

NORTHERN PIPELINE AGENCY
ANNUAL REPORT
1978-1979



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COVER—View of Kluane Ranges from Alaska Highway

December 31, 1979.

Dear Sir:

I have the honour to present the Annual Report of the Northern Pipeline Agency for the fiscal year ending on March 31, 1979, together with the report of the Auditor General on the accounts and financial transactions of the Agency for the same period, for submission by you to Parliament as provided for under Section 13 of the Northern Pipeline Act.

Yours sincerely,

A handwritten signature in black ink, reading "Mitchell Sharp". The signature is written in a cursive, flowing style.

Mitchell Sharp,
Commissioner,
Northern Pipeline Agency.

The Honourable Robert R. de Cotret, P.C.,
Minister responsible for the
Northern Pipeline Agency,
Ottawa, Ontario.

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ALASKA HIGHWAY NATURAL GAS PIPELINE PROJECT



The Founding of the Northern Pipeline Agency

The Northern Pipeline Agency was established with the proclamation of the Northern Pipeline Act on April 13, 1978, for the purpose of overseeing the planning and construction of the Canadian portion of the Alaska Highway gas pipeline to provide access to the substantial Arctic natural gas reserves of both Canada and the United States.

In addition to creating the Agency, the Act provides the legislative authority required to implement the bilateral agreement between the two nations of September 20, 1977, which governs the joint undertaking of the 9,000-kilometer (5,500-mile) system. A brief description of this system can be found in Appendix B.

The Agency was created as the principal instrument for carrying out the objects of the legislation approved by Parliament. The Agency's mandate is twofold. It is required to facilitate the efficient and expeditious planning, construction and initial operation of the system in Canada by Foothills Pipe Lines (Yukon) Ltd. and five of its subsidiary companies. It is also required to ensure that the project is carried forward in a way that will yield the maximum economic energy and industrial benefits for Canadians with the least possible social and environmental disruption. In particular, the Agency is directed by the Act to take account of the local and regional interests of residents, especially native residents, in areas affected by the undertaking.

In an unprecedented step, the House of Commons in April, 1978, agreed to the establishment of a Standing Committee on Northern Pipelines to maintain continuing surveillance over the implementation of the Northern Pipeline Act and the operations of the Northern Pipeline Agency. The Committee conducted several meetings following its formation in June of that same year to hear testimony from senior officers of the Agency and of

the Canadian and United States project companies, as well as others.

In October, 1978, the Senate also adopted a motion for the establishment of a Special Committee on the Northern Pipeline with authority to "inquire into all matters relating to the planning and construction of the pipeline for the transmission of natural gas from Alaska and Northern Canada ...". The Senate Committee subsequently held a number of hearings related to the project during the course of the year.

The Northern Pipeline Agency was established to provide a 'single window' for the conduct of virtually all dealings at the federal level with the Foothills group of companies which was authorized under the Act to undertake the project in Canada. In keeping with the provisions of the legislation, it is anticipated that many of the regulatory powers of other federal departments and agencies relating to the planning, construction and operation of the Canadian system will be transferred to the Northern Pipeline Agency. The principal exception involves responsibilities reserved exclusively to the National Energy Board or shared between the Board and the Agency. In addition, the Agency is responsible for facilitating the co-ordination of activities bearing on the project that involve other arms of the federal government, other levels of government in Canada, and U.S. departments and agencies.

The management and direction of the Agency come under the authority of a Minister designated for this purpose by the Governor in Council. A Commissioner appointed by Order in Council serves under the Minister as his deputy in charge and is based at the Agency's head office in Ottawa. The main operational office is located in Calgary and functions under the direction of an Administrator appointed by Order in Council, who is also

responsible for the day-to-day direction of regional offices located in Vancouver, British Columbia, and Whitehorse, Yukon Territory. As provided for under the Act, a member of the National Energy Board serves as its Designated Officer, and as a Deputy

Administrator of the Agency, exercising the powers of the Board that were delegated by it on July 27, 1978. A listing of the senior officers of the Agency as of the end of the fiscal year and the location of Agency offices can be found in Appendix C.



Kluane Lake, Yukon

Major Developments Relating to the Alaska Highway Gas Pipeline

Legislative and Regulatory Delays Encountered in the United States

By Joint Resolution of the House of Representatives and the Senate, the United States Congress on November 2, 1977, approved the Decision and Report submitted to it in September, 1977, by the President recommending construction of the Alaska Highway gas pipeline in keeping within the terms of the Canada-U.S. Pipeline Agreement. The Decision was formally enacted into law with the signing of the Joint Resolution by President Carter on November 8, 1977.

Despite the expeditious approval by Congress of the joint Canadian-U.S. undertaking recommended by the President, a series of other legislative and regulatory hurdles were encountered in the United States during the balance of the year which seriously impeded progress on the project. While the bilateral agreement established a timetable which envisaged the flow of gas from Alaska to the lower 48 states commencing by January 1, 1983, the consortium of companies sponsoring the pipeline in the United States concluded that the commencement of operations could not begin before November, 1984, because of these delays.

The first major obstacle arose out of the extended debate in Congress over the National Energy Plan presented to it by the Administration on April 20, 1977. One of the most controversial measures involved a Bill to establish a new regime with respect to the pricing of natural gas both at the well-head and in sales to the ultimate consumer—the determination of which was an essential prerequisite to the development of planning for the Alaska Highway pipeline system. A prolonged deadlock between the two Houses was not overcome until October 15,

1978, when the energy legislation, including the Natural Gas Pricing Act of 1978, was approved by Congress. It was signed into law by President Carter on November 9, 1978.

Within a matter of months following the passage of this legislation, however, it became increasingly evident that considerably more time than originally anticipated would be required to resolve a number of outstanding regulatory issues, many of which involved the breaking of major new policy ground. These included decisions on the innovative rate of return formula to apply to equity invested in the project companies, which both the U.S. and Canadian governments agreed should be established to provide a substantial incentive for them to build the system as economically and efficiently as possible. A second major issue concerned the allocation of the significant costs involved in conditioning the gas at Prudhoe Bay as between producers and shippers. A third set of issues related to the design pressure and capacity of the system in Alaska and its proximity to the Trans-Alaska oil pipeline—which it will generally parallel to a point near Fairbanks, while a fourth involved the tariff system to govern the transportation of gas through U.S. segments of the system.

The Alaska Natural Gas Transportation Act of 1976, which was adopted by Congress to expedite the process under which the United States could gain early access to its reserves in Prudhoe Bay, provided for the creation of the Office of the Federal Inspector. The primary function envisaged for that office was to oversee the implementation of requirements imposed by various federal departments and agencies in an effort to avoid the costly delays encountered in the building of the Trans-Alaska oil pipeline because of the absence of such co-ordination. Although the limited reorganization plan required for the creation of the Office of the Federal Inspector had still not been submitted to Congress

for its approval by the end of March, 1979, President Carter stated his intention at mid-month to put the plan forward early in April, 1979.

Pre-Building of the Southern Segments of the System

In its report of July, 1977, recommending approval of the Alaska Highway gas pipeline project, the National Energy Board raised the possibility of 'pre-building' the southern portion of the proposed system in Canada and the eastern and western legs to the lower 48 U.S. states initially to export to the United States any Alberta gas that might be found to be surplus to Canadian needs. In his *Decision and Report to Congress on the Alaska Natural Gas Transportation System* of September, 1977, President Carter also supported the pre-building concept in principle.

While the concept was a subject of extensive public discussion in Canada, the applications for authorization to export Alberta gas through the pre-built segment was deferred for a number of weeks following the publication by the National Energy Board of a report on domestic natural gas supply and requirements in February, 1979. Among other things, the report set out the Board's conclusions at that time in respect of the amount of gas surplus to Canadian needs that might be made available under various circumstances for export to the United States. In the United States, however, the Federal Energy Regulatory Commission (FERC) gave conditional approval in June, 1978, to the import through pre-built facilities by Northwest Alaskan Pipeline Company of 1.04 billion cubic feet of gas a day from Pan-Alberta Gas Limited, an affiliate of Alberta Gas Trunk Line Company Limited — one of the major sponsors of Foothills. Final approval was made subject to the receipt of many other related authorizations required in both countries.

Revised Agreement on Pipe Size and Pressure

In its application to the National Energy Board, Foothills Pipe Lines (Yukon) Ltd. originally proposed that the section of the system from the Alaska-Yukon border to the point where it bifurcated near Caroline in Alberta should consist of pipe of 48 inches in diameter capable of operating at a pressure of 1260 pounds per square inch (psi). In the September, 1977, pipeline agreement between Canada and the United States, provision was made for establishment of a Technical Study Group to con-

sider the relative merits of two alternative designs from the point of view of safety, reliability and economic efficiency. These involved pipe of 48-inch diameter operating under pressure of 1680 psi and 54-inch pipe under pressure of 1120 psi for the 1,053 miles of the system between Whitehorse in the Yukon and Caroline in Alberta that would be built to transmit both Canadian and U.S. gas from the Arctic. At the same time, the agreement stipulated that the "decision relating to pipeline specifications remains the responsibility of the appropriate regulatory authorities."

Following meetings of the Technical Study Group, the National Energy Board indicated in a statement on its position which it issued on February 17, 1978, that it was not prepared to support the 48-inch diameter, high pressure pipe design favoured by U.S. authorities. The Board concluded that such a system would represent "a large step into new technology" that raised major questions of safety and reliability. Resolutions of those questions could result in delays of up to two years according to estimates of Foothills, the Board said, which was contrary to the interests of both countries.

The Board stated, however, that it was prepared to approve the second preference of the United States — a 56-inch diameter system operating at 1080 psi — which it concluded was more fuel-efficient than the 54-inch alternative referred to in the agreement between the two countries. The report noted that two Canadian mills could produce pipe of either of these specifications, while only one could manufacture the heavy-walled pipe required for the 48-inch high pressure system. Through an exchange of notes between the two governments on June 6, 1978, the bilateral agreement was amended to allow for adoption of the 56-inch system between Whitehorse and Caroline and to provide for necessary revisions to sections dealing with the filed capital costs of the pipeline in Canada.

Agreements between Foothills and the Canadian Government

Although it was not included in the application for certification submitted by Foothills, the National Energy Board recommended that the federal government seek the concurrence of the company with respect to the possible construction of all facilities required to transport natural gas reserves in the Mackenzie Delta of the Northwest Territories to southern Canadian markets.

In keeping with that concept, Foothills entered into two agreements with the federal government on May 4, 1978. Under those agreements, the company undertook to submit an application to the National Energy Board for authority to construct the so-

called Dempster Lateral to link Delta reserves with the Alaska Highway trunkline at Whitehorse and to provide for any expansion in that system that might be required to transport up to 1.2 billion cubic feet of gas daily to southern markets. One of the agreements also provided for possible electrification at some time in the future of pipeline compressors located in South Yukon.

Under the terms of the agreements, Foothills committed itself to carry out the necessary design, economic, environmental and socio-economic

studies on the feasibility of the Dempster Lateral and to apply to the National Energy Board for a certificate to build the line by July 1, 1979. In the event that the Board issued a certificate and determined that the project could be financed satisfactorily, the Foothills group of companies undertook to proceed with its construction as expeditiously as possible. In the event of default, Foothills and its principal shareholders would be liable to make a payment to the federal government of \$50 million.



Destruction Bay, Yukon

Establishment of the Yukon Advisory Council

Section 18 of the Northern Pipeline Act authorizes the Governor in Council — and in the case of the Yukon Territory requires it — to establish advisory councils of up to 10 members to assist the Minister responsible for the Northern Pipeline Agency in carrying out the objects of the legislation. In keeping with the terms of the Act, Deputy Prime Minister Allan J. MacEachen, the Minister then responsible for the Agency, announced on February 28, 1979, that the Governor in Council had approved the creation of the Yukon Advisory Council. Mr. Donald Roberts, Principal of a Whitehorse elementary

school, was appointed Chairman of the Council, and Mr. Raymond Jackson of Haines Junction, the Chief of the Champagne/Aishihik Indian Band, was named Vice-Chairman. The names of all members of the Council at year end are listed on page 9.

In appointing only 8 of the 10 members provided for under the Act, the Minister said in his announcement that it was the government's intention to leave the two remaining positions vacant for the present time. "While native organizations covering the whole of the Yukon have to date declined invitations to nominate representatives to serve as members of the Advisory Council," he said, "I very much hope that they will reconsider their position because I believe it would be very much to the benefit of all the native people of the Yukon for their interests to be represented in this important forum."

Agency Activities

The Northern Pipeline Agency has been actively engaged in many areas during its first year of operation in order to meet its responsibilities under the Northern Pipeline Act.

Two major areas of activity have been:

- the development of proposed socio-economic and environmental terms and conditions, which, together with the technical requirements, will govern the design, construction and initial operation of the pipeline;
- overseeing the preparation of procurement and manpower plans by the project companies, which under the Act are required to submit these plans to the Minister for approval.

During the year, the Agency's operational headquarters in Calgary began to engage qualified personnel to undertake these functions — the extent of the build-up being governed by the stretch-out in the construction timetable. Agency staff recruited during the period represented a blend of experienced personnel from both the private and public sectors. The regional offices in Whitehorse, Yukon Territory, and in Vancouver, British Columbia report to the operational headquarters in Calgary.

The Agency has established a sound working relationship at all levels with Foothills Pipe Lines (Yukon) Ltd. and its subsidiary companies.

Consultations with the Public, Particular Interest Groups and Other Levels of Government

Under the terms of the Northern Pipeline Act, the Northern Pipeline Agency is required to undertake widespread consultation with the public generally,

with particular groups, and with other levels of government so as to take the fullest possible account of their interests and concerns. The legislation in particular imposes a responsibility on the Agency to "facilitate the efficient and expeditious planning and construction of the pipeline taking into account local and regional interests, the interests of residents, particularly the native people . . ." The Agency is required to maintain close consultation with provincial and territorial governments in an effort to co-ordinate their respective operations in relation to the project. As noted previously, the Act also calls for the establishment of an advisory council for the Yukon and allows for the establishment of similar councils in other areas to provide a source of continuing advice to the Minister responsible for the Agency on all matters relating to the pipeline. During the course of the year, the Agency engaged in a number of activities with respect to these obligations.

1. Development of Socio-Economic and Environmental Terms and Conditions to Apply to the Foothills Companies

A major preoccupation of the Agency over the year was the development of proposed socio-economic and environmental terms and conditions to govern the planning, construction and initial operation of the system by the various Foothills companies. These terms and conditions were not developed in a vacuum. They reflect many of the concerns expressed by Canadians before the Berger, Hill and Lysyk inquiries and the National Energy Board, submissions by various interest groups and departments of the federal, provincial



The Hon. Mitchell Sharp, Commissioner (standing centre) meeting with residents of Upper Liard, Yukon. To his right (also standing) is Mr. Harold S. Millican, Administrator.

and territorial governments. They also reflect the undertakings given by Foothills Pipe Lines (Yukon) Ltd. before the National Energy Board during its hearings on the northern gas pipeline applications.

Pursuant to the *Northern Pipeline Act*, the Agency prepared and released in May, 1978, the first drafts of these proposed terms and conditions. These initial drafts, which made no distinction between the different segments, were submitted to other governments and agencies, associations, public interest groups, and Foothills, for their comments and criticisms. The extensive responses to these first drafts were taken into account in the preparation of revised proposals.

Subsequent drafts of the proposed terms and conditions were drawn up for each of the five Foothills subsidiaries authorized to undertake the project in Canada so as to reflect the very different circumstances prevailing along the pipeline route. Second drafts of socio-economic terms and conditions were issued for the Yukon and North B.C. in October and December of 1978, respectively. A revised draft of environmental terms and conditions to apply to the construction of the pipeline in the Yukon was released in March, 1979. Second drafts of terms and conditions for southern B.C., Alberta and Saskatchewan were still in the course of preparation by year's end.

All the terms and conditions must receive adequate public review before they are finalized by the

Agency and recommended for approval by the Governor in Council. Public hearings on the proposed socio-economic and environmental terms and conditions for construction in the Yukon were held starting in March, 1979, and similar hearings are planned for North B.C. It was not intended to conduct hearings on the southern segment documents, although the terms and conditions will be given wide dissemination and submissions from the public to the Agency will be considered carefully.

2. Yukon Public Review

The effects of the Alaska Highway gas pipeline on the Yukon are potentially wide-ranging and varied. To ensure that the people in the Yukon who will be most directly affected had an opportunity to influence the development of the final socio-economic and environmental terms and conditions which will apply to the construction of the pipeline through that part of Canada, the Agency conducted public hearings in the Yukon beginning in March, 1979.

Co-chaired by the Northern Pipeline Agency and the Federal Environmental Assessment Review Office, the Yukon Public Hearings Panel travelled to communities along the pipeline route to hear

Yukoners' comments on the Agency's proposed socio-economic and environmental terms and conditions, the Environmental Impact Statement prepared by Foothills Pipe Lines (South Yukon) Ltd., and other pipeline-related matters. At their requests,

hearings were also held in two communities off the pipeline route. This public input will be reviewed by the Agency in developing the final sets of terms and conditions which will be recommended for approval by the Governor in Council.



The Yukon Public Hearings Panel assembled in Whitehorse. Fifth from the right is Fernand Hurtubise and to his left is Ken McKinnon—Co-Chairmen.

3. Other Public Consultations

In addition to the formal consultations on proposed terms and conditions initiated in the Yukon, Agency officials travelled the length of the pipeline route as part of a community liaison and information program aimed at developing good working relationships with those who will be affected by the project. These activities included contact with local government representatives and officials, native organizations, civic groups, business associations, hunters, fishermen and trappers, fish and game associations, environmental and conservationist groups, women's organizations, labour unions, and all others who indicated an interest in the undertaking.

The Agency also participated in several industrial briefings across the country. Sponsored by Foothills, these briefings were held in Vancouver, Edmonton, Calgary, Winnipeg, Toronto and Montreal in order to familiarize Canadian businessmen with the project and the business opportunities it presented. In addition, senior officials undertook

numerous speaking engagements in both Canada and the United States in an effort to keep the public informed about the role of the Agency and on-going developments related to the project.

4. Federal-Provincial Consultative Council

In keeping with provisions of the Act, a Federal-Provincial Consultative Council composed of senior officials of the governments of British Columbia, Alberta, Saskatchewan, the Yukon, and the Northern Pipeline Agency was established early in the year. Quarterly meetings, which are required under the legislation, were held in Calgary, Whitehorse and Vancouver for the purpose of co-ordinating the pipeline-related activities of the various government bodies. In addition to formal consultations through the mechanism of the Council, extensive bilateral discussions were held between the Agency and the individual provincial and territorial governments.



Audience assembled for public hearings in Whitehorse, Yukon.

5. The Yukon Advisory Council

On February 28, 1979, the Hon. Allan J. MacEachen, Minister then responsible for the Agency, announced that the Governor in Council had approved the establishment of the Yukon Advisory Council to provide advice on all matters relating to the planning and building of the pipeline. As already noted, Mr. D. Roberts, Principal of Selkirk Street Elementary School in Whitehorse, was appointed Chairman, and Mr. R. Jackson, Chief of the Champagne/Aishihik Indian Band was appointed Vice-Chairman. The other members appointed to the Council were:

Mrs. D. Stokes of Whitehorse, who operates a local business with her husband and is active in women's organizations;

Mr. C. D. Taylor of Whitehorse, a retired businessman and a former Territorial Councillor;

Mr. R. Stubenberg of Watson Lake, a local businessman, a member of the Local Improvement District Board and an active participant in civic and community affairs;

Mrs. J. Linzey of Whitehorse, who is active in the women's movement and community affairs;

Mr. W. Palmer of Whitehorse, area representative of Teamster Local 213, a member of

the Executive Board of the Territorial Manpower Needs Committee, and Chairman of the Yukon Labour Federation;

Mr. C. Geddes of Teslin, a businessman and contractor, and member of the Yukon Water Board.

Native Relations

Under the Northern Pipeline Act, the Agency has a responsibility to take special account of the interests of native people. Recognizing the responsibilities of the Government of Canada and other governments as appropriate, the Agency also has an obligation to ensure that any native claim related to the land on which the pipeline is to be situated is dealt with in a just and equitable manner. The Agency itself, however, has no authority to deal with native claims.

On-going dialogue has been established with many Indian Bands in British Columbia and Alberta. In Alberta, an information and counselling program on pipeline employment and contracting opportunities was initiated in February, 1979. Eight Bands located close to the pipeline right-of-way are participating.

Following earlier discussions, an invitation to participate in the Yukon public hearings process



The members of the Yukon Advisory Council. From left to right: Cliff Geddes, Wayne Palmer, Joanne Linzey, Donald Roberts (Chairman), Raymond Jackson (Vice-Chairman), Charles Taylor and Dale Stokes. Missing from the photo is Robert Stubenberg.

held in March, 1979, was extended by the Agency to the Council of Yukon Indians. The CYI, however, chose at that time not to participate in any pipeline-related activities until Indian claims had been settled.

One Yukon Indian Band, Champagne/Aishihik, did participate in the Yukon hearings. As noted earlier, the Chief of the Band, Mr. Raymond Jackson, is Vice-Chairman of the Yukon Advisory Council. A request from the Champagne/Aishihik Band, supported by the Agency, for funds to undertake research aimed at identifying the interests of Band members with respect to the pipeline project, was approved by the federal government early in 1979.

Procurement Plan

The Northern Pipeline Act requires Foothills Pipe Lines (Yukon) Ltd. to submit for the approval of the Minister a comprehensive procurement plan designed to maximize Canadian input into the project and the realization of the greatest possible industrial benefits for this country, while also ensuring that the procurement of goods and services is undertaken on generally competitive terms. The Act also makes provision for the designation of selected items by the Minister, and for all such items Foothills will

require prior approval by the Designated Officer before proceeding with the various stages leading to procurement.

Foothills submitted a draft Procurement Program at the end of 1978. Before submission to the Minister, however, further consultations were planned with the U.S. Administration. It is expected that these consultations will be expedited once the Office of the U.S. Federal Inspector is fully operational, leading to agreement on reciprocal arrangements governing procurement for the project in both countries.

Foothills and the Agency have tentatively agreed on a list of items of procurement that might be designated by the Minister, as provided for under the Act. These items include line pipe, turbomachinery, large valves, and large fittings.

Line Pipe Contracts

In the fall of 1978, Foothills Pipe Lines (Yukon) Ltd. invited tenders for 1.5 million tons of line pipe required on the Canadian portion of the Alaska Highway gas pipeline project and the associated Dempster Lateral. Tenders were invited from three Canadian and four U.S. suppliers, with certain offshore suppliers in Europe and Japan being permitted to bid on a contingency basis.

Bids received by the October 2, 1978, deadline were evaluated by Foothills on the basis of three major criteria — competitiveness, technical acceptability, and potential economic and industrial benefits to Canada. Based on this evaluation, Foothills concluded that the tenders submitted by the Steel Company of Canada (STELCO) and the Interprovincial Steel Company (IPSCO) were clearly superior on all three counts. Both Canadian steelmakers' bids were substantially lower in price than the U.S. competition, as well as being price competitive with all contingent suppliers.

As approved by the Minister, Foothills began detailed pipe negotiations in January, 1979, with STELCO and IPSCO for the purpose of working out final contracts with the two companies. The value of the pipe contracts to the two Canadian suppliers is expected to exceed \$1 billion and to generate about 8,000 man-years of direct employment in the steel industry and an estimated 16,000 man-years in ancillary service and supply industries.

Manpower Plan

Under Schedule III of the Act, Foothills is required to:

"submit to the Minister, on or before a date to be fixed by him, a detailed manpower plan designed to ensure the maximum possible use of Canadian labour in the planning, construction and operation of the pipeline."

In consultation with the Canada Employment and Immigration Commission (CEIC), the Agency developed a set of guidelines to be used by the company in preparing the manpower plan. On November 29, 1978, the Minister formally issued the guidelines to the company and set the following dates for receipt of manpower plans:

- | | |
|-------------------|---|
| February 15, 1979 | — Construction of pre-build (southern) portion; |
| May 1, 1979 | — Construction of northern portion; |
| (date to be set) | — Operation and maintenance of line. |

In compliance with this order, the company submitted a draft manpower plan for the construction of the pre-build portion in four volumes. This document was reviewed by officials of the CEIC and the Agency, who requested that a number of revisions be undertaken. Foothills is currently redrafting the plan for submission by late 1979.

The Agency subsequently agreed that the May 1, 1979, date set for receipt of the plan for the northern portion of the system was no longer appropriate in view of the anticipated delay of the start-up of construction. As a result, the company was relieved of this deadline. Agency and company officials were

continuing consultations on the most appropriate timing for submission of the remainder of the plan.

Engineering Activities

The Agency is responsible in broad terms for approving the engineering design of the pipeline by Foothills and ensuring that the materials used and the methods and procedures for constructing the pipeline meet the necessary requirements.

Orders

On January 31, 1979, the Designated Officer, with the concurrence of the Minister responsible for the Agency, issued the first five formal orders to Foothills. These orders directed that, prior to the construction of any portion of the pipeline, each of the segment companies submit the following for his approval:

- (a) detailed engineering designs, including such specific tests, operations and maintenance procedures as are relevant;
- (b) proposed pipeline project scheduling and cost-control procedures; and
- (c) proposed construction and inspection specifications and procedures.

In making such submissions, the Foothills companies are required to comply with applicable regulations of the National Energy Board.

These orders deal with highly technical engineering provisions relating to the entire Alaska Highway gas pipeline system in Canada with which the Foothills group of companies will be required to comply. Should particular problems with respect to specific sites along the pipeline route become evident as a result of public review of the environmental and socio-economic conditions, further technical orders will be issued as required to meet them.

The orders of the Designated Officer and the legislation require Foothills to undertake comprehensive experimental work and testing prior to the construction of any portion of the pipeline. The Agency has held extensive discussions with Foothills in connection with two such major projects being undertaken by Foothills with respect to frost heave and thaw settlement and pipe durability. The result of these tests will be studied to determine the most feasible means of controlling problems involving frost and thawing and ductile fractures—that is, fractures along the length of pipe. These mitigative measures will subsequently be incorporated in the final design of the system that Foothills will be required to adopt.

1. Frost Heave and Thaw Settlement

Gas pipeline operation in continuous and discontinuous permafrost terrain presents some unique problems with which there has been no previous experience in North America and only limited experience elsewhere.

Foothills proposes to chill the gas below 0°C (32°F) so as to maintain the permafrost in its frozen state north of the first compressor station in the Yukon. In regions of the discontinuous permafrost, a frost "bulb" could be formed around the pipe in soils which are normally unfrozen unless proper measures are taken to prevent or minimize such a development. Certain frost susceptible soils will heave as a result of formation of the frost bulb, a phenomenon that is known as frost heave.

The frost heave engineering studies required for final design decisions have been extensive. Field studies to delineate the extent of the problem, to develop mathematical models to predict the amount of heave that will occur under certain conditions, and to develop mitigative design measures to preserve the integrity of the pipeline and the environment, have been the object of these studies.

The Calgary frost test site previously owned by the Canadian Arctic Gas Study Limited has been obtained and expanded by Foothills. In addition, construction of a new facility in Fairbanks by the Alaska project sponsors was completed early in 1979 to permit further testing of designs to mitigate frost heave of pipelines.

South of the first compressor station in the Yukon, the temperature of the gas will be warmed above 0°C and the pipeline will operate in the conventional way. Areas of discontinuous permafrost, the percentage of which decreases the farther the line extends southward, occur between the last point of cold flow at the first compressor station and into Northern British Columbia.

Thawing of these frozen areas caused by the warm pipeline could lead to differential settlement of the pipeline. Special design considerations are necessary, therefore, to control thaw settlement, provide proper drainage, minimize ground erosion and thereby ensure the stability of the pipeline. Analytical and laboratory work and preliminary field studies to identify the extent of the permafrost areas have been initiated by Foothills.

The Agency staff has been working closely with the company and other government agencies in reviewing the frost heave and thaw settlement research programs and developing additional tests and studies which will contribute to proper final design, monitoring and preventative maintenance procedures.



CALGARY FROST HEAVE TEST SITE—Illustrating insulated pipe in ditch, attached level indicator rods and thermistors for measuring ground and pipe temperatures—September 22, 1978.

2. Pipe Fracture Control

Pipe burst tests are necessary to demonstrate that the pipe used has the strength and quality required for operation and that fractures, if initiated, can be controlled and arrested. To do so, the actual pipe samples need to be tested experimentally under conditions closely simulating actual operations.

For the Alaska Highway gas pipeline, these operating conditions are unique. It consists of pipe varying in diameter from 914 mm to 1,422 mm (36 inches to 56 inches), part of it laid in areas of permafrost and part in discontinuous permafrost, and transmitting gas at different temperatures and under different pressures. The burst test program proposed will determine the special properties of pipe required to arrest a fracture should one occur under these conditions. It will also test the adequacy

of special measures that may be adopted for fracture arrest.

A new burst test facility scheduled to be built at Rainbow Lake, Alberta, is designed to be a Canadian research establishment capable of investigating various modes of pipe fracture and associated phenomena. The completion date for this facility is scheduled for November, 1979, and the first test to be conducted will use the line pipe proposed for the project. The objectives and plans for this facility are under continuing review by the Agency.

Prior to the completion of the Northern Alberta Test Site, arrangements were made for the British Gas Corporation to conduct two full-scale burst tests to determine the adequacy of concrete weights and heavy wall pipe as mechanisms for fracture arrest. The first test was conducted on November 14, 1978, at the British Gas Corporation's Spadeadam Site near Newcastle. The Agency was represented, along with officials of Foothills Pipe Lines (Yukon) Ltd., the National Energy Board, and the U.S. Department of Transportation. The final report on this test remains to be received by the Agency. The second burst test, also to be conducted by the British Gas Corporation, is scheduled for August, 1979.

General Engineering Review

Other general engineering design activities undertaken by the Agency over the past year included the following reviews:

- a) bidding document prepared by Foothills, entitled "Specifications for Line Pipe, Gas Turbine Compressor Packages, and Large Diameter Valves and Fittings";
- b) the analytical basis used in developing computer programs by The Alberta Gas Trunk Line Company Limited and by Westcoast Transmission Company Limited for conducting gas flow studies for their segments of the project;
- c) a study prepared by Foothills Pipe Lines (Yukon) Ltd. entitled "Preliminary Engineering Project Network Analysis" dealing with project risk management;
- d) numerous geotechnical and geophysical surveys and laboratory and drilling reports received from Foothills Pipe Lines (South Yukon) Ltd.;
- e) a preliminary report on compression system design entitled "Unified Hydraulic System Design", which led to a request for additional information on optimization and reliability studies for the system;
- f) a report on Selected Stream Crossings in the Yukon prepared for Foothills Pipe Lines (South Yukon) Ltd.;

g) technical sections of Environmental Impact Statement prepared by Foothills Pipe Lines (South Yukon) Ltd.;

h) contents of preliminary pipeline alignment sheets and certain typical pipeline drawings.

In addition, the Agency also established guidelines for the design of river crossings.

Plans, Profiles and Books of Reference

Under the terms of the Northern Pipeline Act, the Company is required to submit plans, profiles and books of reference, which must be approved by the Designated Officer under the powers, duties, and functions delegated to him by the National Energy Board before construction of any part of the pipeline can be commenced.

In an effort to ensure that appropriate and timely action can be taken, close liaison was maintained between the Company's and the Agency's staff to define the details and information to be shown on the required plans, profiles and books of reference. To date, no approvals have been granted.

Project Control

The first series of orders issued to Foothills by the Designated Officer required the company to develop procedures for scheduling and cost control, including such items as work breakdown structure and cost estimating, all of which are essential for properly managing an undertaking of such enormous dimensions as the Alaska Highway gas pipeline. The establishment of effective control procedures are particularly important from Canada's point of view. In light of the provision in the bilateral agreement, the share of the cost of transporting Canadian gas through the Dempster Lateral between Whitehorse and Dawson is to be borne by the United States and is determined by the total cost of the main pipeline system in Canada.

The Agency will have its own staff group to monitor the company's activities in these areas so that it is in a position to determine whether the project is proceeding as planned.

Loss of tight control over either the expenditure or scheduling aspects of the project could result in significant cost overruns—as was the case in the construction of the Alyeska oil pipeline in Alaska. The Agency, therefore, has a considerable responsibility to monitor Foothills' activities in relation to cost control and scheduling to ensure to the greatest extent possible that the pipeline is built on time and within budget in the interest of all Canadians.

Acquisition of Privately-Owned Land Rights for Pipeline Installation

During the course of the year, the Agency worked closely with Foothills on matters relating to the acquisition from private owners of land and right-of-way easements required for the construction of the pipeline. These discussions focussed primarily on the development of a Landowner Information Booklet and the form of the actual document granting an easement for the pipeline right-of-way across privately-held lands.

Landowner Information Booklet

The Landowner Information Booklet is designed to acquaint property owners with the project, its sponsors, and the Northern Pipeline Agency. Maps in the booklet describe the overall pipeline route and identify the proposed location of the pipeline on each property. The land acquisition procedure to be followed, as well as the rights of the property owner in this process, are also clearly described.

The booklet was prepared by the Company and determined to be suitable in format by the Designated Officer on October 31, 1978. At the end of the year, no right-of-way negotiations for private lands had begun, and no Landowner Information Booklets had been distributed.

Easement Documentation

Although the Agency has no statutory power to direct the companies as to the standard format of the grants of right-of-way documents to be used for the acquisition of rights for pipeline purposes across privately-held lands, the companies co-operated in accepting many of the suggestions made by the Agency to ensure that an equitable document was employed. The easement document provides for the choice of lump sum payments or annual rentals for lands required for surface installations, further payments based on then current land values if an additional pipeline is to be installed within the right-of-way in the future, and simplified arbitration procedures in cases of dispute. Many of these provisions break new ground and go a considerable way to meet concerns expressed by private landowners in the past with respect to property acquired for pipeline purposes.



Cabin near Burwash, Yukon

It should be noted that if Foothills is unable to reach an agreement with a landowner, it has the power, under the *National Energy Board Act*, to expropriate private lands for the purpose of this pipeline. Neither the Northern Pipeline Agency nor the National Energy Board has any direct control over the amount of compensation paid to an expropriated landowner, a matter that is ultimately subject to adjudication by the courts.

As indicated previously, no acquisition of private lands for the pipeline was undertaken during the year.

The Federal Regulatory Role

The Northern Pipeline Agency, as previously noted, was established to provide a 'single window' through which to conduct virtually all dealings at the federal level with the Foothills group of companies—

the principal exception being responsibilities specifically reserved to the National Energy Board.

The Northern Pipeline Act authorizes the Governor in Council to transfer to the Minister responsible for the Northern Pipeline Agency the authority provided under Acts administered by other federal departments and agencies which apply to the project as a means of implementing this single window approach.

Discussions continued throughout the year on the possible transfer of such powers. In cases where the transfer of jurisdiction was considered to be neither necessary nor practical, the Agency began the development of arrangements for close co-operation between itself and the other federal bodies involved. These included Transport Canada with respect to its responsibilities for navigable waters and the Canadian Transport Commission with respect to its responsibilities for railway operations. Co-operative arrangements were also being worked out with the International Boundary Commission and the International Joint Commission on border and river crossings.

Financial

Section 12 of the Northern Pipeline Act provides for an annual audit of the accounts and financial transactions of the Agency by the Auditor General of Canada and for a report thereon to be made to the Minister. Section 13 of the Act requires the Auditor General's report to be laid before Parliament, together with the Minister's annual report on the operations of the Agency. To comply with these requirements, the report of the Auditor General on the accounts and financial transactions of the Agency for the period April 13, 1978, to March 31, 1979, is reproduced as Appendix "A" to this report.

Supplementary Estimates A, 1978-79, provided \$4.2 million for the operation of the Agency in its first year. Actual expenditure was \$3.1 million, approximately \$1 million less than the amount

approved by Parliament. The number of man-years authorized for 1978-79 amounted to 50, of which only 38 were used. Both the spending and the manpower of the Agency were significantly below approved levels because of the delay in construction of the pipeline.

Section 29 of the Act provides for recovery of the costs of the Agency from the company constructing the pipeline in accordance with regulations made under sub-section 46.1 (2) of the National Energy Board Act. These regulations were approved by the Governor in Council April 24, 1978. During the year ended March 31, 1979, recoveries totalling \$1.7 million were made and credited to the Consolidated Revenue Fund. The balance of \$1.4 million was due to be recovered in the Fiscal Year 1979/80.



AUDITOR GENERAL OF CANADA

VÉRIFICATEUR GÉNÉRAL DU CANADA

The Honourable Walter David Baker, P.C., Q.C., M.P.,
Minister Responsible for Northern Pipeline Agency,
Ottawa, Ontario.

I have examined the statement of expenditure and recovery of costs of the Northern Pipeline Agency for the period April 13, 1978 to March 31, 1979. My examination was made in accordance with generally accepted auditing standards, and accordingly included such tests and other procedures as I considered necessary in the circumstances.

In my opinion, this financial statement presents fairly the results of the operations of the Agency for the period April 13, 1978 to March 31, 1979 in accordance with the accounting policies set out in Note 2.

A handwritten signature in cursive script, appearing to read "Neil T. ...".

Senior Deputy Auditor General
for the Auditor General of Canada

Ottawa, Ontario
August 2, 1979

NORTHERN PIPELINE AGENCY
(Established by the Northern Pipeline Act)

**Statement of Expenditure and Recovery of Costs for the period
April 13, 1978 to March 31, 1979**

Expenditure

Salaries and employee benefits	\$1,285,129
Travel and communications	451,199
Rentals	420,874
Professional and special services	412,905
Furniture and equipment	272,406
Leasehold improvements	177,776
Materials and supplies	90,866
Advertising	21,505
Other	3,022
	<u>\$3,135,682</u>

Expenditure provided by:

Privy Council Vote 30a	\$2,951,682
Statutory—Contributions to employee benefit plans	184,000
	<u>\$3,135,682</u>

Recovery of costs of the Agency from Foothills Pipe Lines
(Yukon) Ltd. credited to the Consolidated
Revenue Fund

Expenditure April 13, 1978 to March 31, 1979	\$3,135,682
Less: Portion of 1978-79 expenditure to be recovered in following year	<u>1,454,009</u>
	<u>\$1,681,673</u>

The accompanying notes are an integral part of the financial statement.

Approved:



Commissioner



Chief Financial Officer

NORTHERN PIPELINE AGENCY

Notes to Financial Statement March 31, 1979

1. Objective

The Agency was established on April 13, 1978 to facilitate the efficient and expeditious planning and construction of the Alaska Highway Gas Pipeline in a manner consistent with the best interests of Canada as defined in the Northern Pipeline Act, 1977-78, c. 20.

2. Significant accounting policies

(a) Expenditure

Expenditure is recorded on a cash basis modified to include payments in April relating to work performed, goods received or services rendered prior to March 31, which basis is consistent with that used by departments of the Government of Canada.

(b) Cost-recovery

The amounts required to finance the transactions of the Agency are provided through parliamentary appropriations. However, costs are fully recoverable from Foothills Pipe Lines (Yukon) Ltd. and are credited to the Consolidated Revenue Fund. As the Consolidated Revenue Fund is maintained on a cash basis, the financial statements do not record the full recovery of costs for the fiscal period to March 31, 1979. The balance of 1978-79 expenditure will be recoverable in 1979-80 and recorded in the financial statements for that period.

(c) Services provided by other government departments

As the costs of the Agency are to be recovered, arrangements are being made with other government departments to charge the Agency for any services rendered. These arrangements should be completed in 1979-80.

3. Employees' contingency payment

In order to compensate senior employees who agree to remain with the Agency to the completion of its responsibilities or as long as they may be required, the Treasury Board has approved payment to these employees on termination of an amount equivalent to 13% of total salary paid. These amounts, estimated at March 31, 1979 to total \$69,000 will be charged in the year in which payment is made.

Project Description

The Alaska Highway gas pipeline project is a large diameter pipeline system that will initially transport Alaskan natural gas across a Canadian land bridge to the lower 48 states.

The second phase of the project consists of the Dempster Lateral connection, which will provide access to Canadian gas reserves in the Mackenzie Delta/Beaufort Sea, if and when the lateral is approved.

Foothills Pipe Lines (Yukon) Ltd. of Calgary, Alberta is the parent company responsible for the Canadian portion of the project. Foothills Pipe Lines (Yukon) Ltd. is owned equally by The Alberta Gas Trunk Line Company Limited of Calgary, Alberta and Westcoast Transmission Company Limited, Vancouver, B.C.

The mainline system in Canada will be built in five segments by five subsidiaries:

Foothills Pipe Lines (South Yukon) Ltd.
Foothills Pipe Lines (North B.C.) Ltd.
Foothills Pipe Lines (Alta.) Ltd.
Foothills Pipe Lines (South B.C.) Ltd.
Foothills Pipe Lines (Sask.) Ltd.

A sixth subsidiary, Foothills Pipe Lines (North Yukon) Ltd., may build the Dempster Lateral, if and when it is approved.

In the United States, the Alaskan segment will be built and operated by the Northwest Alaskan Pipeline Company on behalf of the Alaskan Northwest Natural Gas Transportation Company. South of the 49th parallel, Northern Border Pipeline Company, a consortium of U.S. transmission companies will construct the eastern leg of the system. Two California companies, Pacific Gas Transmission Company and its parent corporation Pacific Gas and Electric Company, will construct the western leg.

The mainline project will comprise almost 7,720 km of pipe in the two countries. The diameter of the pipe will be of 1,422, 1,219, 1,067 and 914 mm. A total of approximately 3,270 km will be in Canada, 1,180 km in Alaska and 3,270 km in the United States south of the 49th parallel.¹

The mainline through Canada will consist of the following lengths and diameters:²

Yukon	375 km of 1,219 mm
	443 km of 1,422 mm
B.C. (North)	715 km of 1,422 mm
Alberta	634 km of 1,422 mm
	377 km of 1,066 mm
	301 km of 914 mm
Saskatchewan	258 km of 1,067 mm
B.C. (South)	171 km of 914 mm

The pipeline in Alaska will be approximately 1,180 km of 1,219 mm pipe. In the lower 48 states, the eastern leg will consist of almost 1,800 km of 1,067 mm pipe and the western leg will involve about 1,470 km of looped 914 mm line.³

The system is designed so that when fully powered it would be able to carry 68 million cubic metres per day (2.4 billion cubic feet per day) of Alaskan gas and, if approved, an additional 34 million cubic metres per day (1.2 billion cubic feet per day) of Canadian Mackenzie Delta/Beaufort Sea gas.

The capital cost for the entire system, excluding that for the Dempster Lateral from the Mackenzie Delta, was originally estimated to be \$10.7 billion (Cdn). This reflected a cost of \$4.3 billion for the Canadian segments and \$6.4 billion for the American segments. In February, 1979, Foothills Pipe Lines (Yukon) Ltd., in light of the delay in the project schedule, revised the cost estimates for the Canadian portion to \$5.8 billion (Cdn). To date, no revised cost estimates have been submitted for the American section of the line.

As indicated earlier, the Canada/U.S. Agreement established January 1, 1983, as the target date for completion of the project. As a result of unforeseen regulatory delays in the United States, the current target for completion is November, 1984.

The map found on page vi provides a description of the proposed pipeline route.

¹ The total project will comprise almost 4,790 miles of 56, 48, 42 and 36-inch pipeline. Approximately 2,030 miles will be in Canada, 730 miles in Alaska and 2,030 miles south of the 49th parallel.

² Yukon 233 mi of 48"
 275 mi of 56"
B.C. (North) 444 mi of 56"
Alberta 334 mi of 56"
 234 mi of 42"
 187 mi of 36"

Saskatchewan 160 mi of 42"
B.C. (South) 106 mi of 36"

³ The pipeline in Alaska will be approximately 730 miles of 48-inch pipe. In the lower 48 states, the eastern leg will consist of almost 1,120 miles of 42-inch pipe and the western leg will involve about 910 miles of looped 36-inch line.

Northern Pipeline Agency

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