Committee on Resources

Witness Statement

Committee on Resources
U. S. House of Representatives
Oversight Hearing on
"Compromising our national security by restricting domestic exploration and development of our oil and gas resources"

Written Remarks by
Joseph H. Hegna, ARCO Alaska Inc.
Before the
Committee on Resources
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Good morning Chairman Young and members of the committee. For the record, I am Joe Hegna from ARCO Alaska, Inc. I have spent over 20 years working in the oil industry -- designing, building, and operating facilities. For the last 12 years I have been involved with various environmental management functions.

I welcome the opportunity to testify before this committee on "compromising our national security by restricting domestic exploration and development of our oil and gas resources." The focus of my testimony will be on the use of new technology to minimize environmental impacts for arctic oil and gas development. In Alaska, we call this "doing it right".

Before we get into a discussion of "doing it right" using new technology, I would like to put things into perspective by describing the North Slope of Alaska. The North Slope is a flat treeless plain, or tundra, which covers 88,000 square miles, an area slightly larger than the state of Idaho. It stretches from the Canadian border to the Chukchi Sea. It is 600 miles north of Anchorage, and about 1200 miles south of the North Pole. Winter temperatures are typically minus 30 to minus 40 degrees Fahrenheit with 30 to 40 mile per hour winds. Summers are generally a balmy 40 degrees.

Prudhoe Bay, the largest oil field in North America, was discovered in 1968 and went into production in 1977. Currently, there are 12 separate oil producing fields. These fields occupy less than 2% of the total surface area. Since Prudhoe first went into production, over 12 billion barrels of oil have been produced on the North Slope. These are some of the best facilities in the world - in design and operation. I think they are

the "best of the best".

Extensive research indicates that oil field activities have had no adverse effect on the North Slope's fish and wildlife populations. For example, the caribou move freely through the oil fields and have generally been unaffected by our facilities. In fact, the number of caribou in the Prudhoe Bay area has grown from 3,000 in 1972 to about 20,000 today.

Air quality is consistently better than required by state and national standards. Emission sources are closely regulated by state and federal agencies. The largest quantity of air emissions from North Slope oil operations comes from turbines that power production facilities. These turbines are fired by natural gas, one of the cleanest burning fuels available.

All North Slope operators have a goal of zero spills. In operating these complex fields, however, some spills will occur. Most are from a pint to 10 gallons. And the vast majority of spills never reach the tundra or surface water because they are contained on the gravel pads on which the facilities are constructed, where they are easily cleaned up. All spills, no matter how small, are reported and cleaned up immediately.

These existing facilities are very well designed and operated. Operating excellence, with regard to the environment, has been recognized by others including recently the Environmental Protection Agency (EPA) and the Interstate Oil and Gas Compact Commission (IOGCC). In 1999, the EPA's Region 10 gave Kuparuk its "Evergreen Award" for pollution prevention. In 2000, the IOGCC gave Kuparuk the Stewardship Award for large oil and gas facilities.

Let's look at how new technologies and new approaches are making it possible to find, develop and produce new fields with even less impact on the environment. In the arctic, we can now explore for oil without leaving a footprint on the land. And when we do find new fields, we're able to develop them in ways that have even less impact on the land and the fish and wildlife that inhabit it.

The acquisition of 3-D seismic data is a key step in the exploration process. It's how we identify and map the prospects we're interested in. Onshore seismic acquisition on the North Slope occurs only during the winter after the federal, state and local governments issue permits authorizing tundra travel. Tundra travel doesn't begin until the tundra is frozen and there is six inches of snow cover. We use specialized low-impact tundra travel vehicles which weigh more than 10 tons. However, the tracks are long and wide, spreading the pressure over a large area . . . protecting the tundra from damage.

Onshore exploration is conducted only in the winter. We use ice roads to move drilling rigs, camps, men and material to remote locations. We build ice roads with water from lakes chosen with the assistance of the Alaska Department of Fish and Game. The volume taken from each lake is determined based on water depth and whether a lake contains fish. Ice roads are generally six inches thick.

It's not unusual for us to build 60 to 70 miles of ice road a year to support remote drilling operations. In the spring, these ice roads simply melt away.

The best illustration of how we are "doing it right" is by a real example. I have brought a brochure on the Alpine Field - "Setting The Standard For The New Millenium". On the cover is a drilling rig.

A drilling rig weighs several million pounds and is moved to its location via ice road. The rig is set on an ice pad more than 12 inches thick. When drilling operations are complete, the rig and support facilities are

removed, and all drilling wastes are transported to existing facilities for disposal or injected back downhole. The final step is to take a front end loader and shave the ice pad down to pure ice. Scraped material is hauled out and disposed of in approved facilities. Pads melt, leaving no trace.

On the inside page is a photograph of an exploratory well at Alpine taken the summer after it was drilled. Six months before this picture was taken, a 160-foot tall, 3 million pound drilling rig stood on an ice pad where the well was drilled to an 8,000 foot depth. Prior to drilling we acquired seismic data over this entire area. You can see how much impact we've had.

The only visible sign of our presence is the well tree. And this remains on location because we are developing the field and will one day produce from this well. If the well had been unsuccessful, we'd have plugged and abandoned it below grade, leaving virtually no trace.

The thing that's amazing about ice-pad technology is that the vegetation adjacent to this well is completely undisturbed. We can explore without leaving visible footprints.

Producing oil requires infrastructure and a permanent presence for the life of a field. Our goal is to design, build and operate fields in a way that minimizes impact on the land, the water, the air and on the fish and wildlife that use a given area. To see how, let's look at the Alpine field which is now being developed and which will begin production in 2000.

The first step is understanding the environment. We began environmental studies of the Colville area in 1991, three years before we discovered the Alpine field.

We mapped 24 different habitat classifications that were developed with the assistance of the US Fish and Wildlife Service and the Alaska Department of Fish and Game. Baseline studies were designed with the help of these and other resource agencies. We used satellite infra-red photography, ground-truthed by summer field parties to develop the map. We did regional study first, then focused on the Alpine project area when the discovery was made. Different kinds of habitat are important to different kinds of wildlife. Some kinds of habitat are scarce, others are not. To avoid major impacts, you have to know where the high value and low value areas are.

Nuiqsut residents, who use this area for subsistence hunting and fishing, also played a role in this process. We used their input, agency input and this data to locate our facilities in areas where they would allow development of the field and minimize impact. At Alpine, for example, we moved a drill site away from a lake important to waterfowl and subsistence hunters.

Extended reach drilling allows us to drain oil from a very large area from a single location. At the Niakuk field near Prudhoe Bay, where ARCO and BP have developed two offshore oil accumulations from a single, onshore drill site, we've done it by drilling wells with departures of more than 20,000 feet -- or four miles. Our drilling targets are 9,000 feet deep and four miles away from our drilling rigs.

To illustrate what this means, I had our engineering department prepare a drilling scenario for Washington, D.C. With today's technology, and a 21,000 foot step out well, we could build a drill site on the front lawn of the White House and produce oil from beneath most of Washington and a big piece of Arlington, Virginia. The world-record step out well is longer than 28,000 feet--or 6 miles. With wells of that length you could produce from beneath the entire District of Columbia, all of Arlington, Alexandria, and a big piece of the Maryland suburbs too.

The evolution of production pads -- or drill sites -- on the North Slope is a classic example of how we have done it right. A drill site is a central location from which we drill and operate as many as 50 wells. In the early days, they were generally 65 acres in size. Wells were spaced 120 feet apart, and the pads included large reserve pits for storage of drilling wastes. Today wells are 15 feet apart and we've eliminated the reserve pits. At Tarn, we have space for 50 wells on a 6.7 acre pad. Pads today are one-tenth the size that they used to be.

Traditionally, drilling muds and cuttings have been placed in surface waste disposal impoundments known as "reserve pits". Today, using grind and inject technology, cuttings are crushed and slurried with seawater in a ball mill, then combined with the remaining drilling muds and reinjected into a confining formation 3,000 to 4,000 feet underground. This permanent and environmentally sound disposal method isolates the wastes, eliminates subsequent disposal problems and greatly reduces the spaced required for drilling operations.

The Alpine pipeline river crossing is the first of its kind completed in the arctic. We proved the technology, by installing 18" steel pipe in a 4,200 foot bored hole from one side of the river to the other. The pipe passes 100 feet below the river.

A cased oil pipeline was then installed within the 18" steel pipe. In short, we will have a pipeline within a pipeline. This design ensures instant containment in the unlikely event of a small leak. A state of the art leak detection system will also let us know if we have a problem.

The Alpine field will be produced from just two drill sites, three miles apart. Pads will be joined by a gravel road that will also serve as an airstrip. Surface impact -- gravel footprint -- will comprise about 97 acres. From this small footprint we will be able to access the Alpine reservoir, which encompasses some 40,000 acres--more than ten miles long and four miles wide. Less than 0.2 percent of the field will be impacted - that's less than one-tenth the percentage at Prudhoe. Construction is occurring during the winter, using ice roads. The construction will not disturb wildlife.

The Alpine field will not be connected by a permanent gravel road to existing infrastructure on the north slope. The operation will be much like that of an offshore platform. Drilling supplies and major equipment will be transported in winter using ice roads. Food and personnel will be transported by air, and the number and frequency of flights will be limited for a six week period in June and early July to minimize disturbance of nesting waterfowl.

Our goal is to minimize our impact on the environment and operate oil fields that are sanctuaries for healthy populations of fish, waterfowl, and wildlife. Thousands of caribou still return to our fields to calve and rear their young. The herd is six times larger than it was in the early 70's. Our waterfowl populations are healthy. We have turned our gravel mines into deep lakes that provide crucial winter habitat for fish--a rare commodity because most of the lakes on the North Slope freeze from top to bottom in winter. We've learned a lot over the years. We can explore without leaving footprints. And the footprint required for new developments is a tenth of what it once was.

Alpine - with its new technology -- shows you what we mean by "Doing It Right."

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