



## Shipping for Resource Projects in Canada's High Arctic in the 1980s

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The purpose of this article is to show that resource projects and commercial activity were underway years ago in Canada's High Arctic and all relied on some form of shipping to carry products to southern markets. In other words, the concept of shipping goods in the Arctic Ocean is not new. This article will illustrate the number of resource projects which relied on shipping their products by vessels in the High Arctic in the 1980s. Some of these projects were either proposed or already in operation during this busy period. Indeed, as noted by Adam Lajeunesse:

By the end of the 1970's, the Canadian government was still predicting a massive influx of vessels to service the expected boom in the hydrocarbon and mining industries. The economic and regulatory environment of the time certainly seemed to provide fertile ground for this boom. Government tax incentives were flowing to regional projects, estimates of hydrocarbon reserves across the Canadian North were increasing, and oil was trading for eleven times more in 1980 than ten years earlier.<sup>1</sup>

At this time, companies began exploring in the Canadian Arctic archipelago and the Beaufort Sea and spending millions of dollars on drilling rigs, infrastructure and shipping for oil, gas and minerals. It was an exciting and active time in the region as these various projects advanced in their respective plans to move the various hydrocarbon projects to fruition to markets domestically or internationally by ships. A Canadian company, Fednav, even built a ship (*MV Arctic*) to counter

the harsh climatic conditions to get their products out of their various sites via the Northwest Passage.

### **Polaris Mine, Nunavut**

Little Cornwallis Island in Canada's Arctic held a rich deposit of lead and zinc and Cominco Ltd, the company in control of it, wanted to know how to ship up to 300,000 tons of concentrate a year from its mine. The mine itself was located 1,120 kilometres north of the Arctic Circle, and 96 kilometres north of the community of Resolute in Nunavut, and eventually opened in 1981. It became the most northerly base metal mine in the world.<sup>2</sup>

Cominco acquired land in the area and a gravity survey in 1970 detected a large anomaly. By 1973 drilling and underground development outlined an ore body of 25 million tons with grading approximately 14% zinc and 4% lead. A mining facility was constructed on a barge at Trois-Riviere and towed to the island in 1981.<sup>3</sup> Fednav, the Montreal-based shipping company became in charge of planning how to ship the ore out to market. It also helped Cominco import the necessary equipment to construct and operate the plant. Part of Fednav's plans was to construct the world's first ice-breaking bulk carrier, *MV Arctic*, which was able to operate in these northern waters from July to October.<sup>4</sup> Built in 1978, it had a beam of 23 metres, a length of 97 metres.<sup>5</sup> The ship was considered a Canadian Polar Class (PC-4) multi-purpose cargo vessel.

A mile-long gravel runway was also constructed at the site allowing jets to service the mine year-round. In August 2002 the mine was closed due to the depletion of the ore body. A two-year, 53 million decommissioning and reclamation program was completed at the mine site in 2004.<sup>6</sup>

### **Nanisivik Mine, Nunavut**

Nanisivik Mine was a zinc-lead mine 750 kilometres north of the Arctic Circle on Baffin Island. It was Canada's first mine in the Arctic, opening on 15 October 1976. Mineral Resources International of Calgary had 54% ownership of Nanisivik Mines Limited, with Strathcona Mineral Services Limited as the production manager.<sup>7</sup>

The mine operated year-round accumulating the ore during the winter and then shipping it out to European markets from July until November. *MV Arctic*, owned by Fednav, also serviced Nanisivik Mines as well as Polaris Mines. The annual production totalled 125,000 tons of ore, which was sold to European smelters through Belgium.

Conwest Exploration Company Ltd eventually acquired the mine before it was closed in 2002.<sup>8</sup> In 2007 it was announced by the Stephen Harper government that the existing port at the mine site would be converted into a deepwater facility for the Royal Canadian Navy (RCN) at a cost of 60 million dollars, in "an effort to maintain a Canadian presence in Arctic waters."<sup>9</sup> In July 2020 it was confirmed that the station would not be operational until 2022.

### **Panarctic Oil, Nunavut**

Panarctic Oils Ltd was an industry/government consortium formed in 1968 established to explore for oil and gas in the Canadian Arctic archipelago.<sup>10</sup> The company drilled 150 wells over a large area from Ellesmere Island in the north to Prince of Wales Island to the south. Oil was discovered in 1974 at Bent Horn (N-72) on Cameron Island in the High Arctic. The federal government in

1976 transferred its stake to Petro Canada which eventually attained a stake in the company of 53%.

In 1985, Bent Horn became Nunavut's only commercial oil field on an experimental scale.<sup>11</sup> It began with a single 100,000 bbl tanker load of oil via MV *Arctic* to Montreal. The ship carried two shipments per year until the operation ceased in 1996. During its production from 1985 until 1996 Bent Horn produced a total of 2.8 million barrels.<sup>12</sup>

### **Canadian Marine Drilling (CANMAR), Northwest Territories**

Built by Saint John Shipbuilding and Dry Dock Company (CANMAR) in 1979, *Canmar Kigoriak* was the first commercial icebreaking vessel developed to support offshore oil exploration in the Beaufort Sea. The owner of the vessel was Dome Petroleum Ltd out of Calgary. It was built at a cost of 25 million dollars and was later sold to Russia in 1997.<sup>13</sup>

In exploring for oil in the Beaufort Sea, Dome used *Kigoriak* to move two Single Steel Drilling Caissons (SSDCs) to various drilling sites in the ocean. Dome intended to move crude oil through the Northwest Passage to the Atlantic but was unable to continue because of financial problems. The company was purchased by AMOCO in 1988.

### **The Arctic Pilot Project (APP), Nunavut**

In 1972, the Polar Gas Project was established to determine the best means of moving frontier natural gas reserves from Canada's High Arctic to southern waters.<sup>14</sup> TransCanada Pipelines acted as the project manager of the consortium. The plan was to determine the present and future gas reserves and the best routing for a pipeline to transport the gas down to southern markets.

In the late 1970s, a consortium of companies led by Petro-Canada, established a team to conduct engineering studies, cost estimates as well as environmental and socio-economic impact assessments for a 'pilot project' called the Arctic Pilot Project (APP).<sup>15</sup> The project was deemed to be a 'pilot' because it was designed at the minimum scale to prove the technical and economical feasibility of delivering natural gas found in the Arctic by ship. It was perceived to be one-tenth the size of any full-scale alternative for the delivery of Arctic gas. The project was the first proposal to seek government approval for year-round shipping in the Arctic.

The APP proposal was to bring gas from the Drake Point gas field on the northern Sabine Peninsula on Melville Island 160 kilometres south to the liquefied natural gas (LNG) facilities at Bridport Inlet. Panarctic Oils Ltd would own and operate the eight producing wells, the gathering system and gas processing facilities to produce the 50 billion m<sup>3</sup> of gas required for the expected 20-year life of the project. The pipeline was to be managed by Nova Corporation, a Canadian energy company based in Calgary.

Bridport Inlet, on the southern coast of Melville Island is where the natural gas was to be liquefied and stored before being loaded on to the ships for markets to the south. The two ships would operate year-round between Bridport Inlet and terminals located in southern Canada.

The proposed design of the two ships by Dome Petroleum and Melville Shipping were unique in that they were to be the world's first LNG ships with icebreaking capability. The ships were designed to have double hulls, a length of 375 metres, a beam of 42 metres and a draft of 11.5 metres in open water. The proposed propulsion system was gas turbines with a shaft horsepower of 134 MW per vessel.

It was anticipated that transit east would be through Lancaster Sound and then south to Davis Strait and then to southern markets, approximately 5,200 kilometres. Each ship would have two crews of 42 men who would alternate voyages. Return voyages were estimated to take 33 days in winter and 16 days in summer.<sup>16</sup> APP recommended to the regulators, the Environmental Assessment Panel and the National Energy Board (NEB), two possible terminal sites in Eastern Canada: Gros Cacouna in the Province of Quebec; or the Strait of Canso in Nova Scotia. TransCanada Pipelines would be responsible for constructing the dock, storage tanks and the revapourization equipment. It was planned that each ship would unload their liquid cargo into to 100,000 m<sup>3</sup> storage tanks. The gas would then be distributed to southern markets by conventional pipelines.

In June 1980, an agreement was reached between APP and four companies in the United States to purchase the gas over a 15-year period. APP estimated that the project would be completed by mid-1985. Unfortunately, the market for this gas dried up in the United States and the project was abandoned shortly thereafter, with no report published by the NEB.

From a regulatory perspective, the Department of the Environment created an Environmental Assessment and Review Process (EARP) in 1980 and in November of that year concluded in its report that the project was acceptable provided certain conditions were met. In 1981 the National Energy Board scheduled public hearings in the north and in Ottawa. Before the NEB filed its report, the APP was discontinued for economic reasons, as described above.

## Conclusion

As this article has illustrated, there were a number of interesting projects in the High Arctic in the 1980s. As well, specific ships were envisioned to service the projects in the north. In some of these projects, MV *Arctic* was built for the sole purpose of transporting ore and oil from various remote sites in Nunavut. And in the Beaufort Sea, Dome Petroleum Ltd. was a leader in utilizing *Kigoriak* to transport heavy equipment to various facilities to assist the company exploring for oil and gas in the early 1980s.

Led by Petro-Canada, one of the interesting proposed projects before hearings of the National Energy Board was the Arctic Pilot Project. As noted, the plan was to build huge ice-breaking LNG tankers to transport Arctic gas from Melville Island to markets on the eastern seaboard. This plan did not come to fruition, but years ago, these undertakings demonstrated the feasibility of commercial shipping in the Arctic Ocean. A number of Canadian resource companies were at the forefront of recognizing that ships were a viable means to moving their products via the Northwest Passage.

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## Notes

<sup>1</sup> Adam Lajeunesse, *Lock, Stock and Icebergs: A History of Canada's Arctic Maritime Sovereignty* (Vancouver: UBC Press, 2016), p. 243.

<sup>2</sup> Mine Site News, "Remembering the Polaris Mine," *The Canadian Mining Journal*, October 2002.

<sup>3</sup> En.n.wikipedia.org

<sup>4</sup> Fred Langan, "Shipping innovator Michael Bell found creative solutions for age-old problems," *The Globe & Mail*, 15 June 2020.

<sup>5</sup> En.m.wikipedia.org "MV Arctic".

<sup>6</sup> The mine was now owned by Teck Resources Limited instead of Cominco.

<sup>7</sup> R. Gait and C. Robinson, "Minerals of the Nanisivik Mine," Vol. 21, No. 6 (Nov-Dec 1990).

<sup>8</sup> *Ibid.*

<sup>9</sup> CBC News, "Planned army base, port in North head up Arctic quest," 8 August 2007.

<sup>10</sup> D.M. Masterson, "The Arctic Islands Adventure and Panarctic Oils Ltd," *Cold Regions Science and Technology*, Vol. 85 (2013), pp. 1-14.

<sup>11</sup> Wikimapis.org. Bent Horn Oil Field.

<sup>12</sup> www.aandc.gc.ca.eng.

<sup>13</sup> En.m.wikipedia.org.

<sup>14</sup> O.M. Kaustinen, "A polar gas pipeline for the Canadian Arctic," *Cold Regions Science and Technology*, Vol. 7 (1983), pp. 217-226.

<sup>15</sup> Evidence material provided by APP at the NEB hearings to intervenors (NWT Government – Department of Justice) in 1981.

<sup>16</sup> It is interesting to note that one of the intervenors to the NEB hearings, General Dynamics, proposed building a large nuclear-powered submarine to transport the LNG to southern markets.