CONGRESSIONAL BUDGET OFFICE
U.S. Congress
Washington, DC 20515

Douglas Holtz-Eakin, Director

March 14, 2005

Honorable Russell D. Feingold
United States Senate
Washington, DC 20510

Dear Senator,

In your letter of February 4, 2005, you asked for information about CBO's estimate of potential bonus bids for leases to develop the coastal plain of the National Arctic Wildlife Refuge (ANWR). In addition, you provided a copy of an analysis prepared by Richard A. Fineberg regarding historical trends in bonus bids for oil and gas leases in Alaska and the Gulf of Mexico, and you asked us to compare our results with those suggested in that report.

Estimates of bonus bids attempt to reflect the economic value of the leases to the winning bidders. Such estimates are particularly uncertain because firms can vary significantly in their assessment of the geologic prospects, future market conditions, and the strategic value of the project to their company. CBO estimates that bonus bids for ANWR leases would total about $5 billion. Under previous legislative proposals to lease ANWR, half of the bonus bids would be given to Alaska. Thus, we estimate that net federal proceeds over a 10-year period would be $2.6 billion, including the initial royalties from production near the end of the decade. (Royalties on any production would continue well after this first 10-year period.)

CBO's Estimate of Bonus Bids

Federal oil and gas leases are awarded through a competitive bidding process administered by the Department of the Interior. Firms compete on the basis of their bonus bid, which is an amount paid up front for the lease, regardless of whether the property ever produces any oil or gas. Bonus bids are based on the estimated value of the asset, which, in this case, is the opportunity to earn a return on capital invested in an oil and gas property over a 30- to 40-year period. The amount offered as a bonus will depend on the expected profitability of the project. Investors require a rate of return sufficient to compensate for costs and risks but should be willing to bid any projected surplus above that level to have the right to earn their desired return.

While ANWR is not expected to hold as much oil and gas as Alaska's Prudhoe Bay, the U.S. Geological Survey's (USGS's) estimates of its economically recoverable resources are an order of magnitude larger than the reserve estimates for other areas being leased in the state. According to the USGS, the mean of the estimated economically recoverable resources from the federal area of ANWR's coastal plain (known as the 1002 Area) ranges from about 4 billion barrels at market prices of about $25 (in 2005 dollars) to about 6 billion barrels at prices at or above $35 per barrel (also in 2005 dollars).[1] In contrast, the largest field to come into production in recent years in Alaska, the Alpine field, is estimated to have economically recoverable reserves of roughly 435 million barrels of oil.

CBO's estimate of bonus bids is based on USGS's estimates of the mean value of *economically recoverable oil* that could be produced from Area 1002. (Total resources—or technically recoverable resources—are generally much higher than the amount that is economically recoverable.) The USGS assigns probabilities to the amounts of oil that will be economically recoverable at various prices, noting confidence intervals of 5 percent (a small likelihood of being able to produce a large portion of the resources), 95 percent (a high likelihood of being able to produce a smaller volume), and the mean. CBO's analysis relies on the mean of the USGS ranges. If the USGS were to revise its assessment of the economically recoverable resources, we would change our estimate of potential bonus bids correspondingly.

To gauge the possible range of bonus bids, CBO projected potential cash flows based on alternative assumptions regarding oil prices, production patterns, costs, and rates of return for developing those reserves. We assumed that bidders would calculate values based on long-term market prices for oil ranging from about $25 per barrel to $35 per barrel (in 2005 dollars).[2] We calculated cash flows under two production scenarios—one based on information from the Department of Energy's Energy Information Administration and one based on historical trends for the North Slope of Alaska.

Cost parameters also were varied to reflect alternative levels of capital costs for developing oil reserves in a high-cost area like Alaska. Our estimate of capital costs included those associated with facilities such as housing and other support systems. We also included a projection of operating and transportation costs. While a rise in Arctic temperatures could affect production costs in Alaska, CBO has no basis at this time for predicting whether such changes will occur during the time ANWR would be developed. As a result, we have no

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1. United States Geological Survey, *Arctic National Wildlife Refuge, 1002 Area, Petroleum Assessment, 1998*. CBO converted prices to 2005 dollars based on the GDP deflator.

2. While current spot prices for oil are considerably higher than $35 per barrel, many analysts expect such prices to fall somewhat over the next few years. For a discussion of the oil-futures market, see Box 2-2 on pages 46-47 of CBO's *Budget and Economic Outlook,* January 2005.

basis for adjusting the cost estimates to reflect that possibility. Finally, we discounted the potential cash flows at rates ranging from 12 percent (the rate used in the USGS analysis) to 15 percent, accounting for the fact that the winning firm or firms would have to bear the cost of bonus payments and the risks associated with development of any oil reserves discovered.

These alternative scenarios suggest that the winning bids—which would be the bids offered by the firms with the most favorable view of the economic value of the leases—could range from about $2 billion to about $8 billion, depending on the assumptions made. The winning bids could be near the low end of that range if *all* of the bidders assume that future prices will be near $25 a barrel (in 2005 dollars) and if they *all* assume a relatively high discount rate because they perceive significant risks in the production scenarios. Alternatively, bids could be at the high end of the range if *any one or more* of the bidders anticipated long-term oil prices in the vicinity of $35 a barrel (in today's dollars), perceived more-modest production risks, or assigned unique strategic value to their firm from the acquisition of the ANWR leases. CBO's estimate of $5 billion is in the middle of that range.

To put this estimate into historical context, companies paid bonus bids totaling over $11 billion (in 2005 dollars) over the 1969-1984 period for reserves in the North Slope region that were estimated at that time to total about 10 billion to 12 billion barrels of oil.[3] Bonus bids in Alaska have been much lower in recent years, largely because of lower expectations regarding the size of likely reserves in other areas being offered. When the federal government resumed leasing lands in the National Petroleum Reserve-Alaska in 1999, for example, the mean value of the economically recoverable resources was less than 400 million barrels at the prices then in effect.[4] Likewise, reports by the state of Alaska have indicated that much of the acreage auctioned in recent years under area-wide leases has low-to-moderate petroleum potential.[5]

Alternative Estimates Based on Trends in Amounts Paid Per Acre

Mr. Fineberg's report suggests that CBO's estimate, when measured on a dollars-per-acre basis, is much higher than the amounts paid in recent Alaskan lease sales. Using the $50-per-acre average cited in Mr. Fineberg's report would imply that bonus bids for ANWR leases would total about $75 million.

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3. Bonus bid results are from Appendix A of Mr. Fineberg's report (about $5 billion in nominal dollars), converted to 2005 dollars based on GDP deflators. Reserve estimates are from the state of Alaska, Department of National Resources, "Oil and Gas Resources of Alaska," 1985.

4. U.S. Geological Survey, *2002 Petroleum Resource Assessment of the National Petroleum Reserve in Alaska (NPRA)*. USGS Fact Sheet 045-02.

5. State of Alaska, Department of National Resources, Final Findings of the Director for area-wide lease sales for the North Slope (1998), Beaufort Sea (1999), Cook Inlet (1999), and North Slope Foothills (2001).

CBO does not consider average amounts paid per acre as a useful metric for predicting bonus bids. Further, we believe that a per-acre assessment is not useful for comparing a wide variety of leases or for projecting future bids on potential leases. The fact that bonus bids are lower for some acreage than others is a logical consequence of expected variations in the geologic—and hence economic—potential of different properties. For example, most of the oil from the Prudhoe Bay and Kaparuk fields—which together have generated over 85 percent of the production from the North Slope—has been produced from leases that account for less than 10 percent of the acreage leased in that region.[6]

Furthermore, any comparisons to historical results, whether based on resource estimates or acreage, should adjust the results for inflation. Mr. Fineberg's data on historical lease sales are presented in nominal dollars, which significantly distorts the comparisons between prices paid in 1969 or 1982 with payments expected to be made in 2008. To illustrate, the $900 million paid in 1969 for certain North Slope leases is equivalent to about $3.8 billion in 2005 dollars, roughly four times the amount cited in the Fineberg report. Likewise, one of the winning bidders in the 1982 auction of leases for the Mukluk field paid $40,000 per acre, which is equivalent to $72,000 per acre in 2005 dollars.

Comparisons to past lease sales also should reflect differing expectations about market prices. At the time of the 1969 lease sale, for example, domestic wellhead prices for oil had been declining in real terms for several years and averaged only $3 per barrel (about $12 per barrel in 2005 dollars). CBO's estimate of the potential bonus bids from ANWR has increased over time largely because we believe that expectations about the long-term price of oil (in real terms) are higher than they were in the past. Higher prices affect values by increasing both the volume of economically recoverable resources and the margin of potential profitability.

6. These fields were discovered on lands leased prior to 1970. Pre-1970 leases account for less than 10 percent of the 18 million acre total for lease sales in the North Slope and Near-Shore areas in Appendix A of Mr. Fineberg's report.

I hope that this information is helpful to you. If you have further questions about this estimate, the CBO staff contacts are Megan Carroll and Kathleen Gramp.

Sincerely,

Douglas Holtz-Eakin
Director

Identical letters sent to the Honorable Olympia J. Snowe, the Honorable John F. Kerry, the Honorable Patty Murray, the Honorable Susan M. Collins, the Honorable Ron Wyden, the Honorable Frank Lautenberg, the Honorable Jon S. Corzine, the Honorable Maria Cantwell, the Honorable Barbara Boxer, and the Honorable Richard J. Durbin.