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The Arctic National Wildlife Refuge: The Next Chapter

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SUMMARY

Note: this issue brief has been superseded by CRS Issue Brief IB10094 and will be archived soon.

The 107th Congress is considering approving energy development in the Arctic National Wildlife Refuge (ANWR) in northeastern Alaska. ANWR is an area rich in fauna, flora, and commercial oil potential. Shortages of gasoline and natural gas and resulting increased prices from late 2000 to early 2001, followed by terrorist attacks renewed the ANWR debate for the first time in 5 years; however, its development has been debated for over 40 years. Current law forbids energy leasing in the refuge. President Bush included drilling in the refuge as a major feature of his proposed energy plan. Few U.S. locations stir as much industry interest as the northern portion of ANWR.

Development proponents argue that ANWR oil would reduce U.S. energy markets' exposure to recurring crises in the Middle East; boost North Slope oil production and the economic viability of the TransAlaska Pipeline System; and create numerous jobs in Alaska and elsewhere. They maintain that ANWR oil could be developed with minimal environmental harm. Opponents argue that any intrusion on this ecosystem cannot be justified on any terms; that it should be designated as wilderness; and that oil found (if any) would provide little energy security and could be replaced by cost-effective alternatives.

Some early efforts to allow development of the coastal plain of the ANWR ended with the *Exxon Valdez* oil spill in 1989, though the 1990-91 crisis in the Persian Gulf aided development arguments temporarily.

In May 1998, the U.S. Geological Survey released new estimates of oil in the refuge. If at least one field big enough to make development worthwhile can be found, the agency estimates that there is a 95% chance that 11.6 billion barrels or more would be present. However, not all oil present could be recovered: the agency estimates a 95% chance that 2.0 billion barrels or more would be economically recoverable at a market price of $24 per barrel, and a 5% chance that 9.4 billion barrels or more would be economically recoverable at the same price. The amount actually recovered would vary with several factors, including cost and market prices for oil. The higher the price, the larger the economically recoverable amount. The Energy Information Administration assumes 7 to 12 years from approval to first production.

The main legislative options can be divided into three categories: (1) authorizing development; (2) designating the coastal area in ANWR as wilderness, which, under current law, usually ends the potential for development (unless Congress specifies otherwise); and (3) taking no action. This third choice also prevents development, since current law requires congressional action for oil development to occur.

On July 25, 2001, the House Resources Committee reported H.R. 2436; in it, Title V would open the refuge to exploration and development. This provision was then incorporated into H.R. 4, an omnibus energy package. H.R. 4 passed the House on Aug. 2, 2001 (yeas 240, nays 189; Roll Call No. 320). Some Members wish to expedite this or a similar bill in the Senate, due partly to increased threats of terrorism; others argue that such a response would be too slow and too small to be relevant to the threats.

MOST RECENT DEVELOPMENTS

On August 2, the House passed H.R. 4, one portion of which was the text of H.R. 2436 (H.Rept. 107-160, Part I). Title V, Division F, of H.R. 4 would open ANWR to exploration and development. Representatives Markey and Johnson (CT) offered an amendment to strike the title; this was defeated (yeas 206, nays 223; Roll Call No. 317). The threat of terrorism, budgetary considerations, and maintenance of the investment in the Alaskan oil infrastructure are key considerations in the renewed interest in energy development in the (ANWR). Currently falling oil prices related to threats of recession may also play a role in the short term in reducing calls for new production.

Note: See CRS Issue Brief IB10094 for the most current information.

BACKGROUND AND ANALYSIS

The Arctic National Wildlife Refuge (ANWR) consists of 19 million acres in northeast Alaska. It is administered by the Fish and Wildlife Service (FWS) in the Department of the Interior (DOI). Its 1.5 million acre coastal plain is currently one of the most promising U.S. onshore oil and gas prospects. Together, the fields on this federal land could hold as much economically recoverable oil as the giant field at Prudhoe Bay, found in 1967 on the state-owned portion of the coastal plain west of ANWR, now estimated at 13 billion barrels.

At the same time, the refuge, and especially the coastal plain, is home to a wide variety of plants and animals. The presence of caribou, polar bears, grizzly bears, wolves, migratory birds, and many other species in a nearly undisturbed state has led some to call the area "America's Serengeti." The refuge and two neighboring parks in Canada have been proposed for an international park, and several species found in the area (including polar bears, caribou, migratory birds, and whales) are protected by international treaties or agreements. The analysis below covers, first, the economic and geological factors that have triggered new interest in development, followed by the philosophical, biological, and environmental quality factors that have triggered opposition to it.

The conflict between high oil potential and nearly pristine nature creates a dilemma: should Congress open the area for oil and gas development or should the area's ecosystem be given permanent protection from development? What factors should determine whether to open the area? If the area is opened, how can damages be avoided, minimized, or mitigated? To what extent should Congress legislate special management of the area (if it is developed) and to what extent should federal agencies be allowed to manage the area under existing law? (Basic information on the refuge can be found at the FWS web site, [http://www.r7.fws.gov/nwr/arctic]; it includes links to a number of other organizations interested in the area. A presentation of development arguments can be found at [http://www.anwr.org], sponsored by a consortium of groups. Opponents arguments can be found at [http://www.alaskawild.org], [http://www.protectthearctic.com/], or [http://www.tws.org/arctic/]. Maps of the coastal plain showing existing oil development areas on state land can be found at [http://www.dog.dnr.state.ak.us/oil/products/maps/maps.htm].)

History and Congressional Actions

North Slope energy resources have raised controversy for decades, from legislation in the 1970s, to a 1989 oil spill, to more recent efforts to use ANWR resources to address energy needs or to help balance the federal budget.

Early History of the Arctic Refuge. Much of what is now ANWR, including the coastal plain, was set aside in December 1960 by Public Land Order 2214; protection of wildlife was named as one of the refuge's purposes. The Alaska National Interest Lands Conservation Act of 1980 (ANILCA, P.L. 96-487, §1003) prohibits oil and gas development in the refuge unless authorized by Congress. Under §1002 of ANILCA, Congress required DOI to report on the biological resources and the oil and gas potential in 1.5 million acres of the coastal plain of ANWR. This "1002 area" forms 8% of the refuge. It is where oil deposits are most likely, and where wildlife resources are most abundant. This information was presented in DOI's Final Legislative Environmental Impact Statement (FLEIS or 1002 report), in April 1987. While acknowledging significant impacts to wilderness values, wildlife, and water resources in the area, DOI described leasing alternatives and recommended full leasing. The report (like nearly all reports on the 1002 area) drew criticism, in this instance primarily by environmental groups.

Since 1987, many hearings on development proposals and on wilderness designation of the 1002 area have been held, and many bills have been introduced. Issues covered have included the adequacy of the FLEIS, the environmental effects of oil development in ANWR or at Prudhoe Bay, assessments of the need for additional sources of oil, and the biological resources of the coastal plain. Before 2000, peaks of interest occurred in the 100th, 101st, 102nd, and 104th Congresses. (For the issues and bills considered since 1987, see CRS Report 88-380 ENR, CRS Report 89-266 ENR, and CRS Report 91-325 ENR.) In between, low oil prices dampened enthusiasm for energy development in the refuge. Other exploration opportunities (e.g., the Caspian Sea, parts of Latin America, and elsewhere) have attracted industry attention. Industry has also focused on lease sales held in the National Petroleum Reserve-Alaska (NPRA), to the west of the Prudhoe Bay area. These sales were supported by industry and the Clinton Administration, but not by the environmental community.

***Exxon Valdez*: the Political Spillover.** The grounding of the *Exxon Valdez* oil tanker on March 24, 1989, near the southern terminal of the TransAlaska Pipeline System in Prince William Sound played the major role in placing the development debate on hold for several years. Damage at the time included an estimated 300,000 to 645,000 dead seabirds; 4,000 to 6,000 dead marine mammals; and $100 million in other losses. Possible damage awards remain in litigation. Scientific disagreement persists over the legacy of the spill. Environmentalists continue to cite the accident in their opposition to ANWR drilling.

ANWR Consideration in the 104th -106th Congresses. Congress attempted to authorize the opening of ANWR in the FY1996 reconciliation bill (H.R. 2491, §§5312-5344), but the measure was vetoed. President Clinton cited the ANWR sections as one of his reasons for vetoing the measure. (For key provisions of that legislation, see Archived Issue Brief 95071.) Key Senate votes occurred on May 24 and October 27, 1995, on motions to table amendments that would have stripped ANWR development titles from the Senate version of the bill (Roll Call #190 and #525, respectively). Both motions succeeded.

In a related debate, diminished concerns about the security of oil supply, coupled with new leadership in the 104th Congress, led to renewed interest in lifting the ban on Alaskan oil exports. P.L. 104-58, lifting the ban, was signed by President Clinton on Nov. 28, 1995. As a result, Alaskan oil prices rose to world market levels, and the West Coast crude surplus ended. If oil were found in ANWR, it could be exported under current law; however, no oil is being exported now from the North Slope. (See *Oil Export Legislation*, below.)

While bills were introduced, the ANWR issue was not debated in the 105th Congress. In the 106th Congress, bills to designate the 1002 area of the refuge as wilderness, and others to open the refuge to energy development were introduced. Assumptions about ANWR revenues were included in the FY2001 budget resolution (S.Con.Res. 101) as reported by the Senate Budget Committee on March 31, 2000. An amendment to remove the language was tabled (51-49) April 6, 2000 (Roll Call #58); however, conferees rejected the language. The conference report on H.Con.Res. 290 did not contain this assumption, and the report was passed by both Houses on April 13. S. 2557 was introduced May 16, 2000; it included a title to open the refuge to development. These three roll call votes, all in the Senate, are the only recorded votes on ANWR development from the 101st through the 106th Congress.

Legislative Choices in the 107th Congress

Legislative choices can be divided into three categories. One category is passing legislation such as H.R. 4. Division F, Title V of this bill would permit oil and gas leasing in the 1002 area. It would repeal §1003; create a leasing program for the 1002 area, with specified deadlines for lease offerings; permit Secretarial designation of up to 45,000 acres of Special Areas, where surface occupancy would be prohibited; determine that the leasing program is compatible with the purposes for which ANWR was designated; require an EIS for certain actions; specify that certain Secretarial actions are deemed to comply with all requirements for environmental analysis of the leasing program; prohibit export of any ANWR oil, and authorize other activities. The bill would also specify the 1987 FLEIS as sufficient for compliance with the National Environmental Policy Act and specify requirements for safety and environmental compliance in leases. Section 6511 creates a small fund for local community assistance. Section 6512 allocates 50% of all revenues to the State of Alaska; 50% of bonus bids to a renewable energy technology fund; and 50% of rents and royalties to a fund to restore, conserve, and maintain DOI and Forest Service lands, and to fund various other federal, state, and tribal conservation efforts. All programs would be subject to annual appropriation.

A second category is designating the area as wilderness, as in H.R. 770 and S. 11. Wilderness designation, under current law, usually ends the potential for development unless Congress specifies otherwise, which is not the case in these two bills. (For the ramifications of wilderness designation, see CRS Report RL30867). Wilderness designation would add a layer of restrictive management, in addition to the provisions of §1003. (Congress could later explicitly allow development, or reverse the designation. Such reversals are quite rare.)

Finally, Congress could choose to take no action. Because current law prohibits energy development unless Congress acts, this choice allows continued management for the purposes for which the refuge is currently designated.

Oil Export Legislation. Until the export ban was lifted in 1995, a West Coast oil glut helped reduce the price received by producers on Alaska's North Slope (ANS). The market effect of the ban, combined with TransAlaska Pipeline System (TAPS) and shipping costs, resulted in producer revenues often below $10.00/barrel, according to a Department of Energy study. Exports began in 1996. West Coast prices rose, as did the prices for Alaskan crude. (For further details on ANS and West Coast oil pricing and exports, see CRS Report RS20540.) Exports peaked at 7% of production, and have since declined to zero. Some have proposed again restricting Alaskan oil exports to ease oil prices on the West Coast – the primary market for Alaskan crude if foreign sales are forbidden. In this Congress, H.R. 660 would prohibit export of North Slope crude. Oil companies operating in Alaska oppose such a move. As noted above, H.R. 2436 contains such a provision. As a practical matter, as long as other North Slope crude can be exported, it is unclear what effect this provision would have on the oil arriving at Valdez, since only a small fraction of such oil has ever been exported.

Administration Energy Plan. The Administration's energy plan "recommends that the President direct the Secretary of the Interior to work with Congress to authorize exploration and, if resources are discovered, development of the 1002 Area of ANWR. Congress should require the use of the best available technology and should require that activities will result in no significant adverse impact to the surrounding environment" (p. 5-10). It is not clear whether the proposal refers to a two-step process (authorization of exploration, and a second congressional decision on proceeding to development) or a single step. In the past, industry has opposed such a two-step process. The plan provides no details on possible legislation, however, the ANWR provisions in H.R. 2436 appear to be consistent with the Administration's proposals, and enjoy Administration support.

Geological Variables, Economics, and Development Options

ANWR's Geology and Potential Petroleum Resources. Parts of the ANS coastal plain have proved abundant in oil reserves, and its geology holds further promise. The oil-bearing strata extend eastward from structures in the NPRA, to the 2 billion barrel Kuparuk River field, past the Prudhoe Bay field (originally 11-13 billion barrels, with about 4 billion barrels remaining), and a few smaller fields, and may continue through ANWR's 1002 area. Further east in Canada's Mackenzie River delta, once promising structures have not produced significant amounts of oil. Some fields there have produced intermittently and others are currently noncommercial due mainly to lack of transportation infrastructure. The 1002 area contains one of the most promising U.S. undrilled onshore structures with petroleum potential known; there is no evidence of oil elsewhere in the refuge.

Estimates of ANWR oil potential, both old and new, depend on limited data and numerous assumptions about geology and economics. New geological data from outside ANWR and the interpretation of the old, limited FLEIS information can change estimates of ANWR's oil potential. Another important factor in recovery estimates is the projected price of oil, which the Bureau of Land Management (BLM) in 1987 assumed would increase steadily (excluding inflation) over coming decades. In actuality, except for short intervals of spiking, the price of oil has not risen to the extent assumed by BLM until recently. (Proven world reserves of oil have increased 45% during the same period, primarily early in the interval.) A third factor is falling production cost. As technology improves, once unprofitable structures may become profitable, and this has occurred at Prudhoe Bay.

What the Numbers Mean. There are many widely varying estimates of oil quantity in the 1002 area. Here is a guide to these estimates and their meaning.

Minimum field size is the amount of oil that must be present in at least one field to make a defined area likely to be profitable. Embedded in this concept are assumptions about future oil prices, technology development, and costs of production and transportation; if these change, this threshold will change. At ANWR, the minimum field size is usually estimated at a few hundred million barrels. Many little fields, very close together, might substitute for a larger one.

How much oil might be present? This number is just a starting point, since it is not possible to extract every drop of oil in a field. The response is almost never given as a single number, but instead, usually as two and sometimes three numbers. First, scientists ask "what quantity of oil are we confident of finding?" There is a good chance of finding a small amount (or more), and a small chance of finding a large amount (or more). The probability levels used are fixed (by tradition) at 95% (chance of at least a certain small amount), and 5% (chance of at least a certain large amount). The third number is the mean estimate: it is the average of all of the estimated amounts. The numbers could change with better data or better technology.

How much oil is technically recoverable? This number assumes that cost of recovery and price of oil are irrelevant, and that only current technology is used. Like the previous estimates, it gives the large (95%) chance that a certain small amount (or more) of oil is present, the small chance (5%) that a large amount (or more) is present, and the mean estimate. These three numbers are always smaller than the estimates of oil that might be present. As technology advances, this number could also change.

How much oil is economically recoverable? These numbers are the most useful. They include assumptions about oil prices, costs of production, etc. They also are given as 95%, mean, and 5% estimates (of small or more, mean or more, and large or more amounts). If technology later advances, costs decrease, or prices rise, then these numbers could increase, and vice-versa.

What area is being measured? Some estimates of oil include the inholdings of the Kaktovik Inupiat Corporation and those of other Native corporations, as well as state owned lands offshore. (In general, this report refers to estimates on federal lands only.)

Geological Studies, 1991, 1995, and 1998. In 1991, BLM reviewed its 1987 estimate of ANWR's recoverable petroleum resource, based on reprocessed geophysical data, newly-acquired information on four wells drilled near ANWR, additional seismic data from offshore areas near the coastal plain, and the characteristics of new applicable technology (used in the development of the Endicott and Milne Point fields on the ANS frontier). This review gave BLM a greater level of confidence that ANWR is part of the North Slope oil province, and increased its estimates of the probability of economic success. BLM reduced its estimate of the smallest field that could be developed economically from 0.44 billion to 0.40 billion barrels, and increased the marginal probability of economic success from a 19% to 46% chance of finding at least one such field, and that if such a field is found, the mean stimate of economically recoverable oil would be 3.57 billion barrels, with a small chance (5%) of finding 10 billion barrels or more in the area.

In June 1995, the U.S. Geological Survey (USGS) revisited BLM's 1991 estimates, relying upon several geologic studies and data from one new well, the Tenneco Aurora, at a federal offshore location north of the 1002 Area. USGS reduced its estimates of recoverable oil reserves in the area to between 0.148 billion and 5.15 billion barrels.

The most recent government study of oil prospects in ANWR is a 1998 study by USGS (Open File Report 98-34). USGS scientists gathered new data from nearby fields both onshore and offshore and examined the reprocessed seismic data collected in the refuge in 1984-1985. Table 1 shows some of the results of this study. The results assume that at least one commercial-size field is discovered. (The USGS study does not give a probability that such a minimum field would be found.)

Table 1. Probability of the Presence of Given Quantities of Oil and the Recoverability of the Oil on Federal Lands in the 1002 Area.
(billions of barrels)

Crude oil	95% chance this much or more	Mean Estimate	5% chance this much or more
In place	11.59	20.73	31.52
Technically recoverable	4.25	7.69	11.80
Economically recoverable at $18/barrel	0	2.4	6.15
... at $24/barrel	2.03	5.24	9.37
... at $30/barrel	2.98	6.30	10.47

Source: U.S. Geological Survey. *The Oil and Gas Resource Potential of the Arctic National Wildlife Refuge 1002 Area, Alaska. 1999.* USGS Open File Report 98-34. Summary, and Table EA4. (Report available on 2 disk CD-ROM.)

According to USGS, there is an excellent chance (95%) that at least 11.6 billion barrels are present on federal lands in the 1002 area. There is also a small chance (5%) that 31.5 billion barrels or more could be found. With current technology, and if cost were no object, USGS estimates that there is an excellent chance (95%) that 4.3 billion barrels or more is technically recoverable. And there is a small chance (5%) that 11.8 billion barrels or more could be technically recoverable. (If state offshore lands and Native corporation lands are included, these numbers become 5.7 and 16.0 billion barrels, respectively.)

However, in the extreme conditions of the North Slope, cost is inevitably an object. Thus, the third question is *how much oil can be extracted profitably*? The higher the price of crude oil, the greater the proportion that would be economically recoverable. High prices could also provide incentives to improve extraction technology thereby reducing extraction costs. The USGS estimated, at $24/barrel (in 1996 dollars) there is a 95% chance that 2.0 billion barrels or more could be recovered, and a 5% chance of 9.4 billion barrels or more. (For comparison, West Texas crude ranged from $11.35/barrel in late 1998, to $34.34/barrel in November 2000, according to the Energy Information Administration (EIA).)

The projected price of oil is only one of many factors entering into the decision on bidding for a lease. Efforts to reduce exploration and production costs through new technologies play a key role, for example. Each prospective bidder will do its own analysis of the economic and physical factors of lease offers, and company analyses historically have differed from government analyses. With geological evidence pointing to the presence of recoverable oil and gas, developers are expected to be eager to bid on ANWR leases.

Economics of Alaskan Oil Production. While crude oil prices and production costs affect the economics of ANS production, transport costs and regional market conditions – unique to ANS production – also bear on an oil prospect's commercial viability. Over the years, low wellhead prices exacerbated the natural decline in production by (a) diminishing the incentive to drill more wells and otherwise enhance output from existing reservoirs and (b) encouraging the abandonment of some exploration and development work outside the Prudhoe Bay and Kuparuk fields. Even so, some development continued, with discoveries as recent as 1998, and development has begun in the eastern portion of the NPRA. The new Alpine field, just outside the NPRA, has already exceeded expectations. Expansion into these areas has required capital intensive expansion of the infrastructure, but has also helped offset falling output at Kuparuk and Prudhoe Bay. At the same time, falling investment makes this offset is less likely to continue. Production can also be maintained by improving production efficiency at existing sites, and this too has been pursued. Neither alternative can maintain production levels indefinitely.

Industry interest in the 1002 area is based in part on interest in keeping TAPS operating efficiently. Pipeline costs are largely fixed; a smaller flow of crude means higher pipeline rates per barrel. The effect of declining ANS oil output on transportation economics in turn aggravates the negative effect on production. Lower output and rising unit costs could erode the outlook for existing oil fields. Rising oil prices might provide some respite from cost pressures from declining volume, as could cost reductions (e.g., through better technology), or increased volume (whether from the 1002 area or elsewhere in the ANS).

Natural Gas Development on the North Slope. Construction of a natural gas pipeline to North American markets and/or a warm-water port could enhance the commercial prospects of the 1002 area (and the rest of the ANS). The prospect of being able to sell its abundant gas (now being reinjected) would also enhance Prudhoe Bay economics. Until recently, estimated costs of transporting the gas ($15 to $17 billion) and low returns precluded serious consideration of pipeline construction. However, a recent doubling in the price of natural gas and projected continued high prices relative to the average of the past 15 years have improved the relationship between market price and the cost of known ANS gas resources. The Alaska state legislature strongly supports proposals for a pipeline to the south, for the sake of jobs and economic development. Gas, whether marketed or not, will have to be removed eventually to continue production in maturing oil fields; this need may affect the project's outlook. In H.R. 4, §801 forbids the issuance of any federal permit or license for a natural gas pipeline from the Prudhoe Bay area, across the Beaufort Sea and into Canada.

World Oil Prices and Foreign Oil. Besides uncertainty about future oil prices and the complexities confronting ANS development and production, U.S. dependence on imported oil is important in the ANWR debate. Development supporters cite recent oil import levels of 57% of the U.S. market, and project 65% by 2020. While prices were low or falling, there was little interest in the 1002 area. However, in 1999, the Organization of Petroleum

Exporting Countries (OPEC), and certain other oil-exporting nations, agreed to cut production. World oil prices went from $10 to $33 per barrel in 5 months and back down to about $26 per barrel in early 2001. While ANWR development would be one of the longer term responses to the increased price of crude oil prices, interest in Alaskan oil has increased markedly. Recent OPEC production agreements have renewed demand for U.S. policies that might reduce dependence on foreign oil. Falling prices in the face of recession could counter this pressure. (For additional information on world oil prices and the OPEC agreement, see CRS Report RS20487, *OPEC Oil Production - Facts and Figures*.)

Supporters cite recent high oil prices and increased oil imports, as well as $8 billion in annual benefits by the petroleum industry to Alaska's economy in 2000, and declining U.S. and ANS output among their major reasons for wishing to open the refuge. Many factors contribute to high prices, but domestic and world supplies and increasing demand are central to the issue. While U.S. proven crude reserves have declined between 1980 and 1990, proven reserves world wide increased from 659 billion barrels to just over 1 trillion barrels, or 52%. But reserves increased less than 1% in the subsequent decade, starting 2000 at 1,016 billion barrels. Those concerned about global oil supply and its effect on prices contend that there have been virtually no net reserve additions during the past 10 years. The opposing view holds that a trillion barrels comprises about 35 years of supply at current consumption rates, and that, as in the past, additional oil in place will be converted into proven reserves as geological information grows, technology improves, and economics changes. (See also CRS Report RL30459, *Coping With High Oil Prices: A Summary of Options*.)

ANWR and the U.S. Oil Market. ANWR development would constitute a long-term response to current oil supply problems. According to EIA, the time from approval to first production for that area is assumed to be about 7 to 12 years. Peak annual 1002 Area production assuming that 9.4 billion barrels are economically recoverable at a world market price of $24 per barrel would be very roughly 1.4 million barrels per day (bbl/d),[1] compared with projected U.S. oil imports of 15.25 million bbl/d and petroleum use of 24.26 million bbl/d in 2015 according to EIA. (The level and timing of peak production would depend upon the rate at which the 1002 area oilfields are developed.) If 2.0 billion barrels are economically recoverable at the same price, peak annual production would be roughly 300,000 bbl/d. (There is a 5% chance 9.4 billion barrels or more will be found and a 95% chance that 2.0 billion barrels or more will be found. See table 1.) Supporters of development argue that ANWR oil would reduce dependency on foreign sources, and that the additional incremental supply could be crucial in determining oil prices. Opponents argue that even at the higher estimates ANWR oil would add to the nation's supply only marginally and would affect prices (determined in the world market) hardly at all.

Pristine and Untrammeled?

For opponents of development, the central issue is whether the area should be maintained as an intact ecosystem – off limits to development – not whether development can be accomplished in an environmentally sound manner. In terms that emphasize deeply held values, supporters of wilderness designation argue that few places as untrammeled as the 1002 area remain on the planet, and fewer still on the same magnificent scale. Any but the

[1] The level and timing of peak production would depend upon the rate at which the 1002 Area oilfields are developed.

most transitory intrusions (e.g., visits for recreation, hunting, fishing, subsistence use, research, etc.) would, in their view, damage the "child-like sense of wonder" they see the area as instilling. The mere knowledge that a pristine place exists, whether one ever visits it, can be important to those who view the debate in this light.

Thus, even if many measures of biodiversity were stable in the face of development, from their perspective, the nature of the area as a place where a larger truth may be sought would be seriously corrupted. Similarly, when told that the total "footprint" of development (the area actually occupied by drill pads, roads, pipelines, etc.) would be less than 2000 acres, they note that the infrastructure would be scattered over the 1002 area, disrupting the terrain, the ecosystem, and the sense of isolation. They further note that such acreage estimates rarely count pipelines, gravel pits, water processing plants, ports, and similar features. They also question the ability of the area to recover, once energy production is not profitable.

Development advocates counter this argument by arguing that the 1002 area is not pristine. They note the presence of the Native village of Kaktovik, the nearby DEWline (Distant Early Warning line, for missile detection) station (both on Barter Island on the coast), and the remnants of former or uncompleted DEWline installations scattered in or near the 1002 area. Together with Kaktovik, the DEW site operates a garbage dump and a runway. Many Natives of Kaktovik (population about 250) add that an argument about the value of pristine nature relegates their village to the margin of the debate.

Taken together, these issues mean that the 1002 debate sometimes takes on a feud-like aspect due to a culture clash: those who believe in wilderness (statutory or otherwise) as a place where "man is a visitor who does not remain" and that any intrusion into the area would spoil its wilderness value, versus those who place a higher value on job creation, domestic oil supply, economic development, or who reject the "pristine" concept for slighting the natural environment's human dimension. The re-injection of drilling wastes and similar issues is not likely to raise the temperature of the debate higher than these issues.

Refuge Management

Under ANILCA (§303(2)(B)), one of the purposes of ANWR is to "conserve fish and wildlife populations and habitats in their natural diversity...." The other three purposes cite fish and wildlife treaty obligations, subsistence use, and maintenance of water quality and quantity. ANWR energy development was specifically forbidden unless authorized by Congress (§1003). Under current law (16 U.S.C.668dd), additional activities[2] are allowed on refuges to the extent that they are compatible with the purposes for which the refuge was designated. Both H.R. 4 and S. 388 declare that energy development is compatible with ANWR's purposes.

Technology has changed impacts considerably since the FLEIS was issued in 1987. Arctic oil exploration takes place in winter, via ice road. (See *Advances in Technology*, below.) Modern 3-D seismic exploration requires vehicles to leave the thick ice roads and travel in a fine grid across the frozen tundra. Impacts then are an issue for those few species

[2] According to DOI, oil development, where it now occurs, arises primarily from a pre-existing right in subsurface resources or, in rare cases, from efforts to prevent drainage of the federal estate due to development on adjacent land.

(e.g., musk oxen and denning polar bears) that are winter residents, and for tundra vegetation. Summer impacts would be small at the exploration phase (due to reduced activity), peak during construction, and drop or change during production. Advances in technology result in fewer gravel roads and greater aircraft use and thus would change impacts relative to those considered in 1987. Some of these management impacts are outlined below.

Refuge Purposes: Plants and Animals. Development advocates note that 92% of the Refuge would remain closed to development. Environmentalists counter that, while the 1002 area is only 8%, the 1002 report said it "is the most biologically productive part of the Arctic Refuge for wildlife and is the center of wildlife activity." The importance of these resources (such as caribou, polar bears, musk oxen, grizzly bears, wolves, snow geese, wildflowers, water quality and quantity, etc.) in the debate derives from their value for aesthetic enjoyment, sport hunting and fishing, ecological roles, and/or subsistence take, depending on the observer's point of view. H.R. 4 and S. 388 would authorize a leasing program that would "result in no significant adverse effect on fish and wildlife, their habitat, subsistence resources, and the environment" and provide that leases shall contain terms and conditions relating to these requirements. S. 388 (§513) requires the Secretary to enforce the regulations, stipulations, etc., and to hold specified on-site inspections. Lease-holders are required to provide access. Penalties for violations are not specified. H.R. 4 has no similar provisions. (See also *Long-Term Cleanup*, below.) Both bills authorize the Secretary to select up to 45,000 acres of habitat in which surface occupancy would be prohibited. H.R. 770 and S. 411 address these issues by designating the entire area as wilderness.

Different Listed Species than in 1987. In 1987, when the 1002 report was issued, three species were listed under the Endangered Species Act (ESA): the endangered bowhead and gray whales, and the threatened arctic peregrine falcon. The bowhead is still listed as endangered; according to the report, the development activities most likely to affect it would be summer noise and disturbance offshore, though these effects were not deemed to be serious in the 1987 report. (See *Subsistence Use and Access*, below, regarding a recent Native lawsuit over effects of offshore activities on this species.) The gray whale population for this area was de-listed on June 15, 1994. The Arctic peregrine was de-listed on October 5, 1994. Two other species have been added as threatened. The spectacled eider (a large diving duck) was listed throughout its range on June 9, 1993; it was once found in the 1002 area, but is now very rare. Stellar's eider was listed on July 11, 1997. The latter once nested in significant numbers in the 1002 area, but it too is extremely rare. In neither case is the cause of the decline well understood.

Caribou and Other Species. Opponents of development argue that the entire ecosystem of caribou, polar and grizzly bears, wolves, falcons, wildflowers, etc., is worth preserving intact, especially since it represents the least disturbed Arctic coastal area under U.S. ownership, and one of the "wildest" habitats of any type left in the United States. Scientists and sport hunters both stress the importance of the coastal plain for migratory game birds, especially snow geese, taken in Canada and the United States. Some hunters fear that summer development, especially aircraft overflights, could interfere with feeding enough to prevent the geese from gaining adequate weight for migration. In 1987, the 1002 report noted some studies supporting that view and said that this and other possible consequences to birds could be minimized by controlling transportation and siting of facilities. Control could be more difficult if summer air traffic increases due to fewer roads.

The species which has drawn the most attention in this debate is the caribou. The Porcupine Caribou Herd (PCH) calves in or near the 1002 area in most years [http://www.r7.fws.gov/nwr/arctic/pchmaps.html], and winters south of the Brooks Range in Alaska or Canada; it is the subject of a 1987 executive Agreement Between the United Sates and Canada on the Conservation of the Porcupine Caribou Herd. In 1994, the herd numbered 152,000 and is currently estimated at 130,000 according to the international Porcupine Caribou Management Board. In both countries it is an important food source to Native people and others – especially since other meat is either expensive or unavailable. Some scientists cite studies that show a reduction in density of cows with calves near roads and developed areas around Kuparuk (Nellemann and Cameron, 1998). They fear that development and production in the 1002 area could cause cows to calve in less desirable locations or prevent the herd's access to sites where they can escape from the voracious insects common in early summer.

Development proponents counter with a comparison to the Central Arctic Herd (CAH) that summers near Prudhoe, whose population grew from about 13,000 when oil was discovered to about 25,000, and in 1995 declined to about 18,000. Environmentalists and some Natives note that the CAH has a much larger area than the PCH in which to calve, that caribou cows with young calves tend to avoid developed areas, and that predators have been controlled in the CAH's area. The effect of oil development on the PCH is likely to remain one of the hotly contested issues in a new round of debate over the refuge.

Review of 1987 Assessment. On August 25, 1995, DOI released a *Preliminary Review of the Arctic National Wildlife Refuge, Alaska, Coastal Plain Resource Assessment*. Examining especially biological impacts, the report concluded "there would be major environmental impacts from oil and gas development on the coastal plain." (The report noted that it joined the earlier 1987 FLEIS in that conclusion. However, the 1987 report held that most of these could be mitigated and that the energy and security benefits outweighed the negative impacts.) The primary new information was the greater dependence of the PCH on the 1002 area for calving (due to lower calf survival in years when calving occurs elsewhere) and for insect relief after calving. It further noted that if development displaced the herd, calving was likely to shift to areas of higher predation. Muskoxen were reported vulnerable to winter disturbance, when their low, energy-conserving metabolism would make movement difficult. Polar bears, according to the 1987 and 1995 reports, are vulnerable to disturbance in their maternity dens. The newer report considers revegetation to be a difficult and unproven technique, and notes that a "showcase" effort to revegetate an exploratory well site near Kaktovik still bore a visible scar 8 years later. (For a history of this well on an area of Native inholdings within the 1002 area, see Archived Issue Brief 91011.) The report (like nearly all reports on the 1002 area) drew criticism, in this instance primarily by oil interests.

Areas of Special Environmental Significance. The wildlife debate has focused mainly on the areas important to the migratory Porcupine Caribou Herd. However, some believe other species, such as polar bears, grizzly bears, wolves, or migratory birds, may be at greater risk. Bills in some previous Congresses have included special protection (e.g., wilderness designation, delayed exploration, or a special regulatory regime) of the most important habitats. The areas most often mentioned for some special status include the major calving area of the PCH, the area around Sadlerochit Spring (a warm spring that flows all year), and the overlapping areas near the coast where substantial bird populations occur in the summer and where pregnant female polar bears often make their winter dens. From 1981-

1991, 90 dens of female polar bears were found in the latter area, making up about 43% of the dens of this Beaufort Sea population of eastern Alaska and western Canada. H.R. 39 and S. 388 would allow the Interior Secretary to designate up to 45,000 acres in which surface occupancy is forbidden as a response to some of these concerns.

Control of Access. One access issue could be the logistical conflict between the area's management as an oil production site versus its current management as a refuge devoted not only to wildlife conservation but also to recreation (including sport fishing and hunting) and subsistence uses, among other functions. This conflict could become more intense as human populations and road networks increased with development. In contrast to the current open but difficult access at ANWR, access to the state-owned Prudhoe Bay complex is strictly (if not always effectively) controlled. Visitors' and workers' belongings are searched for firearms, alcohol, and drugs, which are prohibited. (None of these requirements now applies to the 1002 area.) Moreover, hunting, even for subsistence, is forbidden at Prudhoe and limited in other developed areas. Similar restrictions are not found in the 1002 area and such restrictions may conflict with the refuge's purposes as currently interpreted. However, with the advent of new technologies, gravel roads could be more scarce in ANWR, even in the production phase, and might be unconnected to the main network at Prudhoe. If the network is unconnected, summer tourism pressure is less likely. The pressure of tourism on the winter ice roads seems likely to be very small. Due to the larger area that can be explored and produced from a given pad, the number of wells is also likely to be fewer than at older fields. (See *Advances in Technology*, below.)

Environmental Quality Management

Environmental quality management issues can be divided into three categories: resource management, pollution, and waste disposal. Congress could choose to leave these matters to administrative agencies under existing laws. Alternatively, Congress could impose a higher standard of environmental protection because of the area's biological resources or because of the fragility of the Arctic environment. Another issue would be the use of gravel and water resources essential for oil exploration and development; another would be setting fees for and allocating any revenues from exploiting these resources. H.R. 39 and S. 388 do not set specific standards in these areas, but specify the leasing program must be "environmentally sound" and must ensure that there will be "no significant adverse effect on fish and wildlife, their habitat, subsistence resources, and the environment...."

Air and water pollution (whether chronic or acute) may involve questions of subtle, long-term ecological effects. Potential legislative issues include the adequacy of existing standards, research needs, monitoring, prevention and treatment of spills, the adequacy of current waste disposal requirements, the development of alternatives to landfills, and liability concerns that can make consolidation of disposal facilities unattractive to oil companies.

Advances in Technology. If ANWR were opened to development today, many environmental effects would likely be less than in 1987. Among the chief advances are smaller gravel pads to support the wells, greater distances that can be reached from a single pad from a diameter of 2 miles to 8 miles (thereby reducing the number of pads necessary to drain an oil field), the re-injection of drilling wastes (thereby obviating the need for large waste pits), and a reduction in the need for gravel roads. Together, these advances decrease the "footprint" of development. The industry points with pride to the Alpine field, just east

of the NPRA. The road between the two pads also serves as a runway, and in summer, only pipelines connect the field to the remainder of ANS development. Heavy equipment needs are met in the winter via ice road. Equipment or personnel arriving in summer are flown in.

In addition, 3-D seismic exploration, 4-D time lapse imaging, ground-penetrating radar, and enhanced computer processing of resulting data on geological structures, and other advanced technologies, have increased the number of successful wells from about 10% to as much as 50%. The higher fraction of successful wells decreases the number of pads and exploration costs. However, in contrast to earlier seismic exploration, a 3-D seismic convoy of vehicles travels a much finer grid across the frozen tundra to obtain the necessary level of detail. Mitigation to avoid an impact on winter residents such as musk oxen or denning female polar bears could be necessary. Damage to vegetation could occur more readily on open tundra than through ice roads. While these developments would mitigate impact, development opponents argue that even so, the "most biologically productive part" of the refuge would no longer be "pristine wilderness" even under the most optimistic scenario.

Management of Support Services. Activities of the independent support service industry (repair, cleaning, laundry, aircraft supply, etc.) in the Prudhoe Bay area have been widely criticized, particularly at Deadhorse, where the state leases land for these independent services. Firms in this industry are generally employed by, rather than part of, major oil companies, and the oil companies have played a role in reducing their impacts. Industry, the state, and environmentalists have agreed in the past on the need to manage and control support facilities. Neither H.R. 4 nor S. 388 place conditions on support facilities specifically. Section 1003 of ANILCA does not cover the role the 1002 area might play as a land base for state or federal offshore activity. Both the United States and Alaska are proceeding with offshore leasing near the 1002 area. But despite occasional small flurries of interest, no well has been commercially developed offshore from the refuge.

Long-Term Cleanup. Congress may consider various proposals on assuring the long-term environmental quality of the area. Central to any decision on these proposals is determining what the ultimate rehabilitation goal(s) should be. Environmentalists would presumably want strong standards, but would simultaneously argue that complete recovery is nearly impossible. Development advocates would presumably argue that existing and future ANS practices are adequate. If no commercial quantity of oil were found, recovery of the ecosystem would involve the melting of ice roads and ice pads, as well as recovery from the effects of 3-D seismic exploration over open tundra. In the north, recovery is slowed by the very low growth rate of plants. Plants protected by thicker layers of ice might recover more quickly. If creation of ponds near rivers is required to provide sufficient water for ice roads and pads, recovery in those immediate areas would be lengthened further.

If major oil deposits were found, development would probably last for decades and, if production of associated natural gas became commercially feasible, perhaps even a century. Recovery from the much higher level of disturbance might then take substantially longer in the harsh Arctic environment. Thus, Congress might be debating rehabilitation that would not begin until 2070 or 2100. Furthermore, some types of cleanup might not be desirable or practical: deep gravel production pads, for example, might be impossible to remove without further damage, and thus might necessarily become a permanent feature of the landscape. No existing federal laws (e.g., concerning performance bonds or fees) are known to cover such long terms in planning for a future cleanup, the exact nature of which is unknown.

S. 388 addresses these issues in §509, requiring the Secretary to establish bonding requirements to ensure reclamation of the lease tract. The duration of the lessee's responsibility would continue until the Secretary determines that "there has been compliance with the terms and conditions of the lease and all applicable law." It is unclear how such potentially long-term bonding would work in practice. H.R. 39 has no similar provisions.

Subsistence Use and Access

The village of Kaktovik and the lands of the Kaktovik Inupiat Corporation (KIC) lie along the coast within the refuge and mostly adjacent to the 1002 area. KIC owns significant land (surface rights) along the coast of the 1002 area, and, through the Arctic Slope Regional Corporation, the subsurface rights to these areas. Current law prevents developing any energy resources that may underlie its lands. Natives of Kaktovik are the major users of the resources in the coastal plain, although they focus significantly on marine resources. (For example, on Dec. 19, 2000, they joined other North Slope Native villages in suing Phillips petroleum for a proposed offshore development in the Beaufort Sea, based on new data suggesting possible harm to their subsistence whale hunting.) Kaktovik Natives support ANWR leasing generally. However, they oppose both leasing in the primary caribou calving area in the east-central 1002 area and restrictions on discharging firearms.

In contrast, subsistence hunters in the interior of Alaska and Canada (especially the Gwich'in people who hunt the herd in its winter range) and the Canadian government oppose leasing in the 1002 area, since it is the main calving area of the herd in most years and support wilderness designation. If the area is opened to leasing, Congress may be asked to consider whether the current access or hunting rights of Native users should be restricted to protect pipeline safety; whether subsistence users should have a special voice in new regulations as 1002 exploration or development evolve, and what provision might be made to minimize any harmful impacts of development on Native culture among both North Slope and interior Alaska groups.

Revenue Allocation

If leasing, development, and production occur, ANWR revenues from bonuses, rents, and royalties, as well as from any sales of gravel and water, could generate billions of dollars for the federal and Native landowners, depending on the amount of oil that is found and on oil prices. Peak annual royalties alone might range from $200 million to $2.5 billion, followed by declining revenues for 30-50 years. The allocation of these revenues between the state and the federal government could be one of the most contentious issues if development legislation were to proceed. Although 90% of the federal share of revenues would be paid to Alaska under the Mineral Leasing Act, H.R. 4 and S. 388 specify an alternative disposition. (See *Legal Issues*, below.) Additionally, some have suggested using federal revenues from ANWR for various purposes, including land acquisition in Alaska or elsewhere as part of the mitigation for reduced habitat values in a developed 1002 area. (In past years, opponents have said any amount of funding cannot mitigate damage to the refuge.) Although the provisions are ambiguous as to derivation and amounts, under S. 388, a portion of revenues from the leasing of ANWR would be placed in a special Renewable Energy Research and Development Fund to be used for research into wind, solar, biomass, geothermal and hydroelectric sources of energy. Whether options for alternative disposition of revenues are

available depends on whether Congress lawfully may make an alternative allocation for the revenues from the Refuge. (See *Legal Issues*, below.)

Legal Issues

Ownership. For decades, the United States and Alaska disputed ownership of submerged lands within and offshore of ANWR. In 1997, in United States v. Alaska, 521 U.S. 1, the Supreme Court decided several issues related to calculating the shoreline "baseline" for purposes of measuring the territorial sea, and decided that the submerged lands and resources beneath tidally influenced waters within the refuge did not pass to Alaska at statehood, finding that executive actions setting aside the Refuge lands before statehood were sufficient to preserve ownership in the United States.

Preparation of EIS. Some question whether the existing environmental impact statement (EIS), completed in 1987, is adequate to support development, or whether an updated or new EIS needs to be prepared. A court in a declaratory judgment action (NRDC v. Lujan, 768 F. Supp. 870 (D.D.C. 1991), held that the DOI should have prepared a Supplemental Environmental Impact Statement (SEIS) at that time (1991) to encompass new information about the 1002 area, in connection with the Department's recommendation that Congress legislate to permit development. Therefore, it seems clear that either an SEIS or a new EIS would have to precede development, unless Congress eliminated this requirement. Section 505 of S. 388 states that the 1987 EIS is adequate legally and procedurally – thereby eliminating the need to redo it prior to leasing. H. R. 39 is silent on this issue, but § 5(a) directs that regulations be prepared no later than ten months after enactment, a short deadline that a court might conclude obviated the preparation of a new EIS. Both bills would direct that leasing have "no significant effect" on the environment. This language arguably might obviate the need for preparation of an EIS, but might not eliminate all NEPA compliance. Section 503(c) of H.R. 2436 deems the 1987 FLEIS to satisfy NEPA with respect to the development and promulgation of the initial leasing regulations, but requires an EIS with respect to all other actions authorized in Title V, a provision that is not clear as to its effects, since not all such actions would require an EIS under NEPA.

Revenues. Many supporters of ANWR energy development have called for a 50/50 split of revenues between the federal and state governments. Alaska has indicated that the state will dispute any revenue distribution that deviates from the 90/10 share to which Alaska is entitled under a 1976 Act and, according to the state, under the Alaska Statehood Act. It can be argued, however, that that split was intended to put Alaska on par with other states' share under the 1920 Mineral Leasing Act, and that Congress has at times prescribed other disposition of revenues, e.g., for the NPRA. A federal court has agreed with the latter interpretation in Alaska v. United States, 35 Fed. Cl. 685, 701 (1996). S. 388 provides that Alaska would receive the same share that it received under P.L. 96-514, relating to the NPRA (apparently a 50/50 federal/state split). H.R. 39 is silent on the issue, but also states in § 4(d) that that Act is the *sole authority* for leasing in the Refuge. This may result in an interpretation that all revenues would be deposited in the U.S. Treasury as miscellaneous receipts under 31 U.S.C. § 3302. H.R. 2436 provides that $10 million of leasing revenues go into a Coastal Plain Local Government Impact Aid Assistance Fund and is silent as to the disposition of the rest of the revenues. After H.R. 2436 was reported by the Committee, a provision (§6512) was added to the version in Division F of H.R. 4 to divide any revenues from the energy leasing program evenly between the federal and state governments. (It is

unclear whether the $10 million for local assistance is to be taken from the revenues before this split is made, or from the federal share afterwards.)

LEGISLATION

H.R. 4 (Tauzin)

Divison F, Title V, contains the provisions of H.R. 2436, with the inclusion of a new provision for a 50:50 federal:state revenue split. Introduced July 27, 2001; referred to Committees on Energy and Commerce, Science, Ways and Means, Resources, Education and the Workforce, Transportation and Infrastructure, the Budget, and Financial Services. Markey-Johnson (CT) amendment to strike Title V defeated (yeas 206, nays 223; Roll Call No. 317). Passed House Aug. 2, 2001 (yeas 240, nays 189; Roll Call No. 320).

H.R. 39 (D. Young)

Repeals current prohibition against ANWR leasing; directs Secretary to establish competitive oil and gas leasing program; specifies that the 1987 FLEIS is sufficient for compliance with the National Environmental Policy Act; authorizes set-asides up to 45,000 acres of Special Areas that restrict surface occupancy; sets minimum for royalty payments and for tract sizes; and for other purposes. Introduced January 3, 2001; referred to Committee on Resources.

H.R. 770 (Markey)

Designates Arctic coastal plain of ANWR as wilderness. Introduced Feb. 28, 2001; referred to Committee on Resources.

H.R. 2436 (Hansen)

Title V repeals current prohibition against ANWR leasing; directs Secretary to establish competitive oil and gas leasing program; specifies that the 1987 FLEIS is sufficient for compliance with the National Environmental Policy Act; authorizes set-asides up to 45,000 acres of Special Areas that restrict surface occupancy; sets minimum acreage for the first lease sale and minimum royalty payments; prohibits ANWR oil export; specifies project labor agreements; and for other purposes. Introduced July 10, 2001; referred to Committee on Resources and on Energy and Commerce. Reported (amended) by Resources on July 25 (H.Rept. 107-160, Part I) and discharged by Energy and Commerce on July 25, 2001.

S. 388 (Murkowski)

Title V opens the 1002 area to energy leasing; provides for the timing and size of lease sales; specifies that the 1987 FLEIS is sufficient for compliance with the National Environmental Policy Act; requires posting of bonds for reclamation; requires expedited judicial review; authorizes set-asides up to 45,000 acres of Special Areas that restrict surface occupancy; provides for a 50:50 revenue split with the State; requires on-site inspections, provides for use of any federal revenues; and other purposes. Introduced Feb. 26, 2001; referred to Committee on Energy and Natural Resources.

S. 411 (Lieberman)

Designates Arctic coastal plain of ANWR as wilderness. Introduced Feb. 28, 2001; referred to Committee on Environment and Public Works.

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