

**AAE / Econ / Env. St. 343
Environmental Economics**

Readings for Homework #3

Oil Field or Sanctuary?

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For starters, since the stakes are so high, imagine this slice of coastal Alaska as a deck of cards. Cut the deck in the right place and you could tap open a petroleum reservoir believed to have the greatest onshore potential for production in the United States. It could be a prize to be measured in billions of barrels—and billions of dollars. Or don't cut the deck. Let it sit there untouched—the biological heart of one of the largest protected natural areas on the face of the Earth, a prize to be measured in the diversity of its wildlife and the melody of its silence. But this is a choice only Congress can make, and it isn't a game: to cut and deal or not to cut on the coastal plain of the 19-million-acre (7.7 million hectares) Arctic National Wildlife Refuge in northeast Alaska.

Pinched between the Brooks Range and the Beaufort Sea, the plain within the refuge stretches west from the Yukon border more than a hundred miles, a flat expanse of tundra laced with tussock wetlands and braided rivers. In 1980, when the Alaska lands act expanded the refuge to embrace an area the size of South Carolina—and designated 8 million acres of it statutory wilderness—1.5 million acres (607,000 hectares) of the coastal plain was set aside under Section 1002 for study of its environmental value and petroleum potential. Hence the name: the 1002 Area.

In 1987 President Ronald Reagan's secretary of the interior, Donald Hodel, recommended to Congress that the 1002 be opened for oil and gas leasing, even though interior's environmental impact statement, prepared by the U.S. Fish and Wildlife Service, found that the "expected displacement and reduction of wildlife populations and natural processes would cause a major reduction in the value of the area as a pristine, natural scientific laboratory." Wilderness values within the 1002 Area, the report concluded, "would be eliminated."

If the service's report wasn't enough to turn Congress against the Hodel proposal, the grounding of the oil-laden Exxon Valdez in Alaska waters two years later was. Another proposal to drill was advanced in 1991 and soon defeated. In 1995 congressional Republicans attached a drilling provision to a budget bill; President Clinton vetoed it. Finally, earlier this year, President George W. Bush identified the 1002 as a plank in his energy agenda. In Congress the response was not enthusiastic.

One overriding question is whether the refuge's coastal plain contains enough oil to make its extraction worth both the economic cost and the environmental risk. Estimates of undiscovered petroleum resources there have varied wildly over the past two decades. Proponents of development often cite 16 billion barrels of oil as their best number, while some opponents hold the count to less than 4 billion barrels. But according to one recent assessment by the U.S. Geological Survey, seismic data and information provided from recent oil discoveries nearby indicate that the amount of oil that is technically recoverable from the 1002, not including native lands or offshore state holdings, falls into the range of 4 to 12 billion barrels, with the lower number having a 95 percent probability of recovery and the higher only a 5 percent probability.

After folding in the cost of getting the oil to market, however, the USGS estimated the likeliest amount of oil that might profitably be recovered would probably fall between 3.2 and 5.6 billion barrels, assuming a market price of \$20 to \$25 a barrel. And this raises the second big question: To what extent would ANWR production help reduce the nation's dependence on foreign oil?

The U.S. consumes petroleum at the rate of 19.4 million barrels a day. About 57 percent of it is imported. That figure is certain to increase if domestic production continues to decline, as it has for a quarter century in the dwindling fields of the lower 48 and, more recently, in Alaska's largest North Slope reservoirs at Prudhoe Bay and Kuparuk. If oil from the 1002 were made available by Congress today, production probably would not begin until around 2010. At peak production—probably not until 2030—the field could produce about one million barrels a day. At today's rate of consumption that would reduce the current need for imports by only 9 percent.

"Extra domestic crude production of the greatest imaginable amount would still leave the Nation dependent on imports for at least 40 percent of its petroleum needs," the Congressional Research Service noted in 1996. "From an energy security perspective, the basic situation would be unchanged—the Nation would still depend heavily on imports." Later reports have softened that assessment, and President Bush has declared the amount of oil that could profitably be produced from ANWR to be more than enough to offset the quantity imported from Iraq.

If there is any issue more contentious than the amount of oil likely to be found beneath the coastal plain, it is the extent to which the infrastructure necessary to extract it—roads, airstrips, drilling pads—might adversely affect habitat essential to some 200 species of birds and mammals, including the barren-ground caribou of the Porcupine herd. Numbering about 130,000 animals, the herd traditionally migrates from scattered winter ranges in the boreal forests of Alaska and northwest Canada over the mountains to the coastal plain. There the pregnant cows drop their calves in an environment favorable for forage, relatively free of predators, and fanned by mosquito-repelling ocean breezes.

In the rhetorical wars between those who favor drilling the 1002 and those who don't, the caribou issue raises conflicting claims. Proponents point to the oil fields at Prudhoe Bay and Kuparuk, some 60 miles (100 kilometers) west of the refuge, where a different caribou herd, the central Arctic, has increased its numbers in spite of several hundred miles of gravel roads and more than a thousand miles of elevated pipe. Opponents respond that the industry's argument ignores a major difference between the two herds: The 1002 coastal plain provides calving habitat for a herd nearly five times as large as the central Arctic herd, in an area one-fifth as big. Some biologists fear development here could push caribou into the foothills, where calves would be more prone to predation.

Then there are the arguments over "footprints" (the area occupied by infrastructure) and the latest advances in drilling technology. Critics of the oil industry point to the sprawling development around Prudhoe and warn that it could happen again in the 1002. Whereupon supporters of the industry explain that development of the 1002 can be achieved with a total footprint no larger than that of a fair-size airport. But since the oil there is believed to be scattered in many small pockets rather than in one large pool, as at Prudhoe, environmentalists argue that the infrastructure would fall across the 1002 like a net. Most opponents of development, however, do concede that advanced technology—multilateral drilling and directional drilling that can reach farther out from a smaller drill-pad footprint—would help reduce the net's impact.

In the exploratory phase, the oil industry has said it could minimize impact by operating in winter on ice pads and over ice roads that disappear in spring thaws. But the Fish and Wildlife Service paints the coastal plain in winter as a virtual Arctic desert. Most lakes freeze to the bottom, and there's enough river water "to freeze into and maintain only 10 miles of ice roads." Moreover, while the Porcupine herd and migratory birds are absent in winter, a significant number of pregnant polar bears are denning in snowbanks along the 1002's coastal and riverine bluffs. The Fish and Wildlife Service reports: "Maternal polar bears with newborn cubs can be prematurely displaced from their winter dens by oil exploration."

Finally there is the cultural and political landscape to consider, starting across the border. The Ottawa government strongly opposes drilling in the 1002. Two of Canada's wildest national parks, Ivvavik and Vuntut in the Yukon, abut the U.S. refuge and with it embrace the second largest internationally protected natural area in North America. The parks provide safe passage for the Porcupine herd to and from calving grounds on the coastal plain. Canada has banned industrial activity in both parks and expects the U.S. to do likewise in the Arctic refuge.

In Alaska most residents like living in an oil-enriched state, which, in lieu of levying an income tax, rewards each individual with an annual dividend from oil-lease revenues (last year's dividend came in at \$1,964 per resident). Along with their governor, legislature, and congressional delegation, Alaskans for the most part are in favor of opening the 1002. Oil is a big employer in the 49th state.

The Native American community in Alaska, however, is deeply divided. South of the Brooks Range, in such places as Arctic Village and Venetie, the Gwich'in Indians view development of the coastal plain as a threat to the caribou herd that supplies them with much of their protein. Subsistence hunters from these and Athapaskan villages in Canada kill and use some 3,000 to 5,000 caribou every year. They view the coastal plain as sacred ground.

But north of the mountains, many Inupiat Eskimos in Kaktovik on Barter Island favor onshore oil leasing for the economic opportunities it might bring them—especially if oil is found on their coastal land. Inupiat subsist on caribou too, but they also have access to marine mammals such as seals and bowhead whales. The Inupiat view their offshore waters as sacred and oppose drilling there.

A new twist in the tangle of the 1002 developed earlier this year when electrical black-outs began to roll across California, and the Bush administration took that as further evidence that additional supplies of Alaska crude would be needed to avert a pending national energy crisis. But oil and diesel fuels generate less than one percent of California's in-state power; the top contributor, at more than 30 percent, is natural gas. So it was only natural that the nation's talk of supply and demand should suddenly shift from oil to gas. And there is plenty of gas on Alaska's North Slope.

According to a spokesman for British Petroleum, a principal operator on the North Slope, some eight billion cubic feet (226 billion liters) of natural gas is drawn from existing oil fields there every day and re-injected into the ground because there is no pipeline to carry the gas to U.S. or Canadian markets. Eight billion cubic feet of gas represents more than half of what residential consumers throughout the United States use in a single day.

There was talk of building a gas pipeline out of Alaska through Canada to existing lines in the U.S. even before oil began to flow down that other pipe from Prudhoe to Prince William Sound in 1977. But until recently the market price of gas wasn't sufficient to justify the construction cost, now estimated at about ten billion dollars. The price may be right today, given the growing need for gas in the lower 48. But construction could delay delivery for at least five years. Meanwhile, there are untapped reservoirs of natural gas in states that already have some capacity for delivery in place.

So the debate drags on. New estimates. New assurances. New alarms. And old uncertainties about the future of that coastal plain.