NORTHERN PIPELINE AGENCY

ANNUAL REPORT

1981-1982

Canada

Northern Pipeline Agency
Canada

Administration du pipe-line du Nord
Canada

ANNUAL REPORT

1981-1982

Acknowledgements

We wish to thank the following organizations for permission to use the photographs shown in this report:

Foothills Pipe Lines (Yukon) Ltd., Calgary, Alberta.
Office of the Federal Inspector, Washington, D.C.
Pacific Interstate Transmission Co., Los Angeles, California.

Ottawa, Ontario
December 31, 1982.

Dear Sir:

I present herewith the Annual Report of the Northern Pipeline Agency for the fiscal year ending March 31, 1982, 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,

Mitchell Sharp,
Commissioner,
Northern Pipeline Agency.

Senator The Honourable H.A. (Bud) Olson, P.C., M.P.,
Minister responsible for the
Northern Pipeline Agency,
Ottawa, Ontario.

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ALASKA HIGHWAY
NATURAL GAS PIPELINE PROJECT

See Project Description for imperial measurements

Major Developments in Canada and the United States Involving the Alaska Highway Gas Pipeline Project

Overview

Considerable strides were made on a number of fronts during fiscal year 1981-82 in moving forward with the planning and construction in both Canada and the United States of the Alaska Highway Gas Pipeline Project.

As part of the first-stage development of the project, which initially provides for the transmission of surplus Canadian gas to U.S. markets, building of the 1 960-km (1,218-mi.) Eastern Leg of the system was commenced in the spring of 1981, with completion scheduled for the fall of 1982. By October, 1981, gas began flowing to California through the 1 040-km (623-mi.) Western Leg, construction of which began in the latter half of 1980. Initially, these two lines will have the capacity to transport more than 1.1 billion cubic feet of gas a day (bcf/d) to the western and mid-western United States.

Meanwhile, a broad range of activities involving second-stage construction of the northern segments of the project continued in Canada and the United States. These included the further development of socio-economic, environmental and logistics plans, continuing research into technical problems associated with pipeline installation in areas of discontinuous permafrost, and the design and engineering of both the northern segments of the pipeline and of the gas conditioning plant to be built at Prudhoe Bay in Alaska.

The continuing work on preparation of final design and engineering of the pipeline and gas conditioning plant in Alaska followed an agreement reached in June, 1980, between the pipeline sponsor—Alaskan Northwest—and the three leading owners of natural gas reserves at Prudhoe Bay—Exxon, Sohio and Arco—to share the cost of this undertaking, estimated at $500 million or more.

At the same time, the pipeline sponsor and the producers also stated their intention of working together to develop a plan aimed at meeting the greatest challenge of all—privately financing the immense cost of building the Alaskan system. The outcome of that cooperative effort was the development of a "conceptual approach" for funding of the Alaskan project, which was made public in May, 1981, in order to provide the basis for further discussions with members of the investment community.

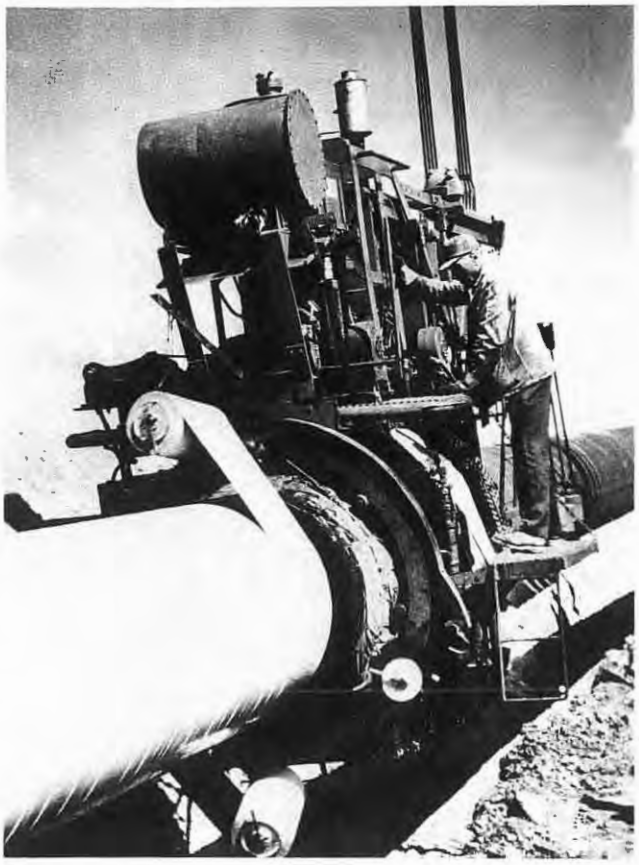
From the beginning, the joint participation of the Alaskan pipeline sponsor and the producers in undertaking final design and engineering of the system and developing a financing plan had been predicated on the assumption—implicit or explicit—that the governing U.S. legislation would be revised to eliminate or modify certain conditions that were considered to create an almost insuperable barrier to the private financing of the Alaska segment. This applied particularly to provisions that prohibited the producers from participating in the ownership and management of the pipeline in Alaska, assigned sole responsibility for the construction and operation of the gas conditioning plant at Prudhoe Bay to the producers rather than treating it as an integral part of the entire system, and precluded the Canadian sponsor—Foothills Pipe Lines (Yukon) Ltd.—from being assured of its ability to begin recovering its full investment costs once the project in Canada was completed, which was a basic condition of its participation.

In mid-June of 1981, the Alaskan pipeline sponsor requested that President Reagan submit to Congress a series of amendments to the U.S. legislation designed both to overcome these three particular problems and to remedy other shortcomings identified by members of the investment community, as more fully explained in the following section dealing with major U.S. developments.

Following an extensive round of consultations with the Alaskan pipeline sponsor, the producers, financial institutions, and key congressional leaders, the Administration on October 15, 1981, submitted a series of proposed waivers to the U.S. legislation for consideration by the Senate and House of Representatives. In an accompanying statement to Congress, President Reagan recalled that in a prior message to Prime Minister Trudeau he had expressed his hope that the legislative amendments would help to remove remaining impediments to the private financing of the pipeline. "I believe," the President wrote, "that this project is important not only in terms of its contribution to the energy security of North America. It is also a symbol of U.S.-Canadian ability to work together cooperatively in the energy area for the benefit of both countries and peoples."

Following lengthy hearings, committee recommendations supporting approval of the waiver package submitted by the Administration were approved by both the Senate and House of Representatives and the revised legislation was signed into law by the President on December 15, 1981.

The last major milestone during the course of the fiscal year came on March 16, 1982, when Commissioner Anthony Sousa of the U.S. Federal Energy Regulatory Commission (FERC), who earlier had been assigned lead responsibility for the Alaska Highway Gas Pipeline Project, presided over a one-day procedural conference to consider the status of the pipeline and the plans of its sponsors for dealing with outstanding financial and regulatory issues. In their statement to the Commissioner, spokesmen for Alaskan Northwest disclosed that, because of the long lead-time required from the completion of financing arrangements until the system was operational (around five and a half years), the scheduled date for the commencement of gas flows had been set back from late 1986 to late 1987. At the same time, however, they also submitted a schedule of submissions to the FERC by July 1, 1982, that was designed to meet all outstanding regulatory requirements. This included a financing plan, a gas marketability study, and an assessment of net economic benefits of the project. The company projected a timetable for consideration of these various issues by the Commission that anticipated issuance of a final FERC certificate of public convenience and necessity for the Alaskan portion of the system by December, 1982.



Wrapping operations at the pipeline crossing of the South Saskatchewan River in eastern Alberta.

(Within a matter of weeks, however, participants in the Alaskan segment of the project substantially revised their plans because of difficulties encountered in developing feasible funding arrangements. In a statement issued on April 30, 1982, following a two-day meeting in Salt Lake City, they announced that they planned to continue development of such financial arrangements with a view to completing the system and commencing operations by 1989, or earlier if possible. The participants reiterated their commitment to the project, which they believed was economically sound and in the national interest. Reflecting the factors that led to the revision in plans unfolded earlier before the FERC, the statement observed: "Financial planning must necessarily take into account changing circumstances which are beyond the control of the project, such as current short-term excess world energy supply, depressed crude oil prices, lower levels of economic activity in the U.S. and abroad, and uncertainties in financial markets.")

Major U.S. Developments

The Mainline Project

As first-stage construction of the southern segments of the pipeline proceeded, the primary focus of attention in the United States during the fiscal year was on the enactment of certain amendments to the governing U.S. legislation that were considered a fundamental prerequisite for the successful private financing of the northern segments of the project.

The first step forward came in May, 1981, when, as already indicated, the Alaskan pipeline sponsors and the owners of the Prudhoe Bay gas unveiled the "conceptual approach" they had drawn up as a framework for developing a concrete financing plan following further consultation with major financial institutions.

For purposes of financial planning, the "as spent" cost of the pipeline in Alaska (assuming completion by 1986) was estimated at $21 billion and that of the gas conditioning plant at Prudhoe Bay at $6 billion. The proposal envisaged provision being made for an additional $3 billion in funds as a cushion designed to cover any cost overruns and provide assurance of completion of construction. The total requirement for funds, therefore, was estimated to be a maximum of $30 billion. Of this amount, 75 per cent was to be raised from debt securities and the remaining 25 per cent from equity. It was proposed that the pipeline sponsor would own 70 per cent of the Alaskan system and the producers the remaining 30 per cent. Alaskan Northwest would be responsible for the raising of a total of $21 billion in debt and equity, the producers a total of $9 billion.

Nearly a month after the conceptual financing approach was made public, John G. McMillian, Chairman of the Alaskan Northwest consortium of gas shippers sponsoring the building of the pipeline, wrote to President Reagan to request that he submit to Congress a series of amendments to the existing U.S. legislation as a means of meeting "the essential concerns which must be addressed if we are to move forward with private sector financing".

The "essential concerns" referred to by Mr. McMillian involved certain conditions established by President Carter in the Decision and Report to Congress that he submitted in September, 1977, subsequently adopted as part of the *Alaska Natural Gas Transportation Act,* which increasingly came to be viewed as a fundamental impediment to the private financing of the project.

The President's submission to Congress, for example, anticipated that the major owners of gas reserves in Prudhoe Bay would play a substantial role in supporting the financing of the pipeline in Alaska because of the very large benefit they would derive from its construction. But because of anti-trust considerations, the 1977 Decision prohibited the producers from having any participation in the ownership of the Alaskan pipeline or any part in managing its planning and construction. The producers, however, steadfastly declined to lend support to the financing of the pipeline under these circumstances.

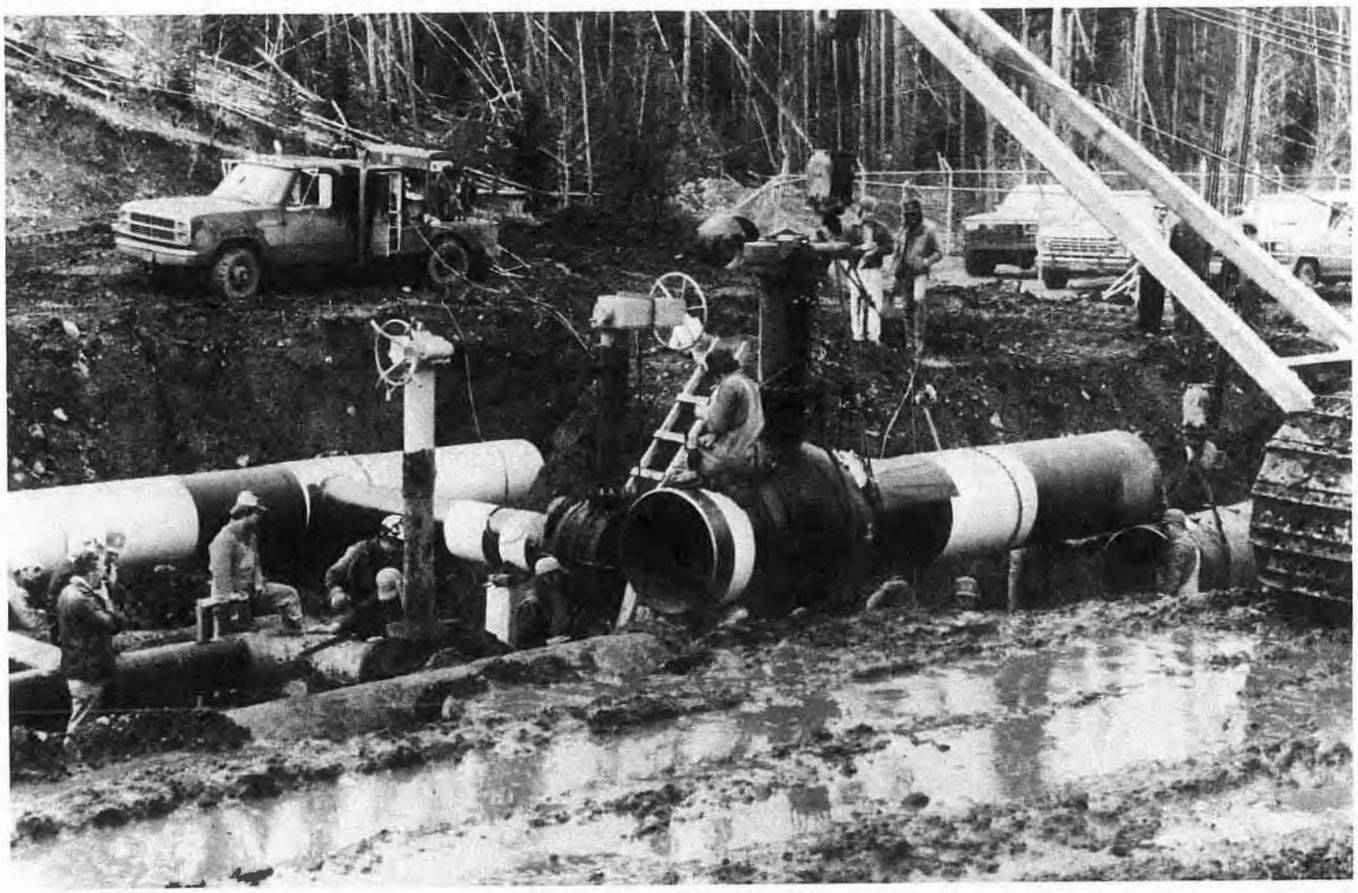
Under the President's Decision, the massive plant required to condition the Prudhoe Bay gas prior to its delivery to the pipeline (through the removal of such substances as moisture, carbon dioxide and natural gas liquids) did not come under the provisions of the *Alaska Natural Gas Transportation Act*, with the result that the producers were required to assume primary responsibility for the cost of its construction and operation. Because the conditioning plant will, in fact, form an integral part of the pipeline system, this stipulation also was regarded as unrealistic and, hence, as a serious impediment to the successful financing of the project.

The third concern, one which was shared by pipeline sponsors in both Canada and the United States, was a condition laid down in the President's Decision that prohibited them from levying a charge against U.S. shippers of Alaskan gas and their customers until the entire pipeline system had been completed and commissioned—that is, judged by regulatory authorities as being ready to become fully operational.

As noted earlier, Foothills (Yukon), the sponsor of the project in Canada, had from the outset insisted on assurances that it would begin to be fully reimbursed for its investment costs, including provision for a return on and of equity, once the mainline in this country had been completed and leave-to-open the system granted by the National Energy Board, even if parts of the U.S. system were not yet ready to go into operation.

In a letter to Prime Minister Trudeau in mid-July, 1980, which formed one element of the assurances required by the Canadian government prior to authorizing commencement of first-stage construction of the southern segment of the project, President Carter stated that he would be prepared to request Congress to adopt any legislative amendment required to meet the "reasonable concern" of the Canadian pipeline sponsor.

In the United States, an earlier order issued by the Federal Energy Regulatory Commission would have had the effect of permitting the Alaskan pipeline com-



Final tie-in of the Western Leg into the system of Alberta Natural Gas Company Ltd. in the Crowsnest Pass area of southeastern B.C. in May 1981.

pany to begin imposing a tariff on gas shipping firms only after the entire system in both countries had been completed, even if it were not yet operational. Under this order, however, the tariff would only have been sufficient to cover the Alaska pipeline's "minimum bill"—that is, sufficient to cover debt servicing, operating and maintenance costs, but without any provision for return on or of equity invested. In its submission to President Reagan, Alaskan Northwest said that it had been advised by its bankers and other financial advisors that the Alaskan segment of the system could not be funded unless provision were made for the imposition of a minimum bill on gas shippers when either the pipeline *or* the conditioning plant were ready to go into operation, even if other parts of the system still remained to be completed before gas could begin flowing.

The legislative amendments proposed to Congress by the President on October 15, 1981, were aimed at resolving all of the problems outlined above, as well as meeting certain other ancillary concerns—one of the foremost being the establishment of a greater degree of certainty with respect to the permanence of the regulatory regime governing the system. There was widespread support in and outside of Congress for the waivers proposed by the President both to permit the producers to participate in the ownership and management of the Alaskan pipeline on terms and conditions approved by the FERC, consistent with anti-trust laws, and to bring the Prudhoe Bay conditioning plant under the provisions of the Act.

Considerably more controversy surrounded the proposed contingency provision enabling the builders of any one of the three segments—the conditioning plant, the Alaskan pipeline, and the Canadian pipeline—to begin recovering their costs (fully in the case of Canada and partially in the case of the other two Alaskan segments) from U.S. consumers in the event that any one of them was ready to go into operation prior to completion of the entire system and the commencement of gas flows.

The principal criticism directed against the provision concerned the risk that consumers could be required to begin meeting some part of the cost of the pipeline system before gas actually began to flow through it. In point of fact, however, the proposed amendment had the effect only of modifying the risk to which the con-

sumer was already exposed under the original legislation adopted by Congress. Under that Act, consumers could have been required to begin meeting system costs once the entire pipeline were ready to go into operation even if gas were not flowing to market. Such a contingency could have arisen if the whole of the pipeline had been completed but the conditioning plant, which under the 1977 law was the sole responsibility of the producers, were still not operational. While the amendment proposed by the Administration altered the nature of the risk through a contingency billing provision involving each of the three separate segments, it also added a new element of protection for the consumer through a stipulation that no charges could be levied to cover the cost of any completed segment until after a "date certain" established by the FERC—a date when the entire system was expected to be in operation.

Following a series of hearings by congressional committees, the Senate in November approved adoption of the waiver package recommended by the President by a vote of 75 to 19 and the House of Representatives gave its concurrence the following month by a final vote of 229 to 188.

In January, 1982, several members of the Senate and House of Representatives, together with five state attorneys-general and a number of consumer groups, filed a complaint in the U.S. federal court challenging, on procedural grounds, the waiver package passed by Congress and the subsequent action taken by the Federal Energy Regulatory Commission amending the conditional certificate to include the conditioning plant as part of the system. (The case was subsequently dismissed by the federal court in April, 1982.)

During the period under review, the Federal Energy Regulatory Commission issued an interim report on the estimated construction costs for the Alaskan segment. In its report, the FERC endorsed the conclusions reached by independent engineering consultants (Williams Brothers) to reduce the certificated capital costs filed by the sponsor from $8.13 to $6.73 billion (1980 U.S. dollars), excluding financing charges. At the same time, the FERC deferred decisions on a number of related issues. These matters remained under review at the end of the fiscal year.

As indicated in the previous section, on March 16, 1982, the Federal Energy Regulatory Commissioner charged with special responsibility for the project, Anthony Sousa, presided over a technical conference to receive a report from the sponsors on the status of the project and their plans for meeting the outstanding financing and regulatory requirements.

In the course of testimony, the U.S. sponsors indicated publicly for the first time that they were now working towards an in-service date of November 1, 1987, one year later than earlier anticipated. This new target date was predicated on the assumption that a financing plan could be in place by June 1, 1982, with final certification being granted by the FERC by December 1, 1982.

The sponsors also raised a series of issues which needed to be addressed by the FERC if this timetable was to be met. These included such matters as approval of preliminary expenditures by the sponsors, endorsement of the certification cost estimate, and the determination of those costs that could be passed along by the shipper to the consumer. The sponsors also outlined a schedule by which they would make certain submissions to the FERC by July 1, 1982, including information relating to the tariff, a financing plan, a gas marketability study, an examination of net national economic benefits, and amendments to the partnership agreement.

Urged by the U.S. sponsors to expedite the regulatory procedures wherever possible, Commissioner Sousa proposed the use of phased proceedings in the nature of technical conferences and the less formal rule-making procedures for the final certification proceedings.

(As already noted, the pipeline participants were subsequently forced to conclude that prevailing economic conditions ruled out completion of the project by 1987 and indicated they would continue to work to conclude the project by late 1989, with the possibility of advancing this date by one year.)

First-Stage Construction of the Western and Eastern Legs

Throughout the year under review, construction continued on the southern segments of the pipeline in the United States.

Following the commencement of construction activity in December, 1980, work proceeded throughout the first half of the fiscal year to complete the 258 km (160.5 mi.) of loops to the Pacific Gas Transmission System, from the Canadian border at Kingsgate, B.C., to Stanfield, Oregon, which makes up the first phase of the U.S. Western Leg. An additional 565 km (361 mi.) of loops were completed on the existing systems of Northwest Pipelines and El Paso Natural Gas, known together as the Western Delivery System, to allow for the initial transport of surplus Canadian gas to California markets. (During Stage Two construction, the

At a ceremony sponsored by Pacific Gas Transmission Co. in Los Angeles on October 1, 1981, to mark the first flow of gas through the Western Leg, Senator H. A. (Bud) Olson, Minister responsible for the Northern Pipeline Agency, recounts the participation of the Canadian government in the Alaska Highway Gas Pipeline Project.

Western Leg will be further extended from Stanfield, Oregon, to Antioch, California — a distance of approximately 1 464 km (911 mi.).)

On October 1, 1981, Canadian and U.S. representatives of government and industry attended a ceremony in Los Angeles, California, sponsored by the Pacific Gas Transmission Co., to mark the commencement of gas flow through the system.

Construction got underway on May 4, 1981, on six spreads along the U.S. Eastern Leg, which was scheduled to be built over a two-year period. Original plans, which had called for this segment to be completed in one year, were revised as a result of a decision by the North Dakota Public Service Commission to reject, for environmental reasons, the route of the pipeline that had previously been approved by the Federal Energy Regulatory Commission. In the fall of 1980, this decision was challenged in the courts on constitutional grounds by the U.S. federal regulatory authorities and the pipeline company. In April, 1981, the court upheld the federal position that the responsibility to determine routing issues should rest with the federal authority.

By winter shutdown approximately 77 per cent of the 1 321 km (821 mi.) Eastern Leg, being undertaken by Northern Border Pipeline Co., had been completed. Work resumed on the remaining portion in March, 1982. (The Eastern Leg began to transmit gas to midwestern U.S. markets on September 1, 1982.)

Final design cost estimates for first-stage construction of the southern U.S. segments were approved by the Office of the Federal Inspector (OFI) during the year. Excluding financing charges, estimates of approximately $1.16 billion (in 1979 U.S. dollars) were approved for the Eastern Leg. The OFI also approved final design cost estimates of approximately $168 million (in 1981 U.S. dollars) for the first phase of the Western Leg.

Major Canadian Developments

The Mainline Project

Although the overseeing of first-phase construction required much of their attention throughout the fiscal year, officials of the Northern Pipeline Agency continued to be engaged in planning, research and consultations with respect to the design and construction of the second-stage segment in northern Canada.

The Canadian sponsor, Foothills Pipe Lines (Yukon) Ltd., maintained development of the many plans and studies required under the Agency's engineering orders and socio-economic and environmental terms and conditions. In May, 1981, the Minister responsible for the Northern Pipeline Agency, Senator H.A. (Bud) Olson, approved the company's Manpower Plan for the Canadian portion of the pipeline except for the Yukon segment.

As more fully described later in this report, the Environmental Assessment and Review Panel resumed public hearings in Whitehorse, Yukon, in June, 1981, to consider Foothills' proposal to route the pipeline around the city via the Ibex Pass and other possible routing alternatives. Because of the environmental risk to the Pass that could result from increased access following construction, the Panel recommended that the pipeline follow an alternate route around Whitehorse, a

recommendation that was endorsed by the Minister of the Environment. The issue remained in abeyance at year's end pending the consideration by the Yukon Territorial Government of plans being developed for the management of the Ibex area.

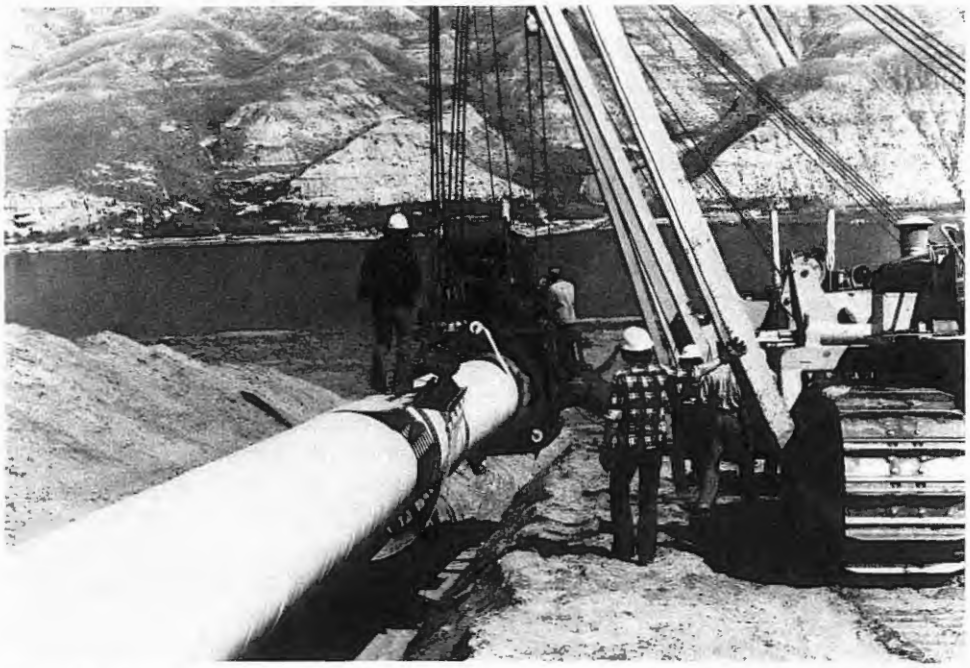
Other issues addressed by the company during the year included the method of installing the pipeline in areas of discontinuous permafrost in the Yukon. Foothills also submitted its final report to the National Energy Board with respect to the series of fracture tests on large-diameter pipe that had been conducted over the past several years at the Northern Alberta burst-test facility. The report's findings were subsequently approved by the Board.

Throughout the year under review, Agency officials continued to consult with their U.S. counterparts in the Office of the Federal Inspector on matters of mutual interest and concern. At a meeting held in Ottawa in March, 1982, it was decided that future sessions should be scheduled on a quarterly basis in order to keep both organizations better apprised of developments related to the project.

First-Stage Construction of the Western and Eastern Legs

With the final leave-to-open on the Western Leg through southeastern British Columbia being granted by the National Energy Board on May 21, 1981, construction commenced the following day on the Eastern Leg, which traverses the provinces of Alberta and Saskatchewan. As already noted, gas began to flow through the Western Leg to southern California in the autumn of 1981. By December of 1981, approximately two-thirds of Canada's Eastern Leg was built, including the entire Saskatchewan portion of the pipeline. Construction resumed on the remaining sections of the pipeline and one compressor station in Alberta and on three compressor stations and a meter station in Saskatchewan in the spring of 1982. (As noted earlier, the Eastern Leg began to carry gas to mid-western U.S. markets on September 1, 1982.)

Following public hearings to consider the final design cost estimates prepared by Foothills Pipe Lines (Yukon) Ltd. for the southern segments of the system, the National Energy Board announced its Reasons for Decision in August, 1981. In its report, the Board approved final design cost estimates of approximately $164,031,000 for the Western Leg, thereby reducing the company's estimates by two per cent. For the Eastern Leg, the Board approved final design cost estimates of $621,254,000, which was approximately five per cent less than those costs requested by the company. The approved costs do not include charges for the actual funds used during construction and certain other costs associated with regulation by the appropriate authorities. (As described in more detail later in this report, the final design cost estimates were later revised to take into account actual construction costs for the Western Leg and a major design change on the Eastern Leg.)



Wrapping operations at the pipeline crossing of the South Saskatchewan River in eastern Alberta.

Subsequent to the Canadian government's decision in July, 1980, to approve the first-stage construction of the southern segments of the Alaska Highway Gas Pipeline, Ian Waddell, New Democratic Party Member of Parliament for Vancouver-Kingsway, filed a suit in the B.C. Supreme Court. Mr. Waddell alleged that the Governor in Council had exceeded its authority in amending the terms and conditions of the *Northern Pipeline Act* so as to permit first-stage construction of the southern segments of the system in Canada. Following a hearing to consider preliminary matters in July, 1981, Mr. Justice Murray ruled both that the British Columbia Supreme Court had jurisdiction to hear the case and that the plaintiff had standing to bring the action. Appeals to the B.C. Court of Appeal challenging Mr. Justice Murray's decision, which were filed by the Governor in Council and the Foothills Group of Companies in the summer of 1981, remained to be heard at the end of the fiscal year.

Parliamentary Surveillance

In April, 1978, Parliament established the House of Commons Standing Committee on Northern Pipelines to oversee the implementation of the *Northern Pipeline Act* and the activities of the Northern Pipeline Agency during the course of the project. In June of the same year, the Senate took a similar step and created a Special Committee of the Senate on the Northern Pipeline.

The House of Commons committee met several times throughout the year to hear testimony from senior Agency officials. In a special presentation to the committee in June, 1981, members of Parliament were briefed on the Agency's unique role of regulating and facilitating the Alaska Highway Gas Pipeline Project.

Members of the Senate Committee travelled to points along the pipeline route in Yukon and Alaska in the spring of 1981 to acquaint themselves better with the potential impacts of the project. During their trip, the Senators met with Agency members, staff from the U.S. Office of the Federal Inspector, departmental secretaries and officials of the State of Alaska, as well as representatives from industry, special interest groups, and native organizations.

Operations of the Northern Pipeline Agency

Agency Activities

The year began at a high level of activity with leave-to-open granted by the National Energy Board to Foothills Pipe Lines (Alta.) Ltd. and Foothills Pipe Lines (South B.C.) Ltd. for the completed first-stage sections of the Western Leg of the Alaska Highway Gas Pipeline in southwestern Alberta and southeastern British Columbia.

In preparation for the start of construction of the Eastern Leg through southeastern Alberta and southwestern Saskatchewan, the Northern Pipeline Agency approved in May, 1981, the remaining plans required by Foothills Pipe Lines (Sask.) Ltd. and Foothills (Alta.) under the Agency's environmental and socio-economic terms and conditions. Following a series of leave-to-proceed orders issued to Foothills (Alta.) and Foothills (Sask.) in late May by the Agency's Designated Officer, work commenced on three spreads, each monitored by an Agency surveillance team.

During the year, the Agency handled a total of 441 individual submissions by the Foothills Group of Companies relating to first-stage construction of the Western and Eastern Legs and the second stage of the project in northern Canada. These included 20 approvals under the environmental and socio-economic terms and conditions, 94 orders relating to the taking of additional right-of-way lands in Alberta and Saskatchewan, and 7 approvals of contracts, agreements and recommendations with respect to the purchase of various pipeline components.

Socio-Economic and Environmental Plan Review

Early in the fiscal year, the Agency approved schedules prepared by Foothills (South Yukon) and Foothills (North B.C.) for the submission and review of the socio-economic and environmental plans for construction of the pipeline in southern Yukon and northeastern British Columbia, respectively. The plans outline how each company intends to fulfil the terms and conditions set by the Agency for each section of the line. As of the end of the fiscal year, the terms and conditions for the Yukon segment still awaited approval by the Governor in Council pending consideration of their compatibility with the mobility provisions of the new Canadian Charter of Rights and Freedoms.

During the year, Agency staff reviewed a series of draft plans for the Yukon and northeastern B.C. sections in consultation with the territorial and provincial governments and regional advisory councils. These documents included the companies' plans for providing project information to affected communities and groups before and during construction, a transportation and logistics plan for moving material and manpower, and details on the size, scheduling and location of work camps. The first 4 of about 20 environmental protection plans required for the Yukon segment were also submitted to the Agency for review.

By the close of the fiscal year, 10 out of 12 socio-economic draft plans for Yukon were in an advanced stage of review, including the telecommunications and transportation and logistics plans, both of which also cover northeastern B.C. The Agency reviewed five draft plans for northeastern B.C.

Crew member at work during 1981 construction.

Prior to the March, 1982, start of the second season of Eastern Leg construction in Alberta, the Agency had approved the relevant route alignment sheets and an amendment to Foothills' environmental plans and procedures manual dealing with methods of topsoil salvage in Alberta. Alberta government officials, through the Pipeline Co-ordinator's office in the Department of Federal and Intergovernmental Affairs (FIGA) and members of the province's Development and Reclamation Review Committee, participated in considering the material submitted by the company.

Environmental Assessment and Review Panel for Yukon

In a report released in August, 1981, the federal Environmental Assessment and Review Panel (EARP) studying the environmental implications of building the Alaska Highway Gas Pipeline through Yukon recommended the line be routed north and west of Whitehorse. Foothills (South Yukon) had previously proposed to bypass the city by following a route through the Ibex Valley south of Whitehorse, an issue examined by the EARP Panel at a two and a half day public hearing in Whitehorse in June, 1981.

In September, 1979, the EARP Panel had submitted an interim report to the Minister of Environment identifying areas which it considered to be deficient in the Environmental Impact Statement submitted earlier by the company. During the year under review, the Agency reviewed and forwarded to the Panel the outstanding submissions made by the company with respect to the additional information required. The additional material included information on geotechnical, hydrological, pipeline design and revegetation issues, matters relating to route alternatives, pipeline facilities, and construction scheduling with respect to fisheries and wildlife. By April, 1982, preparations were under way for a final technical hearing to be held by the EARP Panel in Whitehorse to consider the company's series of submissions and interventions filed by interested parties.

Compensation for Loss of Livelihood

One of the long-standing concerns of the Agency has been that of the establishment of a fair and effective system to provide compensation for loss of livelihood to native people and others whose traditional use of the land may be adversely affected by the impact of the Alaska Highway Gas Pipeline Project.

The commitment to provide compensation to hunters and trappers for any losses incurred was one of the undertakings made by Foothills (Yukon) before the National Energy Board in 1977. During the fiscal year covered by this report, the Agency and the company took steps to develop a compensation policy that takes into account the concerns of the provincial and territorial governments involved and those of particular interest groups such as native communities and trappers' and hunters' associations.

During the course of the year, an Agency working group was formed to examine the various social, cultural, economic, and biological aspects of the question. Consisting of three senior Agency officials and consultant W. Winston Mair, who presided over the Agency's 1979 hearings in B.C. and who was acting in this case as an adviser to the Commissioner, the working group held several meetings early in 1982 with representatives of Foothills to discuss in broad terms the elements of a possible compensation policy. In April, the Agency held a series of meetings with the Alberta,

Crossing the South Saskatchewan River in eastern Alberta. As sideboom tractors lower the first section of pipe into the water, a bulldozer anchored on the opposite shore pulls the pipe with cables.

B.C. and Yukon governments and the various interest groups. All parties indicated that the first priority, as underlined by the Agency's environmental terms and conditions, should be the reduction or prevention of adverse environmental impacts.

During the course of these discussions, the Agency contracted with the Treaty 8 Tribal Association of B.C. to conduct community and band consultations in northern B.C. and to convey the views of the various native groups to the Agency on the subject of compensation for loss of livelihood, as well as route and facility locations.

Native Relations

Throughout the year, Agency staff maintained contact with representatives from the Indian Association of Alberta, the Union of B.C. Indian Chiefs (UBCIC), the Métis Association of B.C., the United Native Nations, and local Indian Friendship Centres. Consultations also took place with the two newly-formed native organizations in northeastern B.C.—the Kaska Dena Council, which represents 830 status and non-status Indians north and east of Fort Nelson, and the Treaty 8 Tribal Association, which speaks for about 1,000 status Indians from seven bands in and south of Fort Nelson.

The Kaska Dena was recently formed to press its case for land claims in the area of northeastern B.C. The proposed route of the Alaska Highway Gas Pipeline traverses a portion of the land to which the Kaska Dena filed a claim with the Department of Indian Affairs in February, 1982.

The Agency and Foothills (North B.C.) held meetings early in 1982 with each of these native groups to provide an update on plans for construction of the pipeline through northeastern B.C., including the proposed route and the location of access roads, compressor stations and construction camps.

In November, 1981, the UBCIC completed a five month contract for the Agency involving community-level consultations on the general route alignment of the pipeline in northeastern B.C. and the anticipated impact of the project on traditional areas used for trapping, hunting, fishing and cultural activities. Following completion of the preliminary work, it was decided by the parties involved that another contract, to carry out a further phase of consultation, would be entered into with the Treaty 8 Tribal Council. Negotiations were subsequently undertaken by the Agency in the spring. Towards the end of the fiscal year, similar contracts were also under negotiation between the Agency and the Kaska Dena Council and the Indian Association of Alberta.

In February, 1982, Foothills undertook a series of visits to several Yukon communities along the pipeline route. The purpose of these visits was to provide the public with an opportunity to respond to the company's draft socio-economic plans, including the transportation and logistics, information, consultation and liaison, and work-camp plans. In connection with this public review, company and Agency officials met with all Indian bands along the pipeline corridor in Yukon.

Members of the Agency's Whitehorse office established a process, in co-operation with the Department of Indian Affairs' Office of Native Claims, for resolving with affected Indian bands any conflict between land required for construction of the Alaska Highway pipeline and traditional land interests of Yukon Indian people.

With respect to employment resulting from first-stage construction of the southern segments of the project, native people represented about 7.4 per cent of the crew working on the Eastern Leg during 1981—similar to the participation level for Western Leg construction during the previous year.

Several contracts for pipeline-related activities in Alberta were awarded to native-owned companies,

including Longbranch Contractors Ltd. of Atikameg, Alberta, for clearing the initial 54 km (34 mi.) of the Eastern Leg right-of-way and Noceta Enterprises Ltd. of Grande Prairie, Alberta, which undertook the revegetation work along the sections of the pipeline near Olds and Brooks.

In May, 1981, the Agency issued a direction to Foothills (South B.C.) to halt operations on the Western Leg in southeastern B.C. until the issue of local native employment on the project was resolved with the Kootenay Indian Area Council. As a result of negotiations among Agency, Council and company representatives, native people participated in the clean-up phase. Kootenay Indian Enterprises Ltd. was also awarded a contract for the revegetation of the southeastern B.C. right-of-way. About 15 local Indians were involved in the work, which began on July 20 and was completed ahead of schedule in mid-September.

The Hon. Mitchell Sharp, Commissioner of the Northern Pipeline Agency (left) and Harold S. Millican, Administrator and Chief Operating Officer (right), tour Eastern Leg Construction in Alberta.

Federal-Provincial-Territorial Co-ordination

Regular quarterly conferences by the Federal-Provincial-Territorial Consultative Council (FPTCC) continued during the year. Composed of senior officials from the Agency and the Governments of Yukon, British Columbia, Alberta and Saskatchewan, the FPTCC was established in 1978 under the *Northern Pipeline Act* to ensure the co-ordination of activities with respect to the Alaska Highway Gas Pipeline.

At the September 16, 1981, meeting of the FPTCC in Dawson City, Yukon, the Hon. Mitchell Sharp, Commissioner of the Agency, on behalf of the Government of Canada, signed a Memorandum of Agreement with the Government of Saskatchwan. Similar to that entered into the previous year with the Alberta goverment, the agreement provides for consultation and co-operation on all relevant matters related to the planning, construction and operation of the pipeline in Saskatchewan. These include the socio-economic and environmental plans, final routing, the granting of land rights on provincial Crown land, and surveillance of construction of the pipeline.

During the year, the Agency consulted with provincial and territorial government bodies, as well as with other federal departments, on such issues as manpower and training, compensation for loss of livelihood, and Foothills' draft environmental and socio-economic plans for second-stage construction of the pipeline.

Regional Advisory Councils

During its first year and a half of operation, the Northern British Columbia Advisory Council identified employment and training, local business opportunities, and transportation upgrading as the chief concerns northern B.C. residents have with respect to construction of the Alaska Highway Gas Pipeline in the province. As provided for under the *Northern Pipeline Act*, the 10-member group was appointed by the Governor in Council in September, 1980, to advise the Minister responsible for the Northern Pipeline Agency on all matters relating to the pipeline project.

Since its inception, the Council has submitted two briefs to the Minister. The first, dated May, 1981, contained recommendations for setting up a tax system to ensure that the people of northeastern B.C. do not bear the increased costs of social services and capital works resulting from pipeline construction. In the

second brief, submitted in February, 1982, the Council stressed its desire for Foothills (North B.C.) to provide local employment, training and small business opportunities for individuals and non-union firms.

Throughout the year, the Council met regularly with representatives from the Agency and Foothills (North B.C.) and consulted with people from labour unions, native groups, B.C. Rail, and local Chambers of Commerce. The Council also opened an office in Fort Nelson in February, 1982, to provide better contact with local citizens on pipeline-related issues.

In September, 1981, the Minister appointed Margaret Elizabeth Todrick of Fort St. John as a member of the Council to fill the vacancy created by the resignation of Patrick Walsh, who served as the first Chairman of the Council. He withdrew from membership to assume the position of Commissioner and Chief Executive Officer of Tumbler Ridge, B.C. The Council subsequently elected Don Edwards of Fort Nelson as the new Chairman. In March, 1982, Jack Hannam of Fort St. John became the new Vice-Chairman, replacing George Miller of Lower Post, who resigned because of the executive duties he had assumed with the Kaska Dena Council.

Among the highlights of the year was a joint meeting between the Northern British Columbia and the Yukon Advisory Councils on November 28, 1981, in Fort St. John. A member of the Board of Directors of the Impact Information Centre in Fairbanks, Alaska, spoke to the group on the purpose and function of the organization that was set up by the city during construction of the Alyeska oil pipeline to gather and disseminate information on the impacts created by the project. The Yukon Advisory Council pressed during the year for the establishment of a similar centre in Whitehorse to determine how the Alaska Highway Gas Pipeline would affect the average resident in Yukon.

Appointed by the Federal Cabinet in February, 1979, and chaired by Don Roberts of Whitehorse, the Yukon Advisory Council was consulted during the year by the Yukon Government on the preparation of a proposal for government-sponsored training programs in construction skills. The Council also focussed on project-related issues such as small business opportunities, compensation to trappers and hunters for loss of livelihood, the proposed route of the pipeline through the Ibex Pass area near Whitehorse and possible routing alternatives, and the distribution of Alaskan natural gas to Yukon communities along the route once the pipeline becomes operational.

In May, 1981, the Council Chairman met in Whitehorse with the Hon. H. A. (Bud) Olson, Minister responsible for the Northern Pipeline Agency. In June, members of the Council also had the opportunity to brief visiting members of the Special Committee of the Senate on the Northern Pipeline on their role and activities.

Other Public Consultations

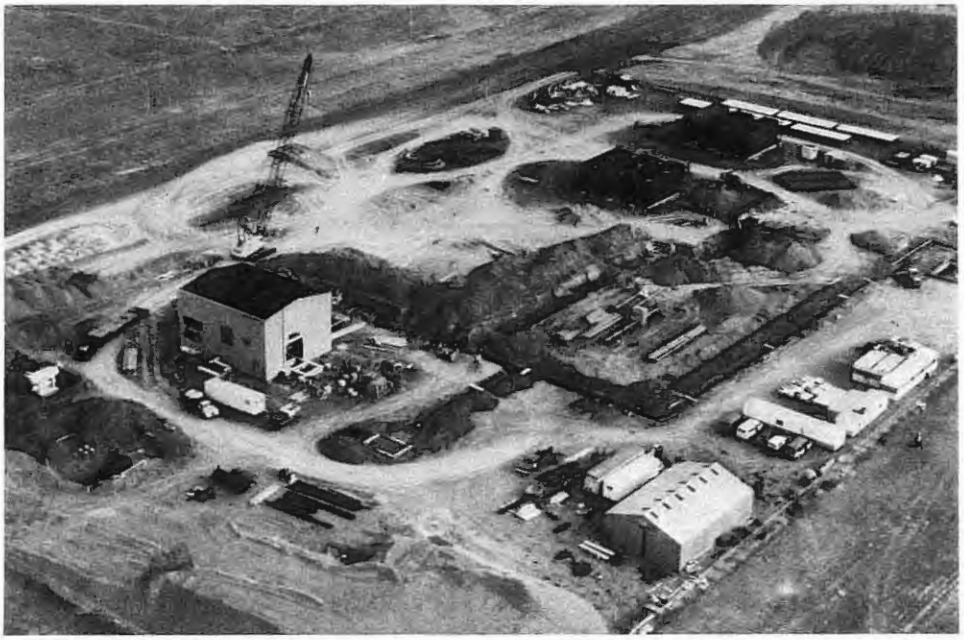
As construction wound down and revegetation of the right-of-way progressed along the Western Leg in southeastern B.C., the Agency's Vancouver staff maintained frequent contact with the Kootenay Indian Area Council and other local interest groups. Several meetings were also held during the year with landowners in the Yahk, B.C. area to discuss concerns related to construction activity on their property and the reclamation work that followed.

In addition, Agency staff monitored the progress of the Foothills' companies in Alberta and Saskatchewan in negotiating settlements with property owners for the acquisition of land along the route of the Eastern Leg. Agency representatives also visited each of the communities along the Eastern Leg to provide information relating to the Agency's role in the project and to ensure local interests were considered.

Staff from the Agency's Vancouver and Whitehorse offices continued to meet throughout the year with individuals and groups living near the pipeline's proposed route in northeastern B.C. and Yukon.

Mr. Sharp, Commissioner of the Agency, participated as a guest speaker on several occasions during the year, including an address in October, 1981, to a gathering of financiers in New York City hosted by the Canadian Consul General, Kenneth Taylor, and a speech in February, 1982, to the annual meeting of the Canadian Association of Oilwell Drilling Contractors in Calgary.

To mark the start of construction of the U.S. Eastern Leg of the pipeline, Northern Border Pipeline Co. held a groundbreaking ceremony on May 5, 1981, in Aberdeen, South Dakota, attended by government and business leaders from both Canada and the U.S. On October 1, 1981, several Canadian industry and government representatives, including Senator Olson, the Minister responsible for the Agency, were in Los Angeles, California, for a ceremony held by Pacific Gas Transmission Co. to commemorate the first flow of gas through the Western Leg. At each of these events, Agency spokesmen took the opportunity to confer on an informal basis with their U.S. counterparts from the Office of the Federal Inspector (OFI). In addition, an official meeting with the OFI was held in Ottawa in February, 1982.



Aerial view of compressor station facilities under construction at Jenner, Alberta in November 1981.

Manpower Planning and Labour Affairs

In May, 1981, Senator Olson, the Minister responsible for the Agency, approved Section I of the Manpower Plan, which covered all pipeline construction activities south of 60° North. In March, 1982, Foothills (Yukon) filed a draft version of Section II of this plan, which deals with construction of the Yukon section of the pipeline and the operations phase of the entire project. Following initial study of this submission by Agency staff, a joint review by representatives of the Yukon Government, the Yukon Advisory Council, and Employment and Immigration Canada, was scheduled to be undertaken in the 1982-83 fiscal year.

The draft includes the Opportunity Measures Plan, which outlines the steps to be taken by the company to provide for the training and employment of native people and women. The company's previously approved Opportunity Measures Plans were successfully implemented during Phase I construction, with employment of native people during Western Leg activity averaging approximately 7.5 per cent and employment of women approximately 2.9 per cent.

During 1981 Eastern Leg construction, 7.2 per cent of the total number of person-days of employment in Alberta was worked by natives and 4.7 per cent by women. In Saskatchewan, native employment comprised 7.3 per cent of the total workdays, while female employment made up 5.6 per cent of the total.

Pipe is installed under a railroad near Piapot, Saskatchewan using a "slip bore". Powered by the machine in the foreground, an auger inside a length of pipe bores a tunnel under the railroad. The pipe is then pulled or "slipped" out and the "carrier" or permanent piece of pipe is inserted.

In May, 1981, Foothills (South Yukon) began a series of community visits in Yukon to gather information which could be developed into an interest and skills inventory for northern residents who might be expected to seek construction work on the pipeline project. The Agency monitored the company's methods of gathering and compiling the information received during the course of the community tours. By the end of the fiscal year, approximately 470 residents of Yukon and the Mackenzie District of the Northwest Territories had replied to the interest and skills inventory, which provides information on those people seeking pipeline jobs, the type of work they are interested in, the skills they possess, and the training they would require to qualify for employment of various kinds. A similar employment-related survey, sponsored by three federal departments, was conducted among native people in northeastern B.C. during the fall of 1981.

The Agency also monitored Foothills' Operations and Maintenance Training/Employment program for northerners. The company began recruiting in April, 1981, and, out of 250 applications, hired 21 people for on-the-job technical training beginning in October, 1981, in Alberta with Nova, An Alberta Corporation, and in British Columbia with Westcoast Transmission Company Ltd. The ultimate goal of the program is to make it possible for residents from Yukon and the Mackenzie Valley district to fill between 125 and 150 permanent operational and maintenance jobs in Yukon once the system is completed.

Other Agency responsibilities included the monitoring of labour market conditions and collective agreements.

Industrial Benefits

During the year, Foothills' procurement of goods and services for the project continued to provide substantial industrial benefits as a result of a high level of Canadian input. In its report to the Agency on industrial benefits for the period ending December 31, 1981, Foothills indicated that the overall level of Canadian content was 91 per cent for the Western Leg and 87 per cent for the Eastern Leg. The estimated person-years of direct and indirect Canadian employment were 2,255 and 6,050 for the Western and Eastern Legs, respectively.

Canadian-based manufacturing facilities continued to benefit from the major materials procurement activities with respect to such designated items as line pipe, turbo-compressors and large-diameter valves and pipe fittings. The line pipe for 1981 was again supplied by Stelco Inc. and Interprovincial Steel and Pipe Corporation Ltd. under the terms of the original contract, while Rockwell International of Canada Ltd. of Barrie, Ontario, and Borsig Hartmann Valve Ltd. of Calgary, Alberta, supplied a substantial portion of the large-diameter valve requirements for 1981. Fittings were again supplied, for the most part, by EPG Taylor Forge Division of Hamilton, Ontario, and ITT Grinnell of Princeton, Kentucky.

Bids were issued and orders placed for two major items of compression equipment during the year. The first of these involved the replacement of one of the two gas-driven turbine units originally proposed to be installed at the compressor station at Jenner, Alberta, by an electrically-driven unit of equivalent capacity.

This unit, the contract for which was awarded to Siemens Electric Ltd. of West Germany, is believed to be the most powerful electric motor ever installed to operate a gas pipeline compressor. The installation of the unit will allow Foothills to gain valuable experience in connection with its longer-term commitment to consider electrically-driven compressors as an alternative to gas turbines in southern Yukon.

The second unit, which was ordered from Cooper Rolls Corp. of Mississauga, Ontario, resulted from various design modifications to the pipeline system to accommodate the short-term export of Alberta gas and will be installed at Richmound, Saskatchewan. The compressor station will ultimately be needed to accommodate the flow of Alaskan gas. The total value of the contracts approved by the Agency was approximately $15 million.

As part of its preparation for the procurement of materials for Stage Two construction and, in particular, to increase the security of supplies, Foothills continued discussions with various pipe manufacturers with the intent of entering into a standby pipe supply contract. These discussions resulted in a request to the Agency from Foothills for approval to enter into a contract with Mannesman Handel A.G. of West Germany for pipe on a standby basis only in the event that the Canadian suppliers were unable to meet their contract commitments. This contract was approved by the Designated Officer in January, 1982.

Foothills continued during the year to increase the potential for Canadian industrial benefit in the development of management expertise and pipeline-oriented research. The latter area was particularly highlighted by the operation of the Northern Alberta Burst Test Facility and the Quill Creek test facility, together with the development of self-steering pipe transportation equipment.

Self-Steering rear assembly of a four-axle tractor-trailer loaded with 23-m (76-ft.) lengths of pipe for test runs along the Alaska Highway.

The Agency has continued to develop its relationship with the Office of the Federal Inspector in connection with those matters related to procurement under the terms of the Canada-U.S. Pipeline Agreement and the reciprocal agreement relating to designated items. This relationship has allowed for timely notification of procurement activities on both sides of the border.

Transportation and Logistics

While Transportation and Logistics field activities for Stage-One construction of the Alaska Highway Pipeline continued, the pace of planning related to Stage Two accelerated.

The delivery of materials required for 1981 construction, including line pipe, fittings and valves, began early in the construction season and was completed by early September.

During the winter of 1981-82, 192 km (120 mi.) of 1 067-mm (42-in.) diameter pipe, required for 1982 construction of the remaining portion of the Eastern Leg in Alberta, were shipped by rail to nine off-loading points near the pipeline route and trucked to stockpile sites along the actual right-of-way. Little use of public highways was required. The Agency's field surveillance staff followed the movement of pipe from railhead to stockpile and reported no significantly adverse impacts on the area's road system or its users.

Since Stage-Two construction in northern Alberta, B.C. and Yukon will go through areas of rugged terrain and limited transportation facilities, planning the safe and efficient movement of materials and manpower is a more complex exercise. The Agency's socio-economic terms and conditions for northeastern B.C. and Yukon require Foothills to minimize disruption of existing transportation services and that any additional transportation infrastructure built at company cost be of long-term benefit to the affected communities. By the end of the year, the company was preparing its final transportation and logistics plan following extensive review of earlier drafts by the Agency, the Alberta, B.C. and Yukon governments, and regional advisory councils. The plan identifies the routes, as well as the types and number of vehicles the company intends to use, with the aim of demonstrating the ability of the system to handle the total volume of project-related traffic.

The Agency continued to monitor various experiments Foothills conducted using specialized vehicles and methods of transporting large-diameter pipe. In February and March, 1982, the company ran test hauls of three joints of 24-m (80-ft.) pipe along the Alaska Highway in Yukon and northern B.C. as far south as Fort Nelson, using a specially designed tractor-trailer. The four-axle trailer unit has a rear-wheel assembly which is capable of automatically tracking the path of the front assembly. A similar experiment had been conducted the previous winter with a lighter weight, three-axle trailer. B.C. and Yukon Highway authorities have indicated they would permit use of the new four-axle version subject to certain conditions, in particular, that Foothills' pipe transportation contractors provide a training program to familiarize drivers with both the vehicle and the Alaska Highway.

The Agency also reviewed the transportation and logistics aspects of certain Foothills' reports that had been requested by the EARP Panel, which dealt with such construction-related issues as the movement of hazardous materials, the impact of campgrounds and recreation areas on the existing road system, and the construction of access roads.

As in past years, Agency staff consulted with federal, provincial and territorial officials and with operating companies on the capabilities of all elements of the existing transportation system to handle pipeline transportation requirements. An Agency representative attended detailed briefings held by Foothills in January, 1982, in Calgary for the trucking industry and in Vancouver for the marine industry.

Project Scheduling and Cost-Control Procedures

With the start of construction of the Eastern Leg in June, 1981, Foothills implemented a revised procedure

A completed pipeline section is ready for hydrostatic testing near Piapot, Saskatchewan. Heavy-walled test heads welded onto the pipe end are designed for safety as the water inside the pipe is pumped to test pressure—a minimum of 10 863 KPa (1,575 psi).

for reporting project costs to the Northern Pipeline Agency on a regular basis. The new system provided for more detailed and up-to-date cost information to be included in the company's monthly progress reports.

Agency staff met during the year with Foothills' representatives to develop a consistent format for the submission of plans and scheduling information required by regulation from the three segment companies—Foothills (South Yukon), Foothills (North B.C.) and Foothills (Alta.)—which will be constructing the northern portion of the pipeline in Canada. When completed, the regulatory schedule will include detailed lists of plans and documents requiring Agency approval prior to the start of construction and will establish the actual timing of submissions by Foothills and approvals by the Agency. (As a result of the delay in the completion date of Stage Two, announced in April, 1982, the company decided to postpone further work on the regulatory schedule.)

Incentive Rate of Return and Final Design Cost Estimates

Throughout the year, Agency staff members continued to work closely with the National Energy Board in analysing Foothills' final design cost estimates. As approved by the Board, these estimates provide the basis for determining the Incentive Rate of Return (IROR) on equity Foothills is allowed to earn under a previously established formula that takes into account the company's actual construction costs.

In August, 1981, the Board released its decision with respect to the final design cost estimates submitted by Foothills for the Stage I facilities of the pipeline. Based on a hearing held during the spring of 1981, the Board approved final design cost estimates of approximately $164,031,000 for the Western Leg, thereby reducing the company's estimates by two per cent. For the Eastern Leg, the Board approved final design cost estimates of $621,254,000, which represented approximately five per cent less than those costs submitted by Foothills. At the time of the hearing, construction on the Western Leg was almost completed and work on the Eastern Leg was about to begin.

Prior to the decision on Foothills' final design costs estimates for the southern segments, the Board had published a formula for calculating the rate of return allowed to the company under the Incentive Rate of Return program. As an inducement to keep expenditures to a minimum—consistent with sound design, engineering and operating practices—the IROR scheme provides the owner companies of the Alaska Highway Gas Pipeline with a higher rate of return on their equity investment in the project if actual costs are lower than the estimated costs approved by the Board and a reduced rate of return if costs exceed those estimates. Under the formula, Foothills was allowed a rate of return of 17.9 per cent on the Eastern and Western Legs if actual costs were the same as the approved final design cost estimates.

Since the company's actual costs for the Western Leg in Alberta came in at 8.5 per cent below estimated costs, and in southeastern B.C. at 1.5 per cent over estimated costs, rates of return on those two segments were calculated at 18.52 per cent and 17.66 per cent, respectively.

Pipeline Crossings

During the year, the Agency reviewed and approved the Plans, Profiles and Books of Reference required for 1981 construction on the Eastern Leg in Alberta and Saskatchewan, as well as the majority of those required for the 1982 construction phase on the Eastern Leg in Alberta.

Sideboom tractors lower the pipe into the bed of the Frenchman River in southwestern Saskatchewan.

The Agency also reviewed and approved both the crossing of highways and utilities by the Eastern Leg of the pipeline in Alberta and applications by other companies to cross the pipeline facilities.

In keeping with the "single-window" concept that led to its creation, the Agency also co-ordinated the granting of a number of approvals by other federal authorities involving pipeline crossings during the 1981 construction season. Thirteen orders approving the crossings of navigable waters in Alberta and Saskatchewan were authorized by the Ministry of Transport. The Railway Transport Committee of the Canadian Transport Commission approved three orders granting leave for the crossings of nine railways in Alberta, Saskatchewan and southeastern B.C.

In addition, the International Boundary Commission gave approval for the pipeline crossing of the Canada-United States boundary near Monchy, Saskatchewan, under the *International Boundary Commission Act.*

Landowner Concerns

During the fiscal year, Agency staff continued to monitor the efforts of the various Foothills companies to negotiate damage settlements and to deal with landowner concerns on the completed sections of the pipeline in Alberta, Saskatchewan and southeastern British Columbia.

Bill C-60, An Act to Amend the National Energy Board Act

Agency staff devoted a significant amount of time in early 1982 to analysing *Bill C-60, An Act to Amend the National Energy Board Act,* and the regulations required to implement it.

The legislation, which was passed by the Parliament of Canada on December 18, 1981, but not yet brought into force by proclamation by the end of the fiscal year, deals largely with the acquisition of land for pipeline projects.

The Act is aimed at strengthening the rights of private property owners affected by such projects through major changes in the procedures pipeline companies will be required to follow in the selection of routes and acquisition of land, as well as in the procedures to be followed by regulatory authorities in considering the approval of the Plans, Profiles and Books of Reference submitted by proponents.

Land Acquisition in Alberta for the Eastern Leg and 56-Inch Pilot Spread

In April, 1981, Foothills (Alta.) began the route selection process for a proposed 59-km (37-mi.)

stretch of the Alaska Highway gas pipeline extending northward from James River Junction in west central Alberta.

Construction of this initial section of the northern segment, known as the 56-Inch Pilot Spread, was intended to test heavy equipment and techniques to be used for installing 1 422-mm (56-in.) diameter pipe, which will comprise approximately 1 792 km (1,053 mi.) of the 2 167-km (1,286-mi.) system through Yukon, British Columbia and Alberta.

After receiving copies of the Landowner's Information Booklet, which was distributed for the purpose of informing all of those affected by the pilot spread about the pipeline project and indicating the proposed location of the right-of-way on each property, four property owners filed objections to the route proposed by the company with the Agency. Foothills resolved three of these objections by making minor route adjustments to accommodate the landowners, while the fourth was settled after the Agency undertook consultations with the company and the landowner. Since the route objections were resolved by negotiation and consultation, a hearing under the auspices of the Agency's Designated Officer was not required.

As provided for under the *National Energy Board Act*, Foothills applied to the Designated Officer during the year for leave to take additional lands for the right-of-way of the pipeline in Alberta, which was required both for the Eastern Leg and for the 56-Inch Pilot Spread. The lands requested were in addition to the 18.3-m (60-ft.) wide right-of-way the legislation permits a pipeline company to expropriate in the event that it is unable to reach an agreement with a landowner for acquisition of the property required.

As a result of applications by Foothills for additional right-of-way to provide permanent and temporary working space for the 1982 construction sections of the Eastern Leg in Alberta, two hearings were held by the Designated Officer. The first, involving a total of 66 landowners, was held in July, 1981, in Strathmore, Alberta, and the second, involving one landowner, was held at the Agency's Calgary office in August and November, 1981.

In November, 1981, the Agency held another hearing at Rocky Mountain House, Alberta, to consider Foothills' applications for extra lands for the 56-Inch Pilot Spread. Of the 33 landowners or occupants whose interests were affected, 14 appeared at the hearing.

Finding the company's reasons for requiring additional lands valid in each instance, the Designated Officer approved Foothills' applications.

Pipeline crew members discuss construction procedures during 1981 season.

In February, 1982, two owners of property located on the route of the proposed 56-Inch Pilot Spread filed a notice of application for appeal in the Federal Court of Canada against the order of the Designated Officer relating to the taking of additional land by the company. The matter had not been resolved by year's end.

(Construction of the 56-Inch Pilot Spread, which had been scheduled to be carried out in 1983, was subsequently deferred because of the further two-year delay in the planned construction of the second stage of the pipeline.)

Exercise of Other Federal Regulatory Powers

Under the authority of the *Northern Inland Waters Act* and the *Territorial Lands Act*, which for purposes of the pipeline was transferred to the Minister responsible for the NPA as provided for the *Northern Pipeline Act*, the Agency issued a number of permits and authorizations during 1981-82.

In Yukon, four land-use permits and one quarry permit were issued to Foothills with respect to geotechnical investigations, a meteorological observations site, centre-line surveys, and the Quill Creek facility for testing pipeline design and construction methods in discontinuous permafrost. Amendments to six permits were also authorized.

In addition, the Agency issued three water-use authorizations in Yukon related to hydro-static testing and camp operation at the Quill Creek test facility and for geotechnical drilling investigations along the proposed route of the pipeline across Kluane Lake.

An Agency official based in Whitehorse administered the permits and authorizations issued in Yukon and carried out field inspections to ensure compliance with the provisions governing these activities. The investigations and surveys are necessary to determine the final route and design of the pipeline in Yukon and for the preparation of the Plans, Profiles and Books of Reference.

During the year, discussions were held with the Yukon Government and the federal Department of Indian Affairs and Northern Development to determine the terms to be established with respect to a grant of easement to Foothills (South Yukon) for a right-of-way across Crown land for pipeline purposes. Procedures for outlining and reviewing Foothills' requirements for facilities off the right-of-way were also established.

Field Surveillance

Preparations for the surveillance by the Agency of 1981 construction activities on the Eastern Leg of the pipeline project in Alberta and Saskatchewan commenced in April with a two-week orientation program for surveillance personnel. Additional staff was recruited to allow for three surveillance teams in the field, each headed by a senior surveillance officer. These officers, in turn, were responsible to a group made up of the Regional Manager of Surveillance, the Manager of Engineering Surveillance and the Manager for Environmental Surveillance, all of whom were located in Calgary.

The three teams were in the field by May 10, 1981, working from initial headquarters at Olds and Medicine Hat, Alberta, and Maple Creek, Saskatchewan. A four-member team, based first in Olds and later in Brooks, was responsible for surveillance of mainline construction in Alberta by the contractor, Marine Pipeline Construction of Canada Ltd.

A team of three surveillance officers based in Medicine Hat carried out surveillance of construction activities associated with the crossing of the South Saskatchewan River by O.J. Pipelines Ltd. and later oversaw construction of the compressor station at Jenner, Alberta, by Brown and Root Ltd. In Saskatchewan, a five-member team, quartered initially in Maple Creek, was responsible for surveillance of mainline construction by Majestic Wiley Contractors Ltd. This team later moved to Shaunavon, Saskatchewan, as construction progressed southeastward. The Medicine Hat team conducted surveillance of preliminary work on the compressor stations at Piapot and Monchy, Saskatchewan, and the meter facilities at Monchy, which was begun in late August, 1981, by Interpro Contractors Ltd. The remaining responsibilities associated with right-of-way reclamation on the Western Leg and construction of the meter station at Kingsgate, B.C., were covered by surveillance personnel as required.

In view of the Alberta government's interest in the project and its responsibilities for certain environmental matters, the Administrative Agreement that was signed in August, 1980, between the Agency and the provincial government was revised to enable provincial specialists to work with the Agency surveillance teams on a part-time basis. In Saskatchewan, provincial authorities were kept fully informed of activities and environmental matters and Agency staff held meetings periodically with officials in the field to ensure that provincial concerns were being met.

The Agency's senior surveillance officers maintained direct contact with Foothills' senior field representatives and personally discussed with them any initial concerns they had respecting the company's compliance with the Agency's terms and conditions. Particular issues were further identified by written field memoranda and a Report of Non-Compliance issued in cases where the company failed to respond to concerns expressed by the senior surveillance officers. On balance, the number of concerns raised by the Agency's surveillance teams was relatively few, in part at least because of the comparatively straightforward nature of construction through predominantly prairie grassland and cultivated fields.

During the 1981 construction period, three Reports of Non-Compliance were issued, each dealing with environmental matters. The first report related to the maintenance of a buffer zone of Vegetation between the right-of-way and any stream course, as well as the use of hand-clearing methods on slopes adjacent to a water body. The second report concerned construction activity in the Red Deer River outside the prescribed "fish window", the time period within which fish are least sensitive to the effects of silt. Both of these matters were resolved satisfactorily. The third report related to the interruption of water flow in Bone Creek, Saskatchewan, which resulted in the killing of some fish.

Concerns identified in written field memoranda dealt with improper protection of archaeological sites, spillage of machinery oil and other fluids on the right-of-way, and excessive lengths of open ditch and stream siltation, which caused unnecessary disturbance to fish and wildlife. In all cases, these problems were resolved promptly and satisfactorily.

Ditching in the Great Sandhills of Saskatchewan. This ditcher is capable of digging a trench three-m (10-ft.) deep and two-m (6.5-ft.) wide to allow for a minimum of 0.8-m (three-ft.) of cover over the pipe.

During the 1981 construction season, a total of 439 km (266 mi.) of Eastern Leg pipeline was built by the three contractors—171 km (106 mi.) in four construction sections in Alberta and 258 km (160 mi.) in Saskatchewan. The only major delay occurred when 10 construction days were lost between July 25 and August 6, 1981, due to a strike by welders.

The 1981 construction activities concluded in November and field surveillance offices at Brooks and Shaunavon were closed. The Medicine Hat office remained open as a base for the surveillance of compressor station construction, which continued through the winter except for a break between mid-December and mid-January.

With the March, 1982, start of construction of the remaining 207 km (129 mi.) of the Eastern Leg in Alberta, only two surveillance teams were placed in the field due to the reduction in activity from the level of the previous year. One team, consisting of a senior surveillance officer and one surveillance officer, stayed in Medicine Hat to oversee compressor station construction activities. The second team of four, including three surveillance officers and a senior surveillance officer, initially worked out of Brooks and later moved to Beiseker, Alberta.

Communication between the field surveillance offices and the Calgary office of the Agency was maintained at all times when the field teams were operational, using telephones, mobile radio-telephones and facsimile-transmission machines. In 1981, the system of daily reporting was revised, improving the degree of detail provided to specific divisions within the Agency and lessening the time required for dissemination. Each morning senior surveillance officers submitted, by facsimile transmission, a field report containing construction data and progress for the previous day, as well as information on concerns and non-compliances. These daily field reports were analysed and converted, using a microcomputer, into a Daily Surveillance Report, which was distributed to Agency officials, the Commissioner's office in Ottawa, the National Energy Board, and the provincial departments concerned. This daily report was designed to provide a complete record of construction activity and progress over the life of the project.

Special Environmental Protection Measures

In addition to normal surveillance of construction operations outlined above, a number of special measures was instituted by the Agency to minimize the impact of construction on fisheries and wildlife and procedures for land reclamation and revegetation.

The Agency imposed restrictions on construction activity until July 15 in the vicinity of nesting ferruginous hawks, Swainson's hawks and prairie falcons along the Eastern Leg to reduce the risk of disturbing these birds of prey during the nesting and fledging periods. Agency and Foothills staff who maintained surveillance of the occupied nests reported no abandonments.

Scheduling also proved to be the most effective means of mitigating disruptive impacts on mammals. Construction did not occur during winter, the season when ungulates such as deer and antelope are most sensitive to disturbance. Agency surveillance officers monitored animal crossings of the right-of-way and nearby activity and detected no adverse effects.

Equally important as measures taken to ensure environmental protection during pipeline construction were the land reclamation and revegetation procedures which followed. The Agency required Foothills to restore land disturbed by construction or operational activities to its former level of productivity, with control and mitigation of erosion as the main objectives.

In accordance with a plan approved by the Agency, Foothills successfully reseeded the right-of-way of the southern B.C. portion of the Western Leg of the pipeline in the summer of 1981.

In the dry sandy areas of eastern Alberta and southwestern Saskatchewan along the Eastern Leg, special revegetation methods were required. These included shrub planting, straw crimping on steep coulees and river banks, and use of a Hodder Gouger machine to plant seeds. Used for the first time in Canada along 26

Automatic welders move down the 45-m (140 ft.) deep west bank of Irishman's Coulee in eastern Alberta.

km (16 mi.) of the right-of-way, this machine digs small hollows in the soil that afford favourable growing environments for plants and assist in the retention of moisture.

During the winter, the Agency's environmental staff developed a plan for monitoring completed portions of the pipeline right-of-way to ensure continued compliance with the environmental terms and conditions, including the maintenance of erosion control, revegetation, slope stability, water quality and fisheries and wildlife protection.

Engineering Activities

The National Energy Board granted Foothills (Alta.) and Foothills (South B.C.) leave-to-open the Western Leg of the pipeline in the early spring of 1981 and by May the Agency's Designated Officer had issued all engineering approvals for construction of the meter station at Kingsgate, B.C. With leave-to-open for this latter facility given in October, 1981, the Phase I Western Leg construction program was completed.

By mid-July, 1981, the Designated Officer had granted all engineering approvals for the first construction season of the Eastern Leg in Alberta and Saskatchewan, as required under the Technical Orders. Issued in January, 1979, these orders stipulate that each of the segment companies of Foothills must obtain approval from the Designated Officer for the detailed engineering designs and specifications of the pipeline prior to the commencement of construction. The companies must also provide information in support of their designs, including any required field test reports. In addition, the Technical Orders define the construction and inspection procedures to be followed by the companies.

The 1981 construction program in Alberta consisted of 171 km (106 mi.) of pipeline in four sections, plus a compressor station at Jenner. The Saskatchewan portion of the work consisted of 258 km (160 mi.) of pipeline, plus compressor stations at Piapot and Monchy and a meter station at Monchy.

Approximately 380 drawings, as well as numerous reports detailing specific design criteria for 1981 construction, were reviewed by the Agency's engineering staff prior to approval. All hydrostatic testing of the pipeline was witnessed by staff members to ensure compliance with National Energy Board regulations, accepted practice and approved procedure.

In March, 1982, the National Energy Board granted leave-to-open to Foothills (Alta.) and Foothills (Sask.) for that portion of the Eastern Leg installed in 1981.

For the 1982 Eastern Leg construction program, Agency staff reviewed drawings and reports of specific design criteria. The Alberta portion of the work consisted of 207 km (126 mi.) of pipeline in four sections, a second, electrically-driven compressor unit at Jenner, and the carry-over of mainline valve assembly installations from the 1981 program. By March, 1982, Foothills (Alta.) had received all of the engineering approvals required from the Designated Officer to begin construction. Work in Saskatchewan consisted of valve assembly installations, plus completion of the compressor stations at Piapot and Monchy, the meter station at Monchy, and an additional compressor station at Richmound. Leave-to-proceed with construction of the Richmound station was given to Foothills (Sask.) early in 1982.

Agency engineering staff also reviewed several general engineering design principles and activities during the year, including:

- approval of specifications for Stage II line pipe, valves and fittings;
- approval of the stress criteria and its reconciliation with the pipeline design for the Eastern Leg in Alberta and Saskatchewan;
- modifications to the system flow studies to allow for the change in the last point of cold flow in Yukon and the design change to utilize the Stage I of the Eastern Leg to transport additional volumes

of natural gas for TransCanada Pipelines through Alberta;

- construction specifications for Stage II compressor stations to be utilized by Foothills (Yukon) in Alberta and Saskatchewan;
- river crossing design criteria for selected streams and rivers in southern Yukon;
- a series of reports detailing the liquefaction potential along selected portions of the pipeline route in Yukon; and
- an update of the frost-heave program description.

Quill Creek Test Program

Agency staff continued to monitor activity at the Quill Creek test facility, which is located 300 km (186 mi.) northwest of Whiterhorse, following the start-up of operations by Foothills (South Yukon) in April, 1981. The test program for pipeline design and construction in discontinuous permafrost will help determine the most effective and economic means of dealing with the problem of thaw settlement. This occurs when a buried pipeline carrying gas above the freezing point—that is, in the so-called "warm-flow" mode—causes the surrounding ice-rich permafrost soils to thaw, resulting in greatly reduced pipe restraint due to soil erosion. Changes in temperature or pressure can subsequently lead to excessive shifting of the pipe, sometimes to the point where it could rupture.

Conversely, a chilled pipeline operating below 0°C (32°F) in areas of unfrozen ground creates the potential for frost-heave or upward displacement of the pipe as moisture freezes in frost-susceptible soils. During 1981-82, the pipeline sponsor in Alaska, Northwest Alaskan Pipeline Company, continued to conduct tests on this frost-heave problem.

During construction of the Quill Creek test site in early 1981, pipe was buried in conventional underground ditches and also installed in above-ground embankments. Warm air is being circulated throughout the pipe to simulate the movement of natural gas. The soil surrounding the pipe is instrumented with thermistors, which register the effects of heat transfer from the pipe and seasonal changes in ground temperature. Foothills will compare recorded temperatures with those predicted in simulation models to determine to what extent ice-rich soils may be adversely affected by various pipeline designs and modes of installation.

Experiments were also conducted at Quill Creek in erosion control techniques, ditch preparation, the effects of drilling and blasting, and the use of ice chips for building a protective road-bed over permafrost. In addition, tests have continued to investigate the possible effects that telluric activity may have on the pipe, pipe coating and cathodic protection systems. Telluric activity refers to stray electrical currents that are caused by variations in the earth's magnetic field.

Experimental pipe installation in aboveground concrete restrained mode at Quill Creek test facility in Yukon. The pipe is placed on an insulated workpad and covered by precast concrete for protection and to provide restraint of the pipe against vertical and horizontal movements due to temperature and pressure changes.

In September, 1981, Foothills began to submit reports to the Agency detailing the data collected and observations made at the facility during its operation.

In mid-September, 1981, construction activity at Quill Creek resumed for a month when Foothills conducted a program to evaluate procedures for building access roads and work pads in permafrost areas during the period when the layer of ground above the permafrost has thawed to a seasonal maximum depth. Results of the program will be used to determine the feasibility of summer construction of access roads and work pads in terrain subject to seasonal freezing and thawing where pipe installation in above-ground embankments is planned.

In December, 1981, Foothills (Yukon) announced a decision to change the last point of cold flow from a compressor station south of Beaver Creek, Yukon, to a point 149 km (93 mi.) southeast, on the west side of Kluane Lake. Results of the geotechnical drilling program, terrain mapping and analyses led the company to conclude that its initial assessment of the amount of permafrost along this segment of the pipeline route was underestimated. As a result of this work, Foothills considered that continuation of the flow of chilled gas to the Kluane Lake compressor station would not only minimize associated thaw-settlement problems, but

Geotechnical crew sets up drill to take core sample along the Alaska Highway near Marsh Lake in Yukon.

also be more cost effective. This would require the installation of gas refrigeration at the compressor station south of Beaver Creek to maintain the temperature of the gas arriving from Alaska between 0° and -5°C.

Geotechnical Drilling Program

As in past years, Agency engineering and environmental staff oversaw the geotechnical investigations carried out by Foothills to study soil conditions along the proposed pipeline route in Yukon and at prospective sites for compressor stations and other facilities.

In addition to drilling boreholes to confirm locations and determine the extent of permafrost and to test the stability of the approach slopes to water crossings, the company conducted a drilling program to check the availability of sand and gravel at selected sites along the pipeline route in southern Yukon.

As well as the field and laboratory testing of soil properties and terrain typing, Foothills installed instruments to monitor ground temperature, frost heave, thaw settlement and ground water conditions at many locations along the proposed route and at the sites of related facilities such as compressor stations and construction camps.

Towards the end of the fiscal year, Foothills undertook an investigation of the terrain under Kluane Lake—the largest proposed lake crossing by the pipeline, a distance of six km (four mi.). The purpose of the investigation was to study the stability and potential for liquefaction which occurs when the side slopes and lake bottom give way or slump under seismic conditions.

Pipe Fracture Control

In August, 1981, the Agency received the final report on the results of a series of seven burst tests conducted by Foothills (Yukon) between December, 1979, and April, 1981, at the company's facility near Rainbow Lake in northwestern Alberta. The report was filed with the Agency in compliance with the Technical Orders and as support for the company's fracture control methodology. The burst-test program was aimed at determining the fracture arrest capabilities of large-diameter pipe under operating conditions similar to those planned for the mainline sections of the pipeline.

The burst-test report confirmed Foothills' contention that pipe produced in accordance with proposed specifications has sufficient toughness to restrict the length of a fracture to within acceptable limits. This conclusion, coupled with the specification of a high minimum toughness value to reduce the probability of fracture initiation, formed the basis of the company's proposed fracture-control methodology. The burst-test report and fracture-control document were reviewed

by the Agency and National Energy Board during the last quarter of 1981 and, after some modifications related to the implementation and monitoring aspects of distribution of line pipe, were approved by the Designated Officer in January, 1982.

With the fracture control design approval in place, the way was cleared for the consideration of the line pipe and fitting specifications for Stage II construction. These were approved by the Designated Officer in February and March, 1982.

Finance, Personnel and Official Languages

Finance and Personnel

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 of Canada on the accounts and financial transactions of the Northern Pipeline Agency for the year ended March 31, 1982, is reproduced as Appendix B to this report.

Estimates for 1981-82 provided $9.1 million for the operation of the Agency. Actual expenditure was $7.1 million, $2 million less than the amount approved by Parliament. The number of person-years authorized for 1981-82 amounted to 132, of which only 105 were used. The shortfall in expenditure and manpower utilization reflected the continued delay in plans for the construction of the northern segments of the Alaska Highway Gas Pipeline Project.

Section 29 of the *Northern Pipeline Act* provides for recovery of the costs of the Agency from the company constructing the pipeline in accordance with regulations made under subsection 46.1(2) of the *National Energy Board Act.* During the year, recoveries totalling $7.2 million were made, representing the unrecovered balance from the previous year and part of 1981-82 expenditure. Recoveries were credited to the Consolidated Revenue Fund.

Official Languages Plan

Although the Northern Pipeline Agency is a separate employer under Part II of the *Public Service Staff Relations Act* and is not subject to the *Public Service Employment Act,* the language policies and procedures established for other government departments and agencies have generally been applied, and the Agency conforms as fully as possible with the provisions of the *Official Languages Act.*

Enquiries of the Agency are answered in the language chosen by the enquirer and public documents are available in both official languages. Employees in Ottawa, 38 per cent of whom have French as their first official languages, may work and receive service in the language of their choice. Within the merit principle, every reasonable effort is made to balance the participation of both official languages communities, including the advertisement of competitions through media serving the official languages minorities. The working language of the Calgary office is English, but it is the policy of the Agency to ensure that a minimum of two employees, one officer and one member of support staff, are qualified and available to provide service to the public in the French language.

These policies are contained in the Agency's Official Languages Plan and are being monitored each year.

In order to allow members of the public to comment on the linguistic aspect of services provided, enquiries may be directed by telephone at (613)593-7466 or by writing to the Head, Administrative Services, at the head office, the address of which is shown in Appendix D on page 34.

The Role 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 of September 20, 1977, between the two nations, which governs the joint undertaking of the 9 000-km (5,500-mi.) system. A brief description of this system can be found in Appendix C.

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 regulate the project and to facilitate the efficient and expeditious planning and construction of the system in Canada by the Foothills Group of 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 has 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 June, 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 also has held a number of hearings related to the project since its formation.

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, many of the regulatory powers of other federal departments and agencies relating to the planning, construction and operation of the Canadian system have been 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 of the Agency. The Commissioner is based at the 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 also as a Deputy Administrator of the Agency. The Designated Officer exercises the powers of the Board that were delegated by it on July 27, 1978. Following a further delegation of authority from the Board in September, 1981, the Designated Officer also exercises those powers contained in Parts I, II and III of the Gas Pipeline Regulations with respect to the Alaska Highway Gas Pipeline. A list 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 D on Page 34.

AUDITOR GENERAL OF CANADA

VÉRIFICATEUR GÉNÉRAL DU CANADA

AUDITOR'S REPORT

Senator The Honourable H.A. (Bud) Olson, P.C., M.P.
Minister responsible for the Northern Pipeline Agency

I have examined the statement of expenditure and receipts of the Northern Pipeline Agency for the year ended March 31, 1982. 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 expenditure and receipts of the Agency for the year ended March 31, 1982 in accordance with the accounting policies set out in Note 2 to the financial statement, applied on a basis consistent with that of the preceding year.

Auditor General of Canada

Ottawa, Ontario
September 15, 1982

NORTHERN PIPELINE AGENCY

(Established by the Northern Pipeline Act)

Statement of Expenditure and Receipts
for the year ended March 31, 1982

	1982	1981
Expenditure		
Salaries and employee benefits	$4,519,297	$3,357,938
Rentals	838,042	656,496
Travel and communication	809,405	735,112
Professional and special services	518,743	618,215
Materiel and supplies	221,474	160,525
Furniture and equipment	97,744	102,317
Information	73,707	82,478
Other	58,547	42,207
	7,136,959	5,755,288
Receipts credited to the Consolidated Revenue Fund		
Recovery of costs from Foothills Pipe Lines (Yukon) Ltd. (Note 3)	7,137,897	5,281,488
Other recoveries	38,306	4,116
	7,176,203	5,285,604
Excess of expenditure over receipts (receipts over expenditure)	$ (39,244)	$ 469,684
Expenditure provided for by:		
Parliamentary appropriations (Note 4)	$7,133,491	$5,754,132
Government departments which provided services without charge	3,468	1,156
	$7,136,959	$5,755,288

Approved by:

Commissioner

Chief Financial Officer

NORTHERN PIPELINE AGENCY

Notes to Financial Statement
March 31, 1982

1. Authority and objective

The Agency was established on April 13, 1978 by the Northern Pipeline Act (S.C. 1977-78, c. 20). The objective of the Agency is 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 Act.

2. Accounting policies

Expenditure

Expenditure includes the cost of work performed, goods received or services rendered prior to April 1, except for the costs of the employees' contingency plan which are charged to expenditure when paid. Capital acquisitions are charged to expenditure in the year of purchase. Expenditure also includes all actual costs incurred on behalf of the Agency by government departments, except for contributions to employee benefit plans which are based on budgeted employee strength. All expenditure is financed by parliamentary appropriations and government departments which provided services without charge.

Receipts

Receipts are recorded when credited to the Consolidated Revenue Fund. Costs are recoverable from Foothills Pipe Lines (Yukon) Ltd. based on quarterly billings.

3. Recovery of costs from Foothills Pipe Lines (Yukon) Ltd.

	1982	1981
Costs recoverable for the year		
Expenditure for the year	$7,136,959	$5,755,288
Other recoveries	(38,306)	(4,116)
	7,098,653	5,751,172
Costs to be recovered in the following year	(1,917,971)	(1,957,215)
Prior year costs recovered in the current year	1,957,215	1,487,531
	$7,137,897	$5,281,488

4. Parliamentary appropriations

	1982	1981
Economic Development (1981—Privy Council) Vote 5 (1981—Vote 25)—Program expenditures	$8,474,000	$7,672,000
Statutory—Contributions to employee benefit plans	595,000	535,000
	9,069,000	8,207,000
Amount lapsed in accordance with Section 30 of the Financial Administration Act	(1,935,509)	(2,452,868)
	$7,133,491	$5,754,132

5. Employees' contingency plan

Senior and certain other key employees who remain with the Agency until completion of their responsibilities and whose service exceeds two years, are entitled to a termination allowance of 13% of accumulated salary received. Based on employees on strength at year-end who may become entitled to this benefit in the future, unpaid costs are estimated at $695,000 (1981—$463,000). These costs, when paid, will be recoverable from Foothills Pipe Lines (Yukon) Ltd.

6. Subsequent event

On May 1, 1982 the United States sponsors of the Alaska Highway Gas Pipeline and Foothills Pipe Lines (Yukon) Ltd. announced that the target date for completion had been set back two years to 1989. All parties are to scale down their activities to correspond to a revised construction schedule. Consequently, the Agency must reorder the scale of its operations to ensure that they are in line with those of Foothills Pipe Lines (Yukon) Ltd.

To some extent the reduction of the Agency staff can be achieved through secondments and other arrangements. However, it is expected that some employees will have to be separated. The Agency has developed a termination plan for these employees. This plan is distinct from the employees' contingency plan referred to in Note 5 as the provisions of that plan are not appropriate to the present circumstances. It is not possible to estimate the actual cost of this termination plan because the number of employees that will qualify for compensation is subject to a number of conditions.

Project Description

The Alaska Highway Gas Pipeline Project is a large-diameter system that will initially transport natural gas from the North Slope of Alaska across Canada to the lower 48 states. It will also provide access through the Dempster Lateral to Canada's own reserves in the Mackenzie Delta-Beaufort Sea area of the Northwest Territories as and when they are required.

In 1980, Canadian and U.S. authorities approved the early construction of the Western and Eastern Legs that make up the southern portions of the system initially to permit the export of surplus Canadian gas to U.S. markets. A brief outline of this first-stage construction is given below.

Foothills Pipe Lines (Yukon) Ltd. of Calgary, Alberta, is the parent company responsible for the Canadian portion of the project. It is owned equally by Nova, An Alberta Corporation, of Calgary, Alberta, (formerly known as the Alberta Gas Trunk Line Company Ltd.), and Westcoast Transmission Company Ltd., of Vancouver, British Columbia.

The mainline system in Canada has been or will be built in five segments by the following subsidiary companies:

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., will build the Dempster Lateral if and when it is approved by the National Energy Board.

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 made up of four U.S. transmission companies and one Canadian company, TransCanada PipeLines Ltd., has already constructed most of the planned Eastern Leg of the system. Two California companies—Pacific Gas Transmission Company and its parent corporation, Pacific Gas and Electric Company—have completed first-stage construction on the Western Leg in the United States.

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] An additional 1 200 km of 860 mm pipe will be laid when and if the Dempster Lateral is approved.

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 1 067 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 1 067 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 the Dempster Lateral is approved, an additional 34 mil-

[1] The total project will comprise almost 4,790 miles of 56-, 48-, 42- and 36-inch pipe. Approximately 2,030 miles will be in Canada, 730 miles in Alaska and 2,030 miles south of the 49th parallel. The Dempster Lateral would comprise approximately 746 miles of 34-inch pipe.

[2]

Yukon	233 mi. of 48 in. 275 mi. of 56 in.	Saskatchewan	160 mi. of 42 in.
B.C. (North)	444 mi. of 56 in.	B.C. (South)	106 mi. of 36 in.
Alberta	334 mi. of 56 in. 234 mi. of 42 in. 187 mi. of 36 in.		

[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 911 miles of 42-inch line.

lion cubic metres per day (1.2 billion cubic feet per day) of Canadian Mackenzie Delta-Beaufort Sea gas.

The capital costs for the entire system, excluding those for the Dempster Lateral from the Mackenzie Delta and the gas conditioning plant at Prudhoe Bay, Alaska, were originally estimated to be $10.7 billion (Cdn.). This estimate reflected a cost of $4.3 billion for the Canadian segments and $6.4 billion for the U.S. segments. These estimates were based on the assumption that the entire system would be completed and ready to go into operation by January, 1983, as provided for in the timetable envisaged in the Canada-United States Agreement.

In testimony prepared for the congressional committee hearings on the U.S. legislation waivers in October, 1981, John G. McMillian, Chairman of the Alaskan Northwest Natural Gas Transportation Co., indicated that approximately $38.7 billion to $47.6 billion (U.S.) would be required to construct the entire system in both countries, including the gas conditioning plant and the $2.4 to $2.7 billion estimated for first-stage construction. Estimates of the amounts needed for financing purposes were based on a range of inflation and interest rates in the United States from 7 per cent to 11 per cent and 10 per cent to 14 per cent, respectively, and on a revised in-service date of late 1986.

A submission by Foothills Pipe Lines (Yukon) Ltd. to the congressional committee hearings estimated that approximately $17.6 billion on an escalated basis would be required to finance the entire Canadian section, based on a late 1986 completion date. Foothills subsequently indicated in testimony before the Special Committee of the Senate on the Northern Pipeline in May, 1982, that the Canadian sections would cost approximately $19 billion (Cdn.) in as-spent dollars given a 1987 completion date.

The pipeline sponsors in Canada and the United States had yet to file revised cost estimates with their respective regulatory authorities by the end of the fiscal year under review to reflect the further extension of the completion date to late 1989.

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

First-Stage Plan for Construction of the Southern Sections

The first-stage plan provided for construction in Canada and the United States of all or part of the proposed Western and Eastern Legs of the system from the point where they branch off from the main line 105 km (63 mi.) north of Calgary, Alberta.

This first-stage program involves the laying of some 2 992 km (1,858 mi.) of pipe in Canada and the United States, of which 850 km (526 mi.) are in Canada. Capital costs are estimated at approximately $1.4 billion (U.S.) for the American section and $928 million (Cdn.) for the Canadian. Costs for the Canadian sections include provision for actual funds used during construction, as well as certain other expenses associated with regulatory charges. The system will be capable of transporting some 32.11 million cubic metres (1.14 billion cubic feet) of Alberta gas a day to U.S. markets, rising to a possible peak flow between 1983 and 1986 of 38.03 million cubic metres (1.35 billion cubic feet).

Construction of the Western Leg in Canada, which began in August, 1980, involved the installation of seven loops over a distance of 215 km (132 mi.) of pipe, 914 mm (36 in.) in diameter. Work on this section was completed in the spring of 1981.

Construction of the U.S. Western Leg, which began in December, 1980, involved the installation of 258 km (160.5 mi.) of loops to the Pacific Gas Transmission pipeline from the Canadian border point at Kingsgate, B.C., to Stanfield, Oregon. From Stanfield, the Canadian gas is being transported to southern California through the addition of some 565 km (361 mi.) of loops to Northwest Pipelines and El Paso Natural Gas, which has been designated the Western Delivery System. For purposes of transmission of Alaskan gas on the Western Leg, the Pacific Gas Transmission and Pacific Gas and Electric systems will be further extended from Stanfield to Antioch, California, which is close to San Francisco. On October 1, 1981, gas began to flow through the Western Leg to U.S. markets.

The Eastern Leg, in Canada and the United States, will be comprised of 1 956 km (1,215 mi.) of 1 067-mm (42-in.) pipe. Construction began in both countries in May, 1981, and was to be completed over a two-year construction period. (Gas began to flow through the system on September 1, 1982.)

Northern Pipeline Agency

Senior Offices and Office Locations

Ottawa—Head Office
The Hon. Mitchell Sharp, P.C., Commissioner,

15th Floor, Varette Building,
130 Albert Street,
Ottawa, Ontario.
K1P 5G4

Calgary—Operational Headquarters
Mr. Harold S. Millican, Administrator,
Mr. William A. Scotland, Deputy Administrator and
Designated Officer,
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