Lookout Mountain Analysis

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Barbara Cubin, Chairman
Committee on Resources
Subcommittee on Energy and Mineral Resources
1625 Longworth HOB
Washington, DC 20515

Dear Ms Cubin:

I was a scheduled witness for the April 18, 2002 Oversight Hearing on Oil and Gas Resource Assessment Methodology. Although I did submit written testimony for the hearing record, I was unable to attend the hearing and give oral testimony, because of illness.

This letter responds to four questions submitted to me after the April 18, 2002 Hearing:

Q1. Regarding your analysis entitled "Examination and Critique of ARI Report: Undiscovered Natural Gas and Petroleum Resources Beneath Inventoried Roadless and Special Designated Areas on Forest Service Lands ...," did the Hewlett Foundation or the Energy Foundation pay for any of this study?

A1. Absolutely not.

Q2. Please cite the studies that show "that if every acre of U.S. land was opened up to drilling, including all parks, wilderness areas, and every offshore acre out as far as the 200-mile limit, the U.S. can never realistically expect to be able to produce all of its own energy. Not now and not in the future."

A2. There are many contributory studies that give estimates of the amounts of discovered and yet-to-be-discovered oil, gas, and other energy sources in the United States. When one matches up the estimates of future domestic energy production with estimates of future U.S. energy consumption, it becomes readily apparent that the U.S. does not and will not have the capability of producing all of its energy needs as measured by any defensible mineral economics estimates.

One document that I can use to support the questioned statement in my recent testimony is from the U.S. Geological Survey. It is titled "Economics and the 1995 National Assessment of U.S. Oil and Gas Resources", U.S.G.S. Open-File Report 95-75-M, by Emil D. Attanasi.

Mr. Attanasi projects that *a maximum of* 69 billion barrels of oil (BBO) could be available for production from 1994 to 2015 (USGS OFR 95-75-M). The 69 BBO is derived from summing discovered and undiscovered conventional and unconventional oil resources that would be available at real oil prices up to $30 per barrel (in 1994 dollars).

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DOE's Energy Information Administration (EIA) shows historical and projected U.S. oil consumption from 1994 to 2000 and projected consumption from 2000 to 2015 (EIA, website, Table 5.1 Petroleum Overview 1949-2000, and Table 21, International Petroleum Supply and Disposition, 1999 to 2020). Adding together the total petroleum products consumed from 1994 to 2000 (47.59 BBO) and projected consumption for the same commodities from 2001 to 2015 (125.00 BBO), results in a total historical and projected petroleum product consumption of 172.58 BBO for the period 1994 - 2015. This amounts to 103.58 BBO more than the maximum available amount of 69 BBO, as estimated by Mr. Attanasi.

The above exercise shows that U.S. petroleum product consumption during Mr. Attanasi's study period (1994-2015) would amount to about 250 percent of the maximum possible domestic petroleum supply. And, this exercise also assumes that all U.S. oil would be completely consumed by the year 2015. This is not a likely scenario.

It is possible that the inflation-adjusted oil price could exceed $30 per barrel (in 1994 dollars, I believe). It is also possible that Mr. Attanasi has under-estimated the amounts of economically producible oil that is known and yet-to-be-discovered in the U.S. However, Mr. Attanasi's estimates would have to be more than 250 percent in error in order to come to the conclusion that the U.S. has enough domestic oil to supply its own needs from 1994 to 2015.

A second piece of evidence to support my assertion that the U.S. cannot be self-sufficient in oil production can be inferred by looking at the attached graph that I produced (Figure 1). This graph compares EIA estimates of future petroleum consumption, domestic production, and the potential impact of a 3.2 billion barrel find of oil from the Arctic National Wildlife Refuge (ANWR), Alaska.

Figure 1 shows the huge gap between domestic oil production and projected consumption. Short of a combination unforeseen and miraculous events, I believe that no reasonable energy analyst will predict that any policy actions by the U.S. could result in this country producing all of its oil needs.

Q3. *I have enclosed a recent article in Newsday that describes ongoing research at Woods Hole Oceanographic Institution indicating that some U.S. oil and gas reservoirs are being recharged, perhaps from an as yet unknown source. In some cases known structures are refilling relatively rapidly. This is evident in the Gulf of Mexico and may very well be occurring elsewhere. Would you comment on the implications this ongoing research could have [on] the long term outlook for U.S. oil and gas supply, both generally and particularly with regard to the statement above?*

The U.S. has been producing oil since the mid-1850s. In that time this country has become the most thoroughly-explored oil province on earth. I believe that the observations referred to in the above article are apparently very preliminary and have not yet been exposed to scientific scrutiny over time. Because I am not familiar with these specific circumstances, my statements are only speculative in nature.

Having qualified my remarks, I would say that, if there were shown to be a mechanism that is recharging depleted and depleting oil fields over time, that the rate of recharge would most likely be measured in geologic time, not in years. Otherwise the recharge phenomenon would have already been observed in the approximately 150 years worth of historical U.S. oil production.

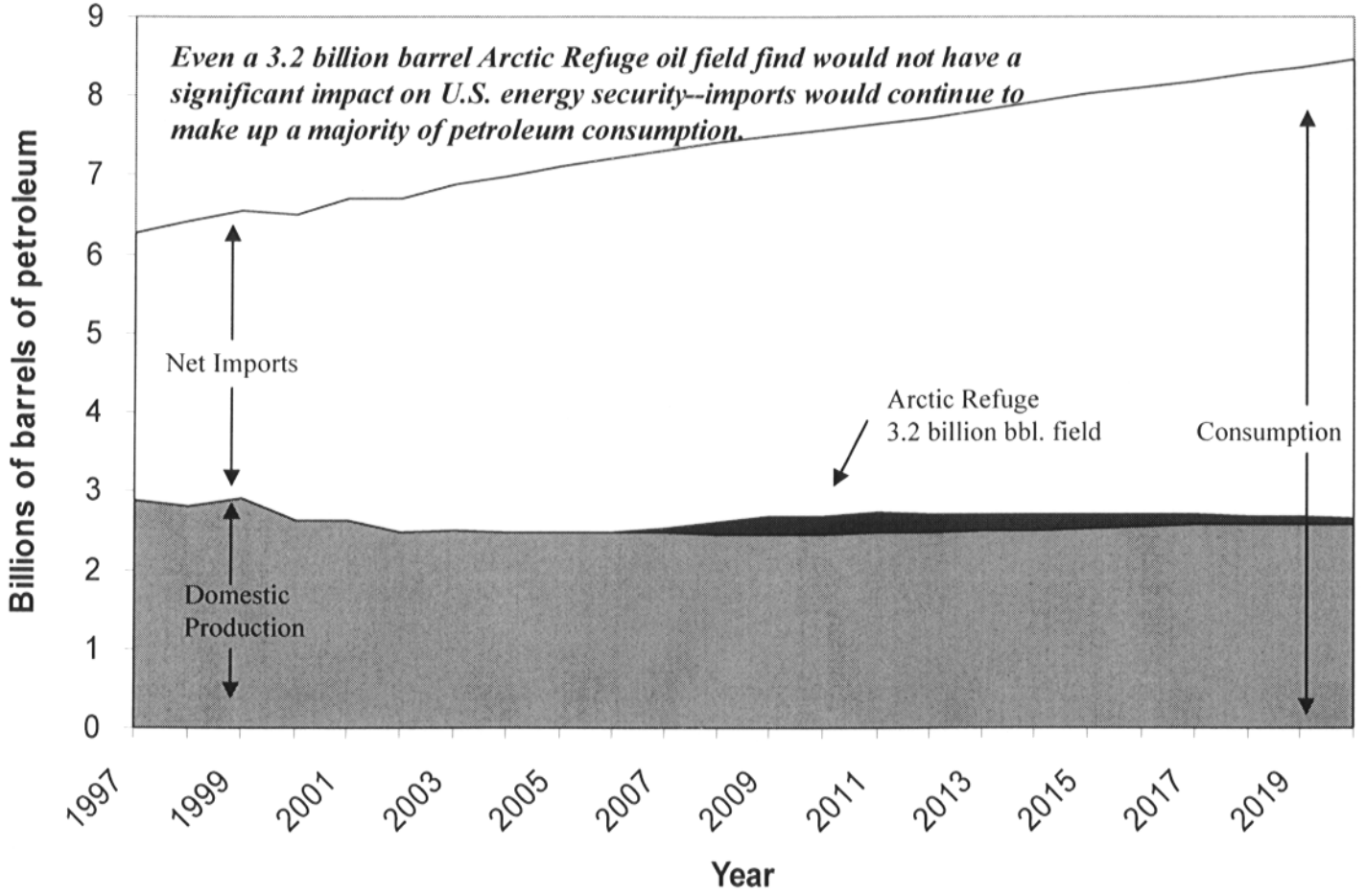
But, if science does show that there is some "rapid-recharge" mechanism working in this country, it would strengthen some of the most prominent statements that I made in my written testimony to this Committee.

The cheapest and most environmentally benign sources of future oil and gas in the U.S. are likely to be found within the boundaries of already discovered oil fields, not in the few remaining unexplored regions. Because most mineral economists assume that we have already found the majority of oil and gas that existed within U.S. boundaries, the largest sources of any "rapid-recharge oil" would also likely be found in already identified oil fields.

Additionally, the U.S. can reap an added bonus from more intensive exploitation of known oil fields. On average, even in "depleted" oil fields there is likely more oil still remaining in known oil fields than has ever been produced from them. By concentrating on recovering the 50 percent-or-more of remaining oil in known fields, this country can leverage the huge investment already made in oil field infrastructure, pipelines, refineries, companies, and people that exist in known oil fields and regions.

Figure 1

Arctic Refuge Energy Security



Sources: U.S. DOE, EIA, 2000, *Annual Energy Outlook 2000*, (historical and projected consumption, domestic production, and net imports), EIA, 1987, *Potential Oil Production from the Coastal Plain of the Arctic National Wildlife Refuge,* (annual production profiles, lease/exploration/development/production timing, and oil field decline curves).

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