

Committee on Resources

resources.committee@mail.house.gov

[Home](#) [Press Gallery](#) [Subcommittees](#) [Issues](#) [Legislation](#) [Hearing Archives](#)

Natural Resources Defense Council

40 West 20th Street

New York, NY 10011

Tel: (212) 727-2700

Fax: (212) 727-1773

Testimony of

Natural Resources Defense Council

Before the

Subcommittee on Energy and Mineral Resources

House Committee on Resources

On

Environmental Aspects of Modern Oil and Gas Development

September 17, 2003

Prepared by:

Lisa Speer, Senior Policy Analyst

Johanna Wald, Senior Attorney

My name is Lisa Speer. I am Senior Policy Analyst with the Natural Resources Defense Council (NRDC) in New York. NRDC is a national nonprofit organization dedicated to protecting public health and the environment with more than a million members and e-activists around the country. My testimony today addresses environmental issues surrounding oil and natural gas exploration, development and production.

Background

The United States has 5 percent of the world's population, but consumes nearly a quarter of the world's energy supply. Two distinct visions of an energy policy for the United States have emerged in the current debate over how to meet this demand. One vision focuses chiefly on extracting as much energy as possible, mostly in fossil fuel form (oil, coal and natural gas), in hopes that supply can catch up with demand. The alternative vision, however, calls for encouraging innovation and new technology to meet our energy needs in an environmentally responsible manner. This vision emphasizes efficient use of energy, and places priority on using energy resources that are least damaging to our environment. It promotes economic growth and American industrial competitiveness. This energy path would not force consumers to make sacrifices; instead it relies on improved technologies that will eliminate waste while increasing productivity and comfort. Such an approach will decrease America's reliance on foreign sources of energy in the near- and long-term, provide for America's energy needs, buffer the economy against short-term swings in the market, and protect the environment from the effects of oil and gas exploration, production and transportation, the subject of today's hearing.

The evolution of industry practices

The last two decades have witnessed important improvements in the way the oil and gas industry operates, both onshore and offshore. No longer are millions of gallons of toxic wastes routinely dumped untreated into Alaska's sensitive tundra ponds or Louisiana's productive coastal wetlands. Oil-based drilling fluids are no longer allowed to pollute the waters off our coasts. Spill preparedness has improved, and innovative technologies such as the use of coiled tubing, ice roads and pads, and more accurate exploration methods have significantly changed, and in many cases reduced, environmental effects.

Despite this progress, however, critical environmental problems remain. Some stem from the continued use of old technologies, others result from newer practices that, while ameliorating some impacts, create others. The following is a brief overview of some of the more important issues offshore and onshore. The onshore portion of this testimony focuses on Alaska's North Slope.

Environmental consequences of offshore development

Seismic exploration: Recent scientific investigations indicate that seismic surveys can seriously affect gray whales, sperm whales, beaked whales and bowheads,[1] and can injure fish at substantial distances. The ears of fish are particularly vulnerable, and many species rely heavily on their hearing to avoid predators, locate prey, communicate, and sense their environment. Mortality is also possible in species that, like salmon, have swim bladders, which have been shown to rupture on exposure to intense sounds.[2] Salmon are of particular concern because of the endangered status of some populations off the Atlantic and Pacific coasts, and because of their apparent inability to detect and avoid low-frequency sound until damaging levels are reached.

Onshore damage: The industrial infrastructure associated with offshore oil or gas – roads, pipelines, processing facilities, etc. -- can cause significant harm to sensitive coastal environments. For example, OCS pipelines crossing coastal wetlands in the Gulf of Mexico are estimated to have destroyed more coastal salt marsh than can be found in the stretch of land running from New Jersey through Maine.[3] Moreover, the industrial character of offshore oil and gas development is often at odds with the existing economic base of the affected coastal communities, many of which rely on tourism, coastal recreation and fishing.

Water pollution: Drilling muds are used to lubricate drill bits, maintain downhole pressure, and serve other functions. Drill cuttings are pieces of rock ground by the bit and brought up from the well along with used mud. Massive amounts of waste muds and cuttings are generated by drilling operations – an average of 180,000 gallons per well.[4] Most of this waste is dumped untreated into surrounding waters. Drilling muds contain toxic metals, including mercury, lead and cadmium. Significant concentrations of these metals have been observed around drilling sites, [5] raising concerns regarding the contamination of fish and other marine life, with potential implications for human consumption of fish.

A second major polluting discharge is “produced water,” the water brought up from a well along with oil and gas. Offshore operations generate large amounts of produced water. The Minerals Management Service estimates that each offshore Gulf platform discharges hundreds of thousands of gallons of produced water every day.[6] Produced water typically contains a variety of toxic pollutants, including benzene, arsenic, lead, naphthalene, zinc and toluene, and can contain varying amounts of radioactive pollutants. All major field research programs investigating the fate and effects of produced water discharges have detected petroleum hydrocarbons, toxic metals and radium in the water column down-current from the discharge.[7]

Air pollution: Drilling an average exploration well generates some 50 tons of nitrogen oxides (NOx), 13 tons of carbon monoxide, 6 tons of sulfur dioxide, and 5 tons of volatile organic hydrocarbons. Each OCS platform generates more than 50 tons per year of NOx, 11 tons of carbon monoxide, 8 tons of sulfur dioxide and 38 tons of volatile organic hydrocarbons every year.[8]

Oil spills: According to statistics compiled by the Department of the Interior, some 3 million gallons of oil spilled from OCS oil and gas operations in 73 incidents between 1980 and 1999.[9] Oil is extremely toxic to a wide variety of marine species. Unfortunately, as noted by a recent National Academy of Sciences study, current cleanup methods are incapable of removing more than a small fraction of oil spilled in marine waters. Spills pose a particular problem in the arctic, where the industry has not demonstrated the ability to clean up oil spilled in conditions of broken ice.[10]

Oil spills are typically associated with the exploration, production and particularly transportation of offshore

oil. But even in gas-prone areas, spills are an issue. If offshore areas are leased for gas exploration there is always the possibility that oil also will be found. We have no instance where a lease prohibits an oil company from developing oil if oil is found in a “gas prone” region.

Concerns over these and other environmental consequences of offshore oil and gas development has led Congress to impose restrictions on OCS activities in sensitive areas off the nation's coasts every year since 1981. These moratoria now protect the east and west coasts of the U.S., Bristol Bay, Alaska, and most of the Eastern Gulf of Mexico. The moratoria reflect a clearly established consensus on the appropriateness of OCS activities in most areas of the country, and have been endorsed by an array of elected officials from all levels of government and diverse political persuasions, including former Presidents George H.W. Bush and Clinton and the current President Bush, who included the moratorium in his FY '04 budget request to Congress. We strongly support continuation of the moratoria, and oppose recent attempts to permit seismic exploration in the moratorium areas.

Environmental Consequences of Onshore Oil Development on Alaska's North Slope

In March of this year, the National Research Council of the National Academy of Sciences issued a report entitled, *The Cumulative Environmental Effects of Oil and Gas Activities on Alaska's North Slope* (“NAS report”). The report documents the environmental and cultural damage that has accumulated over three decades of oil development in the area. New technologies have reduced some damage, but despite this, the NAS report concluded that expansion into new areas is certain to exacerbate existing effects and generate new ones.[11]

Examples of effects that continue despite new technologies include the following (numbers in parentheses refer to page numbers in the Pre-publication version of the NAS report).

Footprint: Development has directly affected 17,000 acres spread across an area roughly the size of the land area of Rhode Island (67, 70). The environmental effects of oil development are not limited to the “footprint” (actual area covered by a structure), but occur at distances that vary depending on the environmental component affected, from a few miles (animals), to much farther (visual effects and seismic effects on whales) (8 and 15). For example, roads kill tundra vegetation beneath them, but they can also displace wildlife, impede wildlife movements, kill surrounding vegetation through the dust they generate, change hydrological patterns and destroy wilderness values (123 and 126).

Restoration: Only about 100 acres (1%) of the habitat affected by gravel fill on the North Slope have been restored (15). The report estimates that the costs of removing facilities and restoring habitat will run in the billions of dollars. No money has been set aside for this purpose by either the oil companies or the government (155). The Committee concluded that it is unlikely that most disturbed habitat on the North Slope will ever be restored unless current conditions change substantially (16). Because natural recovery in the arctic is slow, effects of unrestored structures are likely to persist for centuries, and will accumulate as new structures are added (16).

Climate change and new technologies: Climate change will continue to affect the usefulness of many oilfield technologies and how they affect the environment (8). For example, the length of the winter season when seismic and other off road tundra travel is permitted, and ice roads and pads are constructed, has been steadily decreasing since the 1970's (137 and 138) and will likely to continue to do so. The coastline of the North Slope is presently eroding at a rate of 8 feet per year, the fastest rate of coastline erosion in the United States, and this will accelerate with climate change (95).

In addition, climate change is anticipated to affect the way in which animals respond to development. The Porcupine caribou herd, which calves in the Arctic National Wildlife Refuge, has the lowest growth capacity of the four arctic herds and the least capacity to resist natural and human-caused stress (187). Higher insect activity associated with climate warming could counteract any benefits of reduced surface development by increasing the frequency with which caribou encounter infrastructure (187).

Though limited development offshore has taken place to date, full scale industrial development offshore would displace polar bears and ringed seals from their habitats, increase mortality, and decrease their reproductive success. Predicted climate change is likely to have serious effects on polar bears and ringed seals that will accumulate with those related to oil development (169).

Wilderness: Oil development has compromised wilderness values over 1,000 square miles of the North

Slope. The potential for further loss is at least as great as what has already occurred as development expands into new areas (239). Roads, pads, pipelines, seismic vehicle tracks, transmission lines, air, ground and vessel traffic, drilling activities, and other industrial activities and infrastructure have eroded wilderness values over an area that is far larger than the area of direct effects (227).`

Air pollution: More than 70,000 tons of NOx are emitted each year by industrial facilities on the North Slope, along with thousands of tons of sulfur dioxide, carbon monoxide, volatile organic hydrocarbons, and millions of tons of carbon dioxide (66). Even though air quality meets national ambient air quality standards, it is not clear that those standards are sufficient to protect arctic vegetation (141). Not enough information is available to provide a quantitative baseline of spatial and temporal trends in air quality over long periods across the North Slope, and little research has been done to quantify effects.

Winter off-road seismic exploration and ice roads: The Committee estimates that more than 32,000 miles of seismic trails, receiver trails, and camp-move trails were created between 1990 and 2001, an annual average of 2,900 miles each year (154). If current trends continue, some 30,000 line miles will be surveyed on the North Slope over the next decade. These trails produce accumulating visual effects and can damage vegetation and cause erosion. Data do not exist to determine the period that the damage will persist, but some effects are known to have lasted for several decades.(252). Seismic exploration is expanding westward into the western arctic and the foothills, where the hilly topography increases the likelihood that vehicles will damage vegetation (252). The use of ice roads and pads has increased and will continue to do so, but little information is available on how long effects persist.

Animals: The reproductive success of some bird species in the oilfields has been reduced to the point where some oil-field populations are likely maintained only by immigration from more productive “source” habitats elsewhere (200). An important consequence of this phenomenon is that loss of such “source” habitats can threaten the viability of a population even though most of the habitat occupied by the species in region remains relatively intact. The location of important source habitat for birds or other species is not well characterized for the North Slope. Thus, the spread of industrial development into new areas could result in unexpected species declines, even though total habitat loss might be modest (158, 253).

With respect to caribou, Although industrial development has not resulted in a long term decline in the Central Arctic Herd (the herd most affected by current oil development), the Committee concluded that by itself is not a sufficient measure of whether adverse effects have occurred (185). Female caribou exposed to oilfield activity and infrastructure produced fewer calves, and following years when insect harassment was high, that effect increased, which may have depressed herd size. The spread of industrial activity into other areas that caribou use for calving and relief from insects, especially to the east where the coastal plain is narrower than elsewhere, would likely result in reductions in reproductive success if disturbance is not reduced. (15, 254).

Environmental issues related to development on public lands in the west

The environmental problems associated with onshore oil and gas development in Alaska are mirrored on public lands in the Interior West. According to the Bureau of Land Management (BLM), there are currently over 94,000 producing oil and gas wells on the public lands that it manages within the Rocky Mountain West. In fiscal year 2001, the BLM permitted 4,472 drilling projects on those lands,[12] a “strong increase” over 1999 and 2000 levels.[13] Since the Administration took office, 7, 158 APDs have been approved and the BLM has been fast-tracking land use plans and energy projects to achieve its stated goal of increasing domestic production.[14] The expedited list includes the Powder River Basin in Montana and Wyoming, where the agency recently approved the drilling of up to 66,000 new coalbed methane wells over the next 10 years.[15] Also included are public lands in the Farmington, New Mexico area, where the agency’s “reasonably foreseeable development scenario” projected the drilling of 9,970 new wells during the next twenty years in an area that currently has over 19,000 producing oil and gas wells.[16]

Current practices in oil and gas development have had serious and widespread impacts across broad expanses of public land. Oil and gas fields have become spiderwebbed with pipelines and access roads, and pockmarked with well pads. Full-field development has often converted pristine wildlands and pastoral rural areas into industrial zones. The wild character of the public’s lands has been destroyed, recreational values severely diminished, long-term degradation of scenic viewsheds, and wildlife habitats seriously degraded. Not only the environment, but also the cornerstones of the West’s economy – outdoor recreation, hunting and fishing – have been affected.[17]

Research shows that roads and drill pads fragment and diminish the quality of wildlife habitat for elk, antelope, and sage grouse. A recent GIS analysis of an oil and gas field in Wyoming's Upper Green River Valley indicates that 97% of the 166-square-mile study area was within one-quarter mile of a road, pipeline, or well pad, providing no habitat for the Greater Sage grouse, a potential candidate for the federal endangered species list.[18] Other research has shown that oil and gas development can have a major impact on big game animals, including elk.[19]

Seismic exploration activities can also have serious environmental impacts. Desert soils are susceptible to compaction and destruction from the heavy vehicles used for certain types of exploration and can take 50-200 years to recover.[20] Seismic activities can have negative impacts on big game as well as other wildlife species.[21]

The environmental consequences of oil and gas development onshore and offshore are an important reason why NRDC supports a different approach to energy security in this country, one that shifts reliance away from fossil fuels and toward more sustainable energy future.

Thank you for the opportunity to testify.

[1] See, e.g., NAS Report, p. 164 (bowheads); National Marine Fisheries Service, Southeast Regional Office, 2002. Final Biological Opinion, Gulf of Mexico Outer Continental Shelf Lease Sale 184, pages 37-48 (sperm whales).

[2] McCauley, R.D., J. Fewtrell and A.N. Popper, 2003. "High intensity anthropogenic sound damages fish ears." J.Acoust.Coc.Am. 113, January, 2003.

[3] Boesch and Rabalais, eds., "The Long-term Effects of Offshore Oil and Gas Development: An Assessment and a Research Strategy." A Report to NOAA, National Marine Pollution Program Office at 13-11.

[4] MMS, 2000. Gulf of Mexico OCS Oil and Gas Lease Sale 181, Draft Environmental Impact Statement (DEIS), p. IV-50.

[5] Id.

[6] Id., p. IV-32.

[7] Id., p. IV-32-33.

[8] Id., p. IV-40.

[9] MMS, 2000. Gulf of Mexico OCS Oil and Gas Lease Sale 181, Draft Environmental Impact Statement (DEIS), pp. IV-50.

[10] National Academy of Sciences, National Research Council, 2003. Cumulative Environmental Effects of Oil and Gas Activities on Alaska's North Slope, p. 15.

[11] Id., p. 21.

[12] BLM, Oil and Gas Activity on Public Lands, p. 5 (March 2002).

[13] Id. See also, BLM, Budget Justifications and Annual Performance Plan, Fiscal Year 2003, pp. III-116 through III-121.

[14] See, e.g., BLM, Land Use Plans and Major Environmental Impact Statements – Energy Development Workloads (December 28, 2001).

[15] We are among the groups that have filed suit over these decisions. However, neither we nor any of the other plaintiff groups have asked for any injunctive relief as of this date and BLM has begun approving

APDs.

[16] Alberswerth, D. 2003. Testimony before the Senate Energy and Resources Committee, The Wilderness Society, Washington, DC.

[17] Hunters and anglers spend \$5.5 billion each year in the Rocky Mountains, including \$2 billion a year in Colorado. Recreation and tourism, much of which is dependent on public lands, brings in \$8 billion annually to Colorado's economy. See, e.g., Morton, Peter A., Ph.D., Testimony before the Speaker's Task Force on Affordable Natural Gas, U.S. House of Representatives, August 25, 2003, The Wilderness Society, DC.

[18] Weller, C., J. Thomson, P. Morton, and G. Aplet. 2002 Fragmenting our lands: the ecological footprint from oil and gas development. The Wilderness Society, www.wilderness.org/Library/Documents/FragmentingOurLands.cfm

[19] See, e.g., Powell, J.H., and F.G. Lindzey. 2001. 2000 progress report: Habitat use patterns and the effects of human disturbance on the Steamboat elk herd. Unpublished report, Wyoming Cooperative Fish and Wildlife Research Unit; Van Dyke, F., and W.C. Klein. 1996. Response of elk to installation of oil wells. *J. Mamm.* 77(4):1028-1041; Johnson, B., and L. Wollrab. 1987. Response of elk to development of a natural gas field in western Wyoming 1979-1987, Wyoming Department of Game and Fish Report.

[20] Belnap, J. 1995. Surface disturbances: Their role in accelerating desertification. *Environmental Monitoring*.

[21] See, e.g., Gillin, C. 1989. Response of elk to seismograph exploration in the Wyoming Range. M.S. Thesis, University of Wyoming; Menkens, G.E., and S.H. Anderson. 1985. The effects of vibroseis on white-tailed prairie dog populations on the Laramie Plains of Wyoming. Report to the U.S. Bureau of Land Management, Interagency Agreement #WY910-IA2-1187.