

ARCTIC OIL AND GAS



1



Panarctic well, Axel Heiberg Island, Nunavut

G. Nowlan, NRCan

History

Geologists have long believed that the north has potential for petroleum discoveries. By the 1950s, increasing exploration and study by the oil and gas industry and the Geological Survey of Canada showed this potential, as did exploratory drilling. Three major events spurred exploration to the next level. In 1967, a partnership between government and industry resulted in the formation of Panarctic Oils Ltd., and a year later, a huge oil field was discovered on Alaska's north slope, at Prudhoe Bay. A politically engineered oil shortage in 1973 was an additional reason to find North American sources of petroleum.

Between 1969, when Panarctic discovered the Drake Point gas field on Melville Island, and the late 1980s, when activity declined, more than 400 wells were drilled. Eighteen petroleum fields had been discovered in the Arctic Islands and 47 in the Beaufort-Mackenzie area. But the costs of developing the fields and getting the oil and gas to market were huge, and low oil prices meant that, for the time being, the discoveries just weren't economic.

Today it's a different story. High oil and gas prices, and the promise of new pipeline systems that will make delivering the resources easier have reawakened interest in the North's vast oil and gas potential.

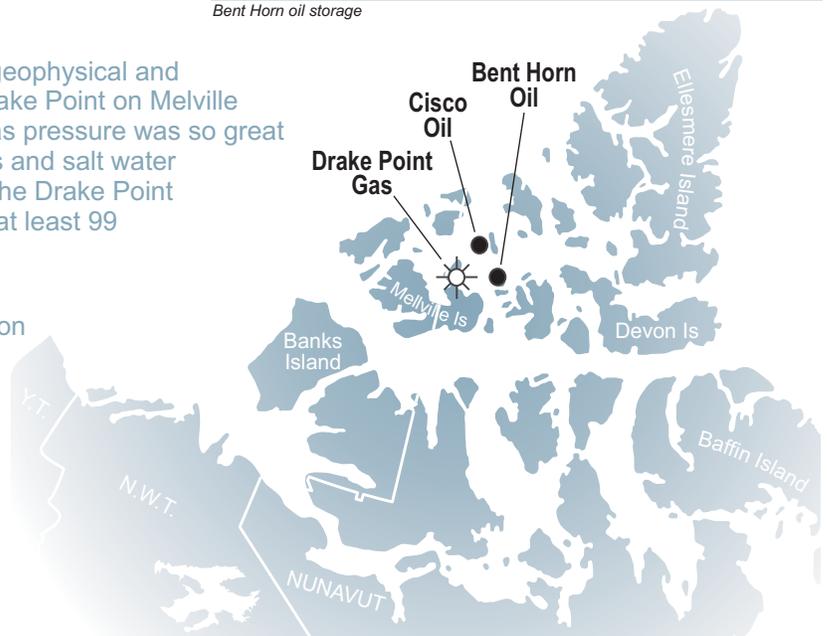


Bent Horn oil storage

© Fednav Ltd., with permission

Drake Point Gas: In 1969, after extensive geophysical and geological fieldwork, a well was drilled at Drake Point on Melville Island. It struck gas in sandstone, but the gas pressure was so great the well blew out of control. The blowing gas and salt water created a spectacular ice cone 61 m high! The Drake Point field is the largest in the Arctic Islands, with at least 99 billion cubic metres of gas.

Bent Horn Oil: Early in 1974 Panarctic discovered the Bent Horn oil field on Cameron Island. The oil lies in ancient reef rocks, more than 3 km below surface! In 1985 the first shipment of 100,000 barrels was made by an ice-breaking tanker to a refinery in Montreal. These shipments continued until the late 1990s. The Bent Horn field is small – 12 million barrels of oil – compared to the largest yet found, Cisco, near Loughheed Island, which has an estimated 584 million barrels of oil.



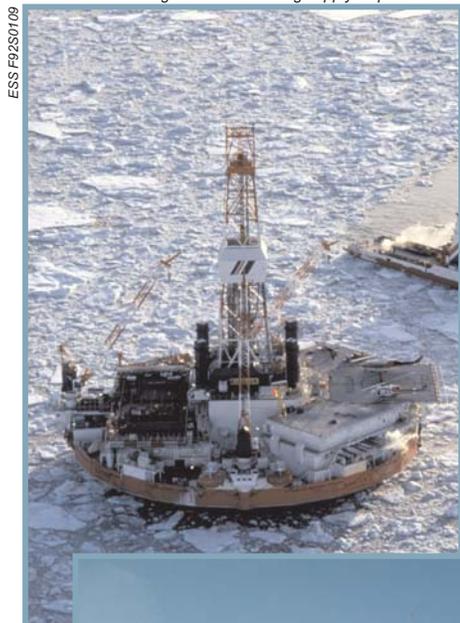
ARCTIC OIL AND GAS



Technology – Making it Work

Developing oil and gas reserves in the Arctic calls for innovations not needed farther south. Drilling on land in winter's cold and darkness is often challenging, but drilling offshore is even more so. Artificial islands of silt or ice were built to allow drilling in shallow water, and in medium-depth water, steel and concrete platforms called caissons were used. A major breakthrough was the converted tanker SSDC (Single Steel Drilling Caisson), which sat on a steel platform that could be moved, allowing year-round drilling and oil storage. Drilling in deeper water required ice-strengthened drill ships, including a revolutionary, eight-sided vessel, the M.V. *Kulluk*. Other innovations were airstrips built of thickened ice, new icebreaker designs, ice-breaking supply boats, and floating drydocks for servicing the other ships on site.

M.V. *Kulluk* drill barge with ice-breaking supply ship



ESS F9250709

SSDC drill ship and platform



© EnCana Corporation



M.V. *Arctic*, ice-breaking tanker and cargo ship in Admiralty Inlet, 1986

© Fednav Ltd., with permission



U.S.S. *Manhattan*, ice-breaking tanker, 1969

ESS 2003-469

Transportation – A Big Problem

Right from the start, people realized that getting the oil and natural gas to markets in the south would be a big problem. The climate and geography are challenging, to say the least, and there are major concerns about the environment, wildlife, and the local people. Experience from the 1960s to the 1980s proved that ice-breaking oil tankers could work in the Arctic, although at the time perhaps not economically. As an alternative to ships, the Polar Gas Pipeline Project saw several routes proposed for pipelines from the islands, across the Northwest Territories and Nunavut, to markets in the south. Today, pipelines are again being proposed for transporting this gas.