

National Energy Board/Office National De L'Énergie

Memorandum/Note de Service

Security/Sécurité:

File/Référence: WIDs 153, 213, 367
(Wells J-19, M-08, G-08)

Document: f:\n-cross.97\eaglepln.eal

Date: 4 March 1998

To/À: Andy Graw
Technical Coordinator

From/De: John Korec
Environment Assessment Officer

Subject/Objet: **Northern Cross (Yukon) Limited ("Northern Cross"),
Application to Alter Condition of a Well(s) Dated 7 May 1996, Revised 30 December 1997
Fluid Swab Tests of Eagle Plains Wells: Socony Mobil W.M. Chance YT G-08,
Western Minerals Chance YT M-08 and Canoe River Chance YT J-19**

Description of the Project

Northern Cross has applied pursuant to paragraph 5(1)(b) of the *Canada Oil and Gas Operations Act* ("COGOA") for approval to alter the condition of three suspended gas wells in the Eagle Plains area, Yukon Territory. The proposed project is to re-enter, complete three wells, conduct fluid swab tests, and evaluate the wells. This represents a reduction in the scope of the project that was assessed under the *Canadian Environmental Assessment Act* ("CEAA") by Indian and Northern Affairs prior to issuance of a Land Use Permit. Extended flow tests have been eliminated from the proposed project.

Consultation

John Stewart - Socio-Economic and Public Participation
Bruce Moores - Emergency Response Plan

Staff Analysis

In accordance with section 18 of the CEAA, an environmental screening has been carried out for the proposal, based on the application, Indian and Northern Affairs Canada's ("INAC") the response to the Board's request for additional information, specialist advice, and public concerns. Staff is of the view that, taking into account the implementation of Northern Cross' proposed mitigative measures, the project is not likely to cause significant adverse environmental effects. A Board decision of this nature would represent a decision pursuant to paragraph 20(1)(a) of the CEAA. Should Northern Cross' application be approved, Staff recommends that any order be conditioned so as to ensure that Northern Cross implements all the policies, practices, recommendations for protection of the environment included or referred to in its application and subsequent information.

INAC, in preparation for conducting its CEAA environmental screening, distributed the Land Use application

to numerous other federal departments, departments of the Yukon Government, communities in the area of operation and concerned aboriginal groups. INAC sought comments from these various groups based on their area of expertise or their concerns to help ensure minimum negative impact on the environment. INAC allowed for numerous and extended opportunities, especially for groups such as the Vuntut Gwitchin First Nation ("VGFN") and the Porcupine Caribou Management Board ("PCMB"), to provide input to INAC's CEEA screening process. More than a year after the submission of Northern Cross' application, on 30 May 1997, INAC issued Land Use Permit YA6A160, including specific Permit conditions. INAC's in its CEEA Environmental Screening of 28 May 1997 determined, pursuant to paragraph 20(1)(a) of the CEEA, that significant adverse environmental effects are unlikely and the project may proceed.

In its application to the Board, Northern Cross submitted a listing of meetings and correspondence dating back to September 1994, with interested parties including various First Nations (Vuntut Gwitchin, Nacho N'ya'k Dun, and Dawson), wildlife management boards, chambers of commerce (Whitehorse, Dawson City and Yukon), federal and Yukon government departments, and non-government parties. A recurring concern raised by various parties, relates to the political lobby efforts to protect the Porcupine Caribou Herd Calving grounds in Alaska.


Subsequent to the issuance of the Land Use permit, the VGFN, on 26 June 1997, filed an Originating Notice of Motion with the Federal Court of Appeal in an attempt to set aside the Land Use Permit and to have INAC redetermine the Permit. The Trial Division Court Judge dismissed the Motion, indicating that INAC acted within its jurisdiction and that INAC's CEEA Screening Report properly addressed the "environmental effects" of the project. The Judge considered it appropriate for INAC to omit the political concerns raised by the VGFN from the "environmental factors" screened in its environmental assessment.

Staff is of the view that the political concerns fall outside of the scope of environmental effects of the project and do not warrant further consideration.

In Staff's view, Northern Cross has conducted a satisfactory early public consultation program and environmental concerns raised by various parties have either been adequately addressed by Northern Cross and through the conditions of the INAC Land Use Permit.

Recommendation

Staff recommends that the Board approve the Environmental Screening Document and a finding pursuant to paragraph 20(1)(a) of the CEEA. Appendix I includes the draft conditions to be included in any approval to Northern Cross. Appendix II includes the Environmental Screening Document which is to be included in the item to the Board for approval.



John Korec
Environmental Assessment Officer

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Order Condition

1. Unless the Board otherwise directs, Northern Cross (Yukon) Limited shall implement or cause to be implemented all the policies, practices, recommendations and procedures for the protection of the environment included in or referred to in Northern Cross' application.

National Energy Board/Office National De L'Énergie

ENVIRONMENTAL SCREENING REPORT

1.0 GENERAL INFORMATION

Applicant:	Northern Cross (Yukon) Limited
NEB File:	WIDs 153, 213, 367 (Wells J-19, M-08, G-08)
FEAI No:	
Application Date:	7 May 1996, Latest Revision 30 December 1997
Screening Document Name:	f:\n-cross.97\eaglepln.ea1
Environmental Assessment Type:	Screening
Screening Date:	4 March 1998

Title: Re-entry / Well Completion / Fluid Swab Tests of Eagle Plains Wells, Socony Mobil W.M. Chance YT G-08, Western Minerals Chance YT M-08 and Canoe River Chance YT J-19 ("G-08", "M-08", and "J-19")

1.1 Description of the Project

Northern Cross has applied to the National Energy Board (the "Board") pursuant to paragraph 5(1)(b) of the *Canada Oil and Gas Operations Act* ("COGOA") for approval to Alter the Condition of a Well ("ACW") for three suspended oil wells in the Eagle Plains area, Yukon Territory (Figure 1.). The wells are located in Significant Discovery Licence 022 area, owned 100% by Northern Cross.

The purpose of the project is to re-enter and complete three wells and to conduct fluid swab tests to evaluate the hydrocarbon potential. The project includes:

- re-opening of existing winter access roads, and clearing and smoothing the access roads by ploughing and packing snow to accommodate the mobile service rig and other vehicles;
- clearing sufficient vegetation from previously disturbed areas near the three wellheads to complete and swab test the wells;
- placing surface equipment (a 400 barrel heater treater, a 12.2 m flare stack, a portable power generator, a heated shelter with communications facilities, and diesel storage tanks) at the wellsite;
- placing a 400 barrel storage tank at one of the wellsites;
- using a mobile service rig to re-enter in sequence, the J-19, G-08, and M-08 wells, and evaluate the condition of each well;
- completion of each well by re-perforating the oil pay zones and conducting fluid swab tests;
- producing to storage tanks, any crude oil that may be swabbed from the wells and to truck the oil from wellsites on a daily or alternate day basis;
- suspending each well after evaluation, chaining and locking wellheads; and
- removing all equipment and refuse from the site at the time of project completion.

The scope of the project does not include transportation of product, once off-site, nor the final use of product. Northern Cross has submitted a number of program revision, the latest dated 30 December 1997. The latest revision proposes a much-reduced scope of work by eliminating the originally proposed extended flow testing. Northern Cross now proposes to conduct swab tests to recover approximately 500 barrels only of oil per well.

Wellsites and Access Route to Chance Field

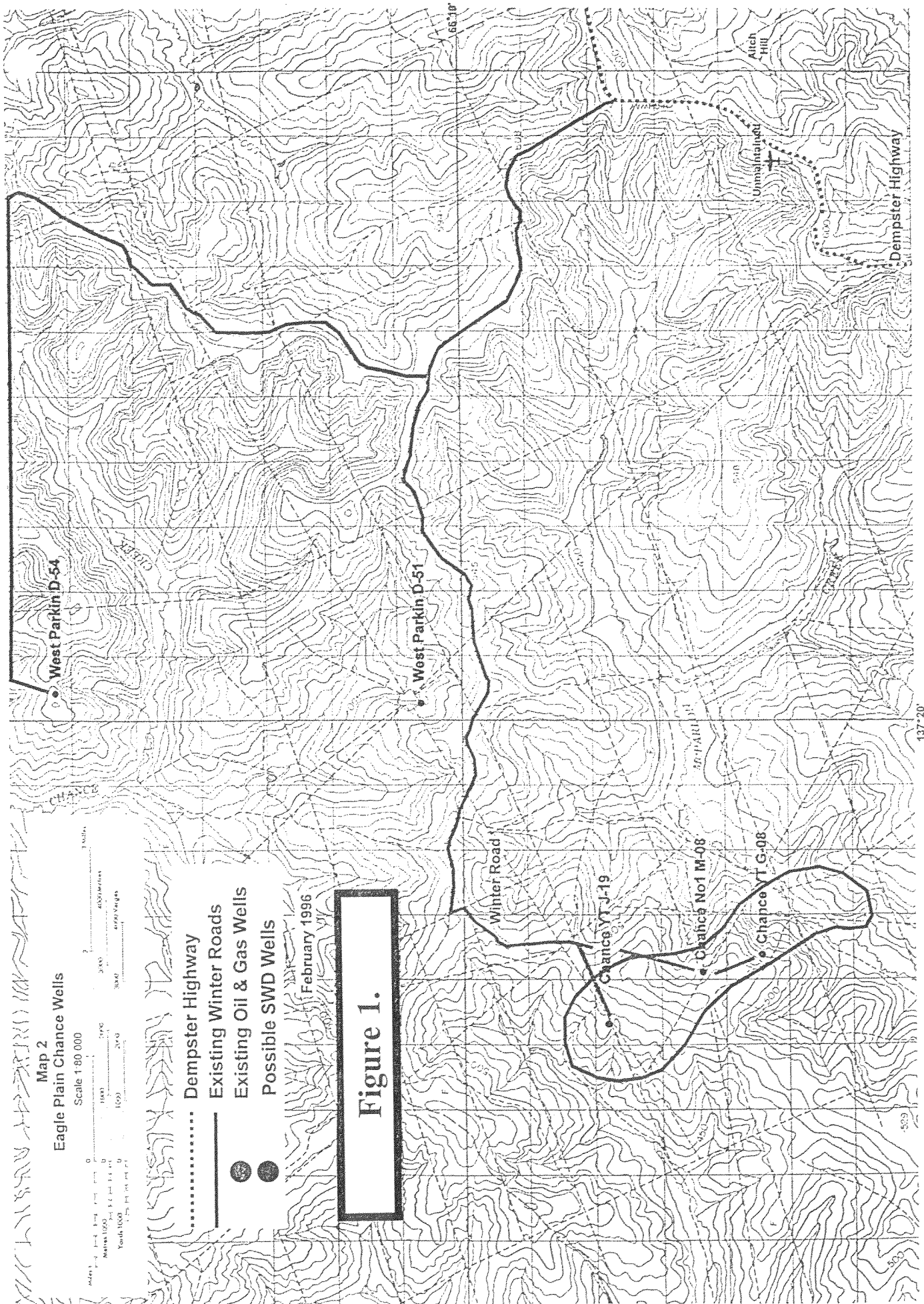


Figure 1.

Northern Cross submits that the storage tank and treaters would be surrounded by dykes lined with an impermeable barrier. Produced water, expected by Northern Cross to be negligible, would be stored in a surface tank and disposed, through dual completion, into a separate porous geologic zone in the Chance YT M-08 well.

No on-site camp is proposed by the Company. Personnel would use the Eagle Plains Hotel for accommodations and travel daily to the wellsites.

The following is a further summary of the proposed operations related to Northern Cross' Application to the Board for authorization to Alter Condition of a Well for three wells:

Summary for Socony Mobil W.M. Chance YT G-08

Run into the well with wireline equipment and retrieve the Camco "G-Lock" plug. Perforate the tubing. Circulate the well to water. Pull the tubing and packer equipment. Re-perforate the Chance Sand zone. Run the tubing into the well and conduct a swab test. Equip the well for bottom hole hydraulic pumping.

Summary for Western Minerals Chance YT M-08

For single zone completion procedures, drill out the cement retainer. Run tubing into the well. Perforate the Chance Sand zone. Swab test the perforated formation. Equip the well for bottom hole hydraulic pumping. For optimal dual zone completion procedures drill out the retainer (and abandon cement plugs) to Hart River Lower Limestone. Set an injection packer and complete the Chance Sand zone. Configure the wellbore equipment for a dual zone completion which would enable water to be injection into the Lower Limestone zone and would enable hydraulic pumping production to occur from the Chance Sand zone.

Summary for Canoe River Chance YT J-19

Install a wellhead. Run into the well with a casing scraper and circulate the well to water. Run a cement bond log. Run tubing into the well. Swab the fluid level down and perforate the Chance Sand zone. Conduct a swab test of the well. Pull the tubing out of the well. Equip the well for bottom hole hydraulic pumping.

1.2 Description of the Environment

The proposed project is to be located approximately 10 km due west of the 327 kilometre post on the Dempster Highway and about 60 km by road southwest of the community of Eagle Plains. Following are the coordinates, well identification number ("WID #") and ground elevation for each well:

<u>Well</u>	<u>WID #</u>	<u>Latitude</u>	<u>Longitude</u>	<u>Elevation</u>
M-08	153	66°07'46" N	137°31'27" W	534.0 m
G-08	213	66°07'18" N	137°30'50" W	518.8 m
J-19	367	66°08'31" N	137°32'28" W	514.2 m

In its Application, Northern Cross provided the following description of the environment.

The geography of the Eagle Plains is characterized by rolling hills covered for the most part by mature forests of black spruce. The region is in an area of discontinuous permafrost and the ground can be

hummocky as a result. Ground cover is typically a mixture of lichens, sedges, shrubs and sphagnum moss. In areas recently disturbed by forest fire or human activity, pioneering species like fireweed, horsetail, willows and foxtail grass are common. Depending on elevation and latitude, tamarack also grows. White spruce and cottonwoods occur in sheltered valleys that have a southern exposure.

The Eagle Plains is an unglaciated region, with elevation ranging from about 400 meters to about 800 meters above sea level. Bedrock, consisting of weathered sandstone and shale, is generally close to the surface.

The major drainage systems that are found at Eagle Plains are the Eagle River, which transects the area, in a north by northwest direction, and the Whitehorse and Porcupine Rivers which drain northwards along the western part of the Eagle Plains area. All of these systems ultimately drain into the Yukon River.

Wildlife at Eagle Plains is quite abundant with healthy populations of caribou, moose, grizzly and black bears, wolves, various fur bearing animals (such as martens), various rodents (such as ground squirrels), and ptarmigan.

2.0 ROLE OF OTHER FEDERAL AGENCIES

The Board, as a responsible authority pursuant to the *Canadian Environmental Assessment Act* ("CEAA"), notes that the following federal departments or agencies have been contacted by Indian and Northern Affairs Canada ("INAC") regarding Northern Cross' proposed project.

- Environment Canada, Environmental Protection Service, Pacific and Yukon Region, Whitehorse;
- Department of Fisheries and Oceans, Whitehorse;
- Department of Indian and Northern Development, Resource Management Officer, Dawson; and
- Department of Indian and Northern Development, Northern Oil and Gas, Ottawa.

INAC, as a responsible authority pursuant to CEAA, conducted an environmental screening of the project and made a determination on 28 May 1997, under paragraph 20(1)(a) of the CEAA, that significant adverse environmental effects are unlikely and the project may proceed. INAC issued Land Use Permit YA6A160.

No other federal departments or agencies were identified by the Board with respect to Northern Cross' project.

3.0 CONSULTATION

3.1 Public / Interested Parties / Government Agencies

Northern Cross submits that it has conducted ongoing community consultations for the project since March 1995. The Company submits that it has solicited feedback in order to learn of any sensitivities that various stakeholders may have with the proposed activities. In support of its Application, Northern Cross submitted a chronology of consultations that included a list of meetings and correspondence with various interested parties including:

- Vuntut Gwitchin First Nation ("VGFN");
- Nacho N'ya'k Dun First Nation;
- Dawson First Nations;
- Porcupine Caribou Management Board;
- Yukon Energy;

- Yukon Electrical;
- Yukon Chamber of Commerce;
- Whitehorse Chamber of Commerce;
- Dawson City Chamber of Commerce;
- MLA for Old Crow;
- Canada Manpower;
- Yukon Fish and Wildlife Management Board;
- Environment Canada - Canadian Wildlife Service;
- Department of Indian Affairs and Northern Development, Yukon; and
- Yukon Territory Government (Department of Highways, and Economic Development).

Northern Cross submits that First Nations were contacted, including the VGFN at Old Crow, the Tetlit Gwitchin at Fort McPherson, the Nacho N'ya'k Dun at Mayo, and the Dawson Band. Although the Company's attempts to arrange community meetings in Old Crow were not successful, the Company states that it was able to convey the nature of its proposed project to all the First Nations whose traditional lands are included in, or are in proximity to, the project area.

INAC, through its Land Use Advisory Committee ("LUAC"), requested the following organizations and agencies to review and provide comments with respect to the Land Use Permit application and its CEEA Screening for the proposed project:

- INAC, Resource Management Officer, Dawson;
- Yukon Conservation Society, Whitehorse;
- Council of Yukon First Nations;
- VGFN (letter only);
- Vuntut Gwitchin Renewable Resource Council;
- Porcupine Caribou Management Board ("PCMB");
- Canadian Wildlife Service;
- DIAND Northern Oil and Gas;
- Tetlit Gwich'in Council;
- Tr'on dëk Hwëch'in;
- Nacho N'ya'k Dun;
- Mayo Renewable Council;
- Northern Tutchone Council;
- Canadian Parks and Wilderness Society;
- Yukon Territorial Government, Economic Development
- National Energy Board

3.2 Public Concerns

The VGFN, in a facsimile dated 3 June 1996, provided the Board with a copy of its 17 May 1996 letter to Northern Cross expressing concerns regarding any development within VGFN Traditional Lands. As well, the PCMB, in a letter dated 4 June 1996, expressed its concerns with any attempt to open this area to any development and that it has been actively lobbying to protect the Alaska '1002' calving grounds as well as the wintering range of the herd. The Board, in letters to the VGFN and PCMB dated 4 September 1997, noted that it would consider any concerns that the VGFN or PCMB might have with the technical or environmental aspects of the proposed program. In response to the Board letter, the PCMB, in its letter dated 19 September 1997, reiterated its earlier concerns and expressed additional concerns regarding who would be responsible for monitoring airborne emissions, who would be responsible for, and the effectiveness of, proposed caribou monitoring, and who would be responsible for reporting the effects on the nearby habitat including lichen.

Further, during the INAC land use permitting and environmental assessment screening processes, several organizations and First Nations expressed concerns with regards to the proposed project. A number of the concerns related to government policy aspects and/or legislation which has not yet been developed. Various groups noted that there is no legislation currently in place for land use planning, including the possible protection of the caribou winter range. Concern was also expressed to INAC that its approval of the project could have a detrimental effect on lobby efforts to protect caribou calving grounds in Alaska. As well, the Yukon Development Assessment Process ("DAP") is under development and is yet to be tabled in the House of Commons for consideration. These political concerns do not fall within the scope of the environmental assessment of the project.

Concerns were expressed regarding the potential environmental effects on the Porcupine Caribou Herd and its habitat, including effects on the quality of air, soil and vegetation. These potential environmental effects are addressed in section 4.2 of the this Environmental Screening Report.

On 26 June 1997, the VGFN, as Applicant, filed an Originating Notice of Motion between itself and Respondents the Attorney General of Canada, representing the Minister of Indian and Northern Affairs and Northern Cross (Yukon) Ltd. The VGFN made application in the Federal Court of Canada, Trial Division for the purpose of obtaining:

- An Order setting aside the decision of the Engineer dated May 30, 1997 granting Land Use Permit YA6A160 to the Respondent Northern Cross (Yukon) Ltd. pursuant to Section 25 of the Territorial Land Use Regulations;
- An Order requiring the aforesaid Engineer to redetermine the aforesaid Land Use Permit according to the law; and
- Such other relief as the Court might deem meet and just.

On 29 October 1997, at Ottawa, Ontario, the Trial Division Court Judge dismissed the VGFN application. Following, in part, are Reasons for Order provided by the Judge in the decision:

"First, Chapter 12 of the Vuntut Gwitchin Final Agreement provides that the Government of Canada shall recommend Development Assessment Legislation to Parliament or the Legislative Assembly, as the case may be, no later than two years after the effective date of Settlement Legislation [February 14, 1995]. The Northern Cross application was submitted to the Department on May 30, 1996, prior to any government obligation to submit Development Assessment Process (DAP) legislation to Parliament or the Legislative Assembly."

"In the absence of such legislation, chapter 12.19.5 [of the Vuntut Gwitchin Final Agreement] mandates the Land Use Engineer to follow the procedures and criteria set out in the *Canadian Environmental Assessment Act* and the *Territorial Lands Act*, which is precisely what Mr. Zrum [Land Use Engineer] did."

"Second, [the Trial Division Court Judge was] persuaded that in assessing the Northern Cross proposal pursuant to the requirements of the *Canadian Environmental Assessment Act*, the Department remained within its jurisdiction and provided the Vuntut Gwitchin First nation with every reasonable opportunity for consultation and input into the matters required to be considered under the legislation."

"The Screening Report properly addresses the "environmental effects" of the project, including the environmental concerns raised by the applicant and other concerned groups and agencies. Mr. Zrum

appropriately omitted from consideration the "political" concerns raised by the Vuntut Gwitchin First Nation, such as failure to accord it governmental status in the consultation process, concerns over possible implications on lobbying efforts in the United States, and requirement for a higher level of funding than offered by Department [of Indian and Northern Development] to enable the First Nation to better study the Northern Cross proposal. These facts quite simply do not fall within the definition of "environmental effects" in the *Canadian Environmental Assessment Act*, and accordingly were not within Mr. Zrum's jurisdiction in conducting his review of the Northern Cross proposal."

"Finally, the applicant cannot reasonably allege that it has not been afforded adequate consultation throughout the assessment process. At virtually every step in the application process both Northern Cross and the Department have sought to elicit the input of the Vuntut Gwitchin First Nation and to involve the First Nation's representatives in the consultation process."

"Unfortunately, with the exception of a single meeting with Northern Cross on June 9, 1995, the First Nation representatives did not avail themselves of the many opportunities offered by the company for direct consultation."

In conclusion, the Judge states that there is no evidence that the Department exercised its discretionary power in an improper manner, that it erred in applying the relevant provisions or that it denied the applicant natural justice or procedural fairness. Accordingly, the application was dismissed.

4.0 ASSESSMENT PROCESS

4.1 Procedures

In accordance with section 18 of the CEAA, the Board has carried out an environmental screening for the proposal based on the Application, Northern Cross' Emergency Response Plan, the response to the Board's request for additional information, INAC's CEAA environmental screening report (including specialist advice), and public concerns.

The Board has an obligation to determine the scope of the project in relation to which an environmental assessment is to be conducted. The Board determined that if the proposed project were to proceed, it does not make the decision to undertake any other projects inevitable. No other physical work or activity must be carried out in relation to the proposed project in order to complete the project.

4.2 Project Components and Effects / Proposed Mitigation / Significance of the Effects

The environmental concerns associated with the proposed project include potential effects to permafrost, ground surface stability, vegetation, wildlife, archaeological and historical resources, socio-economic effects, and cumulative effects, as well as effects from waste materials and malfunctions and accidents. The mitigative measures proposed by Northern Cross were presented in its assessment. Further mitigation and environmental protection measures are identified as conditions contained in INAC's Land Use Permit.

Northern Cross submits that, overall, the impact of the oil swab testing program would not be large and any risks can easily be controlled by known technologies and procedures. In a letter dated 7 May 1997 to INAC's Land Use Section, Northern Cross submits that it is very important to the Company that its operations are conducted in an environmentally responsible manner.

^ Additionally, Northern Cross has revised its program in December 1997 to eliminate extended flow testing.
e Company now proposes to swab the wells and recover approximately 500 barrels (80 m³) of oil per well. The reduced scope of work would result in a reduced level of adverse environmental effects related to the proposed program.

Permafrost and Ground Surface Stability

The Company indicates that the Eagle Plains region is in the area of discontinuous permafrost, and to obtain baseline permafrost data at the wellsites, Northern Cross proposes to run a temperature survey to a depth of 300 m. INAC's *Environmental Operating Guidelines: Hydrocarbon Well-sites in Northern Canada, 1986* states that permafrost is sensitive to changes in ground and air temperature and is protected from these changes by an organic mat and snow, which act as insulation, and by shade provided by vegetation cover.

The region has not been glaciated, and Northern Cross submits that, although bedrock is close to surface, the area is likely only passable for heavy equipment during the winter months. Accordingly, Northern Cross proposes to conduct its testing program during the winter months as it does not know whether the surface integrity would be strong enough to take heavy equipment in the summer. Further, Northern Cross proposes to use the existing winter access road and indicates that it would pack snow on the access roads to accommodate the mobile service rig and other vehicles.

Accidents and malfunctions, in the form of spills of fuels, chemicals and fluids produced from the well, have potential to affect the ground surface and the organic mat. Northern Cross, in its Safety and Emergency Response Procedures Manual provides environmental protection measures and response procedures to prevent or minimize potential environmental effects of spills. These proposed measures and procedures are outlined below, under the heading of "Malfunctions and Accidents"

With respect to potential environmental effects to the ground surface, INAC's Land Use Permit YA6A160 conditions Northern Cross to:

- not move any equipment or vehicles unless the ground surface is in a state capable of fully supporting the equipment or vehicles without rutting or gouging;
- suspend overland travel of equipment or vehicles if rutting occurs;
- not conduct any overland movement of equipment or vehicles before 0800 hours local time on 1 November unless otherwise authorized in writing by the Land Use Inspector;
- not conduct any overland movement of equipment and vehicles after 0800 hours local time on 1 April unless otherwise authorized by the Land Use Inspector;
- use existing accesses where possible; and
- construct and maintain winter roads with a minimum of 10 cm packed snow at all times during this land use operation.

Conclusions

The Board notes that the proposed project to re-enter and conduct fluid swab tests on three wells would be relatively small, restricted to the access road and wellsite leases and would be a short-duration winter project. The Board further notes that the project does not require any construction, except for small sewage sumps, that would directly disturb the ground surface or the organic mat cover that insulates the permafrost. Since the Company proposes to conduct the operation during frozen ground conditions, the surface and organic mat cover would be further protected and the ground surface would remain stable.

The Board is of the view that, given its minor nature, and implementation of Northern Cross' environmental protection measures and spill response procedures, the project would not likely cause adverse environmental effects to permafrost or ground surface stability.

Vegetation and Air Emissions

The environmental concern with respect to air emissions relates to the potential effects of the emissions on lichen, a food source for the caribou. Vegetation clearing would be confined to previously cleared areas that may have become overgrown.

Northern Cross states that the geography of the Eagle Plains is characterized by rolling hills covered for the most part by mature forests of black spruce and the ground cover is typically a mixture of lichens, sedges, shrubs and sphagnum moss. Lichen is a food source for caribou. The Company indicates that to conduct the fluid swab tests, it would have to re-open the winter road which would involve some clearing as well as clearing about one hectare near each wellsite to allow vehicle access and equipment placement. No camp is proposed for the sites as personnel would be accommodated at the Eagle Plains Hotel, approximately 60 km east of the project site.

Northern Cross submits that, in all cases, the clearing would be of vegetation that has grown over the areas previously affected by activities of former operators and that the prospective impact of its activities will be smaller than has occurred historically.

In a letter dated 14 June 1996, included in the INAC Environmental Screening Report, Environment Canada, Canadian Wildlife Service ("CWS") states that lichens supply up to 80% of the winter diet of the Porcupine Caribou Herd and that, within the winter range [three areas identified below under 'Wildlife'], the Eagle Plains has the best lichen communities in terms of biomass. Emissions from the flaring of produced gasses, with an H_2S content of 0.42% or possibly higher, may have potential to impinge on, and affect lichen.

In its Application, Northern Cross states that a temporary flare stack would be erected at each well to flare solution gas not required for firing the heater treaters. In the minutes of the INAC Land Use Advisory Committee meeting of 13 August 1996, Northern Cross indicated that the Company is unsure that anything could be learned that would show a difference in air quality over the short period that gasses would be burned. Northern Cross indicates that a 12 m flare stack would be located 40 m from the wellhead and 20 m from the nearest tree cover and that, when sour gas is ignited, the H_2S is converted to SO_2 and is carried by the heat of combustion higher into the atmosphere, causing it to disperse over a larger area. The Company states that this tends to lower the ground level concentration of SO_2 to manageable levels. Additionally, in the interim since the project was assessed by INAC, Northern Cross has reduced the scope of the proposed work to eliminate extended flow testing of the well in favour of swab testing to recover 1,500 barrels (238 m^3) of oil. Produced gas would still be flared.

With regards to vegetation and air emissions issues, INAC, in its Land Use Permit YA6A160 for the project, further conditions Northern Cross to:

- not clear any trees or brush except on already cleared areas;
- take every precaution to ensure that wildlife habitat is not damaged;
- produce and supply an atmospheric dispersion model for the flare stack and provide it to the Land Use Engineer prior to operation; and
- design a monitoring and sampling program to gather baseline information accumulations that results from this project.

Conclusions

The Board notes that there are only a small number of vehicles and equipment proposed for the project. Further, given the short duration of the swab tests and the proposed use of 12 m tall flare stacks, any sulphur dioxide (SO₂) produced would be carried by the heat of combustion higher into the atmosphere, causing it to disperse over a larger area and would result in minor ground level concentrations. The potential adverse environmental effects of the SO₂ on lichen would extend only over a small area and would be of low magnitude, and transitory. Vegetation clearing would not clear any new area, but would be confined to the overgrown, previously cleared access routes and wellsite leases. Potential adverse environmental effects of clearing would be of low magnitude, localized and reversible.

The Board is of the view that the project would not likely cause significant adverse environmental effects to lichen as a result of air emissions or clearing associated with the project.

Wildlife

In its Application, Northern Cross indicates that wildlife in the Eagle Plains area is quite abundant with healthy populations of caribou, moose, grizzly and black bears, wolves, various fur bearing animals, various rodents, and ptarmigan. Of these, Northern Cross states that the caribou, from the Porcupine Caribou Herd, are probably the most noteworthy. The Company submits that, in the winter range, the caribou are widely dispersed and engaged in basic activities for survival, primarily searching for food. An aerial reconnaissance conducted by Northern Cross, in February 1996, identified four caribou and one moose in the general area of the access road and the wellsites. A surface inspection of the wellsites and access route by the Company in March 1996, revealed tracks of caribou and moose, but not in any large numbers.

Northern Cross presented a map analysis from a report by the International Porcupine Caribou Board, 1993 that shows the distribution of the herd in late winter, with early and mid-winter distributions tending to overlap late winter distribution. The map appears to indicate that the herd is present in the vicinity of the project, in fewer than 20% of the 16 years with survey data. In a letter dated 14 June 1996, included in the INAC Environmental Screening Report, CWS states that in the Yukon, the three main wintering areas are the Richardson Mountains, the Eagle Plains and the Ogilvie/Hart/Peel basins. CWS states that the Eagle Plains can be utilized in any year, although most use occurs in average to below average snow years. CWS further states that snow depths on the Eagle Plains tends to be deeper because weather systems from the Bering Sea arrive relatively unobstructed from the west.

In its environmental assessment, INAC noted that the location of the proposed land use is well away from the known migration corridors of the Porcupine Caribou Herd and that the area is not a key winter range used infrequently by caribou.

Northern Cross, in its letter dated 7 May 1997 to INAC¹, states that in discussions with D. Russell, CWS, the only real problems identified were related to the risks associated with public access, vehicle speed and wildlife access to substances stored or otherwise found at the wellsites. Northern Cross further states in its letter that the mitigation measures suggested in INAC's CEEA Environmental Screening report of speed limits, restricted access and storage are acceptable to Northern Cross.

¹ Referenced letter is attached to INAC's Environmental Screening Report, dated 28 May 1997.

In its Application, Northern Cross submits that to mitigate the potential impact of the Company's activities caribou, a barrier would be placed at the entrance to the winter road at the Dempster Highway and signs would be posted restricting access to authorized personnel only. In addition, crews would be advised not to disturb the caribou should any be encountered. Northern Cross submits that, since studies conducted in the past suggest that caribou are tolerant of human activity during the winter, any contact is unlikely to have any lingering effect. The Company further states that, normal activity on the Dempster Highway is likely to be more significant for caribou than the testing program.

Accidents and malfunctions, in the form of spills of fuels, chemicals and fluids produced from the well, have potential to affect caribou and other wildlife through direct contact or may affect local vegetation. Northern Cross, in its Safety and Emergency Response Procedures Manual provides environmental protection measures and response procedures to prevent or minimize potential environmental effects of spills. These proposed measures and procedures are outlined below, within section 4.2 of this document, under the heading of "Malfunctions and Accidents"

With respect to managing potential wildlife conflicts, INAC's Land Use Permit YA6A160 conditions Northern Cross to:

- take every precaution to ensure that wildlife habitat is not damaged;
- report encounters with wildlife to the Conservation Officer in Dawson;
- insure all facilities are secure from wildlife and in particular bears; and
- not unnecessarily interfere with critical wildlife activity by:
 - (a) ceasing activity other than production testing when caribou are present;
 - (b) maintaining a maximum approach distance of 300 m line-of-sight to caribou when opening or constructing wellsites;
 - (c) storing all chemicals and substances that may be attractive to wildlife in a fashion to ensure they are not available to wildlife;
 - (d) breaking all snow berms or windrows, except for wellsite contaminant berms, at intervals no greater than 300 m and, where possible, berms are to be kept to a minimum height;
 - (e) keeping vehicular speeds on the access routes to a maximum of 50 KPH or less when wildlife is present; and
 - (f) employing a person dedicated to monitoring wildlife activity during active construction or demobilization stages of the operation.

Waste Management

Yukon Renewable Resources noted, in its letter to INAC dated 3 July 1996 regarding Northern Cross' Land Use Permit application, that wildlife may be attracted to the wellsite operations during the active period and may visit the site after operations are completed. Renewable Resources states that if food and other attractants are regularly available, wildlife may alter their behaviour and habits. In addition, some specific materials such as petroleum products and antifreeze may be harmful to wildlife. Renewable Resources recommends that, to reduce potential for negative impacts, the Company ensures proper storage, incineration and waste disposal would reduce concerns during the active period. Further, the camp should be bear proofed for the off-season and hazardous materials should be removed or securely stored.

Although Northern Cross has indicated that it would not use a camp for its operations personnel, a small sewage sump would be present on site associated with an emergency and crew trailer. As well, a separate sump would be used to dispose drilling mud.

With respect to waste management, INAC's Land Use Permit YA6A160 conditions Northern Cross to:

- dispose of all waste petroleum products by removal to a disposal site approved by the Land Use Inspector and subject to all applicable legislation;
- ensure that the land use area is kept clean and tidy at all times;
- remove all scrap metal, discarded machinery and parts, drums, buildings and building materials;
- provide in writing, a plan for removal of storage equipment and materials;
- notify a Land Use Inspector prior to backfilling any sump; and
- store all chemicals and substances that may be attractive to wildlife to ensure that they are not available to the wildlife.

Northern Cross' proposed environmental protection measures with respect to waste management further includes:

- removing diesel oil and/or drilling mud from the wells for disposal in a small sump;
- using a small, 2 m³ sump at each jobsite for sewage disposal;
- burying fluids to be disposed at a suitable time after operations are finished;
- using the approximately 28 m³ of 9% calcium chloride solution, after use as a displacement fluid and to stabilize the well, by disposing the solution on a Department of Highways gravel stockpile for use in highway dust control; and
- trucking and disposing of volumes of produced water to a disposal site in northeastern B.C.

With regards to diesel fuel that was used as a wellbore inhibitor, Northern Cross, in its letter dated 7 May 1997 to INAC, states that the diesel would be recovered and either used as utility fuel, mixed with treated crude oil and delivered to market, or recycled to use as inhibitor fluid at the completion of the test. Appropriate storage and handling procedures on site would be followed to mitigate any environmental hazard.

Conclusions

The Board notes that:

- the 1993 analysis by the International Porcupine Caribou Board indicates that the caribou herd is present in the vicinity of the project in fewer than 20% of the 16 years with survey data;
- INAC indicates that the area is not a key winter range and is only used infrequently by caribou;
- no additional habitat would be cleared of vegetation;
- Northern Cross' spill protection measures and response procedures would prevent or minimize potential effects to wildlife;
- INAC's Land Use Permit conditions provide additional measures to facilitate wildlife movement, reduce opportunities for contact, protect habitat, and provide increased wildlife monitoring;
- the project is of short duration during late winter; and
- the project area is relatively small.

Given these factors, the Board is of the view that the potential to disturb or encounter caribou is minimal, and that in the event of caribou encounters, Northern Cross' proposed mitigation measures and the conditions attached to INAC's Land Use permit would minimize or prevent conflict situations. The potential adverse environmental effects to caribou would occur infrequently and would be localized, of short duration, minor and reversible. The Board is of the view that the project would not likely result in significant adverse environmental effects to caribou.

Stream Crossings and Fisheries Resources

Northern Cross submits that the established access route follows the top of a ridge and does not cross or pass nearby any bodies of water. As well, the Company indicates that the wellsites are not near any significant bodies of water.

Archaeological and Heritage Resources

In its Application, Northern Cross notes that the impact of the project would be restricted to a region previously disturbed by exploration activities conducted by others during the past forty years. The Heritage Resource Officer for the VGFN Land Claims Department, in his letter dated 22 May 1997 to INAC, notes that the proposed project is in a traditional hunting and trapping area. Furthermore, the Heritage Resource Officer states that the VGFN is not aware of any assessment of archaeological or other heritage resources which may be present on, or adjacent to, the project. The Heritage Branch of Yukon Tourism notes, in its letter dated 29 April 1997 to INAC, that an overview assessment of heritage resources has never been conducted and the Heritage Branch has no data for the region.

In the event that, during the Company's operations, archaeological sites and/or burial grounds are discovered, INAC's Land Use Permit YA6A160 conditions Northern Cross to immediately suspend the land use operation on the site and notify the Land Use Inspector of the location of the site and the nature of the unearthed materials, structures or artifacts.

Accidents and Malfunctions

Spill Containment and Management

Mitigation measures proposed for spills of oil or produced fluids are presented in Northern Cross' Safety and Emergency Procedures Manual and include:

- surrounding all production vessels with a 1.0 m high impermeable berm that would have a holding capacity greater than the combined volume of the vessels and tanks inside the berm;
- constructing a 1.0 m high ice berm across low drainage areas at the lease edge so that any spills would be contained during winter drilling and wells servicing operations;
- reporting of any oil or produced water spills greater than 2.0 m³;
- constructing ice barriers to minimize the drainage area associated with a spill;
- loading cold weather hardened oil and oil stained snow and ice into tanks for recovery; and
- using vacuum trucks to collect free standing oil.

In the event of a crude oil spill, Northern Cross indicates that, since the crude oil would gel at temperatures anticipated during the test period, it can be readily cleaned up.

Public and Worker Protection

Northern Cross submits that hydrogen sulphide, a poisonous gas, is known to be present in the associated gas in concentrations up to about 0.42% and may be slightly higher in the produced solution gas. In its Safety and Emergency Procedures Manual, Northern Cross provides an outline for command posts, response exercises, determination of appropriate levels of alert, emergency notification procedures and contacts, equipment, and safety and environmental policies and procedures. The Company states that warning signs would be posted to alert personnel of the potential danger and appropriate safety measures would be taken to minimize risk to personnel.

Additional proposed safety measures include:

- contacting the on-site supervisor before workers leave for the site or return to Eagle Plains;
- equipping all vehicles transporting workers with winter survival gear;
- frequently evaluating any incident to assess the potential affect on the public and workers;
- evacuating the public at a Level Two or Three Alert or igniting the gas release at a Level Three Alert of an uncontrolled release; and
- establishing road blocks to secure the site specific emergency planning zone, if evacuation occurs.

The Company notes that the proposed fluid swab tests of the three existing wells at Chance is a small scale project by any standard of comparison. Northern Cross submits that, overall, the impact of the test program would not be large and any risks could easily be controlled by known technologies and procedures.

Conclusions

Potential environmental effects related to malfunctions and accidents have been assessed in the preceding portion of this Environmental Screening Report. No further conclusions are drawn here.

Socio-Economic Matters

Northern Cross notes that, from the information meetings held in the Yukon, no concerns were identified with regards to the traditional lifestyles of the First Nations. The Company submits that the project area is not actively trapped and is some distance away from popular hunting areas for caribou.

In its Application, Northern Cross indicates that the project would evaluate the degree to which crude oil from the wells could satisfy energy demand in the Yukon. Northern Cross states that it hopes to be able to provide a cheaper source of energy and displace higher cost, imported fuel. Anyone connected to the power grid, according to Northern Cross, would directly benefit from anticipated cost savings.

The Company notes that, although the scale of the proposed operations is small, and employment during the test period would result in only few relatively short-term opportunities, more significant benefits would arise if the project results are favourable. For the project, Northern Cross indicates that it would require labour assistance to re-open and maintain the access route and transport any produced crude. Further, the Company would employ a variety of oilfield services to complete and test the wells. Northern Cross submits that its desire is to involve Yukoners as much as possible, and in the long-term the Company would prefer to nurture local competence.

Northern Cross submits that the benefits to Yukoners would be much larger than the potential costs.

Conclusions

The Board notes that, although caribou may potentially be affected by the project, those adverse environmental effects are not considered to be significant. Further the Board notes that the project area is not actively trapped and is some distance away from popular hunting areas for caribou. The Board is of the view that the potential adverse environmental effects of the project would not result in directly-related adverse socio-economic effects.

Cumulative Environmental Effects

Northern Cross notes that oil and gas activities have occurred in the Eagle Plains area during the past 40 years. However, there has been no activity since 1985 when the West Parkin D-54 and Chance D-22 wells were drilled. Further, no other oil and gas projects are proposed for this area.

The Company notes that the area is not actively trapped and is some distance from popular hunting areas for caribou.

Conclusions

Taking into account that potential adverse environmental effects of Northern Cross' project would be of low magnitude, localized, transitory, and mostly reversible, the spatial extent of adverse environmental effects are narrow and temporal overlap limited. The Board is of the view that the project will not cause significant adverse impacts in combination with the existing or past projects and activities.

5.0 THE BOARD'S CONCLUSION

The Board is satisfied with the environmental and socio-economic information provided by Northern Cross with regard to the potential adverse environmental effects which may result from the construction and operation of the proposed facilities and is satisfied with Northern Cross' proposed monitoring and mitigation measures.

The Board is of the view that the environmental effects of the proposed construction, in combination with past, existing, and future projects and activities, are not likely to cause significant adverse cumulative environmental effects.

The Board is satisfied that Northern Cross has notified and discussed the proposed Application in a timely and satisfactory fashion with government agencies, public interest groups and affected landowners.

The Board is of the view that if Northern Cross' proposed environmental mitigative measures, as well as those agreed to by Northern Cross with other regulatory agencies, are implemented, the project would not likely cause significant adverse environmental effects. Should Northern Cross' Application be approved, the Board would condition the order so as to ensure adherence to mitigative measures.

5.1 Order Condition

1. Unless the Board otherwise directs, Northern Cross (Yukon) Limited shall implement or cause to be implemented all the policies, practices, recommendations and procedures for the protection of the environment included in or referred to in Northern Cross' application.

6.0 CEAA DETERMINATION

The Board is of the view that, taking into account the implementation of the proposed mitigative measures, and those set out in the above-noted conditions, the project is not likely to cause significant adverse environmental effects. This represents a decision pursuant to paragraph 20(1)(a) of the CEAA.

7.0 DECISION

The Environmental Screening and the CEAA determination were approved by the Board on 4 March 1998.


8.0 DEPARTMENTAL / AGENCY CONTACT

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Northern Cross (Yukon) Limited ("Northern Cross")
Fluid Swab Test of Eagle Plains Wells: Socony Mobil W.M. Chance YT G-08,
Western Minerals Chance YT M-08 and Canoe River Chance YT J-19


4 March 1998

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