



THE WILDERNESS SOCIETY

Drilling and Spilling on Alaska's North Slope

North Slope Oil Development: Air and Water Pollution, Spills, and Sprawl

Three decades of oil industry public relations have drilled away at one familiar theme that belies the reality on the ground: that drilling can be done in an “environmentally responsible” fashion. The reality is that the sprawling industrial infrastructure and pollution associated with drilling on the North Slope continue to have pervasive, lasting, and serious environmental consequences.

Sprawling Infrastructure

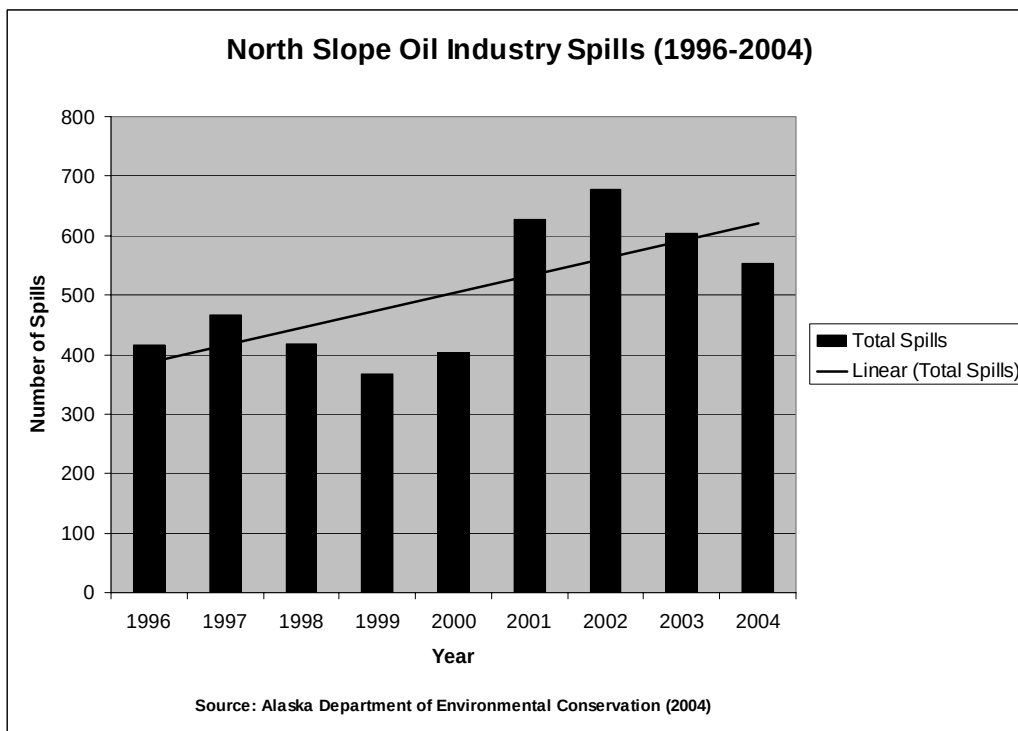
Prudhoe Bay and 26 other producing fields¹ sprawl across 1,000 square miles of Alaska's North Slope. There are more than 4,800 exploratory and production wells,² 223 production and exploratory drill pads,³ over 500 miles of roads,⁴ 1,800 miles of trunk and feeder pipes in over 600 miles of pipeline corridors,⁵ two refineries,⁶ 20 airports,⁷ 107 gravel pads for living quarters and other support facilities,⁸ five docks and gravel causeways,⁹ 36 gravel mines,¹⁰ and a total of 28 production plants, gas processing facilities, seawater treatment plants, and power plants.¹¹



Bullet Hole Spill: After a drunken hunter shot the Trans-Alaska Pipeline north of Fairbanks in October 2001, crude oil gushed out at 100 gallons per minute for 36 hours until 285,000 gallons had pooled in the boreal forest and Alyeska Pipeline Service Co. plugged the hole.¹²

More than a Spill a Day

The Prudhoe Bay oil fields and Trans-Alaska Pipeline have caused an average of 504 spills annually on the North Slope since 1996, according to the Alaska Department of Environmental Conservation (ADEC). Forty different toxic substances from acid to waste oil have been spilled during routine operations. There were 4,532 spills between 1996 and 2004 totaling more than 1.9 million gallons of toxic substances, most commonly diesel, crude oil, and hydraulic oil.¹³



Risks of Devastating Oil Spills

The effects of a major oil spill in coastal or marine waters could be devastating to waterfowl flocks in lagoons, ringed seals, bowhead whales, and polar bears due to the difficulty of cleaning up crude.¹⁴ According to the National Academy of Sciences, “No current cleanup methods remove more than a small fraction of oil spilled in marine waters, especially in the presence of broken ice.”¹⁵ Sixteen years since the Exxon Valdez oil spill, the devastating toll on fish, wildlife, and people continues. Most species of fish and wildlife injured by the oil spill have not fully recovered. Out of 28 species and resources studied, only 7 species or resources are considered to have recovered, according to the Exxon Valdez Trustee Council.¹⁶

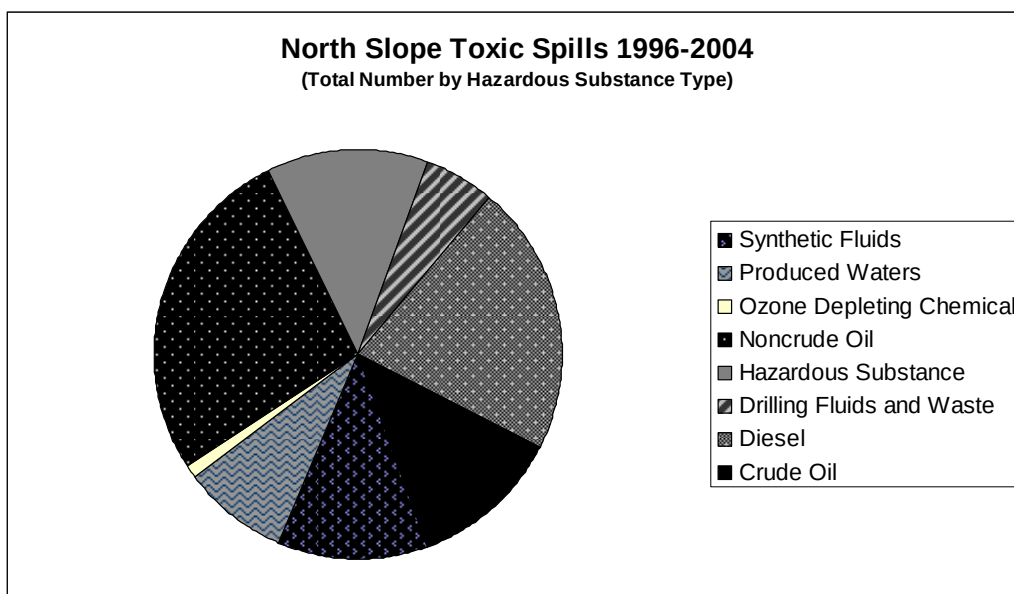
Effects of Pollution More Severe and Persistent in the Arctic

Recovery from spills in the Arctic is slower due to cold temperatures, the slower growth rates for plants, and the longer life spans of animals.¹⁷ Even localized, relatively small spills can have tragic consequences. While many spills do not spread beyond the gravel drilling pads, the sites themselves can become contaminated and pose long-term restoration problems.¹⁸ The ADEC lists over 100 sites of contamination caused by the North Slope oil industry.¹⁹

Toxic Spills in Tundra Wetlands and Lakes

A recent study observed that 177 spills of greater than 50 gallons to the tundra totaled 691,173 gallons associated with the oil and gas operations on the North Slope.²⁰ For example, in February 2001, BP discovered a ruptured pipeline at Prudhoe Bay and reported 9,400 gallons of crude oil and 2,100 gallons

of methanol had spilled. The oil company later revealed that they believed the spill occurred in early December 2000.²¹ Oil had spilled to wetlands and leaked through ice cracks to lake waters, which was a drinking water source.²² The Alaska Department of Environmental Conservation contended BP was liable for civil fines for the spill that it calculated at 60,000 gallons and for spill response mistakes.²³ In November 2002, BP settled with ADEC and agreed to pay \$675,000 for the agency's spill response and investigation costs.



More Air Pollution than Washington, DC

Prudhoe Bay air pollution emissions have been detected nearly 200 miles away in Barrow, Alaska.²⁴ The oil industry on Alaska's North Slope annually emits approximately 70,000 tons of nitrogen oxides, an important component of smog.²⁵ This is more than twice the amount emitted by the city of Washington, DC, according to the Environmental Protection Agency (EPA), and more pollution than many other U.S. cities produce.²⁶

Other pollutants include 1,470 tons of sulfur dioxide, 6,199 tons of particulate matter, 11,560 tons of carbon monoxide, and 2,647 tons of volatile organic compounds emitted annually, according to industry records submitted to the Alaska Department of Environmental Conservation.²⁷ North Slope oil facilities also release large quantities of greenhouse gases, including 24,000 metric tons of methane and 7.3 to 40 million metric tons of carbon dioxide annually.²⁸

Long Lasting Damage

When spilled, produced water, a byproduct of oil extraction, and seawater spilled from wells and pipelines kill vegetation with long-lasting damage to the tundra. Produced water typically contains crude oil and water-soluble contaminants, including carcinogens like benzene, naphthalene, toluene, and other aromatic hydrocarbons.²⁹ A tremendous amount of salty water courses through hundreds of miles of feeder pipelines in the oil fields. Seawater is pumped from the ocean to injection wells for water flooding, which is an enhanced method of oil recovery. At an ARCO Alaska Inc. spill in the Kuparuk oil field in 1982, all vegetation within 90 to 140 meters (11 acres) of the spill point was killed. Thaw depths were significantly greater in the brine-affected areas.³⁰

EXAMPLES OF RECENT ENVIRONMENTAL FINES AND PENALTIES

\$80,000 civil penalty. ConocoPhillips. March 2004. The Alaska Department of Environmental Conservation imposed an \$80,000 civil penalty for Clean Air Act violations at the Alpine oil field.³¹ High carbon monoxide emissions from turbines at the Central Processing Facility used to re-inject natural gas exceeded the air quality permit over a year-long period.

Criminal Probation. BP. December 2002. U.S. District Court found BP had not installed a leak detection system that could promptly detect Prudhoe Bay pipeline spills, and failed to comply with Alaska Department of Environmental Conservation requirements for best-available technology for crude oil pipelines.³²

\$130,000 penalty. Arctic Utilities Inc. and TDX North Slope Generating Inc. December 2002. ADEC penalty for Clean Air Act violations at Prudhoe Bay power plant. The company failed to obtain air quality permits for installing new emissions sources and constructing upgraded facilities for this major source of nitrogen oxides pollution.³³

\$675,000 civil assessments and costs. BP. November 2002. Fine for spill cleanup problems with 60,000 gallon Prudhoe Bay pipeline spill (\$300,000 waived by ADEC if spent on environmental project to increase using low-sulfur fuel use in school buses).³⁴ Crude oil spilled to wetlands and leaked through ice cracks to a drinking water lake.³⁵

\$22 million fines. BP. February 2000. The federal court ordered BP to pay \$6.5 million in civil penalties, \$15.5 million in criminal fines, and to implement a new environmental management program, and ordered five years of probation for late reporting of hazardous dumping down Endicott wells.³⁶

Conclusion

Oil drilling can have a devastating impact on the Arctic environment and the wildlife that live there. While oil companies have been trying to claim that they are able to drill for oil in an environmentally responsible way, sprawling infrastructure, pollution, and toxic spills continue to occur.

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¹ Alaska Department of Natural Resources. 2004. *Alaska Oil & Gas Report, December 2004*. Division of Oil and Gas. Table 3.2, pp. 3-35 to 3-36.

http://www.dog.dnr.state.ak.us/oil/products/publications/annual/2004_annual_report/complete_report.pdf

² Alaska Oil and Gas Conservation Commission. January 13, 2005. Pers. Comm. Howard Okland. AOGCC Well database (geographic areas: Arctic Foothills, Arctic Ocean, Arctic Slope, Beaufort Sea, Chukchi Sea).

Alaska Department of Natural Resources, Division of Oil and Gas, (27 additional offshore wells from well database, last updated in 2002) (<http://www.dog.dnr.state.ak.us/oil/products/data/wells/wells.htm>; www.well_lat_lon).

³ National Research Council. 2003. *Cumulative environmental effects of oil and gas activities on Alaska's North Slope*. National Academies Press, Washington DC. P. 44 (223 - includes onshore and offshore production and exploratory sites). Their analysis did not include NPRA.

- ⁴ National Research Council. 2003. *Cumulative environmental effects of oil and gas activities on Alaska's North Slope*. National Academies Press, Washington DC. P. 45, Fig. 4-9. 400 miles gravel roads and causeways. Does not include Dalton Highway.
170 miles Haul Road/ Dalton Highway on North Slope; does not include Spur roads to TAPS and Sag River. U.S. Bureau of Land Management. *Alpine Satellite Development Plan. Final Environmental Impact Statement*. Vol. 2. Table 4G.4.4-2.
- ⁵ National Research Council. 2003. *Cumulative environmental effects of oil and gas activities on Alaska's North Slope*. National Academies Press, Washington DC. P. 44.
- ⁶ State of Alaska, DNR, *Historical and Projected Oil and Gas Consumption*, (1999). Appendix B, p.51.
- ⁷ National Research Council. 2003. p. 44.
- ⁸ National Research Council. 2003. p. 44 (subtract 28 pads for production, etc. facilities Northwest NPRA FEIS Table IV-09, from total of 20 pads with processing facilities and 115 pads with other support facilities (power stations, camps, staging pads).
- ⁹ U.S. DOI, BLM. 2003. *Northwest National Petroleum Reserve-Alaska, Final Integrated Activity Plan/ Environmental Impact Statement*, Vol. 3, Table IV-09.
- ¹⁰ State of Alaska, DNR. May 30, 2001. North Slope material sale contracts pit information. Fairbanks.
U.S. Army Corps of Engineers. June 24, 1997. Colville River 17 permit (4-960869) to Nuiqsut Constructors {Alpine gravel pit}. U.S. Fish & Wildlife Service. 1987. P. 12.
U.S. Department of the Interior, Bureau of Land Management. November 2002. *Final environmental impact statement: Renewal of the Federal Grant for the Trans-Alaska Pipeline System Right-of-Way*. Vol. 2, Table 3.5-1; Vol. 7, Map Atlas pp. 1-6.
- ¹² U.S. DOI, BLM. 2003., *Northwest National Petroleum Reserve-Alaska, Final Integrated Activity Plan/ Environmental Impact Statement*, Vol. 3, Table IV-09.
- ¹² Alaska Department of Environmental Conservation, et al. February 8, 2002. *Joint After-action report for the TAPS bullet hole response (October 2001)*. http://www.state.ak.us/dec/spar/perp/taps_rpt.htm.
Fairbanks Daily News-Miner. October 4, 2002. Pipeline shooting: one year later.
- ¹³ Alaska Department of Environmental Conservation spill database 1996-2004.
ADEC Statewide oil spill data base for North Slope region (available from Camille Stephens). Village and Military DEWline spills removed for the analysis.
- ¹⁴ National Research Council. 2003. P.106; 123.
- ¹⁵ National Research Council. 2003. *Cumulative environmental effects of oil and gas activities on Alaska's North Slope*. Washington DC: National Academies Press. P.15.
- ¹⁶ ExxonValdez Oil Spill Trustees Council. 2004. *2004 Annual Report*. Anchorage. 20 pp. p. 6-7.
<http://www.evostc.state.ak.us/pdf/AnRpt04.pdf> (accessed 2/6/05); <http://www.evostc.state.ak.us/facts/status.html>.
- ¹⁷ Arctic Monitoring and Assessment Programme (AMAP). 1997. *Arctic Pollution Issues: A State of the Arctic Environment Report*. Oslo, Norway. P. 157.
- ¹⁸ National Research Council. 2003. P. 7.
- ¹⁹ Alaska Department of Environmental Conservation. January 15, 2003. Contaminated sites database. Available from Bill Petrick, Anchorage.
http://info.dec.state.ak.us/SPAR/CSP/Search/csites_search.asp. Downloaded 1-5-05. Selected for North Slope cities and areas "near" them, including Nuiqsut, Kaktovik, Deadhorse, Prudhoe Bay and Coldfoot; excluded non-oil industry sites, military and former defense sites, and village sites unless oil industry is responsible party. This includes 59 active and 41 inactive sites; there are also another 29 classified "no further remedial action" and 23 listed on the database that have been closed, for a total of 152 listed oil industry sites on the database.
- ²⁰ Behr-Andres, C.B., J.K. Weigers, S.D. Forester, and J.S. Conn. 2001. *Tundra spill cleanup and remediation tactics: A study of historic spills and literature*. AMEC Earth & Environmental and Alaska Department of Environmental Conservation. Fairbanks. P. 16.
- ²¹ ADEC. 2001. GCI flowline release sit rep #10. www.state.ak.us/local/akpages/ENV.CONSERV/dspar/perp/gciflow.
- ²² *Anchorage Daily News*. February 24, 2001. Prudhoe oil spill exceeds estimates.
- ²³ Bruce Botelho, Attorney General of the State of Alaska and Neil Mc Cleary, BP Exploration (Alaska) Inc., Operator of the Prudhoe Bay Unit. November 15, 2002. Settlement Agreement: Flowline 86-D Release.
- ²⁴ Jaffe, D.A. R.E. Honrath, D. Furness, T.J. Conway, E. Dlugokencky, and L.P. Steele. 1995. A determination of the CH₄, NO_x and CO₂ emissions from the Prudhoe Bay, Alaska Oil Development. *Journal of Atmospheric Chemistry* 20: 213-227.
Brooks, S.B., T.L. Crawford, and W.C. Oechel. 1997. Measurement of carbon dioxide emissions plumes from Prudhoe Bay, Alaska oil fields. *Journal of Atmospheric Chemistry* 27: 197-207.
- ²⁵ National Research Council. 2003. *Cumulative environmental effects of oil and gas activities on Alaska's North Slope*. National Academies Press, Washington DC. P.41.
- ²⁶ EPA. March 2000. *National Air Pollutant Emissions Trends: 1900-1998*. www.epa.gov/ttn/chief/trends98/emtrnd.html.
- ²⁷ U.S. Army Corps of Engineers. June 1999. *Final Environmental Impact Statement Beaufort Sea Oil and Gas development/Northstar Project*. Volume III, Table 5.4-7
- ²⁸ National Research Council. 2003. *Cumulative environmental effects of oil and gas activities on Alaska's North Slope*. National Academies Press, Washington DC. P.41.

Jaffe, D.A., R.E. Honrath, D. Furness, T.J. Conway, E. Dlugokencky, and L.P. Steele. 1995. A determination of the CH₄, NO_x, and CO₂ emissions from the Prudhoe Bay, Alaska oil development. *Journal of Atmospheric Chemistry* 20: 213-227.

Brooks, S.B., T.L. Crawford, and W.C. Oechel. 1997. Measurement of carbon dioxide emissions plumes from Prudhoe Bay, Alaska oil fields. *Journal of Atmospheric Chemistry* 27: 197-207.

²⁹ Wills, J. 2000. *Muddied waters: A survey of offshore oilfield drilling wastes and disposal techniques to reduce the ecological impact of sea dumping*. Ekologicheskaya Vahkta Sakhalina (Sakhalin Environment Watch). 139 pp.

³⁰ D.A. Walker. 1996. Disturbance and recovery of Arctic Alaskan vegetation. In: J.F. Reynolds and J.D. Tenhunen (eds). *Ecological Studies*, Vo. 120. pp. 35-71.

³¹ ConocoPhillips Alaska, Inc. and Alaska Department of Environmental Conservation. March 1, 2004. *Settlement Agreement on Alpine Central Processing Facility, Permit No. 0073-ACO60* issued January 31, 2001. 3 pp. Alaska Department of Law.

EPA. December 11, 2004 Enforcement & compliance history outline, Detailed facility report, ConocoPhillips Alaska- Alpine CPF. (CAA, AFS, Source IDs 0218500071; 0218500095; 021850095C). <http://www.epa.gov/cgi-bin/get1cReport.cgi?tool=echo&IDNumber=110010418645>. (accessed January 31, 2005).

³² U.S. District Court for the District of Alaska. December 23, 2002. James K. Singleton . Joint application for modification of conditions of probations with consent of the offender. Defendant BP Exploration (Alaska) Inc. Case No. A99-0141-01CR (JKS).

³³ EPA. December 11, 2005 Enforcement & compliance history outline, Detailed facility report, TDX North Slope Generating, Inc.-Deadhorse, CAA, AFS, Source ID 0218500069. <http://www.epa.gov/cgi-bin/get1cReport.cgi?tool=echo&IDNumber=110010418645>. Downloaded January 31, 2005.

Alaska Department of Environmental Conservation v. Arctic Utilities, Inc. and TDX North Slope Generating, Inc. December 23, 2004. Compliance Order by Consent #

³⁴ State of Alaska. November 14, 2002. *BPXA Flowline 86-D Settlement Agreement*.

³⁵ *Anchorage Daily News*. February 24, 2001. Prudhoe oil spill exceeds estimates.

³⁶ *Anchorage Daily News*. February 2, 2000. "BP settles for \$15.5 million."