United States General Accounting Office

GAO

Report to the Committee on Armed Services, U.S. Senate

January 1995

NAVAL PETROLEUM RESERVE

Opportunities Exist to Enhance its Profitability

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United States
General Accounting Office
Washington, D.C. 20548

Resources, Community, and
Economic Development Division

B-259495

January 12, 1995

The Honorable Strom Thurmond
Chairman
The Honorable Sam Nunn
Ranking Minority Member
Committee on Armed Services
United States Senate

The Naval Petroleum Reserve in Elk Hills, California, (known as the NPR-1), is jointly owned by the United States government and Chevron U.S.A., Inc. It is currently operated by Bechtel Petroleum Operations, Inc., under a contract that expires in July 1995. Because Chevron believes that it can operate the NPR-1 more profitably than a government contractor, in May 1993 it proposed taking over operation of the reserve. You asked us to evaluate the economic feasibility of that proposal.

Subsequently, the Department of Energy (DOE), representing the federal government, suspended negotiations with Chevron on this proposal. Instead, DOE has recently solicited interest from other parties to operate the NPR-1 and is planning to develop a proposal on which the interested parties will be asked to compete. Like Chevron, DOE is interested in lowering the costs of operating the reserve. In light of these events, we agreed with your offices to refocus our review on actions that the Secretary of Energy and the Congress can now take to improve the profitability of the NPR-1.[1] Over the past few years, several organizations, including the National Academy of Public Administration (NAPA) and an independent industry panel, have noted that the profitability of the NPR-1 and the resulting revenues to the U.S. Treasury could be increased by adopting management practices more in line with those of commercial oil and gas operations. They believe that doing so could substantially reduce the costs of operating the NPR-1 while at the same time generating more revenues. DOE is considering alternatives for managing the reserve—including establishing a government corporation to operate it, selling it, or leasing it—as a means of improving its efficiency and enhancing its value to the taxpayer. We also believe that management changes will be needed to enhance the profitability of the NPR-1 and that the actions discussed in this report will complement those changes.

[1]Our May 1994 report Naval Petroleum Reserve: Limited Opportunities Exist to Increase Revenues From Oil Sales in California (GAO/RCED-94-126) also addressed ways to enhance the NPR's profitability through various marketing strategies.

Results in Brief

Three actions could enhance the profitability of the NPR-1. First, DOE could be allowed to set the rate of production in a way that maximizes profits, which is standard industry practice. In contrast, the production rate of oil and gas at the reserve is currently set by statutory requirement at the rate that can be achieved "without detriment to the ultimate recovery" of the resource—called the maximum efficient rate (MER). For example, DOE has traditionally reinjected gas produced from the reserve to maximize the recovery of oil from the NPR-1. While this practice has increased oil recovery, DOE, Chevron, and Bechtel have estimated that selling the gas could be more profitable.

Second, making a final decision on how ownership shares in the NPR-1 are distributed between DOE and Chevron could enhance the reserve's profitability by allowing the owners to focus on investments that enhance the venture as a whole. Currently, an open-ended arrangement between Chevron and DOE governs their equity or ownership shares of production. The Naval Petroleum Reserves Production Act of 1976, as amended, and the contract between DOE and Chevron require that these ownership shares, expressed as percentages, be revised from time to time. The new percentages apply not only to future production but also to past production dating back to 1942. This open-ended situation has undermined trust and cooperation between the two owners, and both spend a significant amount of resources examining the likely impact of proposed investments on their equity shares before committing to new projects. These expenditures and the slowed decision-making result in reduced profits. By contrast, standard industry practice calls for operating a mature commercial oil and gas field like the NPR-1 with the equity shares finalized among the partners so the unit can be developed and production managed in the most profitable manner possible.

Finally, adding a clause to the contract between DOE and Chevron to promote risk sharing could help encourage investments that enhance profits. Under the current contract, DOE and Chevron may be drilling fewer profitable wells than they could because they do not always share in the risks or costs of drilling. In standard industry practice, sharing such risks is encouraged by a contract's "nonconsent clause," which governs how a partner that does not share the initial risks or costs of a project will be treated. Without such a clause, one partner may decide not to participate in drilling a well but later decide that it wants a share of any resulting profits. Because the current contract has no such clause, DOE has sometimes borne all of the initial risks or costs of drilling potentially profitable wells, only to have Chevron later share in the profits without penalty.

Background

The Naval Petroleum and Oil Shale Reserves were established in the early 1900s as a strategic reserve of fuel supplies for the military. The NPR-1 produces both crude oil and natural gas. The reserves were largely inactive until the Congress passed the Naval Petroleum Reserves Production Act of 1976 (P.L. 94-258) in response to the 1973-74 Arab oil embargo. This statute changed the NPR from a strategic reserve for the military to a source of oil for the U.S. economy. Among other things, the act required that the NPR-1 be fully developed and its resources produced at the maximum efficient rate of production (MER) that permits "economic development and depletion of the reservoir without detriment to the ultimate recovery" of the resource. In response to the Arab oil embargo, the United States has also established a Strategic Petroleum Reserve designed to soften any negative impacts of disruptions in the oil supply. Because oil production from the NPR-1 represents a small fraction of the nation's daily oil consumption, the reserve's ability to offset supply disruptions is limited.

The U.S. government currently owns about 78 percent of the NPR-1; Chevron U.S.A., Inc., (Chevron) owns 22 percent. The percentage that each party owns of the four major commercially productive oil and gas zones at the reserve varies depending on what was originally agreed to in the unit plan contract (UPC), signed by the two owners in 1944.[2] The NPR Production Act of 1976, as amended, and the UPC require the owners to redetermine from time to time how the equity shares or ownership percentages of the producing zones are to be divided. This division is made on the basis of estimates of the location and amounts of oil and natural gas in the NPR-1. DOE and Chevron recently completed such a redetermination for one zone and are revising the equity shares in a second zone. DOE, as the administrator of the reserve for the U.S. government, develops and operates the reserve. The total revenues generated at the reserve in fiscal year 1993 were $382.1 million.

Over the past several years, a number of experts have called for increasing the capacity of the NPR-1 to generate profits and, ultimately, revenues for the U.S. Treasury. In addition, the Senate Committee on Armed Services has called for the NPR-1 to increase its operating efficiency. In response, an

[2]Changes to the UPC require DOE to consult with the Senate and House Committees on Armed Services.

independent industry panel, the National Academy of Public Administration (NAPA), and DOE have evaluated operations at the NPR-1 and suggested ways to lower its operating costs and enhance its profitability.[3] They have also considered other alternatives for managing the reserve. In addition, in May 1993 Chevron proposed that it operate the NPR-1, estimating that it could reduce operating costs by as much as $37 million per year. However, negotiations between Chevron and DOE on this proposal were suspended in the spring of 1994 because of the Secretary of Energy's concerns that this proposal might not be appropriate given the need to ensure competitive selection of the next operator or contractor.

Opportunities to Increase the Profitability of the NPR-1

We identified three ways to enhance the profitability of the NPR-1 and complement future management changes. First, to meet the statutory requirement of MER, DOE is producing at a rate intended to achieve the ultimate recovery of oil—sometimes to the exclusion of gas; such an approach may not maximize profits. Second, because the equity or ownership shares currently are not finalized, individual owners spend considerable sums of money on studies on ways to protect their equity shares rather than investing in projects that would enhance the profits of the operation as a whole. Third, as a result of the absence of a nonconsent clause in the current contract between DOE and Chevron, DOE at times takes all the risk but Chevron shares in the profits at no penalty. Because the risk is not shared, there is less incentive to undertake investments that could enhance profits.

Eliminating the MER Can Increase the NPR-1's Profitability

In operating the NPR-1 to maximize the recovery of oil, DOE has not always maximized the profitability of the field's oil and gas production. The NPR Production Act of 1976 requires DOE to produce oil or gas from the NPR-1 at the "maximum sustainable daily oil or gas rate [known as the MER] from a reservoir which will permit economic development and depletion of that reservoir without detriment to the ultimate recovery" of the resource. DOE has operated the NPR-1 in a fashion intended to recover the maximum amount of oil. In a commercially operated field, the owners strive to maximize profitability from oil and gas production rather than simply to recover the maximum amount of oil.

[3]Evaluation of Operations at Naval Petroleum Reserve No. 1, an Independent Industry Panel (Oct. 1993); Restructuring the Naval Petroleum and Oil Shale Reserves, NAPA, Apr. 1994; Organizational Alternatives for the Naval Petroleum and Oil Shale Reserves, DOE, June 1994 (draft).

DOE's Office of General Counsel believes that the concept of the MER is outdated and needs to be changed.[4] For example, to achieve the MER, DOE requires Bechtel to inject recovered gas back into the ground to enhance the ultimate recovery of oil in two reservoirs of the reserve—even though it would be more profitable to sell the gas. A preliminary study by DOE, Bechtel, and Chevron estimated that in the first of these two reservoirs, as much as $135 million in present value of future profits could be gained if the gas is sold rather than reinjected after 1996.[5] Apreliminary analysis by Bechtel estimated that in the second reservoir, discontinuing gas reinjection in 1994 and selling the gas instead could result in a gain of as much as $66 million in present value of future profits.[6] In each of these cases, DOE would receive about 80 percent of the resulting profits.[7] DOE has stated in the past that selling gas to increase profits is not consistent with the act's MER requirement since doing so may reduce the amount of oil that is ultimately recovered.

We agree with DOE's Office of General Counsel that the concept of MER is outdated and needs to be changed. We believe that eliminating the MER requirement would give DOE greater flexibility to adjust operations in response to changes in oil and gas prices and forecasted prices and thus to earn greater expected profits and provide greater expected revenue to the U.S. Treasury.

Finalizing the Equity Shares Can Increase the Profitability of the NPR-1

Because DOE and Chevron have not finalized the ownership shares, opportunities to increase the profitability of the NPR-1 have been lost. Equity or ownership shares determine how each partner shares in the expenses and profits of an oil and gas operation. In a typical commercial operation, the equity shares of the owners are finalized as specific percentages once the operation becomes mature—that is, after a number of years of operation, when good information is available about the size of the field. As long as the equity shares are not finalized, money will be spent on costly redeterminations, and revenues will be deferred and forgone as

[4]In interpreting the MER requirement, DOE has focused primarily on the recovery of oil.

[5]This estimate covers a 30-year period and accounts for any profits forgone as a result of leaving an estimated 5.2 million barrels of oil in the ground. Changes in gas prices, among other things, would affect the outcome of this estimate.

[6]This estimate covers a 20-year period and accounts for any profits lost as a result of not recovering an estimated 2.4 million barrels of oil. Changes in gas prices, among other things, would affect the outcome of this estimate.

[7]Both parties would incur some cost to improve the reserve's infrastructure—including the cost of building pipelines.

projects are delayed while each owner determines if individual projects threaten its ownership shares.[8] Finalizing the equity shares ensures that the partners know exactly what their share of potential profits will be; they will thus focus more on increasing profits for the venture as a whole.

The NPR Production Act of 1976, as amended, and the 1944 UPC preclude finalizing the equity shares. In fact, the shares can be redetermined whenever both parties agree to do so. Moreover, changes to the equity shares are retroactively applied to all production and its related costs since 1942. Because of the partners' concerns about protecting their equity shares at the NPR-1, opportunities for profitability have been lost.

For example, in August of 1992, Chevron proposed injecting water into the ground to enhance oil production in a section of the reserve (a technique known as a waterflood). Chevron estimated that the resulting production would provide DOE with a gain of about $41 million in present value of future profits. DOE ultimately responded to the proposal by deciding to begin a pilot project in January 1995. Chevron believes that DOE's 2-year delay—which resulted in deferred and forgone revenues—resulted from considerations of the impact of the project on DOE's equity share because the area to be flooded is mostly on Chevron land. According to a Chevron official, the choice of that area was based on the availability of idle wells that could be used for a new waterflood without incurring high capital costs. Chevron believes that DOE saw this project as an attempt by Chevron to increase oil recovery from its land, thereby increasing Chevron's overall equity share at a future redetermination.

According to a DOE headquarters official, the NPR-1 is a mature field, and its production history is long enough to provide sufficient knowledge to support a project of this type. He also stated that the project is a good example of the difficulty of enhancing profits at the NPR-1 when the equity shares have not been finalized. He added that while using idle wells on Chevron's section of the NPR-1 would reduce the costs of the project, it could also potentially boost Chevron's equity position during a future redetermination of that zone. However, lower costs, rather than equity considerations, would have been the issue if the equity shares had been finalized.

Currently, how the equity shares are apportioned can be reexamined at the request of either owner. According to DOE and Chevron officials, this process consumes and will continue to consume a considerable amount of

[8]Revenues are forgone because their present value is less.

time, labor, and money at the NPR-1 if the equity shares are not finalized. Redetermining equity shares is a complex and costly process, requiring sophisticated engineering and geologic studies. For the NPR-1, there is an overall committee and several subcommittees whose primary responsibility is to make decisions about the development and operation of the reserve. Instead, members of these committees spend much of their time arguing over the equity positions of the respective owners. Members of the committees from both DOE and Chevron acknowledged that the process of redetermining the equity shares at the NPR-1 has consumed much of their time in several meetings.

By focusing attention on who owns what, DOE and Chevron are diverting management attention away from enhancing the overall profitability of the field. For example, in the fall of 1993 and early 1994, respectively, DOE and Chevron conducted separate redetermination studies for one hydrocarbon zone. While they initially disputed each other's results, in November 1994 they reached an agreement on what the new equity percentages should be. DOE officials told us that they have spent over $10 million to date in expert studies for this zone and for a second zone where a reexamination is under way. Chevron officials estimated that they have spent about $4 million to date for studies of these two zones. While the potential benefits to an individual owner of a gain in equity shares can be significant, these benefits can result in a commensurate loss to the other owner. Thus, the owners may, at times, be engaging in a zero-sum game, in which the end result may lead to a redistribution of ownership shares but no overall gain in the field's profitability. Moreover, because potential losses from a change in the equity shares could be significant, each owner has an incentive under the present arrangement to spend considerable resources to make sure such changes do not occur.

Further compounding the problem of redetermining the equity shares is the requirement that production and related costs be reallocated back to 1942. Specifically, the NPR Production Act of 1976 and the UPC require that changes in the equity shares be applied retroactively. When possible, future allocations of oil and gas are adjusted to make up for previous surpluses and deficits experienced by the partners. However, as overall production declines, the prospect increases that a redetermination will occur that requires a reallocation that cannot be met from future production. In that case, a cash settlement would be required. Finalizing the equity shares and eliminating the requirement that adjustments be made retroactively would mitigate this situation.

In November 1993, Chevron formally requested that the two owners finalize the equity shares. While DOE never officially responded to Chevron's request, DOE officials told us they are in favor of finalizing the shares. However, they expressed some reservations. Because of uncertainty about how much oil and gas is in the ground, the DOE officials said that they can never be sure that the equity shares agreed to are the right ones. However, uncertainty is a fact of life in the oil and gas business, and an effective strategy must be developed to deal with this uncertainty. The standard industry practice for a mature oil and gas field like the NPR-1 is to finalize equity on the basis of the knowledge gathered over the years. Experts in the oil and gas industry that we spoke with and an independent industry panel are also in favor of finalizing the equity shares and eliminating the requirement for retroactive adjustments. Because the NPR-1 is now a mature oil and gas field, much of the information needed to finalize the equity shares is already available, and these experts believe the shares should be finalized. In addition, Chevron officials told us that if the equity shares are not finalized and the U.S. government decides to sell the reserve, the price it receives will be discounted to reflect the uncertainty.

Adopting a Nonconsent Clause Would Enhance Profitability by Encouraging a More Cooperative Approach

Because of the absence of a nonconsent clause concerning the NPR-1, DOE has, at times, borne all of the initial risks or costs of drilling potentially profitable wells, only to have Chevron share in the profits without penalty.[9] The purpose of a nonconsent clause is to share the risks or costs incurred in drilling wells. If these risks or costs are shared, drilling ventures expected to be profitable will likely be more readily agreed to and embarked on.

Exploration and/or drilling for hydrocarbons is inherently risky. A nonconsent clause is typically included in petroleum partnership agreements as an incentive for partners to share in the risks of drilling potentially profitable wells. With such a clause, if a drilling project proves profitable, the partner that did not consent to the project in the beginning may share in the profit but is penalized (generally about 300 percent) of the costs incurred by the partner that bore all the risk. On the other hand, if the drilling project is not profitable, the partner that did the drilling absorbs all the cost.

Currently, the UPC between DOE and Chevron does not contain a nonconsent clause. Both DOE and Chevron agree that the lack of such a

[9]The absence of a nonconsent clause also means that Chevron could bear all the risks or costs of drilling potentially profitable wells, only to have DOE share in any resulting profits without penalty.

clause has affected their relationship in drilling projects at the NPR-1 and has proved a disincentive to drilling. DOE and Chevron officials cited examples of drilling that DOE carried out without Chevron's participation. In one case, Chevron later shared from the profits, but since there is no nonconsent clause, Chevron was not penalized. For example, DOE drilled four wells in 1993 to prevent oil from being drained from the NPR-1. DOE spent $3.55 million on this project, in which Chevron originally declined to participate, saying that it did not have the money at the time. However, after these wells proved to be commercially productive, Chevron agreed to pay its share of the drilling costs at no penalty. In another case, in the mid-1980s, DOE drilled an exploratory well at a cost of over $30 million, but Chevron declined to participate. DOE later spent another $6.5 million to redrill the well, but oil has still not been found. Chevron believes that this drilling project was not a risk worth taking. However, a Chevron official also pointed out that if the well had proved to be productive and profitable, Chevron would have agreed to participate and pay its share of the project's costs. In any event, Chevron officials told us that because there is no nonconsent clause in the UPC, they have no incentive to take such joint risks with DOE. Both DOE and Chevron officials indicated that they would be in favor of amending the UPC to include a nonconsent clause because including such a clause is a typical industry practice.

Conclusions

According to several experts in the oil and gas industry, including an independent industry panel, a primary goal of the NPR-1 should be to maximize profits and, thus, the capacity of the reserve to produce revenues for the U.S. Treasury. The NPR Production Act of 1976, as amended, and the unit plan contract currently inhibit a management approach that would enhance the NPR-1's profitability. Eliminating the MER requirement could enable DOE to focus on the overall profitability of the reserve rather than on maximizing the recovery of its oil. Eliminating the MER requirement would also give DOE greater flexibility to adjust operations in response to changes in oil and gas prices and forecasts so as to earn greater profits and provide more revenues to the U.S. Treasury.

In addition, wrangling over the equity shares has led DOE and Chevron to focus on issues that take away from more effective management of the reserve. As a result, the reserve is not as profitable as it could be. Furthermore, as a result of the absence of a nonconsent clause in the contract, DOE has, at times, taken all of the risks while Chevron has shared in the profits with no penalty. The lack of such a clause also diminishes the incentive for DOE and Chevron to cooperate in drilling projects, which can affect the overall profitability of the reserve.

DOE is considering alternatives to managing the reserve—including establishing a government corporation to operate it, selling it, or leasing it—as a means of enhancing its value to the taxpayer. We believe that the actions discussed here—eliminating the MER requirement; finalizing the equity shares, including eliminating the requirement that adjustments be retroactive; and adding a nonconsent clause to the contract—could enhance profitability. Such actions would complement any future management changes—first proposed by Chevron to lower operating costs—and move the field towards a more commercial type of operation. The value of the NPR-1 would thus be enhanced and, its return to the taxpayer increased.

Recommendation to the Congress

In the context of reconsidering the purpose of the NPR-1, we recommend the following actions to enhance its profitability: amend the Naval Petroleum Reserve Production Act of 1976 by (1) eliminating the MER requirement, (2) requiring that the equity shares be finalized, and (3) eliminating the requirement that adjustments in the equity shares be retroactive.

Recommendation to the Secretary of Energy

To help enhance the profitability of the NPR-1, we recommend that, in consultation with the Senate and House Committees on Armed Services, DOE amend the unit plan contract to require the addition of a nonconsent clause.

Agency Comments

We discussed the factual information in this report with DOE's Deputy Assistant Secretary for Naval Petroleum and Oil Shale Reserves and his staff, the Director of the NPR-1 at Elk Hills, and Chevron officials in Washington, D.C. These officials generally agreed with the facts presented. While DOE and Chevron officials agreed that the actions discussed in this report will enhance the profitability of the NPR-1, they believe that other steps also need to be taken to enhance profits. They believe that management changes, such as establishing a corporation or its equivalent to operate the reserve, are needed to provide DOE with the flexibility to operate the NPR-1 more cost-effectively, as a commercial oil and gas operation is operated. These officials also provided technical comments, which are reflected in the report where appropriate. As requested, we did not obtain written agency comments on the report.

Scope and Methodology

To develop this report, we interviewed knowledgeable officials from DOE and Chevron U.S.A., Inc., as well as various industry experts. We reviewed documents provided by these officials on enhancing the NPR-1's profitability and on the issues discussed in the report.

As arranged with your offices, unless you publicly release its contents earlier, we plan no further distribution of this report until 30 days after the date of this letter. At that time, we will send copies to the Secretary of Energy, Chevron U.S.A., and other interested parties. We will also make copies available to others on request. Please call me at (202) 512-3841 if you have any questions. Major contributors to this report are listed in appendix I.

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