

## BROKEN PROMISE #2

# The Oil Development Footprint



Roads, pipelines, air landing strips, and other infrastructure spreads across Alaska's industrialized North Slope.

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## The Promise

The oil development "footprint" is smaller than ever.

## The Reality

The full impact of oil development extends well beyond physical structures and its footprint is larger than ever.

For years, proponents of drilling in the Arctic National Wildlife Refuge have argued that the development "footprint" will impact only 2,000 acres. According to Sarah Palin, "this is like laying a 2-by-3-foot welcome mat on a basketball court."<sup>1</sup> In fact, oil development impacts are not limited to the area where drill pads and pipeline support beams touch the ground.

Alaska's North Slope industrial complex—a network of roads, pipelines, airstrips, and power lines—sprawls across 640,000 acres, fragmenting the landscape. The aggregate area and impact of this development simply cannot be measured by the physical structures alone. Although the size and number of drill pads required to extract oil may be getting smaller, the true development footprint, measured in the full scope of impacts, is getting larger.

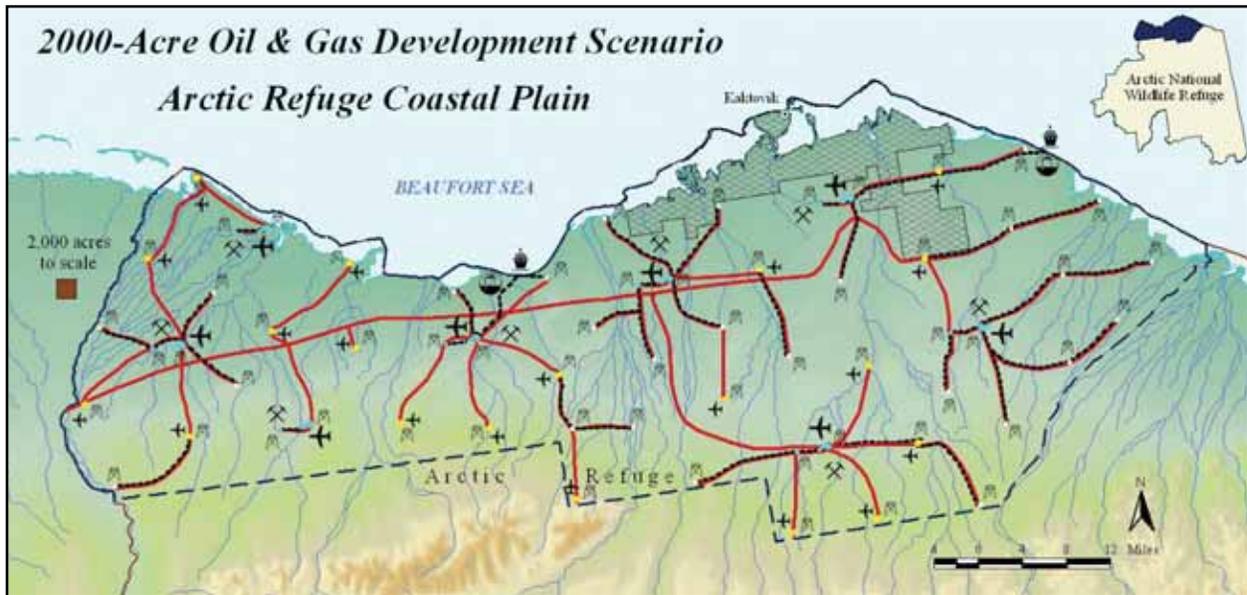
### Oil development's footprint spreads across the landscape

When oil is discovered, one or more production wells are drilled and permanent structures are built to support them. Eventually, development spreads like a web as wells are drilled to tap the full extent of the oil field, and roads and pipelines are built to connect the infrastructure and transport materials and services. According to the National Academy of Sciences, "the common practice of describing the effects of particular projects in terms of the area directly disturbed by roads, pads, pipelines, and other facilities ignores the spreading character of oil development on the North Slope and the consequences of this to wildland values over an area far exceeding the area directly affected."<sup>2</sup>

On Alaska's North Slope today there are 32<sup>3</sup> active oil fields spread across more than 1,000 square miles. Thousands of production wells have been drilled, and these are supported by a vast infrastructure of roads, pipelines and other facilities.

At Alpine, one of Arctic Alaska's newest onshore oil fields, industry initially claimed that directional drilling technology would enable development of this field with only two drill sites and 115 acres or less.<sup>4</sup> That promise was quickly replaced with the usual pattern of incremental sprawl seen elsewhere on the North Slope.

- ▷ The footprint of oil development spreads across the landscape.
- ▷ The footprint extends beyond drill pads and physical structures.
- ▷ The true footprint of oil development includes all of its direct and indirect impacts, as well as cumulative and long-term impacts.



Proponents of drilling the Arctic National Wildlife Refuge argue that development would be contained to a 2000-acre footprint. In reality, the aggregate footprint of drill pads, roads, and pipelines could sprawl across 1.5 million acres.

**“...the footprint that you put on the ground is a function of the geology of the reservoir that you discover. If that reservoir is spread out over 50 miles, obviously, your footprint is going to be spread out over 50 miles.”<sup>5</sup>**

Mr. Herrera (British Petroleum geologist)

In 2004 federal agencies approved industry plans to build five more drill sites connecting to the Alpine oil field. In total, Alpine plans now include seven drill sites, 33 miles of permanent gravel roads, two airstrips, two gravel mines, and 72 miles of pipeline covering some 570 acres.<sup>6</sup> To fully develop the oil field, the Bureau of Land Management projects the addition of 24 more production well pads, seven airports, 150 miles of pipeline, 122 miles of gravel roads, and another 1,262 acres of tundra covered by gravel fill or mines.<sup>7</sup>

### Oil development’s footprint extends beyond physical structures

Oil development’s footprint extends well beyond permanent physical structures such as drill pads and wells. On land industry’s imprint begins with seismic testing. The marks from heavy vehicles travelling across fragile tundra creates visible lines extending for miles.<sup>8</sup> Other mobile vehicles, including airplanes are also part of the footprint, contributing noise and air pollution beyond stationary structures.

Oil development activities can interfere with hydrologic processes and affect animal populations as much as a few miles from any physical structure.<sup>9</sup> The air pollution generated by stationary sources in Alaska’s North Slope oil fields and other emissions from Prudhoe Bay have been detected nearly 200 miles away in the village of Barrow.<sup>10</sup> Carbon dioxide emissions are contributing to climate change and ocean acidification at a global scale.<sup>11</sup>

Offshore, oil development’s footprint also extends far beyond any physical structures.<sup>12</sup> Exploratory drills can affect benthic communities for up to a mile.<sup>13</sup> Spilled oil can spread across hundreds of miles<sup>14</sup> and low frequency sonar can travel hundreds of miles through the ocean at considerable intensities.<sup>15</sup> Sound generated by seismic exploration, drilling, and marine vessel traffic can harm whales and other marine animals and drive them away from migration routes and feeding grounds.<sup>16</sup>

## The true development footprint

Figure 2.1 lists the physical structures associated with oil development on the North Slope, but these are just one small piece of the overall footprint of oil development. To fully account for oil development's footprint, one must also consider air and noise pollution, water extraction, oil spills and other toxic discharges, gravel pits, habitat fragmentation, and the numerous direct, indirect, and cumulative impacts to wildlife and human populations. These impacts are significant and only growing more so as development continues and expands.

**FIGURE 2.1: Oil development's footprint on the North Slope**

- ▼ **5,549** exploration and production wells<sup>17</sup>
- ▼ More than **390** gravel pads<sup>18</sup>
- ▼ More than **500** miles of roads<sup>19</sup>
- ▼ More than **600** miles of pipelines<sup>20</sup>
- ▼ **2** refineries<sup>21</sup>
- ▼ **20** airstrips<sup>22</sup>
- ▼ **6** docks and gravel causeways<sup>23</sup>
- ▼ More than **6,000** acres of gravel mines<sup>24</sup>
- ▼ **27** production plants and processing facilities<sup>25</sup>
- ▼ The **800** mile-long Trans Alaska Pipeline
- ▼ **219** miles of power transmission lines<sup>26</sup>

<sup>1</sup> Palin, Sarah. (2009, February 1). Sarah Palin: The case for drilling in ANWR. Minneapolis Star Tribune editorial.

<sup>2</sup> National Research Council. (2003). Cumulative environmental effects of oil and gas activities on Alaska's North Slope. Washington, DC: National Academies Press. p. 148.

<sup>3</sup> Minerals Management Service. (2008, November). Arctic Multiple-Sale Draft EIS. Beaufort and Chukchi Sea Planning Areas. MMS OCS EIS/EA 2008-0055. Table 3.1.1-1. Vol. IV. Appendix K-Tables.

<sup>4</sup> Anadarko Petroleum Corporation. (2000, November 16). Production begins from Alpine field on Alaska's North Slope. Press release. Retrieved August 19, 2009 from website: [www.anadarko.com/Investor/Pages/News Releases; Resource Review](http://www.anadarko.com/Investor/Pages/News_Releases; Resource_Review). (1998, June). State backs ARCO in lawsuit, Knowles says company "doing it right."

<sup>5</sup> U.S. Congress, House of Representatives, Committee on Merchant Marine and Fisheries, 102d Cong., 1st Session, Arctic National Wildlife Refuge, Part 1- Consideration of several proposals to authorize oil and gas leasing within the Arctic National Wildlife Refuge. May 1, June 11, and July 16, 1991. Serial No. 102-26, p. 39. Cited in: Trustees for Alaska. 1998. Under the influence: Oil and the industrialization of America's Arctic. p. 34.

<sup>6</sup> U.S. Bureau of Land Management. (2004, November). Alpine Satellite Development Plan Record of Decision. Website: <http://www.blm.gov/eis/AK/alpine/rod.pdf>.

<sup>7</sup> U.S. Bureau of Land Management. (2004, September). Alpine Satellite Development Plan Final Environmental Impact Statement. Vol. 1, Sec. 2. Alternative A-Full Field Development. Tables 2.4.1-6, 7, 8. pp. 69,71. Website: <http://www.blm.gov/eis/AK/alpine/dspfeisdoc.html>; Trustees for Alaska. (2007, June). Sectional Analysis, Stevens/Murkowski Arctic refuge drilling amendment to S.1419. p. 8.

<sup>8</sup> U.S. Fish and Wildlife Service. Seismic trails. Retrieved July 20, 2009 from Arctic National Wildlife Refuge website: <http://alaska.fws.gov/nwr/arctic/seismic.htm>. Jones, B., R. Rykhus, Z. Lu, C. Arp and D. Selkowitz. (2008). Radar imaging of winter seismic survey activity in the National Petroleum Reserve-Alaska. Polar Record 44 (230): 227-231.

<sup>9</sup> National Research Council. p. 5.

<sup>10</sup> Trustees for Alaska. Air pollution fact sheet. Retrieved July 24, 2009 from Trustees website: [http://138group.com/alaska/oil\\_in\\_the\\_arctic/FSAirPollution.htm](http://138group.com/alaska/oil_in_the_arctic/FSAirPollution.htm); Jaffe, D., R. Honrath, D. Furness, T. Conway, E. Dlugokencky, and L. Steele. (1995). A determination of the DH4, NOx and CO2 emissions from the Prudhoe Bay, Alaska oil development. Journal of Atmospheric Chemistry 20: 213-227.

<sup>11</sup> Caldeira, K. and M. Wickett. (2003). Anthropogenic carbon and ocean pH. Nature, 425: 365, p. 365.

<sup>12</sup> National Research Council. P.5.

<sup>13</sup> Currie, D.R. and L. Isaacs. 2005. Impact of exploratory offshore drilling on benthic communities in the Minerva gas field, Port Campbell, Australia. Marine Environmental Research. 59:3, 217-233.

<sup>14</sup> The Exxon Valdez oil spill produced an oil slick that stretched across 460 miles. Source: World Wildlife Fund. (2009). Lessons not learned: 20 years after the Exxon Valdez disaster little has changed in how we respond to oil spills in the Arctic. WWF-US, Kamchatka/Bering Sea Ecoregion, Anchorage, Alaska.

<sup>15</sup> Marine Connection. Effects of sonar. Retrieved July 21, 2009 from website: [www.marineconnection.org/campaigns/sonar\\_sonar.html](http://www.marineconnection.org/campaigns/sonar_sonar.html).

<sup>16</sup> Siebert, Charles. (2009, July 12). Watching whales watching us. The New York Times; Schick, R., and D. Urban. (2000). Spatial components of bowhead whale distribution in the Alaskan Beaufort sea. 57 Can. J. Fisheries and Aquatic Sci. 2193.

<sup>17</sup> Alaska Oil and Gas Conservation Commission. 2009. <http://www.state.ak.us/local/akpages/ADMIN/ogc/publicdb.shtml>; Alaska Department of Natural Resources. 2009. <http://www.dog.dnr.state.ak.us/oil/products/data/wells/wells.htm>; Well data compiled by Doug Tosa, Alaska Center for the Environment. July 2009.

<sup>18</sup> National Research Council, Table 4-2. p. 43.

<sup>19</sup> BLM. (2004, September) Alpine Satellite Development Plan Final EIS. Vol. 2, Table 4G.4.4-2, p. 1246.

<sup>20</sup> National Research Council. P. 43.

<sup>21</sup> State of Alaska, Department of Natural Resources, Historical and Projected Oil and Gas Consumption, (1999). Appendix B, p.51.

<sup>22</sup> BLM. (2004, September). Alpine Satellite Development Plan Final EIS. Table 4G.4.4-2.

<sup>23</sup> U.S. Bureau of Land Management. (2003). Northwest National Petroleum Reserve-Alaska, Final Integrated Activity Plan/Environmental Impact Statement. Vol. 3. Table IV-09. Pp. 100-101.

<sup>24</sup> National Research Council. (2003). Table 4.4. p. 44.

<sup>25</sup> BLM. 2003. Northwest NPR-A, Final Integrated Activity Plan/EIS. Vol. 3. Table IV-09. Pp. 100-101.

<sup>26</sup> National Research Council. (2003). P. 44.