.1	191	450.5	195
1985	489.3	159	493.3	119
1986	506.4	47	511.6	51
1987	533.9	75	540.6	80
1988	554.7	57	559.5	52
1989	577.1	62	579.9	56
1990	589.6	34	585.7	27
1991	568.5	(58)	568.5	(47)
1992	571.4	8	574.7	17
1993	585.7	39	587.1	34
1994	591.7	16	591.7	13
1995	591.7	**	591.6	**
1996	573.6	(49)	565.8	(70)
1997	563.4	(28)	563.4	(7)
1998	563.4	**	561.1	***
1999	564.9	4	567.0	16
2000	570.3	5	540.7	(64)****

- \* Fill rates adjusted for oil sales.
- \*\* Fill suspended during this period
- \*\*\* Decrease due to Maya exchange
- \*\*\*\* Net decrease due to Exchange 2000

**Table 4**  
**Crude Oil Receipts through December 2000**  
**(Million Barrels)**

Source Country	2000	Cumulative	Percent of Total
<b>Mexico</b>	<b>0.5</b>	<b>266.2</b>	<b>41.8</b>
<b>United Kingdom</b>	<b>0.5</b>	<b>150.0</b>	<b>23.6</b>
<b>United States*</b>	<b>2.3</b>	<b>51.8</b>	<b>8.1</b>
<b>Saudi Arabia</b>		<b>27.1</b>	<b>4.3</b>
<b>Libya</b>		<b>23.8</b>	<b>3.7</b>
<b>Iran</b>		<b>20.0</b>	<b>3.1</b>
<b>United Arab Emirates</b>		<b>18.4</b>	<b>2.9</b>
<b>Nigeria</b>	<b>0.1</b>	<b>15.8</b>	<b>2.5</b>
<b>Norway</b>		<b>11.9</b>	<b>1.9</b>
<b>Oman</b>		<b>9.0</b>	<b>1.4</b>
<b>Egypt</b>		<b>8.9</b>	<b>1.4</b>
<b>Ecuador</b>		<b>6.2</b>	<b>1.0</b>
<b>Algeria</b>		<b>6.2</b>	<b>1.0</b>
<b>Cameroon</b>		<b>3.4</b>	<b>0.5</b>
<b>Iraq</b>		<b>3.4</b>	<b>0.5</b>
<b>Gabon</b>		<b>2.4</b>	<b>0.4</b>
<b>Qatar</b>		<b>2.3</b>	<b>0.4</b>
<b>Columbia</b>		<b>1.2</b>	<b>0.2</b>
<b>Angola</b>		<b>1.0</b>	<b>0.2</b>
<b>Venezuela</b>	<b>3.4</b>	<b>6.9</b>	<b>1.1</b>
<b>Peru</b>		<b>0.4</b>	<b>0.1</b>
<b>Argentina</b>		<b>0.4</b>	<b>0.1</b>
<b>Total **</b>	<b>6.7</b>	<b>636.7</b>	<b>100.0</b>

\* Included receipts from offshore Gulf of Mexico.

\*\* Cumulative total receipts unadjusted for sales and operational gains and losses.

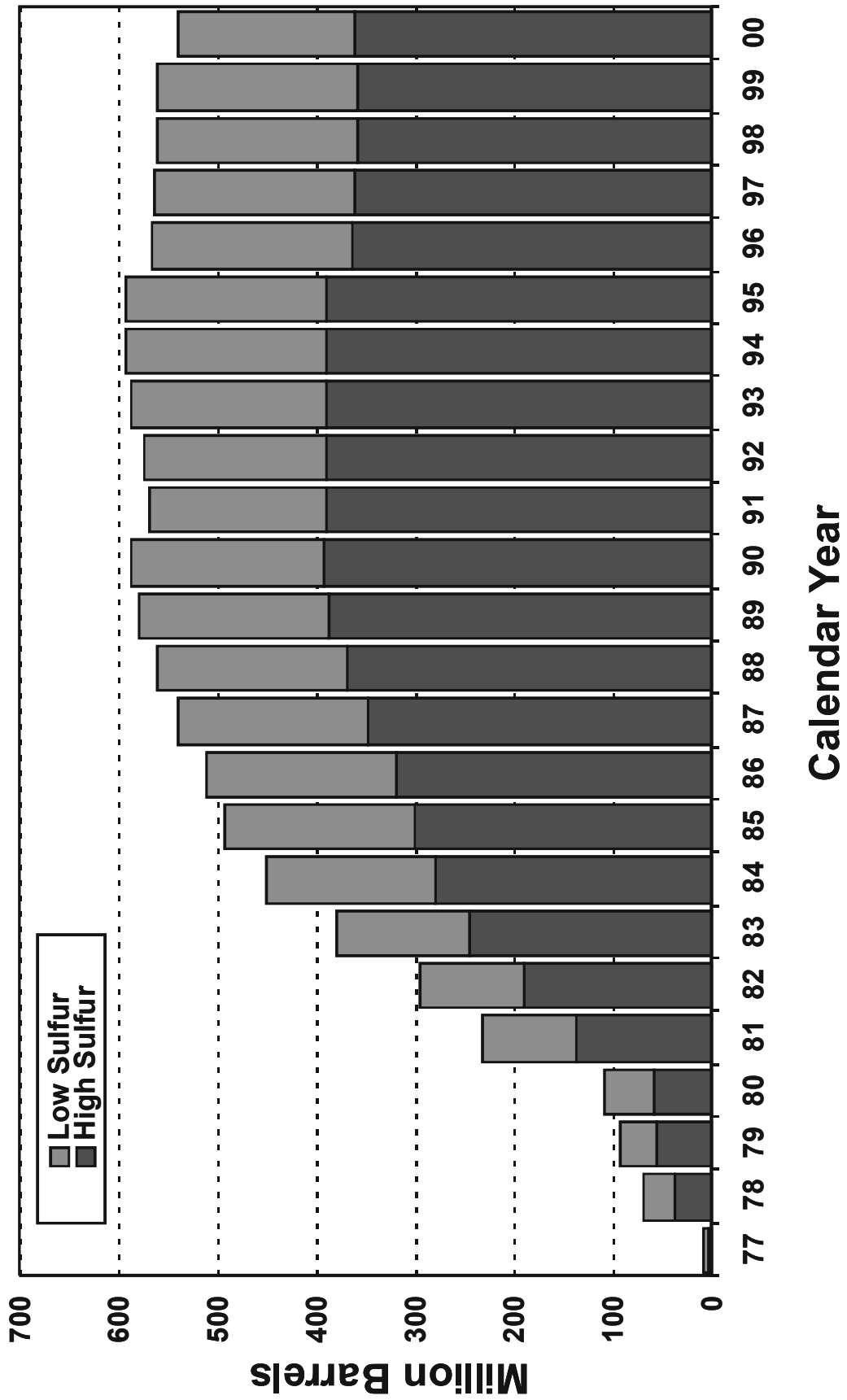
**Table 5**  
**Crude Oil Inventory through December 2000**  
**(Million Barrels)**

Storage Site	Inventory			Cubic Meters (Millions)
	Sweet*	Sour**	Total	
Bryan Mound Brazoria County, Texas	62.1	149.4	211.6	33.6
Big Hill Jefferson County, Texas	18.9	71.0	89.9	14.3
West Hackberry Cameron Parish, Louisiana	75.8	90.1	166.0	26.4
Bayou Choctaw Iberville Parish, Louisiana	22.1	49.2	71.3	11.3
Subtotal Underground Inventory	179.0	359.7	538.7	85.7
Tanks and Pipelines	0.6	1.4	2.0	0.3
Total	179.6	361.1	540.7	85.9

\* Sulfur content not exceeding 0.5 percent

\*\* Sulfur content greater than 0.5 percent

**Figure 3**  
**Cumulative Oil Fill**





### ***Royalty-in-Kind Crude Oil Transfer***

In February 1999, the Department of Energy and the Department of the Interior agreed to place up to 28 million barrels of Federal royalty oil into the Strategic Petroleum Reserve. This oil would replace 28 million barrels sold in 1996-1997. Under this plan, Federal land leaseholders in the Gulf of Mexico agreed to pay a portion of royalties in crude oil (royalty-in-kind) instead of cash. The Department of Energy contracted with commercial entities to receive the oil at offshore production facilities and transfer it to the Strategic Petroleum Reserve, either directly or in exchange for other crude oil delivered. Since the transfer of the royalty oil involves contractor costs, paid in crude oil, for transportation to the storage sites, and considers the differences in quality of the royalty oil and the oil delivered, the total amount of oil delivered was expected to be 26-27 million barrels.

As of December 31, 1999, contracts had been awarded to assure the transfer of the total 28

million barrels of royalty oil. The last group of contracts called for the transfer of royalty-in-kind oil through October 2000, and delivery of oil, in exchange, through November 2000. However, several deliveries of exchange oil have been deferred until calendar year 2001, to alleviate crowding at terminals, and to take advantage of favorable market conditions for swapping oil for delivery of a greater number of barrels in the future. These deferrals will result in a gain of 2.2 million barrels for the Strategic Petroleum Reserve.

As of October 31, 2000, 28 million barrels of royalty-in-kind oil had been transferred to the Reserve's commercial exchange contractors. As of December 31, 2000, the Strategic Petroleum Reserve received 13.8 million barrels of exchange oil (6.3 million barrels in calendar year 2000). Delivery of 15.5 million barrels is scheduled for completion at the end of 2001, for a total of 29.3 million barrels.

### Crude Oil Time Exchange

Alarmed by low distillate inventories in the Northeast, President Clinton directed the Secretary of Energy on September 22, 2000, to enter into exchange agreements with oil companies to exchange up to 30 million barrels of oil. Under the exchange agreements, companies will return a like quantity, plus a bonus percentage of similar crude oil, in the fall of 2001.

From October 2-4, 2000, contracts for 30 million barrels were awarded to 11 companies for delivery in November 2000. The contracts stipulated that successful offerors provide a Letter of Credit, equal to the contract value, within five business

days after the date of the award. Two of those companies failed to secure financial backing, which resulted in a re-solicitation for an exchange of 7 million barrels. Contracts for that quantity were awarded on October 24, 2000, for delivery in December 2000. Some customers arranged early transportation and deliveries began October 15, 2000, and continued through December 2000. More than 130 individual cargoes were delivered.

The Strategic Petroleum Reserve will receive delivery of 31.35 million barrels of exchange oil during August-November 2001. The final contracts are listed in Table 6.

**Table 6**  
**Crude Oil Time Exchange Contracts**

Contractors	SPR Crude Type	SPR Quantity Awarded
BP Oil Supply Company	West Hackberry Sweet	9,000,000
Burhany Energy Enterprises, Inc.	West Hackberry Sweet	3,000,000
Elf Trading Inc.	West Hackberry Sweet	1,000,000
Equiva Trading Company	Bayou Choctaw Sour West Hackberry Sweet	500,000 2,000,000
Hess Energy Trading Company, LLC	Bryan Mound Sour West Hackberry Sweet	1,000,000 1,000,000
Marathon Ashland Petroleum LLC	Bayou Choctaw Sour West Hackberry Sweet	1,500,000 3,900,000
Morgan Stanley Capital Group Inc	Bryan Mound Sour West Hackberry Sweet	500,000 1,500,000
Valero Marketing & Supply Co.	Bryan Mound Sour	1,000,000
Vitol S. A., Inc.	Bryan Mound Sour West Hackberry Sweet	550,000 3,550,000
<b>Total</b>		<b>30,000,000</b>

### ***Exchanges of Crude Oil for Regional Distillate Reserve***

The Department of Energy used its crude oil exchange authority to acquire the storage services and heating oil for the interim reserve, established in the Northeast in July 2000. This interim reserve became the permanent Regional Distillate Reserve. The Department of Energy, through the Defense Energy Support Center, awarded three contracts for heating oil storage in exchange for 117,667 barrels of crude oil on August 17, 2000, and four contracts for 2,000,000 barrels of heating oil, in exchange for 2,718,000 barrels of crude oil on August 29, 2000. The Strategic Petroleum Reserve fulfilled these contracts during September-October 2000, by delivering a total of 2,835,695 barrels of crude oil from the West Hackberry storage site. The capitalized cost for 2,000,000 barrels of petroleum distillate was \$77 million (92 cents per gallon).

### ***Emergency Crude Oil Exchange for Ship Channel Incident***

On June 14, 2000, a shipyard dry dock sank into the Calcasieu Ship Channel, adjacent to the Louisiana Intercoastal Waterway near Lake Charles, potentially tying up tanker traffic for up to 30 days. Conoco and Citgo refineries contacted the Strategic Petroleum Reserve and requested a loan of 500,000 barrels, each, to keep their refineries running. Both refineries were able to receive the oil from a 22-inch Equilon pipeline connected at the Lake Charles Meter Station to a pipeline from West Hackberry. The Strategic Petroleum Reserve signed emergency oil exchange contracts with both companies to exchange 995,969 barrels of oil, delivered to the companies from June 17-22, 2000. The companies returned 1,026,314 barrels between July 19 and August 4, 2000.

## **EMERGENCY RESPONSE CAPABILITIES**

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### ***Drawdown and Distribution of Oil***

The method for distributing crude oil is price competitive sale, described in the "Strategic Petroleum Reserve Drawdown (Distribution) Plan," Amendment Number 4 to the Strategic Petroleum Reserve Plan. The sale is open to the largest possible universe of eligible buyers to ensure an economic and efficient distribution. The Plan also provides for the Secretary of Energy to direct, in any calendar month, a distribution of up to ten percent of the volume of oil sold in that calendar month. The price will be the average price of oil sold at the contemporaneous competitive sale, or at the most recent competitive sale if no contemporaneous competitive sale is held.

### ***Competitive Sales Procedures***

The Department of Energy's Standard Sales Provisions\* govern the competitive sales process. The first step in the process is the issuance of a Notice of Sale identifying the volume, characteristics, and location of the petroleum for sale, delivery dates, and procedures for submitting offers. Measures required for assuring performance and financial responsibility are also described in the Notice of Sale.

During a drawdown, several Notices of Sale may be issued, each covering a sales period of one to two months. Offerors may have only seven days from the date a Notice of Sale is issued until offers are due, and thirty days or less until purchasers must begin accepting delivery of the

oil. A less compressed schedule may become more feasible in subsequent sales periods. Because of the possible short initial lead-time, the Department maintains a list of prospective offerors who will receive all Notices of Sale and intends to make maximum use of electronic communication for Notice of Sale distribution.

The second step in the sales process is for prospective purchasers to submit offers, as specified in the Notice of Sale. Offerors must accept, unconditionally, all terms and conditions in the Notice of Sale, offer at least the minimum price, if any is specified in the Notice of Sale, and submit an offer guarantee of 5 percent of the maximum potential contract amount, or \$10 million, whichever is less. The offer evaluation process is structured so that the offerors bidding the highest prices determine the transportation methods, up to the limits of the distribution system. Specific delivery arrangements are negotiated later in the process.

Within five business days of being notified, all "apparently successful offerors" are required to provide a Letter of Credit equal to 100 percent of the contract amount as a guarantee of performance and payment of amounts due under the contract. Upon timely receipt of the financial guarantees, and a final determination by the Contracting Officer that offers are responsive and offerors responsible, Notices of Award are issued. Deliveries to the purchasers may then begin, consistent with their arrangements for commercial pipeline or marine vessel transportation. Such deliveries may begin as soon as the 16th day of the sales process, to the extent that the purchasers submit their financial guarantees and can arrange timely transportation.

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\* Department of Energy, 10 CFR Part 625, Price Competitive Sale of Strategic Petroleum Reserve Petroleum; Standard Sales Provisions. The most recent edition of the Standard Sales Provisions was published in the *Federal Register* on October 8, 1998 (63 FR 54196).

### Drawdown Capabilities

The crude oil acquired for the Strategic Petroleum Reserve is commingled in caverns at the storage sites, creating various distinct crude oil streams

available for sale during a drawdown. Table 7 identifies these crude oil streams, delivery modes, and locations, as of December 31, 2000.

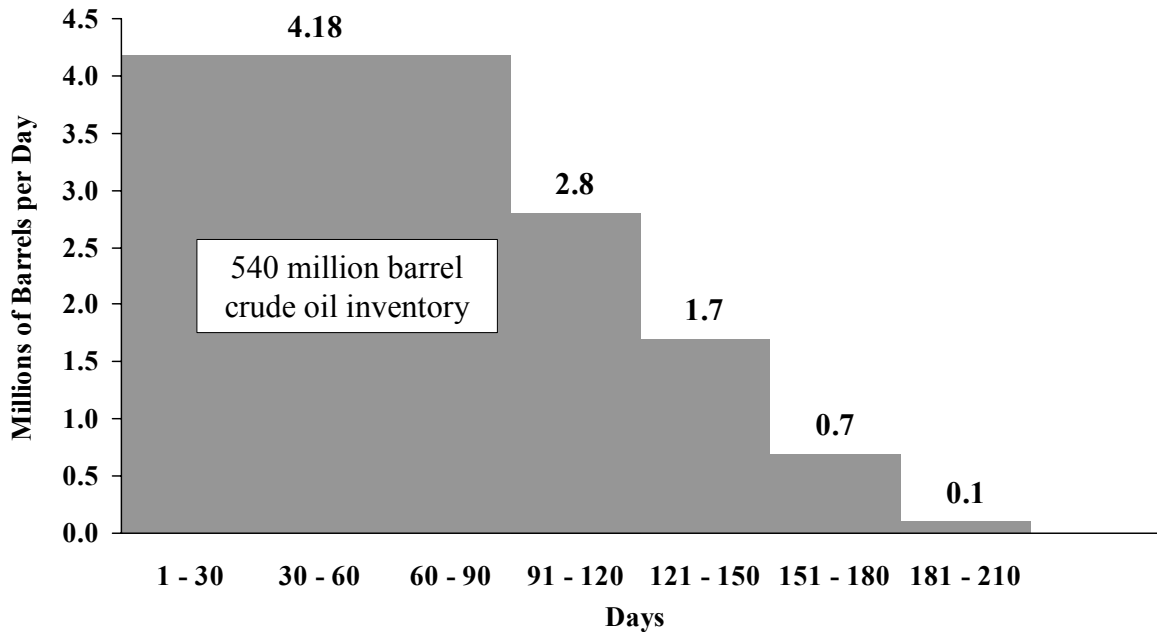
**Table 7  
Crude Oil Streams**

Crude Oil Stream	API Gravity	Sulfur Content	Delivery Mode and Location
<b>Seaway System</b>			
Bryan Mound Sweet	35.9	0.33	Pipeline or tankship at Seaway Terminal, Freeport, Texas; or Seaway Terminal, Texas City, Texas
Bryan Mound Sour	33.4	1.38	
<b>Texoma System</b>			
West Hackberry Sweet	37.0	0.29	Pipeline, tankship or barge at Sunoco Terminal, Nederland, Texas; Pipeline at Equilon-22"/DOE connection, Lake Charles, Louisiana
West Hackberry Sour	33.5	1.41	
Big Hill Sweet	35.9	0.48	Pipeline, tankship or barge at Sunoco Terminal, Nederland, Texas; Pipeline or tankship at Unocal Terminal, Nederland, Texas; Pipeline at Equilon-20"/DOE connection, Winnie, Texas
Big Hill Sour	30.3	1.38	
<b>Capline System</b>			
Bayou Choctaw Sweet	36.0	0.36	Pipeline at Capline or LOCAP Terminals, St. James, Louisiana; Tankship at Sugarland St. James Terminal, St. James, Louisiana 24-inch site connection to Red Stick Pipeline, Iberville Parish, Louisiana
Bayou Choctaw Sour	32.2	1.43	

The Strategic Petroleum Reserve can draw down crude oil at an initial sustainable rate of 4.2 million barrels per day, for a period of 90 days. After this period, the drawdown rate will gradually decrease as site inventories are depleted, and the declining number of caverns containing crude oil becomes a constraint. Figure 4 illustrates the physical drawdown capability, which provides for a distribution of 378 million barrels in 90 days, and 535 million barrels in 180 days.

The current sustainable drawdown rate of 4.2 million barrels per day is higher than the 1999 rate of 4.1 million barrels per day as a result of the completion of life extension activities at Big Hill. The initial sustainable drawdown capability will be 4.42 million barrels per day when the currently available capacity is filled.

**Figure 4**  
**Projected Maximum Drawdown Capability**  
**(As of December 31, 2000)**



Note: Rates after 90 days are based on cavern-use assumptions. Actual rates are contingent on the specific caverns drawn down during a previous drawdown period.

### ***Drawdown Readiness Activities***

The Strategic Petroleum Reserve conducted its first full-scale simulated drawdown exercise, called Eagle I, from January 11 through March 4, 2000, to test program readiness. The exercise simulated a world oil disruption that would result in a Presidential decision to draw down the Strategic Petroleum Reserve.

The exercise was conducted throughout the Strategic Petroleum Reserve organization, including the Program Office in Washington, D.C., the Project Management Office in New Orleans, and the four sites (Bayou Choctaw, West Hackberry, Big Hill and Bryan Mound). The State of Hawaii participated in the exercise to test the procedures related to the “binding offer” provisions of the Energy Conservation and Reauthorization Act of 1998.

The exercise resulted in recommendations for additional resources, training and certification programs, further documentation of procedures, and a better understanding of the relationships between discrete tasks and the overall drawdown process.

Additional drawdown readiness activities included:

- Conducting recovery program exercises at the Bayou Choctaw and Big Hill sites to demonstrate their ability to recover drawdown capabilities using barge-mounted, diesel-driven pumps after damage from natural or man-made disasters.
- Demonstrating the Big Hill site’s capability to sustain maximum drawdown rate for a prescribed period.

- Training program development to support turnover of the Site Operations Training Simulator.
- Conducting periodic assessments of the readiness and availability of all functions, facilities, and systems associated with a drawdown.

### ***Distribution Plan and Capabilities***

The Strategic Petroleum Reserve has the capability to distribute its crude oil to United States refineries by both pipeline and marine transportation in the event of an emergency. The Reserve is connected by commercial pipeline systems to over one-half of the United States’ refining capacity, and is capable of delivering crude oil to 22 refineries in the Gulf Coast region, and 28 refineries in the Mid-continent and Midwest regions. The Strategic Petroleum Reserve is connected to all four major interstate pipeline systems, Capline, Seaway, ExxonMobil and MidValley, serving the Mid-continent and the Midwest. These 50 refineries processed approximately 55 percent of United States’ crude oil imports during 2000.

The Strategic Petroleum Reserve is connected to five marine terminals with a combined distribution capacity of approximately 2.5 million barrels per day. These are: Seaway Terminal (Phillips), Freeport, Texas; Seaway Terminal (ARCO), Texas City, Texas; Sunoco and Unocal Terminals, Nederland, Texas; and Sugarland Terminal (formerly St. James Terminal) St. James, Louisiana. Figure 5 illustrates the Strategic Petroleum Reserve’s pipeline and marine distribution capabilities.

The current drawdown and distribution capabilities of the Strategic Petroleum Reserve are summarized in Table 8, and are based on current

crude oil stream inventories, existing site drawdown systems, and commercial distribution capabilities.

**Table 8**  
**Drawdown and Distribution Capabilities**  
**(Thousands of Barrels Per Day)**

	<b>Drawdown</b>	<b>Distribution</b>
Seaway System	1,500	2,160
Texoma System	2,165	3,197
Capline System	515	1,553
<b>Total</b>	<b>4,180</b>	<b>6,910</b>

***Distribution Assessment***

An annual distribution assessment is conducted of the Strategic Petroleum Reserve’s crude oil distribution system capabilities to ensure there are adequate connections to the commercial distribution systems, and to identify the need for any remedial plans. The assessment for the year 2000 evaluated the Strategic Petroleum Reserve’s capability to sustain its maximum drawdown rate in 2000, 2005, and 2010, based on future U.S. petroleum refining demands as forecasted in the Energy Information Administration’s *Annual Energy Outlook, 2000*.

The assessment took into account changes made to commercial pipeline distribution systems and modifications to the infrastructure, including the commissioning of Equilon’s 24-inch pipeline from Bayou Choctaw to the Placid Port Allen Refinery, the commissioning of ExxonMobil’s 24-inch pipeline from LOCAP to the ExxonMobil

Baton Rouge refinery, and the reversal of West Texas Gulf’s 26-inch pipeline from Sun Terminal to Longview, Texas. Equilon Pipeline Company also initiated the operation of its Millennium pipeline system, a 12-inch pipeline from Nederland, Texas to Longview, Texas.

Finally, the assessment confirms that the Strategic Petroleum Reserve has sufficient offsite distribution capabilities (defined as 120 percent of the maximum drawdown rate) to achieve current drawdown rates. The assessments for 2005 and 2010 predict that the Strategic Petroleum Reserve’s distribution capability will continue to increase in the Seaway and Texoma systems as refinery imports increase, and distribution in the Capline system will decrease due to increasing inflow of domestic production from the Gulf, but not sufficient to impact the Reserve’s distribution requirements.



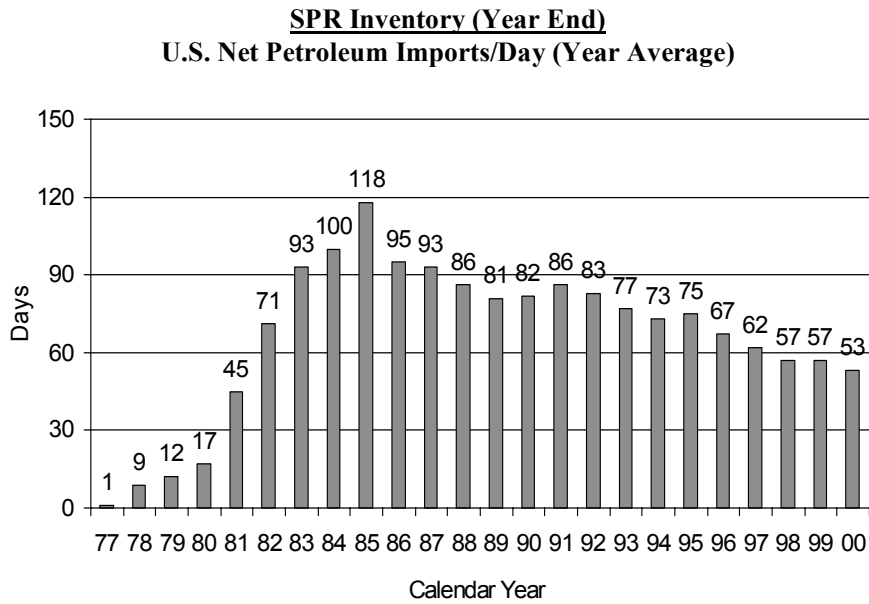


### Import Protection Levels

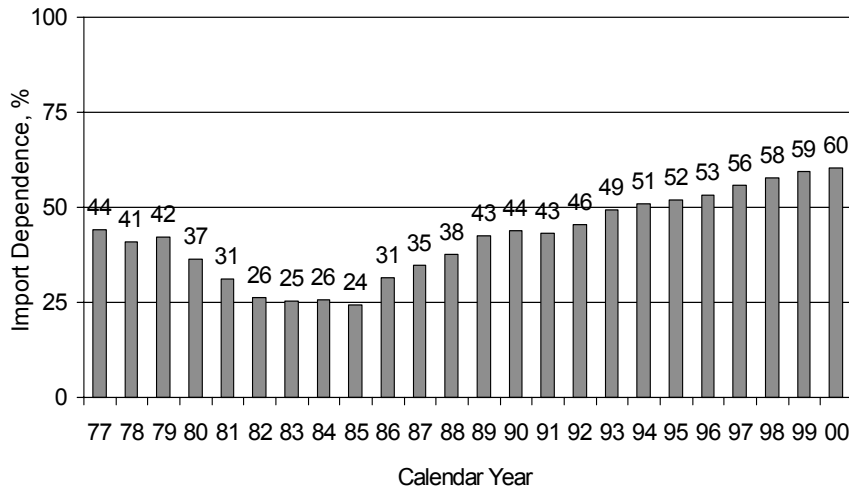
In the Energy Policy and Conservation Act of 1975, the Congress established an initial storage objective of 90 days of net petroleum imports, which at that time equated to 500 million barrels. The Strategic Petroleum Reserve's inventory of 540.7 million barrels on December 31, 2000, was equivalent to 53 days of net petroleum imports of

crude and refined products during 2000. The inventory in equivalent days of net petroleum imports has been on a continual decline since 1985, principally as a result of increasing United States dependence on oil imports (Figure 6). The United States dependence on foreign crude imports exceeded 60 percent in 2000 (Figure 7).

**Figure 6**  
**Days of Net Import Protection (1977-2000)**



**Figure 7**  
**U.S. Net Crude Oil Import Dependence (1977-2000)**



As a member nation of the International Energy Agency, the United States is committed to maintaining stocks of crude and products in reserves equivalent to 90 days of net oil imports. Computations of member stockpile requirements are based on both public and privately held stocks,

and net imports are defined as the average daily level in the previous year. The most recent International Energy Agency computation credits the United States with 123 days of emergency reserves, based on both the Strategic Petroleum Reserve and privately held stocks.

## **COMMERCIALIZATION ACTIVITIES**

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### ***Commercial Leases***

Since 1995, the Strategic Petroleum Reserve has promoted the commercialization of its under-utilized crude oil distribution facilities to make the program more cost-effective, and has leased four crude oil pipelines and a marine terminal to private industry. The contracts for these leases require that the facilities be maintained in good condition and, that in the event of an emergency drawdown of oil, the leased pipelines be returned on 15 days notice.

**Bayou Choctaw Pipeline:** Leased to Shell Pipe Line Corporation (now Equilon Pipeline Company) on May 1, 1997, on a revenue-sharing basis. In 1998, the lease was converted from an annual lease to a ten-year lease. In 2000, lease revenues amounted to \$217,573.

**Big Hill Pipeline:** Leased to Texaco Pipe Line Incorporated (now Equilon Pipeline Company) on October 15, 1997, under a 75 percent capacity lease contract. This three-year lease expired on October 15, 2000, and was extended through January 15, 2001. In 2000, lease revenues amounted to \$493,359.

**Bryan Mound Pipelines:** Two of the three Bryan Mound pipelines were leased to Exxon Pipeline Company on January 14, 1999. Exxon began using the pipelines in June 2000, as part of its onshore distribution system for the Diana-Hoover production in the Gulf of Mexico. In 2000, lease revenues amounted to \$652,146.

**St. James Terminal:** Leased to Shell Pipe Line Corporation (now Equilon Enterprises LLC) on January 31, 1977, on a revenue-sharing basis. The contract is for one year with automatic renewals each year for a period of 19 years, unless either party gives notice of termination 90 days prior to

the renewal date. In 2000, lease revenues amounted to \$748,986.

### ***Foreign Oil Storage***

The Strategic Petroleum Reserve promotes the concept of storing foreign oil in its unused storage space as a strategy to increase world oil stockpiling, generate revenues for the United States Treasury, and/or add oil to the Strategic Petroleum Reserve (in lieu of a fee). The Balanced Budget Act of 1997 (Public Law 105-33) provides specific authority to store petroleum products of another country, or its representatives, in the Strategic Petroleum Reserve, provided that the United States is fully compensated for all related costs, and that the ability to draw down U.S. oil is not impaired.

To enhance the Strategic Petroleum Reserve's offer to store oil for foreign governments or their representatives, the Big Hill storage site was activated as a special purpose Foreign Trade Zone subzone on September 28, 1998. This designation permits customers to store oil without paying customs fees and certain taxes. For now, the Big Hill storage site is the only storage site to receive this designation.

The Strategic Petroleum Reserve did not pursue any commercial or foreign storage initiatives during 2000. In 1999, the Department of Energy resumed filling the Strategic Petroleum Reserve, primarily the Big Hill site, through its agreement with the Department of the Interior for Federal royalty oil, which continued through 2000. In addition, the world oil market was characterized by oil prices higher than the price for future delivery, and there were no market incentives for commercial oil storage.

## **BUDGET AND FINANCE**

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Appendix C of the Consolidated Appropriations Act, 2000 (Public Law 106-113) included \$159 million for Strategic Petroleum Reserve facilities operations and management.

### ***Appropriations through Fiscal Year 2000***

A total amount of \$21.5 billion, net of sales and transfers, has been appropriated for the Strategic Petroleum Reserve through fiscal year 2000. Included in this total is the distribution of annual and total appropriations described in Table 9. Figure 8 illustrates the cumulative appropriations for storage facilities operations and management, as well as petroleum acquisition and transportation.

### ***Strategic Petroleum Reserve Account***

The Strategic Petroleum Reserve Account funds the development, operation, and maintenance of facilities; the salaries and expenses necessary to plan and manage the program, including the operation of the Project Management Office in New Orleans, Louisiana; and the activities pertinent to major issues concerning the development and use of the Strategic Petroleum Reserve.

Obligations for the Strategic Petroleum Reserve in fiscal year 2000 totaled approximately \$144.2 million. From this amount, \$10.9 million was obligated for Federal program management salaries and benefits, and \$133.3 million was obligated for contractual goods and services to operate and maintain the Strategic Petroleum Reserve.

### ***SPR Petroleum Account***

The SPR Petroleum Account funds the acquisition of oil for the Strategic Petroleum Reserve; the associated costs for transportation and terminalling; United States customs duties, Superfund and Oil Spill Liabilities Trust Fund taxes; and other miscellaneous costs, such as Defense Energy Support Center administration costs associated with non-emergency sales, as well as oil acquisition, and transportation support. During an emergency drawdown and sale, the SPR Petroleum Account is the source of funding for the incremental costs of withdrawing oil from the storage caverns and transporting it to the point where purchasers take title. During an emergency drawdown and sale, an amount equal to Federal receipts realized is deposited in the SPR Petroleum Account to create additional budget authority for filling the Reserve. At the end of fiscal year 2000, approximately \$32 million remained available for obligation in the Account, an amount sufficient to finance approximately 60% of the incremental costs of a six-month emergency drawdown.

The capitalized cost for the crude oil in the Strategic Petroleum Reserve at the end of fiscal year 2000 was \$15 billion, for an average cost per barrel of approximately \$27. The cost for the Department of Defense inventory was \$125 million, for an average cost per barrel of \$19.32.

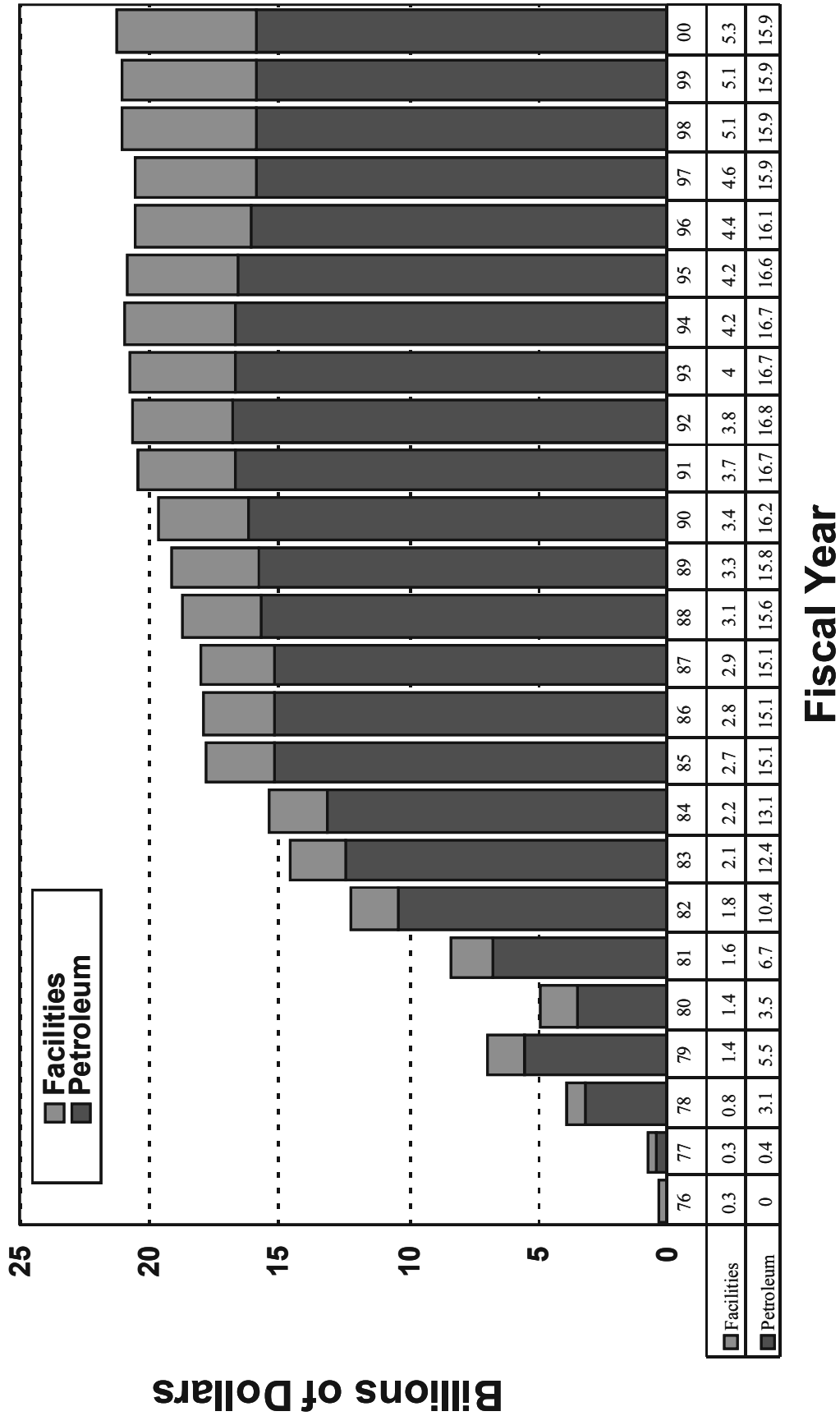
**Table 9**  
**Annual Appropriations for Storage Facilities Operations and Management and Petroleum Acquisition and Transportation (Thousands) (Data as of December 31, 2000)**

Fiscal Year	Oil Account	Facilities	Management	Total	Defense SPR
1976	0	300,000	13,975	313,975	
1977	440,000	0	7,824	447,824	
1978	2,703,469	463,933	14,704	3,182,106	
Total 1979 Appropriations*	2,356,456	632,504	18,111	3,007,071	
Total 1980 Appropriations*	(2,022,272)	0	22,272	(2,000,000)	
Total 1981 Appropriations*	3,205,094	108,168	19,391	3,332,653	
Total 1982 Appropriations*	3,679,700	175,656	20,076	3,875,432	
1983	2,074,060	222,528	19,590	2,316,178	
1984	650,000	142,357	16,413	808,770	
1985	2,049,550	441,300	17,890	2,508,740	
Total 1986*	(12,964)	106,979	13,518	107,533	
1987	0	134,021	13,412	147,433	
1988	438,744	151,886	12,276	602,906	
1989	242,000	160,021	13,400	415,421	
1990	371,916	179,530	12,953	564,399	
1991	566,318	187,728	12,846	766,892	
1992	88,413	171,678	13,384	273,475	
1993	(125,625)	161,940	14,227	50,542	
DOD Transfer (non add)	124,925	700	0	125,625	125,625
1994	0	191,035	15,775	206,810	
1995	<u>(107,764)</u>	<u>226,938</u>	<u>16,780</u>	<u>135,954</u>	
1996 transfer from SPR Petroleum Account	(187,000)	170,173	16,827	0	
1996 Weeks Is. Oil Sale	(97,114)	97,114	0		
1996 deficit reduction oil sale	<u>(227,000)</u>	<u>0</u>		<u>(227,000)</u>	
1996 Total	<u>(511,114)</u>	<u>267,287</u>	16,827	<u>(227,000)</u>	
1997 Total*	(220,000)	(193,000)	(16,000)	(11,000)	
1998	0	191,500	16,000	207,500	
1999	0	145,120	14,805	159,925	
2000	0	144,000	15,000	159,000	

\* Includes reprogramming and rescission actions.

Note: Fiscal year 1991 SPR Petroleum Account of \$566,318 includes proceeds of \$122,681 from the Test Sale recorded as additional budget authority, rather than reductions to obligations, costs, and outlays. It also includes \$315,424,985 in Desert Storm Drawdown proceeds from January 1991, and \$19,755,064 from fiscal year 1991 NPR excess receipts. Thus, the cumulative budget authority is "gross" and not related directly to the inventory of oil on hand.

Figure 8  
Cumulative Funding



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***Summary of Commercialization Revenues***

During the year 2000, the Strategic Petroleum Reserve received \$2,112,064 in revenues from the commercial leases of its distribution facilities and

pipelines, \$1,556,205 paid in crude oil equivalent, and \$555,859 paid in cash (transferred to the United States Treasury).

**Table 10**  
**Summary of Commercialization Revenues**  
**(December 31, 2000)**

Calendar Year	Bryan Mound Pipeline	Big Hill Pipeline	Bayou Choctaw Pipeline	St. James Terminal Lease	Total Revenue Generated
1996	102,606	472,809			575,415
1997		429,824	0	133,300	563,124
1998	12,500	402,525	0	481,010	896,035
1999	679,393	400,000	163,030	546,125	1,788,548
2000	652,146	493,359	217,573	748,986	2,112,064



### Performance Measurement

The Strategic Petroleum Reserve has incorporated the mandates of the Government Performance and Results Act of 1993 into its performance management system. During fiscal year 2000, 20

out of 24 performance targets were met. Details of program goals, objectives, and progress are in the Strategic Petroleum Reserve's Annual Performance Report.

<b>PERFORMANCE MEASURES</b> (Value or characteristic used to measure output)	<b>FY 2000 TARGET</b>	<b>FY 2000 ACTUAL</b>
Total capacity at four sites.	700 MMB	700 MMB
Distribution capability as a percentage of drawdown rate.	≥ 120% of drawdown rate	165%
Percent of Life Extension Program under contract.	100%	97%
Drawdown rate.	4.1 MMB/Day	4.2 MMB/Day
The calculated predicted site availability.	≥ 95%	96%
The weighted annual average of the performance elements in the Maintenance Performance Appraisal Report.	≥ 95% of possible points	97%
The weighted annual average of the performance elements of Material Performance Appraisal Compilation.	≥ 95 Points	97 Points
Recovery equipment testing.	95% Test Objectives	100%
Crude oil inventory available.	582.4 MMB	570.3 MMB
Accountability: Variance between oil sent and oil received during oil movements.	≤ .4%	.15%
Oil Quality Assurance: Percentage of crude oil samples meeting specifications.	≥ 95%	95%
Days with no reportable/recordable ES&H events.	≥ 310	335
Number of environmental permit noncompliances received (includes NOVs).	≤ 10	9
Total waste generated.	≤ 3,265,000 LBS	654,645 LBS
Hazardous waste volume.	3,600 LBS	4,078 LBS
Lost workday case rate for SPR.	≤ 1.1 cases per 200,000 worker hours	1.0
Lost workdays per case for SPR.	≤ 35 days per 200,000 worker hours	28.6
Operating cost per barrel of storage capacity.	≤ \$0.1896 per barrel	\$.1861
Percent of Level 1 and 2 Milestones completed on schedule.	≥ 90%	75%
Percent of performance measure output targets achieved.	≥ 90%	87%

## ***OTHER ACTIVITIES***

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### ***Environment, Safety, and Health***

The Strategic Petroleum Reserve received external verification of its Integrated Safety Management (ISM) system, which was fully implemented in November 1999, and demonstrated its compliance with nationally and internationally recognized benchmarking standards.

#### **(ISO) 14001 Certification**

On May 19, 2000, the Strategic Petroleum Reserve became the first bulk petroleum storage organization in the United States, public or private, to receive multi-site International Standardization Organization (ISO) 14001 certification for its environmental management system.

#### **OSHA Recognition**

The Strategic Petroleum Reserve earned recognition from the Occupational Safety and Health Administration's (OSHA) Voluntary Protection Program. This program is highly selective and recognizes only those facilities that demonstrate outstanding comprehensive safety and health programs that reduce hazards in the workplace. Fewer than 600 facilities have earned this recognition. Under this program, OSHA recognizes three achievement levels: Star, is the highest level of achievement, Merit and Demonstration.

OSHA inspected three sites, West Hackberry, Bayou Choctaw and Big Hill. West Hackberry gained Star status, and OSHA recommended Bayou Choctaw for Star status. Big Hill gained approval as a Merit facility, the first Fossil Energy site to achieve this recognition. Bryan Mound is scheduled for inspection in 2001.

### ***Security***

The Strategic Petroleum Reserve's protective force engages with Federal, state and local law enforcement agencies to provide emergency responses at all its facilities. Intensive training and periodic tactical exercises with law enforcement agencies ensure the proficiency of its protective force.

Pinkerton Government Services (formerly Borg-Warner Protective Services Corporation and Burns International Security Services) provides protection services under a subcontract with DynMcDermott.

The current protection force is 151 uniformed Security Police Officers who provide protection for the Project Management Office in New Orleans and four storage sites.

On October 25, 2000, the Strategic Petroleum Reserve's protection force hosted a joint counter-terrorism exercise with the Federal Bureau of Investigation (FBI) at the Bayou Choctaw site, code-named "Black Gold." The FBI deployed 350 agents, established a command post in the Baton Rouge area and a tactical operations center at the Bayou Choctaw site. This joint exercise investigated simulated terrorist incidents using FBI Special Weapons and Tactics (SWAT) teams to resolve a hostage-barricade incident. The exercise tested the FBI's support of national contingency programs, Department of Energy executive orders, Critical Infrastructure Protection Program and the Strategic Petroleum Reserve's Contingency Plan. The FBI congratulated the Strategic Petroleum Reserve's Security Program and the professionalism of all personnel involved.

The Strategic Petroleum Reserve's storage sites continue to be on enhanced vigilance status due to continuing tensions in the Middle East.

### ***Real Estate Actions***

The Department of Energy out-granted a pipeline easement across the West Hackberry site to Pinnacle Gas Company for \$23,800. On August 22, 2000, the Department acquired from a private landowner a five-year road-use permit to access the Department's valve site near West Hackberry for \$14,450.

### ***Organizational Improvement Activities***

Highlights of organizational improvement activities are:

- Expanding organizational improvement efforts based on the Malcolm Baldrige National Quality Award, including applying for the President's Quality Award Program Application 2001, which is modeled after the Baldrige Award;
- Interviewing customers (refiners) at their places of business to develop a dialogue and improve product quality and customer service; and
- Benchmarking the Strategic Petroleum Reserve against other organizations, using the U.S. Office of Personnel Management's Performance America Employee Satisfaction Survey.

### ***Major Improvement Initiatives***

Mark Graham Brown, a nationally recognized authority on the Baldrige award criteria, trained employees in applying the Baldrige award criteria to improve the organization. This training proved useful in preparing the President's Quality Award Program Application 2001. A major benefit derived from the President's Quality Award Program Application 2001 is a feedback report

that provides an objective review of the organization and can be used for making additional improvements. Three employees served as Quality Award Examiners for the President's Quality Award.

The Strategic Petroleum Reserve used the U.S. Office of Personnel Management (OPM) Performance America's 165-item Employee Survey to assess employee satisfaction and the results compared favorably with other Federal organizations and Fortune 50 companies. Survey results indicated very high employee satisfaction with the organization's leadership and work environment.

The OPM survey results set six new benchmarks in 17 categories that characterize high performing organizations, tied four other benchmarks, and had three results that were statistically insignificant from previous benchmarks, compared to other Federal organizations.

### ***Customer Service Initiatives***

The Strategic Petroleum Reserve's primary customers are 33 U.S. refiners that dominate the refining capacity in the United States. To improve relationships with these customers, cross-functional teams conducted structured interviews with them to discuss crude oil quality, distribution logistics, and sales processes. Subsequently, a customer service team developed a database to centralize customer data and customer contacts.

Customer outreach continues at industry conferences, including the National Petroleum Refiners Association Annual Meeting, the Offshore Technology Conference, and the National Association of Foreign Trade Zones Conference.

## **APPENDIX A**

### **Strategic Petroleum Reserve Site Information**

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#### ***Bryan Mound***

##### **Location**

Brazoria County, Texas (3 miles southwest of Freeport, Texas).

##### **Site Description**

232-million-barrel storage facility consisting of 20 caverns.

24-inch diameter, 6-mile brine disposal pipeline extending 4 miles offshore in the Gulf of Mexico.

Oil, brine and raw water piping distribution system connecting caverns with central plant and water intake structure located on Brazos River. Twenty-one (21) pumps totaling approximately 46,700 horsepower.

##### **System Parameters**

Drawdown Rate:	1,500,000 bbl/d
Raw Water Pumping Rate:	1,545,000 bbl/d
Oil Fill Rate:	225,000 bbl/d
Brine Disposal Rate:	260,000 bbl/d

##### **Distribution Facilities**

DOE 3.9 mile, 30-inch pipeline to Seaway Freeport Marine Terminal, DOE 4.0 mile, 30-inch pipeline to Seaway Jones Creek Tank Farm and Pipeline and DOE 46 mile, 40-inch pipeline to Seaway Texas City Terminal and Docks.

##### **Acquisition**

Acquired 499.47 acres fee simple, by condemnation April 1977, from Freeport Mineral Company and other owners. Dow Chemical Company was the previous operator.

#### ***West Hackberry***

##### **Location**

Cameron Parish, Louisiana (25 miles southwest of Lake Charles, Louisiana).

##### **Site Description**

222-million-barrel storage facility consisting of 22 caverns.

Oil, brine, and raw water piping distribution system connecting caverns with central plant, water intake structure located on Intra-coastal waterway and 9-brine disposal wells. Thirty-three (33) pumps totaling over 41,680 horsepower.

##### **System Parameters**

Drawdown rate:	1,300,000 bbl/d
Raw Water Pumping Rate:	1,632,000 bbl/d
Oil Fill Rate:	225,000 bbl/d
Brine Disposal Rate:	225,000 bbl/d

##### **Distribution Facilities**

DOE 42.8 mile, 42-inch pipeline to Sunoco Nederland Terminal.

DOE 13.6 mile, 36-inch pipeline to Equilon common carrier pipeline system at Carlyss.

##### **Acquisition**

Acquired 405.36 acres fee simple by condemnation, April 1977, from numerous private landowners. Olin Corporation was the previous site operator. Acquired 160.0 additional acres fee simple by condemnation in two actions, July 1979 and March 1980.

## **Big Hill**

### **Location**

Jefferson County, Texas (26 miles southwest of Beaumont, Texas).

### **Site Description**

170-million-barrel storage facility consisting of fourteen caverns.

Oil, brine, and raw water systems connecting caverns with central plant, water intake structure located on the Intracoastal Waterway, and a 48-inch diameter, 14-mile brine disposal pipeline extending 4 miles offshore in the Gulf of Mexico. Forty-eight (48) pumps totaling 46,000 horsepower.

### **System Parameters**

Drawdown Rate:	1,100,000 bbl/d
Raw Water Pumping Rate:	1,400,000 bbl/d
Oil Fill Rate:	225,000 bbl/d
Brine Disposal Rate:	432,000 bbl/d

### **Distribution Facilities**

DOE 24.5 mile, 36-inch pipeline to Sunoco Nederland Terminal

Unocal 2 mile, 24-inch pipeline to Unocal Docks  
Equilon 20-inch pipeline system to East Houston.

### **Acquisition**

Acquired 271 acres fee simple, by condemnation November 1982 and July 1983, from three landowners, i.e., 238.48 acres from Amoco, 27.06 acres from the Pipkin estate, and 5.46 acres from the Patrick Henry Phelan estate.

## **Bayou Choctaw**

### **Location**

Iberville Parish, Louisiana (12 miles southwest of Baton Rouge, Louisiana).

### **Site Description**

76-million-barrel storage facility consisting of six caverns.

Oil, brine, and raw water piping distribution system connecting caverns with central plant, a water intake structure, 12 brine disposal wells, and a pipeline for disposing of brine to Union Texas Petroleum, Inc. Eighteen (18) pumps totaling over 18,000 horsepower.

### **System Parameters**

Drawdown Rate:	515,000 bbl/d (sour) 300,000 bbl/d (sweet)
Raw Water Pumping Rate:	515,000 bbl/d
Oil Fill Rate:	110,000 bbl/d
Brine Disposal Rate:	110,000 bbl/d

### **Distribution Facilities**

DOE-owned 37.2 mile, 36-inch pipeline to Equilon's Sugarland Terminal and Capline Pipeline. Equilon-owned 16 mile, 24 inch pipeline to Baton Rouge.

### **Acquisition**

Acquired 355.95 acres fee simple, by condemnation April 1977, from numerous private owners. Union Texas Petroleum (a subsidiary of Allied Corporation) was the previous operator.

In 1985, the Department of Energy acquired an additional existing cavern through a cavern exchange agreement with Union Texas Petroleum. The transaction involved a 3.5-acre exchange with no net change in Government-owned acreage.

## **APPENDIX B**

### ***Regional Distillate Reserve in the Northeast\****

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#### ***Creation of Reserve***

On July 10, 2000, the President directed the Secretary of Energy to use existing legal authority in EPCA to establish an interim, two million barrel home heating oil component of the Strategic Petroleum Reserve in the Northeast, in order to avert a potential winter energy emergency resulting from, among other factors, record low distillate stocks. Also on July 10, 2000, and pursuant to the President's direction, the Department of Energy submitted Strategic Petroleum Reserve Plan Amendment No. 6 to Congress to make the interim reserve the permanent "Regional Distillate Reserve." Plan Amendment No. 6 became effective September 8, 2000, after a 60-day waiting period.

On November 9, 2000, the President signed the Energy Act of 2000 (Public Law 106-469). Title II of Public Law 106-469 amends title I of EPCA to insert a new part D, authorizing the Secretary "to establish, maintain, and operate a Northeast Home Heating Oil Reserve," containing, like the Regional Distillate Reserve, no more than two million barrels of petroleum distillate. Unlike the Regional Distillate Reserve, established under provisions of EPCA deleted by Public Law 106-469, the Northeast Home Heating Oil Reserve (to which the Regional Distillate Reserve will convert assuming the new part D Reserve is created) will not be a component of the Strategic Petroleum Reserve under title I of EPCA.

Title II of Public Law 106-469 requires the Secretary to transmit to the President within 45 days of enactment, and if the President approves, to Congress, a plan describing the Northeast Home Heating Oil Reserve. Title II also requires

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\* Commonly referred to as the Home Heating Oil Reserve.

the Secretary to determine procedures (currently posted as the "Petroleum Distillate Sales Provisions" at [www.fe.doe.gov](http://www.fe.doe.gov)), and provides two bases for the discretionary release of oil from the Northeast Home Heating Oil Reserve. These bases would replace the provisions in section 161 of EPCA, which currently govern the drawdown of the Regional Distillate Reserve as part of the Strategic Petroleum Reserve.

As of December 31, 2000, the 45-day plan had not been transmitted to the President, and the two million barrel reserve in the Northeast is the Regional Distillate Reserve, a component of the Strategic Petroleum Reserve.

#### ***Product and Storage Acquisition***

Immediately after the President's July 10, 2000, directive, the Department, acting through the Defense Energy Support Center, issued a solicitation to exchange crude oil from the Strategic Petroleum Reserve for two million barrels of distillate stocks and interim storage facilities and related services in the Northeast.

Contracts were awarded on August 17, 2000 for two million barrels of storage in New Haven, Connecticut and New York Harbor, and on August 29, 2000, for two million barrels of heating oil.

The contracts for storage capacity were awarded to the following companies:

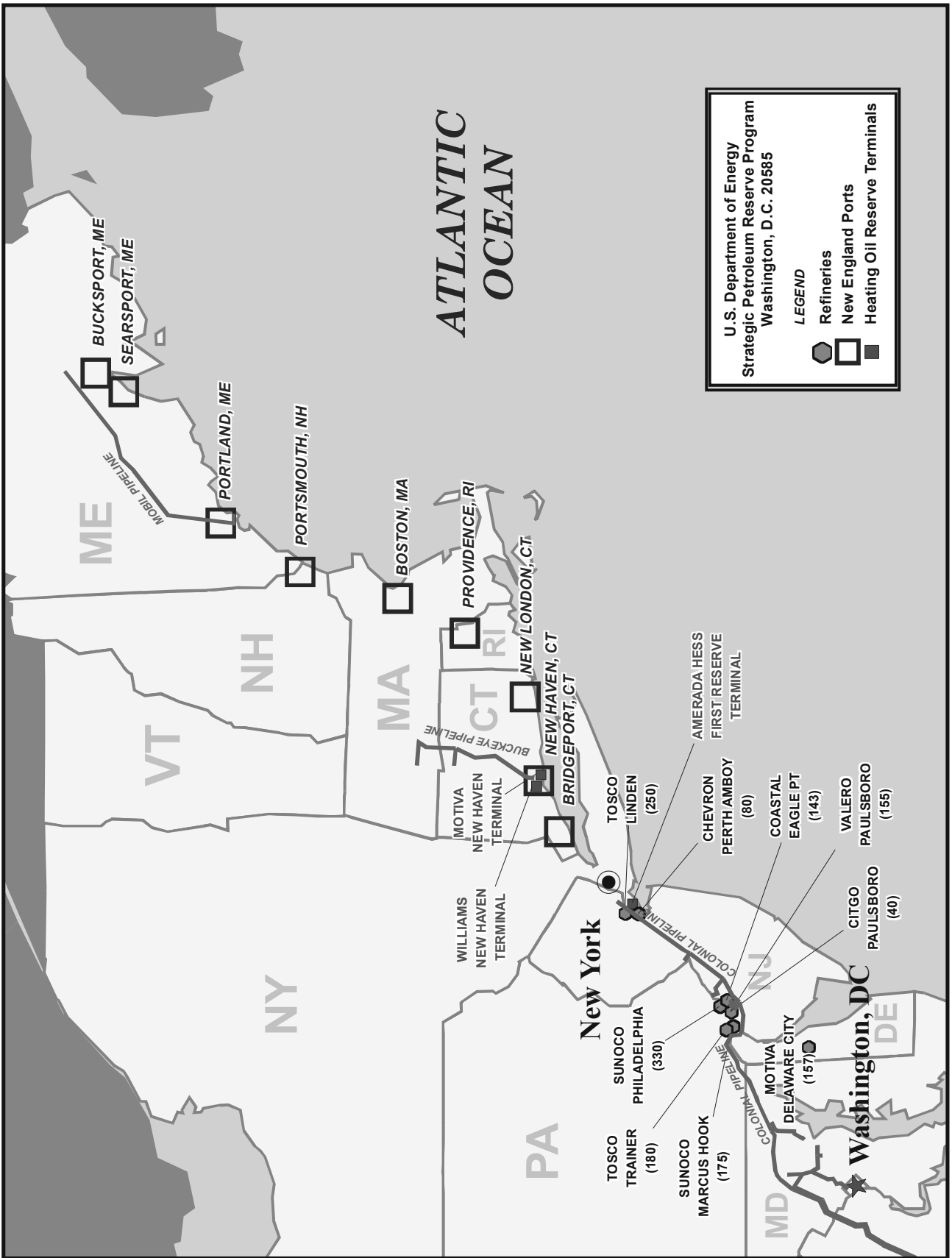
- Equiva Trading Co., for 500,000 barrels of tank capacity at Motiva Terminal, New Haven, Connecticut.
- Morgan Stanley, for 500,000 barrels of tank capacity at the Williams Terminal, New Haven, Connecticut.

- Amerada Hess Corp, for one million barrels of tank capacity at the Hess Terminal, Woodbridge, New Jersey.

A contract for delivery of one million barrels of heating oil to terminals in New Haven, Connecticut was awarded to Equiva Trading Co., and a second contract for the delivery of one

million barrels of heating oil to the Hess Terminal in New Jersey was awarded to Morgan Stanley. As of October 13, 2000, two million barrels of heating oil were delivered. The storage contracts are for one year with an option to extend for an additional year. Quality and inventory audits of the heating oil are performed by the Defense Contract Management Administration.

Figure 9  
Regional Distillate Reserve And Storage Facilities





### ***Sales Plan and Procedures***

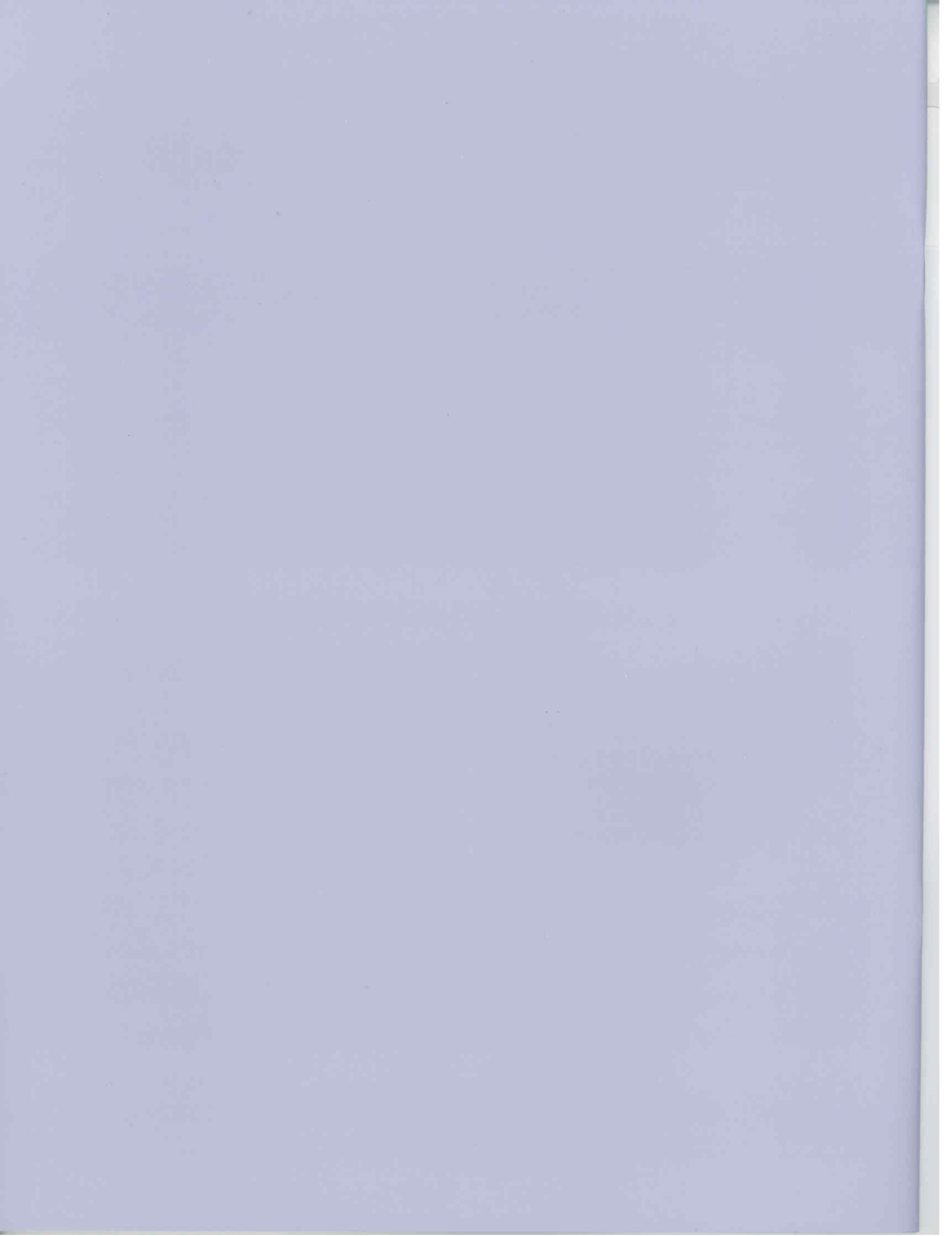
If the President orders a drawdown of the Strategic Petroleum Reserve, the principal sales method is a competitive sale by closed bid. A Notice of Sale is issued, stipulating the volume of oil offered and the terms and conditions of the sale, and sent by e-mail to companies registered with the Department of Energy. The Fossil Energy Website, [www.fe.doe.gov](http://www.fe.doe.gov), posts the Petroleum Distillate Sales Provisions, the Sale Implementation Plan and registration mechanism.

Under the closed bid competitive sales process, applicants submit bids by 12:00 noon on a specified date (generally one or two days following the Notice of Sale), via the Internet or Fax, to the Department of Energy. The bids are required to be a premium to the near month Nymex closing price on the day of the sale. Bidders are not privy to other bids.

Applicants are also required to wire a bid guarantee of \$250,000 to the Department of the Treasury by the same noon deadline. Treasury notifies DOE of the bid guarantee receipt.

Award and notification to successful and unsuccessful bidders occur within several hours following receipt of the bids. No bidder may receive more than 40 percent of the heating oil offered at any one geographical location (New Haven or New York Harbor). The companies awarded contracts for the heating oil will make arrangements with the terminals for delivery of the heating oil by truck, barge, tanker, or pipeline. Payment for the heating oil must occur within 48 hours of award or before the initiation of delivery if the initiation of delivery occurs within 24 hours. The terminals have the capability to deliver the oil in less than 10 days on 24-hour notice.





**Table 9 (Amended May 15, 2001)**  
**Annual Appropriations for Storage Facilities Operations and Management and Petroleum**  
**Acquisition and Transportation (Thousands) (Data as of December 31, 2000)**

Fiscal Year	Oil Account	Facilities	Management	Total	Defense SPR
1976	0	300,000	13,975	313,975	
1977	440,000	0	7,824	447,824	
1978	2,703,469	463,933	14,704	3,182,106	
Total 1979 Appropriations*	2,356,456	632,504	18,111	3,007,071	
Total 1980 Appropriations*	(2,022,272)	0	22,272	(2,000,000)	
Total 1981 Appropriations*	3,205,094	108,168	19,391	3,332,653	
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Total 1986*	(12,964)	106,979	13,518	107,533	
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1996 transfer from SPR Petroleum Account	(187,000)	170,173	16,827	0	
1996 Weeks Is. Oil Sale	(97,114)	97,114	0		
1996 deficit reduction oil sale	<u>(227,000)</u>	<u>0</u>		<u>(227,000)</u>	
1996 Total	<u>(511,114)</u>	<u>267,287</u>	16,827	<u>(227,000)</u>	
1997 Total*	(220,000)	193,000	16,000	(11,000)	
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\* Includes reprogramming and rescission actions.

Note: Fiscal year 1991 SPR Petroleum Account of \$566,318 includes proceeds of \$122,681 from the Test Sale recorded as additional budget authority, rather than reductions to obligations, costs, and outlays. It also includes \$315,424,985 in Desert Storm Drawdown proceeds from January 1991, and \$19,755,064 from fiscal year 1991 NPR excess receipts. Thus, the cumulative budget authority is "gross" and not related directly to the inventory of oil on hand.

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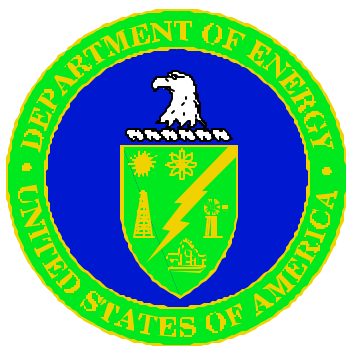
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# Strategic Petroleum Reserve

## Annual Report for Calendar Year 2001

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*Official Use Only*

**U.S. Department of Energy**  
**Assistant Secretary for Fossil Energy**  
**Office of Strategic Petroleum Reserve**  
**Washington, DC**

**SPR Home Page:** [www.spr.doe.gov](http://www.spr.doe.gov)

## TABLE OF CONTENTS

---

<b>EXECUTIVE SUMMARY .....</b>	<b>1</b>
<b>PROGRAM MISSION</b>	
<b>Introduction.....</b>	<b>2</b>
<b>Legislative History.....</b>	<b>2</b>
<b>Strategic Petroleum Reserve Plan and Amendments .....</b>	<b>5</b>
<b>PROGRAM MANAGEMENT</b>	
<b>Organization .....</b>	<b>6</b>
<b>Contractual Support .....</b>	<b>7</b>
<b>CRUDE OIL STORAGE PROGRAM</b>	
<b>Storage Facilities and Capabilities .....</b>	<b>8</b>
<b>Status of Storage Sites.....</b>	<b>10</b>
<b>Major Maintenance Program .....</b>	<b>10</b>
<b>Operational Limitations And Issues.....</b>	<b>11</b>
<b>PETROLEUM ACQUISITION AND SALES</b>	
<b>Crude Oil Inventory Status.....</b>	<b>12</b>
<b>Royalty-in-Kind Crude Oil Transfer .....</b>	<b>17</b>
<b>Crude Oil Time Exchange.....</b>	<b>18</b>
<b>EMERGENCY RESPONSE CAPABILITIES</b>	
<b>Drawdown and Distribution of Oil.....</b>	<b>19</b>
<b>Competitive Sales Procedures .....</b>	<b>19</b>
<b>Drawdown Capabilities.....</b>	<b>20</b>
<b>Drawdown Readiness Activities .....</b>	<b>22</b>
<b>Distribution Plan and Capabilities.....</b>	<b>22</b>
<b>Distribution Assessment .....</b>	<b>23</b>
<b>Import Protection Levels .....</b>	<b>25</b>
<b>COMMERCIALIZATION ACTIVITIES</b>	
<b>Commercial Leases.....</b>	<b>27</b>
<b>Foreign Oil Storage.....</b>	<b>27</b>
<b>BUDGET AND FINANCE</b>	
<b>Appropriations through Fiscal Year 2001.....</b>	<b>28</b>
<b>Strategic Petroleum Reserve Account .....</b>	<b>28</b>
<b>SPR Petroleum Account .....</b>	<b>28</b>
<b>Northeast Home Heating Oil Reserve Account .....</b>	<b>28</b>
<b>Commercialization Revenues.....</b>	<b>31</b>
<b>Performance Measurement .....</b>	<b>32</b>

**OTHER ACTIVITIES**

Security .....	33
Environment, Safety, and Health.....	33
National Environmental Achievement Track.....	33
ISO 14001 Environmental Management System.....	34
Voluntary Protection Programs.....	34
Fossil Energy Award .....	34
Emergency Management and Fire Protection.....	34
Pollution Prevention .....	34
Real Estate Actions.....	35
Organizational Improvement Activities.....	35

**APPENDIX A Strategic Petroleum Reserve Site Information**

Bryan Mound .....	36
West Hackberry .....	36
Big Hill.....	37
Bayou Choctaw.....	37

**APPENDIX B Northeast Home Heating Oil Reserve**

Establishment of the Reserve.....	38
Product and Storage Acquisition .....	38
Sales Plan and Procedures.....	40

**LIST OF FIGURES**

Figure 1. Storage Sites and Distribution System .....	9
Figure 2. Cumulative Oil Fill .....	16
Figure 3. Projected Maximum Drawdown Capability .....	21
Figure 4. Pipeline and Marine Distribution Capabilities.....	24
Figure 5. Days of Net Import Protection (1977-2001).....	25
Figure 6. U.S. Crude Oil Import Dependence (1977-2001) .....	26
Figure 7. Cumulative Funding .....	30
Figure 8. Northeast Home Heating Oil Reserve and Storage Facilities .....	39

**LIST OF TABLES**

Table 1. Storage Capacity and Drawdown Capabilities .....	8
Table 2. Year-End Inventories and Oil Fill History .....	13
Table 3. Crude Oil Receipts through 2001 .....	14
Table 4. Crude Oil Inventory through 2001 .....	15
Table 5. Crude Oil Streams .....	20
Table 6. Drawdown and Distribution Capabilities.....	23
Table 7. Annual Appropriations for Storage Facilities Operations and Management, and Petroleum Acquisition and Transportation .....	29
Table 8. Summary of Commercialization Revenues.....	31

## **EXECUTIVE SUMMARY**

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### ***Strategic Petroleum Reserve Status***

The Strategic Petroleum Reserve's storage facilities are capable of storing 700 million barrels of crude oil. As of December 31, 2001, the crude oil inventory was 550.2 million barrels and the drawdown rate was 4.2 million barrels a day. All storage sites are operational and ready for fill or drawdown in the event of an energy emergency.

On November 13, 2001, President George W. Bush announced his intent to fill the Strategic Petroleum Reserve to capacity. The Strategic Petroleum Reserve will be filled to a level of 700 million barrels through the transfer of offshore royalty-in-kind oil from the Department of the Interior to the Department of Energy.

### ***Northeast Home Heating Oil Reserve***

The Energy Act of 2000 authorized the Secretary of Energy to establish a "Northeast Home Heating Oil Reserve," separate from the Strategic Petroleum Reserve, containing two million barrels of petroleum distillates. On March 6, 2001, Secretary Spencer Abraham announced the permanent establishment of the Reserve. The Northeast Home Heating Oil Reserve replaced the Regional Distillate Reserve established administratively by the Department pursuant to Presidential directive and the Energy Policy and Conservation Act.

### ***Oil Acquisitions and Exchanges***

As of December 31, 2001, the Strategic Petroleum Reserve received 18.4 million barrels of exchange oil (4.6 million barrels in calendar year 2001) under the 28-million barrel royalty-in-kind crude oil transfer agreement with the Department of the Interior.

As of December 31, 2001, the Strategic Petroleum Reserve received 4.9 million barrels of crude oil, out of a total of 34.5 million barrels, due under crude oil time exchange contracts. Delivery of the remaining 29.6 million barrels is scheduled for completion by early 2003.

### ***Commercialization Activities***

The Strategic Petroleum Reserve received \$2,527,160 in revenues from the commercial leases of its distribution facilities and pipelines, \$2,494,056 of which were paid in crude oil equivalent.

### ***Security***

Following the terrorist attacks on September 11, 2001, the Strategic Petroleum Reserve instituted a higher level of alert and initiated plans for physical security enhancements commensurate with the increased threat.

### ***Awards***

The Strategic Petroleum Reserve received the Fossil Energy Environmental, Safety, and Health Award for fiscal year 2001. The award was based on the achievement of "Star" status in the Voluntary Protection Programs of the Occupational, Safety, and Health Administration, and the Department of Energy. All four sites enjoy "Star" status and the Strategic Petroleum Reserve is the only DOE organization to achieve this status.

The Strategic Petroleum Reserve won the Achievement Award in the Department's *Energy Performance Excellence Award Program*, with the highest score ever accomplished by an organization within the Department.



## ***PROGRAM MISSION***

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### ***Introduction***

The Strategic Petroleum Reserve was established in 1975 in response to the 1973 Arab oil embargo. It is authorized by the Energy Policy and Conservation Act (EPCA)(Public Law 94-163), and by the comprehensive energy plans of all Administrations since 1975, in recognition of the long-term dependence of the United States on imported crude oil and petroleum product. Section 165 of EPCA requires the Secretary of Energy to submit an Annual Report to the President and the Congress.

As of December 31, 2001, the inventory in the Strategic Petroleum Reserve included 550.2 million barrels of crude oil, down from a peak of 592 million barrels in 1994. The inventory amounted to 51 days of net imports in 2001. The United States relies on a combination of oil in the Strategic Petroleum Reserve and private stocks to meet its oil storage obligations to the International Energy Agency. In addition, the Northeast Home Heating Oil Reserve contains two million barrels of heating oil.

### ***Legislative History***

EPCA, enacted on December 22, 1975, authorized the establishment of the Strategic Petroleum Reserve to reduce the impact of a severe energy supply interruption, and to carry out the obligations of the United States under the International Energy Program.

EPCA was amended by Title VIII of the Energy Security Act (Public Law 96-294), enacted on June 30, 1980. The Act established a minimum average daily fill rate of 100,000 barrels and precluded sale of Naval Petroleum Reserve Numbered 1 (Elk Hills, California) crude oil, except to fill the Strategic Petroleum Reserve,

unless the Strategic Petroleum Reserve was being filled at the minimum rate or had an inventory of 500 million barrels.

The Energy Policy and Conservation Amendments Act of 1985 (Public Law 99-58), enacted on July 2, 1985, extended the provisions of Title I, Part B, of the EPCA relating to the Strategic Petroleum Reserve until June 30, 1989, and directed the Secretary of Energy to conduct a sale or exchange of 1.1 million barrels of crude oil to test the drawdown and distribution capabilities of the Strategic Petroleum Reserve.

The Omnibus Budget Reconciliation Act of 1986 (Public Law 99-509), enacted on October 18, 1986, amended EPCA to require that the Strategic Petroleum Reserve be filled at a minimum rate of 75,000 barrels a day until at least 750 million barrels are in storage.

Public Law 101-46, an Act to extend Title I of EPCA, enacted on June 30, 1989, extended Strategic Petroleum Reserve authorities contained in EPCA until April 1, 1990. The Act also required the Secretary to submit a report to Congress by February 1, 1990, on alternative means of financing oil acquisition for the Strategic Petroleum Reserve. Short-term extensions of the Strategic Petroleum Reserve authorities contained in EPCA were enacted on March 31, 1990 (Public Law 101-262), and August 10, 1990 (Public Law 101-360).

On September 15, 1990, the President signed the Energy Policy and Conservation Act Amendments of 1990 (Public Law 101-383), extending authorities until September 30, 1994. This legislation also contained provisions to amend

drawdown authorities, require a Strategic Petroleum Reserve Plan Amendment for comple-

tion of storage capacity for one billion barrels, authorize drawdown and distribution tests, and provide for a refined petroleum product reserve test program.

On October 24, 1992, the President signed the Energy Policy Act of 1992 (Public Law 102-486). The bill included provisions to (1) add new conditions for drawdown in emergency situations involving a supply reduction of significant scope and duration, coupled with a severe price increase likely to cause a major adverse impact on the nation's economy, (2) enlarge the Reserve to one billion barrels, (3) permit the Secretary to make payment in advance for delivery of petroleum product either owned or not owned by the United States for storage in the Strategic Petroleum Reserve or non-Strategic Petroleum Reserve facilities, (4) give the President discretionary authority to acquire domestic stripper well oil at competitive prices to fill the Reserve, and (5) amend the eligibility criteria for a Regional Petroleum Reserve.

On October 22, 1994, the President signed into law the Energy Policy and Conservation Act Amendments Act of 1994 (Public Law 103-406), extending authorities to June 30, 1996.

The Balanced Budget Downpayment Act (Public Law 104-99), enacted on January 26, 1996, required the sale of up to \$100 million of Weeks Island oil to fund decommissioning activities.

The Omnibus Consolidated Rescissions and Appropriations Act of 1996 (Public Law 104-134), enacted on April 26, 1996, required the sale of \$227 million of Weeks Island oil for deficit reduction.

The Omnibus Consolidated Appropriations Act (Public Law 104-208), enacted on September 30,

1996, appropriated \$220 million for the Strategic Petroleum Reserve in fiscal year 1997 to be financed through the sale of oil. The Strategic

Petroleum Reserve authorities expired on June 30, 1996. On October 14, 1996, Public Law 104-306 extended the Strategic Petroleum Reserve authorities until September 30, 1997. After the expiration of Strategic Petroleum Reserve authorities on September 30, 1997, these authorities were not reauthorized until June 1998.

The Balanced Budget Act of 1997 (Public Law 105-33), enacted August 5, 1997, added a new section 168 to EPCA, authorizing the leasing of underutilized Strategic Petroleum Reserve facilities for the storage of oil owned by a foreign government or its representatives.

The Department of the Interior and Related Agencies Appropriations Act, 1998 (Public Law 105-83), enacted on November 14, 1997, appropriated \$207.5 million for the Strategic Petroleum Reserve in fiscal year 1998 to be financed through the sale of Reserve oil.

The 1998 Supplemental Appropriations and Rescissions Act (Public Law 105-174), enacted on May 1, 1998, included a provision which prohibited the sale of Strategic Petroleum Reserve oil, contingent upon a Presidential determination that a sale would be imprudent in light of current market conditions and a designation of the \$207.5 million in foregone revenue as an emergency requirement under the Balanced Budget Act of 1985. The President made the requisite determination and designation on May 8, 1998.

On June 1, 1998, the President signed Public Law 105-177 to extend certain EPCA programs. The Act extended authorities for the Strategic Petroleum Reserve and participation in the International Energy Program through September 30, 1999, and expanded the antitrust protection for U.S. companies participating in International

Energy Agency activities. The Act also authorized the drawdown and distribution of the Strategic Petroleum Reserve only for the purposes described in the Act, and required that the

Secretary of Energy request funds for acquisition, transportation and injection of petroleum products for storage in the Reserve or provide a written explanation if no request for funds is made. The Omnibus Consolidated and Emergency Supplemental Appropriations Act, 1999 (Public Law 105-277), enacted on October 21, 1998, included \$160.1 million for the Strategic Petroleum Reserve.

On November 13, 1998, the President signed Public Law 105-388, an Act to extend energy conservation programs under the Energy Policy and Conservation Act and the Energy Conservation and Production Act, and for other purposes. The Act provides that, during a drawdown of the Strategic Petroleum Reserve, the State of Hawaii may submit a binding offer for Strategic Petroleum Reserve oil and be entitled to purchase the oil at a price equal to the weighted average price of the successful competitive bids for oil in the applicable category. Deliveries under the binding offer would receive priority scheduling during a Strategic Petroleum Reserve drawdown.

The Strategic Petroleum Reserve authorities expired on September 30, 1999. On October 5, 1999, the President signed Public Law 106-64, extending these and the EPCA authorities for United States participation in the International Energy Agency program until March 31, 2000.

Appendix C of the Consolidated Appropriations Act, 2000 (Public Law 106-113), enacted on November 29, 1999, included \$159 million for the Strategic Petroleum Reserve. The Act also allows the Secretary to use other Departmental funds to finance a drawdown of the Strategic Petroleum Reserve.

The Department of the Interior and Related Agencies Appropriations Act, 2001 (Public Law 106-291), signed on October 11, 2000, included \$165 million for the development, operation and management activities of the Strategic Petroleum

Reserve under EPCA, \$4,000,000 to be derived from the transfer of unobligated funds in the “SPR Petroleum Account,” and “of (the \$165 million), \$8,000,000 shall be available for maintenance of a Northeast Home Heating Oil Reserve” (see below).

On November 9, 2000, the President signed Public Law 106-469. Title I of The Energy Act of 2000 reauthorizes titles I and II of EPCA through fiscal year 2003, and updates or deletes the EPCA title I SPR authorities. Title II of Public Law 106-469 amends title I of EPCA to insert a new part D authorizing the Secretary “to establish, maintain, and operate a Northeast Home Heating Oil Reserve,” containing no more than two million barrels of petroleum distillate and located in the Northeast. The new part D Reserve is not a component of the SPR established under part B of title I of EPCA. Title II also sets forth conditions for release of products from the new part D Reserve, requires transmittal to the President and Congress of a plan describing the Reserve, and upon establishment, requires the Secretary of the Treasury to establish a “Northeast Home Heating Oil Reserve” account at Treasury.

On November 5, 2001, the President signed Public Law 107-63, the Interior and Related Agencies Appropriations Act for Fiscal Year 2002. The Act included \$171 million for Strategic Petroleum Reserve facilities and operations and \$8 million for the Northeast Home Heating Oil Reserve. Congress further specified that if the full \$8 million is not needed for the Northeast Home Heating Oil Reserve, the Department is encouraged to apply any excess funds to the vapor pressure project to remove excess heat and gas from the oil in the Strategic Petroleum Reserve.

## ***Strategic Petroleum Reserve Plan and Amendments***

In compliance with Section 154 of EPCA, the Strategic Petroleum Reserve submitted a Plan to Congress on February 16, 1977, addressing the development and implementation of the Strategic Petroleum Reserve. The Plan became effective on April 18, 1977 and has six amendments, as follows:

Strategic Petroleum Reserve Plan Amendment No. 1 accelerated the schedule for filling the Reserve. The Amendment was submitted to Congress on May 25, 1977, and became effective on June 20, 1977.

Strategic Petroleum Reserve Plan Amendment No. 2 authorized an increase in the size of the Strategic Petroleum Reserve from 500 million barrels to one billion barrels, and described plans to store 750 million barrels of petroleum in underground storage facilities. This Amendment was submitted to Congress on May 18, 1978, and became effective on June 13, 1978.

Strategic Petroleum Reserve Plan Amendment No. 3 contained a Distribution Plan describing the methods for drawdown and distribution of petroleum from five existing storage sites. This Amendment was submitted to Congress on October 31, 1979, and became effective on November 15, 1979.

Strategic Petroleum Reserve Plan Amendment No. 4 contained a new Drawdown Plan with procedures for the drawdown, sale, and distribution of petroleum from the Strategic Petroleum Reserve. The Amendment was submitted on December 1, 1982, and went into effect immediately. The Drawdown Plan, required by the Energy Emergency Preparedness Act of 1982, replaced the Distribution Plan in Amendment No. 3.

Strategic Petroleum Reserve Plan Amendment No. 5, submitted February 11, 1999, provides for the acquisition of crude oil that the United States is entitled to receive in-kind as royalties from production on Federal lands under subsection 160(a)(2) of EPCA. Plan Amendment No. 5 became effective April 12, 1999.

Strategic Petroleum Reserve Plan Amendment No. 6, submitted July 10, 2000, established a Regional Distillate Reserve in the Northeast to store up to two million barrels of product. Plan Amendment No. 6 became effective September 8, 2000, and made permanent an interim heating oil reserve established in July 2000, at the direction of the President.

Title I of the Energy Act of 2000, amended EPCA to eliminate requirements for the Plan and plan amendments, but requires the Secretary to submit a plan to Congress if the Secretary decides to expand the Strategic Petroleum Reserve beyond 700 million barrels.

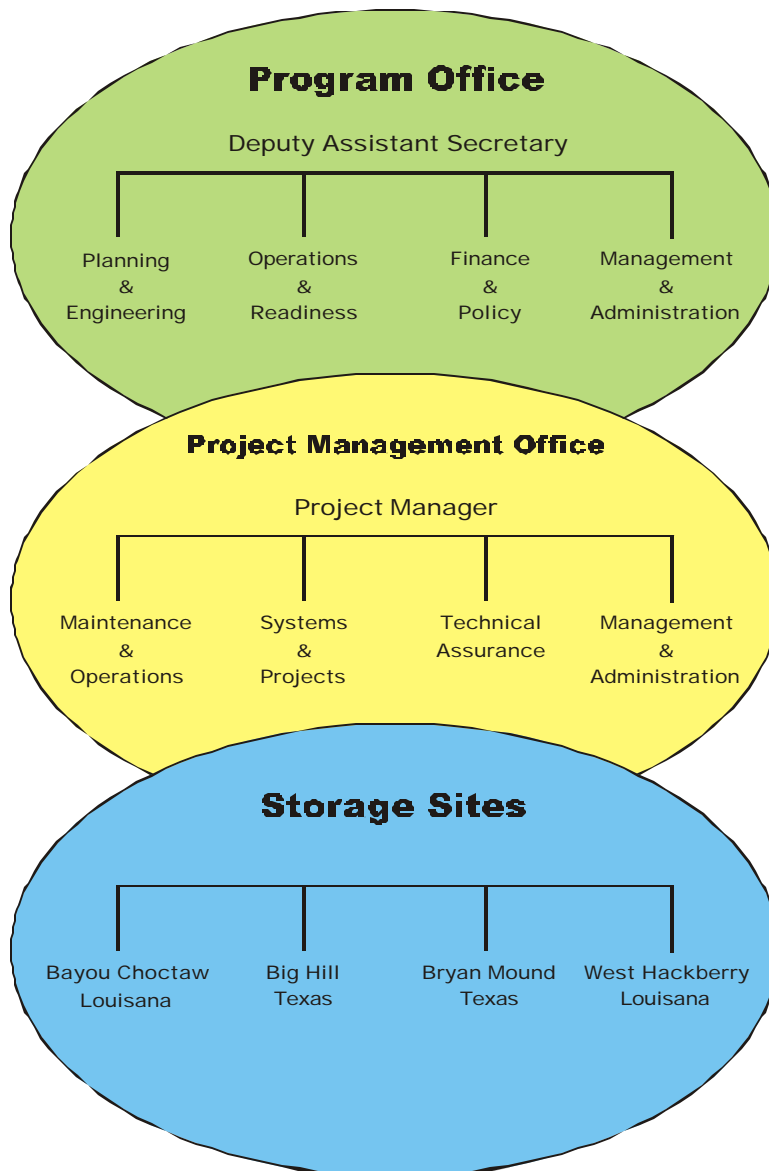
## **PROGRAM MANAGEMENT**

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### **Organization**

The Assistant Secretary for the Office of Fossil Energy in Washington, D.C. has overall program responsibility for achieving the goals and objectives of the Strategic Petroleum Reserve. This responsibility is delegated to the Deputy Assistant Secretary for Petroleum Reserves,

Richard D. Furiga, and is exercised through the Strategic Petroleum Reserve Headquarters Office in Washington, D.C. and the Project Management Office in New Orleans, Louisiana. Total staffing is 128 Federal fulltime equivalent employees and 990 contractor employees.



### ***Contractual Support***

The Project Management Office is responsible for the design, development, operation and maintenance of the Strategic Petroleum Reserve and employs a Management and Operating (M&O) contractor, DynMcDermott Petroleum Operations Company, to provide management and manpower to operate and maintain four storage facilities and certain related pipeline systems. The initial five-year M&O contract was awarded on April 1, 1993, and extended under an option for a second five-year period that began on April 1, 1998.

An Architect/Engineering (A&E) firm, S&B Infrastructure, Ltd., provides the design services for four storage facilities under a two-year contract awarded on March 9, 2000, with three one-year renewal options. Geotechnical support is provided by Sandia National Laboratory. Several construction contractors perform site modifications for major maintenance activities. Most of these contracts are specific to a certain discipline, fixed price, and less than one year in duration.

A number of support services contracts exist for management, technical, and computer support. The largest is Deltha-Critique. It will provide management and technical support services to the Project Management Office for a potential five-year period commencing November 1, 2001. Other support services contractors are Serna and Company, ICF Consulting Inc., PB-KBB Inc. and Cyborg Inc.

Electrical power is provided to four storage facilities by Reliant Energy (formerly Houston Power & Light), and Entergy (formerly Gulf States Utilities).

Four companies, Seaway Pipeline Inc., Sun Pipe Line Company, Unocal and Equilon Pipeline Company, provide commercial terminalling services for fill, drawdown and storage of crude oil. Most of these contracts are for five years, with options to extend the contracts up to 20 years.

## **CRUDE OIL STORAGE PROGRAM**

### ***Storage Facilities and Capabilities***

Originally, the Strategic Petroleum Reserve developed four sites in Louisiana and two sites in Texas. Subsequently, two sites in Louisiana were decommissioned, the Sulphur Mines site in 1992, for cost savings, and the Weeks Island site in 1999, for geotechnical problems. The remaining sites are West Hackberry and Bayou Choctaw in Louisiana, and Bryan Mound and Big Hill in Texas. Their combined storage capacity is 700 million barrels.

The four storage sites are grouped into three geographical distribution systems on the Gulf Coast: Seaway, Texoma and Capline. Each system has access to one or more major refining centers, interstate crude oil pipelines, and marine terminals for crude oil distribution. The locations of the Strategic Petroleum Reserve storage sites, and their respective distribution systems, are shown in Figure 1.

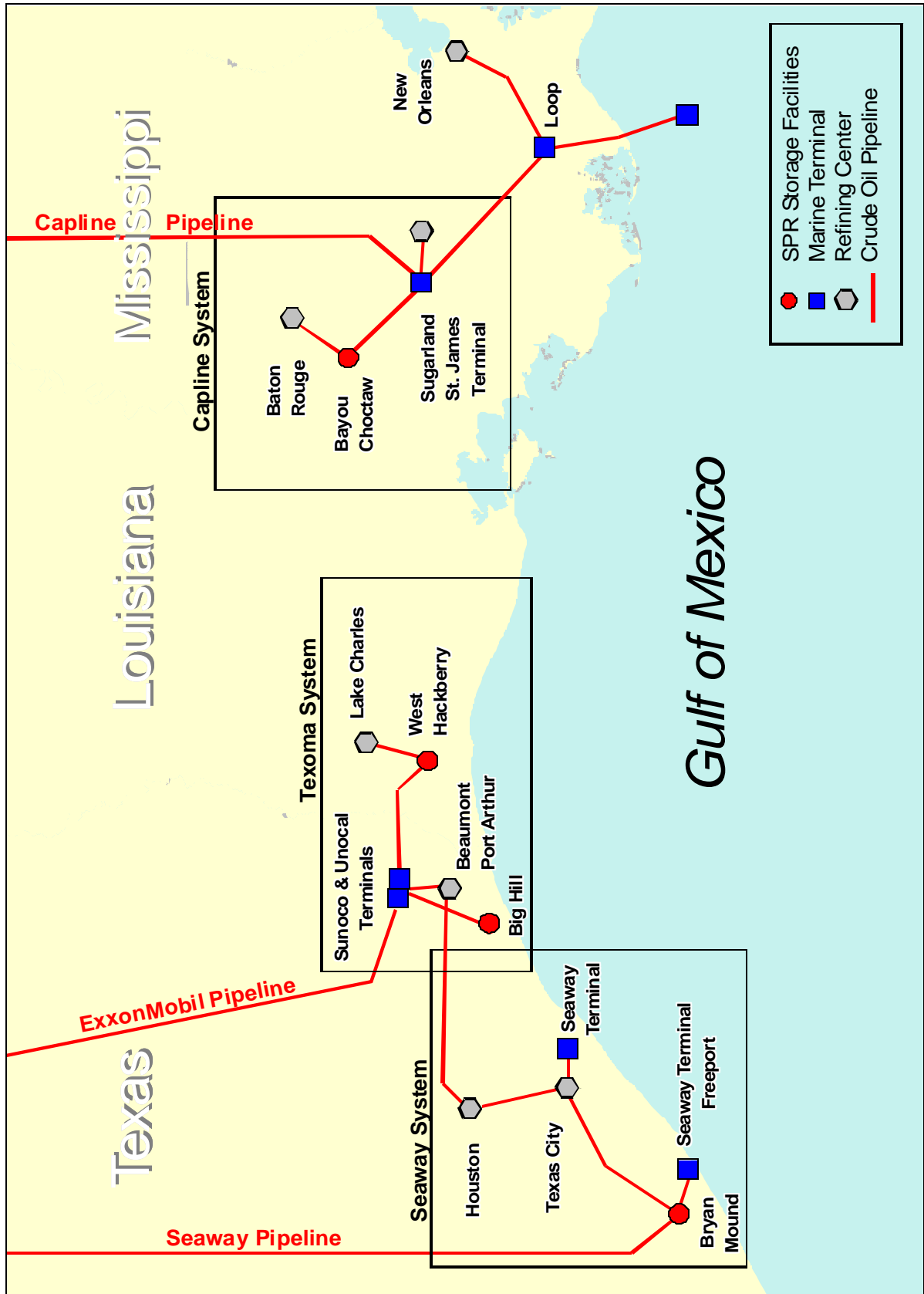
The current storage capacities and drawdown capabilities of the four Strategic Petroleum Reserve storage sites are summarized in Table 1.

**Table 1  
Storage Capacities and Drawdown Capabilities - (December 31, 2001)**

Storage Facility	Storage Capacity (MMB)	Crude Mix Sweet/Sour (MMB)	Drawdown Capability (MB/D) *
Bryan Mound, Texas	232	75/157	1,500
West Hackberry, Louisiana	222	114/108	1,300
Big Hill, Texas	170	72/98	1,100
Bayou Choctaw, Louisiana	76	24/52	515
<b>Total</b>	700	285/415 40%/60%	4,415

\* Represents design rate. Actual rate may be lower due to current inventory levels (see Table 8).  
Legend: MMB = Million Barrels; MB/D = Thousands Barrels Per Day

Figure 1  
Storage Sites and Distribution System





## **Status of Storage Sites**

### **Bryan Mound**

The Bryan Mound storage facility in Brazoria County is approximately three miles southwest of Freeport, Texas. The site has 20 storage caverns, a combined storage capacity of 232 million barrels, and a cavern inventory of 215.5 million barrels. The site is available for both fill and drawdown operations.

Under major maintenance, a new covered storage and laydown area to protect stored equipment and materials was completed, a new motor control center building was constructed at the raw water intake structure, and piping supports and access platforms were installed throughout the site to improve safety and operability. Contracts were awarded to upgrade Bryan Mound's electrical distribution and lightning protection systems, replace control valves at the site's crude oil meter skid, and upgrade the control room.

### **West Hackberry**

The West Hackberry storage facility in Cameron Parish is approximately 25 miles southwest of Lake Charles, Louisiana. The site has 22 storage caverns, a combined storage capacity of 222 million barrels and a cavern inventory of 167.3 million barrels. It is available for both fill and drawdown operations.

Under major maintenance, contracts were awarded for motor control center upgrades, replacing sections of the raw water and crude oil header piping, replacing control valves at the site's crude oil meter skid, control room upgrades, and more efficient temperature controls in site buildings.

### **Bayou Choctaw**

The Bayou Choctaw storage facility in Iberville Parish is approximately 12 miles southwest of

Baton Rouge, Louisiana. The site has six storage

caverns, a combined storage capacity of 76 million barrels, and a cavern inventory of 71.8 million barrels. The site is currently available for both fill and drawdown operations.

Under major maintenance, the site completed the restoration of dikes around three caverns and the resurfacing of site roads. Contracts were awarded to upgrade the site's control room and motor control center.

### **Big Hill**

The Big Hill storage facility in Jefferson County is 26 miles southwest of Beaumont, Texas. The site has 14 storage caverns, a combined storage capacity of 170 million barrels, and a cavern inventory of 93.9 million barrels. The site is currently available for both fill and drawdown operations.

Under major maintenance, the site completed the replacement of a building which houses high-voltage motor control centers at the raw intake structure, and the installation of crude oil meters at Sun Terminal to improve oil accountability. Contracts were awarded to upgrade the site's control room, replace control valves at the crude oil meter skid, and install a new sewage treatment plant.

### **Major Maintenance Program**

The Strategic Petroleum Reserve's Major Maintenance Program typically provides for site construction projects that are over \$100,000, to maintain the storage facilities and systems in an efficient operating condition. Examples are building maintenance, piping replacements, and road paving.

The Major Maintenance Program provides for upgrades and replacement of equipment, as necessary, to maintain system reliability.

## ***Operational Limitations and Issues***

### **Long-term Vapor Pressure Mitigation**

Long-term storage of crude oil in underground solution-mined caverns results in elevated oil temperatures and increased crude vapor pressure due to gradual geothermal heating and methane gas intrusion from the salt formation. Consequently, when oil is drawn down, or removed from the caverns, increased vapor pressure results in gas being released in amounts that are unacceptable, posing environmental, safety, and health risks.

This phenomenon was first discovered in 1992, after fifteen years of storage. Following an extensive analysis of the problem, a degasification program was initiated and conducted on 177 million barrels of crude oil from 1995 until 1998. This brought the Strategic Petroleum Reserve's oil inventory within acceptable vapor pressure levels.

Since 1998, with support from Sandia National Laboratories, the Strategic Petroleum Reserve has maintained a comprehensive monitoring program to ascertain the level of gas regain and the need for future degasification. During 2000, the monitoring program revealed a much higher level of gas regain than anticipated, and the need for a

long-term vapor pressure control program to maintain the Reserve's oil inventory within acceptable vapor pressure levels.

The Strategic Petroleum Reserve assessed numerous concepts and alternatives to provide a long-term solution to the problem during 2000, and concluded that the most cost effective solution was the acquisition of a portable degasification plant, which could be moved from site to site, as needed.

A solicitation for a firm fixed-price turnkey contract was issued in April 2001 and several proposals were received. In November 2001, a contract was awarded to Petrofac LLC of Tyler, Texas in the amount of \$18,510,500 to provide a portable degas plant, which will be operational in April 2004. In addition to construction of the degas plant, additional funds in the amount of \$19,800,000 will be used to acquire necessary measurement equipment, make changes to communications software, and construct site modifications. The total estimated cost for vapor pressure management is \$38,305,000. Through periodic degassing the Strategic Petroleum Reserve will be able to maintain its full mission capability while delivering crude oil that meets all safety and environmental standards.

## ***PETROLEUM ACQUISITION AND SALES***

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### ***Crude Oil Inventory Status***

On December 31, 2001, the Strategic Petroleum Reserve's crude oil inventory was 550, 240,931 barrels, an increase of 9.6 million barrels from calendar year 2000. The increase is due to the receipts from the royalty-in-kind oil transfer and deliveries under the time exchange.

The current mix of crude oil is 67 percent high sulfur (sour) and 33 percent low sulfur (sweet).

Table 2 lists year-end inventories and average daily fill rates from 1977 through 2001 (by fiscal and calendar year).

Table 3 lists crude oil receipts by country of origin since 1977.

Table 4 identifies the location of the inventory by storage site, and Figure 2 illustrates the cumulative oil fill.

**Table 2**  
**Year-End Inventories and Oil Fill History**

	FISCAL YEAR		CALENDAR YEAR	
	Year-End Inventory (MMB)	Average Daily Fill Rate* (MB/D)	Year-End Inventory (MMB)	Average Daily Fill Rate* (MB/D)
1977	1.1	3	7.2	20
1978	49.1	131	68.5	168
1979	91.2	115	91.7	64
1980	92.8	4	107.8	44
1981	199.2	292	230.3	336
1982	277.9	215	293.8	174
1983	361.0	228	379.1	234
1984	431.1	191	450.5	195
1985	489.3	159	493.3	119
1986	506.4	47	511.6	51
1987	533.9	75	540.6	80
1988	554.7	57	559.5	52
1989	577.1	62	579.9	56
1990	589.6	34	585.7	27
1991	568.5	(58)	568.5	(47)
1992	571.4	8	574.7	17
1993	585.7	39	587.1	34
1994	591.7	16	591.7	13
1995	591.7	**	591.6	**
1996	573.6	(49)	565.8	(70)
1997	563.4	(28)	563.4	(7)
1998	563.4	**	561.1	***
1999	564.9	4	567.0	16
2000	570.3	5	540.7	(72)****
2001	544.8	(70)****	550.2	26

\* Fill rates adjusted for oil sales.  
\*\* Fill suspended during this period

\*\*\* Decrease due to Maya exchange  
\*\*\*\* Net decrease due to Exchange 2000

**Table 3**  
**Crude Oil Receipts through December 2001**  
**(Million Barrels)**

<b>Source Country</b>	<b>2001</b>	<b>Cumulative</b>	<b>Percent of Total</b>
<b>Mexico</b>		<b>266.2</b>	<b>41.2</b>
<b>United Kingdom</b>	<b>4.7</b>	<b>154.7</b>	<b>23.9</b>
<b>United States*</b>	<b>.6</b>	<b>52.4</b>	<b>8.1</b>
<b>Saudi Arabia</b>	<b>1.0</b>	<b>28.1</b>	<b>4.3</b>
<b>Libya</b>		<b>23.8</b>	<b>3.7</b>
<b>Iran</b>		<b>20.0</b>	<b>3.1</b>
<b>United Arab Emirates</b>		<b>18.4</b>	<b>2.8</b>
<b>Nigeria</b>		<b>15.8</b>	<b>2.4</b>
<b>Norway</b>		<b>11.9</b>	<b>1.8</b>
<b>Oman</b>		<b>9.0</b>	<b>1.4</b>
<b>Egypt</b>		<b>8.9</b>	<b>1.4</b>
<b>Ecuador</b>		<b>6.2</b>	<b>1.0</b>
<b>Algeria</b>		<b>6.2</b>	<b>1.0</b>
<b>Cameroon</b>		<b>3.4</b>	<b>0.5</b>
<b>Iraq</b>		<b>3.4</b>	<b>0.5</b>
<b>Gabon</b>		<b>2.4</b>	<b>0.4</b>
<b>Qatar</b>		<b>2.3</b>	<b>0.4</b>
<b>Columbia</b>		<b>1.2</b>	<b>0.2</b>
<b>Angola</b>		<b>1.0</b>	<b>0.2</b>
<b>Venezuela</b>	<b>3.3</b>	<b>10.2</b>	<b>1.6</b>
<b>Peru</b>		<b>0.4</b>	<b>0.1</b>
<b>Argentina</b>		<b>0.4</b>	<b>0.1</b>
<b>Total **</b>	<b>9.6</b>	<b>646.3</b>	<b>100.0</b>

\* Included receipts from offshore Gulf of Mexico.

\*\* Cumulative total receipts unadjusted for sales and operational gains and losses.

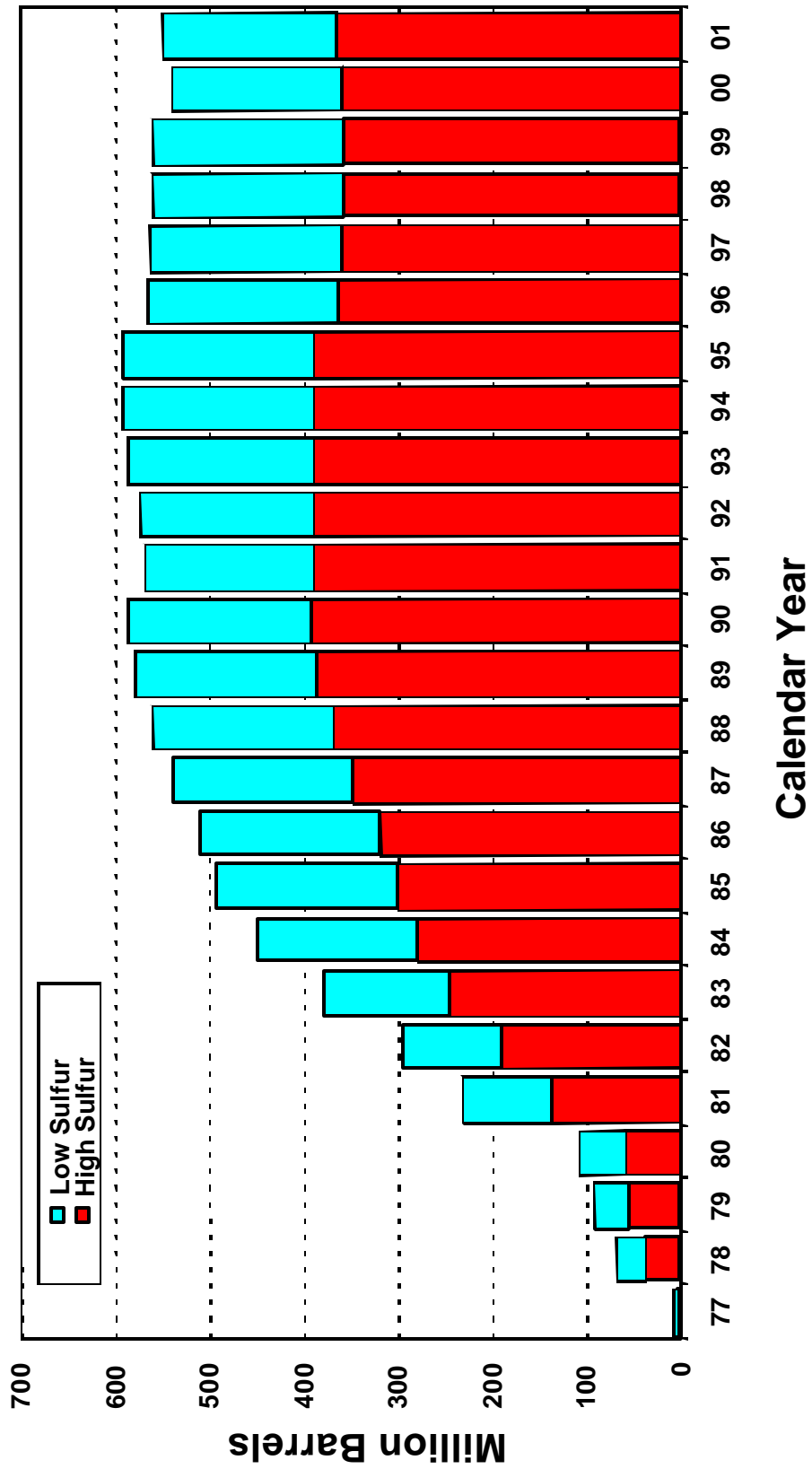
**Table 4**  
**Crude Oil Inventory through December 2001**  
**(Million Barrels)**

Storage Site	Inventory			Cubic Meters (Millions)
	Sweet*	Sour**	Total	
Bryan Mound Brazoria County, Texas	64.8	150.7	215.5	34.2
Big Hill Jefferson County, Texas	19.8	74.2	93.9	14.9
West Hackberry Cameron Parish, Louisiana	77.2	90.1	167.3	26.6
Bayou Choctaw Iberville Parish, Louisiana	22.1	49.7	71.8	11.4
Subtotal Underground Inventory	183.9	364.6	548.5	87.1
Tanks and Pipelines	0.7	1.0	1.7	0.3
Total Inventory	184.6	365.7	550.2	87.4
Total Accounts Receivable	32.4	9.4	41.8	6.6
Total SPR Book Inventory	217.0	375.1	592.1	94.0

\* Sulfur content not exceeding 0.5 percent

\*\* Sulfur content greater than 0.5 percent

Figure 2  
Cumulative Oil Fill



### ***Royalty-in-Kind Crude Oil Transfer***

In February 1999, the Department of Energy and the Department of the Interior agreed to place up to 28 million barrels of royalty oil into the Strategic Petroleum Reserve. This oil would replace 28 million barrels sold in 1996-1997.

Under this plan, Federal land leaseholders in the Gulf of Mexico agreed to pay a portion of royalties (one-eighth to one-sixth of the oil produced) in crude oil (royalty-in-kind) instead of cash to the United States.

The Department of Energy contracted with commercial entities to receive the royalty oil at offshore production facilities and transfer it to the Strategic Petroleum Reserve, either directly or with other crude oil delivered in exchange. Since the transfer of the royalty oil involved contractor costs, paid in crude oil, for transportation to the storage sites, and considered the differences in quality of the royalty oil and the oil delivered, the total amount of oil delivered to the Strategic Petroleum Reserve was expected to be 26-27 million barrels.

As of December 31, 1999, contracts had been awarded to assure the transfer of the total 28 million barrels of royalty-in-kind oil. The last contracts awarded required the transfer of royalty oil through October 2000, and delivery of oil, in exchange, through November 2000. However, several deliveries of exchange oil were deferred until calendar year 2001 to alleviate crowding at terminals, and to take advantage of favorable market conditions to swap oil for delivery of a greater number of barrels in the future. The continuation of similar market conditions during most of 2001 resulted in even further deferrals into 2002 and 2003. However, a reversal of

market conditions late in 2001 resulted in a portion of the deferred barrels reverting to 2001 delivery. These deferrals and subsequent reversions will result in a gain of 3.5 million barrels for the Strategic Petroleum Reserve.

As of December 31, 2001, the Strategic Petroleum Reserve received 18.4 million barrels of exchange oil (4.6 million barrels in calendar year 2001). Delivery of 12.3 million barrels is scheduled for completion by the end of 2002, for a total of 30.7 million barrels.

On November 13, 2001, President George W. Bush took a major step to strengthen our nation's energy security by announcing his intent to fill the Strategic Petroleum Reserve to capacity. The Strategic Petroleum Reserve will be filled to a level of 700 million barrels through the transfer of offshore royalty-in-kind oil from the Department of the Interior to the Department of Energy. A solicitation for the transfer of up to 60,000 barrels per day was issued by the Department of Energy on January 22, 2002, with offers due February 5, 2002. Deliveries, at a rate of up to 60,000 barrels per day, commenced in April 2002.

The Department of the Interior has issued a solicitation for the delivery of offshore oil to designated "market centers." The "market centers" are located at Clovelly, St. James, and Empire, Louisiana. Under the Department of Energy solicitation, companies will acquire oil from these market centers and exchange it for oil that meets the specifications of the Strategic Petroleum Reserve. The Department of the Interior hopes to increase the rate of transfer from 60,000 per day to as much as 100,000 to 130,000 barrels per day, beginning in October 2002.



### ***Crude Oil Time Exchange***

Alarmed by low distillate inventories in the Northeast, President Clinton directed the Secretary of Energy on September 22, 2000, to enter into time exchange agreements with oil companies for up to 30 million barrels of crude oil. Under the exchange agreements, companies were to return a like quantity, plus a bonus percentage of similar crude oil, in the fall of 2001.

The average bonus percentage from the initial awards was 4.5 percent, for a total of 31.2 million barrels of exchange oil to be returned to the Reserve. However, the market conditions favoring a deferral of deliveries under the royalty-in-kind exchange contracts also resulted in negotiation of deferrals for most of the time exchange oil until 2002 and 2003. Similar to royalty-in-kind exchange deliveries, however, some deferred time exchange deliveries also reverted to late 2001 delivery. Due to these additional deferrals and subsequent reversions, the Reserve will receive an additional 3.3 million barrels, for a total of 34.5 million barrels returned under the time exchange.

As of December 31, 2001, the Strategic Petroleum Reserve had received 4.9 million barrels under the time exchange. Delivery of the remaining 29.6 million barrels is scheduled for completion by early 2003.

## ***EMERGENCY RESPONSE CAPABILITIES***

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### ***Drawdown and Distribution of Oil***

The method for distributing crude oil is price competitive sale, described in the "Strategic Petroleum Reserve Drawdown (Distribution) Plan," Amendment Number 4 to the Strategic Petroleum Reserve Plan. The sale is open to all eligible buyers to ensure an economic and efficient distribution.

### ***Competitive Sales Procedures***

The Department of Energy's Standard Sales Provisions\* prescribe the competitive sales process. The first step in the process is the issuance of a Notice of Sale identifying the volume, characteristics, and location of the petroleum for sale, delivery dates, and procedures for submitting offers. Measures required for assuring performance and financial responsibilities are also described in the Notice of Sale.

During a drawdown, several Notices of Sale may be issued, each covering a sales period of one to two months. Offerors may have only seven days from the date a Notice of Sale is issued until offers are due, with delivery of oil commencing no later than thirty days after the Presidential direction to drawdown. Subsequent sales periods will coordinate Notice of Sale issuance with standard industry delivery periods. Because of the possible short initial lead-time, the Department maintains a list of prospective offerors who will receive all Notices of Sale and intends to make maximum use of electronic communication for Notice of Sale distribution.

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\*Department of Energy, 10 CFR Part 625, Price Competitive Sale of Strategic Petroleum Reserve Petroleum; Standard Sales Provisions. The most recent edition of the Standard Sales Provisions was published in the *Federal Register* on October 8, 1998 (63 FR 54196).

The second step in the sales process is for prospective purchasers to submit offers, as specified in the Notice of Sale. Offerors must unconditionally accept all terms and conditions in the Notice of Sale, offer at least the minimum price, if any is specified in the Notice of Sale, and submit an offer guarantee of 5 percent of the maximum potential contract amount, or \$10 million, whichever is less. The offer evaluation process is structured so that the offerors bidding the highest prices determine the transportation methods, up to the limits of the distribution system. Specific delivery arrangements are negotiated later in the process.

Within five business days of being notified, all "apparently successful offerors" are required to provide a Letter of Credit equal to 100 percent of the contract amount as a guarantee of performance and payment of amounts due under the contract. Upon timely receipt of the financial guarantees, and a final determination by the Contracting Officer that offers are responsive and offerors responsible, Notices of Award are issued. Deliveries to the purchasers may then begin, consistent with their arrangements for commercial pipeline or marine vessel transportation. Such deliveries may begin as soon as the 16th day of the sales process, to the extent that the purchasers submit their financial guarantees and can arrange transportation.

**Drawdown Capabilities**

The crude oil acquired for the Strategic Petroleum Reserve is commingled in caverns at the storage sites, creating various distinct crude oil streams

available for sale during a drawdown. Table 5 identifies these crude oil streams, delivery modes, and locations, as of December 31, 2001.

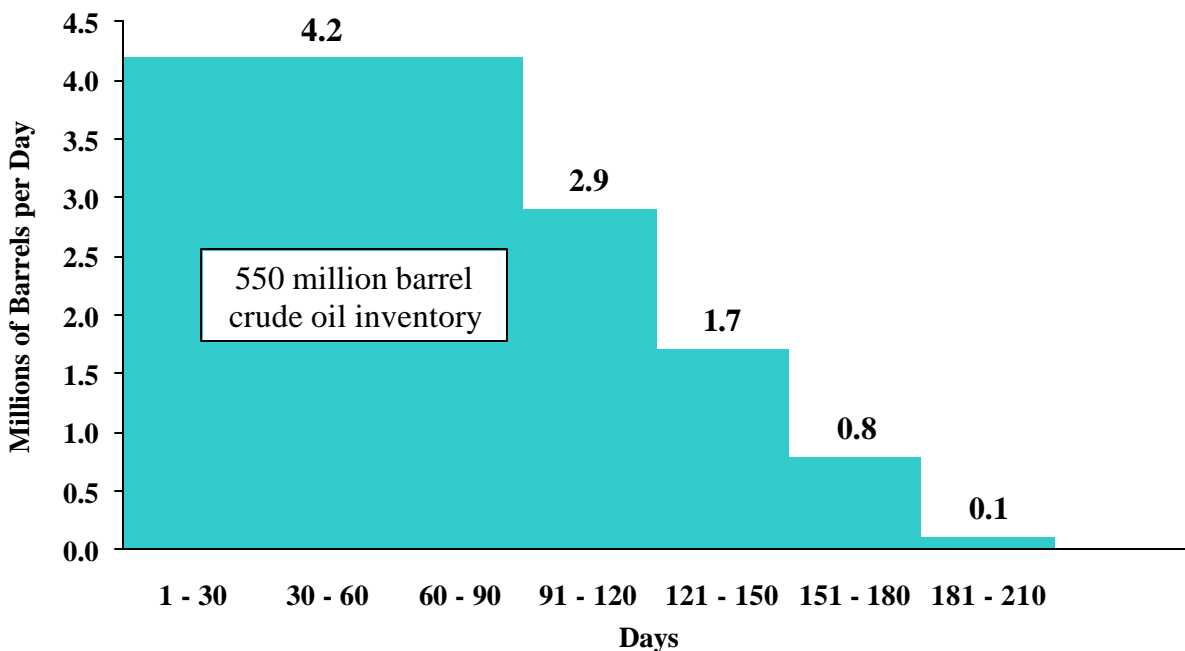
**Table 5  
Crude Oil Streams**

Crude Oil Stream	API Gravity	Sulfur Content	Delivery Mode and Location
<b>Seaway System</b>			
Bryan Mound Sweet	35.9	0.33	Pipeline or tankship at Seaway Terminal, Freeport, Texas; or Seaway Terminal, Texas City, Texas
Bryan Mound Sour	33.4	1.38	
<b>Texoma System</b>			
West Hackberry Sweet	37.0	0.29	Pipeline, tankship or barge at Sunoco Terminal, Nederland, Texas; Pipeline at Equilon-22"/DOE connection, Lake Charles, Louisiana
West Hackberry Sour	33.5	1.41	
Big Hill Sweet	35.9	0.48	Pipeline, tankship or barge at Sunoco Terminal, Nederland, Texas; Pipeline or tankship at Unocal Terminal, Nederland, Texas; Pipeline at Equilon-20"/DOE connection, Winnie, Texas
Big Hill Sour	30.3	1.38	
<b>Capline System</b>			
Bayou Choctaw Sweet	36.0	0.36	Pipeline at Capline or LOCAP Terminals, St. James, Louisiana; Tankship at Sugarland St. James Terminal, St. James, Louisiana 24-inch site connection to Red Stick Pipeline, Iberville Parish, Louisiana
Bayou Choctaw Sour	32.2	1.43	

The Strategic Petroleum Reserve can draw down crude oil at an initial sustainable rate of 4.2 million barrels per day, for a period of 90 days. After this period, the drawdown rate will gradually decrease as site inventories are depleted, and the declining number of caverns containing crude oil becomes a constraint. Figure 3 illustrates the physical drawdown capability, which provides for a distribution of 380 million barrels in 90 days, and 541 million barrels in 180 days.

The current sustainable drawdown rate of 4.2 million barrels per day is a small increase over 2000, because of the limited additions to inventory during the year and no significant site facilities changes. The initial sustainable drawdown capability will be 4.42 million barrels per day when the currently available capacity is filled.

**Figure 3**  
**Projected Maximum Drawdown Capability**  
**(As of December 31, 2001)**



Note: Rates after 90 days are based on cavern-use assumptions. Actual rates are contingent on the specific caverns drawn down during a previous drawdown period.

### ***Drawdown Readiness Activities***

Following Eagle I in 2000, its first full-scale simulated drawdown exercise, the Strategic Petroleum Reserve in 2001 completed a comprehensive review and revision of the procedures for conducting a drawdown. The results of this review were incorporated into flowcharts and a new Drawdown Implementation Manual for distribution program wide. In addition, provisions were made for posting the status of drawdown readiness activities on an intranet, also available program wide. These new procedures were immediately adopted and utilized during the execution of Alert Level 1 following the September 11, 2001 terrorist attacks on America.

Additional drawdown readiness activities included:

- Conducting a recovery program exercise at the Big Hill site to demonstrate its ability to recover drawdown capabilities after damage from natural or man-made disasters using transportable diesel-driven pumps, and temporary piping and valves.
- Conducting a systems test exercise demonstrating the Bayou Choctaw site's capability to sustain a maximum drawdown rate for a prescribed period.
- Training program development supporting turnover of the Site Operations Training Simulator allowing its use for training and qualifying site operations personnel in the Distributive Control System recently installed at each site.

- Conducting periodic assessments of the readiness and availability of all functions, facilities, and systems associated with a drawdown.

### ***Distribution Plan and Capabilities***

The Strategic Petroleum Reserve has the capability to distribute its crude oil to United States refineries by both pipeline and marine transportation in the event of an emergency. The Reserve is connected by commercial pipeline systems to over one-half of the United States' refining capacity, and is capable of delivering crude oil to 22 refineries in the Gulf Coast region, and 27 refineries in the Mid-continent and Midwest regions. The Strategic Petroleum Reserve is connected to all four major interstate pipeline systems, Capline, Seaway, ExxonMobil and MidValley, serving the Mid-continent and the Midwest. These 49 refineries processed approximately 55 percent of United States' crude oil imports during 2001.

The Strategic Petroleum Reserve is connected to five marine terminals with a combined distribution capacity of approximately 2.5 million barrels per day. These are: Seaway Terminal (TEPPCO/Phillips), Freeport, Texas; Seaway Terminal (TEPPCO/ARCO), Texas City, Texas; Sunoco and Unocal Terminals, Nederland, Texas; and Sugarland Terminal (formerly St. James Terminal), St. James, Louisiana.

Figure 4 illustrates the Strategic Petroleum Reserve's pipeline and marine distribution capabilities.

The current drawdown and distribution capabilities of the Strategic Petroleum Reserve are summarized in Table 6, and are based on current

crude oil stream inventories, existing site drawdown systems, and commercial distribution capabilities.

**Table 6**  
**Drawdown and Distribution Capabilities**  
**(Thousands of Barrels Per Day)**

	<b>Drawdown</b>	<b>Distribution</b>
Seaway System	1,500	2,179
Texoma System	2,185	3,109
Capline System	515	1,625
<b>Total</b>	<b>4,200</b>	<b>6,913</b>

### ***Distribution Assessment***

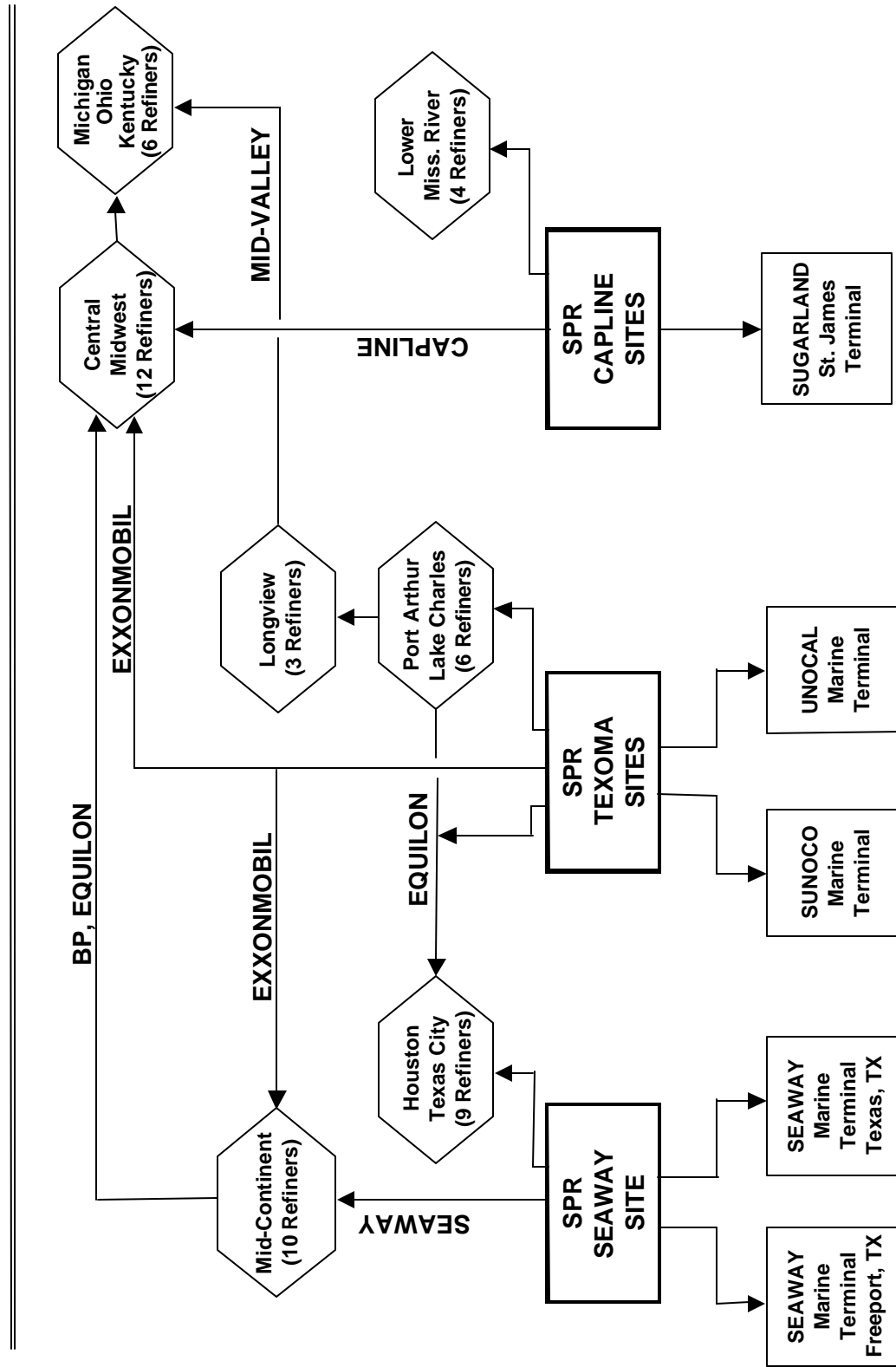
An annual distribution assessment is conducted of the Strategic Petroleum Reserve's crude oil distribution system capabilities to ensure there are adequate connections to the commercial distribution systems, and to identify the need for any remedial plans. The assessment for 2001 evaluated the Strategic Petroleum Reserve's capability, at its maximum drawdown rate, to replace foreign oil in 2000, 2005, and 2010. Future U.S. petroleum refining demands are based on forecasts by the Energy Information Administration's *Annual Energy Outlook, 2001*.

The assessment took into account changes made to commercial pipeline distribution systems and modifications to the infrastructure. The reversal of West Texas Gulf's 26-inch pipeline from Sun Terminal to Longview, Texas, when it is utilized, provides additional distribution potential to the Texoma System. The continued increase in Canadian exports and their southward delivery

into PADD III as replacement to declining domestic production will require review in future distribution assessments.

Finally, the assessment confirms that the Strategic Petroleum Reserve has sufficient offsite distribution capabilities (defined as 120 percent of the maximum drawdown rate) to achieve current drawdown rates. The assessments for 2005 and 2010 predict that the Strategic Petroleum Reserve's distribution capability will continue to increase in the Seaway and Texoma systems as refinery imports increase, and distribution in the Capline system will decrease due to increasing domestic production from the Gulf, but not sufficient to cause the Reserve's performance to drop below the 120 percent requirement.

Figure 4  
Pipeline and Marine Distribution Capabilities



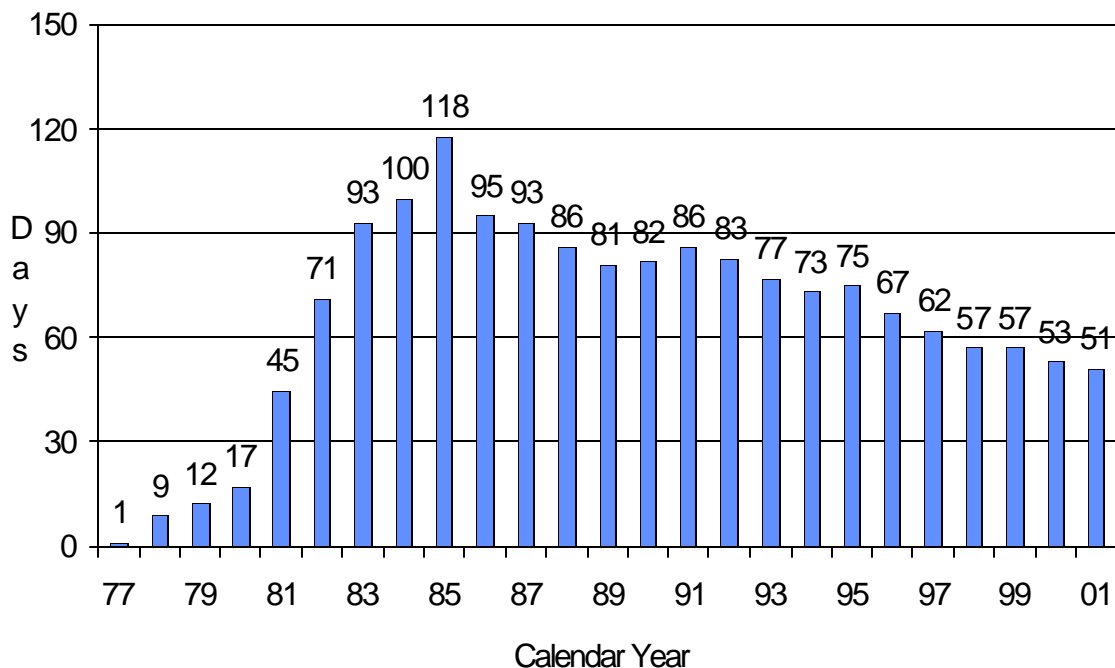
**Import Protection Levels**

In the Energy Policy and Conservation Act of 1975, the Congress established an initial storage objective of 90 days of net petroleum imports, which equated to 500 million barrels then. The inventory of 550.2 million barrels on December 31, 2001, was equivalent to 51 days of net petroleum imports of crude and refined products, (see Figure 5).

The inventory, in equivalent days of net petroleum imports, has been on a continual decline since 1985, principally as a result of increasing United States dependence on oil imports. In 2001, the United States dependence on foreign crude imports exceeded 60 percent, (see Figure 6).

**Figure 5  
Days of Net Import Protection (1977-2001)**

**SPR Inventory (Year End)  
U.S. Net Petroleum Imports/Day (Year Average)**

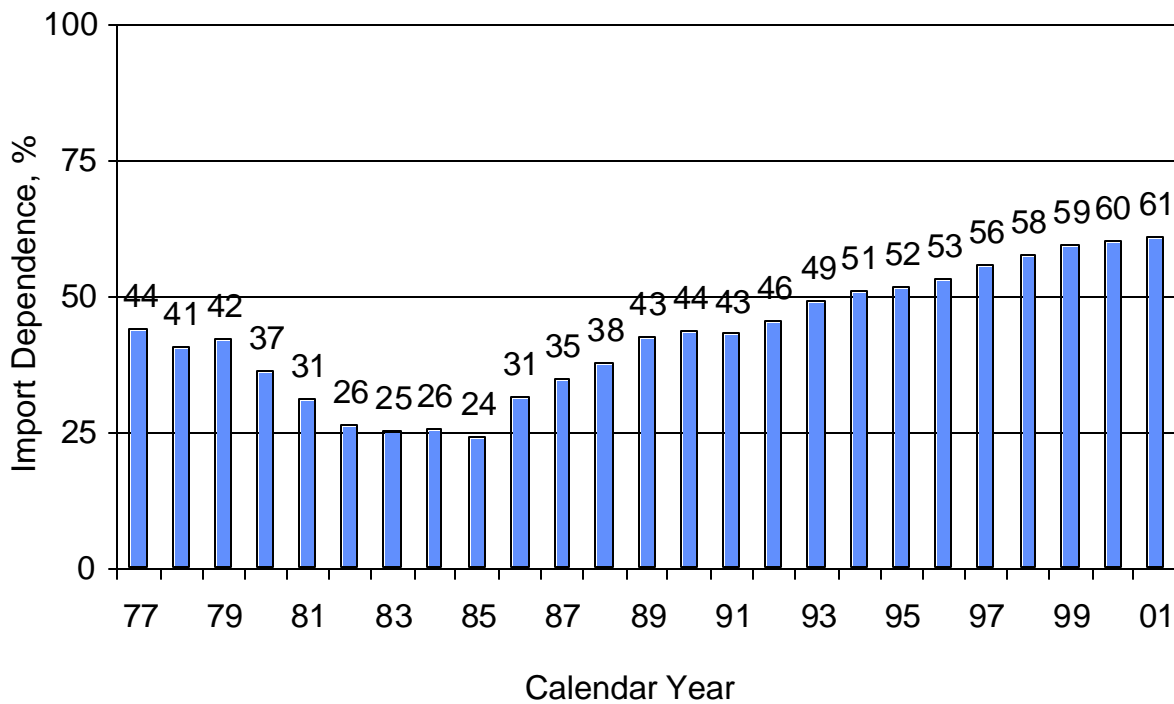




As a member nation of the International Energy Agency, the United States is committed to maintaining stocks of crude and products in reserves equivalent to 90 days of net oil imports. Computations of member stockpile requirements are based on both public and privately held stocks,

and net imports are defined as the average daily level in the previous year. The most recent International Energy Agency computation credits the United States with 129 days of emergency reserves, based on both the Strategic Petroleum Reserve and privately held stocks.

**Figure 6**  
**U.S. Crude Oil Import Dependence**  
**(1977-2001)**



## **COMMERCIALIZATION ACTIVITIES**

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### **Commercial Leases**

Since 1995, the Strategic Petroleum Reserve has promoted the commercialization of its under-utilized crude oil distribution facilities to make the program more cost-effective, and has leased four crude oil pipelines and a marine terminal to private industry. The contracts for these leases require that the facilities be maintained in good condition and, that in the event of an emergency drawdown of oil, the leased facilities are returned on 15 days notice.

**Bayou Choctaw Pipeline:** Leased to Shell Pipe Line Corporation (now Equilon Pipeline Company) on May 1, 1997, on a revenue-sharing basis. In 1998, the lease was converted from an annual lease to a ten-year lease. In 2001, lease revenues amounted to \$212,738.

**Big Hill Pipeline:** Lease to Texaco Pipe Line Incorporated (now Equilon Pipeline Company) on October 15, 1997, under a 75 percent capacity lease contract. This three-year lease expired on October 15, 2000, and was extended through January 15, 2001. In 2001, lease revenues amounted to \$33,104.

**Bryan Mound Pipelines:** Two of the three Bryan Mound pipelines were leased to Exxon Pipeline Company on January 14, 1999. Exxon began using the pipelines in June 2000, as part of its onshore distribution system for the Diana-Hoover production in the Gulf of Mexico. In 2001, lease revenues amounted to \$1,054,297.

**St. James Terminal:** Leased to Shell Pipe Line Corporation (now Equilon Enterprises LLC) on January 31, 1977, on a revenue-sharing basis. The contract is for one year with automatic renewals each year for a period of 19 years, unless either party gives notice of termination 90 days prior to

the renewal date. In 2001, lease revenues amounted to \$1,227,021.

### **Foreign Oil Storage**

The Strategic Petroleum Reserve promotes the concept of storing foreign oil in its unused storage space as a strategy to increase world oil stockpiling, generate revenues for the United States Treasury, and/or add oil to the Strategic Petroleum Reserve (in lieu of a fee). The Balanced Budget Act of 1997 (Public Law 105-33) provides specific authority to store petroleum products of another country, or its representatives, in the Strategic Petroleum Reserve, provided that the United States is fully compensated for all related costs, and that the ability to draw down U.S. oil is not impaired.

To enhance the Strategic Petroleum Reserve's offer to store oil for foreign governments or their representatives, the Big Hill storage site was activated as a special purpose Foreign Trade Zone sub zone on September 28, 1998. This designation permits customers to store oil without paying customs fees and certain taxes. For now, the Big Hill storage site is the only storage site to receive this designation.

The Strategic Petroleum Reserve did not pursue any commercial or foreign storage initiatives during 2001. In 1999, the Department of Energy resumed filling the Strategic Petroleum Reserve, primarily the Big Hill site, through its agreement with the Department of the Interior for Federal royalty oil, which continued through 2001. In addition, the world oil market was characterized by near term oil prices higher than the price for future delivery, so that there were no market incentives for commercial oil storage.

## **BUDGET AND FINANCE**

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Appendix C of the Consolidated Appropriations Act 2001 (Public Law 107-63) included \$164.6 million for Strategic Petroleum Reserve facilities operations and management and the Northeast Home Heating Oil Reserve.

### ***Appropriations through Fiscal Year 2001***

A total amount of \$21.6 billion, net of sales and transfers, has been appropriated for the Strategic Petroleum Reserve through fiscal year 2001. Included in this total is the distribution of annual and total appropriations described in Table 7. Figure 7 illustrates the cumulative appropriations for storage facilities operations and management, petroleum acquisition and transportation, as well as the Northeast Home Heating Oil Reserve.

### ***Strategic Petroleum Reserve Account***

The Strategic Petroleum Reserve Account funds the development, operation, and maintenance of facilities; the salaries and expenses necessary to plan and manage the program, including the operation of the Project Management Office in New Orleans, Louisiana; and the activities pertinent to major issues concerning the development and use of the Strategic Petroleum Reserve.

Obligations for the Strategic Petroleum Reserve in fiscal year 2001 totaled approximately \$148.7 million. From this amount, \$11.2 million was obligated for Federal program management salaries and benefits, and \$137.5 million was obligated for contractual goods and services to operate and maintain the Strategic Petroleum Reserve and the Northeast Home Heating Oil Reserve.

### ***SPR Petroleum Account***

The SPR Petroleum Account funds the acquisition of oil for the Strategic Petroleum Reserve; the associated costs for transportation and terminal ling; United States customs duties, Superfund and Oil Spill Liabilities Trust Fund taxes; and other miscellaneous costs, such as Defense Energy Support Center administration costs associated with non-emergency sales, as well as oil acquisition, and transportation support. During an emergency drawdown and sale, the SPR Petroleum Account is the source of funding for the incremental costs of withdrawing oil from the storage caverns and transporting it to the point where purchasers take title. During an emergency drawdown and sale, an amount equal to Federal receipts realized is deposited in the SPR Petroleum Account to create additional budget authority for filling the Reserve. At the end of fiscal year 2001, approximately \$9.4 million remained available for obligation in the Account, an amount sufficient to finance approximately 17% of the incremental costs of a six-month emergency drawdown.

The capitalized cost for the crude oil in the Strategic Petroleum Reserve at the end of fiscal year 2001 was \$15 billion, for an average cost per barrel of approximately \$26.72.

### ***Northeast Home Heating Oil Reserve Account***

The Northeast Home Heating Oil Reserve Account funds the continued operation of the Home Heating Oil Reserve, solicitation support for the Defense Energy Support Center, and lease of commercial storage space.

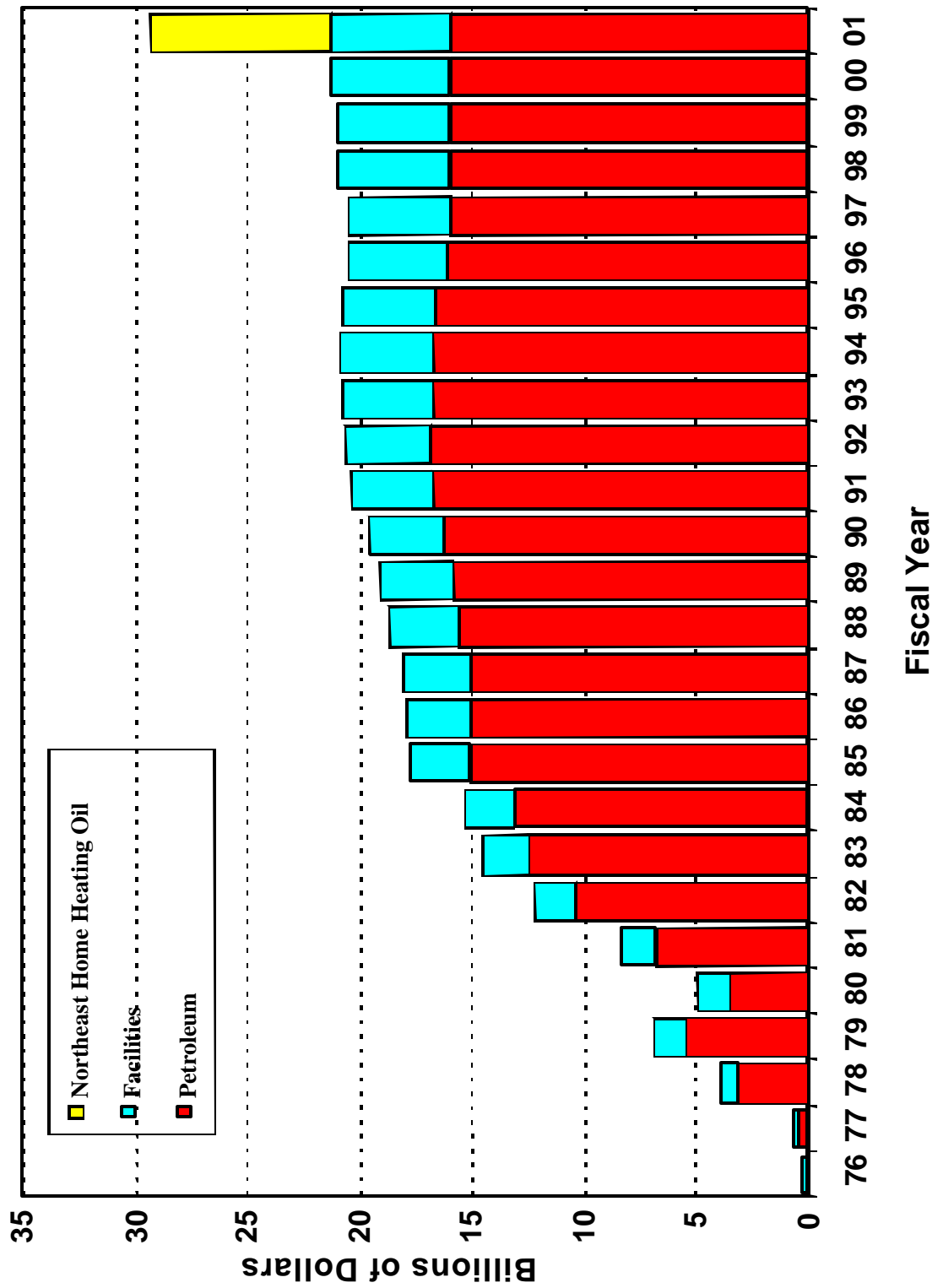
**Table 7**  
**Annual Appropriations for Storage Facilities Operations and Management and Petroleum Acquisition and Transportation (Thousands) (Data as of December 31, 2001)**

Fiscal Year	Oil Account	Facilities	Management	Northeast Home Heating Oil	Total	Defense SPR
1976	0	300,000	13,975		313,975	
1977	440,000	0	7,824		447,824	
1978	2,703,469	463,933	14,704		3,182,106	
Total 1979 Appropriations*	2,356,456	632,504	18,111		3,007,071	
Total 1980 Appropriations*	(2,022,272)	0	22,272		(2,000,000)	
Total 1981 Appropriations*	3,205,094	108,168	19,391		3,332,653	
Total 1982 Appropriations*	3,679,700	175,656	20,076		3,875,432	
1983	2,074,060	222,528	19,590		2,316,178	
1984	650,000	142,357	16,413		808,770	
1985	2,049,550	441,300	17,890		2,508,740	
Total 1986*	(12,964)	106,979	13,518		107,533	
1987	0	134,021	13,412		147,433	
1988	438,744	151,886	12,276		602,906	
1989	242,000	160,021	13,400		415,421	
1990	371,916	179,530	12,953		564,399	
1991	566,318	187,728	12,846		766,892	
1992	88,413	171,678	13,384		273,475	
1993	(125,625)	161,940	14,227		50,542	
DOD Transfer (non add)	124,925	700	0		125,625	125,625
1994	0	191,035	15,775		206,810	
1995	(107,764)	226,938	16,780		135,954	
1996 transfer from SPR Petroleum Account	(187,000)	170,173	16,827		0	
1996 Weeks Is. Oil Sale	(97,114)	97,114	0			
1996 deficit reduction oil sale	(227,000)	0			(227,000)	
1996 Total	(511,114)	267,287	16,827		(227,000)	
1997 Total*	(220,000)	(193,000)	(16,000)		(11,000)	
1998	0	191,500	16,000		207,500	
1999	0	145,120	14,805		159,925	
2000	0	144,000	15,000		159,000	
2001	0	140,672	15,965	8,000	164,637	

\* Includes reprogramming and rescission actions.

Note: Fiscal year 1991 SPR Petroleum Account of \$566,318 includes proceeds of \$122,681 from the Test Sale recorded as additional budget authority, rather than reductions to obligations, costs, and outlays. It also includes \$315,424,985 in Desert Storm Drawdown proceeds from January 1991, and \$19,755,064 from fiscal year 1991 NPR excess receipts. Thus, the cumulative budget authority is "gross" and not related directly to the inventory of oil on hand.

**Figure 7**  
**Cumulative Funding**



### **Commercialization Revenues**

During 2001, the Strategic Petroleum Reserve received \$2,527,160 in revenues from the commercial leases of its distribution facilities and pipelines, \$2,494,056 of which were paid in crude oil equivalent.

**Table 8**  
**Summary of Commercialization Revenues**  
**(December 31, 2001)**

Calendar Year	Bryan Mound Pipeline	Big Hill Pipeline	Bayou Choctaw Pipeline	St. James Terminal Lease	Total Revenue Generated
1996	102,606	472,809			575,415
1997		429,824	0	133,300	563,124
1998	12,500	402,525	0	481,010	896,035
1999	679,393	400,000	163,030	546,125	1,788,548
2000	652,146	493,359	217,573	748,986	2,112,064
2001	1,054,297	33,104	212,738	1,227,021	2,527,160

**Performance Measurement**

The mandates of the Government Performance and Results Act of 1993 are incorporated into our performance management system. Out of a total of 21 performance targets, 20 were positive and 19 measures met or exceeded their target goals.

Details of program goals, objectives, and progress are contained in the Strategic Petroleum Reserve's *Annual Performance Report*.

<b>PERFORMANCE MEASURES</b> (Value or characteristic used to measure output)	<b>Fiscal Year 2001 Target</b>	<b>Fiscal Year 2001 Actual</b>
Total capacity at four storage sites.	700 MMB	700 MMB
Distribution capability as a percentage of drawdown rate.	≥ 120% of drawdown rate	159%
Drawdown rate.	4.2 MMB/Day	4.2 MMB/Day
The calculated predicted site availability.	≥ 95%	98%
The weighted annual average of the performance elements in the Maintenance Performance Appraisal Report.	≥ 95% of possible points	98%
The weighted annual average of the performance elements of Material Performance Appraisal Compilation.	≥ 95 Points	98%
Recovery equipment testing.	95% Test Objectives	100%
Percent of site security survey ratings that are satisfactory.	100%	100%
Crude oil inventory available.	565.2 MMB	544.8 MMB
Accountability: Variance between oil sent and oil received during oil movements.	≤ .4%	.08%
Oil Quality Assurance: Percentage of crude oil samples meeting specifications.	≥ 95%	96%
Days with no reportable/recordable ES&H events.	≥ 310	338
Number of environmental permit noncompliances received (includes NOVs).	≤ 10	4
Sanitary waste volume.	3,261,760 LBS	569,440 LBS
Hazardous waste volume.	3,240 LBS	1,704 LBS
Lost workday case rate per 200,000 worker hours for SPR.	≤ 1.1 cases per 200,000 worker hours	0.5
Operating cost per barrel of storage capacity.	≤ \$ 0.2028 per barrel	\$ 0.2028
Percent of Level 1 and 2 Milestones completed on schedule.	≥ 90%	73%
Percent of performance measure output targets achieved.	≥ 90%	90%
Percent of: -Trained Emergency Response Team members at each site.	95%	113%
Heating oil inventory available	2.0 MMB	2.0 MMB

## ***OTHER ACTIVITIES***

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### ***Security***

The Strategic Petroleum Reserve implemented a higher security alert immediately following the terrorist attacks on New York and Washington on September 11, 2001, and remains at that level.

Additional security protection officers have been placed on duty at all sites and a series of 40 security measures have been implemented, as directed by the Office of Security Operations at Department of Energy Headquarters.

Dogs trained in explosive detection are being used and parking controls are rigidly enforced. Suspicious activities result in an immediate response. In addition, permanent physical security enhancements are being implemented in response to the perceived threat of continued terrorist activity.

Pinkerton Government Services, a private company, provides protection services under a subcontract with DynMcDermott Petroleum Operations Company. The Project Management Office in New Orleans and the four storage sites are protected by security police officers.

This protective force engages in training exercises with Federal, state and local law enforcement agencies to maintain its readiness to respond to incidents.

In April 2001, the Strategic Petroleum Reserve underwent a full inspection and evaluation by 16 Inspectors from the Office of Safeguards and Security Evaluations, Department of Energy Headquarters. All security topical areas were given the highest rating.

### ***Environment, Safety, and Health***

The Strategic Petroleum Reserve received external verification when it demonstrated compliance with nationally and internationally recognized benchmarking standards in the following systems:

- ✓✓ National Environmental Achievement Track.
- ✓✓ Certification under the International Standardization Organization (ISO) 14001.
- ✓✓ Certification in the Voluntary Protection Programs of the Occupational, Safety, and Health Administration, and the Department of Energy.

### ***National Environmental Achievement Track***

In October 2001, the Environmental Protection Agency informed the Strategic Petroleum Reserve that it had been selected to become a Charter Member of the National Environmental Achievement Track, in recognition of its high environmental performance.

Application is open only to organizations that have historically shown a strong compliance record, and have always exceeded regulatory requirements. In addition, organizations must have an operational environmental management system, a commitment to substantial pollution prevention, and energy efficiency for the upcoming fiscal years.

In April 2001, a successful site visit by the Environmental Protection Agency's Region 6 enhanced the Strategic Petroleum Reserve's credibility with Federal regulators.



### ***ISO 14001 Environmental Management System***

In May 2000, the Strategic Petroleum Reserve became the first bulk petroleum storage organization in the United States, public or private, to receive International Standardization Organization (ISO) 14001 certification for its environmental management system. This certification continued into 2001.

The ISO 14001 Registrar (the certifying agency) performed two separate surveillance audits at all the facilities. A successful outcome resulted in continuation of the ISO 14001 certification at all locations.

### ***Voluntary Protection Programs***

The Strategic Petroleum Reserve was recognized for achieving *Star* status in the Voluntary Protection Programs of the Occupational, Safety, and Health Administration and the Department of Energy. The Strategic Petroleum Reserve is the only organization in the Department of Energy to achieve this status. All four sites enjoy Voluntary Protection Program *Star* status and can fly flags from the Voluntary Protection Program of each organization.

The Voluntary Protection Program requires a commitment to an excellent safety and health program. OSHA approval recognizes the outstanding efforts by management and employees to establish cooperative relationships in the workplace.

### ***Fossil Energy Award***

The Strategic Petroleum Reserve received the annual *Fossil Energy Environment, Safety, and Health Award*. The first-place award was based

on the achievement of *Star* status in the Voluntary Protection Programs. The award ceremony took place on November 2, 2001 in Washington, D.C.

### ***Emergency Management and Fire Protection***

The Emergency Management group provides the resources to respond to fire hazardous material spills and personal injuries at all sites. The group coordinates with Federal, state and local response agencies, as well as with response elements from private entities to ensure emergency response proficiency.

Senior management attended Regional Response Team meetings of the Environmental Protection Agency's Region 6, where they met their counterparts from other Federal and state agencies.

Emergency Response Teams from each storage site attended firefighting training at the Texas A&M facility in College Station, Texas, and also received Hazwoper refresher training in Galveston, Texas. Each site conducted a successful drill under the national Preparedness for Response Exercise program to demonstrate response proficiency.

In November 2001, Bryan Mound received the *Oil Spill Prevention Response Award* from the Texas General Land Office. This annual award is designed to recognize excellence in environmental protection. It singles out organizations that have contributed significantly to oil spill prevention preparedness and response in the State of Texas.

### ***Pollution Prevention***

The Strategic Petroleum Reserve continued to improve its pollution prevention performance, particularly in hazardous waste generation. In fiscal year 2001, the Strategic Petroleum Reserve generated 1,704 pounds of hazardous waste. This waste stream is composed of paint, lab, lamps, and mercury wastes. Of the 1,704 pounds of hazardous waste, the majority (58 percent) was paint wastes containing solvents, paints, and still wastes resulting from paint solvent recovery operations. Overall, hazardous waste generation was reduced by 55 percent in fiscal year 2001, compared to fiscal year 2000.

### ***Real Estate Actions***

The Department of Energy granted a pipeline easement across the West Hackberry site to Pinnacle Gas Company for \$23,800. On August 22, 2000, the Department acquired from a private landowner a five-year road-use permit to access the Department's valve site near West Hackberry for \$14,450.

### ***Organizational Improvement Activities***

The Strategic Petroleum Reserve won the Achievement Award in the Department's *Energy Performance Excellence Award Program*, with the highest score ever accomplished by an organization.

The *Energy Performance Excellence Award* examiners cited the following accomplishments:

- ✎✎ Using permanent teams (customer service, strategic planning, and performance measurement), and temporary improvement teams to create an environment for learning and innovation.
- ✎✎ Developing an innovative customer interview program to improve customer service.
- ✎✎ Setting or tying with 10 out of 17 U.S. Office of Personnel Management employee satisfaction benchmarks, compared to 29 other federal agencies with over 500,000 employees.
- ✎✎ Naming the Project Management Office in New Orleans as one out of ten Training and Investment Leaders by the *American Society for Training and Development*.
- ✎✎ Managing the management and operating contractor which was recognized for its outstanding operations, as reflected by awards from the Department of Energy and Fossil Energy, ISO-9001 and ISO-14001 certifications, the Environmental Protection Agency's *National Environmental Achievement Track* award, and the Occupational, Safety and Health Administration's Voluntary Protection Program's "Star" status.

## **APPENDIX A**

### **Strategic Petroleum Reserve Site Information**

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#### ***Bryan Mound***

##### **Location**

Brazoria County, Texas (3 miles southwest of Freeport, Texas).

##### **Site Description**

232-million-barrel storage facility consisting of 20 caverns.

24-inch diameter, 6-mile brine disposal pipeline extending 4 miles offshore in the Gulf of Mexico.

Oil, brine and raw water piping distribution system connecting caverns with central plant and water intake structure located on Brazos River. Twenty-one (21) pumps totaling approximately 46,700 horsepower.

##### **System Parameters**

Drawdown Rate:	1,500,000 bbl/d
Raw Water Pumping Rate:	1,545,000 bbl/d
Oil Fill Rate:	225,000 bbl/d
Brine Disposal Rate:	260,000 bbl/d

##### **Distribution Facilities**

DOE 3.9 mile, 30-inch pipeline to Seaway Freeport Marine Terminal, DOE 4.0 mile, 30-inch pipeline to Seaway Jones Creek Tank Farm and Pipeline and DOE 46 mile, 40-inch pipeline to Seaway Texas City Terminal and Docks.

##### **Acquisition**

Acquired 499.47 acres fee simple, by condemnation April 1977, from Freeport Mineral Company and other owners. Dow Chemical Company was the previous operator.

#### ***West Hackberry***

##### **Location**

Cameron Parish, Louisiana (25 miles southwest of Lake Charles, Louisiana).

##### **Site Description**

222-million-barrel storage facility consisting of 22 caverns.

Oil, brine, and raw water piping distribution system connecting caverns with central plant, water intake structure located on Intra-coastal waterway and 9-brine disposal wells. Thirty-three (33) pumps totaling over 41,680 horsepower.

##### **System Parameters**

Drawdown rate:	1,300,000 bbl/d
Raw Water Pumping Rate:	1,632,000 bbl/d
Oil Fill Rate:	225,000 bbl/d
Brine Disposal Rate:	225,000 bbl/d

##### **Distribution Facilities**

DOE 42.8 mile, 42-inch pipeline to Sunoco Nederland Terminal.  
DOE 13.6 mile, 36-inch pipeline to Equilon common carrier pipeline system at Carlyss.

##### **Acquisition**

Acquired 405.36 acres fee simple by condemnation, April 1977, from numerous private landowners. Olin Corporation was the previous site operator. Acquired 160.0 additional acres fee simple by condemnation in two actions, July 1979 and March 1980.

## **Big Hill**

### **Location**

Jefferson County, Texas (26 miles southwest of Beaumont, Texas).

### **Site Description**

170-million-barrel storage facility consisting of 14 caverns.

Oil, brine, and raw water systems connecting caverns with central plant, water intake structure located on the Intracoastal Waterway, and a 48-inch diameter, 14-mile brine disposal pipeline extending 4 miles offshore in the Gulf of Mexico. Forty-eight (48) pumps totaling 46,000 horsepower.

### **System Parameters**

Drawdown Rate:	1,100,000 bbl/d
Raw Water Pumping Rate:	1,400,000 bbl/d
Oil Fill Rate:	225,000 bbl/d
Brine Disposal Rate:	432,000 bbl/d

### **Distribution Facilities**

DOE 24.5 mile, 36-inch pipeline to Sunoco Nederland Terminal  
Unocal 2 mile, 24-inch pipeline to Unocal Docks  
Equilon 20-inch pipeline system to East Houston.

### **Acquisition**

Acquired 271 acres fee simple, by condemnation November 1982 and July 1983, from three landowners, i.e., 238.48 acres from Amoco, 27.06 acres from the Pipkin estate, and 5.46 acres from the Patrick Henry Phelan estate.

## **Bayou Choctaw**

### **Location**

Iberville Parish, Louisiana (12 miles southwest of Baton Rouge, Louisiana).

### **Site Description**

76-million-barrel storage facility consisting of 6 caverns.

Oil, brine, and raw water piping distribution system connecting caverns with central plant, a water intake structure, 12 brine disposal wells, and a pipeline for disposing of brine to Union Texas Petroleum, Inc. Eighteen (18) pumps totaling over 18,000 horsepower.

### **System Parameters**

Drawdown Rate:	515,000 bbl/d (sour) 300,000 bbl/d (sweet)
Raw Water Pumping Rate:	515,000 bbl/d
Oil Fill Rate:	110,000 bbl/d
Brine Disposal Rate:	110,000 bbl/d

### **Distribution Facilities**

DOE-owned 37.2 mile, 36-inch pipeline to Equilon's Sugarland Terminal and Capline Pipeline. Equilon-owned 16 mile, 24 inch pipeline to Baton Rouge.

### **Acquisition**

Acquired 355.95 acres fee simple, by condemnation April 1977, from numerous private owners. Union Texas Petroleum (a subsidiary of Allied Corporation) was the previous operator.

In 1985, the Department of Energy acquired an additional existing cavern through a cavern exchange agreement with Union Texas Petroleum. The transaction involved a 3.5-acre exchange with no net change in Government-owned acreage.

## **APPENDIX B**

### ***Northeast Home Heating Oil Reserve***

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#### ***Establishment of the Reserve***

The Energy Act of 2000 (Public Law 106-469), signed on November 9, 2000, authorizes the Secretary of Energy “to establish, maintain, and operate a Northeast Home Heating Oil Reserve,” containing no more than two million barrels of petroleum distillate. Under the law, the Northeast Home Heating Oil Reserve is not a component of the Strategic Petroleum Reserve under title I of EPCA.

On March 6, 2001, Secretary Spencer Abraham formally announced the permanent establishment of the Reserve, separate from the Strategic Petroleum Reserve. In May 2001, President Bush again endorsed the Reserve in his National Energy Policy.

Title II of Public Law 106-469 also required the Secretary to determine procedures (currently posted as the “Petroleum Distillate Sales Provisions” at [www.fe.doe.gov](http://www.fe.doe.gov)), and provided two bases for the discretionary release of oil from the Northeast Home Heating Oil Reserve.

#### ***Product and Storage Acquisition***

The Department has contracts for storage capacity with the following companies.

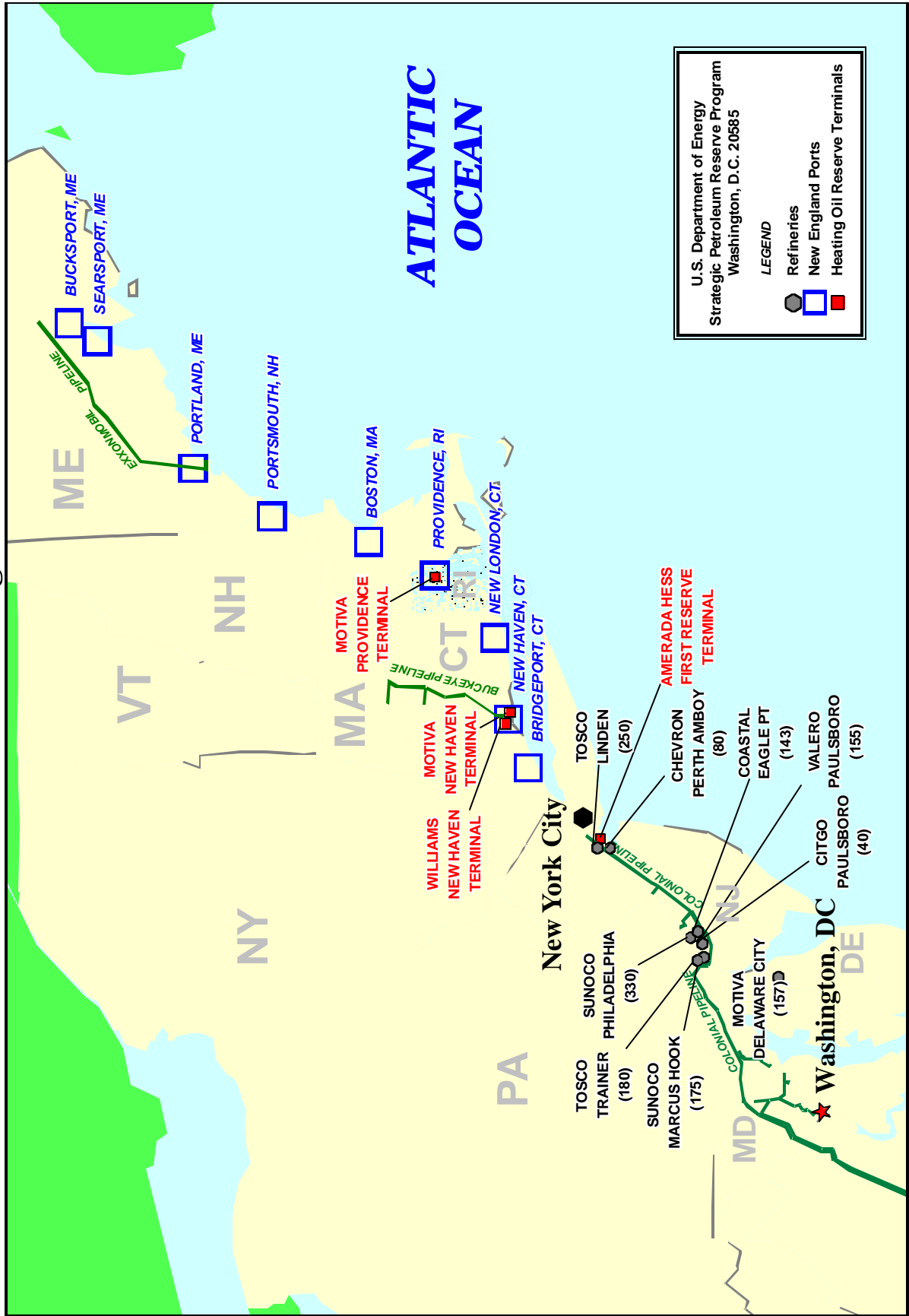
☞☞ Equiva Trading Co., for 250,000 barrels of tank capacity at Motiva Terminal, New Haven, Connecticut and 250,000 barrels of tank capacity at Motiva Terminal, Providence, Rhode Island.

☞☞ Morgan Stanley, for 500,000 barrels of tank capacity at the Williams Terminal, New Haven, Connecticut.

☞☞ Amerada Hess Corp, for one million barrels of tank capacity at the Hess Terminal, Woodbridge, New Jersey.

The storage contracts awarded in October 2000, were for one year with an option to extend for an additional year. In 2001, the option was exercised to extend the contracts for another year. Quality and inventory audits of the heating oil are performed by the Defense Contract Management Administration.

**Figure 8**  
**Northeast Home Heating Oil Reserve**



### ***Sales Plan and Procedures***

If the President orders a drawdown of the Northeast Home Heating Oil Reserve, the principal sales method is a competitive sale. A Notice of Sale is issued, stipulating the volume of oil offered and the terms and conditions of the sale, and sent by e-mail to companies registered with the Department of Energy. The Fossil Energy Website, [www.fe.doe.gov](http://www.fe.doe.gov), posts the Petroleum Distillate Sales Provisions, the Sale Implementation Plan and registration mechanism.

Under the competitive sales process, applicants submit bids generally one or two days following the Notice of Sale, via the Internet. The bids are required to be a premium to the near month Nymex closing price on the day of the sale.

Applicants are also required to wire a bid guarantee of \$250,000 to the Department of the Treasury. DOE verifies receipt of the bid guarantee with Treasury.

Award and notification to successful and unsuccessful bidders occur within several hours following receipt of the bids. No bidder may receive more than 40 percent of the heating oil offered at any one geographical location (New England or New York Harbor). The companies awarded contracts for the heating oil will make arrangements with the terminals for delivery of the heating oil by truck, barge, tanker, or pipeline. Payment for the heating oil must occur within 48 hours of award or before the initiation of delivery if the initiation of delivery occurs within 24 hours. The terminals have the capability to deliver the oil in less than 10 days on 24-hour notice.

To enhance applicant knowledge of the Strategic Petroleum Reserve sales plan and procedures, 34 refiners and 12 traders were visited.

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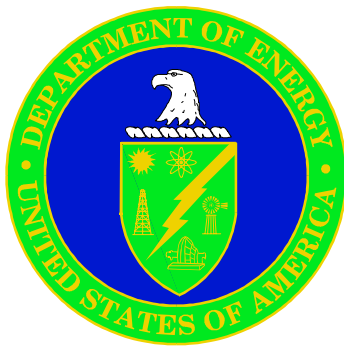
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# Strategic Petroleum Reserve

## Annual Report for Calendar Year 2002

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*Official Use Only*

**U.S. Department of Energy  
Assistant Secretary for Fossil Energy  
Office of Strategic Petroleum Reserve  
Washington, D.C.**

**SPR Home Page: [www.spr.doe.gov](http://www.spr.doe.gov)**



## **TABLE OF CONTENTS**

---

<b>EXECUTIVE SUMMARY .....</b>	<b>1</b>
<b>PROGRAM MISSION</b>	
<b>Introduction .....</b>	<b>3</b>
<b>Legislative History.....</b>	<b>3</b>
<b>Strategic Petroleum Reserve Plan and Amendments.....</b>	<b>6</b>
<b>PROGRAM MANAGEMENT</b>	
<b>Organization .....</b>	<b>7</b>
<b>Contractual Support .....</b>	<b>8</b>
<b>CRUDE OIL STORAGE PROGRAM</b>	
<b>Storage Facilities and Capabilities.....</b>	<b>9</b>
<b>Status of Storage Sites.....</b>	<b>11</b>
<b>Major Maintenance Program.....</b>	<b>12</b>
<b>Operational Limitations And Issues .....</b>	<b>12</b>
<b>PETROLEUM ACQUISITION AND SALES</b>	
<b>Crude Oil Inventory Status .....</b>	<b>13</b>
<b>Royalty-in-Kind Crude Oil Transfer.....</b>	<b>18</b>
<b>Crude Oil Time Exchange .....</b>	<b>19</b>
<b>EMERGENCY RESPONSE CAPABILITIES</b>	
<b>Drawdown and Distribution of Oil .....</b>	<b>20</b>
<b>Competitive Sales Procedures .....</b>	<b>20</b>
<b>Drawdown Capabilities.....</b>	<b>21</b>
<b>Drawdown Readiness Activities .....</b>	<b>23</b>
<b>Distribution Plan and Capabilities.....</b>	<b>23</b>
<b>Distribution Assessment .....</b>	<b>24</b>
<b>Import Protection Levels .....</b>	<b>26</b>
<b>COMMERCIALIZATION ACTIVITIES</b>	
<b>Commercial Leases.....</b>	<b>28</b>
<b>Foreign Oil Storage .....</b>	<b>28</b>
<b>BUDGET AND FINANCE</b>	
<b>Appropriations through Fiscal Year 2002 .....</b>	<b>29</b>
<b>Strategic Petroleum Reserve Account.....</b>	<b>29</b>
<b>SPR Petroleum Account .....</b>	<b>29</b>
<b>Commercialization Revenues.....</b>	<b>31</b>
<b>Performance Measurement.....</b>	<b>32</b>

**OTHER ACTIVITIES**

Security .....	34
Environment, Safety, and Health .....	34
ISO 14001 Environmental Management System.....	35
Voluntary Protection Programs.....	35
Zero Accidents at Big Hill .....	35
Emergency Management and Fire Protection.....	36
Pollution Prevention .....	36
Real Estate Actions .....	36
ISO 9001 Quality Management .....	37
Awards .....	37

**APPENDIX A Strategic Petroleum Reserve Site Information**

Bryan Mound.....	38
West Hackberry .....	38
Big Hill .....	39
Bayou Choctaw.....	39

**LIST OF FIGURES**

Figure 1. Storage Sites and Distribution System.....	10
Figure 2. Cumulative Oil Fill .....	17
Figure 3. Projected Maximum Drawdown Capability .....	22
Figure 4. Pipeline and Marine Distribution Capabilities .....	25
Figure 5. Days of Net Import Protection (1977-2002).....	26
Figure 6. International Energy Program U.S. Emergency Stocks.....	27

**LIST OF TABLES**

Table 1. Storage Capacity and Drawdown Capabilities .....	9
Table 2. Year-End Inventories and Oil Fill History .....	14
Table 3. Crude Oil Receipts through 2002.....	15
Table 4. Crude Oil Inventory through 2002 .....	16
Table 5. Crude Oil Streams.....	21
Table 6. Drawdown and Distribution Capabilities .....	24
Table 7. Annual Appropriations for Storage Facilities Operations and Management and Petroleum Acquisition and Transportation .....	30
Table 8. Summary of Commercialization Revenues.....	31

## ***EXECUTIVE SUMMARY***

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### ***Strategic Petroleum Reserve Status***

The Strategic Petroleum Reserve's storage facilities are capable of storing 700 million barrels of crude oil. As of December 31, 2002, the crude oil inventory was 599.1 million barrels and the drawdown rate was 4.3 million barrels a day. All storage sites are operational and ready for fill or drawdown in the event of an energy emergency.

On November 13, 2001, President George W. Bush announced his intent to fill the Strategic Petroleum Reserve to capacity. The Strategic Petroleum Reserve will be filled to a level of 700 million barrels through the transfer of offshore royalty-in-kind oil from the Department of the Interior to the Department of Energy.

### ***Oil Acquisitions and Exchanges***

As of December 31, 2002, the Strategic Petroleum Reserve had received 28.8 million barrels of exchange oil (10.4 million barrels in calendar year 2002) under the 28-million barrel royalty-in-kind crude oil transfer agreement with the Department of the Interior. In addition, contracts for approximately 27 million barrels were awarded in February and August 2002, under the Administration's extended royalty-in-kind initiative for delivery to the Strategic Petroleum Reserve. Under these contracts, 14.5 million barrels were delivered through December 31, 2002. Subsequent solicitations will be issued until the level of fill has reached 700 million barrels.

As of December 31, 2002, the Strategic Petroleum Reserve had received 28.9 million barrels of crude oil (24 million barrels in calendar year 2002), out of a total of 34.9 million barrels due under crude oil time exchange contracts. Delivery of the remaining 6.0 million barrels is scheduled for completion in 2003.

### ***Commercialization Activities***

In calendar year 2002, the Strategic Petroleum Reserve received \$3,003,504 in revenues from the commercial leases of its distribution facilities and pipelines, \$1,440,529 of which were paid in crude oil equivalent.

### ***Security***

Following the terrorist attacks on September 11, 2001, the Strategic Petroleum Reserve instituted a higher level of alert and initiated plans for physical security enhancements commensurate with the increased threat. Most of the planned enhancements were completed in 2002, and the Reserve remains at a high level of alert.

### ***Awards***

The Strategic Petroleum Reserve won the Department of Energy's 2002 Pollution Prevention Award, recognizing outstanding performance in pollution prevention, affirmative procurement and recycling.

The Strategic Petroleum Reserve was recognized for achieving *Star* status in the voluntary protection programs of the Occupational, Safety and Health Administration and the Department of Energy.

In 2002, all three sites in Louisiana sites received the Louisiana Environmental Management Award, Excellence Category, from the Louisiana Quality Foundation, for the Strategic Petroleum Reserve's environmental management system.

The Strategic Petroleum Reserve was selected to receive the Secretary of Energy's award for outstanding achievement in the placement of prime contract awards to Small Disadvantaged Business Concerns.

## ***PROGRAM MISSION***

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### ***Introduction***

The Strategic Petroleum Reserve was authorized in 1975 in response to the 1973 Arab oil embargo. It is authorized by the Energy Policy and Conservation Act (EPCA)(Public Law 94-163), and by the comprehensive energy plans of all Administrations since 1975, in recognition of the long-term dependence of the United States on imported crude oil and petroleum product. Section 165 of EPCA requires the Secretary of Energy to submit an Annual Report to the President and the Congress.

As of December 31, 2002, the inventory in the Strategic Petroleum Reserve was 599.1 million barrels of crude oil, representing the highest inventory level ever achieved. The inventory amounted to 57 days of net imports in 2002. The United States relies on a combination of oil in the Strategic Petroleum Reserve and private stocks to meet its oil storage obligations to the International Energy Agency. In addition, the Northeast Home Heating Oil Reserve contains two million barrels of heating oil.

### ***Legislative History***

EPCA, enacted on December 22, 1975, authorized the establishment of the Strategic Petroleum Reserve to reduce the impact of a severe energy supply interruption, and to carry out the obligations of the United States under the International Energy Program.

EPCA was amended by Title VIII of the Energy Security Act (Public Law 96-294), enacted on June 30, 1980. The Act established a minimum average daily fill rate of 100,000 barrels and precluded sale of Naval Petroleum Reserve Numbered 1 (Elk Hills, California) crude oil, except to fill the Strategic Petroleum Reserve, unless the Strategic Petroleum Reserve was being

filled at the minimum rate or had an inventory of 500 million barrels.

The Energy Policy and Conservation Amendments Act of 1985 (Public Law 99-58), enacted on July 2, 1985, extended the provisions of Title I, Part B, of EPCA relating to the Strategic Petroleum Reserve until June 30, 1989, and directed the Secretary of Energy to conduct a sale or exchange of 1.1 million barrels of crude oil to test the drawdown and distribution capabilities of the Strategic Petroleum Reserve.

The Omnibus Budget Reconciliation Act of 1986 (Public Law 99-509), enacted on October 18, 1986, amended EPCA to require that the Strategic Petroleum Reserve be filled at a minimum rate of 75,000 barrels a day until at least 750 million barrels were in storage.

Public Law 101-46, enacted on June 30, 1989, extended Strategic Petroleum Reserve authorities contained in EPCA until April 1, 1990. The Act also required the Secretary of Energy to submit a report to Congress by February 1, 1990, on alternative means of financing oil acquisition for the Strategic Petroleum Reserve. Short-term extensions of the Strategic Petroleum Reserve authorities contained in EPCA were enacted on March 31, 1990 (Public Law 101-262), and August 10, 1990 (Public Law 101-360).

On September 15, 1990, the President signed the Energy Policy and Conservation Act Amendments of 1990 (Public Law 101-383), extending authorization for the Strategic Petroleum Reserve until September 30, 1994. This legislation also contained provisions to amend drawdown authorities, require a Strategic Petroleum Reserve Plan Amendment for completion of storage capacity for one billion barrels, authorize

drawdown and distribution tests, and provide for a refined petroleum product reserve test program.

On October 24, 1992, the President signed the Energy Policy Act of 1992 (Public Law 102-486). The Act included provisions to (1) add new conditions for drawdown in emergency situations involving a supply reduction of significant scope and duration, coupled with a severe price increase likely to cause a major adverse impact on the nation's economy, (2) enlarge the Reserve to one billion barrels, (3) permit the Secretary to make payment in advance for delivery of petroleum product either owned or not owned by the United States for storage in the Strategic Petroleum Reserve or non-Strategic Petroleum Reserve facilities, (4) give the President discretionary authority to acquire domestic stripper well oil at competitive prices to fill the Reserve, and (5) amend the eligibility criteria for a Regional Petroleum Reserve.

On October 22, 1994, the President signed into law the Energy Policy and Conservation Act Amendments Act of 1994 (Public Law 103-406), extending authorization for the Reserve to June 30, 1996.

The Balanced Budget Downpayment Act (Public Law 104-99), enacted on January 26, 1996, required the sale of up to \$100 million of Weeks Island oil to fund decommissioning activities.

The Omnibus Consolidated Rescissions and Appropriations Act of 1996 (Public Law 104-134), enacted on April 26, 1996, required the sale of \$227 million of Weeks Island oil for deficit reduction.

The Omnibus Consolidated Appropriations Act (Public Law 104-208), enacted on September 30, 1996, appropriated \$220 million for the Strategic Petroleum Reserve in fiscal year 1997 to be financed through the sale of Reserve oil. The Strategic Petroleum Reserve authorities expired

on June 30, 1996. On October 14, 1996, Public Law 104-306 extended the authorization for the Strategic Petroleum Reserve until September 30, 1997. After the expiration of that authorization, the reserve was not reauthorized until June 1998.

The Balanced Budget Act of 1997 (Public Law 105-33), enacted August 5, 1997, added a new section 168 to EPCA, authorizing the leasing of underutilized Strategic Petroleum Reserve facilities for the storage of oil owned by a foreign government or its representatives.

The Department of the Interior and Related Agencies Appropriations Act, 1998 (Public Law 105-83), enacted on November 14, 1997, appropriated \$207.5 million for the Strategic Petroleum Reserve in fiscal year 1998 to be financed through the sale of Reserve oil.

The 1998 Supplemental Appropriations and Rescissions Act (Public Law 105-174), enacted on May 1, 1998, included a provision which prohibited the drawdown and sale of Strategic Petroleum Reserve oil if the President determined that a sale would be imprudent in light of market conditions and designated the \$207.5 million in foregone revenue as an emergency requirement under the Balanced Budget Act of 1985. The President made the requisite determination and designation on May 8, 1998.

On June 1, 1998, the President signed Public Law 105-177 to extend certain EPCA programs. The Act extended the authorization for the Strategic Petroleum Reserve and participation in the International Energy Program through September 30, 1999, and expanded the antitrust protection for U.S. companies participating in International Energy Agency activities. The Act also authorized the drawdown and distribution of crude oil from the Strategic Petroleum Reserve only for the purposes described in the Act, and required that the Secretary of Energy request

funds for acquisition, transportation and injection of petroleum products for storage in the Reserve or provide a written explanation if no request for funds was made. The Omnibus Consolidated and Emergency Supplemental Appropriations Act, 1999 (Public Law 105-277), enacted on October 21, 1998, included \$160.1 million for the Strategic Petroleum Reserve.

On November 13, 1998, the President signed Public Law 105-388, an Act to extend energy conservation programs under EPCA and the Energy Conservation and Production Act, and for other purposes. The Act provided that, during a drawdown of the Strategic Petroleum Reserve, the State of Hawaii may submit a binding offer for Strategic Petroleum Reserve oil and be entitled to purchase the oil at a price equal to the weighted average price of the successful competitive bids for oil in the applicable category. Deliveries under the binding offer would receive priority scheduling during a Strategic Petroleum Reserve drawdown.

The Strategic Petroleum Reserve authorization expired on September 30, 1999. On October 5, 1999, the President signed Public Law 106-64, extending the authorization for the Reserve and for the EPCA authorities for United States participation in the International Energy Agency program until March 31, 2000.

Appendix C of the Consolidated Appropriations Act, 2000 (Public Law 106-113), enacted on November 29, 1999, included \$159 million for the Strategic Petroleum Reserve. The Act also allowed the Secretary to use other Departmental funds to finance a drawdown from the Strategic Petroleum Reserve.

The Department of the Interior and Related Agencies Appropriations Act, 2001 (Public Law 106-291), signed on October 11, 2000, included \$165 million for the development, operation and management activities of the Strategic Petroleum

Reserve under EPCA, \$4,000,000 to be derived from the transfer of unobligated funds in the "SPR Petroleum Account."

On November 9, 2000, the President signed Public Law 106-469. Title I of The Energy Act of 2000 reauthorized titles I and II of EPCA through fiscal year 2003, and updated or deleted the EPCA title I SPR authorities. Title II of Public Law 106-469 amended title I of EPCA to insert a new part D authorizing the Secretary "to establish, maintain, and operate a Northeast Home Heating Oil Reserve," containing no more than two million barrels of petroleum distillate and located in the Northeast. The new part D Reserve is not a component of the SPR established under part B of title I of EPCA. Title II also sets forth conditions for release of products from the new part D Reserve, requires transmittal to the President and Congress of a plan describing the Reserve, and upon establishment, requires the Secretary of the Treasury to establish a "Northeast Home Heating Oil Reserve" account at Treasury.

On November 5, 2001, the President signed Public Law 107-63, the Interior and Related Agencies Appropriations Act for fiscal year 2002. The Act included \$171 million for Strategic Petroleum Reserve facilities and operations and \$8 million for the Northeast Home Heating Oil Reserve. Congress further specified that if the full \$8 million is not needed for the Northeast Home Heating Oil Reserve, the Department is encouraged to apply any excess funds to the vapor pressure project to remove excess heat and gas from the oil in the Strategic Petroleum Reserve.

Congress passed a series of Continuing Resolutions to fund the Strategic Petroleum Reserve while it considered the Interior and Related Agencies Appropriations Act for fiscal year 2003. The 107<sup>th</sup> House of Representatives recommendation was \$176 million while the Senate's recommendation was \$175 million. The 107<sup>th</sup> Congress adjourned before reaching agreement on funding for the full 2003 fiscal year.

***Strategic Petroleum Reserve Plan and Amendments***

Title I of the Energy Act of 2000 amended EPCA to eliminate the requirement for a Strategic Petroleum Reserve Plan and plan amendment. However, the law requires the Secretary to submit a plan to Congress if the Secretary decides to expand the Strategic Petroleum Reserve beyond 700 million barrels.

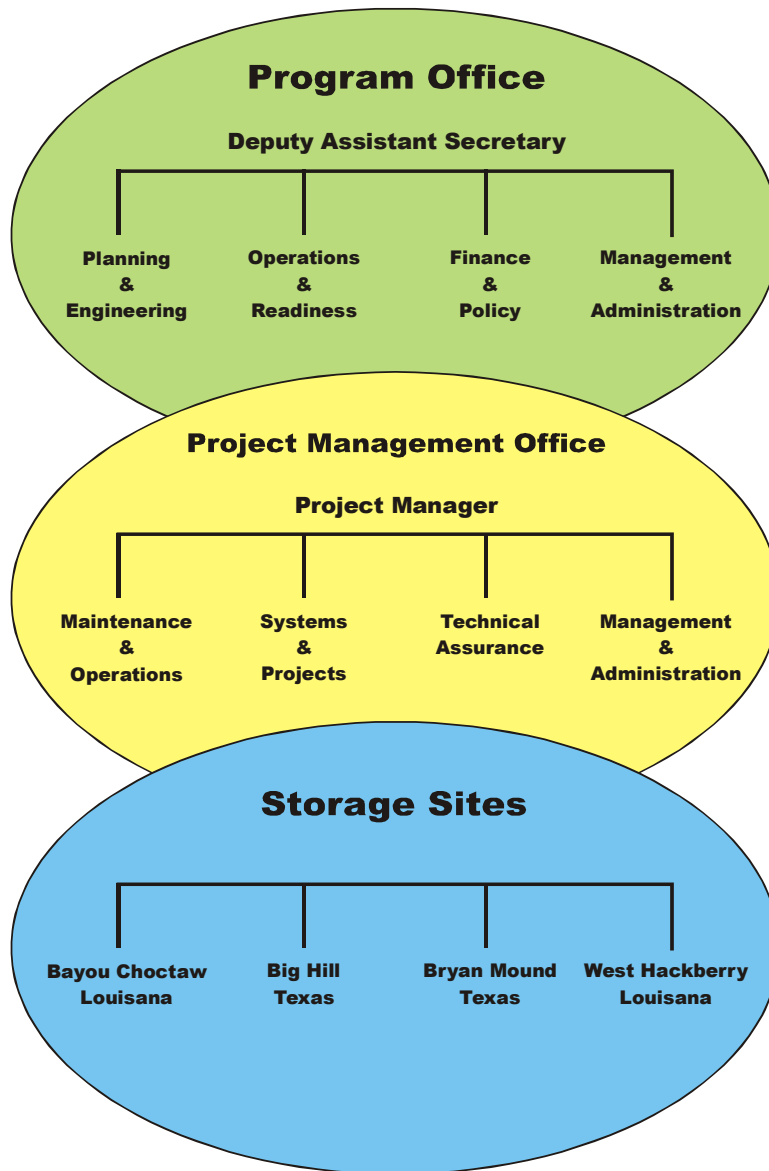


## PROGRAM MANAGEMENT

### Organization

The Assistant Secretary for the Office of Fossil Energy in Washington, D.C. has overall program responsibility for achieving the goals and objectives of the Strategic Petroleum Reserve. This responsibility is delegated to the Deputy Assistant Secretary for Petroleum Reserves,

and is exercised through the Strategic Petroleum Reserve Headquarters Office in Washington, D.C. and the Project Management Office in New Orleans, Louisiana. Total staffing is 128 Federal full time equivalent employees and 1,025 contractor employees.



### ***Contractual Support***

The Project Management Office is responsible for the design, development, operation and maintenance of the Strategic Petroleum Reserve and employs a Management and Operating (M&O) contractor, DynMcDermott Petroleum Operations Company, to provide management and manpower to operate and maintain the four Strategic Petroleum Reserve storage facilities and certain related pipeline systems. The initial five-year M&O contract was awarded on April 1, 1993, and was extended under an option for a second five-year period that began on April 1, 1998. (On January 15, 2003, DynMcDermott Petroleum Operations Company of New Orleans won the Energy Department's competition and will continue operating the Strategic Petroleum Reserve for at least the next five years.)

An Architect/Engineering (A&E) firm, S&B Infrastructure, Ltd., provides design services for the four storage facilities, under a two-year contract awarded on March 9, 2000, with three one-year renewal options. Geotechnical support is provided by Sandia National Laboratory.

Miscellaneous contractors in specific disciplines perform site modifications for major maintenance activities. Most of these contracts are fixed-price with terms of less than one year.

Several support services contracts exist for management, technical, and computer support. The largest support service contractor is Deltha-Critique which provides management and technical support services to the Project Management Office under a contract that commenced November 1, 2001. Other support services contractors are ICF Consulting Inc., PB-KBB Inc. and Cyborg Inc.

Electrical power is provided to the four storage facilities by local utilities, Reliant Energy and Entergy.

Three companies, Seaway Pipeline Inc., Sunoco Partners Marketing & Terminals, and Unocal Corporation, provide commercial terminalling services for fill, drawdown and storage of crude oil. The terms of these contracts are five years with three five-year options that could extend the contracts up to 20 years. Seaway is in its third and final option period; Sunoco is in its first five-year option; and Unocal is in its second five-year option period.

## **CRUDE OIL STORAGE PROGRAM**

### ***Storage Facilities and Capabilities***

Originally, the Strategic Petroleum Reserve developed four sites in Louisiana and two sites in Texas. Subsequently, two sites in Louisiana were decommissioned, the Sulphur Mines site in 1992, for cost savings, and the Weeks Island site in 1999, for geotechnical problems. The remaining sites are West Hackberry and Bayou Choctaw in Louisiana, and Bryan Mound and Big Hill in Texas. Their combined storage capacity is 700 million barrels.

The four storage sites are grouped into three geographical distribution systems on the Gulf Coast: Seaway, Texoma and Capline. Each system has access to one or more major refining centers, interstate crude oil pipelines, and marine terminals for crude oil distribution. The locations of the Strategic Petroleum Reserve storage sites, and their respective distribution systems, are shown in Figure 1.

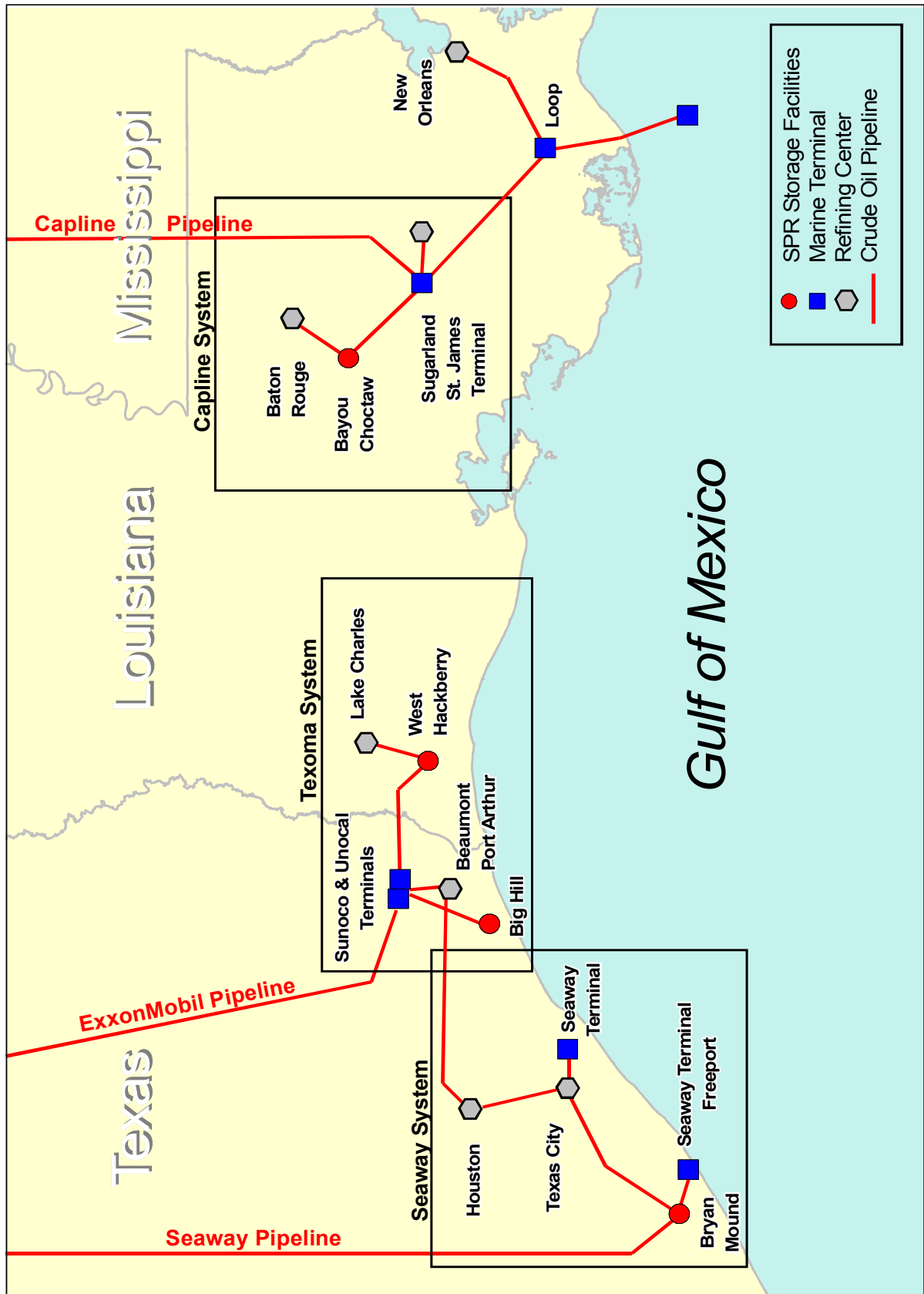
The current storage capacities and drawdown capabilities of the four Strategic Petroleum Reserve storage sites are summarized in Table 1.

**Table 1**  
**Storage Capacities and Drawdown Capabilities - (December 31, 2002)**

Storage Facility	Storage Capacity (MMB)	Crude Mix Sweet/Sour (MMB)	Drawdown Capability (MB/D)
Bryan Mound, Texas	232	75/157	1,500
West Hackberry, Louisiana	222	114/108	1,300
Big Hill, Texas	170	72/98	1,100
Bayou Choctaw, Louisiana	76	24/52	515
<b>Total</b>	700	285/415 40%/60%	4,415

Legend: MMB = Million Barrels; MB/D = Thousands Barrels Per Day

Figure 1  
Storage Sites and Distribution System



## ***Status of Storage Sites***

### **Bryan Mound**

The Bryan Mound storage facility in Brazoria County is approximately three miles southwest of Freeport, Texas. The site has 20 storage caverns, a combined storage capacity of 232 million barrels, and a cavern inventory of 226.6 million barrels. The site is available for both fill and drawdown operations.

In 2002, under major maintenance, electrical substation and control room upgrades have been completed; outdoor lighting controls, off site parking, and a new helipad have been installed; and entry portals and heat exchanger bundles have been upgraded. Contracts have been awarded and construction is ongoing to replace perimeter fences, install perimeter detection and lighting, and install site access control systems.

### **West Hackberry**

The West Hackberry storage facility in Cameron Parish is approximately 25 miles southwest of Lake Charles, Louisiana. The site has 22 storage caverns, a combined storage capacity of 222 million barrels and a cavern inventory of 186.4 million barrels. It is available for both fill and drawdown operations.

In 2002, under major maintenance, sections of the raw water and crude oil headers have been replaced, control room upgrades have been completed; outdoor lighting controls and off site parking have been installed; and entry portals and heat exchanger bundles have been upgraded. Contracts have been awarded and construction is ongoing to replace perimeter fences, install perimeter detection devices, lighting and site access control systems, as well as to upgrade site electrical grounding systems, electrical distribution systems at the spare parts warehouse, and add work platforms.

### **Bayou Choctaw**

The Bayou Choctaw storage facility in Iberville Parish is approximately 12 miles southwest of Baton Rouge, Louisiana. The site has six storage caverns, a combined storage capacity of 76 million barrels, and a cavern inventory of 75.3 million barrels. The site is currently available for both fill and drawdown operations.

In 2002, under major maintenance, control room upgrades have been completed; the strainer system for the brine recycle valve, perimeter detection, outdoor lighting controls, and off site parking have been installed; and entry portals and heat exchanger bundles have been upgraded. Contracts have been awarded and construction is ongoing to install perimeter lighting, upgrade site electrical grounding systems, and install site access control systems.

### **Big Hill**

The Big Hill storage facility in Jefferson County is 26 miles southwest of Beaumont, Texas. The site has 14 storage caverns, a combined storage capacity of 170 million barrels, and a cavern inventory of 109 million barrels. The site is currently available for both fill and drawdown operations.

In 2002, under major maintenance, control room and sewage treatment upgrades have been completed; outdoor lighting controls and off site parking have been installed; a 480V motor control center has been replaced, the switchgear at the emergency generator has been replaced, and entry portals and heat exchanger bundles have been upgraded. Contracts have been awarded and construction is ongoing to install perimeter lighting, upgrade site electrical grounding systems, install site access control systems, and add work platforms.

### ***Major Maintenance Program***

The Strategic Petroleum Reserve's Major Maintenance Program typically provides for site construction projects that are over \$100,000, to maintain the storage facilities and systems in an efficient operating condition. Examples are building maintenance, piping replacements, and road paving.

The Major Maintenance Program provides for upgrades and replacement of equipment, as necessary, to maintain system reliability.

### ***Operational Limitations and Issues***

#### **Long-term Vapor Pressure Mitigation**

Long-term storage of crude oil in underground solution-mined salt caverns results in elevated oil temperatures and increased crude vapor pressure due to gradual geothermal heating and methane gas intrusion from the salt formation. Consequently, when oil is drawn down, or removed from the caverns, increased vapor pressure results in gas being released in amounts that may be unacceptable, posing environmental, safety, and health risks.

An initial degasification program was conducted between 1995 and 1998. With support from Sandia National Laboratories, the Strategic Petroleum Reserve has maintained a comprehensive monitoring program to ascertain the level of gas regain and the need for future degasification. During 2000, the monitoring program revealed a much higher level of gas regains than anticipated, and the need for a long-term vapor pressure control. The most cost effective solution was determined to be the acquisition of a portable degasification plant, which could be moved from site to site, as needed.

Following a competitive solicitation, a contract was awarded to Petrofac LLC of Tyler, Texas, in November 2001, to provide a portable degas plant which will be operational in April 2004. The value of the contract is \$18,533,000. In addition to construction of the degas plant, additional funds in the amount of \$19,772,000 will be used to acquire measurement equipment, make changes to communications software, and construct site modifications. The total estimated cost for the acquisition of facilities to implement vapor pressure management is \$38,305,000. Initial operation of the plant will occur at Big Hill.

During 2002, Petrofac LLC completed the design for the plant and initiated construction. A contract to modify the Big Hill site and accommodate the new degas plant was awarded, and environmental permits were obtained to construct and operate the plant.

## ***PETROLEUM ACQUISITION AND SALES***

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### ***Crude Oil Inventory Status***

On December 31, 2002, the Strategic Petroleum Reserve's crude oil inventory was 599,090,601 barrels, an increase of 48.8 million barrels from calendar year 2001. The increase is due to the receipts from the royalty-in-kind oil transfer and deliveries under the time exchange.

The current mix of crude oil is 63 percent high sulfur (sour) and 37 percent low sulfur (sweet).

Table 2 lists year-end inventories and average daily fill rates from 1977 through 2002 (by fiscal and calendar year).

Table 3 lists crude oil receipts by country of origin since 1977.

Table 4 identifies the location of the inventory by storage site, and Figure 2 illustrates the cumulative oil fill.

**Table 2**  
**Year-End Inventories and Oil Fill History**

	FISCAL YEAR		CALENDAR YEAR	
	Year-End Inventory (MMB)	Average Daily Fill Rate* (MB/D)	Year-End Inventory (MMB)	Average Daily Fill Rate* (MB/D)
1977	1.1	3	7.2	20
1978	49.1	131	68.5	168
1979	91.2	115	91.7	64
1980	92.8	4	107.8	44
1981	199.2	292	230.3	336
1982	277.9	215	293.8	174
1983	361.0	228	379.1	234
1984	431.1	191	450.5	195
1985	489.3	159	493.3	119
1986	506.4	47	511.6	51
1987	533.9	75	540.6	80
1988	554.7	57	559.5	52
1989	577.1	62	579.9	56
1990	589.6	34	585.7	27
1991	568.5	(58)	568.5	(47)
1992	571.4	8	574.7	17
1993	585.7	39	587.1	34
1994	591.7	16	591.7	13
1995	591.7	**	591.6	**
1996	573.6	(49)	565.8	(70)
1997	563.4	(28)	563.4	(7)
1998	563.4	**	561.1	***
1999	564.9	4	567.0	16
2000	570.3	5	540.7	(72)****
2001	544.8	(70)****	550.2	26
2002	587.2	116	599.1	134

\* Fill rates adjusted for oil sales.  
 \*\* Fill suspended during this period

\*\*\* Decrease due to Maya exchange  
 \*\*\*\* Net decrease due to Exchange 2000



**Table 3**  
**Crude Oil Receipts through December 2002**  
**(Million Barrels)**

Source Country	2002	Cumulative	Percent of Total
Mexico		266.2	38.3
United Kingdom	30.4	185.1	26.6
United States*	7.6	60.0	8.6
Saudi Arabia	.2	28.3	4.1
Libya		23.8	3.4
Iran		20.0	2.9
United Arab Emirates		18.4	2.6
Nigeria	.5	16.3	2.3
Norway		11.9	1.7
Oman		9.0	1.3
Egypt		8.9	1.3
Ecuador		6.2	.9
Algeria		6.2	.9
Cameroon	3.6	7.0	1.0
Iraq		3.4	0.5
Gabon		2.4	0.3
Qatar		2.3	0.3
Columbia		1.2	0.2
Angola	.5	1.5	0.2
Venezuela	5.9	16.1	2.3
Peru		0.4	0.1
Argentina		0.4	0.1
Russia	.3	.3	0.0
<b>Total **</b>	<b>49.0</b>	<b>695.3</b>	<b>100.0</b>

\* Included receipts from offshore Gulf of Mexico.

\*\* Cumulative total receipts unadjusted for sales and operational gains and losses.

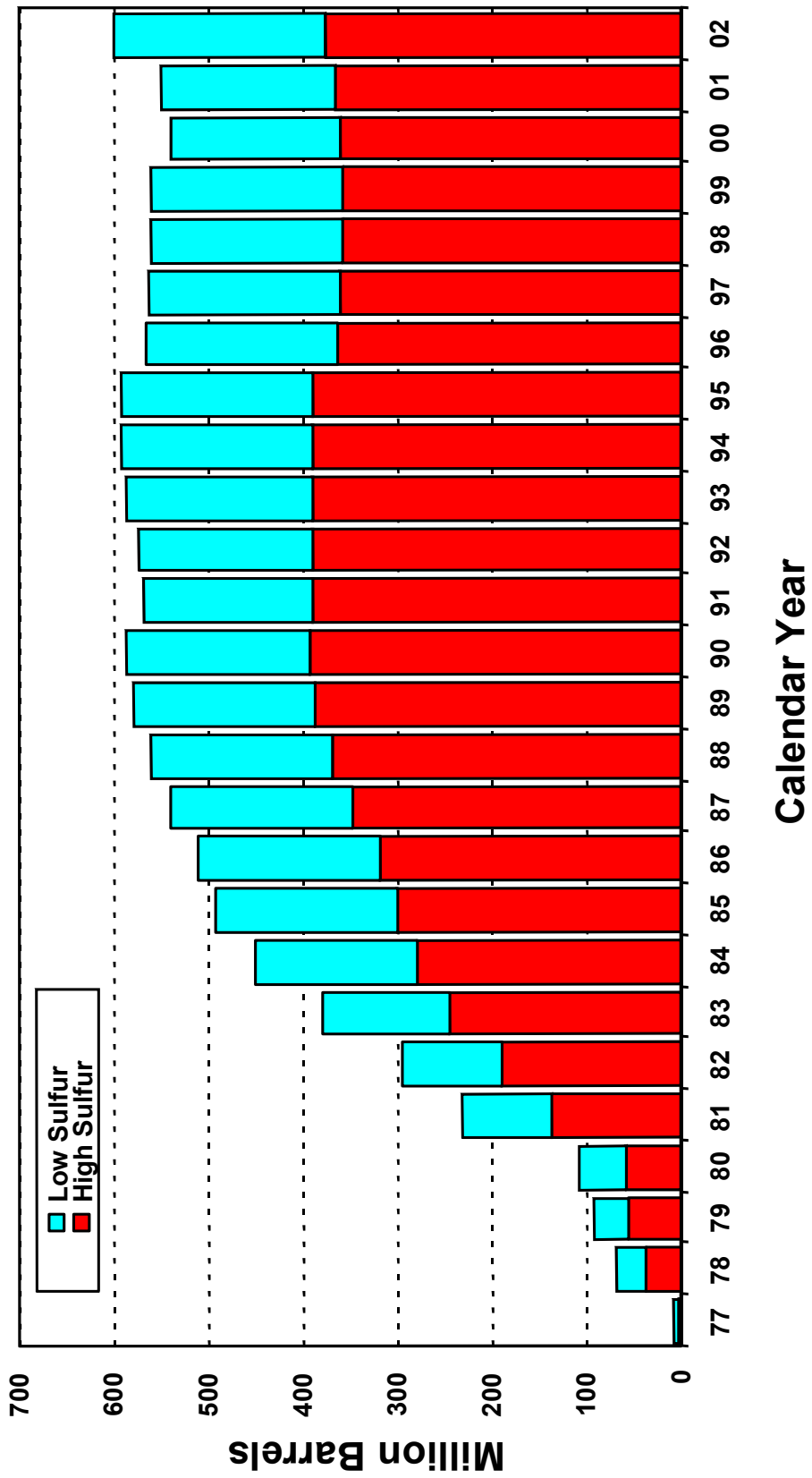
**Table 4**  
**Crude Oil Inventory as of December 2002**  
**(Million Barrels)**

Storage Site	Inventory			Cubic Meters (Millions)
	Sweet*	Sour**	Total	
Bryan Mound, Brazoria County, Texas	73.5	153.1	226.6	36.0
Big Hill, Jefferson County, Texas	32.5	76.4	109.0	17.3
West Hackberry, Cameron Parish, Louisiana	91.8	94.7	186.4	29.6
Bayou Choctaw, Iberville Parish, Louisiana	23.8	51.5	75.3	11.9
Subtotal Underground Inventory	221.6	375.7	597.3	94.8
Tanks and Pipelines	0.8	1.0	1.8	0.3
Total Inventory	222.4	376.7	599.1	95.1
Total Accounts Receivable	5.3	1.9	7.2	1.1
Total SPR Book Inventory	227.7	378.6	606.3	96.2

\* Sulfur content not exceeding 0.5 percent

\*\* Sulfur content greater than 0.5 percent

Figure 2  
Cumulative Oil Fill



### ***Royalty-in-Kind Crude Oil Transfer***

In February 1999, the Department of Energy and the Department of the Interior agreed to place up to 28 million barrels of royalty oil into the Strategic Petroleum Reserve. This oil would replace 28 million barrels sold in 1996-1997.

Under this plan, Federal land leaseholders in the Gulf of Mexico agreed to pay a portion of royalties (one-eighth to one-sixth of the oil produced) in crude oil (royalty-in-kind) instead of cash to the United States.

The Department of Energy contracted with commercial entities to receive the royalty oil at offshore production facilities and transfer it to the Strategic Petroleum Reserve, either directly or with other crude oil delivered in exchange. Since the transfer of the royalty oil involved contractor costs, paid in crude oil, for transportation to the storage sites, and considered the differences in quality of the royalty oil and the oil delivered, the total amount of oil delivered to the Strategic Petroleum Reserve was expected to be 26-27 million barrels.

As of December 31, 1999, contracts had been awarded to assure the transfer of the total 28 million barrels of royalty-in-kind oil. The last contracts awarded required the transfer of royalty oil through October 2000, and delivery of oil through November 2000. However, several deliveries of exchange oil were deferred into calendar years 2001, 2002, and 2003 to alleviate crowding at terminals, and to take advantage of favorable market conditions to swap oil for delivery of a greater number of barrels in the future. These delivery schedule revisions will result in a gain of 3.6 million barrels for the Strategic Petroleum Reserve under this initial royalty-in-kind transfer initiative.

As of December 31, 2002, the Strategic Petroleum Reserve had received 28.8 million barrels of exchange oil (10.4 million barrels in calendar year 2002). Delivery of 1.9 million barrels is scheduled for completion by the end of 2003, for a total of 30.7 million barrels.

On November 13, 2001, President George W. Bush announced his intent to fill the Strategic Petroleum Reserve to capacity. The Strategic Petroleum Reserve will be filled to a level of 700 million barrels through the resumption of the transfer of offshore royalty-in-kind oil from the Department of the Interior to the Department of Energy.

Under the Administration's initiative, the Department of the Interior issued two solicitations in 2002 for the delivery of offshore oil to designated "market centers." The "market centers" are located at Clovelly, St. James, Houma, and Empire, Louisiana. Under complementary Department of Energy solicitations, companies receive oil at these market centers and exchange it for oil that meets the specifications of the Strategic Petroleum Reserve. Under the first contracts awarded, the rate of transfer was 60,000 barrels per day beginning in April 2002. The transfer rate was increased by a second round of contracts to 100,000 barrels per day, beginning in October 2002, and continuing through April 2003. Deferrals negotiated late in 2002 will result in additional barrels being delivered to the Strategic Petroleum Reserve later in 2003.

Under the royalty-in-kind contracts awarded in 2002, 14.5 million barrels of approximately 27 million barrels were delivered to the Strategic Petroleum Reserve as of December 31, 2002.

Subsequent solicitations will be issued until the level of fill has reached 700 million barrels. The rate of transfer is expected to reach 130,000 barrels per day beginning in April 2003 until fill is completed.

### ***Crude Oil Time Exchange***

President Clinton directed the Secretary of Energy on September 22, 2000, to enter into time exchange agreements with oil companies for up to 30 million barrels of crude oil. Under the exchange agreements, companies were to return a like quantity, plus a bonus percentage of similar crude oil, in the fall of 2001.

The average bonus percentage from the initial awards was 4.5 percent, for a total of 31.2 million barrels of exchange oil to be returned to the Reserve. However, the market conditions favoring a deferral of deliveries under the royalty-in-kind exchange contracts also resulted in negotiation of deferrals for a significant portion of the time exchange oil until 2002 and 2003. Due to these delivery schedule revisions, the Reserve will receive an additional 3.7 million barrels, for a total of 34.9 million barrels to be returned under the time exchange.

As of December 31, 2002, the Strategic Petroleum Reserve had received 28.9 million barrels under the time exchange (24 million barrels in calendar year 2002). Delivery of the remaining 6.0 million barrels is scheduled for completion in 2003.

## ***EMERGENCY RESPONSE CAPABILITIES***

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### ***Drawdown and Distribution of Oil***

The method for drawdown and distribution of crude oil is price competitive sale, as required pursuant to Section 161 (e)(1) of the EPCA, Public Law 94-163, as amended. The sale is open to all eligible buyers to ensure an economic and efficient distribution.

### ***Competitive Sales Procedures***

The Department of Energy's Standard Sales Provisions\* prescribe the competitive sales process. The first step in the process is the issuance of a Notice of Sale identifying the volume, characteristics, and location of the petroleum for sale, delivery dates, and procedures for submitting offers. Measures required for assuring performance and financial responsibilities are also described in the Notice of Sale.

During a drawdown, several Notices of Sale may be issued, each covering a sales period of one to two months. Offerors may have only seven days from the date a Notice of Sale is issued until offers are due, with delivery of oil commencing no later than thirty days after the Presidential direction to draw down the Reserve. Subsequent sales periods will coordinate Notice of Sale issuance with standard industry delivery periods.

Because of the possible short initial lead-time, the Department maintains a list of prospective offerors who will receive all Notices of Sale and intends to make maximum use of electronic communication for Notice of Sale distribution.

The second step in the sales process is for prospective purchasers to submit offers, as specified in the Notice of Sale. Offerors must unconditionally accept all terms and conditions in the Notice of Sale, offer at least the minimum price, if any is specified in the Notice of Sale, and submit an offer guarantee of 5 percent of the maximum potential contract amount, or \$10 million, whichever is less. The offer evaluation process is structured so that the offerors bidding the highest prices determine the transportation methods, up to the limits of the distribution system. Specific delivery arrangements are negotiated later in the process.

Within five business days of being notified, all "apparently successful offerors" are required to provide a Letter of Credit equal to 100 percent of the contract amount as a guarantee of performance and payment of amounts due under the contract. Upon timely receipt of the financial guarantees, and a final determination by the Contracting Officer that offers are responsive and offerors responsible, Notices of Award are issued. Deliveries to the purchasers may then begin, consistent with their arrangements for commercial pipeline or marine vessel transportation. Such deliveries may begin as soon as 13 days after the President issues a finding directing a sale, provided the purchasers submit their financial guarantees and can arrange transportation.

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\*Department of Energy, 10 CFR Part 625, Price Competitive Sale of Strategic Petroleum Reserve Petroleum; Standard Sales Provisions.

**Drawdown Capabilities**

The crude oil acquired for the Strategic Petroleum Reserve is commingled in caverns at the storage sites, creating various distinct crude oil streams

available for sale during a drawdown. Table 5 identifies these crude oil streams, delivery modes, and locations, as of December 31, 2002.

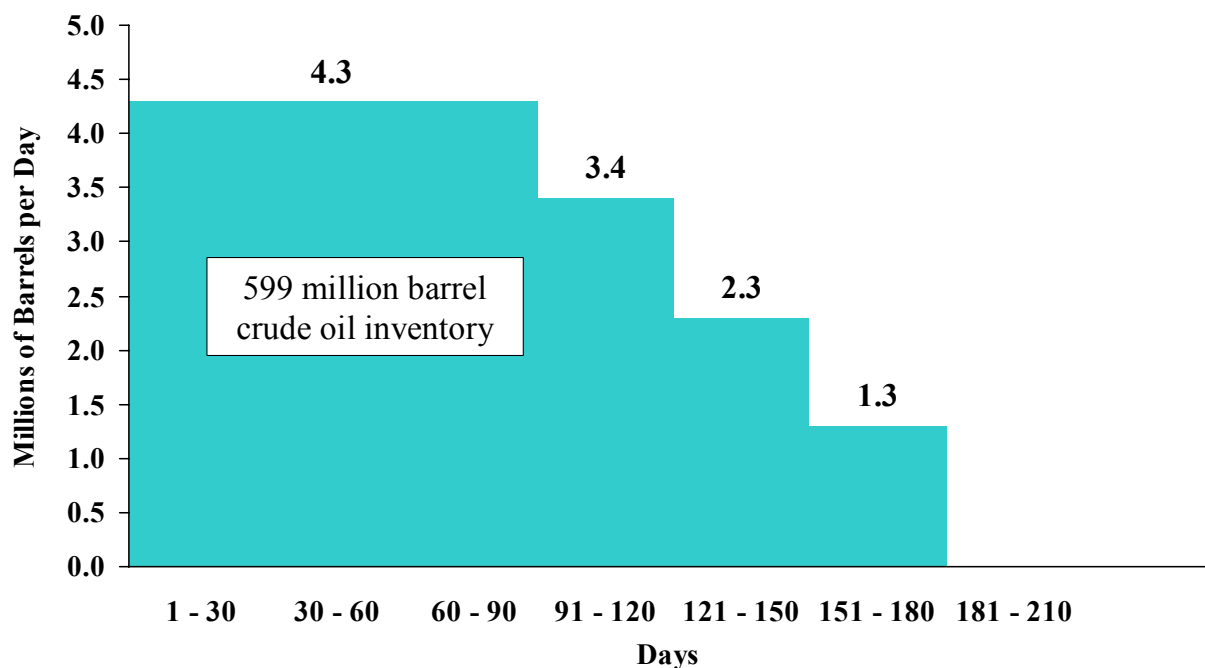
**Table 5  
Crude Oil Streams**

Crude Oil Stream	API Gravity	Sulfur Content	Delivery Mode and Location
<b>Seaway System</b>			
Bryan Mound Sweet	35.9	0.33	Pipeline or tankship at Seaway (TEPPCO) Terminal, Freeport, Texas; or Seaway (TEPPCO) Terminal, Texas City, Texas
Bryan Mound Sour	33.2	1.39	
<b>Texoma System</b>			
West Hackberry Sweet	37.3	0.32	Pipeline, tankship or barge at Sun Partners Marketing & Terminals LP, Nederland, Texas; Pipeline at Shell-22"/DOE connection, Lake Charles, Louisiana
West Hackberry Sour	33.5	1.41	
Big Hill Sweet	35.9	0.48	Pipeline, tankship or barge at Sun Partners Marketing & Terminals LP, Nederland, Texas; Pipeline or tankship at Unocal Terminal, Nederland, Texas; Pipeline at Shell-20"/DOE connection, Winnie, Texas
Big Hill Sour	30.7	1.41	
<b>Capline System</b>			
Bayou Choctaw Sweet	36.0	0.36	Pipeline at Capline or LOCAP Terminals, St. James, Louisiana; Tankship at Sugarland St. James Terminal, St. James, Louisiana 24-inch site connection to Red Stick Pipeline, Iberville Parish, Louisiana
Bayou Choctaw Sour	32.3	1.38	

The Strategic Petroleum Reserve can draw down crude oil at an initial sustainable rate of 4.3 million barrels per day, for a period of 90 days. After this period, the drawdown rate will gradually decrease as site inventories are depleted, and the declining number of caverns containing crude oil becomes a constraint. Figure 3 illustrates the physical drawdown capability, which provides for a maximum distribution of 385 million barrels in 90 days, and 595 million barrels in 180 days.

The current sustainable drawdown rate of 4.3 million barrels per day is an increase over 2001, due to additions to inventory during 2002. The initial sustainable drawdown capability will be 4.42 million barrels per day when the currently available capacity is filled.

**Figure 3**  
**Projected Maximum Drawdown Capability**  
**(As of December 31, 2002)**



Note: Rates after 90 days are based on cavern-use assumptions. Actual rates are contingent on the specific caverns drawn down during a previous drawdown period.



### ***Drawdown Readiness Activities***

Drawdown readiness assurance activities during 2002, included:

- In June 2002, conducting Mistrex I, an exercise to test and evaluate the procedures and execution of Block 12 (evaluation of offers and award of contracts) of the Drawdown Process.
- In December 2002, conducting Pride 3, an exercise to test the development of sales cycle variants and evaluation and approval of bids.
- Identifying training requirements for those positions directly related to drawdown and approving a significant number of courses developed in anticipation of the Eagle II exercise (simulated drawdown) scheduled for 2003.
- Reducing the number of days necessary to begin a drawdown from 15 to 13 days.
- Conducting periodic assessments of the readiness and availability of all functions, facilities, and systems associated with a drawdown.
- Successfully conducting a Recovery Program Exercise (RPX) at the West Hackberry storage facility involving the Emergency Pipeline Contractor (EPC).
- Successfully testing the Bayou Choctaw site's drawdown capability by performing a maximum rate sweet crude oil movement to the Sugarland St. James Terminal to safeguard the terminal's storage tanks during the Hurricane Lili emergency.

### ***Distribution Plan and Capabilities***

The Strategic Petroleum Reserve has the capability to distribute its crude oil to United States refineries by both pipeline and marine transportation in the event of an emergency. The Reserve is connected by commercial pipeline systems to over one-half of United States refining capacity, and is capable of delivering crude oil to 22 refineries in the Gulf Coast region, and 27 refineries in the mid-continent and midwest regions. The Strategic Petroleum Reserve is connected to all four major interstate pipeline systems serving the mid-continent and the midwest: Capline, Seaway, ExxonMobil and MidValley. These 49 refineries processed approximately 55 percent of United States crude oil imports during 2002.

The Strategic Petroleum Reserve is connected to five marine terminals with a combined distribution capacity of approximately 2.5 million barrels per day. These are: Seaway Terminal (TEPPCO/Phillips), Freeport, Texas; Seaway Terminal (TEPPCO/ARCO), Texas City, Texas; Sunoco and Unocal Terminals, Nederland, Texas; and Sugarland St. James Terminal, St. James, Louisiana.

Figure 4 illustrates the Strategic Petroleum Reserve's pipeline and marine distribution capabilities.

The current drawdown and distribution capabilities of the Strategic Petroleum Reserve are summarized in Table 6, and are based on current

crude oil stream inventories, existing site drawdown systems, and commercial distribution capabilities.

**Table 6**  
**Drawdown and Distribution Capabilities**  
**(Thousands of Barrels Per Day)**

	<b>Drawdown</b>	<b>Distribution</b>
Seaway System	1,500	2,228
Texoma System	2,400	3,122
Capline System	515	1,448
<b>Total</b>	<b>4,415</b>	<b>6,798</b>

### ***Distribution Assessment***

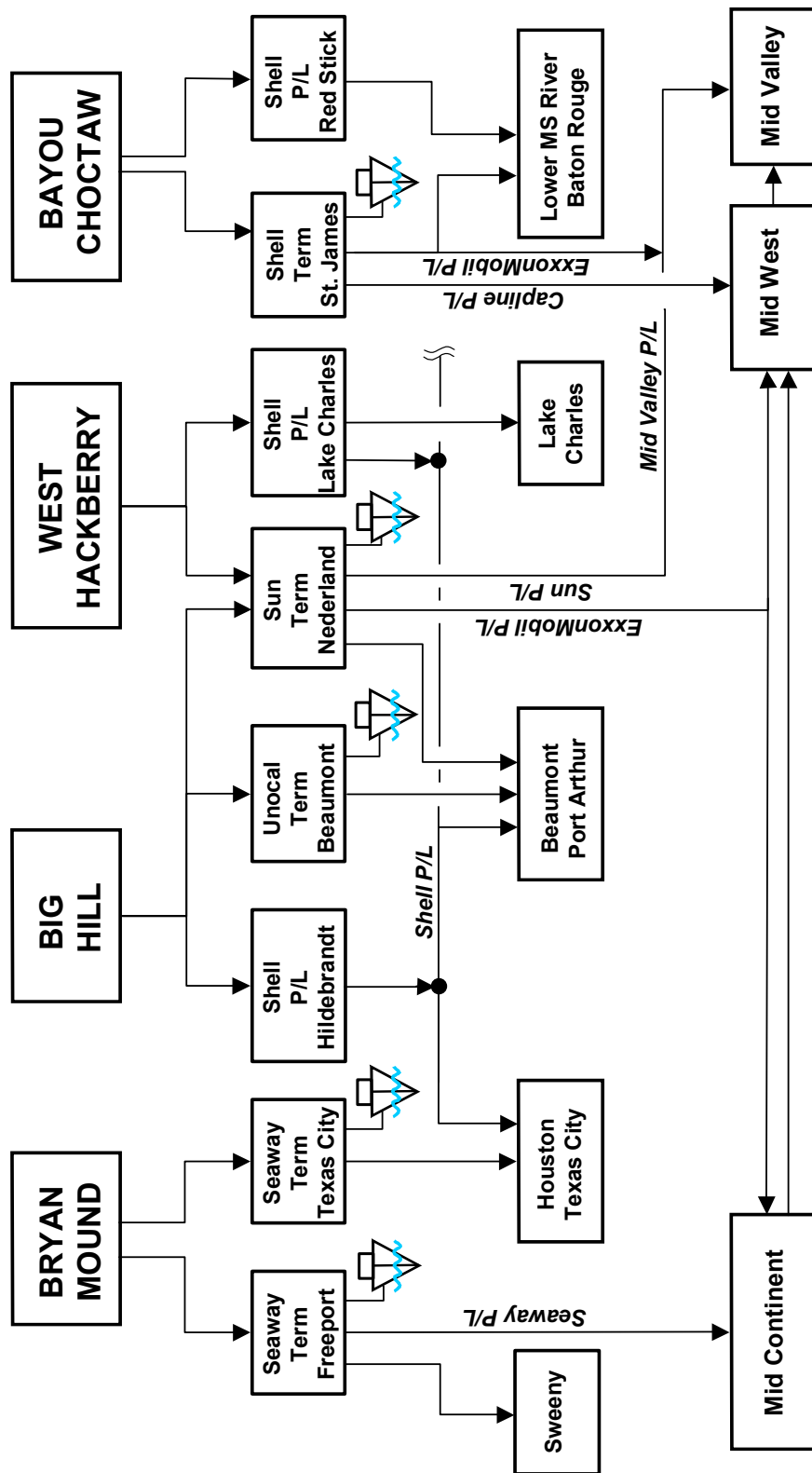
An annual assessment is conducted of the Strategic Petroleum Reserve's crude oil distribution system capabilities to ensure that there are adequate connections to the commercial distribution systems, and to identify the need for any remedial plans. The 2002 assessment evaluated the Strategic Petroleum Reserve's capability, at its maximum drawdown rate, to replace foreign oil in 2001, 2005, 2010, and 2015. Future U.S. petroleum refining demands are based on forecasts by the Energy Information Administration's *Annual Energy Outlook, 2002*.

The assessment took into account changes made to commercial pipeline distribution systems and modifications to their infrastructure. For example, the West Texas Gulf's 26-inch pipeline from Sun Terminal to Longview, Texas, was idled, limiting additional distribution of crude oil within the Texoma System. Canadian imports moved to Southern Illinois and the Petroleum Administration for Defense District III.

The Mustard Line delivers Canadian crude oil to Patoka, Illinois, a major distribution center for midwest refineries, and for the first time, the Jay Hawk Line delivers crude oil to Kansas.

Finally, the assessment confirms that the Strategic Petroleum Reserve has sufficient offsite distribution capabilities (defined as 120 percent of the maximum drawdown rate) to achieve current drawdown rates. The assessments for 2005, 2010 and 2015 predict that the Strategic Petroleum Reserve's distribution capability will continue to increase in the Seaway and Texoma systems as refinery imports increase, and distribution in the Capline system will decrease due to increasing domestic production from the Gulf, but not sufficient to cause the Reserve's performance to drop below the 120 percent requirement.

**Figure 4**  
**Pipeline and Marine Distribution Capabilities**

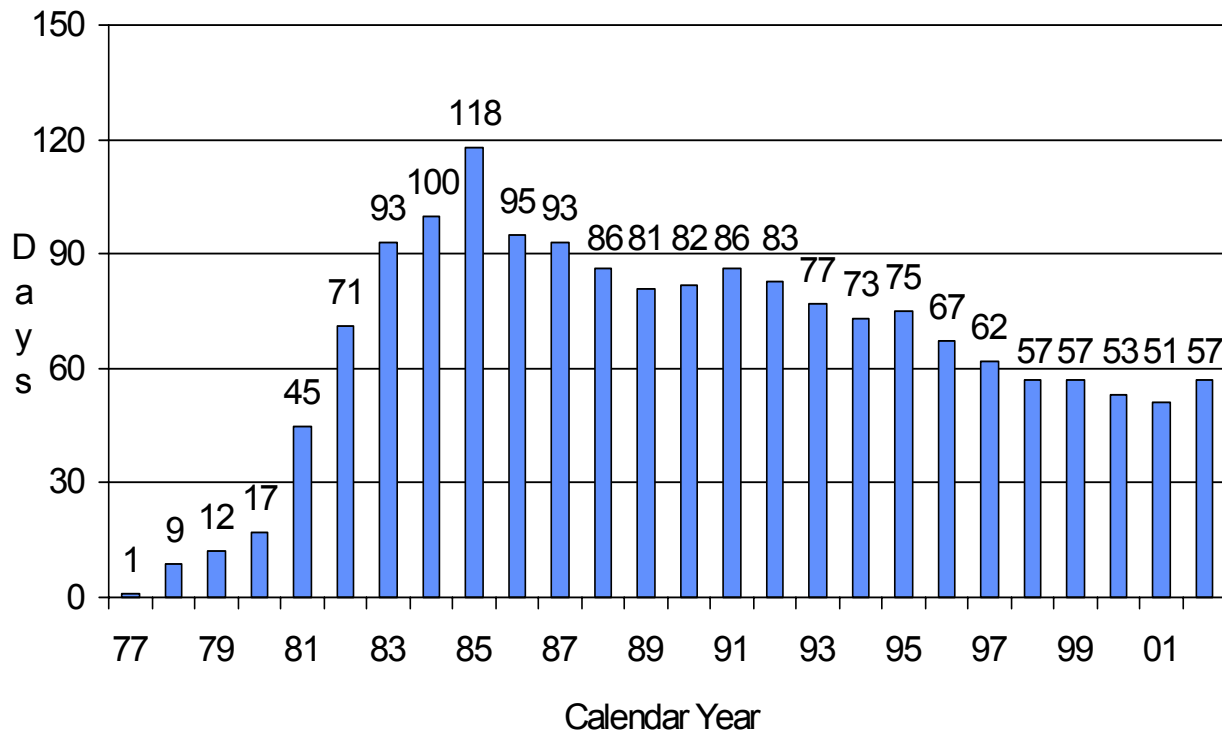


**Import Protection Levels**

In the Energy Policy and Conservation Act of 1975, the Congress established an initial storage objective of 90 days of net petroleum imports, which equated to 500 million barrels at that time. The inventory of 599.1 million barrels on December 31, 2002, was equivalent to 57 days of net petroleum imports of crude and refined products, (see Figure 5).

The inventory, in equivalent days of net petroleum imports, has been on a continual decline since 1985, principally as a result of increasing United States dependence on oil imports. In 2002, the United States dependence on foreign crude oil imports exceeded 61 percent of total U.S. crude oil consumption.

**Figure 5  
Days of Net Import Protection (1977-2002)\***

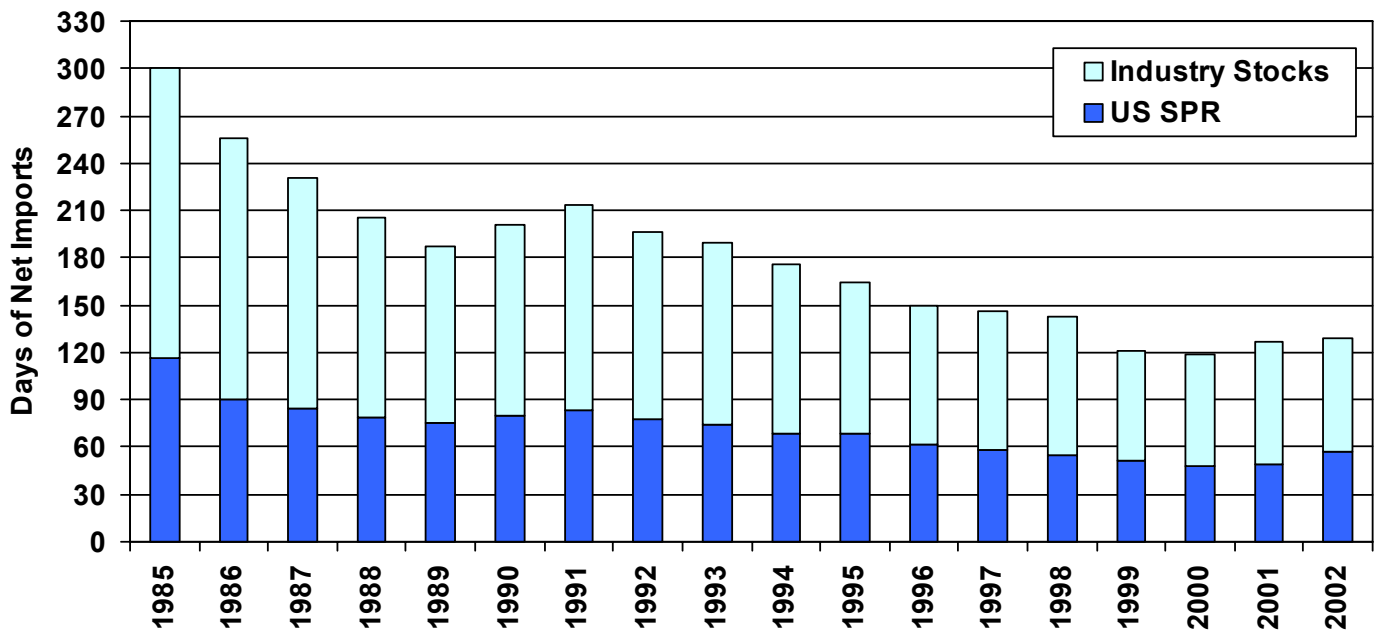


\* Days of Protection = Year End Inventory ÷ US Net Petroleum Imports/Day

As a member nation of the International Energy Agency, the United States is committed to maintaining stocks of crude and products in reserves equivalent to 90 days of net oil imports. Computations of member stockpile requirements are based on both public and privately held stocks, and net imports are defined as the average daily

level in the previous year. The most recent International Energy Agency computation credits the United States with 125 days of emergency reserves, based on both the Strategic Petroleum Reserve and privately held stocks. Figure 6 provides end-of-year computations for the United States through 2002.

**Figure 6**  
**International Energy Program**  
**U.S. Emergency Stocks**



## **COMMERCIALIZATION ACTIVITIES**

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### ***Commercial Leases***

Since 1995, the Strategic Petroleum Reserve has promoted the commercialization of its under-utilized crude oil distribution facilities to make the program more cost-effective, and has leased four crude oil pipelines and a marine terminal to private industry. The contracts for these leases require that the facilities be maintained in good condition and that, in the event of an emergency drawdown of oil, the leased facilities are returned on 15 days notice.

**Bayou Choctaw Pipeline:** Leased to Shell Pipeline Company LP on May 1, 1997, on a revenue-sharing basis. In 1998, the lease was converted from an annual lease to a ten-year lease. In 2002, lease revenues amounted to \$249,708.

**Bryan Mound Pipelines:** Two of the three Bryan Mound pipelines were leased to Exxon Pipeline Company on January 14, 1999. Exxon began using the pipelines in June 2000, as part of its onshore distribution system for the Diana-Hoover production in the Gulf of Mexico. In 2002, lease revenues amounted to \$1,468,613.

**St. James Terminal:** Leased to Shell Pipeline Corporation (now Equilon Enterprises LLC, dba Shell Oil Products US) on January 31, 1997, on a revenue-sharing basis. The contract is for one year with automatic renewals each year for a period of 19 years, unless either party gives notice of termination 90 days prior to the renewal date. In 2002, lease revenues amounted to \$1,285,183.

### ***Foreign Oil Storage***

The Strategic Petroleum Reserve promotes the concept of storing foreign oil in its unused storage space as a strategy to increase world oil stockpiling, generate revenues for the United States Treasury, and/or add oil to the Strategic Petroleum Reserve (in lieu of a fee). The Balanced Budget Act of 1997 (Public Law 105-33) provides specific authority to store petroleum products of another country, or its representatives, in the facilities of the Strategic Petroleum Reserve, provided that the United States is fully compensated for all related costs, and that the ability to draw down Strategic Petroleum Reserve oil is not impaired.

To enhance the Strategic Petroleum Reserve's offer to store oil for foreign governments or their representatives, the Big Hill storage site was activated as a special purpose Foreign Trade Zone subzone on September 28, 1998. This designation permits customers to store oil without paying customs fees and certain taxes. The Big Hill storage site is the only storage site to receive this designation.

The Strategic Petroleum Reserve did not pursue any commercial or foreign storage initiatives during 2002. In 1999, the Department of Energy resumed filling the Strategic Petroleum Reserve, primarily the Big Hill site, through its agreement with the Department of the Interior for Federal royalty oil, which continued through 2002. In addition, the world oil market was characterized by near term oil prices higher than the price for future delivery, so that there were no market incentives for commercial oil storage.

## **BUDGET AND FINANCE**

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The FY 2002 Interior and Related Agencies Appropriations Act (Public Law 107-63) included \$170.8 million for Strategic Petroleum Reserve facilities operations and management.

### ***Appropriations through Fiscal Year 2002***

A total amount of \$21.6 billion, net of sales and transfers, has been appropriated for the Strategic Petroleum Reserve through fiscal year 2002. Included in this total is the distribution of annual and total appropriations described in Table 7.

### ***Strategic Petroleum Reserve Account***

The Strategic Petroleum Reserve Account funds the development, operation, and maintenance of facilities; the salaries and expenses necessary to plan and manage the program, including the operation of the Project Management Office in New Orleans, Louisiana; and the activities pertinent to major issues concerning the development and use of the Strategic Petroleum Reserve.

Obligations for the Strategic Petroleum Reserve in fiscal year 2002 totaled approximately \$189.6 million. From this amount, \$14.8 million was obligated for Federal program management salaries and benefits, and \$174.8 million was obligated for contractual goods and services to operate and maintain the Strategic Petroleum Reserve.

### ***SPR Petroleum Account***

The SPR Petroleum Account funds the acquisition of oil for the Strategic Petroleum Reserve; the associated costs for transportation and terminaling; United States customs duties; Superfund and Oil Spill Liabilities Trust Fund taxes; and other miscellaneous costs, such as Defense Energy Support Center administrative costs associated with non-emergency sales (for example, the sale required by Public Law 104-99 to fund the decommissioning of Weeks Island), as well as oil acquisition and transportation support.

During an emergency drawdown and sale, the SPR Petroleum Account is the source of funding for the incremental costs of withdrawing oil from the storage caverns and transporting it to the point where purchasers take title. An amount equal to Federal receipts realized is deposited in the SPR Petroleum Account to create additional budget authority for filling the Reserve.

At the end of fiscal year 2002, approximately \$6.9 million remained available for obligation in the Account, an amount sufficient to finance approximately 7% of the incremental costs of a six-month emergency drawdown.

Obligations for the Petroleum Account in fiscal year 2002, totaled approximately \$2.4 million in support of the royalty-in-kind program.

The capitalized cost for the crude oil in the Strategic Petroleum Reserve at the end of fiscal year 2002 was \$15.7 billion, for an average cost per barrel of approximately \$26.71.

**Table 7**  
**Annual Appropriations for Storage Facilities Operations and Management and Petroleum Acquisition and Transportation (Thousands) (Data as of December 31, 2002)**

Fiscal Year	Oil Account	Facilities	Management		Total	Defense SPR
1976	0	300,000	13,975		313,975	
1977	440,000	0	7,824		447,824	
1978	2,703,469	463,933	14,704		3,182,106	
Total 1979 Appropriations*	2,356,456	632,504	18,111		3,007,071	
Total 1980 Appropriations*	(2,022,272)	0	22,272		(2,000,000)	
Total 1981 Appropriations*	3,205,094	108,168	19,391		3,332,653	
Total 1982 Appropriations*	3,679,700	175,656	20,076		3,875,432	
1983	2,074,060	222,528	19,590		2,316,178	
1984	650,000	142,357	16,413		808,770	
1985	2,049,550	441,300	17,890		2,508,740	
Total 1986*	(12,964)	106,979	13,518		107,533	
1987	0	134,021	13,412		147,433	
1988	438,744	151,886	12,276		602,906	
1989	242,000	160,021	13,400		415,421	
1990	371,916	179,530	12,953		564,399	
1991	566,318	187,728	12,846		766,892	
1992	88,413	171,678	13,384		273,475	
1993	(125,625)	161,940	14,227		50,542	
DOD Transfer (non add)	124,925	700	0		125,625	125,625
1994	0	191,035	15,775		206,810	
1995	(107,764)	226,938	16,780		135,954	
1996 transfer from SPR Petroleum Account	(187,000)	170,173	16,827		0	
1996 Weeks Is. Oil Sale	(97,114)	97,114	0			
1996 deficit reduction oil sale	(227,000)	0			(227,000)	
1996 Total	(511,114)	267,287	16,827		(227,000)	
1997 Total*	(220,000)	193,000	16,000		(11,000)	
1998	0	191,500	16,000		207,500	
1999	0	145,120	14,805		159,925	
2000	0	144,000	15,000		159,000	
2001	0	140,672	15,965		156,637	
2002	0	154,009	16,871		170,880	

\* Includes reprogramming and rescission actions.

Note: Fiscal year 1991 SPR Petroleum Account of \$566,318 includes proceeds of \$122,681 from the Test Sale recorded as additional budget authority, rather than reductions to obligations, costs, and outlays. It also includes \$315,424,985 in Desert Storm Drawdown proceeds from January 1991, and \$19,755,064 from fiscal year 1991 NPR excess receipts. Thus, the cumulative budget authority is "gross" and not related directly to the inventory of oil on hand.



***Commercialization Revenues***

During calendar year 2002, the Strategic Petroleum Reserve received \$3,003,504 in revenues from the commercial leases of its distribution facilities and pipelines, \$1,440,529 of which was paid in crude oil equivalent.

**Table 8**  
**Summary of Commercialization Revenues**  
**(December 31, 2002)**

Calendar Year	Bryan Mound Pipeline	Big Hill Pipeline	Bayou Choctaw Pipeline	St. James Terminal Lease	Total Revenue Generated
1996	102,606	472,809			575,415
1997		429,824	0	133,300	563,124
1998	12,500	402,525	0	481,010	896,035
1999	679,393	400,000	163,030	546,125	1,788,548
2000	652,146	493,359	217,573	748,986	2,112,064
2001	1,054,297	33,104	212,738	1,227,021	2,527,160
2002	1,468,613	0	249,708	1,285,183	3,003,504

## Performance Measurement

The mandates of the Government Performance and Results Act of 1993 are incorporated into the Strategic Petroleum Reserve's performance management system. Out of a total of 23 performance targets, 23 measures met or exceeded their target goals.

Details of program goals, objectives, and progress are contained in the Strategic Petroleum Reserve's *Annual Performance Report* submitted to the DOE Office of Program Analysis and Evaluation.

Performance Measure	FY 2001 Actual Performance	FY 2002 Target Output	FY 2002 Actual Performance
<b>Public Confidence: Oil Inventory, Drawdown Readiness and Distribution</b>			
Number of Barrels of Crude Oil Inventory in Storage	545 MMB	587 MMB	587 MMB
90-Day Sustainable Drawdown Rate	4.2 MMB/Day	4.14 MMB/Day	4.27 MMB/Day
Number of Days to Commence Crude Oil Drawdown	N/A	13 Days	13 Days
Distribution Capability as a Percentage of Drawdown Rate	159%	≥ 120%	154%
Calculated Site Availability	98%	≥ 95%	98%
Calculated MPAR Rating	98%	≥ 95% of possible points	98%
Percent of Site Security Ratings that are Satisfactory	100%	100%	100%
Number of Barrels of Heating Oil Inventory in Storage	2.0 MMB	2.0 MMB	2.0 MMB
Number of Days to Complete Heating Oil Drawdown	N/A	12 Days	12 Days
<b>Excellent Customer Service: Customer Relations</b>			
Customer Satisfaction Survey Ratings	N/A	≥ 3.5 Points	3.75 Points
Number of New Customer/Stakeholder Outreach Activities	N/A	1	3
<b>Responsible Stewardship: Operational Effectiveness, Efficiency and Knowledge Management</b>			
Identify Business Processes for Reengineering	N/A	3/31/02	3/29/02
<b>Responsible Stewardship: Fiscal Responsibility and Budgetary Control</b>			
Operating Cost per Barrel of Storage Capacity	\$ 0.2028	\$ 0.2058	\$ 0.1981
Fiscal Year Cost Savings	N/A	\$ 2.5 Million	\$ 8.4 Million
<b>Dynamic Teamwork: Continuous Improvement</b>			
Annual ISO 9001 Certification	N/A	3/31/02	3/1/02
<b>Partnerships</b>			
Evaluate Contractor Performance per Schedule	N/A	Semiannually	Completed
<b>Social Responsibility and Citizenship: Local Community Support</b>			
Number of New Public Outreach Activities	N/A	1	3

Performance Measure	FY 2001 Actual Performance	FY 2002 Target Output	FY 2002 Actual Performance
<b>Social Responsibility and Citizenship: Environment, Safety and Health</b>			
Annual Evaluation of OSHA VPP Star Status at Four Sites	N/A	2/15/02	2/14/02
Number of Cited Environmental Violations Received	N/A	0	0
Number of Days with No Reportable/Recordable Spills	338	≥ 355 Days	364 Days
Annual ISO 14001 Certification	N/A	5/31/02	4/11/02
<b>Employee Development and Diversity: Employee Development and Quality of Worklife</b>			
Complete Human Resources Plan	N/A	6/30/02	6/28/02
Update Succession Plan	N/A	9/30/02	9/30/02

## ***OTHER ACTIVITIES***

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### ***Security***

The Strategic Petroleum Reserve implemented a higher security alert immediately following the terrorist attacks in New York, Washington and Pennsylvania, on September 11, 2001, and remained at that level through 2002.

Additional security protection officers have been placed on duty at all sites and a series of 40 security measures have been implemented, as directed by the Office of Security Operations at Department of Energy Headquarters.

Dogs trained in explosives detection are being used and all parking is now off site. Suspicious activities result in an immediate response. In addition, permanent physical security enhancements were implemented in response to the perceived threat of continued terrorist activity. Security enhancements will continue in 2003.

Pinkerton Government Services, a private company, provides protection services under a subcontract with DynMcDermott Petroleum Operations Company. The Project Management Office in New Orleans and the four storage sites are protected by protection force officers.

This protective force engages in training exercises with Federal, state and local law enforcement agencies to maintain its readiness to respond to incidents.

### ***Environment, Safety, and Health***

The Strategic Petroleum Reserve received external verification for the quality of its Environmental, Safety, and Health management systems, when it demonstrated compliance with nationally and internationally recognized benchmarking standards in the following systems:

- The International Organization for Standardization (ISO) 14001.
  
- The voluntary protection programs of the Occupational, Safety and Health Administration and the Department of Energy.

In 2002, work began to complete a gap analysis in the Occupational, Safety and Health Administration's internationally recognized safety management system, 18001. The Strategic Petroleum Reserve may seek certification in 2003.

### ***ISO 14001 Environmental Management System***

In May 2000, the Strategic Petroleum Reserve became the first bulk petroleum storage organization in the United States, public or private, to receive ISO 14001 certification for its environmental management system. This certification continued through 2002.

The ISO 14001 Registrar (the certifying agency) performed two separate surveillance audits including all of the facilities. A successful outcome resulted in continuation of the ISO 14001 certification at all locations.

In 2002, all three Louisiana sites received the Louisiana Environmental Management Award, Excellence Category, from the Louisiana Quality Foundation for the Strategic Petroleum Reserve's environmental management system.

### ***Voluntary Protection Programs***

In 2002, the Strategic Petroleum Reserve sites received a *Star Among Stars* award under the voluntary protection programs of the Occupational, Safety, and Health Administration and the Department of Energy. The Strategic Petroleum Reserve is the only organization in the Department of Energy to achieve this status. Under this program, all four sites enjoy *Star* status and can fly flags at each organization. These awards recognize sites that have accident rates significantly below those required to earn voluntary protection program status.

The Occupational, Safety and Health Administration's voluntary protection program requires a commitment from management and employees to an excellent safety and health program. OSHA approval recognizes their outstanding efforts to establish cooperative relationships in the workplace.

### ***Zero Accidents at Big Hill***

In 2002, Big Hill became the first Strategic Petroleum Reserve site to work more than 1,050 days without recording an accident. Senior management sponsored a recognition luncheon and awards. Big Hill's zero accident rate will earn it a *Star of Excellence* award from OSHA for the second time in 2002.

### ***Emergency Management and Fire Protection***

The Strategic Petroleum Reserve's Emergency Management Group provides the resources required to respond to emergency situations at the sites involving fire, hazardous material spills, and personal injuries. The Emergency Management Group coordinates with Federal, state and local response agencies, as well as response elements from private entities to ensure emergency response proficiency.

In 2002, senior management attended the Environmental Protection Agency's Region 6, Regional Response Team Spill of National Significance (SONS) exercise in New Orleans. This exercise brought together senior government and industry officials, who, over a three-day period, worked through the resolution of three nearly simultaneous oil spill incidents in the Gulf of Mexico region. Issues that could not be resolved locally were elevated to agency headquarters for resolution. Additionally, senior management continued to attend RRT Region VI meetings in order to interface with their counterparts at other Federal and state agencies in the region.

The Emergency Response Teams from each of the four storage sites participated in firefighting training and the Occupational, Safety, and Health Administration's hazardous waste operations and emergency response refresher training, held at the Texas A&M facility in College Station, Texas. Each site conducted a successful National Preparedness for Response Exercise Program (PREP) drill, and demonstrated response proficiency. The West Hackberry team participated in a Headquarters-sponsored no-notice exercise, and the performance results led to improvements in the public information section of the emergency response plans.

### ***Pollution Prevention***

The Strategic Petroleum Reserve continued to improve its pollution prevention performance, particularly in hazardous waste generation. In 2002, the Strategic Petroleum Reserve generated 717 pounds of hazardous waste. Of the 717 pounds of hazardous waste, the majority (55 percent) was lab wastes containing solvents and oils. Overall, hazardous waste generation was reduced by 58 percent in 2002, compared to 2001.

The Strategic Petroleum Reserve won the Department of Energy's Pollution Prevention Award, recognizing outstanding performance in pollution prevention, affirmative procurement and recycling. A paint waste and paint-related waste minimization project won first place in the category Waste/Pollution Prevention. The project was submitted to the Closing the Circle Awards program, sponsored by the White House.

### ***Real Estate Actions***

In connection with the Strategic Petroleum Reserve security enhancements, Dyn McDermott acquired, on behalf of DOE, a temporary overhead easement on March 6, 2002, for air rights that hang over property adjacent to the DOE warehouse. The easement was acquired for very nominal consideration.

The Department of Energy executed a one-year lease on March 13, 2002 to acquire temporary office space for the Source Evaluation Board for the Maintenance and Operations Contractor Solicitation. The consideration for this lease was \$21,275.

Dyn McDermott, on behalf of DOE, acquired a 20-year lease on February 1, 2002, for the new Bayou Choctaw off-site parking lot at a nominal consideration.

The Strategic Petroleum Reserve provided real estate support to the Naval Petroleum Reserve throughout fiscal year 2002. Some of the support included reviewing and commenting on, and approving an agricultural lease, land transfer documents to the Bureau of Land Management, lease modifications to their office space lease and water/utility easements.

In fiscal year 2002, Dyn McDermott issued consents to the following companies, granting them the use of DOE property:

Sunoco for a nitrogen pipeline across Big Hill, and a gasoline pipeline at West Hackberry;

Gulf Road Development for ditch construction in connection with a pipeline installation at Bryan Mound;

Sun Oil for a replacement pipeline at West Hackberry; and

Buckeye Pipeline LP, for a butadiene pipeline across the West Hackberry and Big Hill sites.

On November 26, 2002, the Strategic Petroleum Reserve exercised its final 5-year options on its New Orleans leased office space.

### ***ISO 9001 Quality Management System***

In February 2001, the Strategic Petroleum Reserve received ISO 9001-1994 certification for its quality management system. This certification had been previously achieved for only one other Department of Energy site.

In December 2002, the Strategic Petroleum Reserve received ISO 9001-2000 certification for its quality management system.

### ***Awards***

All four Strategic Petroleum Reserve sites received *Star Among Stars* awards under the Occupational, Safety and Health Administration's voluntary protection program. Big Hill won a *Star of Excellence* award; Bayou Choctaw, Bryan Mound and West Hackberry, received *Superstar* awards.

To be eligible for a *Star Among Stars*, a site must have a total recordable case rate and lost workday case rate of 50% or more, below the average for their Standard Industrial Classification Code. *Superstar* eligibility requires that rates be 75% or more, below the average.

The *Star of Excellence*, which represents the highest award level, requires that sites be at 90% or more, below the Standard Industrial Classification Code average.

## **APPENDIX A**

### **Strategic Petroleum Reserve Site Information**

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#### ***Bryan Mound***

##### **Location**

Brazoria County, Texas (3 miles southwest of Freeport, Texas).

##### **Site Description**

232-million-barrel storage facility consisting of 20 caverns.

24-inch diameter, 6-mile brine disposal pipeline extending 4 miles offshore in the Gulf of Mexico.

Oil, brine and raw water piping distribution system connecting caverns with central plant and water intake structure located on Brazos River. Twenty-one (21) pumps totaling approximately 46,700 horsepower.

##### **System Parameters**

Drawdown Rate:	1,500,000 bbl/d
Raw Water Pumping Rate:	1,545,000 bbl/d
Oil Fill Rate:	225,000 bbl/d
Brine Disposal Rate:	260,000 bbl/d

##### **Distribution Facilities**

DOE 3.9 mile, 30-inch pipeline to Seaway Freeport Marine Terminal, DOE 4.0 mile, 30-inch pipeline to Seaway Jones Creek Tank Farm and Pipeline and DOE 46 mile, 40-inch pipeline to Seaway Texas City Terminal and Docks.

##### **Acquisition**

Acquired 499.47 acres fee simple, by condemnation April 1977, from Freeport Mineral Company and other owners. Dow Chemical Company was the previous operator.

#### ***West Hackberry***

##### **Location**

Cameron Parish, Louisiana (25 miles southwest of Lake Charles, Louisiana).

##### **Site Description**

222-million-barrel storage facility consisting of 22 caverns.

Oil, brine, and raw water piping distribution system connecting caverns with central plant, water intake structure located on Intra-coastal waterway and 9-brine disposal wells. Thirty-three (33) pumps totaling over 41,680 horsepower.

##### **System Parameters**

Drawdown rate:	1,300,000 bbl/d
Raw Water Pumping Rate:	1,632,000 bbl/d
Oil Fill Rate:	225,000 bbl/d
Brine Disposal Rate:	225,000 bbl/d

##### **Distribution Facilities**

DOE 42.8 mile, 42-inch pipeline to Sunoco Nederland Terminal.  
DOE 13.6 mile, 36-inch pipeline to Equilon common carrier pipeline system at Carlyss.

##### **Acquisition**

Acquired 405.36 acres fee simple by condemnation, April 1977, from numerous private landowners. Olin Corporation was the previous site operator. Acquired 160.0 additional acres fee simple by condemnation in two actions, July 1979 and March 1980.



## **Big Hill**

### **Location**

Jefferson County, Texas (26 miles southwest of Beaumont, Texas).

### **Site Description**

170-million-barrel storage facility consisting of 14 caverns.

Oil, brine, and raw water systems connecting caverns with central plant, water intake structure located on the Intracoastal Waterway, and a 48-inch diameter, 14-mile brine disposal pipeline extending 4 miles offshore in the Gulf of Mexico. Forty-eight (48) pumps totaling 46,000 horsepower.

### **System Parameters**

Drawdown Rate:	1,100,000 bbl/d
Raw Water Pumping Rate:	1,400,000 bbl/d
Oil Fill Rate:	225,000 bbl/d
Brine Disposal Rate:	432,000 bbl/d

### **Distribution Facilities**

DOE 24.5 mile, 36-inch pipeline to Sunoco Nederland Terminal  
Unocal 2 mile, 24-inch pipeline to Unocal Docks  
Equilon 20-inch pipeline system to East Houston.

### **Acquisition**

Acquired 271 acres fee simple, by condemnation November 1982 and July 1983, from three landowners, i.e., 238.48 acres from Amoco, 27.06 acres from the Pipkin estate, and 5.46 acres from the Patrick Henry Phelan estate.

## **Bayou Choctaw**

### **Location**

Iberville Parish, Louisiana (12 miles southwest of Baton Rouge, Louisiana).

### **Site Description**

76-million-barrel storage facility consisting of 6 caverns.

Oil, brine, and raw water piping distribution system connecting caverns with central plant, a water intake structure, 12 brine disposal wells, and a pipeline for disposing of brine to Union Texas Petroleum, Inc. Eighteen (18) pumps totaling over 18,000 horsepower.

### **System Parameters**

Drawdown Rate:	515,000 bbl/d (sour) 300,000 bbl/d (sweet)
Raw Water Pumping Rate:	515,000 bbl/d
Oil Fill Rate:	110,000 bbl/d
Brine Disposal Rate:	110,000 bbl/d

### **Distribution Facilities**

DOE-owned 37.2 mile, 36-inch pipeline to Equilon's Sugarland Terminal and Capline Pipeline. Equilon-owned 16 mile, 24 inch pipeline to Baton Rouge.

### **Acquisition**

Acquired 355.95 acres fee simple, by condemnation April 1977, from numerous private owners. Union Texas Petroleum (a subsidiary of Allied Corporation) was the previous operator.

In 1985, the Department of Energy acquired an additional existing cavern through a cavern exchange agreement with Union Texas Petroleum. The transaction involved a 3.5-acre exchange with no net change in Government-owned acreage.

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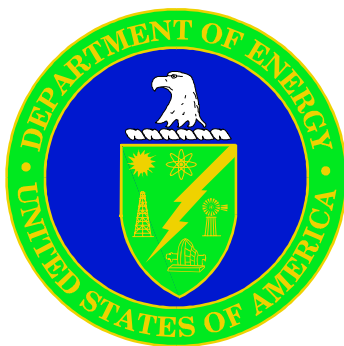
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# Strategic Petroleum Reserve

## Annual Report for Calendar Year 2003

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**U.S. Department of Energy**  
**Assistant Secretary for Fossil Energy**  
**Office of Strategic Petroleum Reserve**  
**Washington, D.C. 20585**

### *Official Use Only*

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## **TABLE OF CONTENTS**

---

### **EXECUTIVE SUMMARY**

Strategic Petroleum Reserve Status .....	1
Oil Acquisitions and Exchanges .....	1
Storage Capacity .....	1
Commercialization Activities .....	1
Eagle II .....	1
Security .....	1
Awards .....	2
Voluntary Protection Programs .....	2

### **PROGRAM MISSION**

Introduction .....	3
Legislative History.....	3
Strategic Petroleum Reserve Plan and Amendments .....	6

### **PROGRAM MANAGEMENT**

Organization .....	7
Contractual Support .....	8

### **CRUDE OIL STORAGE PROGRAM**

Storage Facilities Capacity and Drawdown Capability.....	9
Major Maintenance Program .....	11
Status of Storage Sites .....	11
Operational Limitations and Issues .....	12

### **PETROLEUM ACQUISITION AND SALES**

Crude Oil Inventory Status .....	13
Royalty-in-Kind Crude Oil Transfer .....	18
Crude Oil Time Exchange Agreements.....	19

### **EMERGENCY RESPONSE CAPABILITIES**

Sale of Oil .....	20
Competitive Sales Procedures .....	20
Drawdown Capabilities .....	21
Drawdown Readiness Activities .....	23
Distribution Plan and Capabilities .....	23
Distribution Assessment .....	24
Import Protection Levels .....	26

### **COMMERCIALIZATION ACTIVITIES**

Commercial Leases .....	28
Foreign Oil Storage .....	28

**BUDGET AND FINANCE**

Appropriations through Fiscal Year 2003 .....	29
Strategic Petroleum Reserve Account .....	29
SPR Petroleum Account .....	29
Commercialization Revenues .....	31
Performance Measurement .....	32

**OTHER ACTIVITIES**

Security and Emergency Operations.....	34
Environment, Safety, and Health .....	34
Integration of ISO 14001 into the Environmental Management System .....	35
Environmental Performance Track Program .....	35
Pollution Prevention .....	35
ISO 9001 Quality Management System .....	36
Louisiana Quality Foundation .....	36
New Orleans Federal Performance Excellence Network .....	36
Performance Excellence Conference .....	36
Customer Outreach Day.....	36
Voluntary Protection Programs .....	36
Louisiana Performance Excellence Award .....	37
Real Estate Actions .....	37

**APPENDIX A Strategic Petroleum Reserve Site Information**

Bryan Mound .....	39
West Hackberry .....	39
Big Hill .....	40
Bayou Choctaw .....	40

**LIST OF FIGURES**

Figure 1. Storage Sites and Distribution System .....	10
Figure 2. Cumulative Oil Fill .....	17
Figure 3. Projected Maximum Drawdown Capability .....	22
Figure 4. Pipeline and Marine Distribution Capabilities .....	25
Figure 5. Days of Net Import Protection (1977-2003).....	26
Figure 6. International Energy Program U.S. Emergency Stocks .....	27

**LIST OF TABLES**

Table 1. SPR Storage Capacity and Drawdown Capability .....	9
Table 2. Year-End Inventories and Oil Fill History .....	14
Table 3. Crude Oil Receipts through December 2003 .....	15
Table 4. Crude Oil Inventory as of December 31, 2003 .....	16
Table 5. Crude Oil Streams.....	21
Table 6. Drawdown and Distribution Capabilities .....	24
Table 7. Annual Appropriations for Storage Facilities Operations and Management and Petroleum Acquisition and Transportation .....	30
Table 8. Summary of Commercialization Revenues .....	31

## ***EXECUTIVE SUMMARY***

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### ***Strategic Petroleum Reserve Status***

As of December 31, 2003, the crude oil inventory was 638.4 million barrels and the maximum capable drawdown rate was 4.39 million barrels a day. All storage sites are fully operational.

On November 13, 2001, President Bush announced his intent to fill the Strategic Petroleum Reserve to a level of 700 million barrels. The Strategic Petroleum Reserve will be filled through the transfer of offshore royalty-in-kind oil from the Department of the Interior to the Department of Energy.

### ***Oil Acquisitions and Exchanges***

As of December 31, 2003, the Strategic Petroleum Reserve had received a total of 30.1 million barrels of exchange oil (1.3 million barrels in calendar year 2003) completing an earlier 28-million barrel royalty-in-kind crude oil transfer agreement with the Department of the Interior. In addition, under the Administration's extended royalty-in-kind initiative to fill the Strategic Petroleum Reserve, a total of 46.9 million barrels of oil had been delivered through December 31, 2003 (32.5 million barrels in calendar year 2003). Subsequent solicitations will be issued until the level of fill has reached 700 million barrels.

The Strategic Petroleum Reserve had received a total of 34.4 million barrels of crude oil (because of deferrals), as of December 31, 2003, under the 30 million barrel crude oil time exchange contracts entered into with oil companies in 2000. Delivery of the remaining 0.7 million barrels is scheduled for completion in 2004.

### ***Storage Capacity***

The Strategic Petroleum Reserve's rated crude oil storage capacity has been an estimated 700 million barrels since 1998. This capacity was based on rough estimates of cavern volumes, as measured by cavern storage capacities. A reevaluation of the cavern storage capacity during 2003 revealed that an additional 27 million barrels of capacity is available for crude oil storage. This added capacity results from the dissolution of salt by water injected into the caverns during oil movements and the recertification of an existing 12 million barrel cavern previously considered as too gassy for long term crude oil storage.

### ***Commercialization Activities***

During calendar year 2003, the U.S. Treasury received \$3,679,606 in cash revenues from the commercial leases of the Strategic Petroleum Reserve's distribution facilities and pipelines. In addition, 13,490 barrels of crude oil were earned as in-kind interest on government owned oil in tanks leased to Equilon Enterprises.

### ***Eagle II***

Eagle II, a major exercise to simulate a drawdown, was conducted between June 10 and August 29, 2003, and successfully executed the seventeen major blocks of the drawdown process.

### ***Security***

Following the terrorist attacks on September 11, 2001, the Strategic Petroleum Reserve planned and implemented a security strategy that significantly enhanced protection for crude oil drawdown operations, resources and personnel. This security strategy continues as part of the major maintenance program.

## ***Awards***

The Strategic Petroleum Reserve won the 2003 National Association of Environmental Professionals Environmental Management Award for integrating environmental management into its business processes.

In addition, the Strategic Petroleum Reserve won the Department of Energy Office of Fossil Energy's 2003 Environmental, Security, Safety and Health Achievement Award for integrating NEPA and environmental management into its business processes.

All four storage sites and the New Orleans Project Management Office were recertified by the International Organization for Standardization (ISO) 14001 for their environmental management systems, with zero non-conformities identified.

In addition, they all successfully completed their first three-year cycle as charter members of the U.S. Environmental Protection Agency's performance-track program.

## ***Voluntary Protection Programs***

The Occupational Safety and Health Administration and the Department of Energy recognized the Strategic Petroleum Reserve for achieving *Star* status in their voluntary protection programs, recognizing low accident rates.

In 2003, the Louisiana Quality Foundation awarded the two Louisiana storage sites and the PMO office its environmental management award for excellence.

## ***PROGRAM MISSION***

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### ***Introduction***

The Strategic Petroleum Reserve was authorized in 1975 in response to the 1973 Arab oil embargo. It is authorized by the Energy Policy and Conservation Act (EPCA)(Public Law 94-163), and by the comprehensive energy plans of all Administrations since 1975, in recognition of the long-term dependence of the United States on imported crude oil and petroleum product. Section 165 of EPCA requires the Secretary of Energy to submit an Annual Report to the President and the Congress.

As of December 31, 2003, the inventory in the Strategic Petroleum Reserve was 638.4 million barrels of crude oil, the highest inventory level ever achieved. The inventory amounted to 56 days of net imports. The United States relies on a combination of oil in the Strategic Petroleum Reserve and private stocks to meet its oil storage obligations under the International Energy Agency agreements.

### ***Legislative History***

EPCA, enacted on December 22, 1975, authorized the establishment of the Strategic Petroleum Reserve to reduce the impact of a severe energy supply interruption, and to carry out the obligations of the United States under the International Energy Program.

EPCA was amended by Title VIII of the Energy Security Act (Public Law 96-294), enacted on June 30, 1980. The Act established a minimum average daily fill rate of 100,000 barrels and precluded sale of Naval Petroleum Reserve Numbered 1 (Elk Hills, California) crude oil, except to fill the Strategic Petroleum Reserve, unless the Strategic Petroleum Reserve was being

filled at the minimum rate or had an inventory of 500 million barrels.

The Energy Policy and Conservation Amendments Act of 1985 (Public Law 99-58), enacted on July 2, 1985, extended the provisions of Title I, Part B, of EPCA relating to the Strategic Petroleum Reserve until June 30, 1989, and directed the Secretary of Energy to conduct a sale or exchange of 1.1 million barrels of crude oil to test the drawdown and distribution capabilities of the Strategic Petroleum Reserve.

The Omnibus Budget Reconciliation Act of 1986 (Public Law 99-509), enacted on October 18, 1986, amended EPCA to require that the Strategic Petroleum Reserve be filled at a minimum rate of 75,000 barrels a day until at least 750 million barrels were in storage.

Public Law 101-46, enacted on June 30, 1989, extended Strategic Petroleum Reserve authorities contained in EPCA until April 1, 1990. The Act also required the Secretary of Energy to submit a report to Congress by February 1, 1990, on alternative means of financing oil acquisition for the Strategic Petroleum Reserve. Short-term extensions of the Strategic Petroleum Reserve authorities contained in EPCA were enacted on March 31, 1990 (Public Law 101-262), and August 10, 1990 (Public Law 101-360).

On September 15, 1990, the President signed the Energy Policy and Conservation Act Amendments of 1990 (Public Law 101-383), extending authorization for the Strategic Petroleum Reserve until September 30, 1994. This legislation also contained provisions to amend drawdown authorities, require a Strategic Petroleum Reserve Plan Amendment for completion of storage capacity for one billion

barrels, authorize the drawdown and distribution tests, and provide for a refined petroleum product reserve test program.

On October 24, 1992, the President signed the Energy Policy Act of 1992 (Public Law 102-486). The Act included provisions to (1) add new conditions for drawdown in emergency situations involving a supply reduction of significant scope and duration, coupled with a severe price increase likely to cause a major adverse impact on the nation's economy, (2) allow the enlargement of the Reserve to one billion barrels, (3) permit the Secretary of Energy to make payment in advance for delivery of petroleum product either owned or not owned by the United States for storage in the Strategic Petroleum Reserve or non-Strategic Petroleum Reserve facilities, (4) give the President discretionary authority to acquire domestic stripper well oil at competitive prices to fill the Reserve, and (5) amend the eligibility criteria for a Regional Petroleum Reserve.

On October 22, 1994, the President signed into law the Energy Policy and Conservation Act Amendments Act of 1994 (Public Law 103-406), extending authorization for the Reserve to June 30, 1996.

The Balanced Budget Downpayment Act (Public Law 104-99), enacted on January 26, 1996, required the sale of up to \$100 million of Weeks Island oil to fund decommissioning activities.

The Omnibus Consolidated Rescissions and Appropriations Act of 1996 (Public Law 104-134), enacted on April 26, 1996, required the sale of \$227 million of Weeks Island oil for deficit reduction.

The Omnibus Consolidated Appropriations Act (Public Law 104-208), enacted on September 30, 1996, appropriated

\$220 million for the Strategic Petroleum Reserve in fiscal year 1997 to be financed through the sale of Reserve oil. The Strategic Petroleum Reserve authorities expired on June 30, 1996. On October 14, 1996, Public Law 104-306 extended the authorization for the Strategic Petroleum Reserve until September 30, 1997. After the expiration of that authorization, the Reserve was not reauthorized until June 1998.

The Balanced Budget Act of 1997 (Public Law 105-33), enacted on August 5, 1997, added a new section 168 to EPCA, authorizing the leasing of underutilized Strategic Petroleum Reserve facilities for the storage of oil owned by a foreign government or its representatives.

The Department of the Interior and Related Agencies Appropriations Act, 1998 (Public Law 105-83), enacted on November 14, 1997, appropriated \$207.5 million for the Strategic Petroleum Reserve in fiscal year 1998 to be financed through the sale of Reserve oil.

The 1998 Supplemental Appropriations and Rescissions Act (Public Law 105-174), enacted on May 1, 1998, included a provision which prohibited the drawdown and sale of Strategic Petroleum Reserve oil if the President determined that a sale would be imprudent in light of market conditions and designated the \$207.5 million in foregone revenue as an emergency requirement under the Balanced Budget Act of 1985. The President made the requisite determination and designation on May 8, 1998.

On June 1, 1998, the President signed Public Law 105-177 to extend certain EPCA programs. The Act extended the authorization for the Strategic Petroleum Reserve and participation in the International Energy Program through September 30, 1999, and expanded the antitrust protection for U.S. companies participating in International Energy Agency activities. The Act also authorized the drawdown and distribution of



crude oil from the Strategic Petroleum Reserve only for the purposes described in the Act, and required that the Secretary of Energy request funds for acquisition, transportation and injection of petroleum products for storage in the Reserve or provide a written explanation if no request for funds was made. The Omnibus Consolidated and Emergency Supplemental Appropriations Act, 1999 (Public Law 105-277), enacted on October 21, 1998, included \$160.1 million for the Strategic Petroleum Reserve.

On November 13, 1998, the President signed Public Law 105-388, an Act to extend energy conservation programs under EPCA and the Energy Conservation and Production Act, and for other purposes. The Act provided that, during a drawdown of the Strategic Petroleum Reserve, the State of Hawaii may submit a binding offer for Strategic Petroleum Reserve oil and be entitled to purchase the oil at a price equal to the weighted average price of the successful competitive bids for oil in the applicable category. Deliveries under the binding offer would receive priority scheduling during a Strategic Petroleum Reserve drawdown.

The Strategic Petroleum Reserve authorization expired on September 30, 1999. On October 5, 1999, the President signed Public Law 106-64, extending the authorization for the Reserve and for the EPCA authorities for United States participation in the International Energy Agency program until March 31, 2000.

Appendix C of the Consolidated Appropriations Act, 2000 (Public Law 106-113), enacted on November 29, 1999, included \$159 million for the Strategic Petroleum Reserve. The Act also allowed the Secretary to use other Departmental funds to finance a drawdown from the Strategic Petroleum Reserve.

The Department of the Interior and Related Agencies Appropriations Act, 2001

(Public Law 106-291), signed on October 11, 2000, included \$165 million for the development, operation and management activities of the Strategic Petroleum Reserve under EPCA, \$4,000,000 to be derived from the transfer of unobligated funds in the "SPR Petroleum Account."

On November 9, 2000, the President signed Public Law 106-469. Title I of The Energy Act of 2000 reauthorized titles I and II of EPCA through fiscal year 2003, and updated or deleted the EPCA title I Strategic Petroleum Reserve authorities. Title II of Public Law 106-469 amended title I of EPCA to insert a new part D authorizing the Secretary "to establish, maintain, and operate a Northeast Home Heating Oil Reserve," containing no more than two million barrels of petroleum distillate and located in the Northeast. The new part D Reserve is not a component of the Strategic Petroleum Reserve established under part B of title I of EPCA. Title II also sets forth conditions for release of products from the new part D Reserve, requires transmittal to the President and Congress of a plan describing the Reserve, and upon establishment, requires the Secretary of the Treasury to establish a "Northeast Home Heating Oil Reserve" account at Treasury.

On November 5, 2001, the President signed Public Law 107-63, the Interior and Related Agencies Appropriations Act for fiscal year 2002. The Act included \$171 million for Strategic Petroleum Reserve facilities and operations and \$8 million for the Northeast Home Heating Oil Reserve. Congress further specified that if the full \$8 million is not needed for the Northeast Home Heating Oil Reserve, the Department is encouraged to apply any excess funds to the vapor pressure project to remove excess heat and gas from the oil in the Strategic Petroleum Reserve.

On February 20, 2003, after a series of Continuing Resolutions, the President signed Public Law 108-7, the Consolidated

Appropriations Act, 2003. Public Law 108-7 included \$171.7 million for Strategic Petroleum Reserve operations and program management activities, \$1.9 million for the SPR Petroleum Account, and \$6 million for operation of the Northeast Home Heating Oil Reserve. The law also extended EPCA authority for the Strategic Petroleum Reserve, the Northeast Home Heating Oil Reserve, and United States participation in the International Energy Agency program through September 30, 2008.

On November 10, 2003, the President signed the Department of the Interior and Related Agencies Appropriations Act, 2004 (P.L. 108-108). The Act provided \$171 million for the operations and program management activities of the Strategic Petroleum Reserve and \$5 million for the Northeast Home Heating Oil Reserve.

### ***Strategic Petroleum Reserve Plan and Amendments***

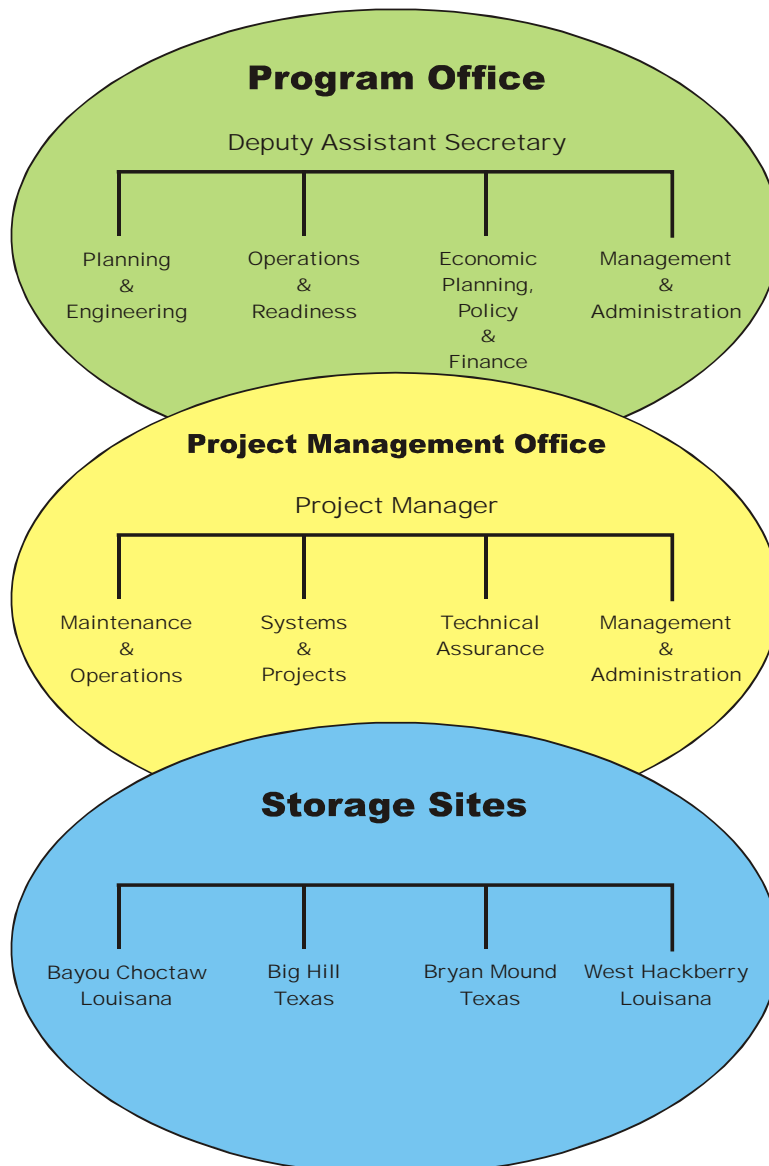
Title I of the Energy Act of 2000 amended EPCA to eliminate the requirement for a Strategic Petroleum Reserve Plan and plan amendment. However, the law requires the Secretary of Energy to submit a plan to Congress if the Secretary decides to expand the Strategic Petroleum Reserve beyond 700 million barrels.

## PROGRAM MANAGEMENT

### Organization

The Assistant Secretary for Fossil Energy at the Department of Energy in Washington, D.C. has overall program responsibility for achieving the goals and objectives of the Strategic Petroleum Reserve. This responsibility is delegated to the Deputy Assistant Secretary for Petroleum Reserves, and is exercised through the

Strategic Petroleum Reserve Headquarters Office in Washington, D.C. and the Project Management Office in New Orleans, Louisiana. Total staffing is 117 Federal full time equivalent employees and 814 contractor employees.



### ***Contractual Support***

The Project Management Office is responsible for the design, development, operation and maintenance of the Strategic Petroleum Reserve and employs a Management and Operating (M&O) contractor, DynMcDermott Petroleum Operations Company, to provide management and manpower to operate and maintain the four Strategic Petroleum Reserve storage facilities and certain related pipeline systems. On January 15, 2003, DynMcDermott Petroleum Operations Company won the Energy Department's re-competition of the M&O contract and will continue operating the Strategic Petroleum Reserve for the next five years through March 31, 2008, with a contract option for DOE to extend the contract for an additional five-year period.

S&B Infrastructure, Ltd., an architect/engineering firm, provides design services for the four storage facilities. The S & B contract ends on March 8, 2005. Sandia National Laboratory provides geotechnical support.

ASRC Construction, Inc. (ACI), a Native Alaskan 8A small business firm, provides construction and construction management services for the four storage facilities under a two-year contract, awarded November 25, 2003, with three one-year renewal option periods, for work formerly performed by the M&O contractor.

Contractors in specific disciplines perform miscellaneous site modifications for major maintenance program activities. Most of these contracts are fixed-price and have terms of less than one year.

Several support services contracts exist for management, technical, and computer support. The largest support service contractor is Deltha-Critique which provides management and technical support services to the Project Management Office under a contract that commenced November 1, 2001. Other support services contractors included ICF Consulting Inc., PB Energy Storage Services, Inc., AOC Petroleum Support Services, LLC., and Cyborg Inc.

Electrical power is provided to the four storage facilities by local utilities, Reliant Energy and Entergy.

Seaway Pipeline Inc., Sunoco Partners Marketing & Terminals, and Unocal Corporation, provide commercial terminalling services for fill, drawdown and storage of crude oil. The terms of these contracts are for five years, with three five-year options by which DOE could extend the contracts up to a total of 20 years each. Seaway Pipeline Inc. is in its third and final option period, Sunoco Partners Marketing & Terminals is in its second five-year option period; and Unocal Corporation is in its third five-year option period.

## **CRUDE OIL STORAGE PROGRAM**

### ***Storage Facilities Capacity and Drawdown Capability***

Originally, the Strategic Petroleum Reserve developed four sites in Louisiana and two sites in Texas. Subsequently, two sites in Louisiana were decommissioned, the Sulphur Mines site in 1992, for cost savings, and the Weeks Island site in 1999, because of geotechnical problems. The remaining sites are West Hackberry and Bayou Choctaw in Louisiana, and Bryan Mound and Big Hill in Texas.

The Strategic Petroleum Reserve's oil storage capacity has been estimated at 700 million barrels since 1998. This capacity was based on rough estimates of cavern volumes as measured by cavern sonar surveys. A reevaluation of the cavern storage capacity during 2003 revealed that an additional 27 million barrels of storage capacity is available. Some of this capacity

results from the dissolution of salt by water injected into the caverns during oil movements during the Desert Storm Drawdown in 1992, the mandatory oil sales in 1996 and 1997, and the oil exchange program in 2000. This added capacity also includes the recertification of an existing 12 million barrel cavern at Bryan Mound, previously considered as being too gassy for long term crude oil storage.

Table I shows the previous and revised storage capacity and drawdown capability of the four storage sites. These are grouped into three geographical distribution systems on the Gulf Coast: Seaway, Texoma and Capline. Each system has access to one or more major refining centers, interstate crude oil pipelines, and marine terminals for crude oil distribution. The locations of the Strategic Petroleum Reserve storage sites, and their respective distribution systems, are shown in Figure 1.

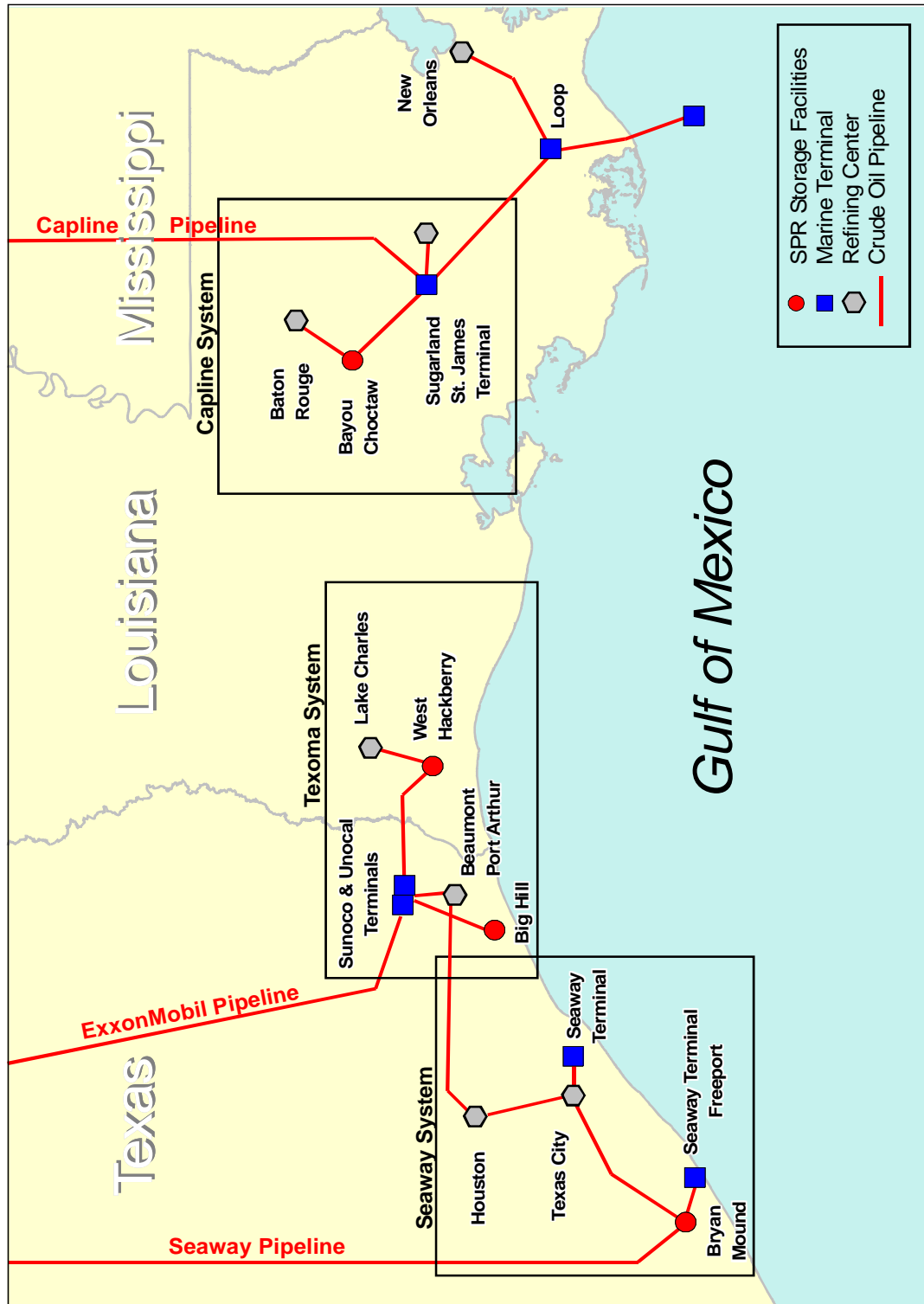
**Table 1**  
**SPR Storage Capacity and Drawdown Capability - (December 31, 2003)**

Storage Facility	PREVIOUS SITE CAPABILITY			CURRENT SITE CAPABILITY		
	Storage Capacity (MMB)	Crude Mix Sweet/Sour (MMB)	Drawdown Capability (MB/D)	Storage Capacity (MMB)	Crude Mix Sweet/Sour (MMB)	Drawdown Capability (MB/D)
Bryan Mound	232	75/157	1,500	251	78/173	1,500
West Hackberry	222	114/108	1,300	230	122/108	1,300
Big Hill	170	72/98	1,100	170	72/98	1,100
Bayou Choctaw	76	24/52	515	76	24/52	515
Total Program	700	285/415 (40%/60%)	4,415	727	296/431 (40%/60%)	4,415

Sweet = Low sulfur crude (S<0.5%)  
Sour = Medium sulfur crude (S<2.0%)

MMB = Million Barrels  
MB/D = Thousand Barrels Per Day

Figure 1  
Storage Sites and Distribution System



SPR2592.ppt

## **Major Maintenance Program**

The Strategic Petroleum Reserve's major maintenance program includes past and current site construction projects that exceed \$100,000. Project examples are building maintenance, piping replacements and road paving.

## **Status of Storage Sites**

### **Bryan Mound**

The Bryan Mound storage facility in Brazoria County is approximately three miles southwest of Freeport, Texas. The site has 20 storage caverns, a combined storage capacity of 251 million barrels, and a cavern inventory of 230.9 million barrels. The site is fully operational.

In 2003, under the major maintenance program, construction was completed to replace perimeter fences, install perimeter detection and lighting, and install site access control systems. Contracts have been awarded and construction is ongoing to remove the halon systems, erect equipment pump shelters, upgrade electrical systems and fire pump supports at the raw water intake structure, upgrade cable tray supports and light poles, and improve the cavern flush system.

### **West Hackberry**

The West Hackberry storage facility in Cameron Parish is approximately 25 miles southwest of Lake Charles, Louisiana. The site has 22 storage caverns, a combined storage capacity of 230 million barrels and a cavern inventory of 198.5 million barrels. The site is fully operational.

In 2003, under the major maintenance program, construction was completed to replace perimeter fences, install perimeter detection and lighting, install site access control systems, as well as to upgrade electrical grounding and

systems, and upgrade distribution systems at the spare parts warehouse. Contracts have been awarded and construction is ongoing to remove the halon systems and add remote control of off-site pipeline valves.

### **Bayou Choctaw**

The Bayou Choctaw storage facility in Iberville Parish is approximately 12 miles southwest of Baton Rouge, Louisiana. The site has six storage caverns, a combined storage capacity of 76 million barrels, and a cavern inventory of 75.6 million barrels. The site is fully operational.

In 2003, under the major maintenance program, construction was completed to install perimeter detection and lighting, install site access control systems, and upgrade site electrical grounding systems. Contracts have been awarded and construction is ongoing to remove the halon systems, upgrade brine system pumps and piping, replace site bridges, remediate bank erosion, and upgrade raw water header piping.

### **Big Hill**

The Big Hill storage facility in Jefferson County is 26 miles southwest of Beaumont, Texas. The site has 14 storage caverns, a combined storage capacity of 170 million barrels, and a cavern inventory of 131.7 million barrels. The site is fully operational.

In 2003, under the major maintenance program, construction was completed to install perimeter lighting, install site access control systems, and to upgrade electrical grounding. Contracts have been awarded and construction is ongoing to remove the halon systems and add remote control of off-site pipeline valves.

## ***Operational Limitations and Issues***

### **Long-term Vapor Pressure Mitigation**

Long-term storage of crude oil in underground solution-mined salt caverns results in elevated oil temperatures and increased crude vapor pressure due to gradual geothermal heating and possible methane gas intrusion from the salt formation. Consequently, when oil is drawn down, or removed from the caverns, increased vapor pressure results in gas being released in amounts that may be unacceptable, posing environmental, safety, and health risks.

An initial degasification program was conducted between 1995 and 1998. With support from Sandia National Laboratories, the Strategic Petroleum Reserve has maintained a comprehensive monitoring program to ascertain the level of gas regain and the need for future degasification. During 2000, the monitoring program revealed a much higher level of gas regain than anticipated, and the need for long-term vapor pressure control. The most cost effective solution was determined to be the acquisition of a portable degasification plant, which could be moved from site to site, as needed.

Following a competitive solicitation, a contract was awarded to Petrofac LLC of Tyler, Texas, in November 2001, to provide a portable degas plant which will be operational by May 2004. The value of the original contract is \$18,533,000. In addition to construction of the degas plant, additional funds in the amount of \$19,772,000 will be used to acquire measurement equipment, make changes to communications software, and construct site modifications. The total estimated cost for the acquisition of facilities to implement vapor pressure mitigation is \$38,305,000. Initial operation of the plant will occur at Big Hill.

During 2003, Petrofac LLC fabricated the degas plant, delivered it to Big Hill, and installed all of the skids and large equipment. Construction activities will continue through 2004 with start-up occurring in May 2004. The supporting site modifications were completed in 2003.



## ***PETROLEUM ACQUISITION AND SALES***

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### ***Crude Oil Inventory Status***

On December 31, 2003, the Strategic Petroleum Reserve's crude oil inventory was 638,387,684 barrels, an increase of 39.3 million barrels from December 31, 2002. The increase is due to the receipts from the royalty-in-kind oil transfer and deliveries under time exchange agreements.

The current mix of crude oil is 61 percent high sulfur (sour) and 39 percent low sulfur (sweet).

Table 2 lists year-end inventories and average daily fill rates from 1977 through 2003 (by fiscal and calendar year).

Table 3 lists crude oil receipts by country of origin since 1977.

Table 4 identifies the location of the inventory by storage site, and Figure 2 illustrates the cumulative oil fill.

**Table 2**  
**Year-End Inventories and Oil Fill History**

	FISCAL YEAR		CALENDAR YEAR	
	Year-End Inventory (MMB)	Average Daily Fill Rate* (MB/D)	Year-End Inventory (MMB)	Average Daily Fill Rate* (MB/D)
1977	1.1	3	7.2	20
1978	49.1	131	68.5	168
1979	91.2	115	91.7	64
1980	92.8	4	107.8	44
1981	199.2	292	230.3	336
1982	277.9	215	293.8	174
1983	361.0	228	379.1	234
1984	431.1	191	450.5	195
1985	489.3	159	493.3	119
1986	506.4	47	511.6	51
1987	533.9	75	540.6	80
1988	554.7	57	559.5	52
1989	577.1	62	579.9	56
1990	589.6	34	585.7	27
1991	568.5	(58)	568.5	(47)
1992	571.4	8	574.7	17
1993	585.7	39	587.1	34
1994	591.7	16	591.7	13
1995	591.7	**	591.6	**
1996	573.6	(49)	565.8	(70)
1997	563.4	(28)	563.4	(7)
1998	563.4	**	561.1	***
1999	564.9	4	567.0	16
2000	570.3	15	540.7	(72)****
2001	544.8	(70)****	550.2	26
2002	587.2	116	599.1	134
2003	624.4	102	638.4	108

\* Fill rates adjusted for oil sales.

\*\* Fill suspended during this period

\*\*\* Decrease due to Maya exchange

\*\*\*\* Net decrease due to Exchange 2000

**Table 3**  
**Crude Oil Receipts through December 2003**  
**(Million Barrels)**

Source Country	2003	Cumulative	Percent of Total
Mexico		266.2	36.2
United Kingdom	7.3	192.4	26.2
United States*	16.4	76.4	10.4
Saudi Arabia		28.3	3.9
Libya		23.8	3.2
Iran		20.0	2.7
Venezuela	3.3	19.4	2.7
United Arab Emirates		18.4	2.5
Nigeria		16.3	2.2
Norway	2.1	14.0	1.9
Cameroon	2.5	9.5	1.3
Oman		9.0	1.2
Egypt		8.9	1.2
Equatorial Guinea	7.3	7.3	1.0
Algeria		6.2	0.8
Ecuador		6.2	0.8
Iraq		3.4	0.5
Gabon		2.4	0.3
Qatar		2.3	0.3
Angola		1.5	0.2
Columbia		1.2	0.2
Argentina		0.4	0.1
Peru		0.4	0.1
West Africa	0.4	0.4	0.1
Russia		0.3	0.0
<b>Total **</b>	<b>39.3</b>	<b>734.6</b>	<b>100.0</b>

\* Included receipts from offshore Gulf of Mexico.

\*\* Cumulative total receipts unadjusted for sales and operational gains and losses.

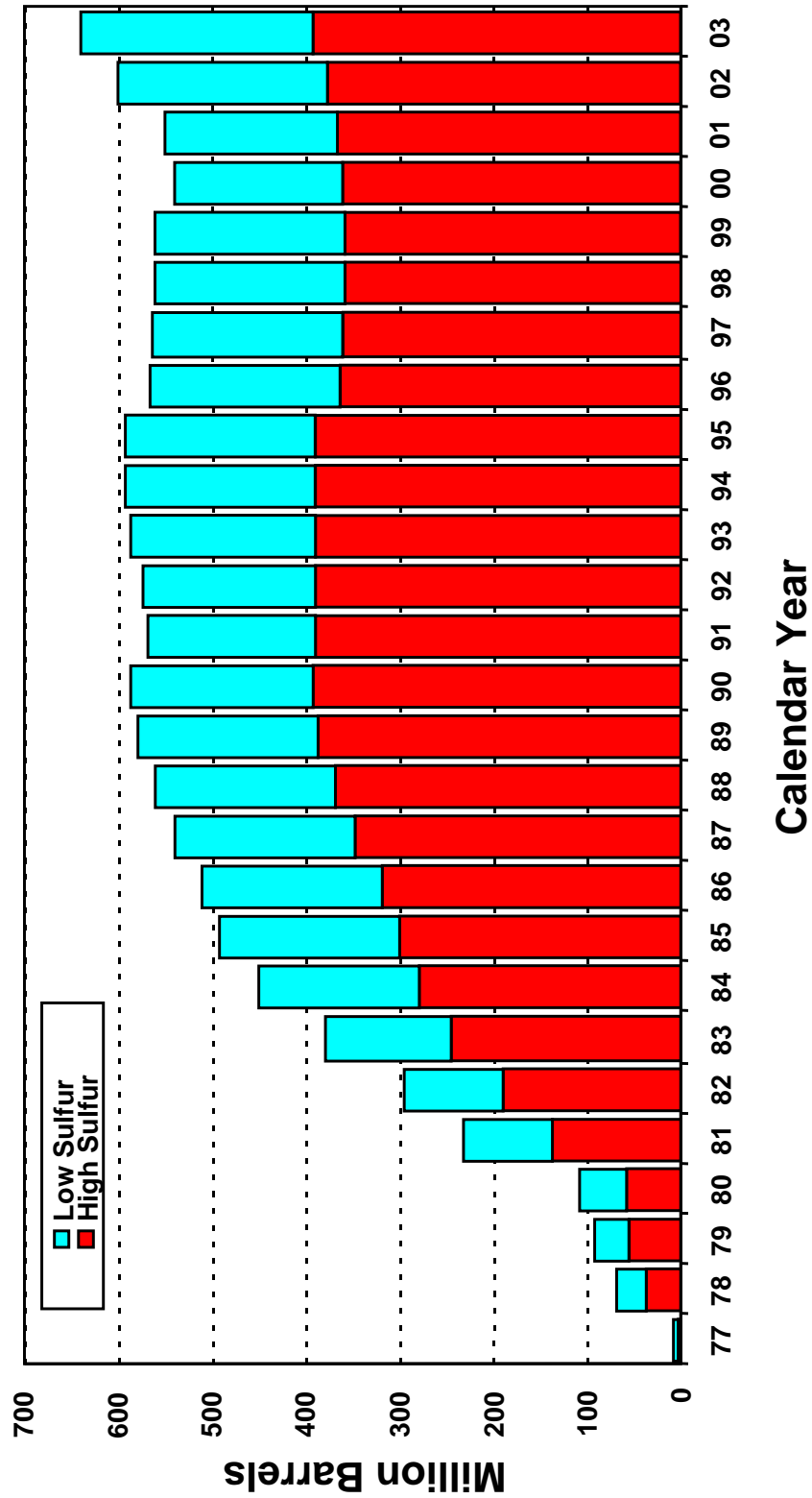
**Table 4**  
**Crude Oil Inventory as of December 31, 2003**

Storage Site	Inventory (Million Barrels)			Cubic Meters (Millions)
	Sweet*	Sour**	Total	
Bryan Mound	74.9	156.0	230.9	36.7
Big Hill	54.7	76.9	131.7	20.9
West Hackberry	92.8	105.7	198.5	31.5
Bayou Choctaw	24.0	51.6	75.6	12.0
Underground Inventory: Subtotal	246.5	390.1	636.6	101.1
Tanks and Pipelines	0.8	1.0	1.8	0.3
Total Inventory	247.2	391.1	638.4	101.4
Total Accounts Receivable	5.0	2.3	7.3	1.2
Total SPR Book Inventory	252.2	393.4	645.6	102.6

\* Sulfur content not exceeding 0.5 percent

\*\* Sulfur content greater than 0.5 percent

Figure 2  
Cumulative Oil Fill



### ***Royalty-in-Kind Crude Oil Transfer***

In February 1999, the Department of Energy and the Department of the Interior agreed to transfer 28 million barrels of royalty oil to the Strategic Petroleum Reserve. This oil would replace 28 million barrels sold in 1996-1997. Under this plan, Federal land leaseholders in the Gulf of Mexico agreed to pay a portion of royalties (one-eighth to one-sixth of the oil produced) in crude oil (royalty-in-kind) instead of cash to the United States.

The Department of Energy contracted with commercial entities to receive the royalty oil at offshore production facilities and transfer it to the Strategic Petroleum Reserve, either directly or with other crude oil delivered in exchange. Since the transfer of the royalty oil involved contractor costs, paid in crude oil, for transportation to the storage sites, and considered the differences in quality of the royalty oil and the oil delivered, the total amount of oil delivered to the Strategic Petroleum Reserve was expected to be 26-27 million barrels.

As of December 31, 1999, contracts had been awarded to assure the transfer of the total 28 million barrels of royalty-in-kind oil. The last contracts awarded would have completed the delivery of the 28 million barrels to the Strategic Petroleum Reserve by November 2000. However, several deliveries of exchange oil were deferred into calendar years 2001, 2002, and 2003 to alleviate crowding at terminals, and to take advantage of favorable market conditions to swap oil for delivery of a greater number of barrels in the future. As of December 31, 2003, the Strategic Petroleum Reserve had received a total of 30.1 million barrels of exchange oil (1.3 million barrels in calendar year 2003), completing this initial royalty transfer program.

On November 13, 2001, President Bush announced his intent to fill the Strategic Petroleum Reserve to 700 million barrels through the resumption of the transfer of offshore royalty-in-kind oil from the Department of the Interior to the Department of Energy.

Under the Administration's initiative, the Department of the Interior issues solicitations every six months for the delivery of offshore oil to designated "market centers." The market centers are located at Clovelly, St. James, Houma and Empire, Louisiana, and Texas City, Texas. Under complementary Department of Energy solicitations, companies receive oil at these market centers in exchange for oil that meets the specifications of the Strategic Petroleum Reserve. The rate of royalty transfer began at 60,000 barrels per day in April 2002. The transfer target rate rose to 130,000 barrels per day under contracts awarded for 2003 deliveries. Actual transfer rate in 2003 averaged 116,000 barrels per day.

Beginning in April 2003, 15,000 barrels per day of total transfers were delivered directly to the Bryan Mound site instead of being competitively exchanged at a market center. This direct delivery, which minimizes deductions for transportation or quality differences, will continue into early 2004, when the Bryan Mound site will be filled to capacity. At that time, direct deliveries of royalty barrels will end and the target of 130,000 barrels per day will be offered in subsequent solicitations for market center exchange.

Due to market instability caused by political uncertainties in Venezuela, deferrals of 18 million barrels of crude oil were negotiated late in 2002 and early in 2003, which resulted in an additional 2.5 million barrels for delivery to the Strategic Petroleum Reserve.

Of the total of 46.9 million barrels of oil delivered to the Strategic Petroleum Reserve as of December 31, 2003, under the Administration's royalty-in-kind initiative, 32.5 million barrels were delivered in calendar year 2003.

Subsequent solicitations will be issued until the level of fill has reached 700 million barrels. The net rate of receipt at the Strategic Petroleum Reserve is expected to average 106,000 barrels per day until fill is completed.

### ***Crude Oil Time Exchange Agreements***

On September 22, 2000, President Clinton directed the Secretary of Energy to enter into time exchange agreements with oil companies for up to 30 million barrels of crude oil. Under the exchange agreements, companies were to return a like quantity, plus a bonus percentage of similar crude oil, in the fall of 2001.

The average bonus percentage from the initial awards was 4.5 percent, for a total of 31.2 million barrels of exchange oil to be returned to the Reserve. However, the market conditions favoring a deferral of deliveries under the royalty-in-kind exchange contracts also resulted in numerous negotiations of deferrals for a significant portion of the time exchange oil until 2002, 2003, and 2004. Due to these delivery schedule revisions, the Reserve will receive an additional 3.9 million barrels, for a total of 35.1 million barrels to be returned under the time exchange.

As of December 31, 2003, the Strategic Petroleum Reserve had received 34.4 million barrels under the time exchange (5.6 million barrels in calendar year 2003). Delivery of the remaining 0.7 million barrels is scheduled for completion in 2004.

## ***EMERGENCY RESPONSE CAPABILITIES***

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### ***Sale of Oil***

Under section 161 of EPCA, the Secretary of Energy is required to sell oil withdrawn from the Strategic Petroleum Reserve at public sale to the highest qualified bidder.

### ***Competitive Sales Procedures***

The Department of Energy's Standard Sales Provisions\* prescribe the competitive sales process. The first step in the process is the issuance of a Notice of Sale identifying the volume, characteristics, and location of the petroleum for sale, delivery dates, and procedures for submitting offers. Measures required for assuring performance and financial responsibilities are also described in the Notice of Sale.

During a drawdown, several Notices of Sale may be issued, each covering a sales period of one to two months. Offerors may have only five days from the date a Notice of Sale is issued until offers are due, with delivery of oil commencing no later than thirty days after the Presidential direction to draw down the Reserve. Subsequent sales periods will coordinate Notice of Sale issuance with standard industry delivery periods. Because of the possible short initial lead-time, the Department maintains a registry of prospective offerors who will receive all Notices of Sale and intends to make maximum use of electronic communication for Notice of Sale distribution.

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\*Department of Energy, 10 CFR Part 625, Price Competitive Sale of Strategic Petroleum Reserve Petroleum; Standard Sales Provisions.

The second step in the sales process is for prospective purchasers to submit offers, as specified in the Notice of Sale. Offerors must unconditionally accept all terms and conditions in the Notice of Sale, offer at least the minimum price, if any, as specified in the Notice of Sale, and submit an offer guarantee of 5 percent of the maximum potential contract amount, or \$10 million, whichever is less. The offer evaluation process is structured so that the offerors bidding the highest prices determine the transportation methods, up to the limits of the distribution system. Specific delivery arrangements are negotiated later in the process.

Within five business days of being notified, all "apparently successful offerors" are required to provide a Letter of Credit equal to 100 percent of the contract amount as a guarantee of performance and payment of amounts due under the contract. Upon timely receipt of the financial guarantees, and a final determination by the Contracting Officer that offers are responsive and offerors responsible, Notices of Award are issued. Deliveries to the purchasers may then begin, consistent with their arrangements for commercial pipeline or marine vessel transportation. Such deliveries may begin as soon as 13 days after the President issues a finding directing a sale, provided the purchasers submit their financial guarantees and can arrange transportation.



**Drawdown Capabilities**

The crude oil acquired for the Strategic Petroleum Reserve is commingled in caverns at the storage sites, creating various distinct crude oil streams available for sale during a drawdown. Table 5 identifies these crude oil streams, delivery modes and locations, as of December 31, 2003.

**Table 5  
Crude Oil Streams**

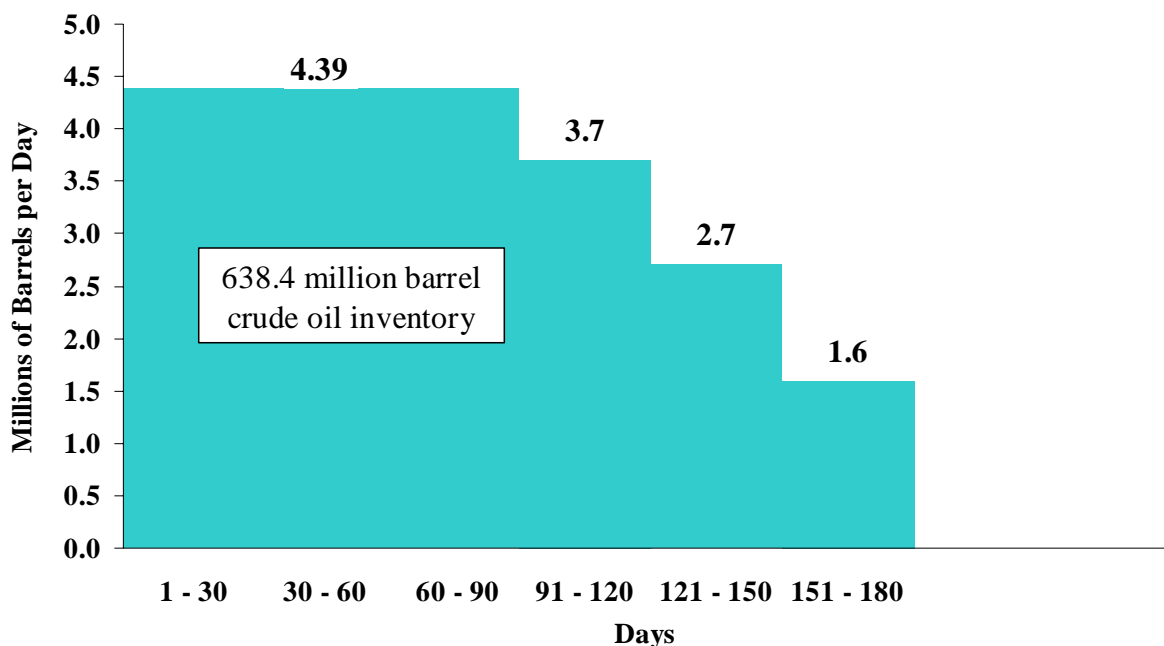
Crude Oil Stream	API Gravity	Sulfur Content	Delivery Mode and Location
<b>Seaway System</b>			
Bryan Mound (Sweet)	35.9	0.33	Pipeline or tankship at Seaway (TEPPCO) Terminal, Freeport, Texas; or Seaway (TEPPCO) Terminal, Texas City, Texas
Bryan Mound (Sour)	33.2	1.39	
<b>Texoma System</b>			
West Hackberry(Sweet)	37.3	0.32	Pipeline, tankship or barge at Sun Partners Marketing & Terminals LP, Nederland, Texas; Pipeline at Shell-22"/DOE connection, Lake Charles, Louisiana
West Hackberry (Sour)	33.5	1.41	
Big Hill (Sweet)	35.9	0.48	Pipeline, tankship or barge at Sun Partners Marketing & Terminals LP, Nederland, Texas; Pipeline or tankship at Unocal Terminal, Nederland, Texas; Pipeline at Shell-20"/DOE connection, Winnie, Texas
Big Hill (Sour)	30.7	1.41	
<b>Capline System</b>			
Bayou Choctaw(Sweet)	36.0	0.36	Pipeline at Capline or LOCAP Terminals, St. James, Louisiana; Tankship at Sugarland St. James Terminal, St. James, Louisiana 24-inch site connection to Red Stick Pipeline, Iberville Parish, Louisiana
Bayou Choctaw (Sour)	32.3	1.38	

The Strategic Petroleum Reserve can draw down crude oil at a maximum initial sustainable rate of 4.39 million barrels per day, for a period of 90 days. After this period, the drawdown rate will gradually decrease as site inventories are depleted and the declining number of caverns containing crude oil becomes a constraint.

The current sustainable drawdown rate of 4.39 million barrels per day is an increase over 2002, due to inventory additions during 2003. The initial sustainable drawdown capability will be 4.42 million barrels per day when the inventory of the Strategic Petroleum Reserve is 700 million barrels.

Figure 3 illustrates the physical drawdown capability, which provides for a maximum distribution of 395 million barrels in 90 days, and 630 million barrels in 180 days.

**Figure 3**  
**Projected Maximum Drawdown Capability**  
**(As of December 31, 2003)**



Note: Rates after 90 days are based on cavern-use assumptions. Actual rates are contingent on the specific caverns drawn down during a previous drawdown period.

### ***Drawdown Readiness Activities***

Drawdown readiness assurance activities during 2003 included:

- Eagle II, a major exercise to simulate a drawdown, took place between June 10 and August 29, 2003, and successfully executed the seventeen major blocks of the drawdown process. The purpose of the exercise was to assess the readiness of current drawdown procedures, personnel, and infrastructure. In addition, oil traders, pipeline lessees, State of Hawaii, and Hawaii's designated entities were included to assess their understanding of their roles in the drawdown process.
- West Hackberry successfully conducted a systems test exercise that demonstrated its maximum drawdown rate capability to send crude oil flows to the Sun terminal and the Lake Charles meter station, simultaneously.
- All of the sites conducted a table-top exercise to implement H2S scavenger and water treatment chemicals.
- Drawdown Level I criteria was revised from 15 days to 13 days.

### ***Distribution Plan and Capabilities***

The Strategic Petroleum Reserve has the capability to distribute its crude oil to United States refineries by both pipeline and marine transportation in the event of an emergency.

The Strategic Petroleum Reserve is connected to all four major interstate pipeline systems serving the mid-continent and the midwest: Capline, Seaway, ExxonMobil and MidValley. The Reserve is connected by commercial pipeline systems to over one-half of United States refining capacity, and is capable of delivering crude oil to 22 refineries in the Gulf Coast region, and 28 refineries in the mid-continent and midwest regions. These 50 refineries processed approximately 55 percent of United States crude oil imports during 2003.

The Strategic Petroleum Reserve is connected to five marine terminals that have a combined distribution capacity of approximately 2.5 million barrels per day. These are: Seaway Terminal (TEPPCO/Conoco/Phillips), Freeport, Texas; Seaway Terminal (TEPPCO/BP), Texas City, Texas; Sunoco and Unocal Terminals, Nederland, Texas; and Sugarland St. James Terminal, St. James, Louisiana.

Table 6 summarizes drawdown and distribution capabilities based on current crude oil stream inventories, existing site drawdown systems, and commercial distribution capabilities. Figure 4 illustrates the Strategic Petroleum Reserve's pipeline and marine distribution capabilities.

**Table 6**  
**Drawdown and Distribution Capabilities**  
**(Thousands of Barrels Per Day)**

	<b>Drawdown</b>	<b>Distribution</b>
Seaway System	1,500	2,177
Texoma System	2,400	3,132
Capline System	515	1,447
<b>Total</b>	<b>4,415</b>	<b>6,756</b>

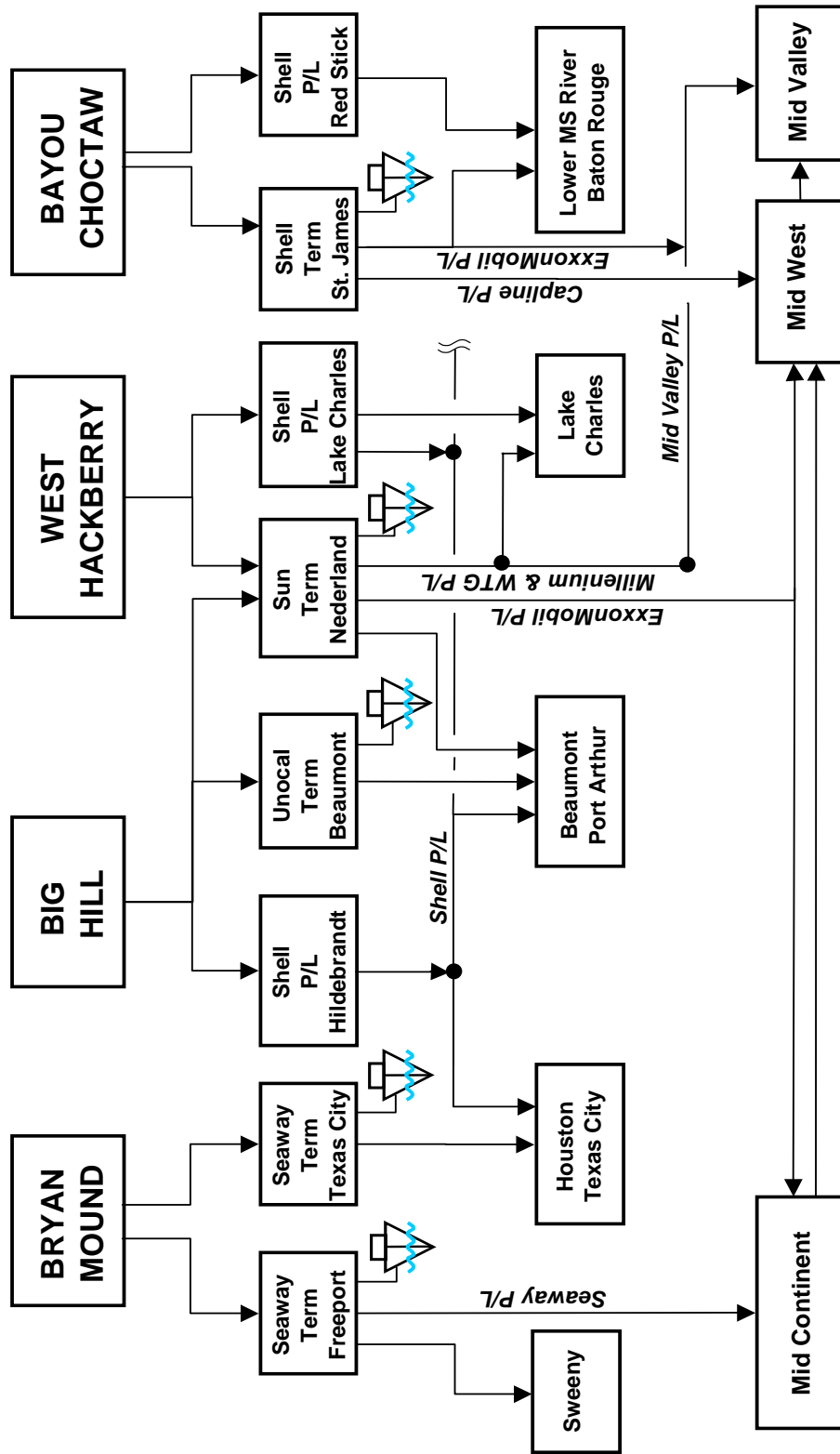
***Distribution Assessment***

An annual assessment is conducted of the Strategic Petroleum Reserve's crude oil distribution system capabilities to ensure that there are adequate connections to the commercial distribution systems, and to identify the need for any remedial plans. The 2003 assessment evaluated the Strategic Petroleum Reserve's capability, at its maximum drawdown rate, to replace imported oil in 2003, 2005, 2010, and 2015. Future U.S. petroleum refining demands are based on forecasts made in the Energy Information Administration's *Annual Energy Outlook, 2003*.

The assessment took into account changes made to commercial pipeline distribution systems and modifications to their infrastructure. A Canadian company, Enbridge Pipeline Co., purchased a products line to move a small amount of crude oil each day to an Oklahoma refinery. Enbridge also announced the planned construction of a new crude oil line from Superior Terminal to the Wood River Terminal in Illinois. When this line is completed, the volume deliverable to refineries in the midwest, and possibly, further south, will increase.

The assessment confirms that the Strategic Petroleum Reserve has sufficient offsite distribution capabilities (defined as 120 percent of the maximum drawdown rate) to achieve current drawdown rates. The assessments for 2005, 2010 and 2015, predict that the Strategic Petroleum Reserve's distribution capability will continue to increase in the Seaway and Texoma systems as refinery imports increase, and distribution in the Capline system will decrease due to increasing domestic production from the Gulf of Mexico, but not enough to cause performance to drop below the 120 percent requirement.

**Figure 4**  
**Pipeline and Marine Distribution Capabilities**

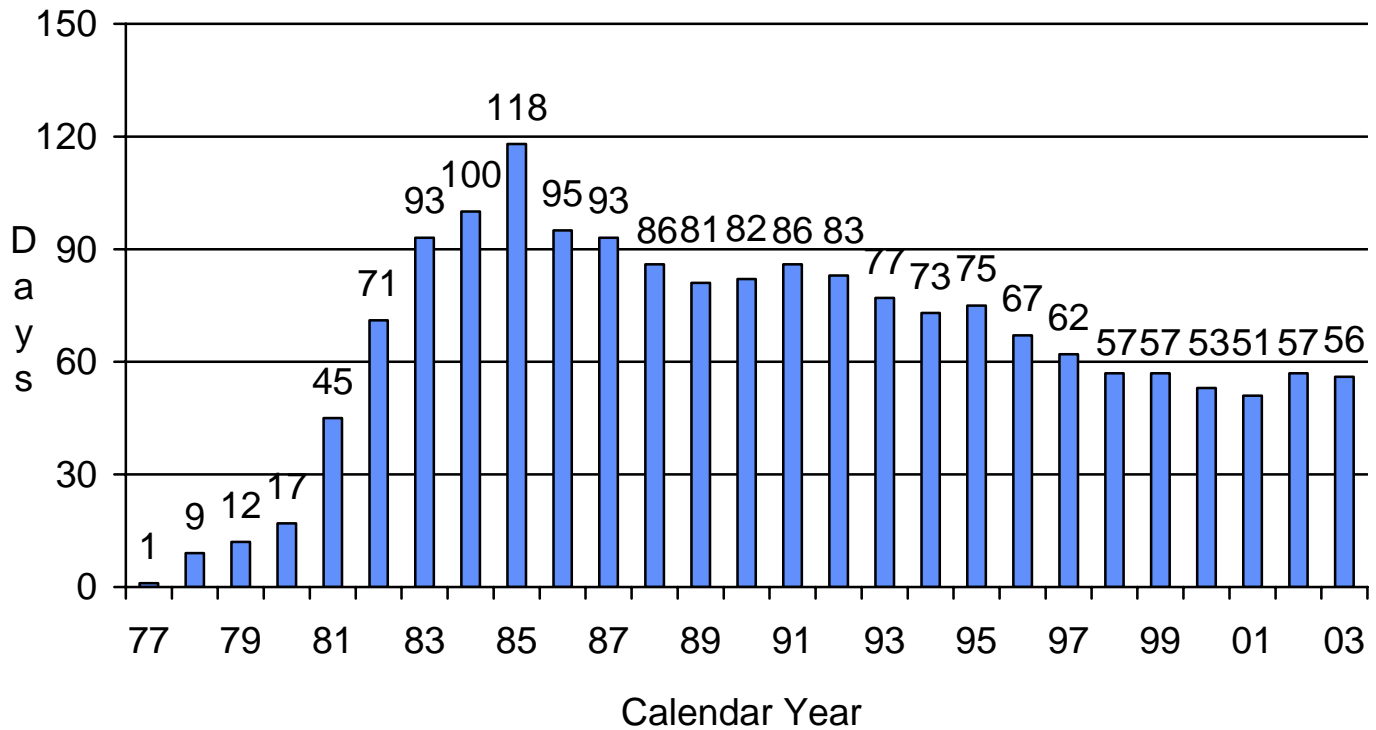


**Import Protection Levels**

In EPCA, the Congress established an initial storage objective of 90 days of net petroleum imports, which equated to 500 million barrels at that time. The Strategic Petroleum Reserve inventory of 638.4 million barrels on December 31, 2003, was equivalent to 56 days of net petroleum imports of crude and refined products (see Figure 5).

The inventory, in equivalent days of net petroleum imports, declined from 1985 to 2001, principally as a result of dependence on oil imports, and increased slightly in 2002 and 2003. In 2003, 56% of domestic consumption of crude and refined products was supplied by foreign imports.

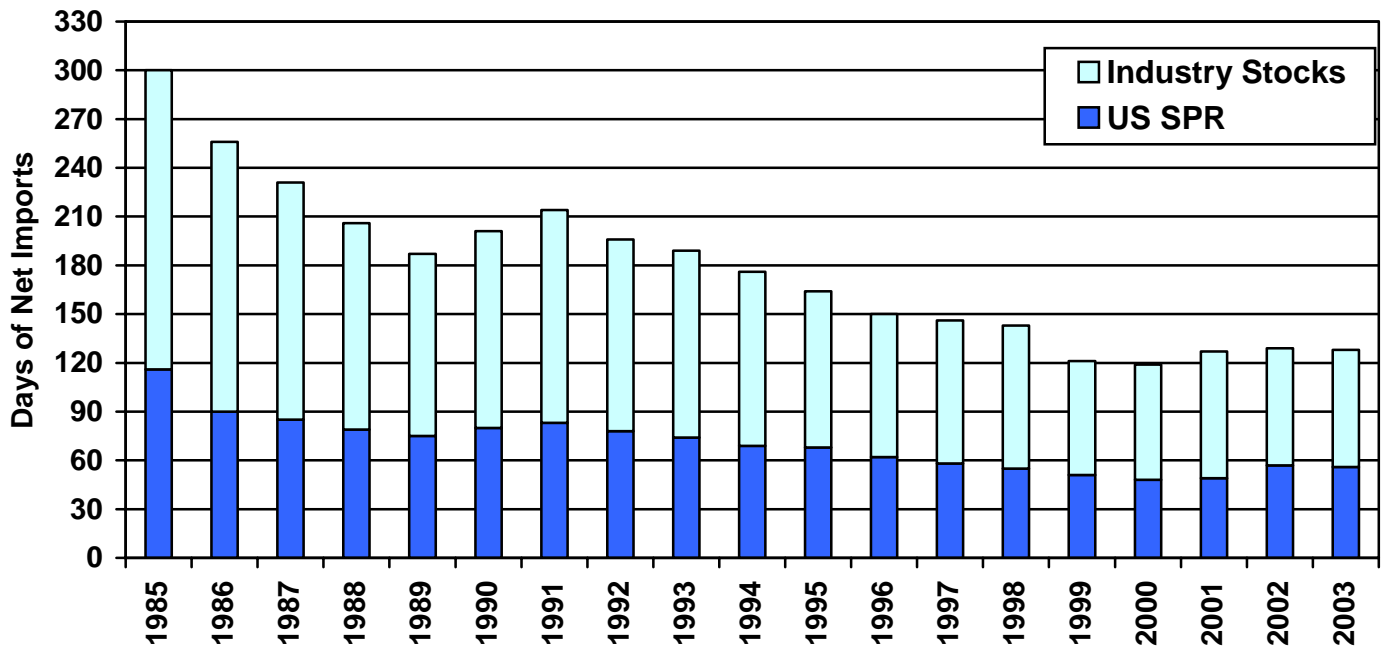
**Figure 5  
Days of Net Import Protection (1977-2003)**



The United States, as a member of the International Energy Agency, is committed to maintaining stocks of crude oil and products in reserves that are equivalent to 90 days of net oil imports. Computations of member-nations' stockpile requirements are based on both public and privately held stocks, and net imports are defined as the average daily level in the previous

year. The most recent International Energy Agency computation credits the United States with 128 days of emergency reserves, based on both the Strategic Petroleum Reserve and privately held stocks. Figure 6 provides end-of-year computations for the United States through 2003.

**Figure 6**  
**International Energy Program**  
**U.S. Emergency Stocks**



## COMMERCIALIZATION ACTIVITIES

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### *Commercial Leases*

Since 1995, the Strategic Petroleum Reserve has commercialized its under-utilized crude oil distribution facilities to be more cost-effective, and has leased two crude oil pipelines and a marine terminal to private industry. The contracts for these leases require that the facilities be maintained in good condition and, in the event of an emergency drawdown of oil, the leased facilities are to be returned on 15 days notice.

**Bayou Choctaw Pipeline:** In 2003, lease revenues amounted to \$168,718. This pipeline was leased to Shell Pipeline Company LP on May 1, 1997, on a revenue-sharing basis. In 1998, the lease was converted from an annual lease to a ten-year lease.

**Bryan Mound Pipelines:** In 2003, lease revenues amounted to \$1,647,828. Two of the three Bryan Mound pipelines were leased to ExxonMobil Pipeline Company on January 14, 1999. ExxonMobil began using the pipelines in June 2000, as part of its onshore distribution system for the Diana-Hoover production in the Gulf of Mexico.

**St. James Terminal:** In 2003, St. James Terminal lease revenues amounted to \$1,863,060. The terminal was leased to Shell Pipeline Corporation (now Equilon Enterprises LLC, doing business as Shell Oil Products U.S.) on January 31, 1997, on a revenue-sharing basis. On April 2, 2003, the contract was re-negotiated for a period of ten years in the amount of \$1.7 million per year, with a five-year option in the amount of \$2 million per year. Payments were retroactive to January 1, 2003. In addition, the lease requires the lessee to pay 6 percent per annum (in-kind) on the government owned oil used in the terminal tanks.

During calendar year 2003, the Strategic Petroleum Reserve earned 13,490 barrels of crude oil as in-kind interest on government owned oil in tanks leased to Equilon Enterprises.

### *Foreign Oil Storage*

The Strategic Petroleum Reserve promotes the concept of storing foreign oil in its unused storage space as a strategy to increase world oil stockpiling, generate revenues for the United States Treasury, and/or add oil to the Strategic Petroleum Reserve (in lieu of a fee). The Balanced Budget Act of 1997 (Public Law 105-33) provides specific authority to store petroleum products of another country, or its representatives, in the facilities of the Strategic Petroleum Reserve, provided that the United States is fully compensated for all related costs, and that the ability to draw down Strategic Petroleum Reserve oil is not impaired.

To enhance the Strategic Petroleum Reserve's offer to store oil for foreign governments or their representatives, the Big Hill storage site was activated as a special purpose Foreign Trade Zone subzone on September 28, 1998. This designation permits customers to store oil without paying customs fees and certain taxes. The Big Hill storage site is the only storage site to receive this designation.

The Strategic Petroleum Reserve did not enter into any commercial or foreign storage initiatives during 2003. However, the Department of Energy continued filling the Strategic Petroleum Reserve, primarily the Big Hill site, through its agreement with the Department of the Interior for Federal royalty oil. In addition, the world oil market was characterized by near term oil prices higher than the price for future delivery, so that there were no market incentives for commercial oil storage.



## **BUDGET AND FINANCE**

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The FY 2003 Interior and Related Agencies Appropriations Act (Public Law 107-63) included \$171.7 million for Strategic Petroleum Reserve facilities operations and management and \$1.9 million for the SPR Petroleum Account.

### ***Appropriations through Fiscal Year 2003***

A total amount of \$21.7 billion, net of sales and transfers, has been appropriated for the Strategic Petroleum Reserve through fiscal year 2003. Included in this total is the distribution of annual and total appropriations described in Table 7.

### ***Strategic Petroleum Reserve Account***

The Strategic Petroleum Reserve Account funds the development, operation, and maintenance of facilities; the salaries and expenses necessary to plan and manage the program, including the operation of the Project Management Office in New Orleans, Louisiana; and the activities pertinent to major issues concerning the development and use of the Strategic Petroleum Reserve.

Obligations for the Strategic Petroleum Reserve in fiscal year 2003 totaled approximately \$155.9 million. From this amount, \$16.3 million was obligated for Federal program management salaries and benefits, and \$139.5 million was obligated for contractual goods and services to operate and maintain the Strategic Petroleum Reserve.

### ***SPR Petroleum Account***

The SPR Petroleum Account funds the acquisition of oil for the Strategic Petroleum Reserve; the associated costs for transportation and terminalling; United States customs duties; Superfund and Oil Spill Liabilities Trust Fund taxes; and other miscellaneous costs.

During an emergency drawdown and sale, the SPR Petroleum Account is the source of funding for the incremental costs of withdrawing oil from the storage caverns and transporting it to the point where purchasers take title. An amount equal to Federal receipts realized is deposited in the SPR Petroleum Account to create additional budget authority for filling the Reserve.

At the end of fiscal year 2003, approximately \$10.2 million was available for obligation in the Account, an amount sufficient to finance approximately 25% of the incremental costs of a three-month emergency drawdown.

Obligations for the Petroleum Account in fiscal year 2003 totaled approximately \$0.6 million in support of the royalty-in-kind program.

The capitalized cost for the crude oil in the Strategic Petroleum Reserve at the end of fiscal year 2003 was \$16.7 billion, for an average cost per barrel of approximately \$26.81 (does not include storage cost). Since April 2002, contracts have been awarded for 40.6 million barrels of exchanged royalty oil from the Department of the Interior. While revenues to the Treasury of \$1.3 billion were foregone, the asset value of the Strategic Petroleum Reserve increased.

**Table 7**  
**Annual Appropriations for Storage Facilities Operations and Management and Petroleum Acquisition and Transportation (Thousands) (Data as of December 31, 2003)**

Fiscal Year	Oil Account	Facilities	Management		Total	Defense SPR
1976	0	300,000	13,975		313,975	
1977	440,000	0	7,824		447,824	
1978	2,703,469	463,933	14,704		3,182,106	
Total 1979 Appropriations*	2,356,456	632,504	18,111		3,007,071	
Total 1980 Appropriations*	(2,022,272)	0	22,272		(2,000,000)	
Total 1981 Appropriations*	3,205,094	108,168	19,391		3,332,653	
Total 1982 Appropriations*	3,679,700	175,656	20,076		3,875,432	
1983	2,074,060	222,528	19,590		2,316,178	
1984	650,000	142,357	16,413		808,770	
1985	2,049,550	441,300	17,890		2,508,740	
Total 1986*	(12,964)	106,979	13,518		107,533	
1987	0	134,021	13,412		147,433	
1988	438,744	151,886	12,276		602,906	
1989	242,000	160,021	13,400		415,421	
1990	371,916	179,530	12,953		564,399	
1991	566,318	187,728	12,846		766,892	
1992	88,413	171,678	13,384		273,475	
1993	(125,625)	161,940	14,227		50,542	
DOD Transfer (non add)	124,925	700	0		125,625	125,625
1994	0	191,035	15,775		206,810	
1995	(107,764)	226,938	16,780		135,954	
1996 transfer from SPR Petroleum Account	(187,000)	170,173	16,827		0	
1996 Weeks Is. Oil Sale	(97,114)	97,114	0			
1996 deficit reduction oil sale	(227,000)	0			(227,000)	
1996 Total	(511,114)	267,287	16,827		(227,000)	
1997 Total*	(220,000)	193,000	16,000		(11,000)	
1998	0	191,500	16,000		207,500	
1999	0	145,120	14,805		159,925	
2000	0	144,000	15,000		159,000	
2001	0	140,672	15,965		156,637	
2002	0	154,009	16,871		170,880	
2003	1,955	157,823	13,909		171,721	

\* Includes reprogramming and rescission actions.

Note: Fiscal year 1991 SPR Petroleum Account of \$566,318 includes proceeds of \$122,681 from the Test Sale recorded as additional budget authority, rather than reductions to obligations, costs, and outlays. It also includes \$315,424,985 in Desert Storm Drawdown proceeds from January 1991, and \$19,755,064 from fiscal year 1991 NPR excess receipts. Thus, the cumulative budget authority is "gross" and not related directly to the inventory of oil on hand.

***Commercialization Revenues***

During calendar year 2003, the U.S. Treasury received \$3,679,606 in cash revenues from the commercial leases of the Strategic Petroleum Reserve's distribution facilities and pipelines, and earned 13,490 barrels of oil for use of tank bottoms at St. James Terminal.

**Table 8**  
**Summary of Commercialization Revenues**  
**(December 31, 2003)**

Calendar Year	Bryan Mound Pipeline	Big Hill Pipeline	Bayou Choctaw Pipeline	St. James Terminal Lease	Total Revenue Generated
1996	102,606	472,809			575,415
1997		429,824	0	133,300	563,124
1998	12,500	402,525	0	481,010	896,035
1999	679,393	400,000	163,030	546,125	1,788,548
2000	652,146	493,359	217,573	748,986	2,112,064
2001	1,054,297	33,104	212,738	1,227,021	2,527,160
2002	1,468,613	0	249,708	1,285,183	3,003,504
2003	1,647,828	0	168,718	1,863,060	3,679,606

### Performance Measurement

The mandates of the Government Performance and Results Act of 1993 are incorporated into the Strategic Petroleum Reserve's performance management system. Out of a total of 22 performance targets, 22 measures met or exceeded their target goals.

Details of program goals, objectives, and progress are contained in the Strategic Petroleum Reserve's *Annual Performance Report* submitted to the DOE Office of Program Analysis and Evaluation.

Performance Measure	FY 2002 Actual Performance	FY 2003 Target Output	FY 2003 Actual Performance
<b>Public Confidence: Oil Inventory, Drawdown Readiness and Distribution</b>			
Number of Barrels of Crude Oil Inventory in Storage	587 MMB	628 MMB	624 MMB
90-Day Sustainable Drawdown Rate	4.27 MMB/Day	4.39 MMB/Day	4.39 MMB/Day
Number of Days to Commence Crude Oil Drawdown	13 Days	13 Days	13 Days
Distribution Capability as a Percentage of Drawdown Rate	154%	>= 120% of Drawdown Rate	153%
Calculated Site Availability	98%	>= 95%	98%
Calculated MPAR Rating	98%	>= 95% of Possible Points	98%
Percent of Site Security Ratings that are Satisfactory	100%	100%	100%
Number of Barrels of Heating Oil Inventory in Storage	2.0 MMB	2.0 MMB	2.0 MMB
Number of Days to Complete Heating Oil Drawdown	12 Days	12 Days	12 Days
<b>Excellent Customer Service: Customer Relations</b>			
Customer Satisfaction Survey Ratings	3.75 Points	>= 3.5 Points	3.8
Number of New Customer/Stakeholder Outreach Activities	3	1	3
<b>Responsible Stewardship: Operational Effectiveness, Efficiency and Knowledge Management/Fiscal Responsibility and Budgetary Control</b>			
Complete FY2003 Business Processes Reengineering Initiative	N/A	9/30/03	9/02/03
Operating Cost per Barrel of Storage Capacity	\$ 0.1981	<= \$.2184 per Barrel	\$.2004
Fiscal Year Cost Savings	\$ 8.4 Million	\$ 9.0 Million	\$ 14.4 Million
<b>Dynamic Teamwork: Continuous Improvement</b>			
Complete Conversion Process for ISO 9001-2000 Certification	N/A	3/31/03	10/31/02
<b>Partnerships</b>			
Evaluate Contractor Performance per Schedule	Completed	Semiannually	Completed

<b>Performance Measure</b>	<b>FY 2002 Actual Performance</b>	<b>FY 2003 Target Output</b>	<b>FY 2003 Actual Performance</b>
<b>Social Responsibility and Citizenship: Environment, Safety and Health</b>			
Number of New Public Outreach Activities	3	1	1
Annual Evaluation of OSHA VPP Star Status at Four Sites	2/14/02	2/15/03	2/14/03
Number of Cited Environmental Violations Received	0	0	0
Number of Days with No Reportable/Recordable Spills	364 Days	>= 355	361
Annual ISO 14001 Certification	4/11/02	5/31/03	5/15/03
<b>Employee Development and Diversity: Employee Development and Quality of Worklife</b>			
Percent of Employees Preparing an Individual Development Plan	N/A	>= 95%	98%

## ***OTHER ACTIVITIES***

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### ***Security and Emergency Operations***

The Strategic Petroleum Reserve significantly strengthened its security systems after September 11, 2001. In October 2003, the Project Management Office consolidated its security, emergency management and fire protection functions under the umbrella of the Security and Emergency Operations Division (S&EOD). Combined planning, training, and emergency responses now endorse an all-hazards approach to handling any future crisis.

An Integrated Safeguards and Security Management (ISSM) initiative combines line operations, engineering and administrative functions for planning and operations purposes. Other initiatives have improved intelligence gathering, threat analyses and response capabilities. Additionally, physical security systems and information technology have been improved, ensuring state-of-the-art protection for crude oil operations.

The S&EOD, in partnership with the Federal Bureau of Investigation, the Bureau of Alcohol, Tobacco and Firearms, the Coast Guard, the U.S. Environmental Protection Agency, the Federal Emergency Management Agency, National Guard chemical response teams, and other first-responders in Louisiana and Texas, participates in annual exercises and drills.

Emergency response teams also have participated in firefighting, hazardous waste operations and refresher emergency response training provided by the Occupational Safety and Health Administration at Texas A&M in College Station, Texas. Each site conducted a successful national Preparedness for Response Exercise Program drill, and demonstrated proficiency.

### ***Environment, Safety, and Health***

The Strategic Petroleum Reserve received external verification for the quality of its environmental, safety, and health management systems by complying with nationally and internationally recognized benchmarking standards in the following systems:

- The International Organization for Standardization, (ISO 9001 and ISO 14001)
- The National Environmental Performance Track Program of the U.S. Environmental Protection Agency
- The voluntary protection programs of the Occupational Safety and Health Administration and the Department of Energy.

In 2003, a gap analysis was completed for the Occupational Safety and Health Administration Series, an internationally recognized safety management system, (OSHAS 18001). The analysis indicated compliance with the majority of the requirements of OSHAS 18001, and identified a list of eight items that need action, if a decision to seek certification is made. A decision to proceed with certification has not been made, pending adoption of OSHAS 18001 as an ISO standard.

### ***Integration of the ISO 14001 into the Environmental Management System***

In May 2000, the Strategic Petroleum Reserve became the first bulk petroleum storage organization in the United States, public or private, to receive ISO 14001 certification for its environmental management system. This certification continued through 2003.

The ISO 14001 Registrar (the certifying agency) performed two separate surveillance audits including all of the facilities. A successful outcome resulted in continuation of the ISO 14001 certification at all locations. The Strategic Petroleum Reserve received triennial third-party recertification against the ISO 14001 environmental management system's international standard. This extensive recertification process, against all seventeen elements of the standard for all five sites, produced zero non-conformances.

In addition, the Strategic Petroleum Reserve received environmental management awards from the National Association of Environmental Professionals and the Department of Energy's Office of Fossil Energy for integrating environmental management into its business processes. The Louisiana Quality Foundation also awarded the two storage sites and the PMO office in Louisiana, the state's environmental management award for excellence.

### ***Environmental Performance Track Program***

In 2003, the Strategic Petroleum Reserve continued its charter member status in the Environmental Protection Agency's environmental performance-track program, in recognition of its outstanding past performance and commitment to future performance. Membership is renewable after each three-year cycle and the Strategic Petroleum Reserve fully expects to continue to participate in the performance-track program.

### ***Pollution Prevention***

**Hazardous Waste:** The Strategic Petroleum Reserve's goal for 2003 was to generate no more than 2,000 pounds of hazardous waste; actual hazardous waste generated at all five sites amounted to 847 pounds, 58 percent below that goal. Of that amount, 47 percent was lab waste containing solvents and oils.

**Recycling:** The Strategic Petroleum Reserve achieved 100 percent recycling of 4.4 million pounds of exploration and production waste generated in 2003. The Strategic Petroleum Reserve achieved a second year of 100 percent procurement of products that meet the Environmental Protection Agency's guidelines for recycled material content.

### ***ISO 9001 Quality Management System***

In October 2003, the Strategic Petroleum Reserve received a favorable report on the ISO 9001 annual surveillance, continuing its ISO 9001-2000 certification.

### ***Louisiana Quality Foundation***

The Louisiana Quality Foundation awarded the two storage sites and the PMO Office in Louisiana, the Louisiana Environmental Management Award for excellence. The Strategic Petroleum Reserve is the only organization in Louisiana to achieve multiple facility winners. Only one other Louisiana facility won this award at the excellence level, and that was a commercial facility in the oil industry.

Support continued for the Louisiana Quality Foundation through co-sponsorship of an annual awards ceremony, support for the Foundation's website ([www.laqualityaward.com](http://www.laqualityaward.com)) and for the Louisiana Performance Excellence and Louisiana Environmental Management Award processes.

### ***New Orleans Federal Performance Excellence Network***

The New Orleans Federal Performance Excellence Network is supported by the New Orleans Federal Executive Board which consists of Federal employees from the Greater New Orleans and Mississippi Gulf Coast regions. It is a forum for sharing benchmarking and performance improvement information. The Strategic Petroleum Reserve cosponsors the Network by providing speakers, and supporting its website, [www.nofpen.org](http://www.nofpen.org).

### ***Performance Excellence Conference***

The Strategic Petroleum Reserve sponsored a conference on performance excellence, October 28-29, 2003, which was attended by approximately 350 persons. Outside vendors were invited to show their displays. Performance improvement teams staffed exhibits and presenters provided learning opportunities during the two-day event.

### ***Customer Outreach Day***

On October 21, 2003, the Big Hill site hosted a customer outreach day for oil refiners, the Strategic Petroleum Reserve's primary customers. The event was attended by approximately 250 visitors.

Throughout 2003, customer service teams from the Strategic Petroleum Reserve visited 31 refineries. The objectives of these visits were to:

- Provide updates on the Reserve
- Learn more about customer requirements
- Solicit ideas for improvements
- Cultivate communications

### ***Voluntary Protection Programs***

In 2003, all four storage sites received *Star Among Stars* awards under the Occupational Safety and Health Administration's voluntary protection program. Big Hill won a *Star of Excellence* award while Bryan Mound and West Hackberry each received *Superstar* awards.

To earn a *Star Among Stars* award, a site must have a total recordable case rate and lost workday case rate of 50% or more, below the average for their Standard Industrial Classification Code. *Superstar* eligibility requires that rates be 75% or more, below the Standard Industrial Classification Code average. The *Star of*



*Excellence*, which represents the highest award level, requires that sites be at 90% or more, below the Standard Industrial Classification Code average.

### ***Louisiana Performance Excellence Award***

In December 2003, DynMcDermott, Petroleum Operations Company, the Management and Operations contractor won the Louisiana Performance Excellence Award for the third time.

### ***Real Estate Actions***

Under the Armament Retooling Manufacturing Support Program, the Congress appropriates dollars to rehabilitate unused industrial facilities. On November 3, 2003, the Strategic Petroleum Reserve executed a contract with Mason Technologies, Inc. to use warehouse space at the Stennis Space Center to house Recovery Program equipment.

Real estate support was provided to the Naval Petroleum Reserve, Bakersfield, California, in the drafting of a proposed modification to its existing office space lease, and a justification for consolidating space.

Real estate support was provided in support of a proposed purchase option for property adjacent to the Big Hill site (Appraisal Review and Title Work) as required by PMD 03-02.

## **APPENDIX A**

### **Strategic Petroleum Reserve Site Information**

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#### ***Bryan Mound***

##### **Location**

Brazoria County, Texas (3 miles southwest of Freeport, Texas).

##### **Site Description**

251-million-barrel storage facility consisting of 20 caverns.

24-inch diameter, 6-mile brine disposal pipeline extending 4 miles offshore in the Gulf of Mexico.

Oil, brine and raw water piping distribution system connecting caverns with central plant and water intake structure located on Brazos River. Twenty-one (21) pumps totaling approximately 45,000 horsepower.

##### **System Parameters**

Drawdown Rate:	1,500,000 bbl/d
Raw Water Pumping Rate:	1,545,000 bbl/d
Oil Fill Rate:	225,000 bbl/d
Brine Disposal Rate:	260,000 bbl/d

##### **Distribution Facilities**

DOE 3.9 mile, 30-inch pipeline to Seaway Freeport Marine Terminal, DOE 4.0 mile, 30-inch pipeline to Seaway Jones Creek Tank Farm and Pipeline and DOE 46 mile, 40-inch pipeline to Seaway Texas City Terminal and Docks.

##### **Acquisition**

Acquired 499.47 acres fee simple, by condemnation April 1977, from Freeport Mineral Company and other owners. Dow Chemical Company was the previous operator.

#### ***West Hackberry***

##### **Location**

Cameron Parish, Louisiana (25 miles southwest of Lake Charles, Louisiana).

##### **Site Description**

230-million-barrel storage facility consisting of 22 caverns.

Oil, brine, and raw water piping distribution system connecting caverns with central plant, water intake structure located on Intra-coastal waterway and 9-brine disposal wells. Thirty-three (33) pumps totaling over 41,680 horsepower.

##### **System Parameters**

Drawdown rate:	1,300,000 bbl/d
Raw Water Pumping Rate:	1,632,000 bbl/d
Oil Fill Rate:	225,000 bbl/d
Brine Disposal Rate:	225,000 bbl/d

##### **Distribution Facilities**

DOE 42.8 mile, 42-inch pipeline to Sunoco Nederland Terminal.  
DOE 13.6 mile, 36-inch pipeline to Shell Pipeline common carrier pipeline system at Carlyss.

##### **Acquisition**

Acquired 405.36 acres fee simple by condemnation, April 1977, from numerous private landowners. Olin Corporation was the previous site operator. Acquired 160.0 additional acres fee simple by condemnation in two actions, July 1979 and March 1980.

## **Big Hill**

### **Location**

Jefferson County, Texas (26 miles southwest of Beaumont, Texas).

### **Site Description**

170-million-barrel storage facility consisting of 14 caverns.

Oil, brine, and raw water systems connecting caverns with central plant, water intake structure located on the Intracoastal Waterway, and a 48-inch diameter, 14-mile brine disposal pipeline extending 4 miles offshore in the Gulf of Mexico. Forty-eight (48) pumps totaling 46,000 horsepower.

### **System Parameters**

Drawdown Rate:	1,100,000 bbl/d
Raw Water Pumping Rate:	1,400,000 bbl/d
Oil Fill Rate:	225,000 bbl/d
Brine Disposal Rate:	432,000 bbl/d

### **Distribution Facilities**

DOE 24.5 mile, 36-inch pipeline to Sunoco Nederland Terminal  
Unocal 2 mile, 24-inch pipeline to Unocal Docks  
Equilon 20-inch pipeline system to East Houston.

### **Acquisition**

Acquired 271 acres fee simple, by condemnation November 1982 and July 1983, from three landowners, i.e., 238.48 acres from Amoco, 27.06 acres from the Pipkin estate, and 5.46 acres from the Patrick Henry Phelan estate.

## **Bayou Choctaw**

### **Location**

Iberville Parish, Louisiana (12 miles southwest of Baton Rouge, Louisiana).

### **Site Description**

76-million-barrel storage facility consisting of 6 caverns.

Oil, brine, and raw water piping distribution system connecting caverns with central plant, a water intake structure, 12 brine disposal wells, and a pipeline for disposing of brine to Union Texas Petroleum, Inc. Eighteen (18) pumps totaling over 18,000 horsepower.

### **System Parameters**

Drawdown Rate:	515,000 bbl/d (sour) 300,000 bbl/d (sweet)
Raw Water Pumping Rate:	515,000 bbl/d
Oil Fill Rate:	110,000 bbl/d
Brine Disposal Rate:	110,000 bbl/d

### **Distribution Facilities**

DOE-owned 37.2 mile, 36-inch pipeline to Equilon's Sugarland Terminal and Capline Pipeline. Equilon-owned 16 mile, 24 inch pipeline to Baton Rouge.

### **Acquisition**

Acquired 355.95 acres fee simple, by condemnation April 1977, from numerous private owners. Union Texas Petroleum (a subsidiary of Allied Corporation) was the previous operator.

In 1985, the Department of Energy acquired an additional existing cavern through a cavern exchange agreement with Union Texas Petroleum. The transaction involved a 3.5-acre exchange with no net change in Government-owned acreage.

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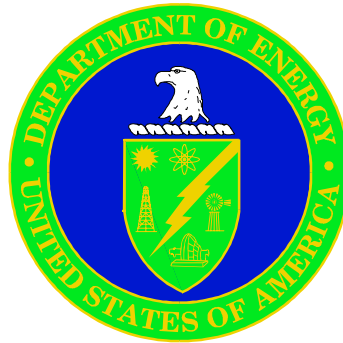
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# Strategic Petroleum Reserve

## Annual Report for Calendar Year 2004

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**U.S. Department of Energy  
Assistant Secretary for Fossil Energy  
Office of Strategic Petroleum Reserve  
Washington, D.C. 20585**

**SPR Home Page: [www.spr.doe.gov](http://www.spr.doe.gov)**

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Name/Org: R. LaMonda, FE-40 Date: 6-01-2005

Guidance (if applicable): CG-SS-4

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## TABLE OF CONTENTS

---

### EXECUTIVE SUMMARY

Strategic Petroleum Reserve Status .....	1
Oil Acquisitions and Exchanges .....	1
Hurricane Ivan .....	1
Storage Capacity .....	1
Commercialization Activities .....	1
Security and Emergency Operations .....	1
Environment, Safety, and Health .....	2

### PROGRAM MISSION

Introduction .....	3
Legislative History .....	3
Strategic Petroleum Reserve Plan and Amendments .....	6

### PROGRAM MANAGEMENT

Organization .....	7
Contractual Support .....	8

### CRUDE OIL STORAGE PROGRAM

Storage Facilities Capacity and Drawdown Capability .....	9
Major Maintenance Program .....	11
Status of Storage Sites .....	11
Operational Limitations and Issues .....	12

### PETROLEUM ACQUISITION AND SALES

Crude Oil Inventory Status .....	13
Royalty-in-Kind Crude Oil Transfers .....	18
Crude Oil Time Exchange Agreements .....	19
Hurricane Ivan Exchange .....	19

### EMERGENCY RESPONSE CAPABILITIES

Sale of Oil .....	20
Competitive Sales Procedures .....	20
Drawdown Capabilities .....	21
Drawdown Readiness Activities .....	23
Distribution Plan and Capabilities .....	23
Distribution Assessment .....	24
Import Protection Levels .....	26

### COMMERCIALIZATION ACTIVITIES

Commercial Leases .....	28
Foreign Oil Storage .....	28
Commercialization Revenues .....	29

**BUDGET AND FINANCE**

Appropriations through Fiscal Year 2004 .....	30
Strategic Petroleum Reserve Account .....	30
SPR Petroleum Account .....	30
Performance Measurement .....	32

**OTHER ACTIVITIES**

Security and Emergency Operations.....	34
Environment, Safety, and Health .....	34
Awards and Certifications.....	36
Louisiana Environmental Management Award .....	36
Integration of the ISO 14001 into the Environmental Management System.....	36
Environmental Performance Track Program .....	38
Pollution Prevention .....	38
ISO 9001 Quality Management System .....	38
New Orleans Federal Performance Excellence Network .....	38
International Petroleum Stockpiling Symposium .....	38
Performance Excellence Conference .....	39
Customer Service .....	39
Real Estate Actions .....	39

**APPENDIX A Strategic Petroleum Reserve Site Information**

Bryan Mound .....	40
West Hackberry .....	40
Big Hill .....	41
Bayou Choctaw .....	41

**LIST OF FIGURES**

Figure 1. Storage Sites and Distribution System .....	10
Figure 2. Cumulative Oil Fill .....	17
Figure 3. Projected Maximum Drawdown Capability .....	22
Figure 4. Pipeline and Marine Distribution Capabilities .....	25
Figure 5. Days of Net Import Protection (1977-2004).....	26
Figure 6. International Energy Program U.S. Emergency Stocks .....	27
Figure 7. Reportable Environmental Events .....	37

**LIST OF TABLES**

Table 1. SPR Storage Capacity and Drawdown Capability .....	9
Table 2. Year-End Inventories and Oil Fill History .....	14
Table 3. Crude Oil Receipts through December 2004 .....	15
Table 4. Crude Oil Inventory as of December 31, 2004 .....	16
Table 5. Crude Oil Streams.....	21
Table 6. Drawdown and Distribution Capabilities .....	24
Table 7. Summary of Commercialization Revenues .....	29
Table 8. Annual Appropriations for Storage Facilities Operations and Management and Petroleum Acquisition and Transportation .....	31

## ***EXECUTIVE SUMMARY***

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### ***Strategic Petroleum Reserve Status***

As of December 31, 2004, the crude oil inventory was 675.6 million barrels and the maximum capable drawdown rate was 4.4 million barrels a day. All storage sites are fully operational.

On November 13, 2001, President Bush announced his intent to fill the Strategic Petroleum Reserve to its then capacity of 700 million barrels. The Strategic Petroleum Reserve will be filled through the transfer of offshore royalty-in-kind oil from the Department of the Interior to the Department of Energy.

### ***Oil Acquisitions and Exchanges***

Under the Administration's extended royalty-in-kind initiative to fill the Strategic Petroleum Reserve, a total of 88.1 million barrels of oil had been delivered through December 31, 2004 (41.1 million barrels in calendar year 2004). A final solicitation will be issued in 2005 to complete fill to a level of 700 million barrels.

In 2004, the Strategic Petroleum Reserve received the final delivery of 0.6 million barrels under the 30 million barrel crude oil time exchange contracts entered into with oil companies in 2000. A total of 35 million barrels were received as of December 31, 2004.

### ***Hurricane Ivan***

Hurricane Ivan struck the Gulf of Mexico in mid-September 2004 and caused significant disruption to crude oil supplies. In response to several emergency requests from refiners for assistance, the Department of Energy loaned a total of 5.4 million barrels of crude oil from the Strategic Petroleum Reserve.

The companies will return a total of 5.6 million barrels to the Strategic Petroleum Reserve, repaying the original barrels plus an interest premium. One million barrels were returned by December 31, 2004, and the remaining 4.6 million barrels are scheduled for delivery in 2005.

### ***Storage Capacity***

The Strategic Petroleum Reserve's rated crude oil storage capacity has been an estimated 700 million barrels since 1998. This capacity was based on rough estimates of cavern volumes, as measured by cavern storage capacities. A re-evaluation of the cavern storage capacity during 2003 revealed that an additional 27 million barrels of capacity is available for crude oil storage. This added capacity results from the dissolution of salt by water injected into the caverns during oil movements and the re-certification of an existing 12 million barrel cavern, previously considered as too gassy for long term crude oil storage.

### ***Commercialization Activities***

During calendar year 2004, the U.S. Treasury received \$3,420,459 in cash revenues from the commercial leases of the Strategic Petroleum Reserve's distribution facilities and pipelines. In addition, 13,791 barrels of crude oil were earned as in-kind interest on government owned oil in tanks leased to Equilon Enterprises.

### ***Security and Emergency Operations***

Following the terrorist attacks on September 11, 2001, the Strategic Petroleum Reserve instituted a higher level of alert and implemented physical security enhancements commensurate with the increased threat. The Strategic Petroleum Reserve continued these measures in 2004.

The Strategic Petroleum Reserve maintains a state-of-the-art security program that provides a high level of protection for crude oil drawdown operations, facilities and personnel.

With the initiation of an “all hazards response” approach in 2004, a more efficient and effective mechanism to mitigate and manage security and/or emergency operations has been established. This approach is the result of a combined effort between security, emergency management, and operations to more effectively mitigate emergency incidents.

Security and Emergency Operations strengthened its formal relationships with local, state, and Federal emergency response teams and law enforcement agencies. These relationships allow Security and Emergency Operations to conduct joint exercises that mirror real-world incidents, as well as contributing to the overall protection of the Strategic Petroleum Reserve and the community.

At the close of calendar year 2004, the Strategic Petroleum Reserve was in Security Condition Yellow, in accordance with Department of Energy Office of Security and Performance Assurance (SP-1) and Homeland Security directives. All of its employees are aware of their protection responsibilities for crude oil operations, resources, and personnel.

### ***Environment, Safety, and Health***

In 2004, three major NEPA compliance activities occurred and the Reserve continued to operate under an ISO 14001 environmental management certification.

In April 2004, a second round of degassing began at the Big Hill site. A portable plant is being used and will be moved to Bryan Mound following completion of degassing operations at Big Hill in 2006.

The Occupational Safety and Health Administration and the Department of Energy recognized the Strategic Petroleum Reserve for achieving *Star* status in its voluntary protection programs in recognition of low accident rates.



## ***PROGRAM MISSION***

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### ***Introduction***

The Strategic Petroleum Reserve was authorized in 1975 in response to the 1973 Arab oil embargo. It is authorized by the Energy Policy and Conservation Act (EPCA)(Public Law 94-163), and by the comprehensive energy plans of all Administrations since 1975, in recognition of the long-term dependence of the United States on imported crude oil and petroleum products. Section 165 of EPCA requires the Secretary of Energy to submit an Annual Report to the President and the Congress.

As of December 31, 2004, the inventory in the Strategic Petroleum Reserve was 675.6 million barrels of crude oil, the highest inventory level ever achieved. The inventory amounted to fifty-seven days of net imports. The United States relies on a combination of oil in the Strategic Petroleum Reserve and private stocks to meet its oil storage obligations under the agreement on an International Energy program.

### ***Legislative History***

EPCA, enacted on December 22, 1975, authorized the establishment of the Strategic Petroleum Reserve to reduce the impact of a severe energy supply interruption, and to carry out the obligations of the United States under the International Energy Program.

EPCA was amended by Title VIII of the Energy Security Act (Public Law 96-294), enacted on June 30, 1980. The Act established a minimum average daily fill rate of 100,000 barrels and precluded sale of Naval Petroleum Reserve Numbered 1 (Elk Hills, California) crude oil, except to fill the Strategic Petroleum Reserve, unless the Strategic Petroleum Reserve was being filled at the minimum rate or had an inventory of 500 million barrels.

The Energy Policy and Conservation Amendments Act of 1985 (Public Law 99-58), enacted on July 2, 1985, extended the provisions of Title I, Part B, of EPCA relating to the Strategic Petroleum Reserve until June 30, 1989, and directed the Secretary of Energy to conduct a sale or exchange of 1.1 million barrels of crude oil to test the drawdown and distribution capabilities of the Strategic Petroleum Reserve.

The Omnibus Budget Reconciliation Act of 1986 (Public Law 99-509), enacted on October 18, 1986, amended EPCA to require that the Strategic Petroleum Reserve be filled at a minimum rate of 75,000 barrels a day until at least 750 million barrels were in storage.

Public Law 101-46, enacted on June 30, 1989, extended Strategic Petroleum Reserve authorities contained in EPCA until April 1, 1990. The Act also required the Secretary of Energy to submit a report to Congress by February 1, 1990, on alternative means of financing oil acquisition for the Strategic Petroleum Reserve. Short-term extensions of the Strategic Petroleum Reserve authorities contained in EPCA were enacted on March 31, 1990 (Public Law 101-262), and August 10, 1990 (Public Law 101-360).

On September 15, 1990, the President signed the Energy Policy and Conservation Act Amendments of 1990 (Public Law 101-383), extending authorization for the Strategic Petroleum Reserve until September 30, 1994. This legislation also contained provisions to amend drawdown authorities, require a Strategic Petroleum Reserve Plan Amendment for completion of storage capacity for one billion barrels, authorize the drawdown and distribution tests, and provide for a refined petroleum product reserve test program.

On October 24, 1992, the President signed the Energy Policy Act of 1992 (Public Law 102-486). The Act included provisions to (1) add new conditions for drawdown in emergency situations involving a supply reduction of significant scope and duration, coupled with a severe price increase likely to cause a major adverse impact on the nation's economy, (2) allow the enlargement of the Reserve to one billion barrels, (3) permit the Secretary of Energy to make payment in advance for delivery of petroleum product either owned or not owned by the United States for storage in the Strategic Petroleum Reserve or non-Strategic Petroleum Reserve facilities, (4) give the President discretionary authority to acquire domestic stripper well oil at competitive prices to fill the Reserve, and (5) amend the eligibility criteria for a Regional Petroleum Reserve.

On October 22, 1994, the President signed into law the Energy Policy and Conservation Act Amendments Act of 1994 (Public Law 103-406), extending authorization for the Reserve to June 30, 1996.

The Balanced Budget Downpayment Act (Public Law 104-99), enacted on January 26, 1996, required the sale of up to \$100 million of Weeks Island oil to fund decommissioning activities.

The Omnibus Consolidated Rescissions and Appropriations Act of 1996 (Public Law 104-134), enacted on April 26, 1996, required the sale of \$227 million of Weeks Island oil for deficit reduction.

The Omnibus Consolidated Appropriations Act (Public Law 104-208), enacted on September 30, 1996, appropriated \$220 million for the Strategic Petroleum Reserve in fiscal year 1997 to be financed through the sale of Reserve oil. The Strategic Petroleum Reserve authorities expired on June 30, 1996. On October

14, 1996, Public Law 104-306 extended the authorization for the Strategic Petroleum Reserve until September 30, 1997. After the expiration of that authorization, the Reserve was not reauthorized until June 1998.

The Balanced Budget Act of 1997 (Public Law 105-33), enacted on August 5, 1997, added a new section 168 to EPCA, authorizing the leasing of underutilized Strategic Petroleum Reserve facilities for the storage of oil owned by a foreign government or its representatives.

The Department of the Interior and Related Agencies Appropriations Act, 1998 (Public Law 105-83), enacted on November 14, 1997, appropriated \$207.5 million for the Strategic Petroleum Reserve in fiscal year 1998 to be financed through the sale of Reserve oil.

The 1998 Supplemental Appropriations and Rescissions Act (Public Law 105-174), enacted on May 1, 1998, included a provision which prohibited the drawdown and sale of Strategic Petroleum Reserve oil if the President determined that a sale would be imprudent in light of market conditions and designated the \$207.5 million in foregone revenue as an emergency requirement under the Balanced Budget Act of 1985. The President made the requisite determination and designation on May 8, 1998.

On June 1, 1998, the President signed Public Law 105-177 to extend certain EPCA programs. The Act extended the authorization for the Strategic Petroleum Reserve and participation in the International Energy Program through September 30, 1999, and expanded the antitrust protection for U.S. companies participating in International Energy Agency activities. The Act also authorized the drawdown and distribution of crude oil from the Strategic Petroleum Reserve only for the purposes described in the Act, and required that the Secretary of Energy request funds for acquisition, transportation and injection

of petroleum products for storage in the Reserve or provide a written explanation if no request for funds was made. The Omnibus Consolidated and Emergency Supplemental Appropriations Act, 1999 (Public Law 105-277), enacted on October 21, 1998, included \$160.1 million for the Strategic Petroleum Reserve.

On November 13, 1998, the President signed Public Law 105-388, an Act to extend energy conservation programs under EPCA and the Energy Conservation and Production Act, and for other purposes. The Act provided that, during a drawdown of the Strategic Petroleum Reserve, the State of Hawaii may submit a binding offer for Strategic Petroleum Reserve oil and be entitled to purchase the oil at a price equal to the weighted average price of the successful competitive bids for oil in the applicable category. Deliveries under the binding offer would receive priority scheduling during a Strategic Petroleum Reserve drawdown.

The Strategic Petroleum Reserve authorization expired on September 30, 1999. On October 5, 1999, the President signed Public Law 106-64, extending the authorization for the Reserve and for the EPCA authorities for United States participation in the International Energy Agency program until March 31, 2000.

Appendix C of the Consolidated Appropriations Act, 2000 (Public Law 106-113), enacted on November 29, 1999, included \$159 million for the Strategic Petroleum Reserve. The Act also allowed the Secretary to use other Departmental funds to finance a drawdown from the Strategic Petroleum Reserve.

The Department of the Interior and Related Agencies Appropriations Act, 2001 (Public Law 106-291), signed on October 11, 2000, included \$165 million for the development, operation and management activities of the Strategic Petroleum Reserve under EPCA,

\$4,000,000 to be derived from the transfer of unobligated funds in the “SPR Petroleum Account.”

On November 9, 2000, the President signed Public Law 106-469. Title I of The Energy Act of 2000 reauthorized titles I and II of EPCA through fiscal year 2003, and updated or deleted the EPCA title I Strategic Petroleum Reserve authorities. Title II of Public Law 106-469 amended title I of EPCA to insert a new part D authorizing the Secretary “to establish, maintain, and operate a Northeast Home Heating Oil Reserve,” containing no more than two million barrels of petroleum distillate and located in the Northeast. The new part D Reserve is not a component of the Strategic Petroleum Reserve established under part B of title I of EPCA. Title II also sets forth conditions for release of products from the new part D Reserve, requires transmittal to the President and Congress of a plan describing the Reserve, and upon establishment, requires the Secretary of the Treasury to establish a “Northeast Home Heating Oil Reserve” account at Treasury.

On November 5, 2001, the President signed Public Law 107-63, the Interior and Related Agencies Appropriations Act for fiscal year 2002. The Act included \$171 million for Strategic Petroleum Reserve facilities and operations and \$8 million for the Northeast Home Heating Oil Reserve. Congress further specified that if the full \$8 million is not needed for the Northeast Home Heating Oil Reserve, the Department is encouraged to apply any excess funds to the vapor pressure project to remove excess gas from the oil in the Strategic Petroleum Reserve.

On February 20, 2003, after a series of Continuing Resolutions, the President signed Public Law 108-7, the Consolidated Appropriations Act, 2003. Public Law 108-7 included \$171.7 million for Strategic Petroleum Reserve operations and program management

activities, \$1.9 million for the SPR Petroleum Account, and \$6 million for operation of the Northeast Home Heating Oil Reserve. The law also extended EPCA authority for the Strategic Petroleum Reserve, the Northeast Home Heating Oil Reserve, and United States participation in the International Energy Agency program through September 30, 2008.

On November 10, 2003, the President signed the Department of the Interior and Related Agencies Appropriations Act, 2004 (Public Law 108-108). The Act provided \$171 million for the operations and program management activities of the Strategic Petroleum Reserve and \$5 million for the Northeast Home Heating Oil Reserve.

On December 8, 2004, the President signed the Consolidated Appropriations Act, 2005 (Public Law 108-447). The Act provided \$172.1 million for the operations and program management activities of the Strategic Petroleum Reserve and \$5 million for the Northeast Home Heating Oil Reserve. The Act also required an across-the-board rescission of 0.594 percent of the budget authority provided, reducing the Strategic Petroleum Reserve budget authority to \$171,078,000 and the Northeast Home Heating Oil Reserve authority to \$4,970,300.

### ***Strategic Petroleum Reserve Plan and Amendments***

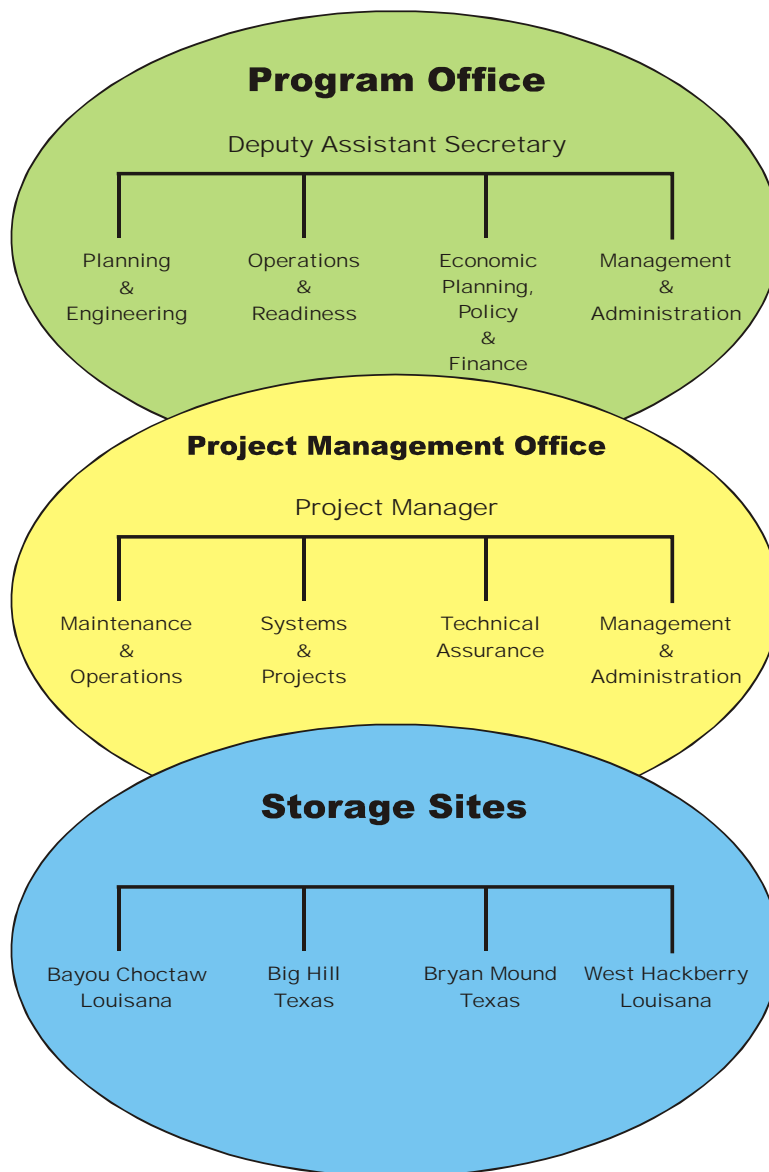
Title I of the Energy Act of 2000 amended EPCA to eliminate the requirement for a Strategic Petroleum Reserve Plan and plan amendments. However, the law requires the Secretary of Energy to submit a plan to Congress if the Secretary decides to expand the Strategic Petroleum Reserve beyond 700 million barrels.

## PROGRAM MANAGEMENT

### Organization

The Assistant Secretary for Fossil Energy at the Department of Energy in Washington, D.C. has overall program responsibility for achieving the goals and objectives of the Strategic Petroleum Reserve. This responsibility is delegated to the Deputy Assistant Secretary for

Petroleum Reserves, and is exercised through the Strategic Petroleum Reserve Headquarters Office in Washington, D.C. and the Project Management Office in New Orleans, Louisiana. Total staffing is 117 Federal full time equivalent employees and 831 contractor employees.



### ***Contractual Support***

The Project Management Office is responsible for the design, development, operation and maintenance of the Strategic Petroleum Reserve and employs a Management and Operating (M&O) contractor, DynMcDermott Petroleum Operations Company, to provide management and manpower to operate and maintain the four Strategic Petroleum Reserve storage facilities and certain related pipeline systems. DynMcDermott will operate the Strategic Petroleum Reserve through March 31, 2008, with an option for DOE to extend the contract for an additional five-year period.

S&B Infrastructure, Ltd., an architect/engineering firm, provided design services for the four storage facilities through March 8, 2005. URS Group Inc. was selected to enter negotiations for the award of a subsequent contract for architectural/engineering services. Sandia National Laboratory provides geotechnical support.

ASRC Construction, Inc. (ACI), a Native Alaskan 8A small business firm, provides construction and construction management services for the four storage facilities under a two-year contract, awarded November 25, 2003, with three one-year renewal option periods, for work formerly performed by the M&O contractor.

Contractors in specific disciplines perform miscellaneous site modifications for major maintenance program activities. Most of these contracts are fixed-price and have terms of less than one year.

Several support services contracts exist for management, technical, and computer support. The largest support service contractor is Deltha-Critique which provides management and technical support services to the Project Management Office under a contract that commenced November 1, 2001. Other support services contractors included ICF Consulting Inc., PB Energy Storage Services, Inc., AOC Petroleum Support Services, LLC., and Cyborg Inc.

Electrical power is provided to the four storage facilities by local utilities, Reliant Energy and Entergy.

Seaway Pipeline Inc., Sunoco Partners Marketing & Terminals, L.P., and Unocal Corporation, provide commercial terminalling services for fill, drawdown and storage of crude oil. The terms of these contracts are for five years, with three five-year options by which DOE could extend the contracts for up to a total of twenty years each. Seaway Pipeline Inc. is in its third and final option period, Sunoco Partners Marketing & Terminals, L.P. is in its second five-year option period, and Unocal Corporation is in its third five-year option period.

## **CRUDE OIL STORAGE PROGRAM**

### ***Storage Facilities Capacity and Drawdown Capability***

Originally, the Strategic Petroleum Reserve developed four sites in Louisiana and two sites in Texas. Subsequently, two sites in Louisiana were decommissioned, the Sulphur Mines site in 1992, for cost savings, and the Weeks Island site in 1999, because of geotechnical problems. The remaining sites are West Hackberry and Bayou Choctaw in Louisiana, and Bryan Mound and Big Hill in Texas.

The Strategic Petroleum Reserve's oil storage capacity had been estimated at 700 million barrels since 1998, but a reevaluation of the cavern storage capacity during 2003 revealed that an additional 27 million barrels of storage capacity is available. Some of this capacity

resulted from the dissolution of salt by water injected into the caverns during several significant oil movements between 1992 and 2000. The added capacity also includes the recertification of an existing 12 million barrel cavern at Bryan Mound, previously considered too gassy for long term crude oil storage.

Table 1 shows the storage capacity and drawdown capability of the four storage sites as of December 31, 2004. These are grouped into three geographical distribution systems on the Gulf Coast: Seaway, Texoma and Capline. Each system has access to one or more major refining centers, interstate crude oil pipelines, and marine terminals for crude oil distribution. The locations of the Strategic Petroleum Reserve storage sites, and their respective distribution systems, are shown in Figure 1.

**Table 1**  
**SPR Storage Capacity and Drawdown Capability - (December 31, 2004)**

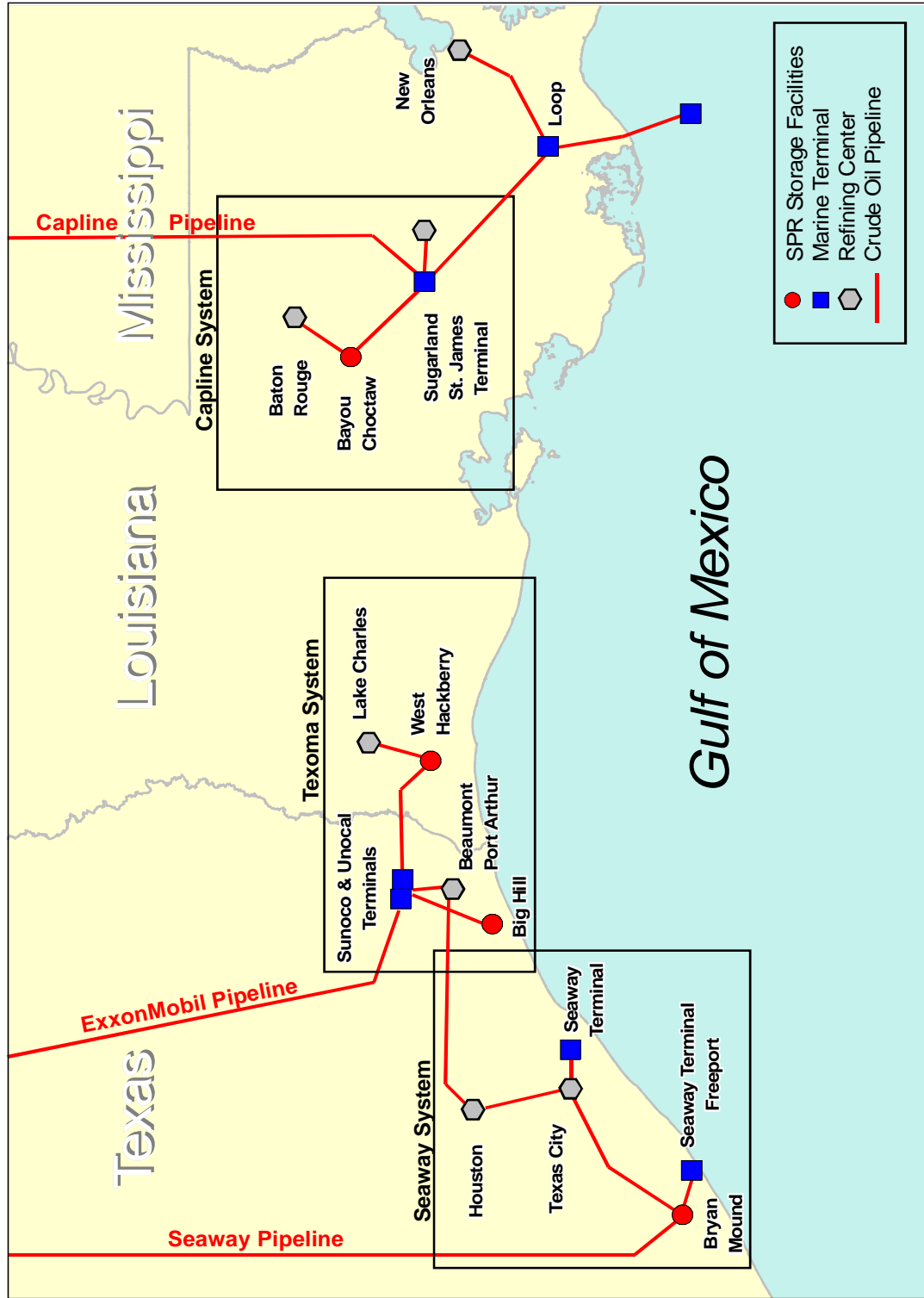
Storage Facility	CURRENT SITE CAPABILITY		
	Storage Capacity (MMB)	Crude Mix Sweet/Sour (MMB)	Drawdown Capability (MB/D)*
Bryan Mound	254	78/176	1,500
West Hackberry	227	119/108	1,300
Big Hill	170	72/98	1,100
BayouChoctaw	76	24/52	515
Total Program	727	293/434 (40%/60%)	4,415

Sweet = Low sulfur crude (S<0.5%)  
Sour = Medium sulfur crude (S<2.0%)

MMB = Million Barrels  
MB/D = Thousand Barrels Per Day

\* Initial 30-day capability.

Figure 1  
Storage Sites and Distribution System



SPR2592.ppt



## **Major Maintenance Program**

The Strategic Petroleum Reserve's major maintenance program includes past and current site construction projects that exceed \$100,000. Project examples are building maintenance, piping replacements and road paving.

## **Status of Storage Sites**

### **Bryan Mound**

The Bryan Mound storage facility in Brazoria County is approximately three miles southwest of Freeport, Texas. The site has 20 storage caverns, a combined storage capacity of 254 million barrels, and a cavern inventory of 230.4 million barrels. The site is fully operational.

In 2004, under the major maintenance program, construction was completed to remove the halon systems, erect equipment pump shelters, upgrade electrical systems and fire pump supports at the raw water intake structure, upgrade cable tray supports and light poles, repair the raw water intake structure, and improve the cavern flush system. Contracts have been awarded and construction is ongoing to purchase new heat exchanger tube bundles, improve site drainage and paving, add site entrance security barriers, and clean, inspect and repair a crude oil tank.

### **West Hackberry**

The West Hackberry storage facility in Cameron Parish is approximately 25 miles southwest of Lake Charles, Louisiana. The site has 22 storage caverns, a combined storage capacity of 227 million barrels and a cavern inventory of 212.2 million barrels. The site is fully operational.

In 2004, under the major maintenance program, construction was completed to remove the halon systems, restore site protection dikes, replace an off site meter control panel, replace

heat exchanger tube bundles, repair off site pipelines, and add remote control of off site pipeline valves. Contracts have been awarded and construction is ongoing to add site entrance security barriers. As of December 31, 2004, construction was near completion to repair the anhydrite pond clay cap.

### **Bayou Choctaw**

The Bayou Choctaw storage facility in Iberville Parish is approximately 12 miles southwest of Baton Rouge, Louisiana. The site has six storage caverns, a combined storage capacity of 76 million barrels, and a cavern inventory of 73.7 million barrels. The site is fully operational.

In 2004, under the major maintenance program, construction was completed to remove the halon systems, upgrade brine system pumps and piping, replace site bridges, and remediate bank erosion. Contracts have been awarded and construction is ongoing to upgrade raw water header piping, replace the Distributed Control System, add site entrance security barriers, and purchase new heat exchanger tube bundles.

### **Big Hill**

The Big Hill storage facility in Jefferson County is 26 miles southwest of Beaumont, Texas. The site has 14 storage caverns, a combined storage capacity of 170 million barrels, and a cavern inventory of 157.6 million barrels. The site is fully operational.

In 2004, under the major maintenance program, construction was completed to remove the halon systems, replace heat exchanger tube bundles, repair off site pipelines, and add remote control to off site pipeline valves. Contracts have been awarded and construction is ongoing to replace site perimeter detection systems, add site entrance security barriers, upgrade site drainage, and renovate site buildings.

## ***Operational Limitations and Issues***

### **Long-term Vapor Pressure Mitigation**

Long-term storage of crude oil in underground solution-mined salt caverns results in elevated oil temperatures and increased crude vapor pressure due to gradual geothermal heating and possible methane gas intrusion from the salt formation. Consequently, when oil is drawn down, or removed from the caverns, increased vapor pressure results in gas being released in amounts that may be unacceptable, posing environmental, safety, and health risks.

An initial degasification program was conducted between 1995 and 1998. With support from Sandia National Laboratories, the Strategic Petroleum Reserve has maintained a comprehensive monitoring program to ascertain the level of gas regain and the need for future degasification. During 2000, the monitoring program revealed the need for further long-term vapor pressure control. The most cost-effective solution was determined to be the acquisition of a modular degasification plant which could be moved from site to site, as needed.

The portable degas plant had a successful and safe startup in April 2004, and has performed beyond design expectations, in both maximum throughput rate and plant availability, as well as in several other performance parameters. Given its performance to date, the Reserve is increasingly confident that the plant will meet long term vapor pressure gas removal needs. Planning is beginning on a task to relocate the plant to Bryan Mound after completion of Big Hill degassing operations in 2006.

## ***PETROLEUM ACQUISITION AND SALES***

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### ***Crude Oil Inventory Status***

On December 31, 2004, the Strategic Petroleum Reserve's crude oil inventory was 675,600,051 barrels, an increase of 37.2 million barrels from December 31, 2003. The net change is due to the receipts from the royalty-in-kind oil transfer, deliveries under time-exchange agreements and Hurricane Ivan deliveries and receipts.

The current mix of crude oil is 60 percent high sulfur (sour) and 40 percent low sulfur (sweet).

Table 2 lists year-end inventories and average daily fill rates for the years 1977 through 2004 (by fiscal and calendar year).

Table 3 lists crude oil receipts by country of origin since 1977.

Table 4 identifies the location of the inventory by storage site, and Figure 2 illustrates the cumulative oil fill.

**Table 2**  
**Year-End Inventories and Oil Fill History**

	FISCAL YEAR		CALENDAR YEAR	
	Year-End Inventory (MMB)	Average Daily Fill Rate* (MB/D)	Year-End Inventory (MMB)	Average Daily Fill Rate* (MB/D)
1977	1.1	3	7.2	20
1978	49.1	131	68.5	168
1979	91.2	115	91.7	64
1980	92.8	4	107.8	44
1981	199.2	292	230.3	336
1982	277.9	215	293.8	174
1983	361.0	228	379.1	234
1984	431.1	191	450.5	195
1985	489.3	159	493.3	119
1986	506.4	47	511.6	51
1987	533.9	75	540.6	80
1988	554.7	57	559.5	52
1989	577.1	62	579.9	56
1990	589.6	34	585.7	27
1991	568.5	(58)	568.5	(47)
1992	571.4	8	574.7	17
1993	585.7	39	587.1	34
1994	591.7	16	591.7	13
1995	591.7	**	591.6	**
1996	573.6	(49)	565.8	(70)
1997	563.4	(28)	563.4	(7)
1998	563.4	**	561.1	***
1999	564.9	4	567.0	16
2000	570.3	15	540.7	(72)****
2001	544.8	(70)*****	550.2	26
2002	587.2	116	599.1	134
2003	624.4	102	638.4	108
2004	670.3	126*****	675.6	102*****

\* Fill rates adjusted for oil sales.

\*\* Fill suspended during this period

\*\*\* Decrease due to Maya exchange

\*\*\*\* Net decrease due to Exchange 2000

\*\*\*\*\* Net Hurricane Ivan deliveries and receipts

*Official Use Only*

**Table 3**  
**Crude Oil Receipts through December 2004\***  
**(Million Barrels)**

<b>Source Country</b>	<b>2004</b>	<b>Cumulative</b>	<b>Percent of Total</b>
<b>Mexico</b>		<b>265.7</b>	<b>34.2</b>
<b>United Kingdom</b>	<b>0.6</b>	<b>192.9</b>	<b>24.8</b>
<b>United States**</b>	<b>8.5</b>	<b>84.9</b>	<b>10.9</b>
<b>Saudi Arabia</b>		<b>28.3</b>	<b>3.6</b>
<b>Libya</b>	<b>3.4</b>	<b>27.2</b>	<b>3.5</b>
<b>Venezuela</b>	<b>4.6</b>	<b>24.0</b>	<b>3.1</b>
<b>Iran</b>		<b>20.0</b>	<b>2.6</b>
<b>United Arab Emirates</b>		<b>18.4</b>	<b>2.4</b>
<b>Nigeria</b>		<b>16.2</b>	<b>2.1</b>
<b>Equatorial Guinea</b>	<b>6.8</b>	<b>14.1</b>	<b>1.8</b>
<b>Norway</b>		<b>14.0</b>	<b>1.8</b>
<b>Angola</b>	<b>11.8</b>	<b>13.3</b>	<b>1.7</b>
<b>Cameroon</b>	<b>1.8</b>	<b>11.3</b>	<b>1.5</b>
<b>Oman</b>		<b>9.0</b>	<b>1.2</b>
<b>Egypt</b>		<b>8.9</b>	<b>1.1</b>
<b>Algeria</b>		<b>6.2</b>	<b>0.8</b>
<b>Ecuador</b>		<b>6.2</b>	<b>0.8</b>
<b>Russia</b>	<b>5.3</b>	<b>5.6</b>	<b>0.7</b>
<b>Iraq</b>		<b>3.4</b>	<b>0.4</b>
<b>Gabon</b>		<b>2.4</b>	<b>0.3</b>
<b>Qatar</b>		<b>2.3</b>	<b>0.3</b>
<b>Columbia</b>		<b>1.2</b>	<b>0.2</b>
<b>Argentina</b>		<b>0.4</b>	<b>0.1</b>
<b>Ivory Coast</b>		<b>0.4</b>	<b>0.1</b>
<b>Peru</b>		<b>0.4</b>	<b>0.1</b>
<b>Total ***</b>	<b>42.7</b>	<b>776.6</b>	<b>100.0</b>

\* Cumulative total receipts unadjusted for sales and operational gains and losses.

\*\* Included receipts from offshore Gulf of Mexico.

\*\*\* Totals do not add due to rounding.

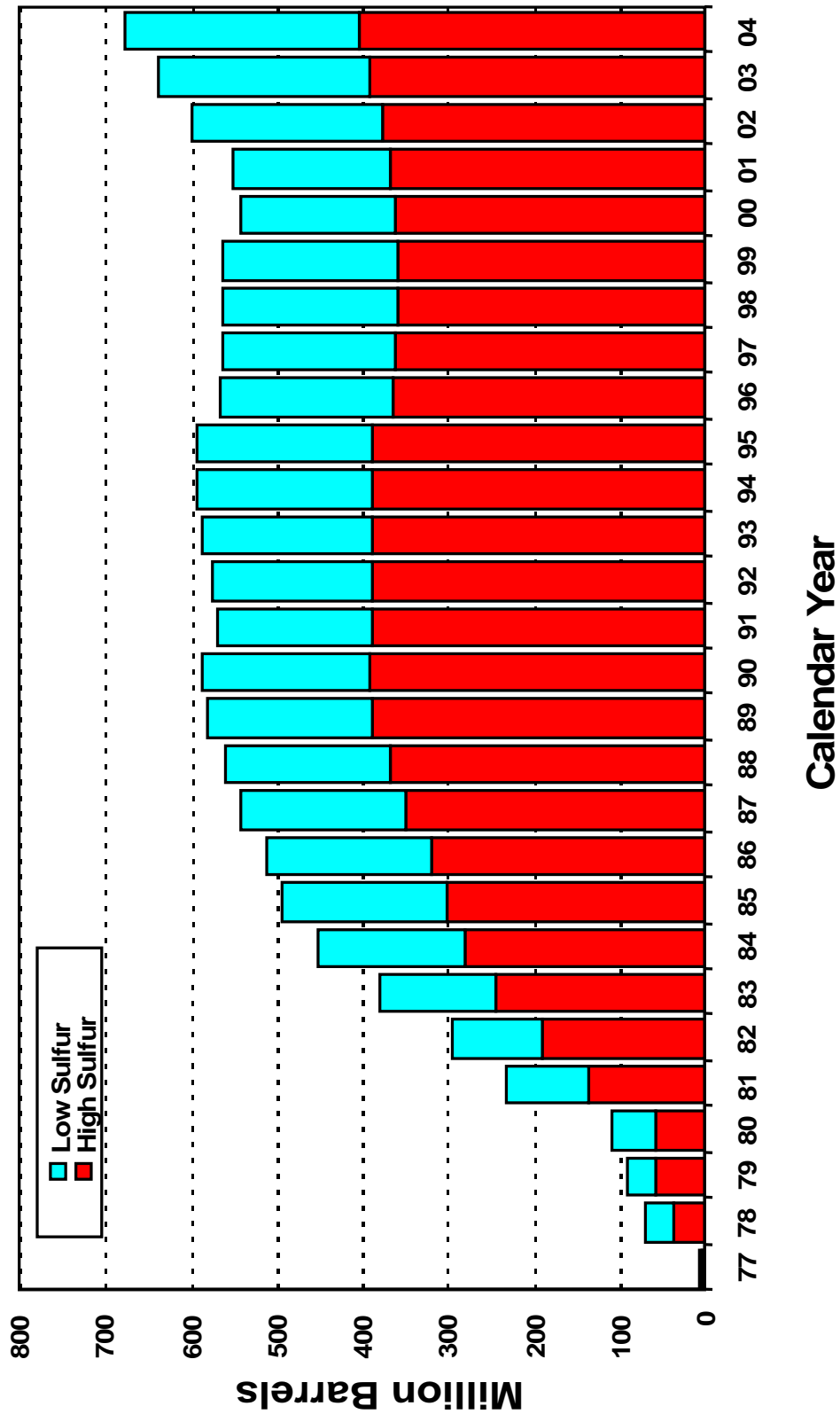
**Table 4**  
**Crude Oil Inventory as of December 31, 2004**

Storage Site	Inventory (Million Barrels)			Cubic Meters (Millions)
	Sweet*	Sour**	Total	
Bryan Mound, Brazoria County, Texas	73.3	157.1	230.4	36.6
Big Hill, Jefferson County, Texas	71.8	85.7	157.6	25.1
West Hackberry, Cameron Parish, Louisiana	104.2	108.0	212.2	33.7
Bayou Choctaw, Iberville Parish, Louisiana	22.1	51.6	73.7	11.7
Underground Inventory Subtotal	271.5	402.4	673.9	107.1
Tanks and Pipelines	0.7	1.1	1.7	0.3
Total Inventory	272.2	403.4	675.6	107.4
Total Accounts Receivable	4.8	0.0	4.8	0.8
Total SPR Book Inventory	277.0	403.5	680.4	108.2

\* Sulfur content not exceeding 0.5 percent

\*\* Sulfur content greater than 0.5 percent

**Figure 2**  
**Cumulative Oil Fill**



### ***Royalty-in-Kind Crude Oil Transfers***

In February 1999, the Department of Energy and the Department of the Interior agreed to transfer 28 million barrels of royalty oil to the Strategic Petroleum Reserve. This oil would replace 28 million barrels sold in the years 1996-1997. Under this plan, Federal land leaseholders in the Gulf of Mexico were directed to pay a portion of royalties (one-eighth to one-sixth of the oil produced) in crude oil (royalty-in-kind) instead of cash to the United States.

The Department of Energy contracted with commercial entities to receive the royalty oil at offshore production facilities and transfer it to the Strategic Petroleum Reserve, either directly or with other crude oil delivered in exchange. Since the transfer of the royalty oil involved contractor costs, paid in crude oil, for transportation to the storage sites, and considered the differences in quality of the royalty oil and the oil delivered, the total amount of oil delivered to the Strategic Petroleum Reserve was expected to be 26-27 million barrels.

As of December 31, 1999, contracts had been awarded to assure the transfer of the total 28 million barrels of royalty-in-kind oil. The last contracts awarded would have completed the delivery of the 28 million barrels to the Strategic Petroleum Reserve by November 2000. However, several deliveries of exchange oil were deferred into calendar years 2001, 2002, and 2003 to alleviate crowding at terminals, and to take advantage of favorable market conditions to swap oil for delivery of a greater number of barrels in the future. As of December 31, 2003, the Strategic Petroleum Reserve had received a total of 30.1 million barrels of exchange oil, completing this initial royalty transfer program.

On November 13, 2001, President Bush announced his intent to fill the Strategic Petroleum Reserve to 700 million barrels through the resumption of the transfer of offshore royalty-in-kind oil from the Department of the Interior to the Department of Energy.

Under the Administration's initiative, the Department of the Interior issues solicitations every six months for the delivery of offshore oil to designated "market centers." The market centers are located at Clovelly, St. James, Houma and Empire, Louisiana, and Texas City and Jones Creek, Texas. Under complementary Department of Energy solicitations, companies receive oil at these market centers in exchange for oil that meets the specifications of the Strategic Petroleum Reserve. The rate of royalty transfer began at 60,000 barrels per day in April 2002. The transfer averaged 116,000 barrels per day in 2003, and 96,000 barrels per day in 2004.

In the first three months of 2004, 11,000 barrels per day of total transfers were delivered directly to the Bryan Mound site instead of being competitively exchanged at a market center. This direct delivery, which minimized deductions for transportation or quality differences, filled the Bryan Mound site to capacity.

Of the total of 88.1 million barrels of oil delivered to the Strategic Petroleum Reserve as of December 31, 2004, under the Administration's 2001 royalty-in-kind initiative, 41.1 million barrels were delivered in calendar year 2004. A final solicitation will be issued in 2005 to fill to a level of 700 million barrels.

The net rate of receipt in 2005 is expected to average 84,000 barrels per day.



### ***Crude Oil Time Exchange Agreements***

On September 22, 2000, President Clinton directed the Secretary of Energy to enter into time exchange agreements with oil companies for up to 30 million barrels of crude oil. Under the exchange agreements, companies were to return a like quantity, plus an agreed premium of similar crude oil, in the fall of 2001.

The average bonus percentage from the initial awards was 4.5 percent, for a total of 31.2 million barrels of exchange oil to be returned to the Reserve. However, the market conditions favoring a deferral of deliveries under the royalty-in-kind exchange contracts also resulted in numerous negotiations for deferrals of a significant portion of the time exchange oil until 2002, 2003, and 2004. As of December 31, 2004, the Strategic Petroleum Reserve had received 35 million barrels (the 0.1 million barrel difference from the 35.1 above was consolidated in a royalty-in-kind contract) under the time exchange (0.6 million barrels in calendar year 2004), completing all deliveries under the time exchange agreements.

### ***Hurricane Ivan Exchange***

Hurricane Ivan struck the Gulf of Mexico in mid-September 2004, and disrupted petroleum supplies. Import vessels were delayed in the short term and a considerable portion of offshore production was delayed for months. Most of the production shut in was sweet crude oil from fields in the Gulf of Mexico, east of Louisiana, which is used in refining gasoline and distillate products.

The Department of Energy received several emergency requests from refiners for assistance in securing supplies of crude oil adequate to avoid cutting back on refining operations. To relieve their shortages, the Strategic Petroleum Reserve loaned a total of 5.4 million barrels of sweet crude oil to five companies. The crude oil from three storage sites was delivered to these refiners in September and early October 2004.

A total of 5.6 million barrels is to be returned to the originating Strategic Petroleum Reserve sites. The crude oil will be of the same quality, plus premium barrels. The premiums were negotiated based on the market value of the loan, accounting for the difference in oil prices between the time of delivery and the time the oil will be returned to the Government.

In November-December 2004, two companies returned one million barrels. The remaining 4.6 million barrels will be delivered by the end of April 2005.

## ***EMERGENCY RESPONSE CAPABILITIES***

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### ***Sale of Oil***

Under section 161 of EPCA, the Secretary of Energy is required to sell oil withdrawn from the Strategic Petroleum Reserve at public sale to the highest qualified bidder.

### ***Competitive Sales Procedures***

The Department of Energy's Standard Sales Provisions\* prescribe the competitive sales process. The first step in the process is the issuance of a Notice of Sale identifying the volume, characteristics, and location of the petroleum for sale, delivery dates, and procedures for submitting offers. Measures required for assuring performance and financial responsibilities are also described in the Notice of Sale.

During a drawdown, multiple Notices of Sale may be issued, each covering a sales period of one to two months. Offerors may have only five days from the date a Notice of Sale is issued until offers are due, with delivery of oil commencing as soon as thirteen days after the Presidential direction to draw down the Reserve. Subsequent sales periods will coordinate Notice of Sale issuance with standard industry delivery periods. Because of the possible short initial lead-time, the Department maintains a registry of prospective offerors who will receive electronic notification of all Notices of Sale.

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\*Department of Energy, 10 CFR Part 625, Price Competitive Sale of Strategic Petroleum Reserve Petroleum; Standard Sales Provisions.

The second step in the sales process is for prospective purchasers to submit offers, as specified in the Notice of Sale. Offerors must unconditionally accept all terms and conditions in the Notice of Sale and submit an offer guarantee of 5 percent of the maximum potential contract amount, or \$10 million, whichever is less. The offer evaluation process is structured so that the offerors bidding the highest prices determine the transportation methods, up to the limits of the distribution system. Specific delivery arrangements are negotiated later in the process.

Within five business days of being notified, all "apparently successful offerors" are required to provide a Letter of Credit equal to 100 percent of the contract amount as a guarantee of performance and payment of amounts due under the contract. Upon timely receipt of the financial guarantees, and a final determination by the Contracting Officer that offers are responsive and offerors responsible, Notices of Award are issued. Deliveries to the purchasers may then begin, consistent with their arrangements for commercial pipeline or marine vessel transportation. Such deliveries may begin as soon as thirteen days after the President issues a finding directing a sale, provided the purchasers submit their financial guarantees and can arrange transportation.

### Drawdown Capabilities

The crude oil acquired for the Strategic Petroleum Reserve is commingled in caverns at the storage sites, creating various distinct crude oil streams available for sale during a drawdown. Table 5 identifies these crude oil streams, delivery modes and locations, as of December 31, 2004.

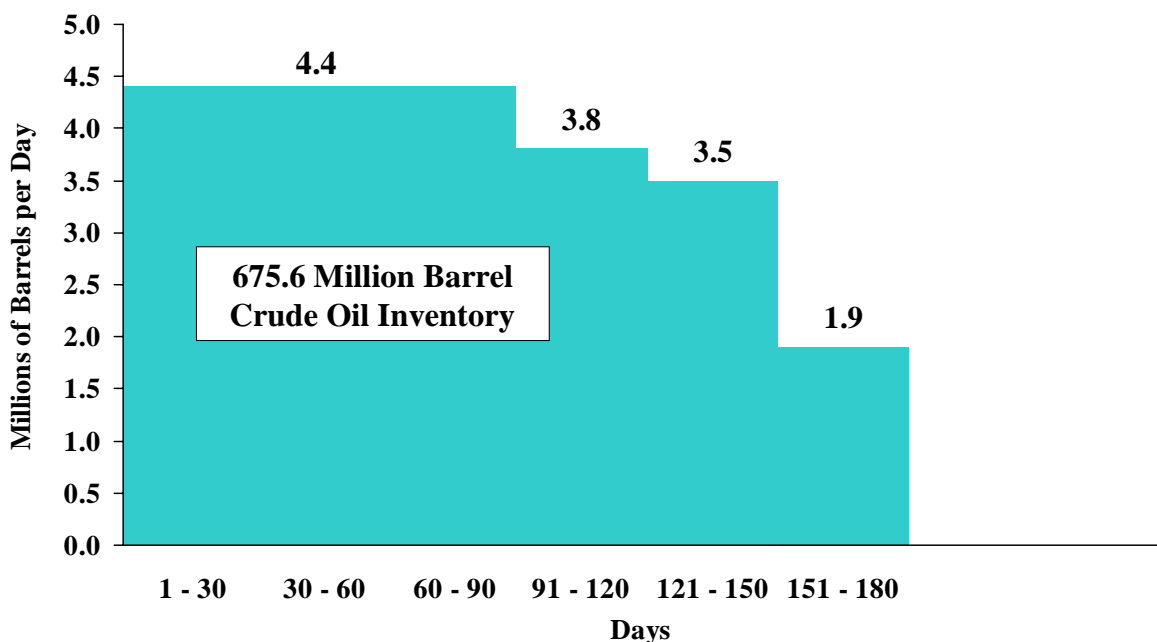
**Table 5  
Crude Oil Streams**

Crude Oil Stream	Gravity (°API)	Sulfur Content (Mass%)	Delivery Mode and Location
<b>Seaway System</b>			
Bryan Mound (Sweet)	35.9	0.33	Pipeline or tankship at Seaway (TEPPCO) Terminal, Freeport, Texas; or Seaway (TEPPCO) Terminal, Texas City, Texas
Bryan Mound (Sour)	33.2	1.39	
<b>Texoma System</b>			
West Hackberry(Sweet)	37.3	0.32	Pipeline, tankship or barge at Sun Partners Marketing & Terminals LP, Nederland, Texas; Pipeline at Shell-22"/DOE connection, Lake Charles, Louisiana
West Hackberry (Sour)	33.5	1.41	
Big Hill (Sweet)	35.9	0.48	Pipeline, tankship or barge at Sun Partners Marketing & Terminals LP, Nederland, Texas; Pipeline or tankship at Unocal Terminal, Nederland, Texas; Pipeline at Shell-20"/DOE connection, Winnie, Texas
Big Hill (Sour)	30.7	1.41	
<b>Capline System</b>			
Bayou Choctaw(Sweet)	36.0	0.36	Pipeline at Capline or LOCAP Terminals, St. James, Louisiana; Tankship at Sugarland St. James Terminal, St. James, Louisiana 24-inch site connection to Red Stick Pipeline, Iberville Parish, Louisiana
Bayou Choctaw (Sour)	32.3	1.38	

The Strategic Petroleum Reserve can draw down crude oil at a maximum initial sustainable rate of 4.4 million barrels per day, for a period of ninety days. After this period, the drawdown rate will gradually decrease as site inventories are depleted and the declining number of caverns containing crude oil becomes a constraint.

Figure 3 illustrates the physical drawdown capability which provides for a maximum distribution of 395 million barrels in ninety days, and 670 million barrels in 180 days. The current maximum sustainable (ninety-day) drawdown rate of 4.4 million barrels per day is a slight increase over 2003, due to inventory additions during 2004.

**Figure 3**  
**Projected Maximum Drawdown Capability**  
**(As of December 31, 2004)**



Note: Rates after 90 days are based on cavern-use assumptions. Actual rates are contingent on the specific caverns drawn down during a previous drawdown period.

### ***Drawdown Readiness Activities***

Drawdown Readiness Assurance activities during 2004 included:

- Drawdown training development and supplemental staff training were completed.
- West Hackberry successfully conducted a systems test exercise that demonstrated its maximum drawdown rate capability to simultaneously send crude oil to the Sun terminal and the Lake Charles meter station.
- Significant progress was made in developing and testing an on-line drawdown sales system. The new system will enable the Strategic Petroleum Reserve to register potential purchasers, issue a Notice of Sale, and receive offers, via the Internet, shortening the overall sales response time.

### ***Distribution Plan and Capabilities***

In the event of an emergency, the Strategic Petroleum Reserve has the capability to distribute its crude oil to refineries in the United States by pipeline and marine transportation. The Strategic Petroleum Reserve is connected to four major interstate pipeline systems, Capline, Seaway, ExxonMobil and MidValley, which serve the mid-continent area (Oklahoma) and the Midwest (Illinois and Ohio).

In addition, the Reserve is connected by commercial pipeline systems to more than half of the refining capacity in the United States and is capable of delivering crude oil to twenty-two refineries in the Gulf Coast region and to twenty-eight refineries in the mid-continent and Midwest regions. These fifty refineries processed approximately 61 percent of crude oil imports to the United States during 2004.

The Strategic Petroleum Reserve is connected to five marine terminals which have a combined distribution capacity of approximately 2.5 million barrels per day. These are: Seaway Terminal (TEPPCO/ConocoPhillips), Freeport, Texas; Seaway Terminal (TEPPCO/BP), Texas City, Texas; Sunoco and Unocal Terminals, Nederland, Texas; and Sugarland St. James Terminal, St. James, Louisiana.

Table 6 summarizes drawdown and distribution capabilities, based on current crude oil stream inventories, existing site drawdown systems, and commercial distribution capabilities. Figure 4 illustrates the Strategic Petroleum Reserve's pipeline and marine distribution capabilities.

**Table 6**  
**Initial (Thirty-Day) Drawdown and Distribution Capabilities**  
**(Thousands of Barrels Per Day)**

	<b>Drawdown</b>	<b>Distribution</b>
Seaway System	1,500	2,521
Texoma System	2,400	3,044
Capline System	515	1,479
<b>Total</b>	<b>4,415</b>	<b>7,044</b>

***Distribution Assessment***

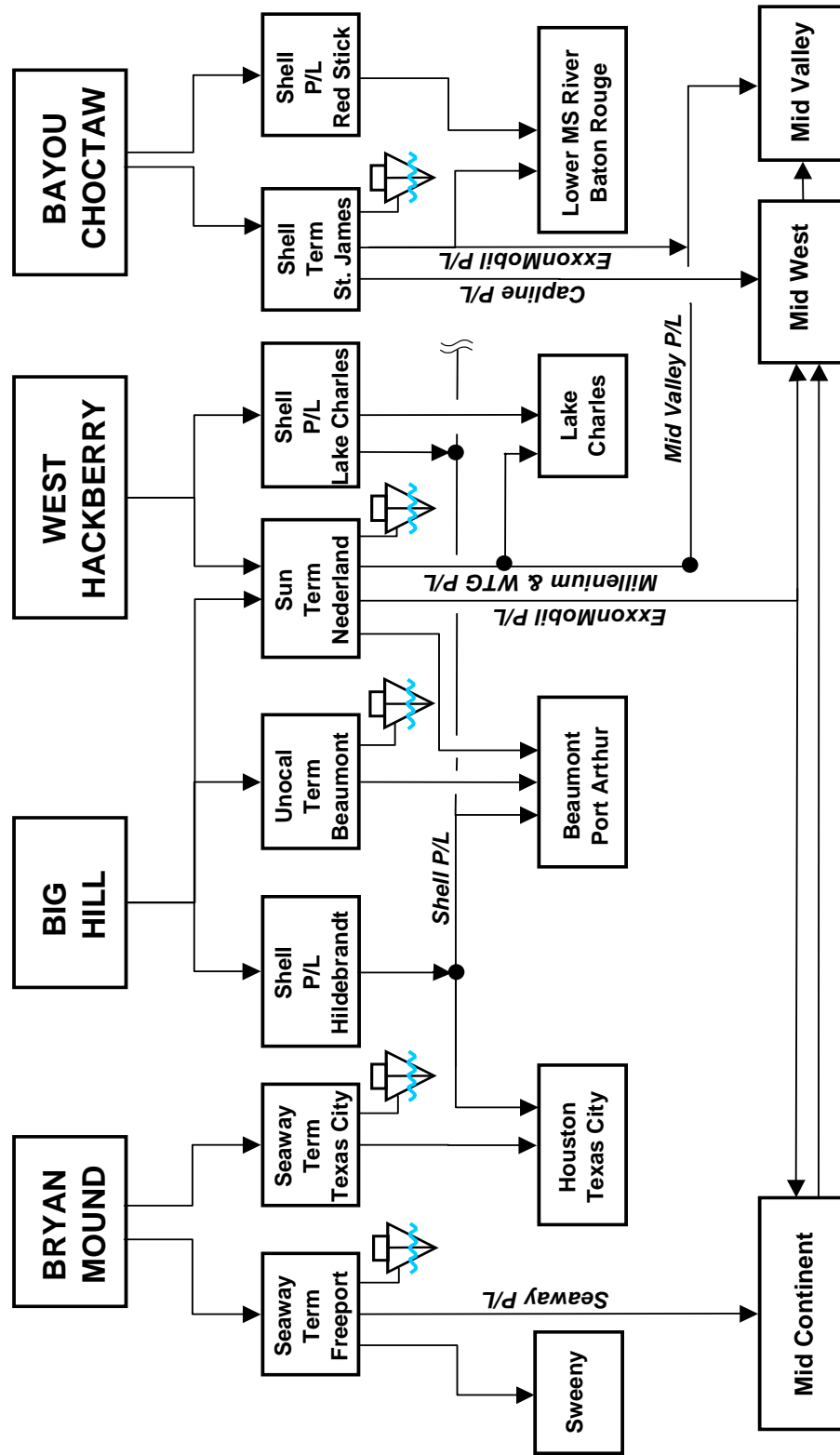
An annual assessment is conducted of the Strategic Petroleum Reserve's crude oil distribution system capabilities to ensure that there are adequate connections to the commercial distribution systems, and to identify the need for any remedial plans. The 2004 assessment evaluated the Strategic Petroleum Reserve's capability, at its maximum drawdown rate, to replace imported oil in 2003, 2005, 2010, and 2015. Future U.S. petroleum refining demands are based on forecasts made in the Energy Information Administration's *Annual Energy Outlook, 2004*.

The assessment took into account changes made to commercial pipeline distribution systems and modifications to their infrastructure. A Canadian company, Enbridge Pipeline Co., purchased a products line to move a small amount of Canadian crude oil each day to an Oklahoma refinery. Enbridge also announced the planned construction of a new crude oil line from Superior Terminal (Canada) to the Wood River Terminal in Illinois. When this line is completed, the volume deliverable to refineries in the Midwest, and possibly, further south, will increase.

The assessment confirms that the Strategic Petroleum Reserve has sufficient offsite distribution capabilities (defined as 120 percent of the maximum drawdown rate) to achieve current drawdown targets.

The assessments for 2005, 2010 and 2015 predict that the Strategic Petroleum Reserve's distribution capability will continue to increase in the Seaway and Texoma systems as refinery imports increase, and distribution in the Capline system will decrease due to increasing domestic production from the Gulf of Mexico, but not enough to cause performance to fall below the 120 percent requirement.

**Figure 4**  
**Pipeline and Marine Distribution Capabilities**

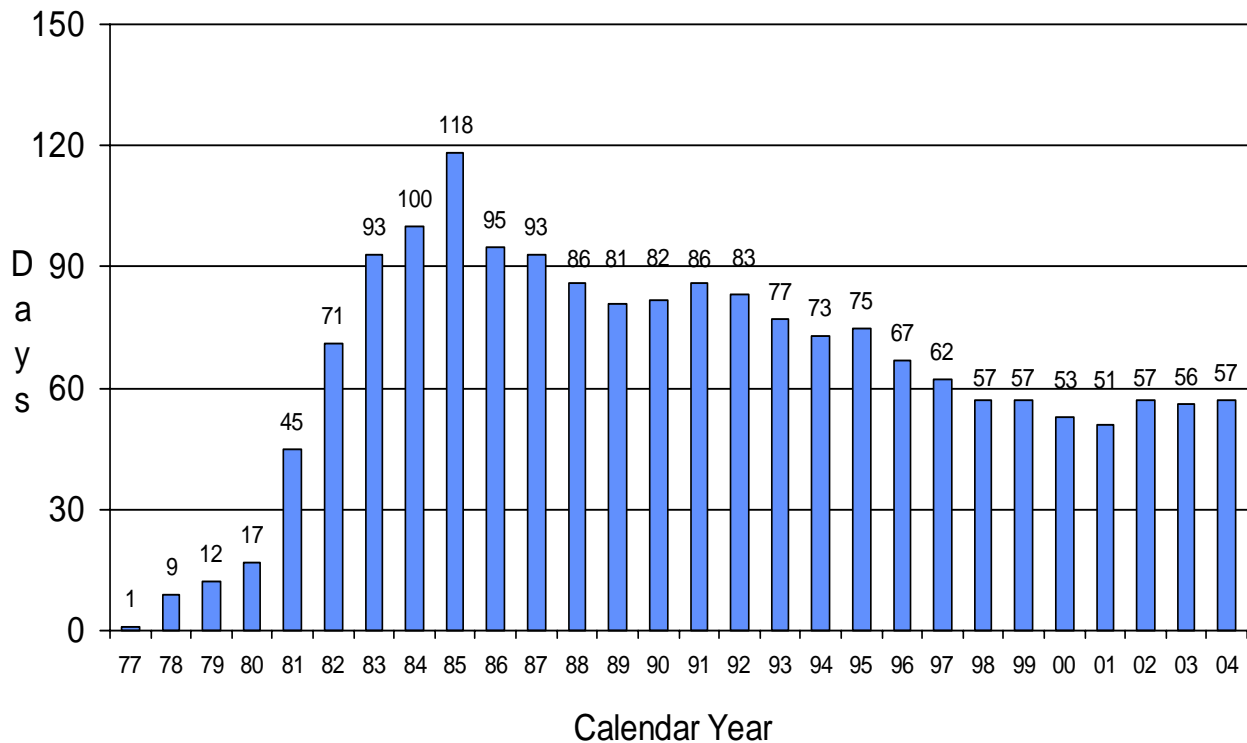


**Import Protection Levels**

In EPCA, the Congress established an initial storage objective of ninety days of net petroleum imports, which equated to 500 million barrels at that time. The Strategic Petroleum Reserve inventory of 675.6 million barrels on December 31, 2004, amounted to fifty-seven days of net import protection (crude oil and refined products). See Figure 5.

The inventory, in equivalent days of net petroleum imports, declined from 1985 to 2001, principally as a result of increasing dependence on oil imports, and increased slightly in 2002 through 2004. In 2004, 57 percent of domestic consumption of crude oil and refined products was supplied by foreign imports.

**Figure 5  
Days of Net Import Protection (1977-2004)\***



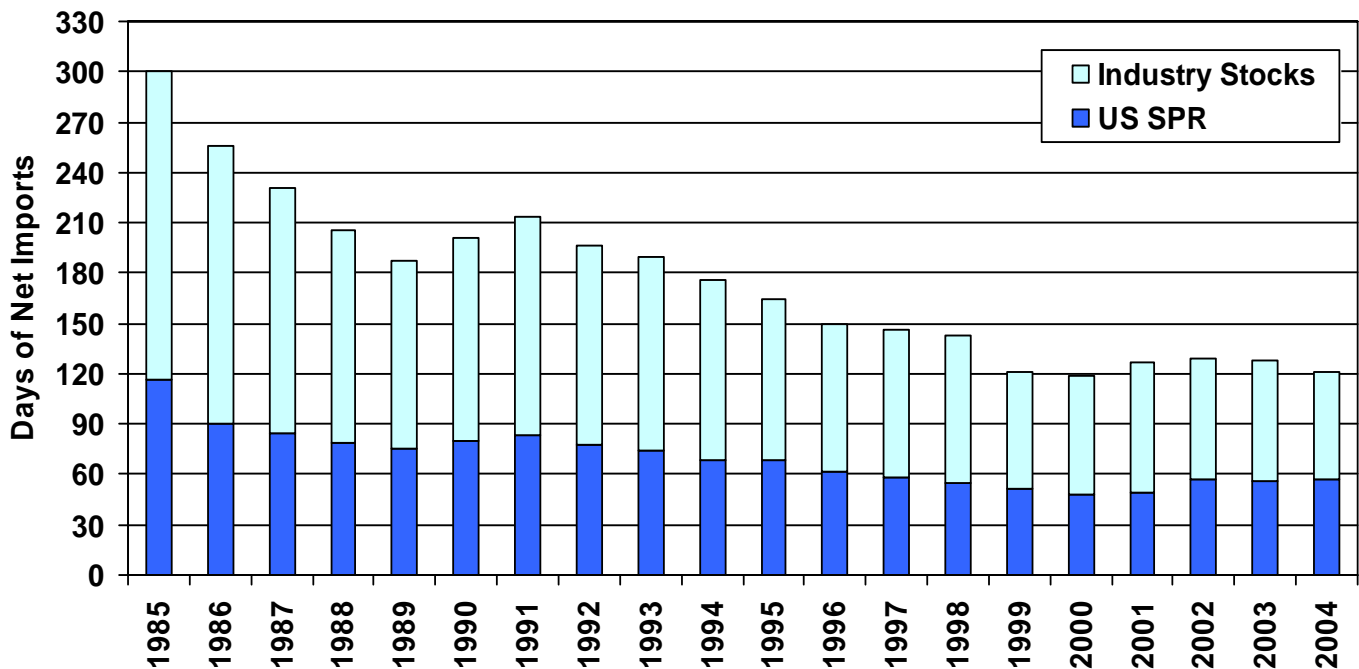
\* Days of Protection = Year End Inventory ÷ US Net Petroleum Imports/Day



The United States, as a member of the International Energy Agency, is committed to maintaining stocks of crude oil and products in reserves that are equivalent to ninety days of net oil imports. Computations of member-nations' stockpile requirements are based on both public and privately held stocks, and net imports are defined as the average daily level in the previous

year. The most recent International Energy Agency computation credits the United States with 121 days of emergency reserves, based on both the Strategic Petroleum Reserve and privately held stocks. Figure 6 provides end-of-year computations for the United States through 2004.

**Figure 6**  
**International Energy Program**  
**U.S. Emergency Stocks**



## COMMERCIALIZATION ACTIVITIES

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### **Commercial Leases**

Since 1995, the Strategic Petroleum Reserve has commercialized its under-utilized crude oil distribution facilities to be more cost-effective, and has leased two crude oil pipelines and a marine terminal to private industry. The contracts for these leases require that the facilities be maintained in good condition and, in the event of an emergency drawdown of oil, the leased facilities are to be returned on fifteen days notice.

**Bayou Choctaw Pipeline:** In 2004, lease revenues amounted to \$174,338. This pipeline was leased to Shell Pipeline Company LP on May 1, 1997, on a revenue-sharing basis. In 1998, the lease was converted from an annual lease to a ten-year lease.

**Bryan Mound Pipelines:** In 2004, lease revenues amounted to \$1,546,121. Two of the three Bryan Mound pipelines were leased to ExxonMobil Pipeline Company on January 14, 1999. ExxonMobil began using the pipelines in June 2000, as part of its onshore distribution system for the Diana-Hoover production in the Gulf of Mexico.

**St. James Terminal:** In 2004, St. James Terminal lease revenues amounted to \$1,700,000. The terminal was leased to Shell Pipeline Corporation (now Equilon Enterprises LLC, doing business as Shell Oil Products U.S.) on January 31, 1997, on a revenue-sharing basis. On April 2, 2003, the contract was re-negotiated for a period of ten years in the amount of \$1.7 million per year, with a five-year option in the amount of \$2 million per year. Payments were retroactive to January 1, 2003. In addition, the lease requires the lessee to pay 6 percent per annum (in-kind) on the government owned oil used in the terminal tanks.

During calendar year 2004, the Strategic Petroleum Reserve earned 14,903 barrels of crude oil as in-kind interest on government owned oil in tanks leased to Equilon Enterprises.

### **Foreign Oil Storage**

The Strategic Petroleum Reserve promotes the concept of storing foreign oil in its unused storage space as a strategy to increase world oil stockpiling, generate revenues for the United States Treasury, and/or add oil to the Strategic Petroleum Reserve (in lieu of a fee). The Balanced Budget Act of 1997 (Public Law 105-33) provides specific authority to store petroleum products of another country, or its representatives, in the facilities of the Strategic Petroleum Reserve, provided that the United States is fully compensated for all related costs, and that the ability to draw down Strategic Petroleum Reserve oil is not impaired.

To enhance the Strategic Petroleum Reserve's offer to store oil for foreign governments or their representatives, the Big Hill storage site was activated as a special purpose Foreign Trade Zone subzone on September 28, 1998. This designation permits customers to store oil without paying customs fees and certain taxes. The Big Hill storage site is the only storage site to receive this designation.

The Strategic Petroleum Reserve did not enter into any commercial or foreign storage initiatives during 2004. However, the Department of Energy continued filling the Strategic Petroleum Reserve, including the Big Hill site, through its agreement with the Department of the Interior for Federal royalty oil. In addition, the world oil market was characterized by near term oil prices higher than the price for future delivery, so that there were no market incentives for commercial oil storage.

***Commercialization Revenues***

During calendar year 2004, the U.S. Treasury received \$3,420,459 in cash revenues from the commercial leases of the Strategic Petroleum Reserve’s distribution facilities and pipelines, and earned 13,791 barrels of oil for use of tank bottoms at St. James Terminal. Table 7 summarizes commercialization revenues from 1996 to 2004.

**Table 7  
Summary of Commercialization Revenues  
(December 31, 2004)**

Calendar Year	Bryan Mound Pipeline	Big Hill Pipeline	Bayou Choctaw Pipeline	St. James Terminal Lease	Total Revenue Generated
1996	102,606	472,809			575,415
1997		429,824	0	133,300	563,124
1998	12,500	402,525	0	481,010	896,035
1999	679,393	400,000	163,030	546,125	1,788,548
2000	652,146	493,359	217,573	748,986	2,112,064
2001	1,054,297	33,104	212,738	1,227,021	2,527,160
2002	1,468,613	0	249,708	1,285,183	3,003,504
2003	1,647,828	0	168,718	1,863,060	3,679,606
2004	1,546,121	0	174,338	1,700,000	3,420,459

## **BUDGET AND FINANCE**

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The FY 2004 Interior and Related Agencies Appropriations Act (Public Law 108-108) included \$170.9 million for Strategic Petroleum Reserve facilities operations and management.

### ***Appropriations through Fiscal Year 2004***

A total amount of \$21.9 billion, net of sales and transfers, has been appropriated for the Strategic Petroleum Reserve through fiscal year 2004. Included in this total is the distribution of annual and total appropriations described in Table 8.

### ***Strategic Petroleum Reserve Account***

The Strategic Petroleum Reserve Account funds the development, operation, and maintenance of facilities, the salaries and expenses necessary to plan and manage the program, including the operation of the Project Management Office in New Orleans, Louisiana, and the activities pertinent to major issues concerning the development and use of the Strategic Petroleum Reserve.

Obligations for the Strategic Petroleum Reserve in fiscal year 2004 totaled approximately \$160.8 million. From this amount, \$14.8 million was obligated for Federal program management salaries and benefits, and \$146.0 million was obligated for contractual goods and services to operate and maintain the Strategic Petroleum Reserve.

### ***SPR Petroleum Account***

The SPR Petroleum Account funds the acquisition of oil for the Strategic Petroleum Reserve; the associated costs for transportation and terminalling; United States customs duties; Superfund and Oil Spill Liabilities Trust Fund taxes; and other miscellaneous costs.

During an emergency drawdown and sale, the SPR Petroleum Account is the source of funding for the incremental costs of withdrawing oil from the storage caverns and transporting it to the point where purchasers take title. An amount equal to receipts realized as a result of the oil sale is deposited with the Department of Treasury in the SPR Petroleum Account to create additional budget authority for filling the Reserve.

At the end of fiscal year 2004, approximately \$8.4 million was available for obligation in the Account, an amount sufficient to finance approximately 25% of the incremental costs of a three-month emergency drawdown.

Obligations for the Petroleum Account in fiscal year 2004 totaled approximately \$2.2 million which was offset by revenues of \$1.8 million for a net revenue increase of \$0.4 million. This represents operational costs necessary to fill the Strategic Petroleum Reserve via the royalty-in-kind program.

For fiscal year 2004, the capitalized cost of the crude oil in the Strategic Petroleum Reserve was \$18.1 billion, for an average cost per barrel of approximately \$26.97 (excluding storage costs). Since April 2002, contracts have been awarded for 111.7 million barrels of exchange royalty oil from the Department of the Interior. The value of crude oil received from the royalty-in-kind program in fiscal year 2004, was \$1.3 billion.

**Table 8**  
**Annual Appropriations for Storage Facilities Operations and Management and Petroleum**  
**Acquisition and Transportation (Thousands) (Data as of December 31, 2004)**

Fiscal Year	Oil Account	Facilities	Management		Total	Defense SPR
1976	0	300,000	13,975		313,975	
1977	440,000	0	7,824		447,824	
1978	2,703,469	463,933	14,704		3,182,106	
Total 1979 Appropriations*	2,356,456	632,504	18,111		3,007,071	
Total 1980 Appropriations*	(2,022,272)	0	22,272		(2,000,000)	
Total 1981 Appropriations*	3,205,094	108,168	19,391		3,332,653	
Total 1982 Appropriations*	3,679,700	175,656	20,076		3,875,432	
1983	2,074,060	222,528	19,590		2,316,178	
1984	650,000	142,357	16,413		808,770	
1985	2,049,550	441,300	17,890		2,508,740	
Total 1986*	(12,964)	106,979	13,518		107,533	
1987	0	134,021	13,412		147,433	
1988	438,744	151,886	12,276		602,906	
1989	242,000	160,021	13,400		415,421	
1990	371,916	179,530	12,953		564,399	
1991	566,318	187,728	12,846		766,892	
1992	88,413	171,678	13,384		273,475	
1993	(125,625)	161,940	14,227		50,542	
DOD Transfer (non add)	124,925	700	0		125,625	125,625
1994	0	191,035	15,775		206,810	
1995	(107,764)	226,938	16,780		135,954	
1996 transfer from SPR Petroleum Account	(187,000)	170,173	16,827		0	
1996 Weeks Is. Oil Sale	(97,114)	97,114	0			
1996 deficit reduction oil sale	(227,000)	0			(227,000)	
1996 Total	(511,114)	267,287	16,827		(227,000)	
1997 Total*	(220,000)	193,000	16,000		(11,000)	
1998	0	191,500	16,000		207,500	
1999	0	145,120	14,805		159,925	
2000	0	144,000	15,000		159,000	
2001	0	140,672	15,965		156,637	
2002	0	154,009	16,871		170,880	
2003	1,955	157,823	13,909		173,687	
2004	0	155,044	15,904		170,948	

\* Includes reprogramming and rescission actions.

Note: Fiscal year 1991 SPR Petroleum Account of \$566,318 includes proceeds of \$122,681 from the Test Sale recorded as additional budget authority, rather than reductions to obligations, costs, and outlays. It also includes \$315,424,985 in Desert Storm Drawdown proceeds from January 1991, and \$19,755,064 from fiscal year 1991 NPR excess receipts. Thus, the cumulative budget authority is "gross" and not related directly to the inventory of oil on hand.

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### Performance Measurement

The mandates of the Government Performance and Results Act of 1993 are incorporated into the Strategic Petroleum Reserve's performance management system. Out of a total of twenty performance target outputs, nineteen measures met or exceeded their goals.

On one performance measure, *Number of Barrels of Crude Oil Processed* (degassed), the SPR did not meet its goal of 23 MMB of crude

oil processed but achieved a level of 22.25 MMB. This minor shortfall had no mission impact.

Details of program goals, objectives, and progress are contained in the Strategic Petroleum Reserve's *Annual Performance Report* submitted to the DOE Office of Program Analysis and Evaluation.

Performance Measure	FY 2003 Actual Performance	FY 2004 Target Output	FY 2004 Actual Performance
<b>Public Confidence: Oil Inventory, Drawdown Readiness and Distribution</b>			
Number of Barrels of Crude Oil Inventory in Storage	624 MMB	656 MMB	670 MMB
90-Day Sustainable Drawdown Rate	4.39 MMB/Day	4.40 MMB/Day	4.40 MMB/Day
Number of Days to Commence Crude Oil Drawdown	13 Days	13 Days	13 Days
Distribution Capability as a Percentage of Drawdown Rate	153%	>= 120% of Drawdown Rate	159%
Calculated Site Availability	98%	>= 95%	98%
Calculated MPAR Rating	98%	>= 95% of Possible Points	98%
Percent of Site Security Ratings that are Satisfactory	100%	100%	100%
Number of Barrels of Heating Oil Inventory in Storage	2.0 MMB	2.0 MMB	2.0 MMB
Number of Days to Complete Heating Oil Drawdown	12 Days	12 Days	12 Days
Commence Processing Vapor Content Crude	N/A	5/3/04	4/16/04
Number of Barrels of Crude Processed	N/A	23 MMB	22.25 MMB
<b>Excellent Customer Service: Customer Relations</b>			
Percentage of Key Customers Visited	N/A	33%	53%
<b>Responsible Stewardship: Operational Effectiveness, Efficiency and Knowledge Management/Fiscal Responsibility and Budgetary Control</b>			
Operating Cost per Barrel of Storage Capacity	\$ 0.2004	<= \$.2073 per Barrel	\$.1940
<b>Dynamic Teamwork: Continuous Improvement</b>			
ISO 9001-2000 Certification	N/A	3/31/04	12/10/03
<b>Partnerships</b>			
Number of Partnership Arrangements with Federal, State, and Local Agencies	N/A	25	35

<b>Performance Measure</b>	<b>FY 2003 Actual Performance</b>	<b>FY 2004 Target Output</b>	<b>FY 2004 Actual Performance</b>
<b>Social Responsibility and Citizenship: Environment, Safety and Health</b>			
Annual Evaluation of OSHA VPP Star Status at Four Sites	2/14/03	2/15/04	2/12/04
Number of Cited Environmental Violations Received	0	0	0
Number of Days with No Reportable/Recordable Spills	361 Days	>= 355	363
Annual ISO 14001 Certification	5/15/03	5/31/04	4/15/04
<b>Employee Development and Diversity: Employee Development and Quality of Worklife</b>			
Complete Annual Employee Survey	N/A	9/30/04	9/30/04

## ***OTHER ACTIVITIES***

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### ***Security and Emergency Operations***

Following the terrorist attacks on September 11, 2001, the Strategic Petroleum Reserve instituted a higher level of alert and implemented physical security enhancements commensurate with the increased threat. The Strategic Petroleum Reserve continued these measures in 2004.

The Strategic Petroleum Reserve maintains a state-of-the-art security program that provides a high level of protection for crude oil drawdown operations, resources and personnel. Physical components of the program include an armed protection force, physical barriers and access control, and intrusion detection. Aggressive training and intelligence activities are also an integral part of the program. The Reserve's security program is continually validated through a program of inspections and exercises.

The Strategic Petroleum Reserve, Security and Emergency Operations Division maintains a dynamic, "all hazards" response operation which is configured to ensure security, emergency management and fire protection, with an integrated response to any crisis or emergency incident. The Reserve achieves this capability by developing and executing a strategy that combines protection resources to ensure Continuity of Operations, Security, Emergency Management, and Fire protection.

The results of these efforts are continually tested during exercises and drills, both planned and no-notice, at all sites. Although the Reserve's all-hazards response is still in its infancy, the overall impact has been extremely positive. The successful deployment of command and control to Jackson, Mississippi during Hurricane Ivan, a disaster recovery exercise in January 2005, and

force-on-force field training exercises have demonstrated the full capability of the Strategic Petroleum Reserve to effectively manage a broad range of emergencies and provide continuity of operations.

The Strategic Petroleum Reserve continues its strong partnerships with other federal and state agencies such as the Federal Bureau of Investigation, the Bureau of Alcohol, Tobacco and Firearms, the Coast Guard, the U.S. Environmental Protection Agency, the Federal Emergency Management Agency, National Guard chemical response teams, and other first-responders. These agencies participate in annual exercises and drills, allowing a high level of reality to be built into exercise scenarios. During 2004, site emergency response teams participated in firefighting, hazardous material operations and refresher emergency response training at Texas A&M, College Station, Texas. Each site conducted successful national Preparedness for Response Exercise Program drills, both unannounced and announced, as required under the Oil Pollution Act of 1990, and demonstrated proficiency.

### ***Environment, Safety, and Health***

The Strategic Petroleum Reserve assures the nation's energy security needs by maintaining millions of barrels of crude. The Reserve is accountable to the public for the delivery of crude oil during a national energy emergency and is a good steward of the environment. During 2004, the Strategic Petroleum Reserve completed the three following major NEPA compliance activities:

- A supplemental analysis of eleven previous Environmental Impact Statements for the purpose of updating a twenty-five year-old NEPA baseline. No



significant changes or un-assessed impacts were identified. The Project Manager approved the supplemental analysis in June 2004.

- An Environmental Assessment for the West Hackberry Raw Water Intake Pipeline replacement and accompanying mitigation action plan in full compliance with all applicable NEPA requirements and policies. The Project Manager approved the Environmental Assessment (EA-1497) on August 31, 2004, and signed the Finding of No Significant Impact on September 3, 2004. The final document, which includes both the approved Environmental Assessment and the Finding of No Significant Impact, was distributed to Headquarters on September 23, 2004.
- An Environmental Assessment for increasing the maximum storage volume for crude oil at the Bryan Mound site from 232 million barrels to 254 million barrels. This Environmental Assessment was completed and approved on November 24, 2004.

### ***Vapor Pressure Mitigation***

To assure the environmental and safety concerns of drawdown operations, the Reserve has established a crude oil degasification program to lower vapor pressure and minimize downstream hydrocarbon and toxic emissions from customer facilities.

The degasification plant innovation will produce twenty-five years of lifecycle benefits of approximately \$218 million or more, against lifecycle costs of \$74 million. More importantly, for each pound of emissions this innovation generates over its lifecycle, 1,900 pounds of emissions could be avoided in a single future drawdown, with 97 percent of that benefit extending directly to the customer.

### ***Miscellaneous***

The Reserve's environmental responsibility includes the preservation of wetlands and wildlife. In the summer of 2004, employees at Bryan Mound designed and constructed a tower for nesting ospreys.

The Big Hill and Bryan Mound sites became the first charter members of Texas's Cleaner World program. The Texas program is modeled after the Environmental Protection Agency's environmental performance-track program.

### ***Occupational Safety and Health Administration's Voluntary Protection Program***

The Reserve participates in the Occupational, Safety and Health Administration's (OSHA) Voluntary Protection Program. In 2004, self assessments were performed at West Hackberry and Bayou Choctaw and both sites achieved *Superstar* status, OSHA'S highest rating. Bryan Mound and Big Hill achieved *Star Among Stars* status, the next highest rating. The Bryan Mound site celebrated 1,000 days without a lost-time accident.

To earn a *Star Among Stars* award, a site must have a total recordable case rate and lost workday case rate of 50 percent or more, below the average for its Standard Industrial Classification Code. *Superstar* eligibility requires that sites be 75 percent or more, below the average of their Standard Industrial Classification Codes. A *Star of Excellence* category is the highest award level and requires that sites be at 90 percent or more, below the average for their Standard Industrial Classification Codes.

All storage sites received OSHA's Voluntary Protection Program (VPP) *Star* status.

In May 2004, Federal and contractor employees held a Management Safety Summit at West Hackberry, Louisiana, to promote safety

goals, including safety statistics, electrical-safety initiatives, OSHA regulations, lock-out and tag-out procedures and behavioral safety.

### ***Awards and Certifications***

In addition to the OSHA awards noted above, the Strategic Petroleum Reserve received the following awards and certifications for 2004:

- Certificate of Achievement for the Best Safety Project, 58<sup>th</sup> Annual Quality Congress, final round team competition.
- 2004 is the fifth year for the ISO 14001 environmental management system's third-party certification of the Reserve's Management and Operations.
- As a Charter Member of the Environmental Protection Agency's performance-track program, the Reserve renewed its commitment for a second three-year cycle.
- The Department of Energy's Pollution Prevention Award for achieving a positive environmental management system return on investment.
- Louisiana Environmental Awards for the Bayou Choctaw, New Orleans and West Hackberry Sites.
- The Department of Energy Office of Fossil Energy's 2004 Environmental, Security, Safety and Health Achievement Award for "Evolving Behavioral Safety to the Next Level."
- Honorable mention in the White House's *Closing the Circle* Award for achieving a positive environmental management system and return on investment.

### ***Louisiana Environmental Management Award***

The Project Management Office in New Orleans and the two storage sites in Louisiana received an Environmental Management Award for Excellence from the Louisiana Quality Foundation, making it the only organization in the state to achieve multiple-facility awards. Only one other organization received this award in the excellence category, a commercial facility in the oil industry.

### ***Integration of the ISO 14001 into the Environmental Management System***

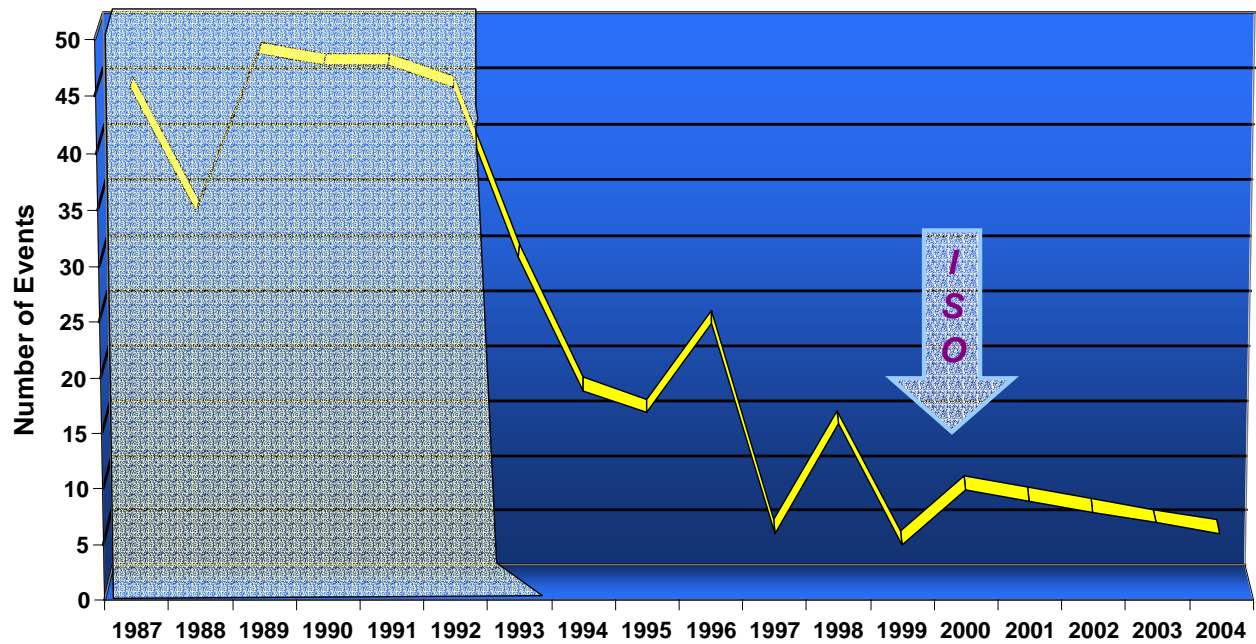
In May 2000, the Strategic Petroleum Reserve became the first bulk petroleum storage organization, public or private, to receive an ISO 14001 certification for its environmental management system. The certification is viable through 2006.

The ISO 14001 Registrar (the certifying agency) performed two separate surveillance audits of all of the facilities. The successful outcome resulted in continuation of the ISO 14001 certification at all locations. This extensive re-certification process, against all seventeen elements of the ISO 14001 International Environmental Management System standard, applied to all five sites and produced zero non-conformances.

In addition, the Strategic Petroleum Reserve received environmental management awards from the National Association of Environmental Professionals and the Department of Energy's Office of Fossil Energy, for integrating environmental management into its business processes.

Figure 7 shows the Reserve's performance for recordable environmental incidents for the years 1987-2004, and displays a downward trend.

**Figure 7**  
**Reportable Environmental Events**



### ***Environmental Performance Track Program***

In 2004, the Strategic Petroleum Reserve continued its charter member status in the Environmental Protection Agency's environmental performance-track program, in recognition of its outstanding past performance and commitment to future performance. Membership is renewable after each three-year cycle and the Strategic Petroleum Reserve fully expects to continue to participate in the performance-track program.

### ***Pollution Prevention***

**Hazardous Waste:** The Strategic Petroleum Reserve's goal for 2004 was to generate no more than 2,000 pounds of hazardous waste. Actual hazardous waste generated at all five sites amounted to 1,333 pounds, 67 percent of that goal. Of that amount, 49 percent was spent on fluorescent lamps.

**Recycling:** The Strategic Petroleum Reserve achieved 99 percent recycling of 5.2 million pounds of exploration and production waste generated in 2004. The majority of the waste generated resulted from the coiled tubing cleanout of brine disposal wells at West Hackberry which resulted in sand being lifted out of the pipe (5.18 million pounds of sand were recycled to a land farm). Other waste (approximately 100,000 pounds) included the brine tank and pond cleanout of solid/liquids, contaminated soil around pig traps and minor seepages.

For a second year, the Strategic Petroleum Reserve achieved a 100 percent in the procurement of products that met the Environmental Protection Agency's guidelines for recycled material content.

### ***ISO 9001 Quality Management System***

In October 2004, the Strategic Petroleum Reserve received a favorable report on the ISO 9001 annual surveillance, continuing its ISO 9001-2000 certification.

### ***New Orleans Federal Performance Excellence Network***

The New Orleans Federal Performance Excellence Network is supported by the New Orleans Federal Executive Board which consists of Federal employees from the Greater New Orleans and Mississippi Gulf Coast regions. It is a forum for sharing benchmarking and performance improvement information. The Strategic Petroleum Reserve co-sponsors the Network by providing speakers, and supporting its website, [www.nofpen.org](http://www.nofpen.org).

### ***International Petroleum Stockpiling Symposium***

On November 30 and December 1, 2004, the Strategic Petroleum Reserve sponsored an international symposium in Houston, Texas, called, "Petroleum Stockpiling in the 21<sup>st</sup> Century." This was the first international stockpiling symposium sponsored by the United States.

The purpose of the symposium was to bring together all of the organizations and individuals involved in strategic oil stockpiling for in-depth discussions on storage technologies and the economic and financial issues facing stockpiling entities worldwide. There was a special emphasis on assisting and providing information to new stockpiling organizations, such as those in China, India, the Philippines and Slovenia.

Approximately 130 participants from twenty-three countries in Asia, Africa, Europe and North America attended the conference. Participants included government officials, private industry, consultants, academia and financial institutions. Distinguished guests from the International Energy Agency, Asian-Pacific Economic Research, the United States Congress and the Executive Branch of the United States Government emphasized the importance of international cooperation in implementing stockpiling programs.

The technical sessions included overviews of various stockpiling media, discussions of technical issues, and presentations on oil release strategies. The policy track featured presentations on the economic benefits of stockpiling, the role and importance of commercial and strategic oil inventories, appropriate use of reserves and country presentations on individual programs. Participants indicated that a follow-up symposium would be appropriate in two years time.

On December 2, 2004, symposium participants toured the Bryan Mound site.

### ***Performance Excellence Conference***

On September 14, 2004, the Strategic Petroleum Reserve sponsored a one-day conference on performance excellence for approximately eighty-five participants. Unfortunately, Hurricane Ivan prevented some outside vendors from attending.

Performance improvement teams staffed exhibits and presenters provided learning opportunities during the event.

### ***Customer Service***

During 2004, customer service teams from the Strategic Petroleum Reserve visited twelve potential customers. The objectives of these visits were to:

- Provide updates on the Reserve
- Learn more about customer requirements
- Solicit ideas for improvements
- Cultivate communications

In March 2004, the National Petrochemical and Refiners Association held its annual meeting in San Antonio, Texas, which provided an opportunity for staff to interact with representatives from the refining industry, many of whom are key customers.

### ***Real Estate Actions***

The Strategic Petroleum Reserve discontinued its exercise of the oil-in-lieu-of-cash option under the commercial leases and liquidated the outstanding balance from the respective accounts, originally established for “in-kind” payment of the revenue earned from the leases. As a result, \$9,970,135 was deposited to the U.S. Treasury, consisting of \$6,371,680 from Shell Oil Products, U.S. and \$3,598,455 from ExxonMobil. Future revenues from the commercial leases will be in cash only.

In July 2004, the Reserve executed a Memorandum of Agreement with the General Services Administration in connection with the disposal of the decommissioned Weeks Island Facility. Through this Memorandum of Understanding, the General Services Administration is providing labor-intensive support to ensure all required documents are in the necessary format and that the remaining obstacles to completely accepting the property for disposal are resolved.

The Real Estate Section of the Ten Year Site Plan, as required by the Real Property Asset Management Order, was completed on August 20, 2004.

## **APPENDIX A**

### **Strategic Petroleum Reserve Site Information**

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#### ***Bryan Mound***

##### **Location**

Brazoria County, Texas (3 miles southwest of Freeport, Texas).

##### **Site Description**

254-million-barrel storage facility consisting of 20 caverns.

24-inch diameter, 6-mile brine disposal pipeline extending 4 miles offshore in the Gulf of Mexico.

Oil, brine and raw water piping distribution system connecting caverns with central plant and water intake structure located on Brazos River. Twenty-one (21) pumps totaling approximately 45,000 horsepower.

##### **System Parameters**

Drawdown Rate:	1,500,000 bbl/d
Raw Water Pumping Rate:	1,545,000 bbl/d
Oil Fill Rate:	225,000 bbl/d
Brine Disposal Rate:	260,000 bbl/d

##### **Distribution Facilities**

DOE 3.9 mile, 30-inch pipeline to Seaway Freeport Marine Terminal, DOE 4.0 mile, 30-inch pipeline to Seaway Jones Creek Tank Farm and Pipeline and DOE 46 mile, 40-inch pipeline to Seaway Texas City Terminal and Docks.

##### **Acquisition**

Acquired 499.47 acres fee simple, by condemnation April 1977, from Freeport Mineral Company and other owners. Dow Chemical Company was the previous operator.

#### ***West Hackberry***

##### **Location**

Cameron Parish, Louisiana (25 miles southwest of Lake Charles, Louisiana).

##### **Site Description**

227-million-barrel storage facility consisting of 22 caverns.

Oil, brine, and raw water piping distribution system connecting caverns with central plant, water intake structure located on Intra-coastal waterway and 9-brine disposal wells. Thirty-three (33) pumps totaling over 41,680 horsepower.

##### **System Parameters**

Drawdown rate:	1,300,000 bbl/d
Raw Water Pumping Rate:	1,632,000 bbl/d
Oil Fill Rate:	225,000 bbl/d
Brine Disposal Rate:	225,000 bbl/d

##### **Distribution Facilities**

DOE 42.8 mile, 42-inch pipeline to Sunoco Nederland Terminal.  
DOE 13.6 mile, 36-inch pipeline to Shell Pipeline common carrier pipeline system at Carlyss.

##### **Acquisition**

Acquired 405.36 acres fee simple by condemnation, April 1977, from numerous private landowners. Olin Corporation was the previous site operator. Acquired 160.0 additional acres fee simple by condemnation in two actions, July 1979 and March 1980.

## **Big Hill**

### **Location**

Jefferson County, Texas (26 miles southwest of Beaumont, Texas).

### **Site Description**

170-million-barrel storage facility consisting of 14 caverns.

Oil, brine, and raw water systems connecting caverns with central plant, water intake structure located on the Intracoastal Waterway, and a 48-inch diameter, 14-mile brine disposal pipeline extending 4 miles offshore in the Gulf of Mexico. Forty-eight (48) pumps totaling 46,000 horsepower.

### **System Parameters**

Drawdown Rate:	1,100,000 bbl/d
Raw Water Pumping Rate:	1,400,000 bbl/d
Oil Fill Rate:	225,000 bbl/d
Brine Disposal Rate:	432,000 bbl/d

### **Distribution Facilities**

DOE 24.5 mile, 36-inch pipeline to Sunoco Nederland Terminal, Unocal 2 mile, 24-inch pipeline to Unocal Docks, Shell 20-inch pipeline system to East Houston.

### **Acquisition**

Acquired 271 acres fee simple, by condemnation November 1982 and July 1983, from three landowners, i.e., 238.48 acres from Amoco, 27.06 acres from the Pipkin estate, and 5.46 acres from the Patrick Henry Phelan estate.

## **Bayou Choctaw**

### **Location**

Iberville Parish, Louisiana (12 miles southwest of Baton Rouge, Louisiana).

### **Site Description**

76-million-barrel storage facility consisting of 6 caverns.

Oil, brine, and raw water piping distribution system connecting caverns with central plant, a water intake structure, 12 brine disposal wells, and a pipeline for disposing of brine to PetroLogistics Olefins, LLC. Eighteen (18) pumps totaling over 18,000 horsepower.

### **System Parameters**

Drawdown Rate:	515,000 bbl/d (sour) 300,000 bbl/d (sweet)
Raw Water Pumping Rate:	515,000 bbl/d
Oil Fill Rate:	110,000 bbl/d
Brine Disposal Rate:	110,000 bbl/d

### **Distribution Facilities**

DOE-owned 37.2 mile, 36-inch pipeline to Shell's Sugarland Terminal and Capline Pipeline. Shell-owned 16 mile, 24-inch pipeline to Baton Rouge.

### **Acquisition**

Acquired 355.95 acres fee simple, by condemnation April 1977, from numerous private owners. Union Texas Petroleum (a subsidiary of Allied Corporation) was the previous operator.

In 1985, the Department of Energy acquired an additional existing cavern through a cavern exchange agreement with Union Texas Petroleum. The transaction involved a 3.5-acre exchange with no net change in Government-owned acreage.

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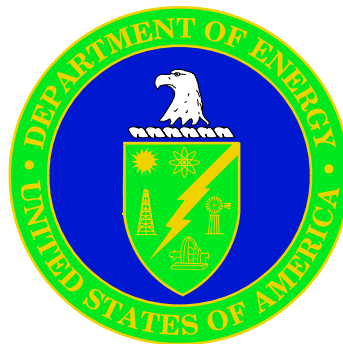
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# Strategic Petroleum Reserve

## Annual Report for Calendar Year 2005

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**U.S. Department of Energy  
Assistant Secretary for Fossil Energy  
Office of Strategic Petroleum Reserve  
Washington, D.C. 20585**

**Strategic Petroleum Reserve: [www.spr.doe.gov](http://www.spr.doe.gov)**

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Name/Org: R. LaMonda, FE-40 Date: 5-30-2006

Guidance (if applicable): CG-SS-4



## TABLE OF CONTENTS

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### EXECUTIVE SUMMARY

Program Highlights and Status .....	1
Emergency Oil Releases .....	1
Oil Acquisitions and Receipts .....	1
Hurricane Impacts to Operations .....	2
Security and Emergency Operations .....	2
Environment, Safety, and Health .....	2
Energy Policy Act of 2005 .....	3
Malcolm Baldrige Quality Award .....	3
Notable Achievements .....	3

### PROGRAM MISSION

Introduction .....	4
Legislative History .....	4
Strategic Petroleum Reserve Plan and Amendments .....	7

### PROGRAM MANAGEMENT

Organization .....	8
Contractual Support .....	9

### CRUDE OIL STORAGE PROGRAM

Storage Facilities Capacity and Drawdown Capability .....	10
Major Maintenance Program .....	12
Status of Storage Sites .....	12
Operational Limitations and Issues .....	13
Energy Policy Act of 2005 .....	13
Site Selection Process .....	14
Public Scoping Process .....	14
Environmental Impact Statement .....	15

### PETROLEUM ACQUISITION AND SALES

Crude Oil Inventory Status .....	16
Royalty-in-Kind Crude Oil Transfers .....	21
Hurricane Katrina Exchange .....	22
Hurricane Ivan Exchange .....	22

### HURRICANE IMPACTS

Operational Impacts .....	23
Hurricane Katrina Drawdown .....	23

**EMERGENCY RESPONSE CAPABILITIES**

Sale of Oil .....	28
Competitive Sales Procedures .....	28
Drawdown Capabilities .....	29
Drawdown Readiness Activities .....	31
Distribution Plan and Capabilities .....	31
Distribution Assessment .....	32
Import Protection Levels .....	34

**COMMERCIALIZATION ACTIVITIES**

Commercial Leases .....	36
Foreign Oil Storage .....	36
Commercialization Revenues .....	37

**BUDGET AND FINANCE**

Appropriations through Fiscal Year 2005 .....	38
Strategic Petroleum Reserve Account .....	38
SPR Petroleum Account .....	38
Performance Measurement .....	40

**OTHER ACTIVITIES**

Security and Emergency Operations .....	42
Environment, Safety, and Health .....	43
Vapor Pressure Mitigation .....	43
Miscellaneous .....	43
Occupational Safety and Health Administration's Voluntary Protection Program .....	44
Accident Rates Meet Goals .....	44
Integrated Safety Management (ISM) .....	44
Safety Summit Becomes Annual .....	44
American National Standards Institute (ANSI) Z10 Certification Begins .....	45
Close Call Program .....	45
Safety Support for Security .....	45
Improved Compliance with Electrical Safety .....	45
Human Performance Improvement .....	45
Support of Strategic Petroleum Reserve Hurricane Victims .....	45
Awards and Certifications .....	46
Louisiana Environmental Management Award .....	46
Malcolm Baldrige National Quality Award .....	47
Environmental Performance Track Program .....	47
New Orleans Federal Performance Excellence Network .....	47
Integration of the ISO 14001 into the Environmental Management System .....	47
Pollution Prevention .....	48
ISO 9001 Quality Management System .....	49
Customer Service .....	49
Real Estate Actions .....	49

**APPENDIX A Strategic Petroleum Reserve Site Information**

Bryan Mound .....	50
West Hackberry .....	50
Big Hill .....	51
Bayou Choctaw .....	51

**LIST OF FIGURES**

Figure 1. Strategic Petroleum Reserve Organizational Structure .....	8
Figure 2. Storage Sites and Distribution System .....	11
Figure 3. Cumulative Oil Fill .....	20
Figure 4. Projected Maximum Drawdown Capability .....	30
Figure 5. Pipeline and Marine Distribution Capabilities .....	33
Figure 6. Strategic Petroleum Reserve Days of Net Import Protection .....	34
Figure 7. International Energy Program U.S. Emergency Stocks .....	35
Figure 8. Reportable Environmental Events .....	48

**LIST OF TABLES**

Table 1. Storage Capacity and Drawdown Capability .....	10
Table 2. Year-End Inventories and Oil Fill History .....	17
Table 3. Crude Oil Receipts .....	18
Table 4. Crude Oil Inventory .....	19
Table 5. Drawdown Quantities Offered for Sale.....	24
Table 6. Drawdown Contract Award Quantities .....	26
Table 7. Drawdown Delivery Quantities and Prices .....	27
Table 8. Crude Oil Streams .....	29
Table 9. Initial Drawdown and Distribution Capabilities .....	32
Table 10. Summary of Commercialization Revenues .....	37
Table 11. Annual Appropriations for Storage Facilities Operations and Management and Petroleum Acquisition and Transportation .....	39
Table 12. Value of Royalty-in-Kind Transferred by the Department of the Interior ....	40
Table 13. Performance Measures .....	41

## ***EXECUTIVE SUMMARY***

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### ***Program Highlights and Status***

As of December 31, 2005, the Strategic Petroleum Reserve was operationally ready with a crude oil inventory of 684.5 million barrels (equal to 55 days of net U.S. imports) and a drawdown capability of 4.4 million barrels per day.

During 2005, the Strategic Petroleum Reserve continued to receive oil from the Department of the Interior royalty-in-kind program, achieving the program's highest inventory level of 700.7 million barrels on August 27, 2005.

Then in late August, Hurricane Katrina hit the Gulf Coast causing crude supply shortages. The Strategic Petroleum Reserve was used immediately to respond to the shortages, first through emergency oil exchange agreements and then through a Presidentially directed oil sale. In total, the Strategic Petroleum Reserve released 20.8 million barrels of crude stocks.

### ***Emergency Oil Releases***

In August 2005, Hurricane Katrina hit the Gulf Coast causing significant crude supply shortages. As a result, the Department of Energy received refiner requests for emergency oil supplies from the Strategic Petroleum Reserve. The Department of Energy responded immediately negotiating emergency oil exchange agreements and released 9.8 million barrels of crude to five companies.

On September 2, 2005, President Bush authorized an emergency drawdown of oil from the Strategic Petroleum Reserve as part of the International Energy Agency's initial collective response to the supply disruption caused by Hurricane Katrina. The Department of Energy conducted a competitive sale and awarded

contracts for 11 million barrels. Oil deliveries were substantially completed by the end of 2005.

### ***Oil Acquisitions and Receipts***

In 2005, the Strategic Petroleum Reserve acquired an additional 20.8 million barrels of crude oil from the Department of the Interior royalty-in-kind program to fill the Reserve to its targeted fill level of 700 million barrels. This was reached on August 27, 2005. The total transfer of royalty barrels by the Department of the Interior is equivalent to \$4.3 billion<sup>1</sup> of foregone receipts to the Treasury. To date the Strategic Petroleum Reserve has received a total of 138.8 million barrels of oil from the Department of the Interior royalty-in-kind program.

In addition to royalty-in-kind oil, the Strategic Petroleum Reserve received 4.6 million barrels in 2005 as the balance of the repayment for emergency oil exchanges made by the Department of Energy to refiners during Hurricane Ivan in 2004. A total of 5.6 million barrels, including an interest premium, was received from the companies as repayment for 5.4 million barrels originally exchanged.

Under the Katrina oil exchanges, the companies will return a total of 10.3 million barrels to the Strategic Petroleum Reserve, repaying the original 9.8 million barrels plus an interest premium. The Strategic Petroleum Reserve received repayment of 4.2 million barrels prior to December 31, 2005.

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1. Department of the Interior data is not available for 1999.

## ***Hurricane Impacts to Operations***

### **Hurricane Katrina**

As Hurricane Katrina approached the Louisiana Gulf Coast in late August 2005, the Strategic Petroleum Reserve Project Management Office in New Orleans was forced to shutdown operations and all personnel safely evacuated the New Orleans area. The Strategic Petroleum Reserve established an alternate Emergency Operations Center (EOC) at its Big Hill storage site near Beaumont, Texas, and relocated key essential personnel to the Big Hill site.

Hurricane Katrina and the subsequent flooding caused substantial damage to the New Orleans area and closed the Strategic Petroleum Reserve office facilities. As a result the New Orleans personnel were forced to operate from alternate locations for an extended period of time.

During this time, the Strategic Petroleum Reserve, operating from its Big Hill site, successfully executed oil exchanges from Bayou Choctaw and conducted an oil sale from its Big Hill, Bryan Mound and West Hackberry sites.

### **Hurricane Rita**

As Hurricane Rita approached the Texas Gulf Coast in September 2005, the Strategic Petroleum Reserve was forced to relocate its alternate EOC from the Big Hill site to the Bayou Choctaw site. Three of the Strategic Petroleum Reserve sites, Bryan Mound, Big Hill and West Hackberry, were forced to shutdown operations based on the projected path and size of the storm. On September 22, 2005 the sites were closed and evacuated.

Hurricane Rita caused substantial flooding and damage to the Beaumont/Port Arthur area. The Big Hill site sustained significant damage to site buildings; however there was no damage to drawdown equipment. Similarly, the West Hackberry site sustained extensive damage to site

buildings. After clean up and drying of site facilities and equipment, West Hackberry was declared ready for drawdown on October 7, 2005. Neither the Bryan Mound nor the Bayou Choctaw sites were affected by Hurricanes Katrina or Rita.

## ***Security and Emergency Operations***

The Strategic Petroleum Reserve maintains a state-of-the-art security program that provides a high level of protection for its storage facilities, personnel, and crude oil assets.

During Hurricanes Katrina and Rita, Security and Emergency Operations personnel provided for an organized command and control and drawdown operation. They facilitated the relocation of the Strategic Petroleum Reserve office to an alternate site, establishing an Incident Command Center to track activities, retrieving and relocating vital data systems and establishing interim communications. Security of facilities and operations was maintained throughout the incident.

At the close of calendar year 2005, the Strategic Petroleum Reserve was in Security Condition Yellow, in accordance with Department of Energy Office of Security and Safety Performance Assurance (SP-1) and Homeland Security directives.

## ***Environment, Safety, and Health***

The Strategic Petroleum Reserve program operates under an ISO 14001 Environmental Management Certification. In 2005, the Strategic Petroleum Reserve warehouse, located in the NASA building of the Stennis Space Center in Mississippi, was independently certified under the ISO 14001 standard. As a result, the Strategic Petroleum Reserve has operated for the past seven years without an environmental Notice of Violation.

The Strategic Petroleum Reserve sites continue to operate under the Occupational Safety and Health Administration (OSHA)'s Voluntary Protection Program (VPP) certification. All four sites achieved "Star Among Stars" awards from OSHA Region VI and Department of Energy performance awards. During 2005 the Big Hill site achieved sustaining Star status in its voluntary protection programs in recognition of low accident rates, continuous improvement, and going above and beyond minimal requirements with an effective safety management system. The Bryan Mound site will be reappraised in January 2006. West Hackberry and Bayou Choctaw sites were recertified in 2004. In 2005, the Strategic Petroleum Reserve had the lowest number of recordable accidents in its history.

### ***Energy Policy Act of 2005***

The Energy Policy Act of 2005, enacted August 8, 2005, directed the Secretary of Energy to acquire petroleum to fill the Strategic Petroleum Reserve to its authorized one billion barrel capacity, "as expeditiously as practical without incurring excessive costs or appreciably affecting the price of petroleum products to consumers." The Energy Policy Act of 2005 also directed that, not later than one year after enactment, the Department of Energy must complete proceedings to select sites necessary to expand the Strategic Petroleum Reserve to one billion barrels.

In response to these directives, the Strategic Petroleum Reserve has initiated the preparation of an Environmental Impact Statement (EIS) in accordance with the National Environmental Policy Act, which will be used by the Department of Energy to make its decision on site selection. The Department of Energy issued a Notice of Intent to prepare an EIS on September 1, 2005 and completed its Public Scoping Process on December 19, 2005.

### ***Malcolm Baldrige Quality Award***

In 2005, DynMcDermott Petroleum Operations Company, the Strategic Petroleum Reserve's Management and Operating (M&O) contractor, was selected as a 2005 recipient of the Malcolm Baldrige National Quality Award. The award is given by the President of the United States to businesses that distinguish themselves through management performance excellence and demonstrate continuous improvement to stakeholders. DynMcDermott Petroleum Operations Company is the first Louisiana organization to receive this prestigious award.

### ***Notable Achievements***

The Strategic Petroleum Reserve storage sites have been recipients of numerous awards for management quality, environmental stewardship, and safety programs. In 2005, the Strategic Petroleum Reserve's two Texas sites, Big Hill and Bryan Mound, were named the first two Certified National Leaders under the Texas Commission on Environmental Quality "Clean Texas Cleaner World" program, highlighting the continuing environmental stewardship leadership position.

The Strategic Petroleum Reserve Louisiana sites are three time recipients of the Louisiana Performance Excellence Award, the Louisiana Department of Economic Development Lantern Award, Louisiana Environmental Management Award, and the National Association of Environmental Professionals National Excellence Award.

## ***PROGRAM MISSION***

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### ***Introduction***

The Strategic Petroleum Reserve was authorized in 1975 in response to the 1973 Arab oil embargo. It is authorized by the Energy Policy and Conservation Act (EPCA)(Public Law 94-163), and by the comprehensive energy plans of all Administrations since 1975, in recognition of the long-term dependence of the United States on imported crude oil and petroleum products. Section 165 of EPCA requires the Secretary of Energy to submit an Annual Report to the President and the Congress.

As of December 31, 2005, the inventory in the Strategic Petroleum Reserve was 684.5 million barrels of crude oil. The inventory amounted to fifty-five days of net imports. The United States relies on a combination of oil in the Strategic Petroleum Reserve and private stocks to meet its oil storage obligations under the agreement with the International Energy Program.

### ***Legislative History***

EPCA, enacted on December 22, 1975, authorized the establishment of the Strategic Petroleum Reserve to reduce the impact of a severe energy supply interruption, and to carry out the obligations of the United States under the International Energy Program.

EPCA was amended by Title VIII of the Energy Security Act (Public Law 96-294), enacted on June 30, 1980. The Act established a minimum average daily fill rate of 100,000 barrels and precluded sale of Naval Petroleum Reserve Numbered 1 (Elk Hills, California) crude oil, except to fill the Strategic Petroleum Reserve, unless the Strategic Petroleum Reserve was being filled at the minimum rate or had an inventory of 500 million barrels.

The Energy Policy and Conservation Amendments Act of 1985 (Public Law 99-58), enacted on July 2, 1985, extended the provisions of Title I, Part B, of EPCA relating to the Strategic Petroleum Reserve until June 30, 1989, and directed the Secretary of Energy to conduct a sale or exchange of 1.1 million barrels of crude oil to test the drawdown and distribution capabilities of the Strategic Petroleum Reserve.

The Omnibus Budget Reconciliation Act of 1986 (Public Law 99-509), enacted on October 18, 1986, amended EPCA to require that the Strategic Petroleum Reserve be filled at a minimum rate of 75,000 barrels a day until at least 750 million barrels were in storage.

Public Law 101-46, enacted on June 30, 1989, extended Strategic Petroleum Reserve authorities contained in EPCA until April 1, 1990. The Act also required the Secretary of Energy to submit a report to Congress by February 1, 1990, on alternative means of financing oil acquisition for the Strategic Petroleum Reserve. Short-term extensions of the Strategic Petroleum Reserve authorities contained in EPCA were enacted on March 31, 1990 (Public Law 101-262), and August 10, 1990 (Public Law 101-360).

On September 15, 1990, the President signed the Energy Policy and Conservation Act Amendments of 1990 (Public Law 101-383), extending authorization for the Strategic Petroleum Reserve until September 30, 1994. This legislation also contained provisions to amend drawdown authorities, required a Strategic Petroleum Reserve Plan Amendment for completion of storage capacity for one billion barrels, authorized the drawdown and distribution tests, and provided for a refined petroleum product reserve test program.

On October 24, 1992, the President signed the Energy Policy Act of 1992 (Public Law 102-486). The Act included provisions to (1) add new conditions for drawdown in emergency situations involving a supply reduction of significant scope and duration, coupled with a severe price increase likely to cause a major adverse impact on the nation's economy, (2) allow the enlargement of the Reserve to one billion barrels, (3) permit the Secretary of Energy to make payment in advance for delivery of petroleum product either owned or not owned by the United States for storage in the Strategic Petroleum Reserve or non-Strategic Petroleum Reserve facilities, (4) give the President discretionary authority to acquire domestic stripper well oil at competitive prices to fill the Reserve, and (5) amend the eligibility criteria for a Regional Petroleum Reserve.

On October 22, 1994, the President signed into law the Energy Policy and Conservation Act Amendments Act of 1994 (Public Law 103-406), extending authorization for the Reserve to June 30, 1996.

The Balanced Budget Downpayment Act (Public Law 104-99), enacted on January 26, 1996, required the sale of up to \$100 million of Weeks Island oil to fund decommissioning activities.

The Omnibus Consolidated Rescissions and Appropriations Act of 1996 (Public Law 104-134), enacted on April 26, 1996, required the sale of \$227 million of Weeks Island oil for deficit reduction.

The Omnibus Consolidated Appropriations Act (Public Law 104-208), enacted on September 30, 1996, appropriated \$220 million for the Strategic Petroleum Reserve in fiscal year 1997 to be financed through the sale of Reserve oil. The Strategic Petroleum Reserve authorities expired on June 30, 1996. On October

14, 1996, Public Law 104-306 extended the authorization for the Strategic Petroleum Reserve until September 30, 1997. After the expiration of that authorization, the Reserve was not reauthorized until June 1998.

The Balanced Budget Act of 1997 (Public Law 105-33), enacted on August 5, 1997, added a new section 168 to EPCA, authorizing the leasing of underutilized Strategic Petroleum Reserve facilities for the storage of oil owned by a foreign government or its representatives.

The Department of the Interior and Related Agencies Appropriations Act, 1998 (Public Law 105-83), enacted on November 14, 1997, appropriated \$207.5 million for the Strategic Petroleum Reserve in fiscal year 1998 to be financed through the sale of Reserve oil.

The 1998 Supplemental Appropriations and Rescissions Act (Public Law 105-174), enacted on May 1, 1998, included a provision which prohibited the drawdown and sale of Strategic Petroleum Reserve oil if the President determined that a sale would be imprudent in light of market conditions and designated the \$207.5 million in foregone revenue as an emergency requirement under the Balanced Budget Act of 1985. The President made the requisite determination and designation on May 8, 1998.

On June 1, 1998, the President signed Public Law 105-177 to extend certain EPCA programs. The Act extended the authorization for the Strategic Petroleum Reserve and participation in the International Energy Program through September 30, 1999, and expanded the antitrust protection for U.S. companies participating in International Energy Agency activities. The Act also authorized the drawdown and distribution of crude oil from the Strategic Petroleum Reserve only for the purposes described in the Act, and required that the Secretary of Energy request funds for acquisition, transportation and injection



of petroleum products for storage in the Reserve or provide a written explanation if no request for funds was made. The Omnibus Consolidated and Emergency Supplemental Appropriations Act, 1999 (Public Law 105-277), enacted on October 21, 1998, included \$160.1 million for the Strategic Petroleum Reserve.

On November 13, 1998, the President signed Public Law 105-388, an Act to extend energy conservation programs under EPCA and the Energy Conservation and Production Act, and for other purposes. The Act provided that, during a drawdown of the Strategic Petroleum Reserve, the State of Hawaii may submit a binding offer for Strategic Petroleum Reserve oil and be entitled to purchase the oil at a price equal to the weighted average price of the successful competitive bids for oil in the applicable category. Deliveries under the binding offer would receive priority scheduling during a Strategic Petroleum Reserve drawdown.

The Strategic Petroleum Reserve authorization expired on September 30, 1999. On October 5, 1999, the President signed Public Law 106-64, extending the authorization for the Reserve and for the EPCA authorities for United States participation in the International Energy Program until March 31, 2000.

Appendix C of the Consolidated Appropriations Act, 2000 (Public Law 106-113), enacted on November 29, 1999, included \$159 million for the Strategic Petroleum Reserve. The Act also allowed the Secretary to use other Department of Energy funds to finance a drawdown from the Strategic Petroleum Reserve.

The Department of the Interior and Related Agencies Appropriations Act, 2001 (Public Law 106-291), signed on October 11, 2000, included \$165 million for the development, operation and management activities of the Strategic Petroleum Reserve under EPCA,

\$4,000,000 to be derived from the transfer of unobligated funds in the “SPR Petroleum Account.”

On November 9, 2000, the President signed Public Law 106-469. Title I of The Energy Act of 2000 reauthorized titles I and II of EPCA through fiscal year 2003, and updated or deleted the EPCA title I Strategic Petroleum Reserve authorities. Title II of Public Law 106-469 amended title I of EPCA to insert a new part D authorizing the Secretary “to establish, maintain, and operate a Northeast Home Heating Oil Reserve,” containing no more than two million barrels of petroleum distillate and located in the Northeast. The new part D Reserve is not a component of the Strategic Petroleum Reserve established under part B of title I of EPCA. Title II also sets forth conditions for release of products from the new part D Reserve, requires transmittal to the President and Congress of a plan describing the Reserve, and upon establishment, requires the Secretary of the Treasury to establish a “Northeast Home Heating Oil Reserve” account at Treasury.

On November 5, 2001, the President signed Public Law 107-63, the Interior and Related Agencies Appropriations Act for fiscal year 2002. The Act included \$171 million for Strategic Petroleum Reserve facilities and operations and \$8 million for the Northeast Home Heating Oil Reserve. Congress further specified that if the full \$8 million is not needed for the Northeast Home Heating Oil Reserve, the Department of Energy is encouraged to apply any excess funds to the vapor pressure project to remove excess gas from the oil in the Strategic Petroleum Reserve.

On February 20, 2003, after a series of Continuing Resolutions, the President signed Public Law 108-7, the Consolidated Appropriations Act, 2003. Public Law 108-7 included \$171.7 million for Strategic Petroleum Reserve operations and program management

activities, \$1.9 million for the SPR Petroleum Account, and \$6 million for operation of the Northeast Home Heating Oil Reserve. The law also extended EPCA authority for the Strategic Petroleum Reserve, the Northeast Home Heating Oil Reserve, and United States participation in the International Energy Program through September 30, 2008.

On November 10, 2003, the President signed the Department of the Interior and Related Agencies Appropriations Act, 2004 (Public Law 108-108). The Act provided \$171 million for the operations and program management activities of the Strategic Petroleum Reserve and \$5 million for the Northeast Home Heating Oil Reserve.

On December 8, 2004, the President signed the Consolidated Appropriations Act, 2005 (Public Law 108-447). The Act provided \$172,100,000 for the operations and program management activities of the Strategic Petroleum Reserve and \$5,000,000 for the Northeast Home Heating Oil Reserve. After an across-the-board rescission of 0.594 percent and a second general reduction the Strategic Petroleum Reserve budget authority was reduced to \$169,710,000 and the Northeast Home Heating Oil Reserve authority to \$4,930,000.

On August 8, 2005, the President signed into law the Energy Policy Act of 2005 (Public Law 109-58). The Act amended EPCA to provide permanent authorization for the Strategic Petroleum Reserve and the Northeast Home Heating Oil Reserve, and to make a technical amendment clarifying the heating season period. The Act also required acquisition of petroleum to fill the Strategic Petroleum Reserve to its authorized one billion barrel capacity, “as expeditiously as practical without incurring excessive costs or appreciably affecting the price of petroleum products to consumers”; promulgation of procedures for the acquisition of petroleum for the Reserve, to include procedures

and criteria for the review of requests for the deferrals of scheduled deliveries; and selection of sites necessary to expand the storage capacity of the Strategic Petroleum Reserve to one billion barrels.

On November 19, 2005, the President signed the Energy and Water Development Appropriations Act, 2006 (Public Law 109-103). The Act provided \$166,000,000 for facility development and operations and program management activities of the Strategic Petroleum Reserve. After an across-the-board rescission of 1%, the Strategic Petroleum Reserve budget authority was reduced to \$164,340,000. The Act provided no new funding for the Northeast Home Heating Oil Reserve, with direction to fund the program using prior year carryover balances.

### ***Strategic Petroleum Reserve Plan and Amendments***

Title I of the Energy Act of 2000 amended EPCA to eliminate the requirement for a Strategic Petroleum Reserve Plan and plan amendments. However, the law requires the Secretary of Energy to submit a plan to Congress if the Secretary decides to expand the Strategic Petroleum Reserve beyond 700 million barrels.

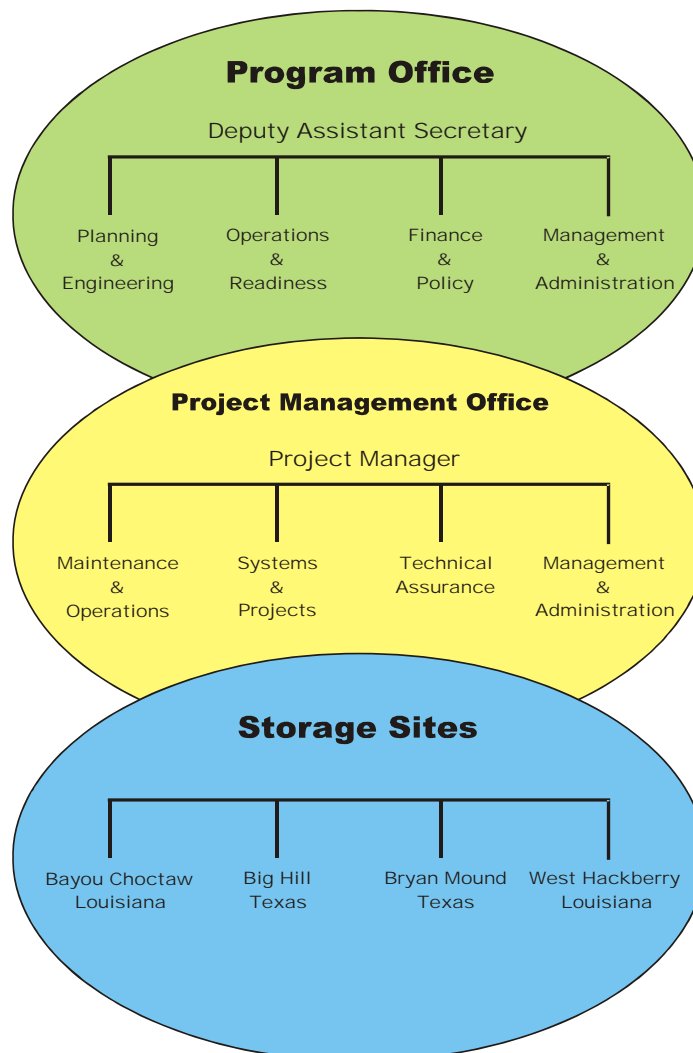
## PROGRAM MANAGEMENT

### Organization

The Assistant Secretary for Fossil Energy at the Department of Energy in Washington, D.C. has overall program responsibility for achieving the goals and objectives of the Strategic Petroleum Reserve. This responsibility is delegated to the Deputy Assistant Secretary for

Petroleum Reserves, and is exercised through the Strategic Petroleum Reserve Headquarters Office in Washington, D.C. and the Project Management Office in New Orleans, Louisiana. Total staffing is 114 Federal full time equivalent employees and 879 contractor employees. Figure 1 depicts the Strategic Petroleum Reserve organizational structure.

**Figure 1**  
**Strategic Petroleum Reserve Organizational Structure**



### ***Contractual Support***

The Project Management Office is responsible for the design, development, operation and maintenance of the Strategic Petroleum Reserve and employs a Management and Operating (M&O) contractor, DynMcDermott Petroleum Operations Company, to provide management and personnel to operate and maintain the four Strategic Petroleum Reserve storage facilities and certain related pipeline systems. DynMcDermott will operate the Strategic Petroleum Reserve through March 31, 2008, with an option for the Department of Energy to extend the contract for an additional five-year period. On November 22, 2005, it was announced by the President and the Commerce Secretary that DynMcDermott had been selected as a recipient of the 2005 Baldrige National Quality Award, thus becoming the first Louisiana organization so recognized.

URS Group Inc., an architect/engineering firm, provides design services for the four storage facilities through March 8, 2007 with options for the Department of Energy to extend the contract for three additional years. Sandia National Laboratory provides geotechnical support.

ASRC Construction, Inc. (ACI), a Native Alaskan 8(a) small business firm, provides construction and construction management services for the four storage facilities under a two-year contract, awarded November 25, 2003, with three one-year renewal option periods. The first of these option years has been exercised. This work was formerly performed by the M&O contractor.

Contractors in specific disciplines perform miscellaneous site modifications for major maintenance program activities. Most of these contracts are fixed-price and have terms of less than one year.

Several support services contracts exist for management, technical, and computer support. The largest support service contractor is Deltha-Critique which provides management and technical support services to the Project Management Office under a contract that commenced November 1, 2001. Other support services contractors included ICF Consulting Inc., PB Energy Storage Services, Inc., AOC Petroleum Support Services, LLC, and Cyborg Inc.

Electrical power is provided to the four storage facilities by local utilities, Reliant Energy and Entergy.

Seaway Pipeline Inc., Sunoco Partners Marketing & Terminals, L.P., and Unocal Corporation, provide commercial terminalling services for fill, drawdown and storage of crude oil. The terms of these contracts are for five years, with three five-year options by which the Department of Energy could extend the contracts for up to a total of twenty years each. Seaway Pipeline Inc. is in its third and final option period, which expires December 1, 2006. Sunoco Partners Marketing & Terminals, L.P. is in its first-five year option period, which expires April 30, 2008, and Unocal Corporation is in its second five-year option period, which expires April 23, 2007.

## **CRUDE OIL STORAGE PROGRAM**

### ***Storage Facilities Capacity and Drawdown Capability***

Originally, the Strategic Petroleum Reserve developed four sites in Louisiana and two sites in Texas. Subsequently, two sites in Louisiana were decommissioned, the Sulphur Mines site in 1992, for cost savings, and the Weeks Island site in 1999, because of geotechnical problems. The remaining sites are West Hackberry and Bayou Choctaw in Louisiana, and Bryan Mound and Big Hill in Texas.

The Strategic Petroleum Reserve's oil storage capacity had been estimated at 700 million barrels since 1998, but a reevaluation of the cavern storage capacity during 2003 revealed that an additional 27 million barrels of storage capacity is available. Some of this capacity

resulted from the dissolution of salt by water injected into the caverns during several significant oil movements between 1992 and 2000. The added capacity also includes the recertification of an existing 12 million barrel cavern at Bryan Mound, previously considered too gassy for long term crude oil storage.

Table 1 shows the storage capacity and drawdown capability of the four storage sites as of December 31, 2005. These are grouped into three geographical distribution systems on the Gulf Coast: Seaway, Texoma and Capline. Each system has access to one or more major refining centers, interstate crude oil pipelines, and marine terminals for crude oil distribution. The locations of the Strategic Petroleum Reserve storage sites, and their respective distribution systems, are shown in Figure 2.

**Table 1**  
**Storage Capacity and Drawdown Capability - (December 31, 2005)**

Storage Facility	CURRENT SITE CAPABILITY		
	Storage Capacity (MMB)	Crude Mix Sweet/Sour (MMB)	Drawdown Capability (MB/D)*
<b>Bryan Mound</b>	<b>254</b>	<b>78/176</b>	<b>1,500</b>
<b>West Hackberry</b>	<b>227</b>	<b>119/108</b>	<b>1,300</b>
<b>Big Hill</b>	<b>170</b>	<b>72/98</b>	<b>1,100</b>
<b>BayouChoctaw</b>	<b>76</b>	<b>24/52</b>	<b>515</b>
<b>Total Program</b>	<b>727</b>	<b>293/434 (40%/60%)</b>	<b>4,415</b>

Sweet = Low sulfur crude (S<0.5%)

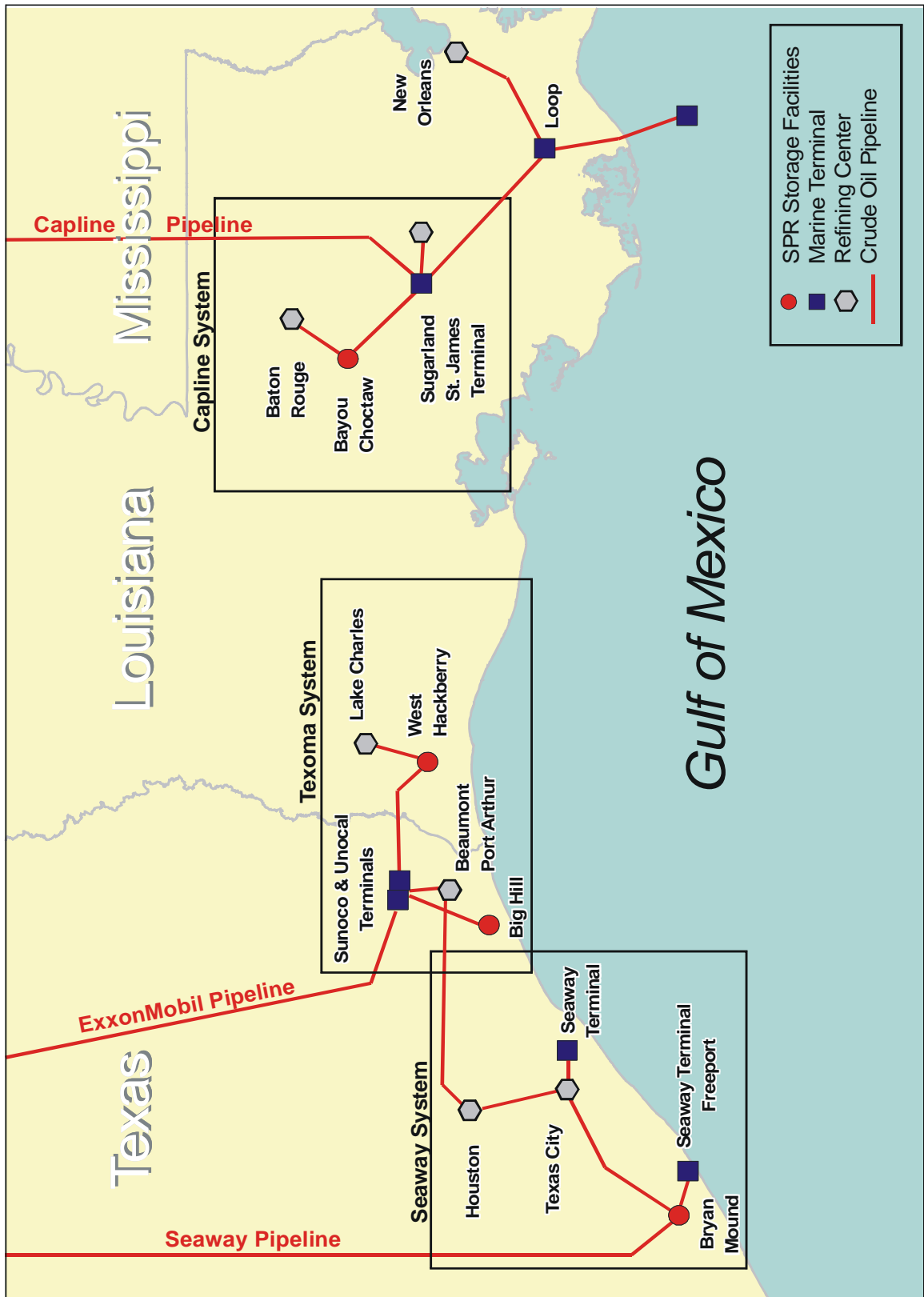
Sour = Medium sulfur crude (S<2.0%)

MMB = Million Barrels

MB/D = Thousand Barrels Per Day

\* Initial 30-day capability

Figure 2  
Storage Sites and Distribution System



## **Major Maintenance Program**

The Strategic Petroleum Reserve's major maintenance program includes past and current site construction projects that exceed \$100,000. Project examples are building maintenance, piping replacements and road paving.

## **Status of Storage Sites**

### **Bryan Mound**

The Bryan Mound storage facility in Brazoria County is approximately three miles southwest of Freeport, Texas. The site has 20 storage caverns, a combined storage capacity of 254 million barrels, and a cavern inventory of 230.5 million barrels. The site is fully operational.

In 2005, under the major maintenance program, construction was completed to improve site drainage and paving and add site entrance security barriers. Contracts have been awarded and construction is ongoing to install new heat exchanger tube bundles, and clean, inspect and repair a crude oil tank.

### **West Hackberry**

The West Hackberry storage facility in Cameron Parish is approximately 25 miles southwest of Lake Charles, Louisiana. The site has 22 storage caverns, a combined storage capacity of 227 million barrels and a cavern inventory of 216.4 million barrels. The site is fully operational.

In 2005, under the major maintenance program, construction was completed to add site entrance security barriers and to repair the anhydrite pond clay cap. Contracts have been awarded and construction is ongoing to install pump protective shelters, install valves for drawdown control and cavern valve flushing, purchase GFE necessary for the Fiscal Year 2006 Raw Water Line Replacement project, and clean and inspect brine tanks. Efforts to repair damage

sustained as a result of Hurricane Rita are also underway.

### **Bayou Choctaw**

The Bayou Choctaw storage facility in Iberville Parish is approximately 12 miles southwest of Baton Rouge, Louisiana. The site has six storage caverns, a combined storage capacity of 76 million barrels, and a cavern inventory of 66.9 million barrels. The site is fully operational.

In 2005, under the major maintenance program, construction was completed to upgrade raw water header piping and add site entrance security barriers. Contracts have been awarded and construction is ongoing to install new heat exchanger tube bundles and provide additional security clear zones.

### **Big Hill**

The Big Hill storage facility in Jefferson County is 26 miles southwest of Beaumont, Texas. The site has 14 storage caverns, a combined storage capacity of 170 million barrels, and a cavern inventory of 168.8 million barrels. The site is fully operational.

In 2005, under the major maintenance program, construction was completed to replace site perimeter detection systems, add site entrance security barriers and upgrade site drainage. Contracts have been awarded and construction is ongoing to replace sections of the brine disposal line, add valves for drawdown control and cavern valve flushing, replace the 34.5 kV transmission line between the main site and the raw water intake structure, and renovate site buildings and HVAC systems.

### **Warehouse Building, Stennis, Mississippi**

During 2004, the Strategic Petroleum Reserve moved its warehouse from the New Orleans area to a more secure, leased building

within the NASA Space Center at Stennis, Mississippi. The Strategic Petroleum Reserve's recovery equipment and critical spares for all the storage sites are stored here and are available for rapid deployment when needed.

An alternate Command and Control Center was also established in the building as part of the Continuity of Operations Program (COOP). This includes prepositioned computer and telecommunications equipment which could be activated on short notice as a backup to the Strategic Petroleum Reserve's main office in New Orleans in cases of emergency.

### ***Operational Limitations and Issues***

#### **Long-term Vapor Pressure Mitigation**

Long-term storage of crude oil in underground solution-mined salt caverns results in elevated oil temperatures and increased crude vapor pressure due to gradual geothermal heating and possible methane gas intrusion from the salt formation. Consequently, when oil is drawn down, or removed from the caverns, increased vapor pressure results in gas being released in amounts that may be unacceptable, posing environmental, safety, and health risks.

An initial degasification program was conducted between 1995 and 1998. With support from Sandia National Laboratories, the Strategic Petroleum Reserve has maintained a comprehensive monitoring program to ascertain the level of gas regain and the need for future degasification. During 2000, the monitoring program revealed the need for further long-term vapor pressure control. The most cost-effective solution was determined to be the acquisition of a modular degasification plant which could be moved from site to site, as needed.

After a successful and safe startup of the degas plant in April of 2004, the plant has continued to perform beyond design expectations,

in both maximum throughput and plant availability as well as several other performance parameters. During 2005, the degas plant processed 39,534,153 barrels of crude oil. Plant availability was nearly 99% excluding down time related to the Katrina drawdown. Given its performance to date, the Reserve is increasingly confident that the plant will meet long term vapor pressure gas removal needs. Design has begun on a task to relocate the plant to Bryan Mound after completion of Big Hill degassing operations in 2006. Contracts for the purchase of Government Furnished Equipment for the Bryan Mound site modifications have been awarded.

### ***Energy Policy Act of 2005***

The Energy Policy Act of 2005, enacted August 8, 2005, directed the Secretary of Energy to acquire petroleum to fill the Strategic Petroleum Reserve to its authorized one billion barrel capacity, "as expeditiously as practical without incurring excessive costs or appreciably affecting the price of petroleum products to consumers." The Energy Policy Act of 2005 also directed that, not later than one year after enactment, the Department of Energy must complete proceedings to select sites necessary to expand the Strategic Petroleum Reserve to one billion barrels.

The Department of Energy has determined that the site selection for a one billion barrel reserve required under the Energy Policy Act constitutes a major Federal action within the context of the National Environmental Policy Act (NEPA) and will require the preparation of an Environmental Impact Statement (EIS).

In selecting new sites, the Act requires that the Secretary of Energy first consider and give preference to the sites which were previously assessed in the Draft Environmental Impact Statement, DOE/EIS-0165-D, and also give consideration to other sites as proposed by a State.



The Department of Energy is giving consideration to five candidates for the development of one or two new sites: Stratton Ridge, Texas and Richton, Mississippi from the prior DOE/EIS-0165-D; Chacahoula, Louisiana and Clovelly, Louisiana, as new sites submitted by the State of Louisiana; and Bruinsburg, Mississippi, as a new site submitted by the State of Mississippi.

### ***Site Selection Process***

The NEPA Environmental Review Process will be used by the Department of Energy to make its decision on site selection for the Strategic Petroleum Reserve. The decision-making process will consider the EIS analysis as well as other factors such as the Strategic Petroleum Reserve programmatic concerns, project cost, and project risks.

The NEPA Environmental Review Process involves the following steps to assure public involvement in the site selection decision:

- Public Scoping Process.
- Draft Environmental Impact Statement.
- Final Environmental Impact Statement.
- Record of Decision.

### ***Public Scoping Process***

On September 1, 2005, the Department of Energy published a Notice of Intent to Prepare an Environmental Impact Statement in the Federal Register (70 FR 52088). The Notice of Intent invited interested agencies, organizations, Native American Tribes and members of the public to submit comments or suggestions to assist the Department of Energy in identifying significant environmental issues and determining the appropriate scope of the impact statement. The Notice also identified the dates and locations for four public scoping meetings and stated that the

public scoping period would run from September 1 through October 14, 2005.

On September 18, 2005, the Department of Energy issued a Notice to extend the public scoping period and reschedule public scoping meetings as a result of the impacts of Hurricanes Katrina and Rita on the Gulf Coast region, extending the scoping period by two weeks, until October 28, 2005, (70 FR 56649).

On October 27, 2005, the Department of Energy received a letter from Haley Barbour, Governor of Mississippi, submitting a new candidate site for consideration in the EIS process. As a result, the public scoping period was re-opened on November 18, 2005, and extended until December 19, 2005, in order to conduct a public scoping meeting for the new site (70 FR 706000).

The Department of Energy conducted four public scoping meetings as shown below, which were attended by approximately 80 people, some of whom provided oral and written comments.

- Lake Jackson, Texas on October 11, 2005, for the Stratton Ridge, Texas site.
- Jackson, Mississippi on October 17, 2005, for the Richton, Mississippi site.
- Houma, Louisiana on October 18, 2005, for the Chacahoula and Clovelly, Louisiana sites.
- Port Gibson, Mississippi on December 7, 2005, for the Bruinsburg, Mississippi site.

***Environmental Impact Statement***

During 2005, the Department of Energy initiated the preparation of an EIS using independent analysis, site inspections, review of scoping period comments, and consultations with Federal, state, and local agencies and Native American tribes. The EIS will describe, analyze, and compare the potential environmental impacts of the alternatives and provide additional information on the methodologies and assumptions used for the analyses.

## ***PETROLEUM ACQUISITION AND EXCHANGE***

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### ***Crude Oil Inventory Status***

On December 31, 2005, the Strategic Petroleum Reserve's crude oil inventory was 684,543,708 barrels, an increase of 8.9 million barrels from December 31, 2004. While the inventory reached a program maximum 700.7 million barrels in August 2005, the net change is attributable to the receipts from the royalty-in-kind oil transfer, lease payments in-kind, deliveries and receipts under emergency hurricane exchanges, and drawdown sales.

A milestone of December 31, 2005, was set to achieve 700 million barrels in storage. On August 27, 2005, four months ahead of schedule, the Strategic Petroleum Reserve completed the last receipt under the royalty-in-kind program into the West Hackberry site to achieve the Presidentially-mandated inventory of 700 million barrels.

The current mix of crude oil is 61 percent high sulfur (sour) and 39 percent low sulfur (sweet).

Table 2 lists year-end inventories and average daily fill rates for the years 1977 through 2005 (by fiscal and calendar year).

Table 3 lists crude oil receipts by country of origin since 1977.

Table 4 identifies the location of the inventory by storage site, and Figure 3 illustrates the cumulative oil fill.

**Table 2**  
**Year-End Inventories and Oil Fill History**

	FISCAL YEAR		CALENDAR YEAR	
	Year-End Inventory (MMB)	Average Daily Fill Rate* (MB/D)	Year-End Inventory (MMB)	Average Daily Fill Rate* (MB/D)
1977	1.1	3	7.2	20
1978	49.1	131	68.5	168
1979	91.2	115	91.7	64
1980	92.8	4	107.8	44
1981	199.2	292	230.3	336
1982	277.9	215	293.8	174
1983	361.0	228	379.1	234
1984	431.1	191	450.5	195
1985	489.3	159	493.3	119
1986	506.4	47	511.6	51
1987	533.9	75	540.6	80
1988	554.7	57	559.5	52
1989	577.1	62	579.9	56
1990	589.6	34	585.7	27
1991	568.5	(58)	568.5	(47)
1992	571.4	8	574.7	17
1993	585.7	39	587.1	34
1994	591.7	16	591.7	13
1995	591.7	**	591.6	**
1996	573.6	(49)	565.8	(70)
1997	563.4	(28)	563.4	(7)
1998	563.4	**	561.1	(6)***
1999	564.9	4	567.0	16
2000	570.3	15	540.7	(72)****
2001	544.8	(70)****	550.2	26
2002	587.2	116	599.1	134
2003	624.4	102	638.4	108
2004	670.3	126*****	675.6	102*****
2005	693.7	64*****	684.5	25*****

\* Fill rates adjusted for oil sales.  
 \*\* Fill suspended during this period  
 \*\*\* Decrease due to Maya exchange  
 \*\*\*\* Net decrease due to Exchange 2000

\*\*\*\*\* Net Hurricane Ivan deliveries and receipts  
 \*\*\*\*\* Net Hurricane Ivan receipts & Katrina deliveries & receipts

**Table 3**  
**Crude Oil Receipts through December 2005\***  
**(Million Barrels)**

Source Country	2005	Cumulative	Percent of Total
Mexico		265.7	33.1%
United Kingdom		192.9	24.0%
United States**	8.4	93.3	11.6%
Saudi Arabia		28.3	3.5%
Libya	0.3	27.5	3.4%
Venezuela	0.4	23.8	3.0%
Iran		20.0	2.5%
Angola	6.2	19.5	2.4%
United Arab Emirates		18.4	2.3%
Nigeria	0.1	16.3	2.0%
Equatorial Guinea	1.0	15.1	1.9%
Norway		14.0	1.7%
Russia	7.1	12.6	1.6%
Cameroon	0.8	12.1	1.5%
Algeria	3.1	9.3	1.2%
Oman		9.0	1.1%
Egypt		8.9	1.1%
Ecuador		6.2	0.8%
Iraq		3.4	0.4%
Gabon		2.4	0.3%
Qatar		2.3	0.3%
Columbia		1.2	0.1%
Peru		0.4	≤0.1%
Argentina		0.4	≤0.1%
Ivory Coast		0.4	≤0.1%
<b>Total***</b>	<b>27.3</b>	<b>803.4</b>	<b>100.0%</b>

\* Cumulative total receipts unadjusted for sales and operational gains and losses.

\*\* Included receipts from offshore Gulf of Mexico.

\*\*\* Totals do not add due to rounding.

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**Table 4**  
**Crude Oil Inventory as of December 31, 2005**  
**(Million Barrels)**

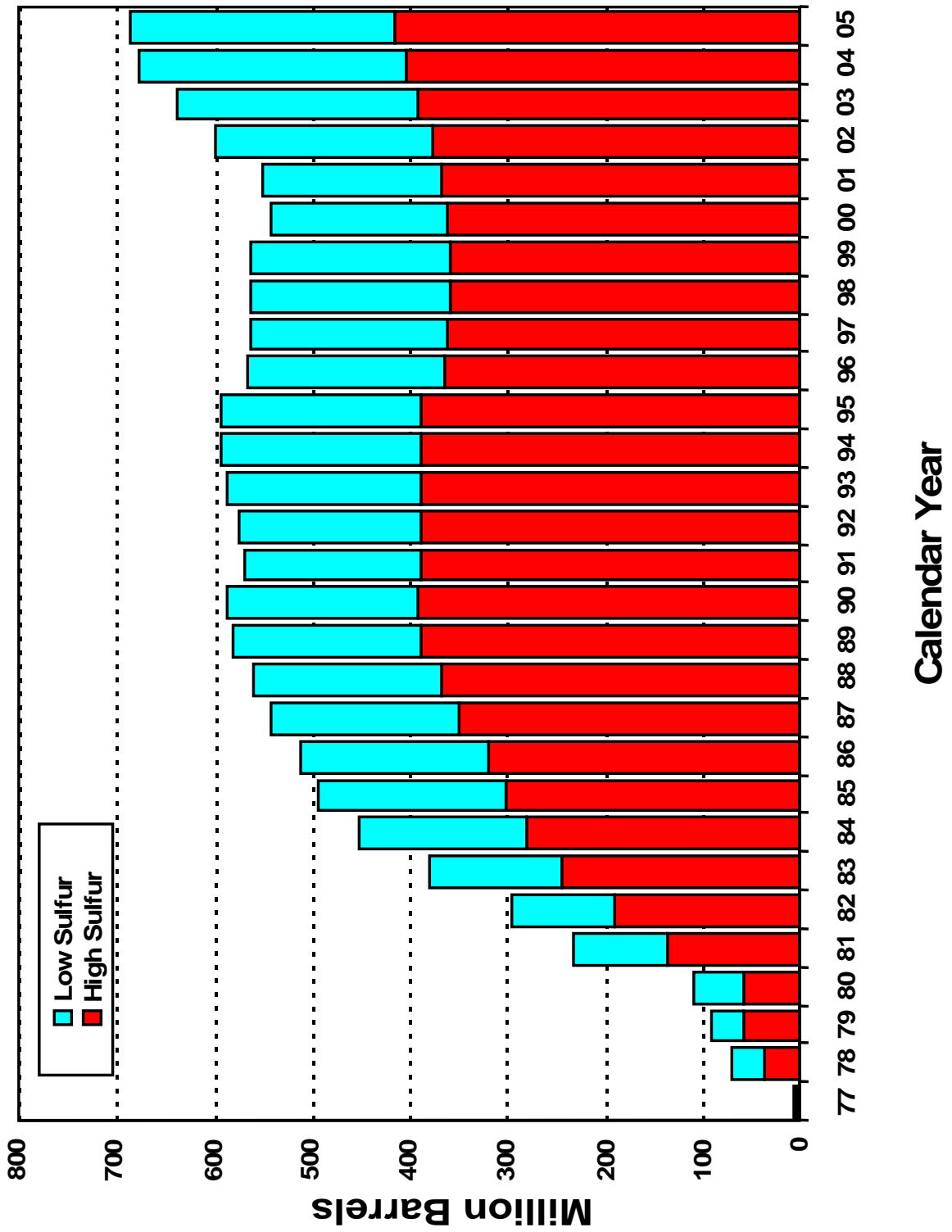
Storage Site	Inventory			Cubic Meters (Millions)
	Sweet*	Sour**	Total***	
<b>Bryan Mound, Brazoria County, Texas</b>	<b>73.3</b>	<b>157.1</b>	<b>230.5</b>	<b>36.6</b>
<b>Big Hill, Jefferson County, Texas</b>	<b>71.4</b>	<b>97.4</b>	<b>168.8</b>	<b>26.8</b>
<b>West Hackberry, Cameron Parish, Louisiana</b>	<b>108.4</b>	<b>108.0</b>	<b>216.4</b>	<b>34.4</b>
<b>Bayou Choctaw, Iberville Parish, Louisiana</b>	<b>15.8</b>	<b>51.1</b>	<b>66.9</b>	<b>10.6</b>
<b>Subtotal Underground Inventory</b>	<b>268.9</b>	<b>413.6</b>	<b>682.6</b>	<b>108.5</b>
<b>Tanks and Pipelines</b>	<b>1.1</b>	<b>0.8</b>	<b>2.0</b>	<b>0.3</b>
<b>Total Inventory</b>	<b>270.1</b>	<b>414.5</b>	<b>684.5</b>	<b>108.8</b>
<b>Total Accounts Receivable</b>	<b>5.6</b>	<b>0.5</b>	<b>6.1</b>	<b>1.0</b>
<b>Total SPR Book Inventory</b>	<b>275.7</b>	<b>415.0</b>	<b>690.7</b>	<b>109.8</b>

\* Sulfur content not exceeding 0.5 percent

\*\* Sulfur content greater than 0.5 percent

\*\*\* Totals do not add due to rounding

Figure 3  
Cumulative Oil Fill



### ***Royalty-in-Kind Crude Oil Transfers***

In February 1999, the Department of Energy and the Department of the Interior agreed to transfer 28 million barrels of royalty oil to the Strategic Petroleum Reserve. This oil would replace 28 million barrels sold in the years 1996-1997. Under this plan, Federal land leaseholders in the Gulf of Mexico were directed to pay a portion of royalties (one-eighth to one-sixth of the oil produced) in crude oil (royalty-in-kind) instead of cash to the United States.

The Department of Energy contracted with commercial entities to receive the royalty oil at offshore production facilities and transfer it to the Strategic Petroleum Reserve, either directly or with other crude oil delivered in exchange. Since the transfer of the royalty oil involved contractor costs, paid in crude oil, for transportation to the storage sites, and considered the differences in quality of the royalty oil and the oil delivered, the total amount of oil delivered to the Strategic Petroleum Reserve was expected to be 26-27 million barrels.

As of December 31, 1999, contracts had been awarded to assure the transfer of the total 28 million barrels of royalty-in-kind oil. The last contracts awarded would have completed the delivery of the 28 million barrels to the Strategic Petroleum Reserve by November 2000. However, several deliveries of exchange oil were deferred into calendar years 2001, 2002, and 2003 to alleviate crowding at terminals, and to take advantage of favorable market conditions to swap oil for delivery of a greater number of barrels in the future. As of December 31, 2003, the Strategic Petroleum Reserve had received a total of 30.1 million barrels of exchange oil, completing this initial royalty transfer program.

On November 13, 2001, President Bush announced his intent to fill the Strategic Petroleum Reserve to 700 million barrels through the resumption of the transfer of offshore royalty-in-kind oil from the Department of the Interior to the Department of Energy.

Under the Administration's initiative, the Department of the Interior issued solicitations every six months for the delivery of offshore oil to designated "market centers." The market centers are located at Clovelly, St. James, Houma and Empire, Louisiana, and Texas City and Jones Creek, Texas. Under complementary Department of Energy solicitations, companies received royalty oil at these market centers in exchange for oil that met the specifications of the Strategic Petroleum Reserve. The rate of royalty transfer by the Department of the Interior began at 60,000 barrels per day in April 2002, and then averaged 116,000 barrels per day in 2003, 96,000 barrels per day in 2004, and 86,000 barrels per day until completed in July 2005. The final exchange oil delivery to the Strategic Petroleum Reserve was completed on August 27, 2005, four months ahead of schedule.

A total of 108.4 million barrels of exchange oil (20.8 million in calendar year 2005) was delivered to the Strategic Petroleum Reserve as of December 31, 2005, under the Administration's 2001 royalty-in-kind initiative. The total transfer of royalty barrels by the Department of the Interior is equivalent to \$4.3 billion of foregone receipts to the Treasury.

Since 1999, an overall total of 138.8 million barrels has been received at the Strategic Petroleum Reserve under the royalty-in-kind program.



### ***Hurricane Katrina Exchange***

Hurricane Katrina struck the Gulf of Mexico in late August 2005, once again disrupting petroleum supplies in the Gulf region. More than 90 percent of offshore production was offline in the first days following the storm's landfall. The hurricane also caused the closing of the Louisiana Offshore Port (LOOP), Capline Pipeline and other pipelines dependent upon LOOP and Gulf of Mexico oil production.

The Department of Energy received several emergency requests from refiners for assistance in securing supplies of crude oil adequate to avoid impacts on refining operations. To relieve their shortages, the Strategic Petroleum Reserve exchanged a total of 9.8 million barrels of crude oil to six companies. Crude oil from two storage sites was delivered to these refiners in September and October 2005.

Crude oil of the same quality will be returned, plus premium barrels. The premiums were negotiated based on the market value of the exchanges, taking into account the length of the repayment period. A total of 10.3 million barrels is to be returned to the Strategic Petroleum Reserve sites. Repayment of 4.2 million barrels was received by the Strategic Petroleum Reserve in 2005.

### ***Hurricane Ivan Exchange***

During 2004 the Strategic Petroleum Reserve delivered 5.4 million barrels of crude oil to five different companies under exchange agreement to make up a portion of the shortfall of Gulf production in the wake of Hurricane Ivan. A total of 5.6 million barrels, including an interest premium, was due in return. One million barrels were returned during 2004 and the remaining 4.6 million barrels completed delivery in April 2005.

## ***HURRICANE IMPACTS***

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### ***Operational Impacts***

#### **Hurricane Katrina**

As a result of the predicted track of Hurricane Katrina, the Strategic Petroleum Reserve Emergency Management Team (EMT) decided to shutdown its operations at the New Orleans Elmwood Office Complex on August 27, 2005, and deploy an advance team to establish an alternate Emergency Operations Center (EOC) at the Big Hill facility near Beaumont, Texas. The breach in the levees that rendered New Orleans and surrounding areas uninhabitable, also damaged the Strategic Petroleum Reserve office facilities, forcing New Orleans personnel to operate from alternate locations for an extended period time after the storm. Additionally, the Strategic Petroleum Reserve's backup network system, located at the Stennis Warehouse facility in Mississippi, was rendered inoperable due to damages to the fiber optics communications cables entering that site. There was no impact to the ability of the four storage sites to drawdown.

The first of the two New Orleans office buildings re-opened and personnel reported to work on October 3, 2005. The Stennis site resumed operations, and served as an alternate worksite at the same time.

#### **Hurricane Rita**

The projected path of Hurricane Rita forced the Strategic Petroleum Reserve Emergency Management Team to re-locate the Alternate EOC from the Big Hill site to the Bayou Choctaw site. On September 22, 2005, three Strategic Petroleum Reserve sites, Bryan Mound, Big Hill and West Hackberry, were forced to cease operations and evacuate based on the projected path and size of the storm.

The Big Hill site sustained significant damage to site building facilities, however there was no damage to drawdown equipment.

The West Hackberry site sustained extensive damage to site building facilities. After clean-up and drying of site facilities and equipment, the site was declared ready for drawdown on October 7, 2005

Neither the Bryan Mound nor the Bayou Choctaw sites were affected by Hurricane Rita.

### ***Hurricane Katrina Drawdown***

In a further response to Hurricane Katrina, the Strategic Petroleum Reserve was called upon by President Bush to supply additional crude oil to the market in the form of a sale. On September 2, 2005, the President issued a Finding of a Severe Energy Supply Interruption as defined in section 161(d) of the Energy Policy and Conservation Act (EPCA), 42 U.S.C. 6 241(d). President Bush authorized and directed the Secretary of Energy to sell crude oil from the Strategic Petroleum Reserve at a rate to be determined by Secretary of Energy Samuel W. Bodman.

The United States' Hurricane Katrina sale was part of a coordinated emergency response with the International Energy Agency (IEA), a coalition of 26 member countries that supports energy supply security through energy policy cooperation. The IEA set a goal to make available 60 million barrels of crude oil and refined products to help mitigate the impact of the disruptions in the global flow of crude oil while efforts were underway to restore operations of offshore production platforms, refineries and other facilities.

On September 6, 2005, the Department of Energy issued a Notice of Sale, offering 30 million barrels of crude oil (15 million barrels each of sweet and sour). Quantities offered for sale by location are listed in Table 5.

**Table 5  
Drawdown Quantities Offered For Sale**

SPR Crude Oil Stream	Quantity (000 barrels)	Delivery Locations	Delivery Modes
<b>Bryan Mound Sweet</b>	<b>6,000</b>	<b>Jones Creek Tank Farm, or Seaway Freeport or Texas City</b>	<b>Pipeline or Vessel</b>
<b>Bryan Mound Sour</b>	<b>6,000</b>	<b>Jones Creek Tank Farm, or Seaway Freeport or Texas City</b>	<b>Pipeline or Vessel</b>
<b>West Hackberry Sweet</b>	<b>6,000</b>	<b>Sun Terminal, or Lake Charles Meter Station</b>	<b>Pipeline or Vessel</b>
<b>West Hackberry Sour</b>	<b>3,000</b>	<b>Sun Terminal, or Lake Charles Meter Station</b>	<b>Pipeline or Vessel</b>
<b>Big Hill Sweet</b>	<b>3,000</b>	<b>Sun or Unocal Terminal, or Shell Pipeline to Houston</b>	<b>Pipeline or Vessel</b>
<b>Big Hill Sour</b>	<b>6,000</b>	<b>Sun or Unocal Terminal, or Shell Pipeline to Houston</b>	<b>Pipeline or Vessel</b>
<b>Total</b>	<b>30,000</b>		

The competitive sale was conducted online for the first time using the Strategic Petroleum Reserve's Crude Oil Sales Offer Program. Sales program registrants were notified by email and a press release informed the general public of the internet address for the Notice of Sale and offer program. Offers were due by 4:00 p.m., Central Daylight Time, September 9, 2005.

Offers were based on the potential purchasers' assessment of the Strategic Petroleum Reserve's crude oil stream values relative to a base reference price specified for each stream. The base reference price was \$68.7638 for all Strategic Petroleum Reserve sweet streams and \$62.0438 for all Strategic Petroleum Reserve sour streams. As in previous drawdown and test sales, a price indexing mechanism was employed wherein a price adjustment factor would be computed which equaled the offer price less the applicable base reference price. The price adjustment factor would be applied to a recomputed delivery reference price at the time of delivery.

The results of the Hurricane Katrina sale were announced on September 14, 2005. Of the 30 million barrels offered for sale, fourteen offers requesting 19.2 million barrels (14.8 million barrels of sweet and 4.4 million barrels of sour) were received from seven companies. Based on the quantities requested, the Department of Energy adjusted quantities to be made available to match the demand and proceeded to evaluate the offers based on quantities and prices offered, and the Department's assessment of reasonable prices, and the IEA goals. Based on these factors, the Department of Energy determined that five companies had submitted successful offers for 11 million barrels. Awards were made for delivery of 10.8 million barrels of sweet and 200 thousand barrels of sour crude oil. Table 6 summarizes the contract award quantities.

**Table 6**  
**Drawdown Contract Award Quantities**  
**(Thousand Barrels)**

	Bryan Mound Sweet	Bryan Mound Sour	West Hackberry Sweet	West Hackberry Sour	Big Hill Sweet	Big Hill Sour	Total
<b>Adjusted Quantity Offered for Sale</b>	<b>4,200</b>	<b>6,000</b>	<b>9,300</b>	<b>3,000</b>	<b>1,500</b>	<b>6,000</b>	<b>30,000</b>
<b>Purchaser Qty Requested</b>	<b>3,500</b>	<b>700</b>	<b>9,300</b>	<b>1,000</b>	<b>2,000</b>	<b>2,700</b>	<b>19,200</b>
<b>Contract Awards</b>							
<b>Astra Oil Company Inc.</b>			<b>1,000</b>				<b>1,000</b>
<b>BP Oil Supply Company (Inc)</b>	<b>700</b>		<b>2,000</b>				<b>2,700</b>
<b>Marathon Ashland Petroleum LLC</b>	<b>800</b>		<b>1,500</b>				<b>2,300</b>
<b>Shell Trading (US) Company</b>			<b>1,800</b>			<b>200</b>	<b>2,000</b>
<b>Vitol SA, Inc.</b>			<b>3,000</b>				<b>3,000</b>
<b>Total</b>	<b>1,500</b>	<b>0</b>	<b>9,300</b>	<b>0</b>	<b>0</b>	<b>200</b>	<b>11,000</b>

The first oil delivery commenced on September 26, 2005 from the Bryan Mound site. Due to delays resulting from the impact of Hurricane Rita in late September, the sales delivery period was extended, and some cargos were delivered from alternative sites. The last movement completed on January 4, 2006. Table 7 summarizes the actual delivery quantities and prices by purchaser.

The weighted average price per barrel was \$55.81 for the sweet deliveries and \$53.44 for the sour deliveries, compared to \$63.93 initially awarded for sweet and \$59.76 initially awarded for sour, reflecting the price adjustment mechanism incorporated in the process. Payments for deliveries totaled \$615,298,394.29.

The total incremental costs for the drawdown were \$11.9 million.

**Table 7  
Drawdown Delivery Quantities and Prices  
(Thousand Barrels)**

Purchaser	Contract Qty <sup>1</sup>	Crude Oil Stream	Delivery Price <sup>1</sup>	Delivered Qty <sup>2</sup>	Delivery Date <sup>3</sup>
Astra Oil Company Inc.	500	West Hackberry Sweet (Pipeline)	\$58.31	502.9	10/31/2005
	500	West Hackberry Sweet (Pipeline)	\$55.61	499.4	11/09/2005
BP Oil Supply Company (Inc)	200	Bryan Mound Sweet (Pipeline)	\$57.97	199.9	10/05/05
	500	Bryan Mound Sweet (Pipeline)	\$57.07	499.5	10/11/05
	2000	West Hackberry Sweet (Pipeline)	\$53.42	2001.1	01/04/06
Marathon Ashland Petroleum LLC	300	Bryan Mound Sweet (Pipeline)	\$63.42	302.0	09/27/05
	250	Bryan Mound Sweet (Pipeline)	\$62.92	247.1	09/27/05
	250	Bryan Mound Sweet (Pipeline)	\$59.72	249.8	10/05/05
	500	West Hackberry Sweet (Tanker)	\$57.71	500.3	10/25/05
	500	Bayou Choctaw Sweet (Pipeline)	\$59.23	500.0	10/15/05
	500	Bayou Choctaw Sweet (Pipeline)	\$57.59	500.0	10/06/05
Shell Trading (US) Company	1300	West Hackberry Sweet (Tanker/Barge)	\$59.33	1352.9	10/27/05
	500	Big Hill Sweet (Tanker)	\$60.12	479.7	10/11/05
	200	Big Hill Sour (Barge)	\$53.44	197.6	10/12/05
Vitol SA Inc	3,000	West Hackberry Sweet (Tanker)	\$51.52	3001.0	11/23/05
<b>Total</b>	<b>11,000</b>			<b>11,033.4</b>	

1. Weighted average price for multiple deliveries.
2. Variances between delivered quantities and contract quantities are inherent to crude oil operations; contracts allow for plus/minus 10 percent variance.
3. Delivery completion date is for final delivery.

## ***EMERGENCY RESPONSE CAPABILITIES***

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### ***Sale of Oil***

Under section 161 of EPCA, the Secretary of Energy is required to sell oil withdrawn from the Strategic Petroleum Reserve at public sale to the highest qualified bidder.

### ***Competitive Sales Procedures***

The Department of Energy's Standard Sales Provisions<sup>2</sup> prescribe the competitive sales process. The first step in the process is the issuance of a Notice of Sale identifying the volume, characteristics, and location of the petroleum for sale, delivery dates, and procedures for submitting offers. Measures required for assuring performance and financial responsibilities are also described in the Notice of Sale.

During a drawdown, multiple Notices of Sale may be issued, each covering a sales period of one to two months. Offerors may have only five days from the date a Notice of Sale is issued until offers are due, with delivery of oil commencing as soon as thirteen days after the Presidential direction to draw down the Reserve. Subsequent sales periods will coordinate Notice of Sale issuance with standard industry delivery periods. Because of the possible short initial lead-time, the Department of Energy maintains a registry of prospective offerors who will receive electronic notification of all Notices of Sale.

The second step in the sales process is for prospective purchasers to submit offers, as specified in the Notice of Sale. Offerors must unconditionally accept all terms and conditions in the Notice of Sale and submit an offer guarantee of 5 percent of the maximum potential contract amount, or \$10 million, whichever is less. The offer evaluation process is structured so that the offerors bidding the highest prices determine the transportation methods, up to the limits of the distribution system. Specific delivery arrangements are negotiated later in the process.

Within five business days of being notified, all "apparently successful offerors" are required to provide a Letter of Credit equal to 100 percent of the contract amount as a guarantee of performance and payment of amounts due under the contract. Upon timely receipt of the financial guarantees, and a final determination by the Contracting Officer that offers are responsive and offerors responsible, Notices of Award are issued. Deliveries to the purchasers may then begin, consistent with their arrangements for commercial pipeline or marine vessel transportation. Such deliveries may begin as soon as thirteen days after the President issues a finding directing a sale, provided the purchasers submit their financial guarantees and can arrange transportation.

Following delivery, the purchaser is invoiced for actual barrels received at a price that reflects the indexed contract award price, plus any adjustments for quality differentials or delivery mode or location changes. Payment is due in the month following the delivery.

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2. Department of Energy, 10 CFR Part 625, Price Competitive Sale of Strategic Petroleum Reserve Petroleum; Standard Sales Provisions, July 7, 2005.

**Drawdown Capabilities**

The crude oil acquired for the Strategic Petroleum Reserve is commingled in caverns at the storage sites, creating various distinct crude oil streams available for release. Table 8 identifies these crude oil streams, delivery modes and locations, as of December 31, 2005.

**Table 8  
Crude Oil Streams**

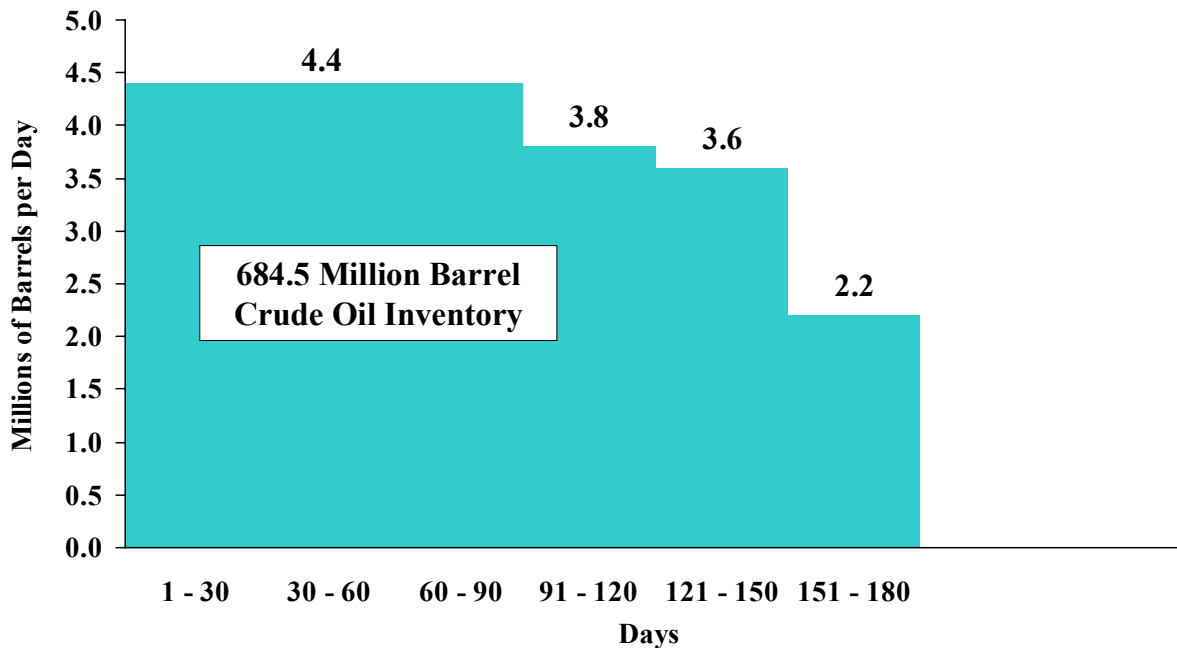
Crude Oil Stream	Gravity (°API)	Sulfur Content (Mass%)	Delivery Mode and Location
<b>Seaway System</b>			
Bryan Mound (Sweet)	35.9	0.33	Pipeline or tankship at Seaway (TEPPCO) Terminal, Freeport, Texas; or Seaway (TEPPCO) Terminal, Texas City, Texas
Bryan Mound (Sour)	33.2	1.39	
<b>Texoma System</b>			
West Hackberry(Sweet)	37.3	0.32	Pipeline, tankship or barge at Sun Partners Marketing & Terminals LP, Nederland, Texas; Pipeline at Shell-22"/DOE connection, Lake Charles, Louisiana
West Hackberry (Sour)	33.5	1.41	
Big Hill (Sweet)	35.9	0.48	Pipeline, tankship or barge at Sun Partners Marketing & Terminals LP, Nederland, Texas; Pipeline or tankship at Unocal Terminal Nederland, Texas; Pipeline at Shell-20"/DOE connection, Winnie, Texas
Big Hill (Sour)	30.7	1.41	
<b>Capline System</b>			
Bayou Choctaw(Sweet)	36.0	0.36	Pipeline at Capline or LOCAP Terminals, St. James, Louisiana; Tankship at Sugarland St. James Terminal, St. James, Louisiana 24-inch site connection to Red Stick Pipeline, Iberville Parish, Louisiana
Bayou Choctaw (Sour)	32.3	1.38	



The Strategic Petroleum Reserve can draw down crude oil at a maximum initial sustainable rate of 4.4 million barrels per day, for a period of ninety days. After this period, the drawdown rate will gradually decrease as site inventories are depleted and the declining number of caverns containing crude oil becomes a constraint.

Figure 4 illustrates the physical drawdown capability which provides for a maximum distribution of 395 million barrels in ninety days, and 690 million barrels in 180 days. While the initial sustainable rate is at the system design maximum, the rates beyond ninety days are slightly increased over 2004 rates for the same periods, due to inventory additions during 2005.

**Figure 4**  
**Projected Maximum Drawdown Capability**  
**(As of December 31, 2005)**



Note: Rates after 90 days are based on cavern-use assumptions. Actual rates are contingent on the specific caverns drawn down during a previous drawdown period.

### ***Drawdown Readiness Activities***

Drawdown Readiness Assurance activities during 2005 included:

- Drawdown reinforcement training was conducted for personnel in critical positions.
- Bayou Choctaw successfully completed a systems test exercise that demonstrated its maximum drawdown rate capability to send crude oil to Shell's Sugarland Terminal. A like test was completed for Bryan Mound which sent its crude oil to Seaway Texas City.
- An on-line drawdown sales system was completed, tested, and implemented prior to Hurricane Katrina. The new system enables the Strategic Petroleum Reserve to register potential purchasers, issue a Notice of Sale and receive offers via the Internet, shortening the overall sales response time.
- The EAGLE III drawdown exercise commenced on August 1, 2005. This exercise, designed to span a seven-week period, proved to be excellent training for Strategic Petroleum Reserve employees in mission critical positions before it was preempted by the events revolving around Hurricanes Katrina and Rita.
- A crude oil exchange procedures manual was developed to standardize the process for carrying out competitive or noncompetitive exchanges. The manual can be used to train personnel.

### ***Distribution Plan and Capabilities***

In the event of an emergency, the Strategic Petroleum Reserve has the capability to distribute its crude oil to refineries in the United States by pipeline and marine transportation. The Strategic Petroleum Reserve is connected to three major interstate pipeline systems - Capline, Seaway, and MidValley - which serve the mid-continent area (Oklahoma) and the Midwest (Illinois and Ohio).

In addition, the Reserve is connected by commercial pipeline systems to more than half of the refining capacity in the United States and is capable of delivering crude oil to twenty-two refineries in the Gulf Coast region and to twenty-eight refineries in the mid-continent and Midwest regions. These forty-nine refineries processed approximately 56 percent of crude oil imports to the United States during 2005.

The Strategic Petroleum Reserve is connected to five marine terminals which have a combined distribution capacity of approximately 2.5 million barrels per day. These are: Seaway Terminal (TEPPCO/ConocoPhillips), Freeport, Texas; Seaway Terminal (TEPPCO/BP), Texas City, Texas; Sunoco and Unocal Terminals, Nederland, Texas; and Sugarland St. James Terminal, St. James, Louisiana.

Table 9 summarizes drawdown and distribution capabilities, based on current crude oil stream inventories, existing site drawdown systems, and commercial distribution capabilities. Figure 5 illustrates the Strategic Petroleum Reserve's pipeline and marine distribution capabilities.

**Table 9**  
**Initial (Thirty-Day) Drawdown and Distribution Capabilities**  
**(Thousands of Barrels Per Day)**

	<b>Drawdown</b>	<b>Distribution</b>
<b>Seaway System</b>	<b>1,500</b>	<b>2,572</b>
<b>Texoma System</b>	<b>2,400</b>	<b>3,135</b>
<b>Capline System</b>	<b>515</b>	<b>1,501</b>
<b>Total</b>	<b>4,415</b>	<b>7,208</b>

***Distribution Assessment***

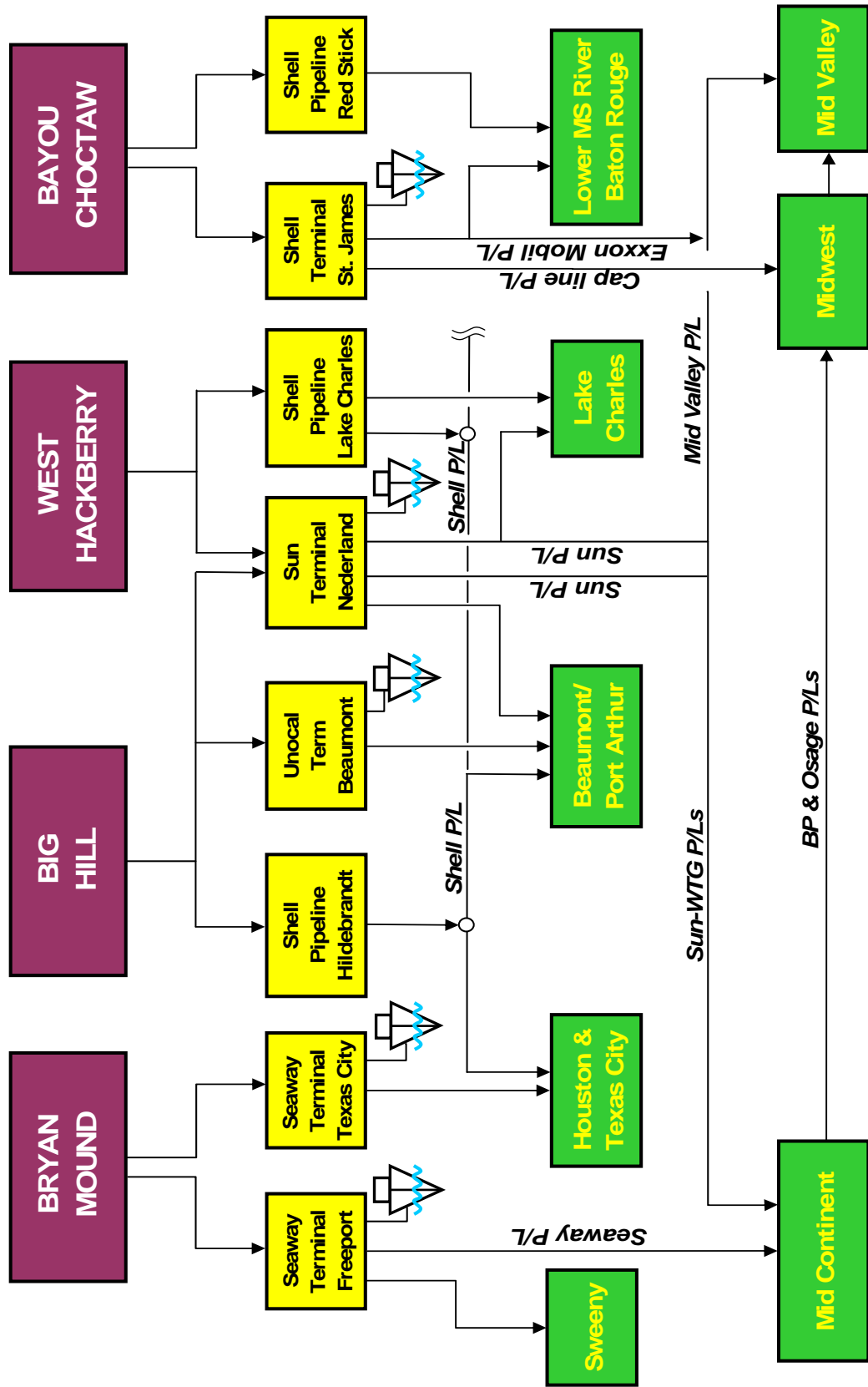
An annual assessment is conducted of the Strategic Petroleum Reserve’s crude oil distribution system capabilities to ensure that there are adequate connections to the commercial distribution systems, and to identify the need for any remedial plans. The 2005 assessment evaluated the Strategic Petroleum Reserve’s capability, at its maximum drawdown rate, to replace imported oil in 2004, 2005, 2010, and 2015. Future U.S. petroleum refining demands are based on forecasts made in the Energy Information Administration’s *Annual Energy Outlook, 2005*.

The assessment took into account changes made to commercial pipeline distribution systems and modifications to their infrastructure. A Canadian company, Enbridge Pipeline Co., purchased Spearhead Pipeline (the Cushing to Chicago) with plans to reverse the flow direction in 2006 to transport Canadian crude to Cushing, OK. Enbridge also announced the planned construction of a new crude oil line from Superior Terminal (Canada) to the Wood River Terminal in Illinois. When this line is completed, the volume deliverable to refineries in the Midwest, and possibly, further south, will increase.

The assessment confirms that the Strategic Petroleum Reserve has sufficient offsite distribution capabilities (defined as 120 percent of the maximum drawdown rate) to achieve current drawdown targets.

The assessments for 2005, 2010 and 2015 predict that the Strategic Petroleum Reserve’s distribution capability will continue to increase in the Seaway and Texoma systems as refinery imports increase, and distribution capability in the Capline system will decrease due to increasing domestic production from the Gulf of Mexico, but not enough to cause performance to fall below the 120 percent requirement.

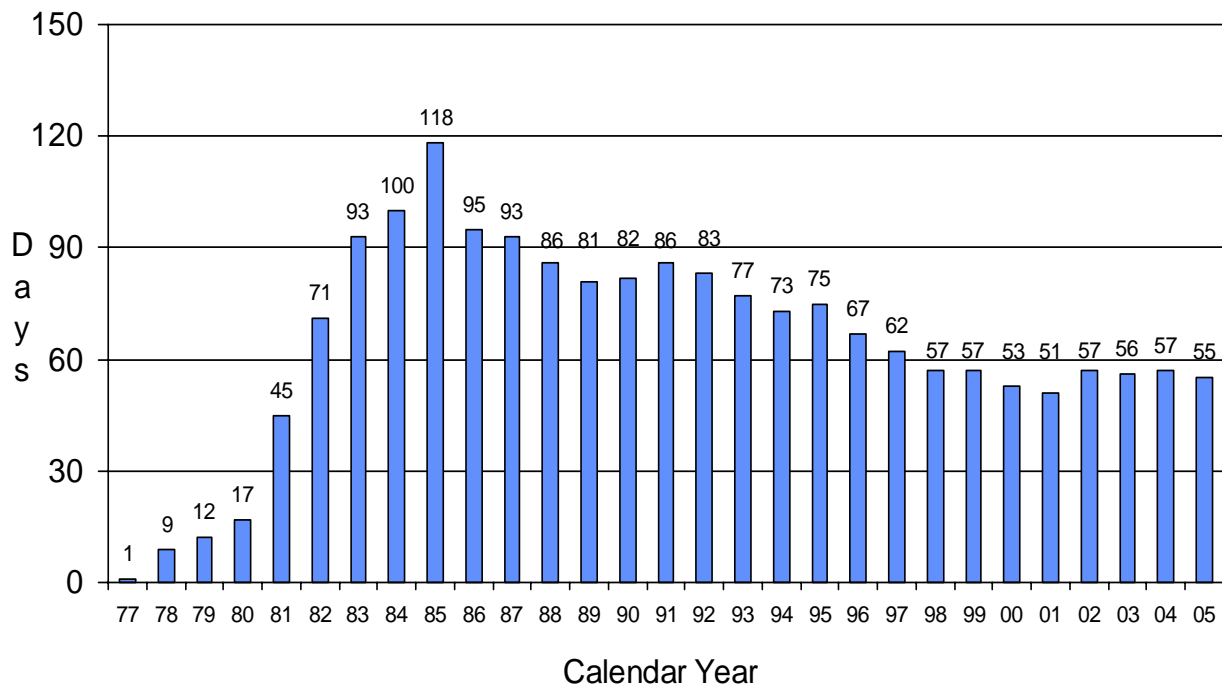
Figure 5  
Pipeline and Marine Distribution Capabilities



**Import Protection Levels**

In EPCA, the Congress established an initial storage objective of ninety days of net petroleum imports, which equated to 500 million barrels at that time. Figure 6 shows the Strategic Petroleum Reserve inventory of 684.5 million barrels on December 31, 2005, which amounted to 55 days of net import protection (crude oil and refined products).

**Figure 6  
Strategic Petroleum Reserve Days of Net Import Protection (1977-2005)\***

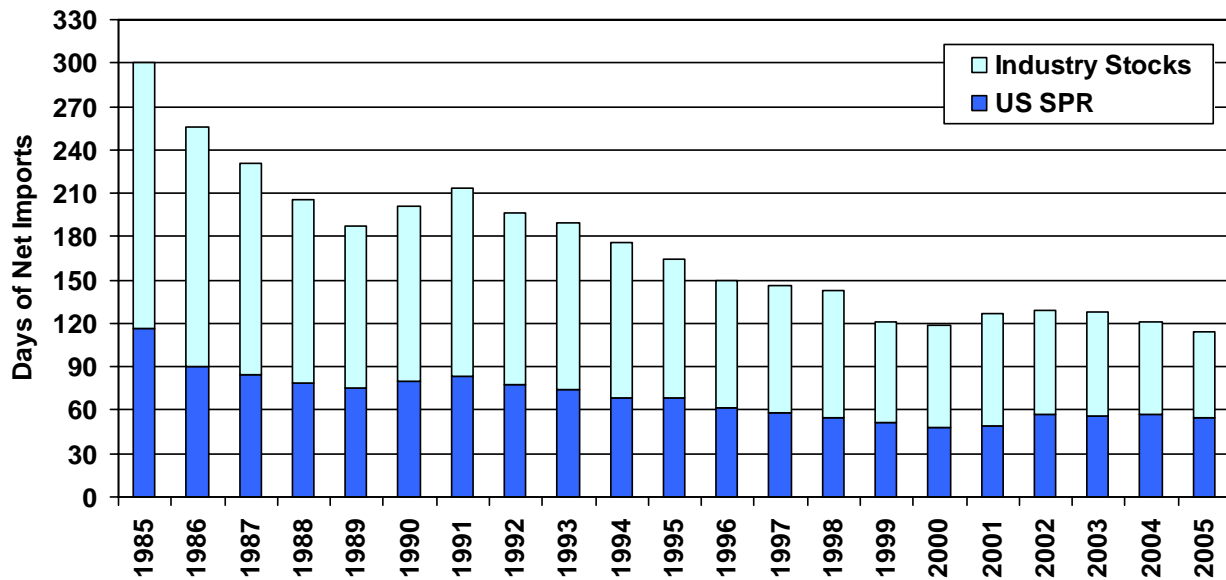


\* Days of Protection = Year End Inventory ÷ US Net Petroleum Imports/Day

The United States, as a member of the International Energy Agency, is committed to maintaining stocks of crude oil and products in reserves that are equivalent to ninety days of net oil imports. Computations of member-nations' stockpile requirements are based on both public and privately held stocks, and net imports are defined as the average daily level in the previous

year. The most recent International Energy Agency computation credits the United States with 114 days of emergency reserves, based on both the Strategic Petroleum Reserve and privately held stocks. Figure 7 provides end-of-year computations for the United States through 2005.

**Figure 7**  
**International Energy Program**  
**U.S. Emergency Stocks**



## COMMERCIALIZATION ACTIVITIES

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### **Commercial Leases**

Since 1995, the Strategic Petroleum Reserve has commercialized its under-utilized crude oil distribution facilities to be more cost-effective, and has leased two crude oil pipelines and a marine terminal to private industry. The contracts for these leases require that the facilities be maintained in good condition and, in the event of an emergency drawdown of oil, the leased facilities can be returned on fifteen days notice.

**Bayou Choctaw Pipeline:** In 2005, lease revenues amounted to \$730,542.25 primarily due to the increased movements on this pipeline from Hurricane Ivan exchange return oil receipts and Hurricane Katrina drawdown and exchange deliveries and receipts. This pipeline was leased to Shell Pipeline Company LP on May 1, 1997, on a revenue-sharing basis. In 1998, the lease was converted from an annual lease to a ten-year lease.

**Bryan Mound Pipelines:** In 2005, lease revenues amounted to \$1,132,668. Two of the three Bryan Mound pipelines were leased to ExxonMobil Pipeline Company on January 14, 1999. ExxonMobil began using the pipelines in June 2000, as part of its onshore distribution system for the Diana-Hoover production in the Gulf of Mexico.

**St. James Terminal:** In 2005, St. James Terminal lease revenues amounted to \$1,700,000. The terminal was leased to Shell Pipeline Corporation (now Shell Pipeline Company) on January 31, 1997, on a revenue-sharing basis. On April 2, 2003, the contract was re-negotiated for a period of ten years in the amount of \$1.7 million per year, with a five-year option in the amount of \$2 million per year. Payments were retroactive to January 1, 2003. In addition, the lease requires the lessee to pay 6 percent per annum (in-kind) on

the government-owned oil used in the terminal tanks.

During calendar year 2005, the Strategic Petroleum Reserve earned 14,423 barrels of crude oil as in-kind interest on government owned oil in tanks leased to Shell Pipeline Company.

### **Foreign Oil Storage**

The Strategic Petroleum Reserve promotes the concept of storing foreign oil in its unused storage space as a strategy to increase world oil stockpiling, generate revenues for the United States Treasury, and/or add oil to the Strategic Petroleum Reserve (in lieu of a fee). The Balanced Budget Act of 1997 (Public Law 105-33) provides specific authority to store petroleum products of another country, or its representatives, in the facilities of the Strategic Petroleum Reserve, provided that the United States is fully compensated for all related costs, and that the ability to draw down Strategic Petroleum Reserve oil is not impaired.

To enhance the Strategic Petroleum Reserve's offer to store oil for foreign governments or their representatives, the Big Hill storage site was activated as a special purpose Foreign Trade Zone subzone on September 28, 1998. This designation permits customers to store oil without paying customs fees and certain taxes. The Big Hill storage site is the only storage site to receive this designation.

The Strategic Petroleum Reserve did not enter into any commercial or foreign storage initiatives during 2005. However, the Department of Energy continued filling the Strategic Petroleum Reserve through its agreement with the Department of the Interior for Federal royalty oil, completing fill capacity at the Big Hill site.

**Commercialization Revenues**

During calendar year 2005, the U.S. Treasury earned 3,563,210 in cash revenues from the commercial leases of the Strategic Petroleum Reserve’s distribution facilities and pipelines, and

earned 14,423 barrels of oil for use of tank bottoms at St. James Terminal. Table 10 summarizes commercialization revenues from 1996 to 2005.

**Table 10**  
**Summary of Commercialization Revenues**  
**(December 31, 2005)**

<b>Calendar Year</b>	<b>Bryan Mound Pipeline</b>	<b>Big Hill Pipeline</b>	<b>Bayou Choctaw Pipeline</b>	<b>St. James Terminal Lease</b>	<b>Total Revenue Generated</b>
1996	102,606	472,809			575,415
1997		429,824	0	133,300	563,124
1998	12,500	402,525	0	481,010	896,035
1999	679,393	400,000	163,030	546,125	1,788,548
2000	652,146	493,359	217,573	748,986	2,112,064
2001	1,054,297	33,104	212,738	1,227,021	2,527,160
2002	1,468,613	0	249,708	1,285,183	3,003,504
2003	1,647,828	0	168,718	1,863,060	3,679,606
2004	1,546,121	0	174,338	1,700,000	3,420,459
2005	1,132,668	0	730,542	1,700,000	3,563,210



## **BUDGET AND FINANCE**

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The FY 2005 Consolidated Appropriations Act, 2005 (Public Law 108-447) included two rescissions totaling \$2,390,000 reduced funding for the Strategic Petroleum Reserve from \$172,100,000 to \$169,710,000.

### ***Appropriations through Fiscal Year 2005***

A total amount of \$22.1 billion, net of sales and transfers, has been appropriated for the Strategic Petroleum Reserve through fiscal year 2005. Included in this total is the distribution of annual and total appropriations described in Table 11.

### ***Strategic Petroleum Reserve Account***

The Strategic Petroleum Reserve Account funds the development, operation, and maintenance of facilities, the salaries and expenses necessary to plan and manage the program, including the operation of the Project Management Office in New Orleans, Louisiana, and the activities pertinent to major issues concerning the development and use of the Strategic Petroleum Reserve.

Obligations for the Strategic Petroleum Reserve in fiscal year 2005 totaled approximately \$163.6 million. From this amount, \$16.8 million was obligated for Federal program management and \$146.8 million was obligated for contractual goods and services to operate and maintain the Strategic Petroleum Reserve.

### ***SPR Petroleum Account***

The SPR Petroleum Account funds the acquisition of oil for the Strategic Petroleum Reserve; the associated costs for transportation and terminalling; United States customs duties; Superfund and Oil Spill Liabilities Trust Fund taxes; and other miscellaneous costs.

During an emergency drawdown and sale, the SPR Petroleum Account is the source of funding for the incremental costs of withdrawing oil from the storage caverns and transporting it to the point where purchasers take title. An amount equal to receipts realized as a result of the oil sale is deposited with the Department of Treasury in the SPR Petroleum Account to create additional budget authority for filling the Strategic Petroleum Reserve. In September 2005, \$43 million was transferred from the SPR Facilities Account to the SPR Petroleum Account to finance the incremental costs of the authorized drawdown of 30 million barrels of crude oil. The Department of Energy ultimately sold 11 million barrels and received \$615,298,394. Incremental costs associated with the crude oil sale totaled \$11.9 million.

For fiscal year 2005, the capitalized cost of the crude oil in the Strategic Petroleum Reserve was \$19.2 billion, for an average cost per barrel of approximately \$27.73 (excluding storage costs). Since April 1999, contracts have been awarded for 138.8 million barrels of exchange royalty oil from the Department of the Interior. The value of crude oil received from the royalty-in-kind program in fiscal year 2005, was \$1.3 billion.

The value of the royalty-in-kind transferred from the Department of the Interior to the Department of Energy by fiscal year is shown in Table 12.

**Table 11**  
**Annual Appropriations (\$000) for Storage Facilities Operations and Management and Petroleum Acquisition and Transportation as of December 31, 2005**

Fiscal Year	Oil Account	Facilities	Management	Total	Defense SPR
1976	0	300,000	13,975	313,975	
1977	440,000	0	7,824	447,824	
1978	2,703,469	463,933	14,704	3,182,106	
<b>Total 1979 Appropriations*</b>	<b>2,356,456</b>	<b>632,504</b>	<b>18,111</b>	<b>3,007,071</b>	
<b>Total 1980 Appropriations*</b>	<b>(2,022,272)</b>	<b>0</b>	<b>22,272</b>	<b>(2,000,000)</b>	
<b>Total 1981 Appropriations*</b>	<b>3,205,094</b>	<b>108,168</b>	<b>19,391</b>	<b>3,332,653</b>	
<b>Total 1982 Appropriations*</b>	<b>3,679,700</b>	<b>175,656</b>	<b>20,076</b>	<b>3,875,432</b>	
1983	2,074,060	222,528	19,590	2,316,178	
1984	650,000	142,357	16,413	808,770	
1985	2,049,550	441,300	17,890	2,508,740	
<b>Total 1986*</b>	<b>(12,964)</b>	<b>106,979</b>	<b>13,518</b>	<b>107,533</b>	
1987	0	134,021	13,412	147,433	
1988	438,744	151,886	12,276	602,906	
1989	242,000	160,021	13,400	415,421	
1990	371,916	179,530	12,953	564,399	
1991	566,318	187,728	12,846	766,892	
1992	88,413	171,678	13,384	273,475	
1993	(125,625)	161,940	14,227	50,542	
<b>DOD Transfer (non add)</b>	<b>124,925</b>	<b>700</b>	<b>0</b>	<b>125,625</b>	<b>125,625</b>
1994	0	191,035	15,775	206,810	
1995	(107,764)	226,938	16,780	135,954	
1996 transfer from SPR Petroleum Account	(187,000)	170,173	16,827	0	
1996 Weeks Is. Oil Sale	(97,114)	97,114	0		
1996 deficit reduction oil sale	(227,000)	0		(227,000)	
<b>1996 Total</b>	<b>(511,114)</b>	<b>267,287</b>	<b>16,827</b>	<b>(227,000)</b>	
<b>1997 Total*</b>	<b>(220,000)</b>	<b>193,000</b>	<b>16,000</b>	<b>(11,000)</b>	
1998	0	191,500	16,000	207,500	
1999	0	145,120	14,805	159,925	
2000	0	144,000	15,000	159,000	
2001	0	140,672	15,965	156,637	
2002	0	154,009	16,871	170,880	
2003	1,955	157,823	13,909	173,687	
2004	0	155,044	15,904	170,948	
<b>2005*</b>	<b>43,000</b>	<b>109,946</b>	<b>16,764</b>	<b>169,710</b>	

\* Includes reprogramming and rescission actions.

Note: Fiscal year 1991 SPR Petroleum Account of \$566,318 includes proceeds of \$122,681 from the Test Sale recorded as additional budget authority, rather than reductions to obligations, costs, and outlays. It also includes \$315,424,985 in Desert Storm Drawdown proceeds from January 1991, and \$19,755,064 from fiscal year 1991 NPR excess receipts. Thus, the cumulative budget authority is "gross" and not related directly to the inventory of oil on hand.

**Table 12**  
**Value of Royalty-in-Kind Transferred by the Department of the Interior**  
**By Fiscal Year**

<b>Fiscal Year</b>	<b>Royalty in Kind Transfer Total Barrels*</b>	<b>Department of the Interior Forgone Receipts** - (\$000)</b>
<b>1999</b>	<b>11,928,981</b>	<b>***</b>
<b>2000</b>	<b>15,105,558</b>	<b>560,521</b>
<b>2001</b>	<b>1,568,220</b>	<b>61,654</b>
<b>2002</b>	<b>10,575,379</b>	<b>262,752</b>
<b>2003</b>	<b>34,742,046</b>	<b>1,044,350</b>
<b>2004</b>	<b>35,506,135</b>	<b>1,191,284</b>
<b>2005</b>	<b>25,185,527</b>	<b>1,194,618</b>
<b>Total</b>	<b>134,611,846</b>	<b>4,315,179</b>

\* Source: Department of Energy

\*\* Source: Department of the Interior

\*\*\* Department of the Interior data not available

### ***Performance Measurement***

The mandates of the Government Performance and Results Act of 1993 are incorporated into the Strategic Petroleum Reserve's performance management system. Table 13 shows that out of a total of twenty-one performance target outputs, eighteen measures met or exceeded their goals.

Due to the impact of Hurricane Rita on the Big Hill and West Hackberry sites, the 90-day sustainable drawdown rate was 4.11 MMB/Day at year end. We recovered to the 4.4 MMB/Day

target on October 21, 2005. Likewise, the senior staff review required to "Develop and Implement a Hiring Flexibilities Plan" was not achieved by the September 30<sup>th</sup> due date because of delayed personnel re-entry to the Project Management Office buildings. This plan will be completed during FY 2006.

Details of program goals, objectives, and progress are contained in the Strategic Petroleum Reserve's *Annual Performance Report*.

**Table 13  
Performance Measures**

<b>Performance Measures</b>	<b>FY 2004 Actual Performance</b>	<b>FY 2005 Target Output</b>	<b>FY 2005 Actual Performance</b>
<b>Public Confidence: Oil Inventory, Drawdown Readiness and Distribution</b>			
Number of Barrels of Crude Oil Inventory in Storage	670MMB	690 MMB	693.7 MMB
90-Day Sustainable Drawdown Rate	4.40 MMB/Day	4.40 MMB/Day	4.11 MMB/Day
Number of Days to Commence Crude Oil Drawdown	13 Days	13 Days	13 Days
Distribution Capability as a Percentage of Drawdown Rate	158%	≥ 120% of Drawdown Rate	163%
Calculated Site Availability	98%	≥ 95%	98%
Calculated MPAR Rating	98%	≥ 95% of Possible Points	98%
Percent of Site Security Ratings that are Satisfactory	100%	100%	100%
Number of Barrels of Heating Oil Inventory in Storage	2.0 MMB	2.0 MMB	2.0 MMB
Number of Days to Complete Heating Oil Drawdown	12 Days	12 Days	12 Days
Commence Processing Vapor Content Crude	N/A	5/3/04	4/16/04
Number of Barrels of Crude Oil Processed	22.25 MMB	30 MMB	44.4 MMB
<b>Excellent Customer Service: Customer Relations</b>			
Percentage of Key Customers Visited	53%	33%	50%
<b>Responsible Stewardship: Operational Effectiveness, Efficiency and Knowledge Management/Fiscal Responsibility and Budgetary Control</b>			
Network and Business Application Availability	N/A	≥ 98%	≥ 99%
Operating Cost per Barrel of Storage Capacity	\$ 0.194	≤ \$.0.198	\$0.180
<b>Dynamic Teamwork: Continuous Improvement</b>			
ISO 9001-2000 Certification	12/10/03	3/31/05	12/13/04
<b>Partnerships</b>			
Number of Partnership Arrangements with Federal, State, and Local Agencies	35	25	35
<b>Social Responsibility and Citizenship: Environment, Safety and Health</b>			
Annual -Evaluation of OSHA VPP Star Status at Four Sites	2/12/04	2/15/05	2/12/05
Number of Cited Environmental Violations Received	0	0	0
Number of Days with No Reportable/Recordable Spills	363Days	≥ 355 Days	364 Days
Annual ISO 14001 Certification	4/15/04	5/31/05	4/22/05
<b>Employee Development and Diversity: Employee Development and Quality of Worklife</b>			
Develop and Implement Hiring Flexibilities Plan	N/A	9/30/05	Not Complete

## ***OTHER ACTIVITIES***

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### ***Security and Emergency Operations***

The Strategic Petroleum Reserve continues to implement physical security enhancements commensurate with the increased threat with a state-of-the-art security program that provides a high level of protection for crude oil flow and drawdown operations, resources and personnel. Physical components of the program include an armed protection force, physical barriers and access control, and intrusion detection. Aggressive training and counter-intelligence activities are also an integral part of the program.

The Strategic Petroleum Reserve Security and Emergency Operations Division maintains a dynamic “all hazards response” operation which is configured to ensure an integrated response to any crisis or emergency incident. The Strategic Petroleum Reserve achieves this capability by developing and executing a strategy that combines protection resources to ensure continuity of operations, security, emergency management, and fire protection.

The results of these efforts are continually tested during exercises and drills, both planned and no-notice, at all sites. The Reserve’s all-hazards response has been extremely positive. The successful activation of the Strategic Petroleum Reserve’s Continuity of Operations Plan in response to Hurricanes Katrina and Rita led to the deployment of the leadership and Emergency Management Team to Beaumont, Texas. Immediately following Hurricane Katrina, the Strategic Petroleum Reserve was directed to execute both a sale and an exchange. These actions were accomplished successfully and the Strategic Petroleum Reserve was awarded the Secretary’s Gold Award in September 2005. The Strategic Petroleum Reserve was again affected

by a hurricane in late September 2005 when Rita came ashore in southwestern Louisiana. This storm impacted two storage sites, West Hackberry and Big Hill, causing personnel evacuations and temporary suspension of activities at the sites. Infrastructure damage to the electrical distribution grid feeding the sites impacted recovery of the sites, although both sites were drawdown capable within two weeks of the storm’s landfall.

The Strategic Petroleum Reserve continues its strong partnerships with other federal and state agencies such as the Department of Homeland Security, the Federal Bureau of Investigation, the Bureau of Alcohol, Tobacco and Firearms, the Coast Guard, the U.S. Environmental Protection Agency, the Federal Emergency Management Agency, National Guard chemical response teams, and other first-responders. These agencies participate in annual exercises and drills, allowing a high level of reality to be built into exercise scenarios. During 2005, site emergency response teams participated in firefighting, hazardous material operations and refresher emergency response training at the Louisiana State Firefighting Academy located in Baton Rouge, Louisiana. Each site conducted successful national Preparedness for Response Exercise Program drills, both unannounced and announced, as required under the Oil Pollution Act of 1990, and demonstrated proficiency.

### ***Environment, Safety, and Health***

The Strategic Petroleum is accountable to the public for the safe delivery of crude oil during a national energy emergency and is a good steward of the environment. During 2005, the Strategic Petroleum Reserve completed the three following major NEPA compliance activities:

- A total of 47 Categorical Exclusions were prepared for projects on the Strategic Petroleum Reserve.
- An Environmental Assessment for the West Hackberry Raw Water Intake Structure Modifications was prepared in full compliance with all applicable NEPA requirements and policies. The Project Manager approved the Environmental Assessment (DOE/SPR/EA-1523) on November 10, 2005, and signed the Finding of No Significant Impact on November 10, 2005. The final document, which includes both the approved Environmental Assessment and the Finding of No Significant Impact, was distributed to the Department of Energy Headquarters on December 12, 2005.

### ***Vapor Pressure Mitigation***

To assure the environmental and safety concerns of drawdown operations, the Reserve has established a crude oil degasification program to lower vapor pressure and minimize downstream hydrocarbon and toxic emissions from customer facilities.

The degasification plant innovation will produce tremendous lifecycle benefits to the environment. For each pound of emissions this innovation generates over its lifecycle, 1,900 pounds of emissions could be avoided in a single future drawdown, with 97 percent of that benefit extending directly to the customer. The

degasification plant operated throughout 2005 demonstrating its viability as an effective pollution prevention control.

### ***Miscellaneous***

The Reserve's environmental responsibility includes the preservation of wetlands and wildlife in a manner integrated with overall operation of the Strategic Petroleum Reserve. For example, in the summer of 2005, interns working at Bryan Mound studied indigenous vegetation that could benefit effective security systems. In addition, the Strategic Petroleum Reserve made operational changes to its brine discharge processes at Big Hill and Bryan Mound that increase discharge exit velocity for the express purpose of increasing dispersion and diffusion of the brine effluent into the Gulf of Mexico. This voluntary initiative increased the effectiveness of the Reserve's brine diffuser systems in reducing the whole effluent toxicity of the discharge plume.

The Big Hill and Bryan Mound sites became the first charter members of Texas's Cleaner World program. The Texas program is modeled after the Environmental Protection Agency's environmental performance-track program and provides benefits that improve efficiency of environmental aspects of operations. An employee recognition event was held at Bryan Mound in 2005, with a similar event planned for Big Hill in 2006.

A charrette, a collaborative planning process to harness the talents and energies of all interested parties, was implemented in 2005 for inclusion of U.S. Green Building Council's green building design criteria for the Big Hill building mold remediation and renovation project. Many of the elements of the Leadership in Energy and Environmental Design (LEED) specification were incorporated by the consensus of the charrette.

Major environmental initiatives in the reuse of heat exchanger fluids at West Hackberry, recycling of boring mud at Big Hill, and reclassification of swamp land requiring mitigation at Bayou Choctaw produced cost avoidances on the order of \$530,000. Many other smaller projects throughout the year also produced such benefits, underscoring the philosophy that good environmental stewardship makes economic sense.

The Strategic Petroleum Reserve decommissioned the Weeks Island facility in 1999, but proceeded to conduct post-closure ground water monitoring to identify indications of impacts from then, through 2004. In 2005, after reviewing historical data and analysis provided by the Strategic Petroleum Reserve, the Louisiana Department of Natural Resources agreed that no indications of contamination existed and authorized cessation of the long term ground water monitoring program.

### ***Occupational Safety and Health Administration's Voluntary Protection Program***

The Strategic Petroleum Reserve participates in the Occupational, Safety and Health Administration's (OSHA) and the Department of Energy's Voluntary Protection Programs. OSHA and the Department of Energy perform an on-site reappraisal of their Voluntary Protection Program sites every three years. Bayou Choctaw and West Hackberry were recertified in both programs as Star facilities in 2004. Big Hill was recertified in 2005 and Bryan Mound is scheduled for reappraisal in January 2006. All four sites maintained their Star status throughout 2005.

In 2005, OSHA Region VI awarded Bryan Mound a *Star of Excellence*, West Hackberry and Big Hill *Superstars*, and Bayou Choctaw *Star among Stars*. These awards

recognize accident rates that range from 50% to 90% below those of their industry average.

### ***Accident Rates Meet Goals***

In 2005, the Strategic Petroleum Reserve's Total Case Incident Case Rate (TCIR) was 1.20 cases per 200,000 worker hours, which exceeded the Department of Energy's nationwide goal of 1.25. The Days Away/Restricted/Transferred (DART) Incident Case Rate was 0.70 cases per 200,000 worker hours, meeting the Strategic Petroleum Reserve's target goal. This year, the Reserve had the lowest number of recordable accidents in its history. The vehicle accident rate was 0.56 cases per 200,000 worker hours, continuing a four-year downward trend.

### ***Integrated Safety Management (ISM)***

The Strategic Petroleum Reserve completed its annual ISM validation and documented performance in the ISM Annual Verification and Continuous Improvement Report. The Reserve is operating a successful ISM system with no significant systemic weaknesses and has generated several recommendations for continuous improvement.

### ***Safety Summit Becomes Annual***

In May 2005, the Strategic Petroleum Reserve held its second annual Management Safety Summit at Bayou Choctaw, Louisiana, to promote safety goals and focus senior management attention on safety-related issues, including safety statistics and how they are derived, electrical-safety initiatives including the site specific arc flash studies being performed, and OSHA regulatory changes.

### ***American National Standards Institute (ANSI) Z10 Certification Begins***

In December the Strategic Petroleum Reserve completed a gap analysis of the new ANSI safety management standard, ANSI Z10, published in September. The analysis indicates that some improvements should be made prior to self-certification. Currently, there is no recognized authority that evaluates and certifies against Z10. The standard allows companies choosing to meet the Z10 requirements to establish their own means of verification.

### ***Close Call Program***

The Close Call Program piloted in New Orleans in 2004 was expanded to include the Department of Energy, DynMcDermott, the construction management contractor, and the Department of Energy support contractor. It was also implemented at all of the storage sites. The Strategic Petroleum Reserve won the Office of Fossil Energy Excellence in ESS&H Award for 2005 for their adoption of a best practice from another Department of Energy facility and then tailoring and improving it for the Strategic Petroleum Reserve.

### ***Safety Support for Security***

The Strategic Petroleum Reserve Safety and Health staff supported the Security Office in several new innovations. The Safety and Health Office provided a risk assessment and recommended hazard controls for the new “pop up” vehicle entrance barriers installed at each of the storage sites. They also participated in the firearms safety committee selection of new weapons, training requirements, and risk assessments.

### ***Improved Compliance with Electrical Safety***

The Strategic Petroleum Reserve initiated arc flash studies, compliant with NFPA 70, for each of the storage sites. Big Hill was completed in 2005 and Bryan Mound is in review. The studies determine the most severe arc flash that each piece of electrical equipment can generate, the radius of exposure, and the personal protective equipment required. In cases where the flash potential exceeds PPE protection, equipment is designated as dangerous and can only be worked on while it is locked out (zero energy). Engineering is used whenever possible to reduce the arc flash potential for this equipment. The reports also provide the appropriate labels for each piece of site electrical equipment. This not only improves compliance, it reduces the risk of an electrical accident during preventive and corrective maintenance.

### ***Human Performance Improvement***

Strategic Petroleum Reserve personnel trained in the philosophy and techniques of Human Performance Improvement (HPI) during the year. Application of its principles should provide additional improvements in accident performance. HPI protocol is being used successfully in expanded-C investigations.

### ***Support of Strategic Petroleum Reserve Hurricane Victims***

Following hurricanes Katrina and Rita the Strategic Petroleum Reserve Safety and Health staff provided continuous support to the Strategic Petroleum Reserve hurricane victims, providing information on health hazards; actions to take when re-entering their homes; on-line resources for obtaining aid, further medical information, and mold remediation. The Safety and Health Office provided continuous support for the Emergency Operations Center and maintained a working



safety management system by stationing Safety and Health employees at alternative sites. Safety and Health personnel also supported the re-entry to the New Orleans and West Hackberry sites by working Indoor Air Quality (IAQ) issues and improving workstation conditions.

### ***Awards and Certifications***

In addition to the previously mentioned awards, the Strategic Petroleum Reserve received the following awards and certifications for 2005:

- White House Closing the Circle Environmental “Honorable Mention” Award for Preventing Downstream Emissions through Sustainable Product Stewardship.
- 2005 Clean Texas – Clean World National Award.
- 2005 Louisiana Department of Economic Development Lantern Award.
- 2005 Big Hill Texas Quality Award.
- Department of Energy’s “Best in Class Pollution Prevention Award” for Preventing Downstream Emissions through Sustainable Product Stewardship.
- Department of Energy’s “P2 Star Award” for Degassing Crude Oil to Reduce Emissions from Customer Facilities.
- Office of Fossil Energy Excellence in ESS&H Award 2004 in recognition of outstanding service and leadership in Evolving Behavioral Safety to the Next Level. (Presented in 2005)
- National Association of Environmental Professionals National Excellence Award for Best Available Environmental Technology.
- Louisiana Governor’s Environmental Leadership Award for mercury reduction.
- Department of Energy’s Energy Management Award for energy efficiency savings in the design of the oil degasification plant.
- 2005 is the sixth year for the ISO 14001 environmental management system’s continuous third-party certification of the Reserve’s Management and Operations at Bayou Choctaw, Big Hill, Bryan Mound, New Orleans, and West Hackberry.
- In 2005, the new Stennis Facility received full third party certification under the ISO 14001 standard.
- As a Charter Member of the Environmental Protection Agency’s performance-track program, the Reserve continued its commitment for its sixth continuous year for the Bayou Choctaw, Big Hill, Bryan Mound, New Orleans, and West Hackberry, a second three-year cycle.

### ***Louisiana Environmental Management Award***

The Project Management Office in New Orleans and the two storage sites in Louisiana (Bayou Choctaw and West Hackberry) each received an Environmental Management Award for Excellence from the Louisiana Quality Foundation, making it the only organization in the state to achieve multiple-facility awards, and the only one to receive this award for three consecutive years.

### ***Malcolm Baldrige National Quality Award***

President George W. Bush and Commerce Secretary Carlos Gutierrez announced on November 22, 2005 that the Strategic Petroleum Reserve's Operating & Maintenance Contractor, DynMcDermott Petroleum Operations Company, had been selected as a 2005 recipient of the Malcolm Baldrige National Quality Award for the service category. The award is presented annually to organizations that distinguish themselves through management performance excellence and demonstrate continuous improvement to stakeholders. DynMcDermott became the first Louisiana organization to receive this prestigious award.

### ***Environmental Performance Track Program***

In 2005, the Strategic Petroleum Reserve continued its charter member status in the Environmental Protection Agency's environmental performance-track program, in recognition of its outstanding past performance and commitment to future performance. Membership is renewable after each three-year cycle and the Strategic Petroleum Reserve fully expects to continue to participate in the performance-track program.

### ***New Orleans Federal Performance Excellence Network***

The New Orleans Federal Performance Excellence Network is supported by the New Orleans Federal Executive Board which consists of Federal employees from the Greater New Orleans and Mississippi Gulf Coast regions. It is a forum for sharing benchmarking and performance improvement information. The Strategic Petroleum Reserve co-sponsors the Network by providing speakers, and supporting its website, [www.nofpen.org](http://www.nofpen.org).

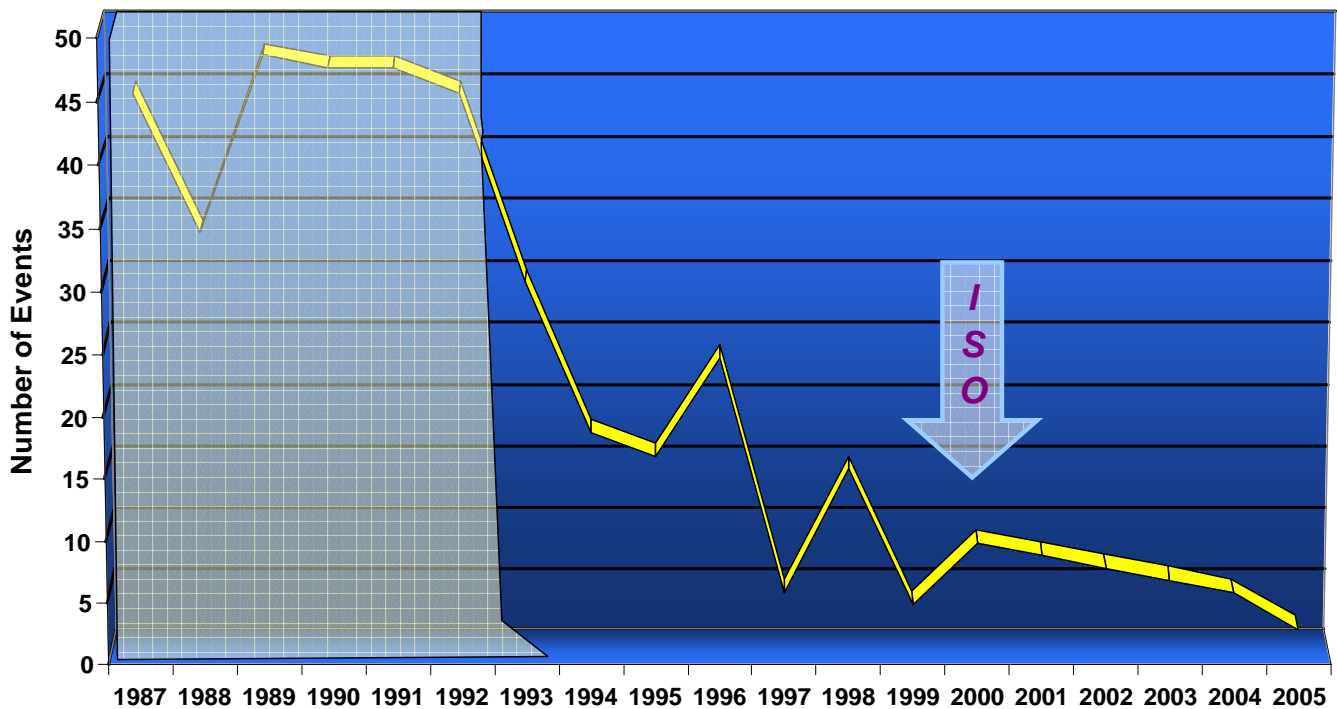
### ***Integration of the ISO 14001 into the Environmental Management System***

In May 2000, the Strategic Petroleum Reserve became the first bulk petroleum storage organization, public or private, to receive an ISO 14001 certification for its environmental management system. This certification, now on its second cycle, is viable through May 2006.

The ISO 14001 Registrar (the certifying agency) performed two separate surveillance audits of all of the facilities against the new ISO 14001-2004 standard. The successful outcome resulted in continuation of the ISO 14001 certification at all five of the original locations, and the additional certification of the Strategic Petroleum Reserve warehouse building located on the NASA Stennis Space Center in Mississippi. In addition, the Strategic Petroleum Reserve received environmental management awards from the National Association of Environmental Professionals and the Department of Energy Headquarters, for Degassing Crude Oil to Reduce Emissions from Customer Facilities.

Figure 8 shows the Reserve's performance for recordable environmental incidents for the years 1986-2005, and displays a downward trend.

**Figure 8**  
**Reportable Environmental Events**



**Pollution Prevention**

**Hazardous Waste**

The Strategic Petroleum Reserve’s goal for 2005 was to generate no more than 539 pounds of hazardous waste. Actual hazardous waste generated at all five sites amounted to 495 pounds; 92 percent was laboratory waste and the remaining 5 percent was spent fluorescent lamps.

wells at West Hackberry which resulted in sand being lifted out of the pipe (59,812 pounds recycled to a land farm), and crude tank bottoms and rinseate (445,079 pounds provided as feedstock to a recycler).

**Recycling**

The Strategic Petroleum Reserve achieved 99 percent recycling of >800,000 pounds of exploration and production (E&P) waste generated in 2005. E&P waste generated included the cleanup of a brine release at West Hackberry which resulted in 352,229 pounds of sand/soil being recycled to a land farm. Other recycled E&P wastes included cleanout of brine disposal

The 2005 overall recycling rate was 88 percent. This rate represents 2,995,051 pounds of non-E&P recycled waste (including paper and cardboard) against 402,616 pounds of sanitary waste.

For a second year, the Strategic Petroleum Reserve achieved 100 percent in the procurement of products that met the Environmental Protection Agency’s guidelines for recycled material content.

### ***ISO 9001 Quality Management System***

The ISO 9001 Recertification Audit scheduled in October 2005 was rescheduled to January 2006 due to the events of Hurricane Katrina and Rita. The Strategic Petroleum Reserve received a favorable report from this audit and thus continued its ISO 001-2000 certification.

### ***Customer Service***

During 2005, customer service teams from the Strategic Petroleum Reserve visited twelve potential customers. The objectives of these visits were to:

- Provide updates on the Reserve.
- Learn more about customer requirements.
- Solicit ideas for improvements.
- Cultivate communications.

In March 2005, the National Petrochemical and Refiners Association held its annual meeting in San Francisco, California, which provided an opportunity for staff to interact with representatives from the refining industry, many of whom are key customers.

### ***Real Estate Actions***

During 2005, the Strategic Petroleum Reserve:

- Successfully acquired through direct negotiations with the landowner, a utility easement (Tract 800 E-4) at Big Hill for the installation of the 34.5 kilovolt power line on June 1, 2005.
- Executed the updated Report of Excess, Report on Title, and CERCLA Document for the Weeks Island Disposal on May 23, 2005. The Weeks Island facility was fully accepted for disposal by GSA on June 28, 2005.
- Executed Occupancy Agreement with GSA on November 9, 2005, for the use of their warehouse parking lot as a trailer site for thirteen Strategic Petroleum Reserve employees displaced by Hurricane Katrina.
- Successfully acquired, through the Corps of Engineers, access and utility easements for mainline valve stations at Big Hill and West Hackberry. A road easement was also acquired for valve station TX-2 via executed Offers to Sell in July/August 2005. Actual deeds have been signed and the closings are pending.
- Successfully acquired, through Corps of Engineers, road easements for the West Hackberry Evacuation Route in June 2005.

## **APPENDIX A**

### ***Strategic Petroleum Reserve Site Information***

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#### ***Bryan Mound***

##### **Location**

Brazoria County, Texas (3 miles southwest of Freeport, Texas).

##### **Site Description**

254-million-barrel storage facility consisting of 20 caverns.

24-inch diameter, 6-mile brine disposal pipeline extending 4 miles offshore in the Gulf of Mexico.

Oil, brine and raw water piping distribution system connecting caverns with central plant and water intake structure located on Brazos River. Twenty-one (21) pumps totaling approximately 45,000 horsepower.

##### **System Parameters**

Drawdown Rate:	1,500,000 bbl/d
Raw Water Pumping Rate:	1,545,000 bbl/d
Oil Fill Rate:	225,000 bbl/d
Brine Disposal Rate:	260,000 bbl/d

##### **Distribution Facilities**

DOE 3.9 mile, 30-inch pipeline to Seaway Freeport Marine Terminal, DOE 4.0 mile, 30-inch pipeline to Seaway Jones Creek Tank Farm and Pipeline and DOE 46 mile, 40-inch pipeline to Seaway Texas City Terminal and Docks.

##### **Acquisition**

Acquired 499.47 acres fee simple, by condemnation April 1977, from Freeport Mineral Company and other owners. Dow Chemical Company was the previous operator.

#### ***West Hackberry***

##### **Location**

Cameron Parish, Louisiana (25 miles southwest of Lake Charles, Louisiana).

##### **Site Description**

227-million-barrel storage facility consisting of 22 caverns.

Oil, brine, and raw water piping distribution system connecting caverns with central plant, water intake structure located on Intra-coastal waterway and 9-brine disposal wells. Thirty-three (33) pumps totaling over 41,680 horsepower.

##### **System Parameters**

Drawdown rate:	1,300,000 bbl/d
Raw Water Pumping Rate:	1,632,000 bbl/d
Oil Fill Rate:	225,000 bbl/d
Brine Disposal Rate:	225,000 bbl/d

##### **Distribution Facilities**

DOE 42.8 mile, 42-inch pipeline to Sunoco Nederland Terminal.  
DOE 13.6 mile, 36-inch pipeline to Shell Pipeline common carrier pipeline system at Carlyss.

##### **Acquisition**

Acquired 405.36 acres fee simple by condemnation, April 1977, from numerous private landowners. Olin Corporation was the previous site operator. Acquired 160.0 additional acres fee simple by condemnation in two actions, July 1979 and March 1980.

## **Big Hill**

### **Location**

Jefferson County, Texas (26 miles southwest of Beaumont, Texas).

### **Site Description**

170-million-barrel storage facility consisting of 14 caverns.

Oil, brine, and raw water systems connecting caverns with central plant, water intake structure located on the Intracoastal Waterway, and a 48-inch diameter, 14-mile brine disposal pipeline extending 4 miles offshore in the Gulf of Mexico. Forty-eight (48) pumps totaling 46,000 horsepower.

### **System Parameters**

Drawdown Rate:	1,100,000 bbl/d
Raw Water Pumping Rate:	1,400,000 bbl/d
Oil Fill Rate:	225,000 bbl/d
Brine Disposal Rate:	432,000 bbl/d

### **Distribution Facilities**

DOE 24.5 mile, 36-inch pipeline to Sunoco Nederland Terminal, Unocal 2 mile, 24-inch pipeline to Unocal Docks, Shell 20-inch pipeline system to East Houston.

### **Acquisition**

Acquired 271 acres fee simple, by condemnation November 1982 and July 1983, from three landowners, i.e., 238.48 acres from Amoco, 27.06 acres from the Pipkin estate, and 5.46 acres from the Patrick Henry Phelan estate.

## **Bayou Choctaw**

### **Location**

Iberville Parish, Louisiana (12 miles southwest of Baton Rouge, Louisiana).

### **Site Description**

76-million-barrel storage facility consisting of 6 caverns.

Oil, brine, and raw water piping distribution system connecting caverns with central plant, a water intake structure, 12 brine disposal wells, and a pipeline for disposing of brine to PetroLogistics Olefins, LLC. Eighteen (18) pumps totaling over 18,000 horsepower.

### **System Parameters**

Drawdown Rate:	515,000 bbl/d (sour) 300,000 bbl/d (sweet)
Raw Water Pumping Rate:	515,000 bbl/d
Oil Fill Rate:	110,000 bbl/d
Brine Disposal Rate:	110,000 bbl/d

### **Distribution Facilities**

DOE-owned 37.2 mile, 36-inch pipeline to Shell's Sugarland Terminal and Capline Pipeline. Shell-owned 16 mile, 24-inch pipeline to Baton Rouge.

### **Acquisition**

Acquired 355.95 acres fee simple, by condemnation April 1977, from numerous private owners. Union Texas Petroleum (a subsidiary of Allied Corporation) was the previous operator.

In 1985, the Department of Energy acquired an additional existing cavern through a cavern exchange agreement with Union Texas Petroleum. The transaction involved a 3.5-acre exchange with no net change in Government-owned acreage.