



National Energy Board

Reasons for Decision

Westcoast Energy Inc.

GH-8-90

November 1990

Facilities

National Energy Board

Reasons for Decision

In the Matter of

Westcoast Energy Inc.

Application dated 7 September 1990 for the
Hossitl Pipeline Project

GH-8-90

November 1990

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Abbreviations

Act	<i>National Energy Board Act</i>
Bcf	billion cubic feet
B.C.	British Columbia
BC Gas	BC Gas Inc.
Board	National Energy Board
Canadian Hunter	Canadian Hunter Exploration Ltd.
CanWest	CanWest Gas Supply Inc.
Czar	Czar Resources Ltd.
EARP Guidelines Order	Environmental Assessment and Review Process Guidelines Order
Esso	Esso Resources Canada Ltd.
ha	hectare
IPAC	Independent Petroleum Association of Canada
km	kilometre
LDC	local distribution company
m	metre
m ³	cubic metre
Mcf	thousand cubic feet
mm	millimetre
m ³ /d	cubic metre per day
MMcfd	million cubic feet per day
NEB	National Energy Board
Northwest	Northwest Pipeline Corporation
O.D.	outside diameter

Onshore Regulations	Onshore Pipeline Regulations
RGT Policy	Westcoast's Raw Gas Transmission Facility Expansion Policy
Surcharge	Toll Surcharge
U.S.	United States of America
Unocal	Unocal Canada Limited
Westcoast	Westcoast Energy Inc.

Recital and Appearances

In the Matter of the *National Energy Board Act* ("the Act") and the regulations made thereunder;

And in the Matter of an application dated 7 September 1990 by Westcoast Energy Inc. for a Certificate of Public Convenience and Necessity, pursuant to Part III of the Act, for the Hossitl Pipeline Project;

And in the Matter of an application for an Order, pursuant to Part IV of the Act, approving a toll surcharge for raw gas transmission service through the proposed facilities;

And in the Matter of the National Energy Board Hearing Order GH-8-90.

Heard at Ottawa, Ontario on 1 November 1990.

Before:

A. Côté-Verhaaf
C. Bélanger
D.B. Smith

Appearances:

J. Lutes	Westcoast Energy Inc.
R. Sirett	Westcoast Energy Inc.
C.B. Johnson	BC Gas Inc.
J. Hopwood, Q.C.	NOVA Corporation of Alberta
M.H. Decter	Unocal Canada Limited
R.W. Graw	National Energy Board

Chapter 1

Background

1.1 The Application

On 7 September 1990, Westcoast Energy Inc. ("Westcoast") filed an application with the National Energy Board ("the Board") for a Certificate of Public Convenience and Necessity pursuant to Part III of the *National Energy Board Act* ("the Act") authorizing the construction of additional pipeline facilities to be added to its existing Fort Nelson raw gas transmission system. In conjunction with this application, Westcoast applied, pursuant to Part IV of the Act, for an order approving a monthly surcharge for the provision of raw gas transmission service through the proposed facilities.

The facilities, known as the Hossitl Pipeline, would consist of approximately 45 km of 219.1 mm outside diameter ("O.D.") pipe and would extend from Unocal Canada Limited's ("Unocal") production facilities in the Hossitl gas field in northeastern British Columbia ("B.C.") to the northern terminus of Westcoast's Petitot Pipeline (Figure 1-1). The facilities would initially be used to provide raw gas transmission service to Unocal from 1 April 1991 to 31 October 2001.

1.2 Westcoast's Raw Gas Transmission Facility Expansion Policy

At the same time that the Board was considering the Hossitl application, the Board was also examining Westcoast's Raw Gas Transmission Facility Expansion Policy ("RGT Policy") as part of Westcoast's RH-1-90 toll proceeding. The purpose of this policy was to establish when it would be necessary to apply a toll surcharge ("surcharge") to a new raw gas transmission pipeline.

On 19 October 1990, the Board released its decision. Under the approved RGT Policy, a surcharge is to be applied when the present value of the incremental cost of service associated with a new raw gas transmission facility exceeds the present value of either one times or two times the raw gas transmission toll revenue plus, in certain instances, one-half of the treatment toll revenue.

In its decision, the Board directed Westcoast, in applying this policy, to use:

- “(a) a two-times test in situations where Westcoast, having determined that further gas development is likely, is constructing facilities that have a capacity that is substantially greater than that required to serve the initial requests supporting the expansion. In applying the two-times test, Westcoast is directed to include the full costs of the expansion in the surcharge analysis; and
- (b) a one-times test when Westcoast is constructing facilities to meet the requirements of only the initial requests supporting the expansion.”

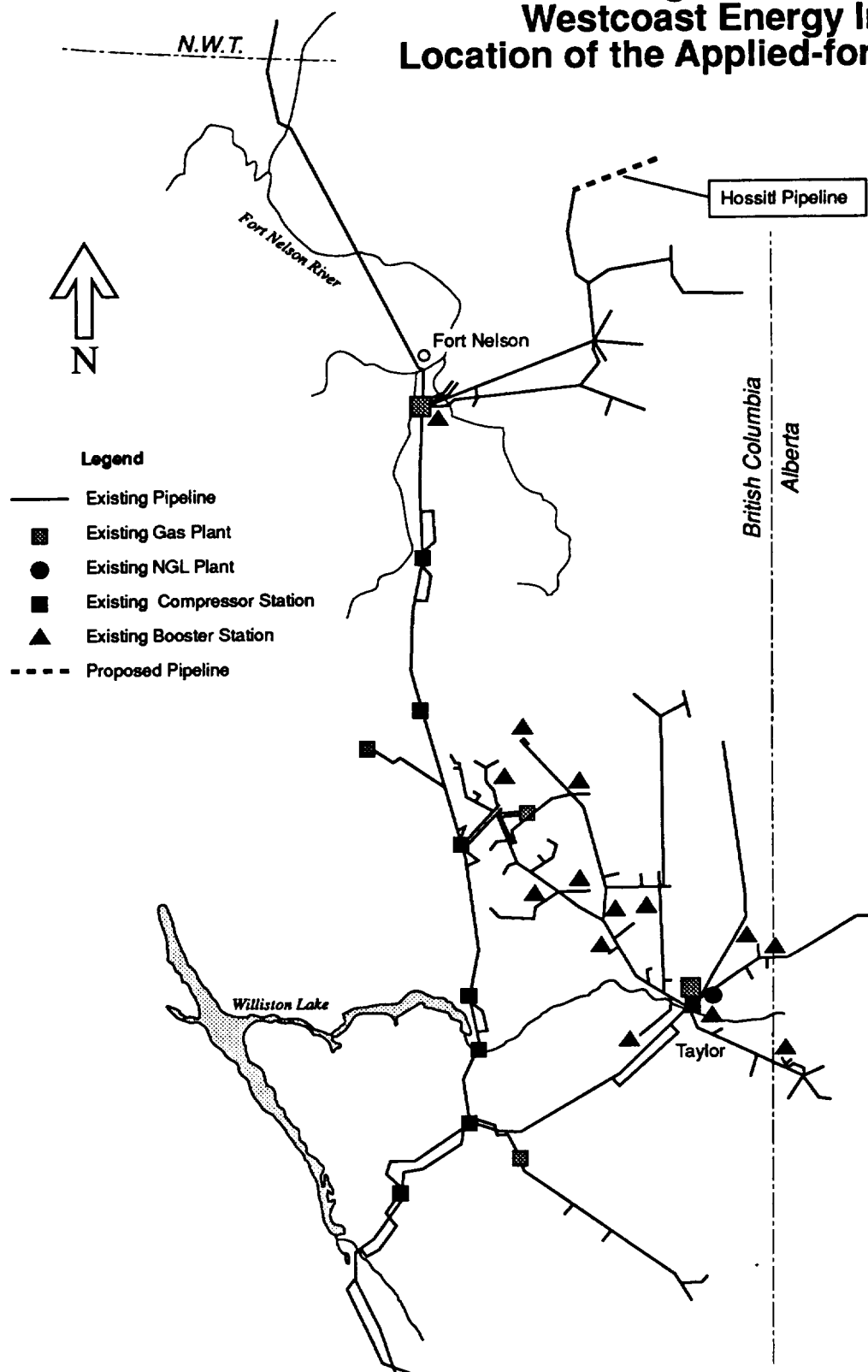
Regarding the treatment of downstream processing revenues, the Board found

“..that it would be appropriate to recognize the incremental downstream processing revenues in the calculation of the surcharge under those circumstances where, at the time of the facilities application, there is excess capacity at the downstream processing facility that will be utilized by the incremental volumes.”

The Board therefore directed Westcoast to

“..include fifty percent of the present value of the incremental contracted downstream processing revenues in the calculation of the surcharge under both the one-times and two-times tests where it has been demonstrated that the processing volumes are indeed incremental and the shippers have signed firm downstream processing contracts at that plant.”

Figure 1-1
Westcoast Energy Inc.
Location of the Applied-for Facilities



On 30 October 1990, the Independent Petroleum Association of Canada ("IPAC") requested the Board to clarify the circumstances under which incremental processing revenues may exist "at the time of the facilities application". The Board invited parties to the RH-1-90 toll proceeding to comment on IPAC's concern in final argument, which was held on 5 and 6 November 1990, after the close of the Hossitl hearing on 1 November 1990. Parties were also invited to offer further comments in writing by 13 November 1990.

1.3 The Hearing

On 17 September 1990, the Board issued Order GH-8-90 setting down Westcoast's application for hearing commencing 29 October 1990 in Fort Nelson, B.C. Subsequent to the issuance of the Hearing Order, the Board rescheduled the hearing to commence 1 November 1990 in Ottawa, Ontario.

In compliance with the *Environmental Assessment and Review Process Guidelines Order* (the "EARP Guidelines Order"), the Board conducted an environmental screening of Westcoast's application. As part of the environmental screening, the Board invited the comments of interested parties pursuant to Hearing Order GH-8-90.

The public hearing was conducted in Ottawa, Ontario, on 1 November 1990, and the Board's decision and reasons therefor are presented in this report.

Chapter 2

Gas Supply

2.1 Reserves

Westcoast provided estimates of established gas reserves and undiscovered potential available to support the Hossitl Pipeline. As shown in Table 2.1, the Board's estimate of established reserves is 23 percent higher than Westcoast's. Since the Board's estimate of undiscovered potential was in general agreement with that submitted by Westcoast, the Board has used Westcoast's estimate of such potential in assessing the proposed project.

Table 2.1
Comparison of Estimates of Remaining
Established Gas Reserves
and Undiscovered Potential

10⁶m³ (Bcf)¹

	Westcoast	NEB
Remaining Established Reserves	1 603 (57)	1 976 (70)
Undiscovered Potential	1 051 (37)	1 051 (37) ²
TOTAL	2 654 (94)	3 027 (107)

1 As of 1 January 1990

2 Adopted from Westcoast's estimate

Established Reserves

In its analysis of Westcoast's gas supply, the Board recognized 17 pools in the Hossitl supply area, none of which are currently on production. These pools are found in the Shunda, Slave Point and Keg River Formations and the Jean Marie Member of the Redknife Formation.

The Slave Point pools account for approximately 72 percent of the Board's estimate of remaining established reserves, while the Jean Marie pools account for 23 percent. The Board's estimate of established reserves for the Slave Point pools is higher than Westcoast's by approximately 30 percent. This difference is primarily due to different net pay and porosity interpretations for the b-81-G and a-98-J/94-P-14 pools. The Board's estimate of established reserves for the Jean Marie pools is in close agreement with Westcoast's estimate.

Undiscovered Potential

In addition to the established reserves described above, Westcoast estimated the undiscovered gas potential within the Hossitl supply area to be $1\,051\,10^6\text{m}^3$ (37 Bcf). Westcoast assigned $376\,10^6\text{m}^3$ (13 Bcf) to the Slave Point play and $675\,10^6\text{m}^3$ (24 Bcf) to the Jean Marie play.

The Slave Point play consists of small isolated reef structures. Westcoast noted that the most active operator in the area has identified three undrilled reef structures and a possible extension to an existing reef from seismic interpretation. Westcoast has used this information as a basis for its estimate of the Slave Point potential in the Hossitl area.

The Jean Marie play is a regional carbonate deposit from which production is currently being obtained in the Helmet North area. Westcoast used an assessment of the production performance from the Helmet North wells in assigning potential to the Hossitl area. After incorporating the effect of the Helmet North pool performance, Westcoast applied a success ratio to the undrilled spacing units and derived a Jean Marie potential of $675\,10^6\text{m}^3$ (24 Bcf) in the Hossitl area.

The Board also developed an estimate of undiscovered potential in the Hossitl area. The Board's estimate is based on an independent assessment of potential for the Slave Point and Jean Marie plays that utilizes most of the information presented by Westcoast. The Board's analysis involved the use of data available for each zone in the Hossitl area (including areal distribution of proven pools, indicated pool reserves from the performance of pools in Helmet North, success rates and the type of structural and/or stratigraphic trap). The Board concluded that Westcoast's estimate of undiscovered Slave Point potential is reasonable. The Board expects the Jean Marie to have significant localized reservoir development in the Hossitl area and has assessed potential in the Jean Marie using a methodology similar to that used by Westcoast. The Board discounted its estimates for these lands in a manner comparable to that reflected in Westcoast's estimates. The Board's estimate of Jean Marie potential was slightly higher than Westcoast's.

Given the uncertainty inherent in estimates of undiscovered potential and the fact that the Board's estimate is very similar to that of Westcoast, the Board has used Westcoast's estimate of undiscovered potential in its analysis.

2.2 Productive Capacity

Westcoast estimated that productive capacity from the immediate Hossitl supply area could be maintained at Unocal's maximum daily requirement for raw gas transmission and treatment service of $547.5\,10^3\text{m}^3/\text{d}$ (19.3 mmcf/d) for 11 years (1991-2001), with increasing shortfalls thereafter. This estimate was based on a 100 percent load factor throughout the projection period.

Westcoast's estimate of productive capacity for the Slave Point pools reflects the reserves-based allowable production rates for that formation. Productive capacity for the estimated reserves in the Jean Marie pools is based upon the results of flow tests. Westcoast's estimate of productive capacity from the Jean Marie potential was based upon the average flow test rate for the existing wells and an assumption that 14 successful development wells would be drilled into that formation.

The proposed raw gas transmission capacity is $702\,10^3\text{m}^3/\text{d}$ (24.8 MMcf/d), or approximately $150\,10^3\text{m}^3/\text{d}$ (5.3 MMcf/d) higher than Unocal's maximum daily requirement. Westcoast stated that it believed that sufficient supply would be developed in the area served by the proposed pipeline during

the term of the Unocal contract to fully utilize the available capacity. Westcoast indicated that bringing the pipeline into the Hossitl area would also allow it to connect further reserves to the east and south, as well as to the north if development were to occur in the Northwest Territories. Westcoast provided letters from three producers that expressed an interest in utilizing the proposed pipeline to transport gas from beyond the immediate Hossitl supply area. These companies were Canadian Hunter Exploration Ltd. ("Canadian Hunter"), Czar Resources Ltd. ("Czar") and Esso Resources Canada Ltd. ("Esso").

The Board estimated the productive capacity from the established reserves in the Hossitl area based on its own analysis of these reserves. The Board reviewed Westcoast's estimate of productive capacity for the undiscovered potential and is satisfied that it represents a reasonable assessment of the additional supply that could be anticipated from these lands.

The Board's estimate of productive capacity is very similar to that of Westcoast and indicates that Unocal's maximum daily requirement could be sustained at a 100 percent load factor until the year 2003, two years further than under Westcoast's estimate. The Board's estimate of productive capacity is largely supported by established reserves.

A comparison of the respective estimates of productive capacity is shown in Figure 2-1. The difference in estimates of productive capacity is due to the Board's use of a higher estimate of established gas reserves.

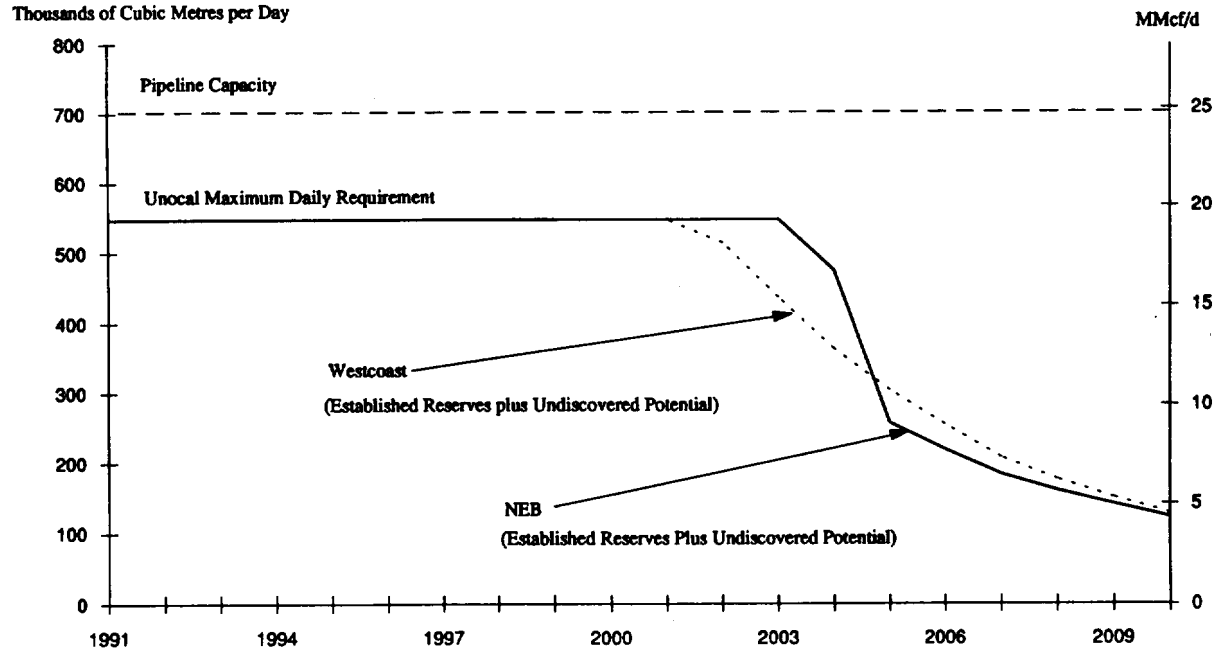
2.3 Views of the Board

The Board is satisfied that Westcoast has demonstrated the adequacy of reserves and productive capacity to support the throughout capacity of the proposed pipeline. In reaching this conclusion, the Board has considered the potential for further reserves additions in the areas adjacent to the Hossitl supply area and the interest expressed by producers in these areas regarding utilization of the proposed pipeline.

The Board also notes that intervenors did not oppose the supply evidence presented by Westcoast.

Figure 2-1

COMPARISON OF ESTIMATES OF PRODUCTIVE CAPACITY FOR THE HOSSLT AREA



Chapter 3

Requirements

3.1 Service Agreement

In support of its application, Westcoast indicated that it had executed a firm service agreement with Unocal for contract demand raw gas transmission service and for contract demand treatment service.

Westcoast filed an executed 10-year firm service agreement between Westcoast and Unocal, dated 5 September 1990, for the services shown in the table below.

In its application, Westcoast indicated that it was unable to comply with Unocal's request for 182.5 10³m³/d (6.4 MMcfd) of raw gas transmission and 150.0 10³m³/d (5.3 MMcfd) of gas treatment beyond 31 October 1991 because it was unable to commit to the availability of gas processing capacity at the Fort Nelson Plant beyond that date. However, at the outset of the hearing, Westcoast stated that, after having reviewed the operations at the Fort Nelson Plant, it had determined that additional processing capacity would be available. Westcoast advised that it could provide Unocal the additional 182.5 10³m³/d (6.4 MMcfd) of raw gas transmission capacity and 150 10³m³/d (5.3 MMcfd) of gas treatment capacity beyond 31 October 1991, until at least 30 June 1994. Westcoast added that, in the event that Unocal were to accept the offering of this additional service, an amending agreement between Westcoast and Unocal would have to be executed.

Unocal indicated that, while it was unable to identify the specific markets that would be served by the gas that would be made available under the agreement, it was actively seeking new gas markets and had started to negotiate gas sales contracts with several potential buyers, including CanWest Gas Supply Inc. ("CanWest") and Canadian Hydrocarbons Marketing Inc. The latter is actively seeking core market gas supplies on behalf of the Vancouver Island Pipeline Consortium, for which deliveries are expected to commence on 1 November 1991.

Unocal advised that it has contracted for firm transportation service on the Westcoast/NOVA interconnection at Gordondale, Alberta, which would allow Unocal to deliver B.C.-sourced gas to markets traditionally served by Alberta-sourced gas. Unocal added that it is a very active participant in the B.C. gas marketplace through its ownership and operation of the Aitken Creek Storage Facility and that production from the Hossitl gas supply will form an integral part of those activities.

Term	Type of Service					
	Raw Gas Transmission		Treatment		Transportation Storage	
	(10 ³ m ³ /d)	(MMcfd)	(10 ³ m ³ /d)	(MMcfd)	(10 ³ m ³ /d)	(MMcfd)
1 April 1991 to 31 October 1991	182.5	6.4	150.0	5.3	300.0	10.6
1 April 1991 to 31 October 2991	<u>365.0</u>	<u>12.9</u>	<u>300.0</u>	<u>10.6</u>	=	=
Total to 31 October 1991	547.5	19.3	450.0	15.9	300.0	10.6

Unocal testified that, as of the time of the hearing, it had not finalized any gas sales agreements and that until it knows definitively when the gas supply will be available to it, the execution of any such agreements cannot be finalized.

3.2 Overall Market Requirements

Westcoast also provided a domestic and export gas market forecast of gas deliveries from the Westcoast system for the ten-year period ending 31 December 2000, which indicated that:

- (a) total domestic gas deliveries are anticipated to increase from 7 139.9 10^6m^3 (252.0 Bcf) to 9 862.5 10^3m^3 (348.2 Bcf), or 3.7 percent on an average annual basis;
- (b) total export gas deliveries are anticipated to increase from 4 696.8 10^6m^3 (165.8 Bcf) to 8 300.1 10^3m^3 (293.0 Bcf), or 6.5 percent on an average annual basis.
- (c) total gas deliveries are anticipated to increase from 11 836.7 10^3m^3 (417.8 Bcf) to 18 162.6 10^6m^3 (641.2 Bcf), or 4.9 percent on an average annual basis;

Westcoast indicated that its domestic market forecast is based upon: historical gas market data; its review of available domestic gas market forecasts; and the medium-term and long-term gas market forecasts supplied by, and reviewed with, BC Gas (Inland and Lower Mainland Divisions), Pacific Northern Gas Ltd., and Pacific Coast Energy Corporation.

Westcoast indicated that the export market forecast is based upon Northwest Pipeline Corporation's ("Northwest") throughput volume and an assessment of the share of the United States of America ("U.S.") gas market accessible to the Westcoast system through the export point near Huntingdon, B.C. The traditional "on-system" Northwest market forecast is based upon the demand forecasts furnished by the U.S. local distribution companies ("LDCs") connected to the Northwest system that serve the states of Washington, Oregon, Idaho, and Nevada. In addition, the export forecast accounts for the U.S. Pacific Northwest electric generation and California markets and the share of those two markets that could be served by exports of Canadian-sourced gas off the Westcoast system at Huntingdon, B.C.

Westcoast argued that the results of its overall market assessment indicate the need for the additional gas supply that would be made available through the construction of the applied-for facilities, and that the need for the gas is further demonstrated through the existence of a firm service agreement between Westcoast and Unocal.

Views of the Board

The Board finds Westcoast's overall market forecast and approach in developing the forecast to be reasonable.

Although Unocal had not yet entered into sales agreements with respect to its gas supply from the Hossilt area at the time of the hearing, the Board is nevertheless satisfied that the execution of the firm service agreement with Westcoast, coupled with Unocal's active participation in the B.C. gas market as demonstrated through its ownership and operation of the Aitken Creek Storage Facility, provides reasonable assurance that those potential markets will be firmed up and that the applied-for facilities will be used and useful.

With respect to the contractual arrangements underpinning these facilities, the Board has noted that Westcoast proposed a condition to the certificate requiring Westcoast to file with the Board, prior to construction, an amendment to the firm service agreement between Westcoast and Unocal that will provide, among other things, the appropriate demand surcharge, the term and level of service, and a new date by which all necessary orders and approvals are to be obtained.

The Board notes that no party either disputed Westcoast's overall gas market assessment or questioned Unocal's ability to firm up its potential gas markets once its gas supplies could be assured. Similarly, the Board notes that both BC Gas and Unocal supported the certification of the applied-for facilities.

Chapter 4

Facilities

4.1 The Pipeline

The proposed facilities would consist of 44.9 km of 219.1 mm O.D. pipe extending from Unocal's production facilities at well b 82 G in the Hossitl gas field in northeastern B.C. to the terminus of Westcoast's Petitot pipeline. The cost of the facilities was estimated to be approximately \$10.9 million. The line, having a maximum capacity of 702 10³m³/d (24.8 MMcfd), would initially transport sour natural gas for Unocal for processing at Westcoast's Fort Nelson Plant.

Westcoast testified that, although the pipeline had been designed to transport more than the volumes requested by Unocal, the initial shipper, the commencement point of the line had been primarily determined by the location of Unocal's production facilities.

Westcoast testified that it had considered routing the pipeline in a southerly direction to connect with its existing Helmet system; however, it determined that this route was not preferred due to its slightly longer distance and the capacity constraints on the Helmet system.

Views of Interested Parties

Although it raised no objection with the commencement point of the applied-for facilities, BC Gas expressed the view that, in the future, when Westcoast constructs facilities to meet the needs of more than just the initial shipper, the commencement point of the facilities should be determined having regard to the location that would be most advantageous for the development of the whole area.

Views of the Board

The Board agrees with the decision to route this gas to the unutilized Petitot system rather than to the Helmet system. The Board shares the view of BC Gas and would expect Westcoast, in its evaluation of the commencement point for future raw gas transmission facilities, to consider not only the location of the production facilities of the initial shipper but also how best to serve the reserve area being developed.

4.2 Use of the Petitot System

The proposed Hossitl Pipeline would tie into Westcoast's existing Fort Nelson gathering system at the northern terminus of the Petitot Pipeline. According to Westcoast, the Petitot Pipeline has been deactivated for more than a year. Westcoast testified that deactivation procedures consisted, in part, of filling the line with nitrogen and maintaining the cathodic protection system. It also testified that the reactivation procedures would consist of introducing sour gas into the line and ensuring that the corrosion inhibition equipment still functions properly.

Views of the Board

Part VII of the Board's *Onshore Pipeline Regulations* ("Onshore Regulations") requires that a company proposing to deactivate a pipeline for 12 months or more must apply

to the Board for deactivation. Furthermore, if a pipeline has been deactivated for this length of time, a company is required to obtain Board approval to reactivate and retest the pipeline.

Since the Petitot Pipeline forms an integral part of the pipeline system necessary to transport gas from the Hossitl field to the Fort Nelson Plant, Westcoast should demonstrate the integrity of the Petitot line prior to putting the Hossitl facilities into service.

Accordingly, the Board will condition the certificate to be issued for the proposed facilities to require Westcoast to satisfy the requirements of the Onshore Regulations with respect to the Petitot Pipeline, prior to the Board granting leave-to-open for the applied-for facilities.

4.3 Adequacy of Downstream Facilities

Westcoast testified that it currently has capacity at the Fort Nelson Plant to process the total volume of $547.5 \times 10^3 \text{ m}^3/\text{d}$ (19.3 MMcfd) of raw gas requested by Unocal beyond 31 October 1991 to at least 30 June 1994.

Westcoast also testified that Unocal is currently in the queue for downstream transportation on the Fort Nelson mainline. Westcoast explained that, in the near future, it would be applying to the Board to expand that segment of its transmission system and that, in all probability, Unocal would be provided with service as a result of that expansion.

In the meantime, Westcoast stated that there is always the opportunity for Unocal to sell its gas at the outlet of the Fort Nelson Plant to another shipper with capacity on the Fort Nelson mainline.

Views of the Board

The Board is of the view that the volumes to be transported through the proposed facilities will not be constrained by the availability of capacity of the downstream facilities.

4.4 Other Technical Considerations

Westcoast testified that, in most instances, in the event of a line break on the proposed facilities, the producer's equipment would shut in automatically, thereby stopping the flow of gas into the Hossitl Pipeline. It also testified that check valves at the Petitot connection would prevent gas drawback from that system. Since the pipeline will lie entirely within unpopulated areas and will be relatively inaccessible, no other valves will be constructed along its length.

Pipeline operations on the proposed facilities will be monitored for flow, temperature and pressure in a co-mingled gas stream through the Yoyo Pipeline at the inlet to the Fort Nelson Plant and Booster Station 12. Operational problems on the Hossitl system will, in most instances, be detected by the producer's operating personnel.

The proposed pipeline route will traverse some zones of discontinuous permafrost. Westcoast testified that some detailed work had been done during the mid- to late 1970's on the nature of permafrost in northeastern B.C. However, it also testified that the proposed Hossitl route had not been investigated specifically for such permafrost locations. Based on experience, Westcoast expects to encounter

permafrost lenses approximately 9 m in width. Westcoast testified that it monitors the right-of-way at least annually for ditch subsidence caused by thaw settlement.

Views of the Board

The Board is of the view that, in order to ensure that the pipeline design is adequate for permafrost conditions, Westcoast should be aware of the location and characterization of the permafrost along the proposed route. Therefore, in light of the tight construction schedule, the Board will condition the certificate to require Westcoast, prior to requesting leave-to-open for the applied-for facilities, to submit a report to the Board:

- (i) detailing the characterization and location of the permafrost encountered during construction;
- (ii) describing the mitigative measures taken to guard against the development of excessive stresses in the pipe due to differential thaw settlement or other permafrost-related concerns; and
- (iii) demonstrating that the actions taken will mitigate excessive stresses in the pipe.

The Board is satisfied with the technical aspects of the Hossitl project discussed above.

4.5 Technical Conditions of the Order

Westcoast was requested to comment on the appropriateness of certain technical conditions that the Board might recommend be included in a certificate for the project. The conditions discussed during the hearing related to the following:

- (i) the submission of construction drawings;
- (ii) the submission of construction schedules, including periodic updates to the schedules, as required;
- (iii) the periodic submission of cost reports, including a breakdown of incurred costs; and
- (iv) the periodic submission of construction progress reports.

Views of the Board

To enable the Board to adequately monitor and inspect the construction of the facilities and to monitor project costs, the Board is of the view that Westcoast should submit construction drawings, schedules including updates, progress reports and cost reports. Accordingly, the Board will include the above conditions in the certificate to be issued for the proposed facilities.

Chapter 5

Land Use and Environmental Matters

5.1 Land Use

5.1.1 Route Selection

The proposed Hossitl Pipeline would be located in a remote area of B.C., within the Fort Nelson Plain physiographic subdivision. That area is characterized by moderate relief, generally poor drainage conditions and large expanses of organic (muskeg) areas. Development activity in the area has been mainly hydrocarbon exploration and production.

Westcoast submitted that the selection of the route was initially determined by airphoto interpretation of terrain conditions and then by application of the following criteria:

- the producers' preferred location;
- ease of access for pipeline operations personnel;
- minimization of line length;
- utilization of existing corridors (e.g. seismic lines etc);
- avoidance of unsuitable terrain; and
- crossing of water courses at stable reaches.

The general route, once determined, was subsequently examined through field reconnaissance.

Westcoast submitted that a route modification could have resulted if any habitat concerns had been raised during consultation with Fish and Wildlife personnel of the B.C. Ministry of Environment.

Specific to the routing of the Hossitl Pipeline, Westcoast was able to utilize only 2.5 km of existing corridors. Westcoast indicated that the seismic line orientation did not coincide with the general pipeline route and that no winter-access roads had been identified for use. It further indicated that the terrain features had influenced the crossing location of the Petitot River and that no habitat concerns had been identified which influenced the route location.

Views of the Board

As is previously indicated in these reasons, the Board accepts Westcoast's selection of the commencement and termination points for the Hossitl Pipeline.

The Board is also satisfied with the other aspects of Westcoast's route selection criteria, its application of these criteria, and the final route determination.

5.1.2 Land Requirements

Westcoast submitted that the proposed Hossitl Pipeline will be approximately 44.9 km in length and will utilize an 18.0 m wide right-of-way. In total, the right-of-way will occupy approximately 82 hectares of land. Under cross-examination, Westcoast indicated that the 18.0 m width would be

required during winter construction to allow sufficient space for snow clearing and roaching from across the right-of-way, as well as for normal pipeline construction operations. Snow clearing is necessary to allow for adequate frost penetration to carry construction vehicles.

Regarding the securing of the right-of-way from the province, Westcoast indicated that an application for a Temporary Permit, which is necessary prior to the commencement of construction, and a Statutory Right-of-Way, to be obtained after the project is completed, would be made to the Ministry of Crown Lands. Westcoast indicated that it anticipates no difficulties in obtaining these authorizations.

Views of the Board

The Board finds that Westcoast's anticipated land requirements for pipeline construction, installation and maintenance are reasonable and justified. The Board will include a condition in the certificate requiring Westcoast to submit evidence that it has secured the necessary Temporary Permit from the province of B.C. prior to the commencement of construction.

5.2 Government Liaison

Development of the Hossitl Pipeline potentially affects the jurisdictional interest of the B.C. Ministries of Environment; Forests; Crown Lands; Municipal Affairs; Recreation and Culture; and Energy, Mines and Petroleum Resources. Westcoast submitted that it had discussed the project with each of those ministries and that it had been accompanied on its final route reconnaissance by personnel of the Ministry of Environment, during which no concerns had been identified. Westcoast also indicated that the timber salvage requirements for the project had been waived and that it has received acceptance of its recommendations regarding archaeological resource protection. Further, Westcoast indicated that it would continue to advise those agencies of project scheduling and developments throughout all phases of construction.

Views of the Board

The Board is satisfied that Westcoast has adequately notified and consulted with the affected provincial agencies. The Board also accepts Westcoast's undertaking to maintain liaison with those agencies throughout all phases of construction.

5.3 Environmental Matters

5.3.1 Environmental Assessment

As part of its application, Westcoast submitted an Environmental and Socio-Economic Assessment of the proposed Hossitl Pipeline. That assessment provided an extensive environmental overview of the project area, the probable environmental effects resulting from project development as well as recommendations and procedures to mitigate or prevent those environmental effects. Subject areas addressed by the assessment included the climate, geology, soils, hydrology, vegetation, wildlife, fisheries, recreation, heritage resources and the socio-economic implications of the project and associated construction workforce.

The environmental impacts stemming from the application were considered under two processes: an environmental screening of the application pursuant to the EARP Guidelines Order and a project

review pursuant to the Board's mandate under Part III of the Act. Each process was conducted pursuant to the Board's Direction on Procedures set out in the Hearing Order GH-8-90. As part of those procedures, the comments of interested parties were invited with respect to the environmental screening of the application. Westcoast was the only party to submit comments.

Views of the Board

Subsequent to its review of the environmental information respecting the Hossitl Pipeline, the Board determined that, pursuant to paragraph 12(c) of the EARP Guidelines Order, the potentially adverse environmental effects, including the social effects directly related thereto that may be caused by the proposal, would be insignificant or mitigable with known technology.

5.3.2 Environmental Effects

Further examination of the environmental implications of the project during the course of the GH-8-90 proceedings served to support Westcoast's procedures and proposed mitigative measures. As noted previously, Westcoast intends to construct the proposed facilities during the winter. That timing, which is in itself a method of mitigating environmental effects, will, in conjunction with the standard construction procedures and the other proposed mitigative measures of Westcoast, minimize the majority of environmental concerns. Certain impacts, however, require additional attention.

Potential impacts resulting from construction across and within drainage channels can result in spawning area disturbance, sediment loading and bank destabilization. Westcoast's mitigative measures will include detailed design for the crossing procedure, bank stabilization and rehabilitation of riverbank slopes for two significant channels, the Petitot river and an unnamed creek. Those measures will be taken in conjunction with other mitigative procedures to reduce erosion along the right-of-way, contamination within the channel and debris accumulation from right-of-way clearing.

Westcoast's review of forest resources, undertaken with the B.C. Ministry of Forests, resulted in the ministry waiving any requirements for pre-logging and timber salvage. While there are no measures to mitigate the forest loss, Westcoast will use the material from clearing for rip-rap and will dispose of timber slash by controlled burning. Westcoast will also reduce subsequent impacts by ensuring that remnant, narrow strips between cleared areas do not occur and do not result in blow-down; that cut trees are not left in drainage channels; and that 'leaners' are removed. Respecting revegetation of cleared lands, Westcoast proposes to reseed areas of mineral soils and to allow natural regeneration in areas of organic soils.

The movement and disturbance of wildlife species during the winter months is also of environmental concern. Westcoast proposes to reduce that impact by providing breaks in construction and trenching activity to allow for cross right-of-way movement and by restricting the right-of-way to 18 m. Westcoast's position with respect to the increased access provided by the opened right-of-way was that, in relation to the existing access from cut lines and winter roads, the increase would be insignificant.

Westcoast determined that the Hossitl Pipeline would cross two registered traplines. Westcoast's proposed measures to reduce any impacts on those traplines include providing notice to the trappers of construction scheduling, providing construction breaks to assist wildlife and trapper movement and compensating the trappers for incurred damages.

Views of the Board

The Board is satisfied with the information from Westcoast respecting the environmental features of the area and the identification of potential environmental impacts. The Board will condition the certificate to require Westcoast to implement the procedure and mitigative measures outlined above in conjunction with its standard construction procedures for environmental protection.

The Board notes that Westcoast has not yet completed its detailed river crossing and rehabilitation designs and will, therefore, condition the certificate to require Westcoast to file these with the Board prior to construction. Concerning the issue of notification to the affected registered trappers, the Board will condition the certificate to require Westcoast to file those notices with the Board prior to the commencement of construction.

The Board will also condition the certificate to require Westcoast to file first- and second-year post-construction environmental reports, indicating the outstanding environmental issues and the procedures to resolve those issues.

Chapter 6

Economic Feasibility of the Project

In support of its argument that the proposed Hossitl Pipeline would be economically feasible, Westcoast submitted a copy of a letter from Unocal confirming that Unocal is still committed to the project despite a surcharge of \$66.71 per 10³m³ per month (6.2¢/Mcf) calculated by Westcoast under its interpretation of the Board's RH-1-90 decision as discussed in Chapter 7. Westcoast also submitted an assessment of the following:

- the long-term markets;
- the adequacy of Unocal's gas supplies; and
- the potential for additional reserve development.

Westcoast maintained that there are sufficient markets available for gas to be produced and delivered through its system to justify the Hossitl Pipeline. As discussed in Chapter 3, Westcoast argued that its overall assessment of the available markets and the execution of the firm service agreement with Unocal both demonstrate the need for the additional gas supply that would be made available through the construction of the applied-for transmission facilities.

With regard to the adequacy of gas supplies, Westcoast indicated that the Hossitl field can sustain deliverability in excess of the currently contracted level, as discussed in Chapter 2. Westcoast stated that it anticipates additional reserve development in the Hossitl field and adjoining gas supply areas once the proposed pipeline is in place. Westcoast has provided the Board with letters from Esso, Czar and Canadian Hunter confirming that these producers have an interest in transporting gas through the proposed pipeline from reserves that they control in adjacent areas.

Given the uncertainty resulting from the request for clarification of the Board's decision on the RGT Policy in the RH-1-90 proceeding and the additional processing capacity now being offered to Unocal, Westcoast proposed that the Board recommend the inclusion of a condition in any certificate for the Hossitl Pipeline that would state that the project shall not proceed until an amended executed service agreement with Unocal is filed with the Board. Westcoast concluded that the economic feasibility of the Hossitl Pipeline would be demonstrated once such an amended executed service agreement with Unocal is provided.

Views of Interested Parties

As discussed in Chapter 3, Unocal provided support for Westcoast's assessment of future gas market potential. According to Unocal, the gas supply and deliverability evidence, together with the filed letters of interest, indicates that additional reserves over and above those associated with the volumes contracted by Unocal will be developed and connected to the Hossitl Pipeline in the future.

Views of the Board

In assessing the economic feasibility of the proposed Hossitl Pipeline, the Board considered the following:

- the adequacy of long-term gas supplies;
- the existence of gas markets; and
- the willingness of Unocal to contract for firm service and pay the applicable tolls including the appropriate surcharge, if any, determined pursuant to the approved RGT Policy.

With regard to the evidence of markets and long-term supply, as discussed previously in Chapters 2 and 3, the Board is satisfied that Westcoast has demonstrated the adequacy of reserves and productive capacity and that the long-term demand in both the domestic and export markets supports Westcoast's assessment that the proposed facilities would likely be required over the forecast period.

The Board is satisfied that the filing of an executed amending agreement between Westcoast and Unocal, in compliance with the condition proposed by Westcoast (as is further discussed in Chapter 7), would demonstrate Unocal's commitment to pay the tolls including the appropriate surcharge, if any.

Based on the above, the Board is of the view that the economic feasibility of the proposed Hossitl Pipeline will be demonstrated once the above certificate condition is satisfied.

Chapter 7

Toll Surcharge for the Hossitl Pipeline

7.1 Introduction

Upon receipt of the Board's RH-1-90 decision dated 19 October 1990 on Westcoast's RGT Policy, as discussed in Section 1.2, Westcoast recalculated the surcharge that would apply to the Hossitl Pipeline. Westcoast determined that a surcharge of \$66.71 per 10^3m^3 per month (6.20/Mcf) would now apply to the Hossitl Pipeline, based on its interpretation of the approved RGT Policy. Westcoast explained that the surcharge incorporates two-times the raw gas transmission toll revenue and fifty percent of the processing toll revenue associated with the agreement with Unocal. Although this represented a significant increase from the surcharge of \$17.97 per 10^3m^3 per month (1.7¢/Mcf) included in the application, Unocal confirmed that it remained prepared to contract for the same level of service and to pay the revised surcharge determined by Westcoast. Westcoast noted that no surcharge would be required under its interpretation of the approved policy if Unocal were to accept the additional service now available at the Fort Nelson Plant, as previously discussed in Chapters 2 and 3.

7.2 Raw Gas Transmission Test

Westcoast explained that it applied a two-times test to the Hossitl Pipeline because the facilities are not being constructed to meet only the initial requirements of Unocal. As discussed in Chapters 2 and 6, several producers with reserves in the area have expressed an interest in transporting gas through the Hossitl Pipeline. Westcoast also noted that it might be possible to connect gas from other supply areas located near the Hossitl field and even from the Northwest Territories.

Westcoast stated that it anticipates sufficient supply to develop in this area so that the $702\ 10^3\text{m}^3/\text{d}$ (24.8 MMcf/d) capacity of the line will be fully contracted during the term of the Unocal contract.

Views of Interested Parties

In final argument, BC Gas said that it was satisfied that a two-times test is appropriate in the circumstances of this application. Also in final argument, Unocal submitted that Westcoast's evidence on gas supply and deliverability establishes that additional reserves over and above those associated with the Unocal contract will be developed and connected to the Hossitl Pipeline in the future.

Views of the Board

The Board is satisfied that the evidence presented by Westcoast supports the application of a two-times test in determining the toll surcharge, if any, that would apply to the Hossitl Pipeline.

7.3 Treatment of Downstream Processing Revenues

Westcoast acknowledged that the Board's clarification regarding the treatment of downstream processing revenues may affect the level of the surcharge for the Hossitl Pipeline. Therefore, Westcoast proposed that, if the Board were to approve the Hossitl application, the Board could recommend a condition to the certificate specifying that Westcoast shall not commence construction of

the pipeline until it has filed with the Board an amended executed service agreement between Westcoast and Unocal where the surcharge, if any, would reflect the Board's clarification.

Views of Interested Parties

Both BC Gas and Unocal agreed with Westcoast's proposal.

Views of the Board

Given that the Board's clarification of the RGT Policy may affect the level of the surcharge for the Hossitl Pipeline as may the offer of additional processing at Fort Nelson, the Board finds the condition suggested by Westcoast to be reasonable. Accordingly, the Board will include a condition in the certificate requiring that, prior to the commencement of construction, Westcoast be directed to file with the Board an amended executed service agreement between Westcoast and Unocal incorporating the appropriate surcharge, if any. The Board will also include a condition in the certificate directing Westcoast to submit the assumptions and calculations supporting the determination of the level of the applicable surcharge.

Upon compliance with these conditions and subsequent to the Board verifying that the proposed toll surcharge for the Hossitl Pipeline complies with the RGT Policy, the Board will issue the appropriate order pursuant to Part IV of the Act.

Chapter 8

Disposition

The Board approves the application by Westcoast Energy Inc., pursuant to Part III of the Act, for a Certificate of Public Convenience and Necessity for the Hossitl Pipeline Project. Upon approval by the Governor in Council, the Board will issue Certificate No. GC-79 certifying the applied-for facilities.

The foregoing chapters, together with Certificate No. GC-79, constitute the Board's Reasons for Decision and Decisions on this application.

A. Côté-Verhaaf
Presiding Member

C. Bélanger
Member

D.B. Smith
Member

Ottawa, Canada
November 1990

Appendix I

List of Issues

1. The appropriateness of the route selection of the proposed Hossitl pipeline, including the availability of gas to be transported by the pipeline.
2. The adequacy of Westcoast downstream facilities to accommodate the additional gas throughput.
3. The reasonableness of the forecast of requirements for domestic and export sales and transportation service.
4. The appropriateness of a monthly surcharge to be levied in addition to the applicable monthly demand toll for raw gas transmission service through the additional pipeline facilities.
5. The potential environmental effects, including any directly-related social concerns, of the proposed facilities during and after construction.
6. The appropriate terms and conditions to be included in any certificate or order which may be issued.

Appendix II

Certificate Conditions in Respect of the Hossitl Pipeline

1. The pipeline facilities for which this certificate is being issued ("the additional facilities") shall be the property of and shall be operated by Westcoast.
2.
 - (a) Westcoast shall cause the additional facilities to be designed, manufactured, located, constructed and installed in accordance with those specifications, drawings, and other information or data set forth in its application, or as otherwise adduced in evidence before the Board, except as varied in accordance with paragraph 2(b) hereof.
 - (b) Westcoast shall cause no variation to be made to the specifications, drawings or other information or data referred to in paragraph 2(a) without the prior approval of the Board.
3. Westcoast shall implement or cause to be implemented all the policies, practices, recommendations and procedures for the protection of the environment included in its application, its Procedures Manual For Environmental Engineering, March 1987, or as otherwise adduced in evidence before the Board in the GH-8-90 proceeding.
4. Westcoast shall, at least 10 days prior to the commencement of construction of the additional facilities, file with the Board a detailed construction schedule or schedules identifying the major construction activities.
5. Westcoast shall, at least 10 days prior to the commencement of site preparation for the crossings of the Petitot River and the unnamed creek at km 8, file with the Board:
 - (a) the environmental specifications and detailed drawings for the crossings; and
 - (b) a copy of the detailed reclamation plans for the crossings.
6. Prior to the commencement of construction, Westcoast shall file with the Board:
 - (a) evidence to demonstrate that it has secured the necessary Temporary Permit from the government of British Columbia for the additional facilities; and
 - (b) a copy of its letter of notification to affected registered trappers along the route.
7. Prior to the commencement of construction, Westcoast shall:
 - (a) file an amended executed service agreement between Westcoast and Unocal Canada Limited ("Unocal") that provides for, among other things, the term, level of service, and the appropriate surcharge, if any, to be payable by Unocal as determined in accordance with Westcoast's approved raw gas transmission facility expansion policy;
 - (b) file the assumptions and calculations supporting the determination of the applicable surcharge, if any; and

- (c) have received an Order of the Board under Part IV of the Act authorizing the appropriate surcharge, if any.
- 8. During construction, Westcoast shall file:
 - (a) monthly construction cost reports providing a breakdown, by location and facility, of costs incurred during that month, the percentage completion of each activity and an update of projected costs to complete the project;
 - (b) monthly construction progress reports; and
 - (c) updated construction schedules, if any significant change to the schedules provided pursuant to paragraph 4 occur.
- 9. Westcoast shall, within 21 days from the commencement of pipeline welding, file with the Board copies of the qualified welding procedures and the nondestructive testing procedures to be used during the project together with supporting documentation.
- 10. Prior to issuing leave-to-open for the additional facilities, the Board will require evidence that Westcoast has complied with the provisions of the Board's Onshore Pipeline Regulations in respect of the Petitot Pipeline.
- 11. Prior to issuing leave-to-open for the applied-for-facilities, the Board will require Westcoast to submit a report, satisfactory to the Board, in:
 - (a) detailing the characterization and location of the permafrost encountered during construction;
 - (b) describing the mitigative measures taken to guard against the development of excessive stresses in the pipe due to differential thaw settlement or other permafrost-related concerns; and
 - (c) demonstrating that the actions taken will mitigate excessive stresses in the pipe.
- 12. Westcoast shall, within six months of putting any of the facilities into service, file with the Board a report providing a breakdown of the costs incurred in the construction of the facilities, including reasons for significant differences from the estimates provided in the application.
- 13.
 - (a) Westcoast shall file with the Board a post-construction environmental report within six months of the date that the last leave-to-open is granted for the additional facilities.
 - (b) The post-construction environmental report referred to in paragraph 13(a) shall set out the environmental issues that have arisen up to the date on which the report is filed and shall:
 - (i) indicate the issues resolved and those unresolved; and
 - (ii) describe the measures that Westcoast proposes to take in respect of the unresolved issues.

- (c) Westcoast shall file with the Board, on or before the 31 December that follows each of the first two complete growing seasons after the post-construction environmental report referred to in paragraph 13(a) is filed:
 - (i) a list of the environmental issues indicated as unresolved in the report and those that have arisen since the report was filed, if any; and
 - (ii) a description of the measures Westcoast proposes to take to solve any unresolved environmental issue.
- 14. Unless the Board otherwise directs, Westcoast shall cause the construction and installation of the additional facilities, herein referred to, to be commenced on or before 31 December 1991.