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WASHINGTON, D.C. 20548

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ENERGY AND MINERALS
DIVISION

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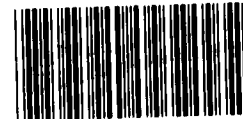
AUG 28 1981

B-203117

RESTRICTED — Not to be released outside the General Accounting Office except on the basis of specific approval by the Office of Congressional Relations.

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

The Honorable John Dingell
Chairman, Committee on Energy
and Commerce
House of Representatives



116279

Subject: Status of Strategic Petroleum Reserve Activities--
August 1981 (EMD-81-136)

This is the eighth in a series of status reports requested by members of the Senate Committee on Energy and Natural Resources and the House Committee on Energy and Commerce on the administration's activities to implement title VIII of the Energy Security Act. (See enc. II for the July 23, 1980, letter requesting these reviews.) Title VIII requires the President to fill the Strategic Petroleum Reserve (SPR) at an average rate of at least 100,000 barrels per day for fiscal year 1981 and each succeeding fiscal year.

Our most recent report on the status of SPR fill activities (EMD-81-118, July 17, 1981) noted that, since passage of the Energy Security Act, the Government had issued contracts for about 95 million barrels of oil to be delivered to the SPR during fiscal year 1981. This is equivalent to an average fill rate of about 260,000 barrels per day for the entire fiscal year and exceeds the administration's goal for the fiscal year presented in its March 10, 1981, budget of filling the SPR at a rate of about 200,000 barrels per day.

This report discusses the Government's activities to contract for SPR oil as of August 21, 1981. It also discusses the volume of oil delivered to the Department of Energy's (DOE's) SPR storage facilities and the status of these facilities as of August 17, 1981.

The report is based on our review of DOE and Defense Fuel Supply Center (DFSC) program documents, and of publications and studies

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related to the program. We also interviewed officials in DOE and DFSC. We did not verify the available capacity of SPR storage facilities nor the volume of oil received by DOE.

DOE'S AUGUST 1981 CONTRACT
TO ACQUIRE MEXICAN OIL

Since our July 1981 report, DOE has signed a multi-year contract with Petroleos Mexicanos (PEMEX), Mexico's State oil company, to acquire up to 110 million barrels of oil for the SPR. DOE officials estimate that, depending on delivery arrangements now being made, about 6 million barrels of oil will be delivered during September 1981 under the August 20, 1981, contract. According to the contract, an additional 31.7 million barrels of oil will be delivered during fiscal year 1982. The remaining 72 million of the 110 million barrels will be delivered between October 1, 1982, and August 31, 1986, at a rate of about 50,000 barrels per day.

The PEMEX contract calls for delivery to the SPR of 6 million barrels of a heavy, high-sulfur crude oil referred to as Maya crude, and 104 million barrels of a blend of Maya and lighter, lower-sulfur Mexican crude oil. DOE expects the blend will consist of 40 percent Maya and 60 percent of a crude oil known as Isthmus crude. The contract establishes new crude oil quality specifications for the Maya/Isthmus blend which differ slightly from the specifications previously established for similar types of SPR sour oil. 1/ However, the 6 million barrels of Maya crude, which is to be delivered between September 1, 1981, and December 31, 1981, does not meet the quality specifications for either the new Maya/Isthmus blend of crude oils, or the specifications of the other classes of sour crudes accepted for the SPR. Quality specifications for Maya crude described in the contract indicate it is a significantly inferior quality crude oil. Its sulfur content is about 1.5 times the sulfur content of the most sour oil accepted to date and 1.5 percentage points higher than the sulfur content standard for the Maya/Isthmus blend. The Maya crude has an American Petroleum Institute (API) gravity 2/ of 22 degrees, which is 6 degrees lower than the Maya/Isthmus blend, and is 7 times more viscous. 3/ Enclosure I provides additional details concerning the quality specifications of SPR sour oils.

1/DOE defines sour crude for the SPR as having between 0.5 percent and 1.99 percent sulfur content, sweet crude is defined as having less than 0.5 percent sulfur content.

2/API gravity is a measure of the mass of fluid relative to water and ranges from 10 degrees for very heavy crude to 45 degrees for very light crudes.

3/Viscosity is a measure of how much energy is needed to move a fluid. Generally, the higher the viscosity of the oil, the more energy is needed to move it through a pipeline.

DOE will pay \$31.80 per barrel and \$28.50 per barrel, exclusive of transportation costs, for the blended oil and Maya crude oil, respectively, which is delivered under the contract during September 1981. Beginning October 1, 1981, prices of crude oils may be adjusted every quarter by mutual agreement. If DOE and PEMEX fail to agree on prices within 10 days after the beginning of each quarter, PEMEX may suspend deliveries for that quarter. The contract can be terminated by either PEMEX or DOE if deliveries are suspended for any quarter and a price agreement cannot be reached for the subsequent quarter. We will follow up as appropriate on the implications of this contract for the SPR.

ADDITIONAL SPR FILL ACTIVITIES

Since our last status report, in addition to the PEMEX contract, the Government has also awarded contracts in response to the February 1981 open continuous solicitation. Between July 21, 1981, and August 18, 1981, DFSC, which is DOE's purchasing agent for most SPR oil, contracted for 8.6 million barrels of oil to be delivered to SPR facilities during August and September 1981.

These contracts and the 6 million barrels which DOE estimates will be delivered during September 1981, under the PEMEX contract, bring total oil to be delivered to the SPR during fiscal year 1981 to about 110 million barrels. This is equivalent to an average fill rate of about 300,000 barrels per day for the entire fiscal year. As of August 17, 1981, about 88 million of the 110 million barrels awarded for fiscal year 1981 had been delivered, which brings the total oil estimated to be in the ground to 176.9 million barrels.

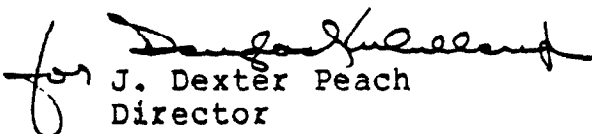
On August 7, 1981, DFSC also issued a solicitation to acquire up to 36.5 million barrels of sour crude oil to be delivered to the SPR during fiscal year 1982. If contracts are awarded for 36.5 million barrels, it would be equivalent to an average fill rate of about 100,000 barrels per day for the new fiscal year. When combined with the 31.7 million barrels, or about 87,000 barrels per day, to be delivered to the SPR during fiscal year 1982 under the PEMEX contract, this would bring fiscal year 1982 deliveries to about 187,000 barrels per day.

DOE and DFSC officials stated that they plan to continue awarding contracts, in response to the February 1981 open continuous solicitation, for short-term delivery of oil during fiscal year 1982. DFSC officials expect the next awards under this solicitation to be issued on September 1, 1981, for delivery during October and November 1981.

Enclosure I also provides additional details on the contracts awarded for SPR oil, the volume of oil delivered to SPR facilities, the status of storage facilities and funds available to purchase additional oil.

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In order to meet the requested report time frames, we did not obtain official agency comments. As requested by your office, we are sending copies of this letter to the Ranking Minority Members of the Senate Committee on Energy and Natural Resources and the House Committee on Energy and Commerce. Unless you publicly announce its contents earlier, we plan no further distribution of this report until 10 days after its date of issuance. At that time we will send copies to the Department of Energy and other interested parties and make copies available to others upon request.


for J. Dexter Peach
Director

Enclosures - 2

Tables and Graphs on the Status of
The Strategic Petroleum Reserve

Table

- 1 Summary of SPR contracting activities for FY 81 and FY 82
- 2 Contracts awarded under open continuous solicitation
- 3 Volume of SPR oil stored in caverns and other facilities
- 4 Status of Phase I SPR storage capacity
- 5 Status of Phase II SPR storage capacity
- 6 Status of funding for the SPR
- 7 Comparison of sour oil quality specifications (DOE's Type I, VI, VIa crude oils, and Maya crude oil)

Figure

- 1 Projected availability and utilization of SPR storage capacity
- 2 Projected availability and utilization of SPR storage capacity assuming alternative fill rates
- 3 Average daily SPR oil receiving rate

Table 1

Summary of SPR Contracting
Activities for FY 1981 and FY 1982

<u>Activity</u>	<u>Number of contracts</u>	<u>Value of contracts</u> (millions)	<u>Date of contracts</u>	<u>Volume of oil contracted for</u>	<u>Oil delivered as of 8/17/81</u>	<u>Remaining Deliveries (note a)</u>		
						<u>Fourth quarter FY '81</u>	<u>First quarter FY '82</u>	<u>Second Through Fourth quarter FY '82</u>
Competitive Exchange	6	\$1,441.5	9/18/80 to 10/31/80	36.6	35.6	1.1	b/ .2	0
Open Continuous Solicitation	28	2,396.9	2/13/81 to 8/19/81	66.8	52.3	15.0	c/ .6	0
Petroleos Mejianos (PEMEX) purchase	1	d/ 320.0	8/20/81	e/ 37.7	0	6.0	18.0	13.7
Total	<u>35</u>	<u>\$4,158.4</u>		<u>141.1</u>	<u>87.9</u>	<u>22.1</u>	<u>18.8</u>	<u>13.7</u>

a/Based on DOE's projections of oil cargoes to be received.

b/For the 6 contracts, oil delivered plus DOE's projection of remaining deliveries is about 300,000 barrels more than the volume of oil indicated on contracts. According to a DFSC official, DFSC has the option of accepting more than the contracted volumes and increasing proportionately the amount paid to the contractor. However, for each contract, if the volume remaining after the last scheduled delivery is less than the volume that can be shipped economically, DFSC may also accept less than the contracted volume.

c/Oil delivered plus DOE's projection of remaining deliveries is about 1,100,000 barrels more than the volume contracted for. The contracts allow companies the options to deliver up to plus or minus 5 percent of their contracted volumes of oil.

d/This represents funds obligated to procure oil under the contract through October 31, 1981. According to the contract, DOE will pay \$28.50 per barrel and \$31.80 per barrel, exclusive of transportation costs, for Maya oil and a blend of Mexican crude oils, respectively, delivered during September 1981. After September 30, 1981, prices may be adjusted by mutual agreement.

e/This represents the volume up to October 1, 1982. The contract calls for 24 million barrels to be delivered between September 1, 1981, and December 31, 1981. Beginning January 1, 1982, oil will be delivered at a rate of about 50,000 barrels per day. Total oil under contract through 1986 is 110 million barrels.

Table 2

Contracts Awarded UnderOpen Continuous Solicitation

<u>Contract date</u>	<u>Supplier</u>	<u>Total barrels to be delivered</u>	<u>Annualized daily fill rate</u>	<u>Type of oil (note c)</u>	<u>Delivery Dates</u>	
		(note a)	(barrels)		<u>First</u>	<u>Last</u>
		(millions)				
2/13/81 to 7/10/81	Various b/	58.3	76,440	Sweet	3/81	8/81
			83,392	Sour	3/81	8/81
7/21/81	Texaco International	3.0	8,219	Sour	8/81	9/81
8/05/81	Exxon International Derby and Co., Inc.	2.3	6,301	Sour	9/81	9/81
		.7	1,986	Sour	9/81	9/81
8/19/81	Exxon U.S.A. Derby and Co., Inc.	1.0	2,740	Sour	9/81	9/81
		.4	1,233	Sweet	9/81	9/81
	.5	1,370	Sour	9/81	9/81	
	Arco Petroleum Products Coastal States Trading, Inc.	.4	959	Sour	9/81	9/81
		.2	411	Sweet	8/81	8/81
Total		<u>66.8</u>	<u>183,051</u>			

a/Rounded to the nearest hundred thousand.

b/Information on individual contracts is presented in our May 4, 1981, June 19, 1981, and July 17, 1981, SPR status reports.

c/Sweet crude for the SPR is defined as having less than 0.5 percent sulfur content, sour crude is defined as having between 0.5 percent and 1.99 percent sulfur content.

Table 3
Volume of SPR Oil Stored in
Caverns and Other Facilities

<u>GAO reporting period</u>	<u>Volume of oil at start of period</u>	<u>Deliveries</u>	<u>Volume of oil at end of period</u>	<u>Average receiving rate</u>	
				<u>For reporting period</u>	<u>Since 9/23/80 (note a)</u>
		(millions of barrels)		(barrels per day)	
9/23/80 to 6/26/81	91.2	<u>b/</u> 68.9	160.1	248,736	248,736
6/27/81 to 8/17/81	160.1	19.6	179.7	376,923	268,997

a/DOE completed receiving the first shipment of oil resulting from the fiscal year 1981 competitive exchange on September 23, 1980.

b/Deliveries include 641,490 barrels of Elk Hills Naval Petroleum Reserve oil delivered to the SPR via pipeline by Pacific Refining Company.

Table 4

Status of Phase I SPR Storage Capacity

<u>SPR site</u>	<u>Capacity constructed</u>	<u>Capacity ready to use (note a)</u>	<u>Volume of oil in underground storage as of 8/17/81</u>	<u>DOE's estimated completion date for additional capacity</u>	<u>Brief description of work to be done</u>
	(millions of barrels)				
Weeks Island, LA	75.0	75.0	33.9	Completed	None
Bayou Choctaw, LA	44.2	44.2	35.9	Completed	None
Sulphur Mines, LA	24.6	5.6	1.0	September 4, 1981-- 5.9 million barrels	Caverns and wells to be recertified in phases. Initial tests of pipes, computer controls, and other equipment to be completed.
				October 15, 1981-- 13.1 million barrels	
West Hackberry, LA	48.8	48.8	41.8	Completed	None
Bryan Mound, TX	<u>64.5</u>	<u>64.5</u>	<u>64.3</u>	Completed	None
Total	c/ <u>257.1</u>	<u>238.1</u>	b/ <u>176.9</u>		

a/Storage facilities certified ready to receive oil.

b/Additional 2.8 million barrels of oil is in pipelines and tanks. This brings total oil in the SPR system to 179.7 million barrels.

c/Our July report showed storage capacity at Bayou Choctaw as 41.5 million barrels and Bryan Mound as 61.8 million barrels; total storage capacity was shown as 251.1 million barrels. As of August 17, 1981, DOE's sonar tests indicate that storage capacity at the Bayou Choctaw and Bryan Mound sites have increased as shown.

Table 5Status of Phase II SPR Storage CapacityAs of August 1, 1981 (note a)

(Millions of Barrels)

<u>SPR site</u>	<u>Total planned storage capacity</u>	<u>Volume of oil injected (note b)</u>	
		<u>Planned</u>	<u>Actual</u>
Bryan Mound, TX	120	.4	.06
West Hackberry, LA	160	(c) 0	0
Bayou Choctaw, LA	<u>10</u>	(d) <u>0</u>	<u>0</u>
Total	<u>290</u>	<u>.4</u>	<u>.06</u>

a/Source: DOE December 1980 baseline leaching schedule and August 1, 1981, monthly report of cavern leaching at Bryan Mound and West Hackberry.

b/DOE is injecting oil into new caverns as capacity becomes available. DOE plans to create capacity by leaching underground salt caverns--a process involving injecting water into a salt formation to dissolve the salt, and removing the salt-saturated water, or brine. However, during leaching, only part of each new cavern can be used to store oil.

c/Leaching began in May 1981. No oil is being injected at this stage of leaching.

d/Drilling of wells which will be used for leaching started March 1981, leaching to begin February 1982.

Table 6
Status of Funding for the SPR
 (Billion \$)

<u>Funds available for fiscal year 1981</u>		
--Prior years' funds		\$2.093
--Fiscal year 1981 appropriations		1.383
--Entitlements (earned on fiscal year 1981 deliveries prior to decontrol on January 28, 1981)		.542
--FY 1981 Supplemental Appropriations		<u>a/ 1.305</u>
Total funds available for fiscal year 1981 oil purchases		<u>b/ 5.323</u>
<u>Contracts as of August 20, 1981</u>		
--Competitive exchange (36.6 million barrels)	\$1.441	
--Open continuous solicitation (66.9 million barrels)	2.397	
--Petroleos Mejicanos (PEMEX) purchase	<u>c/ .320</u>	
Total value of contracts as of August 20, 1981		<u>4.158</u>
<u>Funds remaining for oil purchases</u>		<u>\$1.165</u>

a/President signed the Supplemental Appropriations on June 5, 1981, for \$1.3 billion.

b/As of August 18, 1981, DOE had transferred \$5.078 billion to DFSC for SPR oil acquisitions.

c/According to DOE officials, this represents funds obligated to procure oil under the contract through October 31, 1981.

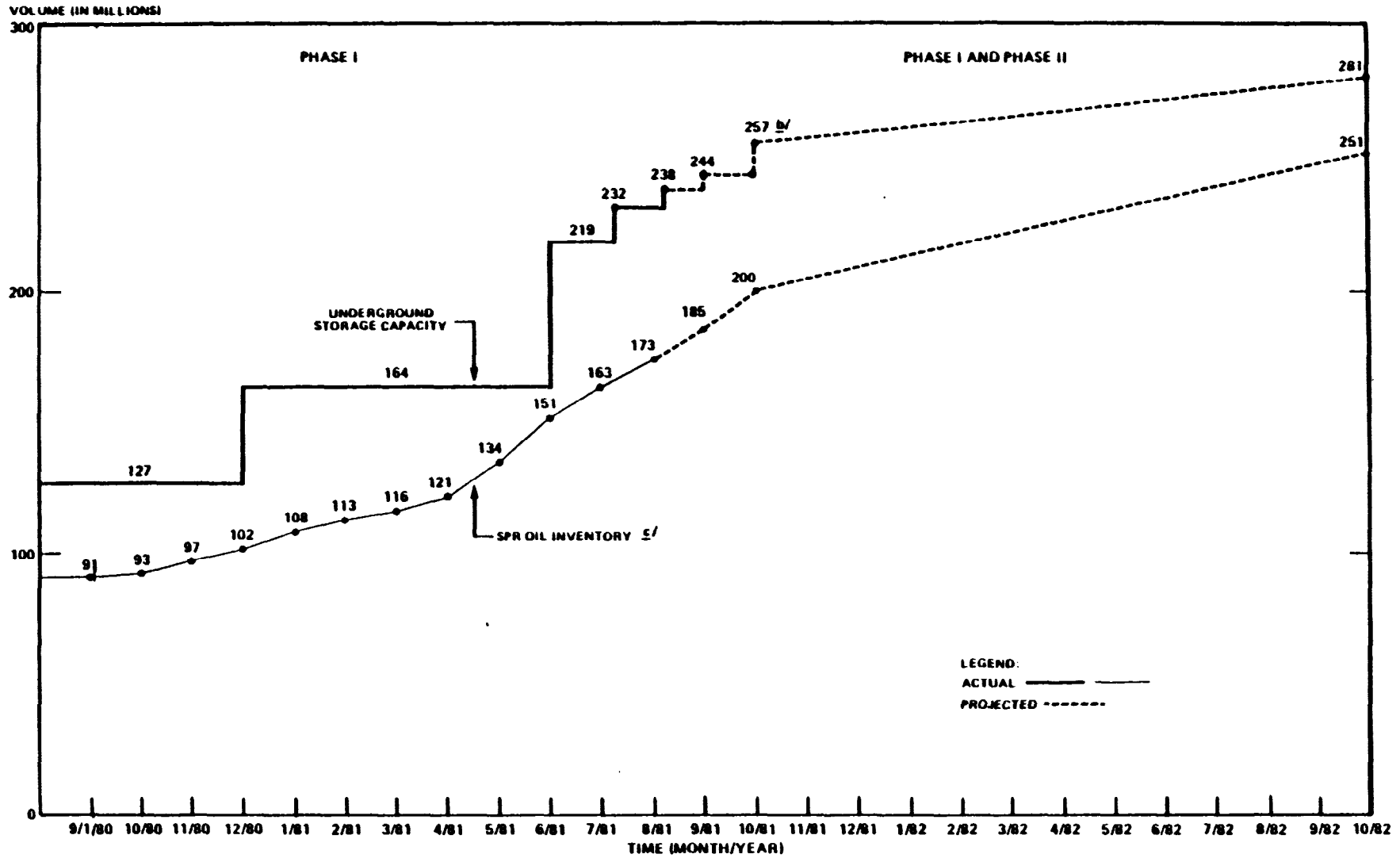
Table 7

Comparison of Sour Oil Quality Specifications(DOE's Types I, VI, VIa Crude Oils, and Maya Crude Oil)

	<u>SPR Type I oil (includes Arab light oil, Mexican Isthmus oil)</u>	<u>SPR Type VI (includes Alaska North Slope oil)</u>	<u>Maya crude oil as specified in PEMEX contract</u>	<u>SPR Type VIa crude oil (blend specified in PEMEX contract)</u>
API gravity (° API)	30°-36°	26°-30°	22° min.	28° min.
Total Sulfur Content (% of weight)	1.99% max.	1.25% max.	3.5% max.	1.99% max.
Viscosity	150 max.	200 max.	1,500 max.	200 max.
Refinery yields				
Naphtha	24-30%	15-20%	10% min.	23% min.
Distillate	17-31%	24-27%	15% min.	22% min.
Gas Oil	26-38%	38-42%	20% min.	32% max.
Residuals	10-19%	15-20%	50% max.	23% max.

FIGURE 1

PROJECTED AVAILABILITY AND UTILIZATION OF SPR STORAGE CAPACITY (Note a)
(MILLIONS OF BARRELS)



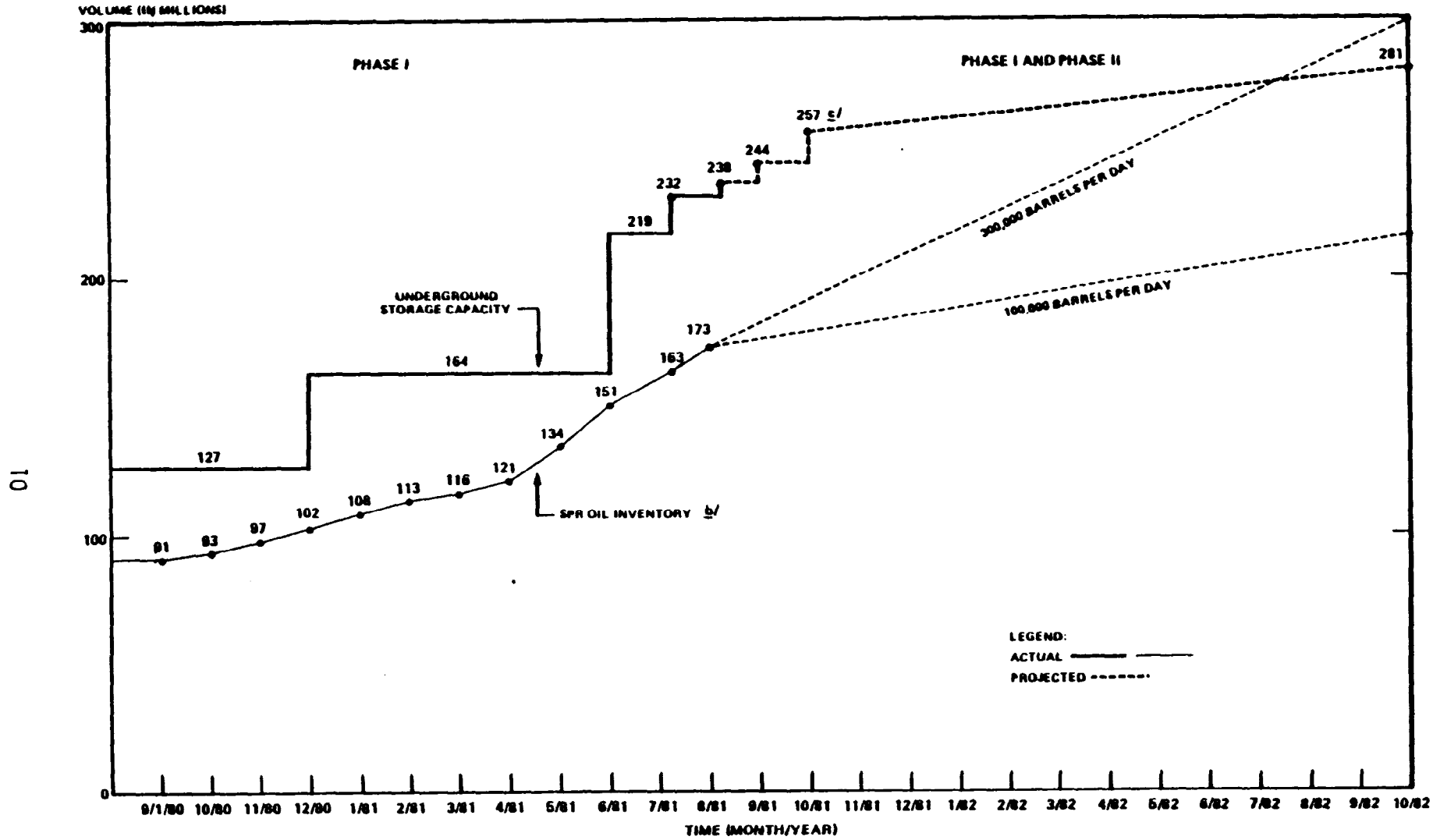
a/ GAO's projections of SPR capability assumes the DOE meets its schedules for bringing Phase I facilities on line and for creating Phase II capacity. Our projections of SPR oil inventory are based on DOE's proposed delivery schedules for existing contracts and DOE's Fiscal Year 1982 budget proposal to fill Phase I storage facilities by October 1, 1982.

b/ As of August 18, 1981 DOE sonar tests of storage capacity at Phase I facilities indicates Phase I capacity is 257 million barrels.

c/ This represents oil in underground storage facilities plus oil in tanks and pipelines.

FIGURE 2

PROJECTED AVAILABILITY AND UTILIZATION OF SPR STORAGE CAPACITY ASSUMING ALTERNATIVE FILL RATES (Note a)
(MILLIONS OF BARRELS)

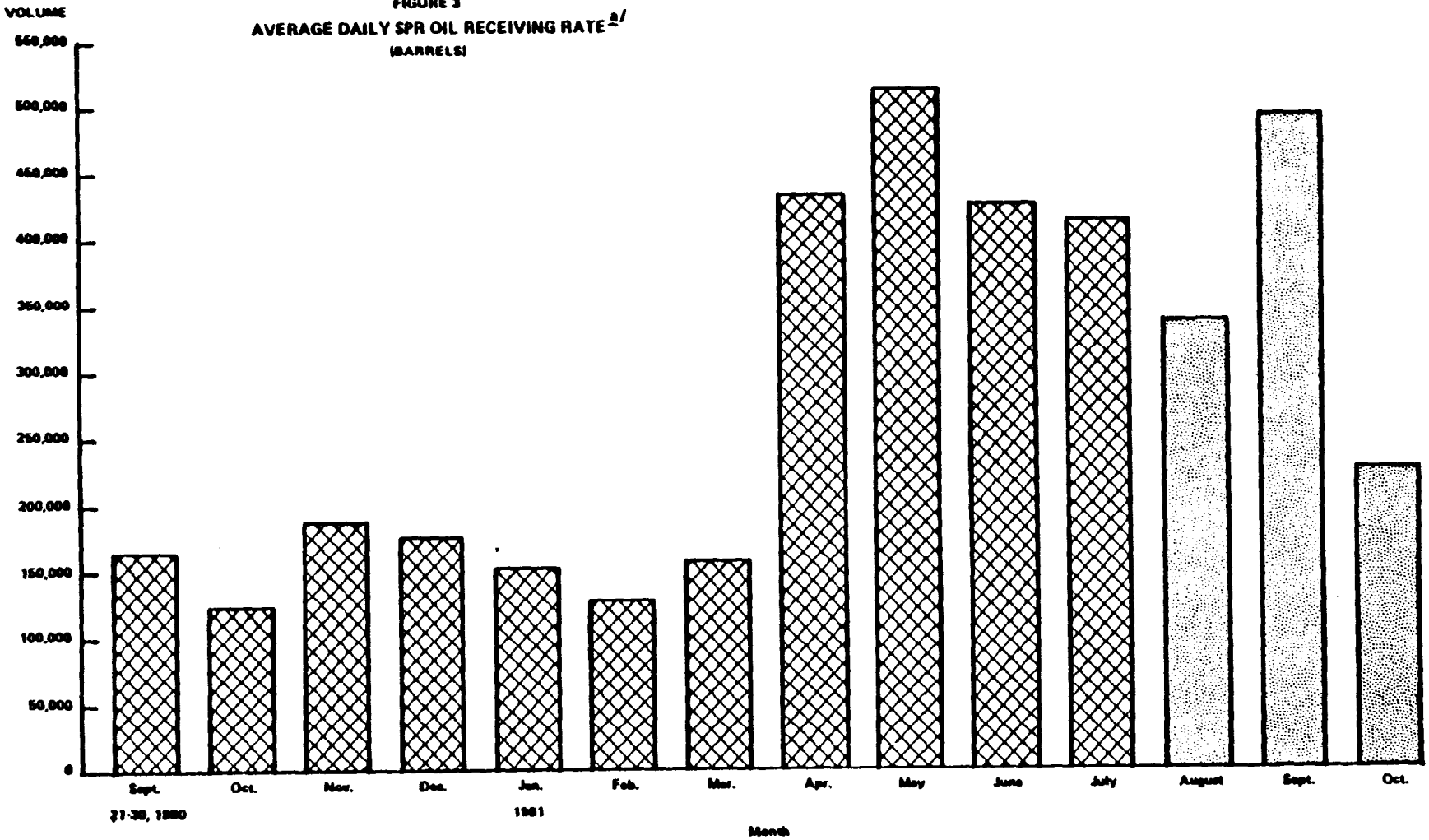


a/ GAO's projections of SPR capability assumes that DOE meets its schedule for bringing Phase I facilities on line and for creating Phase II capacity.

b/ This represents oil in underground storage facilities plus oil in tanks and pipelines.

c/ Does not include any Phase II storage capacity.

FIGURE 3
AVERAGE DAILY SPR OIL RECEIVING RATE^{a/}
(BARRELS)



^{a/} DAILY RECEIVING RATES FOR AUGUST, SEPTEMBER, AND OCTOBER CALCULATED FROM DOE PROJECTIONS AS OF AUGUST 21, 1981

11

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United States Senate

COMMITTEE ON
 ENERGY AND NATURAL RESOURCES

WASHINGTON, D.C. 20510

July 23, 1980

DANIEL A. BREYFUS, STAFF DIRECTOR
 D. MICHAEL HARVEY, CHIEF COUNSEL
 STEVEN G. HICKON, STAFF DIRECTOR FOR THE MINORITY

Honorable Elmer B. Staats
 Comptroller General of the United States
 GENERAL ACCOUNTING OFFICE
 441 G Street, N.W.
 Washington, D. C. 20548

Dear Mr. Staats:

On June 30, 1980 the President signed the Energy Security Act (Public Law 96-294). Title VIII of this Act is intended to provide for a resumption of purchases by the United States government of crude oil for the Strategic Petroleum Reserve authorized in 1975 by the Energy Policy and Conservation Act. Purchases of oil for this purpose have been suspended for well over a year, despite the fact that the present level of the SPR is clearly inadequate insurance against any contemplated interruption in petroleum imports.

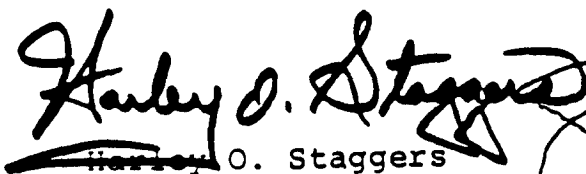
The Congress attaches a high priority to the timely implementation of the provisions of title VIII. Both the language of the Act and the accompanying joint statement of managers are very emphatic on this matter. Accordingly, we are asking that you assist Congress in monitoring implementation of this title by the Executive Branch.

In particular we request that the General Accounting Office report by letter on a monthly basis to the Senate Committee on Energy and Natural Resources and the House Committee on Interstate and Foreign Commerce describing the activities taken by the Executive Branch under the provisions of title VIII of the Energy Security Act. This report should include GAO's evaluation of these activities in relation to the clear intent of Congress, expressed in the Act, to resume as soon as possible the filling of the SPR. These monthly reports should continue through October, 1981. We are further requesting that GAO provide Congress by January 1, 1982 with a comprehensive report on activities of the Executive Branch under title VIII for the period July, 1980 through October, 1981.

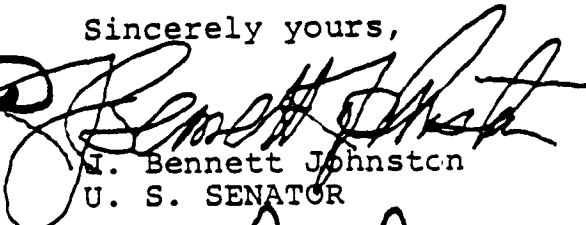
Honorable Elmer B. Staats
Page Two
July 23, 1980

Please let us know if the Senate Committee on Energy and Natural Resources or the House Committee on Interstate and Foreign Commerce can be of assistance in carrying out this request.

Sincerely yours,



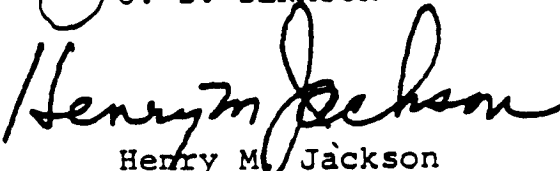
Harley O. Staggers
MEMBER OF CONGRESS



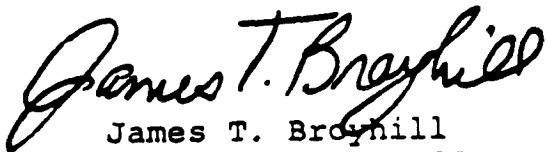
U. Bennett Johnston
U. S. SENATOR



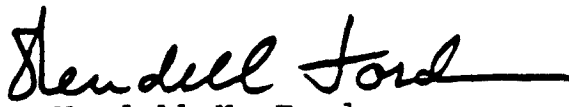
John D. Dingell
MEMBER OF CONGRESS



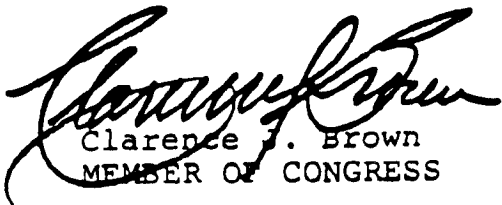
Henry M. Jackson
U. S. SENATOR



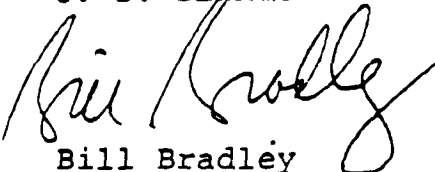
James T. Brody
MEMBER OF CONGRESS



Wendell H. Ford
U. S. SENATOR



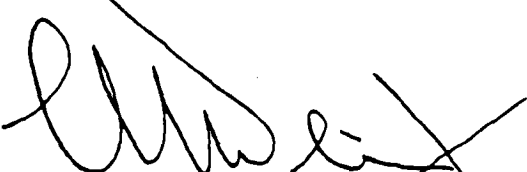
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U. S. SENATOR