

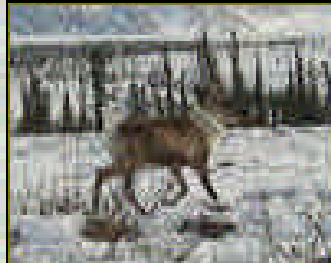
Mackenzie Valley
Environmental Impact Review Board

Report of Environmental Assessment
and Reasons for Decision on the
Paramount Resources Limited

Cameron Hills Extension Project

EA03-005

June 1, 2004



NORTHEAST TERRITORIES
ALBERTA

Table of Contents

REVIEW BOARD ENVIRONMENTAL ASSESSMENT DECISION.....	v
-----------------------------------------------------	---

SUMMARY REPORT OF ENVIRONMENTAL ASSESSMENT.....	vi
-------------------------------------------------	----

1. INTRODUCTORY INFORMATION

1.1.	INTRODUCTION.....	1
1.1.1.	<i>Referral of the Proposed Development to the Review Board.....</i>	1
1.1.2.	<i>Requirements of the Mackenzie Valley Resource Management Act.....</i>	2
1.2.	OVERVIEW OF THE PROPOSED DEVELOPMENT.....	2
1.2.1	<i>Environmental Setting.....</i>	2
1.2.2	<i>Description of the Operation.....</i>	3

2. ENVIRONMENTAL ASSESSMENT PROCESS

2.1.	PARTIES TO THE EA.....	6
2.2.	EA APPROACH.....	6
2.3.	DETERMINATION OF SIGNIFICANCE.....	10
2.4.	SCOPE OF THE PROCEEDING.....	11
2.4.1.	<i>Scope of the Proposed Development.....</i>	11
2.4.2.	<i>Scope of the Environmental Assessment.....</i>	13

3. PUBLIC CONCERN

3.1.	APPROACH.....	13
3.2.	SUBMISSIONS OF THE PARTIES.....	14
3.3.	ANALYSIS.....	14
3.4.	CONCLUSIONS.....	16

4. IMPACTS ON THE ENVIRONMENT

4.1.	APPROACH.....	16
4.1.1.	<i>Structure of Analysis.....</i>	16
4.1.2.	<i>Issues Identification.....</i>	16
4.1.3.	<i>Developer's Commitments.....</i>	17
4.2.	BIOPHYSICAL ENVIRONMENT.....	18
4.2.1.	Air Quality.....	18
4.2.1.1.	<i>Approach.....</i>	18
4.2.1.2.	<i>Study Area.....</i>	19
4.2.1.3.	<i>Submissions of Parties.....</i>	19
4.2.1.4.	<i>Analysis.....</i>	21
4.2.1.5.	<i>Conclusions.....</i>	23

4.2.2.	Water Quality.....	24
4.2.2.1.	Approach.....	24
4.2.2.2.	Study Area.....	25
4.2.2.3.	Submissions of Parties.....	25
4.2.2.4.	Analysis	26
4.2.2.5.	Conclusions.....	27
4.2.3.	Boreal Caribou/Wildlife.....	28
4.2.3.1.	Approach.....	28
4.2.3.2.	Study Area.....	28
4.2.3.3.	Submissions of Parties.....	28
4.2.3.4.	Analysis	30
4.2.3.5.	Conclusions.....	31
4.2.4	Cumulative Effects.....	32
4.2.4.1	Approach.....	32
	Spatial Boundaries.....	32
	Temporal Boundaries.....	32
	Impact Prediction.....	33
4.2.4.2	Submissions of Parties.....	33
4.2.4.3	Analysis.....	36
	Future Project scenarios.....	36
	Effects on vegetation.....	37
	Inconsistent application of assessment criteria.....	37
	Effects on boreal caribou.....	38
	Effects on other wildlife.....	41
4.2.4.4	Conclusions.....	41
4.4	SOCIO-ECONOMIC AND CULTURAL ENVIRONMENT.....	45
4.4.1	Socio-Economic Considerations.....	45
4.4.1.1	Approach.....	45
4.4.1.2	Study Area.....	46
4.4.1.3	Submissions of Parties.....	46
4.4.1.4	Analysis.....	50
4.4.1.5	Conclusions.....	52
4.4.2	Cultural Considerations	53
4.4.2.1	Approach.....	53
4.4.2.2	Study Area.....	53
4.4.2.3	Submissions of Parties.....	53
4.4.2.4	Analysis.....	54
4.4.2.5	Conclusions.....	54

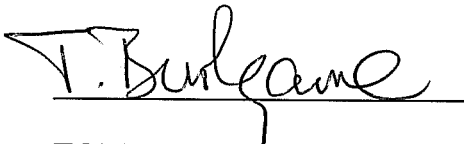
5. SUMMARY OF RECOMMENDATIONS AND SUGGESTIONS.....	55
FIGURES AND TABLES	
Figure 1 – Cameron Hills Project Location Map.....	5
Figure 2 – Paramount Cameron Hills Extension Project EA03-005 Process.....	7
Figure 3 – Paramount Cameron Hills Cumulative Effects Study Areas Map.....	34
LIST OF ABBREVIATIONS.....	59
LIST OF APPENDICES	
Appendix A – Developer’s Commitments.....	61
Appendix B – Public Registry Index.....	69
Appendix C – MVEIRB Authority for Recommendations and Suggestions.....	77
Appendix D – Deh Cho Consultation Principles.....	81
REFERENCES.....	84

Review Board Environmental Assessment Decision

To make its decision in this Environmental Assessment (EA), the Mackenzie Valley Environmental Impact Review Board has relied upon all the information on the Public Record. Having considered the evidence, the Review Board has made its decision in accordance with section 128 of the Mackenzie Valley Resource Management Act (MVRMA).

It is the Board's opinion that without additional mitigation, the proposed development, considered as a whole, would be likely to cause significant adverse impacts on the environment. In order to prevent these significant adverse impacts, the Review Board has recommended a number of measures in this report.

The Board has concluded, pursuant to section 128(b)(ii) of the MVRMA that with the implementation of the measures recommended in this Report of EA and the commitments made by Paramount Resources Ltd. (see Appendix A), the proposed development will not likely have a significant environmental impact or be cause for significant public concern and should proceed to the regulatory phase of approvals.



TODD BURLINGAME

Chair of the Mackenzie Valley
Environmental Impact Review Board



DATE

Summary Report of Environmental Assessment

The Mackenzie Valley Environmental Impact Review Board (Review Board) undertook an Environmental Assessment (EA) of Paramount Resources Limited's (Paramount) proposed Cameron Hills Extension project according to the *Mackenzie Valley Resource Management Act* (MVRMA).

The developer, Paramount Resources Ltd., proposes to drill up to 48 new oil and gas wells and build associated tie-ins to the existing pipeline over the next 10 years on the Cameron Hills Significant Discovery License (SDL). The Cameron Hills are located near the communities of Enterprise and Kakisa, in the southern portion of the Northwest Territories south of Great Slave Lake. Associated development activities proposed by Paramount include access roads, cutlines, camp locations and river crossings.

In addition to analyzing written evidence, the Review Board held a community meeting on February 17, 2004 in Kakisa as well as a public hearing in Hay River on February 18-19, 2004.

A review of the evidence on the public record has convinced the Review Board that:

- The Cameron Hills is an important traditional use area for local First Nations and Metis
- Some of the commitments to mitigation measures regarding harvester compensation made by Paramount in a previous EA have yet to be fulfilled.
- There is a need for air quality monitoring in the NWT emerging as a result of oil and gas development and an emerging need for enforceable air quality standards.
- The cumulative effects of ongoing development in the Cameron Hills may result in adverse effects on the regional boreal caribou population

Having considered all the evidence on the public record, the Review Board has concluded that the potential impacts of the proposed development can be mitigated if the developer's commitments are adhered to and if the mitigation measures proposed in this report of EA are accepted.

The Review Board therefore recommends, pursuant to section 128(b) ii of the *MVRMA* that the proposed development proceed to the regulatory phase for approval.

1. INTRODUCTORY INFORMATION

This section provides background information on the referral of this development to the Mackenzie Valley Environmental Impact Review Board (Review Board) and sets out the requirements for Environmental Assessment (EA) under the *Mackenzie Valley Resource Management Act (MVRMA)*. It also provides an overview of the environmental setting and a brief description of the development proposal.

Section 2, Environmental Assessment Process, presents the Review Board's EA process and the role of each EA phase in making a determination under section 128 of the *MVRMA*.

Section 3, Public Concern, considers the extent of, reasons for, and significance of public concern.

Section 4, Impacts on the Environment, considers the environmental components that the developer was required to examine during its impact assessment of the development on the biophysical and socio-economic environment and includes the Review Board's conclusions about the environmental impacts of the proposed development and their significance.

Section 5, Summary of Recommendations and Suggestions, contains a summary of all recommendations and suggestions of the Review Board in consideration of all material on the public record (PR).

1.1. Introduction

1.1.1. Referral of the Proposed Development to the Review Board

Paramount Resources Ltd. applied for amendments to a Land Use Permit (MV2002A0046) and a Water License (MV2002L1-0007) to the Mackenzie Valley Land and Water Board (MVLWB) on April 22, 2003. The MVLWB carried out a Preliminary Screening of the proposed development according to section 124 of the *MVRMA*. As per section 124 (3), the MVLWB acted as lead screener. The MVLWB consulted 21 organizations during the Preliminary Screening Process.

On May 28, 2003, the MVLWB finalized the Preliminary Screening. It referred the proposed development to EA, according to section 125 of the *MVRMA*, citing the potential for public concern and significant environmental impacts related to cumulative effects. The MVEIRB notified the developer that the EA had been started on May 29, 2003.

1.1.2. Requirements of the Mackenzie Valley Resource Management Act

The Review Board administers part 5 of the *MVRMA* and has decision-making responsibilities in relation to the proposed development.¹ The Board is responsible for the conduct of an EA, which considers the environmental, socio-economic and cultural impacts of the proposed development in accordance with section 114 and section 115 of the *MVRMA*. The conduct of the Paramount EA was based the Board's *Rules of Procedure*.

Pursuant to section 117 of the *MVRMA*, the Board must determine the scope of the development and set out the factors to be considered in the EA for a development in consultation with the federal or territorial responsible Ministers, if such consultation is requested. None was in this case. The Board is also required to prepare and submit a report of EA in accordance with subsection 128(2), a decision under subsection 128(1), and written reasons for decision, required by section 121, to the Minister of Indian and Northern Affairs Canada (INAC).

1.2. Overview of the Proposed Development

1.2.1. Environmental Setting

The environmental setting has been described based on the broad interpretation of environment under the *MVRMA* that includes land, water, air or any other component of the environment, including the social and cultural environment.

The Cameron Hills uplands, based on a geologic formation of cretaceous shale, are located in the southwestern portion of the territory and in the far north east of Alberta. The Paramount Resources Ltd. significant discovery license (SDL) covers a large part of the formation on the NWT side only.

The Taiga Plains ecozone extends to the Mackenzie Delta, along the Yukon border and also includes the western portion of both the Great Slave and Great Bear lakes. The Northern Alberta Uplands ecoregion is the smaller, more distinct region within the ecozone, encompassing the Cameron Hills. Up to 70 percent of the ecoregion is typically covered in wetlands, and permafrost is discontinuous with low ice content².

The Cameron Hills climate is described as subhumid high boreal, marked by cool summers and very cold winters. Precipitation averages 350-500mm annually, which lends itself to the white spruce, balsam fir and aspen mixed wood forest.

¹ The Minister of DIAND and responsible ministers make the final decision in consideration of the Review Board's recommendations and suggestions.

² URL of this page: http://www.ec.gc.ca/soer-ree/English/Framework/NarDesc/taipln_e.cfm

Wildlife communities are mainly composed of boreal (woodland) caribou, moose, black bear, wolf, beaver, snowshoe hare, red squirrel, raven, and waterfowl. The Cameron Hills, in the vicinity of Bistcho Lake, are said to be home to one of the largest occurrences of nesting bald eagles³.

The Northwest Territories communities of Kakisa and Enterprise are the nearest to the proposed development expansion in the Cameron Hills. The Ka'a'Gee Tu First Nation, among many other local First Nations and Metis groups have historically used the Cameron Hills area for traditional activities. These activities continue to be of importance today, as the area is still used for hunting, trapping, fishing, berry and plant gathering on a regular basis.

1.2.2. Description of the Development

The proposed development is an addition to existing and approved activities on the site. Paramount has already obtained permits for an additional 510 kilometers of 3D seismic that has yet to be completed. In order to complete the 3D seismic, Paramount anticipates an additional 200 kilometers of 2D seismic, which has also already been permitted. Seismic will be completed using Vibroseis. All lines will be spaced at an average of 300 meters and will range in widths from 1.5 to 6m for receiver lines and 6m for source lines. Seismic work is scheduled for January and February.

Paramount Resources Ltd. is proposing to expand its current oil and gas operations in the Cameron Hills Significant Discovery License (SDL) area of the Northwest Territories (figure 1).

Paramount intends to drill up to 48 new wells over the next ten years. Paramount estimates that only about 66 percent of new wells drilled will be viable. Viable wells will be tied-in to the existing pipeline and gathering system. Non-viable wells will be abandoned and reclaimed. Drilling activity is to occur in frozen-ground winter conditions only (January to April), and two service rigs will be required each winter season.

New access will be required for establishing well sites, for connecting viable wells to the existing pipeline grid and for seismic operations. All roads will be constructed as winter use only and will follow the guidelines set forth in the NWT Department of Transportation (DOT) Handbook (1993). Water used for the icing of roads and well pads will be drawn from nearby lakes and streams. Where water crossings are required, ice bridges will be constructed. Where clearing of the vegetation is required to establish a site, timber will be salvaged where appropriate or windrowed for use in the reclamation phase. Some grading is anticipated in order to create a level area for well sites. The current temporary winter airstrip will continue to be used for the proposed development.

³ URL of this page: http://www.ec.gc.ca/soer-ree/English/Framework/NarDesc/taipIn_e.cfm

The criteria used by Paramount in selecting access routes were:

1. Utilize existing linear disturbances (i.e., access routes, seismic cutlines) to obtain the shortest route possible;
2. Limit disturbance of sensitive habitat and, in particular, the riparian areas associated with the Cameron River and the larger tributaries; and
3. Limit the number of water crossings, particularly the Cameron River.

Pipelines will be required to cross watercourses in some instances. Paramount has outlined four possible methods to be used for such crossings:

1. Open Cut – where drainage is dry or frozen, pipe is dug into ground.
2. Aerial Crossing – where pipe is supported above ground by piles driven into streambed.
3. Horizontal Directional Drilling – where the pipe is drilled into the substrate below the streambed, leaving no disturbance of stream.
4. Isolated – where the stream is dammed temporarily in order to dig and lay pipe into ground.

Paramount has indicated their preference for either the *open cut* or *aerial crossing* methods for having pipelines cross watercourses in the Cameron Hills. Regular pipeline construction will be along a 20m Right of Way (ROW). Pipe will be laid in-ground at a minimum depth of 1.2m. Excavated soil will be replaced, and allowed to regenerate naturally in most cases. In the presence of permafrost areas, heavy-walled pipe will be used in order to discourage potential thawing. Flowlines will be tested using methanol.

Drilling muds will be contained in above ground tanks at work sites. Water will initially be drawn from nearby lakes and streams. Once used, water will either be re-used or injected into water disposal wells. Drill cuttings will be disposed of in pits close to access roads.

Portable and temporary worker camps will be required to accommodate up to two hundred people in some instances. Campsites will be selected based on the current access routes available, level surfaces and the proximity to the undertaking, always at least 100m from any watercourse.

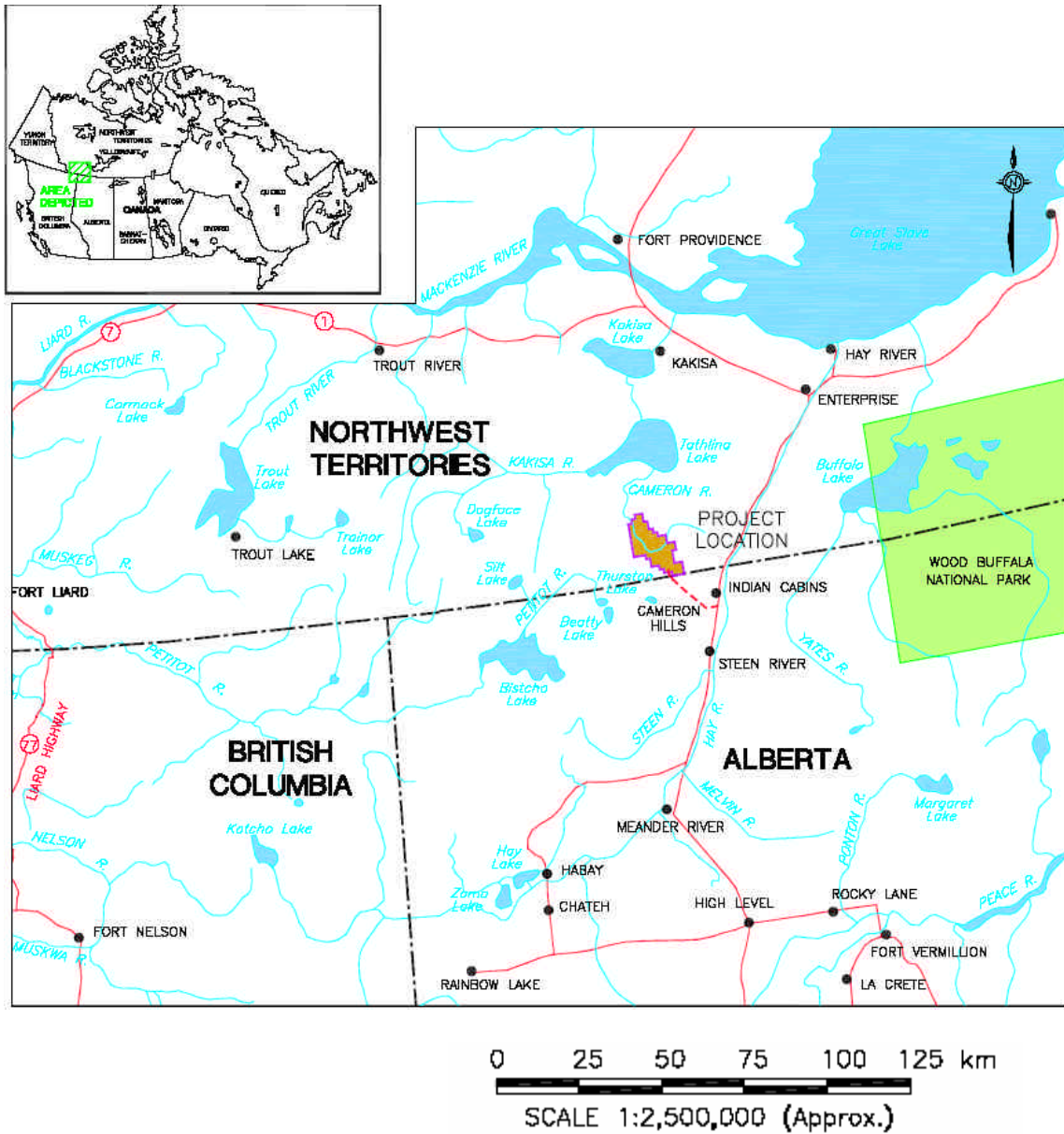


Figure 1 - The Cameron Hills Project Location Map
 Source: Paramount Resources Ltd.

2. ENVIRONMENTAL ASSESSMENT PROCESS

2.1. Parties to the EA

There were 12 parties to the Environmental Assessment (EA). According to the Review Board's *Rules of Procedure*⁴, the developer is deemed to be a directly affected party. The remaining 11 registered parties were composed of government departments, Aboriginal groups and other organizations. They included:

- Deh Cho First Nation
- K'atloodeeche First Nation
- West Point First Nation
- Fort Providence Metis Local 57
- Ka'a'Gee Tu First Nation
- Deh Gah Got'ie First Nation
- Fort Providence Resource Management Board
- NWT Metis Nation
- GNWT-RWED
- DFO
- INAC
- Environment Canada

During the EA process, representatives of government departments had the opportunity to identify their interest in the proceedings and to notify the Review Board of their Minister's intent to participate in the proceeding in the role of a "responsible minister", as defined in section 111 of the *MVRMA*. The Responsible Ministers play a role in the decision-making process. Included in this category are the Ministers of DFO, EC, and the RWED-GNWT. The Minister of INAC is the federal minister as defined by the *MVRMA* and plays the central decision-making role in the EA.

2.2. EA Approach

The EA process had three phases: a scanning phase to define information needs and to describe the development and potential impacts; an analysis phase to explore the reasons for public concern and associated environmental issues; and a decision phase to consider, evaluate, and weigh evidence in order to render an EA decision. Figure 2 shows the various phases of the EA and which tasks were undertaken in each phase.

⁴ MVEIRB. *Rules of Procedure for Environmental Assessment and Environmental Impact Review Proceedings*. (May 2002).

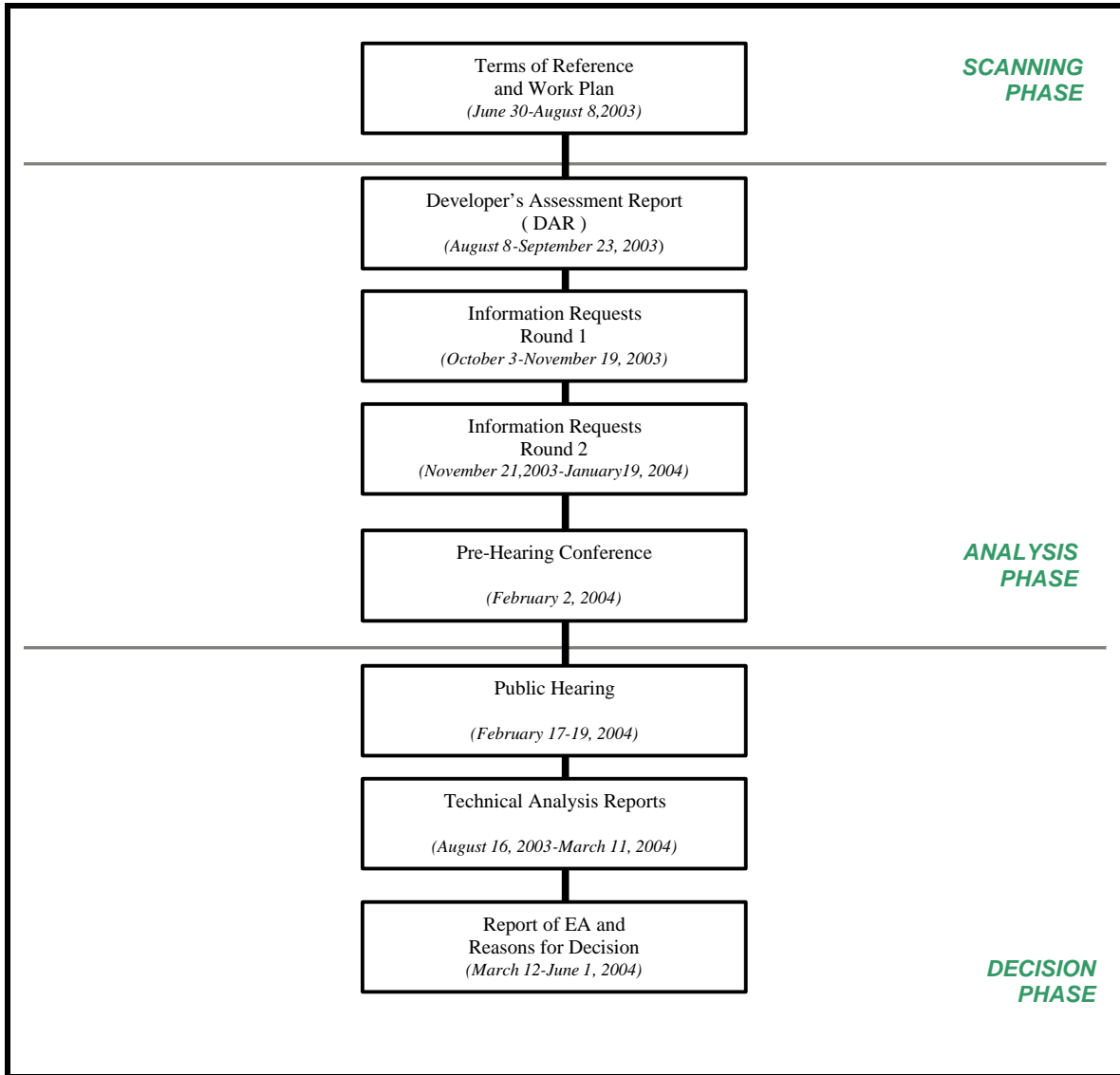


Figure 2 – Paramount Cameron Hills Extension Project EA03-005 Process

Development of the Terms of Reference and Work Plan

The Review Board issued a *draft Terms of Reference and Work Plan* for the EA on June 30, 2003. The documents were distributed by fax and e-mail to organizations that wanted to remain on the distribution list⁵. Comments on the draft were received from June 30 to July 18, 2003. GNWT, Paramount, K'a' Gee Tu First Nation and the Deh Gah Got'ie Dene Council submitted comments that were considered by the Review Board.

The final *Terms of Reference and Work Plan* was issued on August 8, 2003. The Terms of Reference described the scope of development and scope of assessment and provided direction to Paramount and others about their roles, responsibilities and deliverables in the EA process. The Work Plan established the milestones and identified the Review Board's timelines and expectations for the completion of the EA.

The Work Plan was amended by rulings of the Review Board in response to requests or concerns expressed by the parties on four occasions:

- July 15, 2003 the Work Plan was changed to accommodate parties' late submissions of comments on the Draft Terms of Reference and Work Plan (PR #14);
- January 20, 2004 the Work Plan was changed to allow an additional five Information Requests to Round 2 (PR#108); and,
- January 30, 2004 the Work Plan was changed to allow an additional two Information Requests to Round 2 (PR#122); and,
- February 5, 2004 the Work Plan was changed to accommodate FPMC and KTFN request for an extension of the Technical Analysis Report submission deadline (PR# 135).

Submission of the Developer's Assessment Report

The Developer's Assessment Report (DAR) was prepared according to the *final Terms of Reference* issued by the Review Board. The Review Board received the DAR on September 23, 2003 (PR # 33). The DAR was deemed to be in conformity with the final Terms of Reference by the Review Board on (PR#38).

⁵ These organizations were GNWT, Mandell Pinder, Dene Cultural Institute, DOT, INAC, DFO, Dene Nation, PWNHC, MACA-GNWT, NWT Metis Nation, Town of Hay River, K'a' Gee Tu First Nation. Not all organizations decided to be parties to the EA while others sought status as parties just prior to the public hearing.

Site Visit

The Review Board conducted a site visit of Paramount's operations on October 7, 2003 (PR#40)⁶.

Information Request Phase

The Review Board authorized two rounds of Information Requests (IRs). The first round of Information Requests was compiled internally and a total of 33 IRs were issued to the Developer and parties on October 29, 2003 (PR#44). Responses were due November 19, 2003. The second round of Information Requests was compiled internally, based on requests put forth by the parties. A total of 137 IRs were issued to the developer and parties from December 29, 2003 to January 30, 2004 (PR#83,108,122). Responses were due between January 19 and February 6, 2004.

Pre-Hearing Conference

On February 2, 2004 a pre-hearing conference was held in Yellowknife by Review Board staff and legal counsel. The public was notified via public radio. Parties to the EA and the public were invited to attend.

The pre-hearing conference was devoted to a discussion of the hearing process and procedures, and to setting a draft agenda for the public hearing.

Community Meeting and Public Hearing

A community meeting was held in the community of Kakisa February 17, 2004. Residents of Kakisa were notified via posters and the local Band Office (PR#173). A Public Hearing was held February 18 and 19, 2004 in Hay River. The public was notified of the Public Hearing by means of public radio announcements and newspaper ads. The principal goal of the Public Hearing was to allow the public an opportunity to hear and participate in a discussion of technical issues unresolved during the EA Process leading up to the Public Hearing. It was also an opportunity to enable members of the public to speak to issues they considered to be of importance.

Presentations were delivered by the developer and several other parties to the EA. All parties to the EA had the opportunity to question both the developer and other parties to the EA. The scope of the hearing addressed the direct and indirect impacts highlighted by the parties.

⁶ The site visit of October 7, 2003 consisted of an overflight of Paramount's Significant Discovery License area in the Cameron Hills.

EA Decision

The Review Board will provide the Minister of INAC and the designated regulatory authorities (MVLWB and NEB) with its *Report of Environmental Assessment* as per section 128(2) of the *MVRMA*. The Minister of INAC will distribute the report to every responsible minister as per 128(2)(a) of the *MVRMA*. The developer and the other parties will also receive copies of the *Report of Environmental Assessment*.

2.3. Determination of Significance

Section 128 of the *MVRMA* requires the Review Board to decide, in its opinion, based on all the evidence on the public record, whether or not the proposed development will likely have a significant adverse impact on the environment or be a cause for significant public concern. The Review Board's determinations in this regard are contained in this *Report of Environmental Assessment*.

The parties to the EA were asked to assist the Review Board by providing the basis for their conclusions about the significance of the potential impacts of the development. The Review Board asked the parties to identify the expertise applied and, if possible, the source of the information used as a basis for their conclusions. Ultimately, however, the Review Board is required by law to make its determination on the question of impact significance. In so doing, the Review Board considers the following characteristics of any impacts identified:

- Magnitude;
- Geographic extent;
- Timing;
- Duration;
- Frequency;
- Nature of the impact;
- Irreversibility of the impact;
- Probability of occurrence; and,
- Predictive confidence level.

If the evidence on the public record raises issues of public concern, the Review Board evaluates that evidence both in its own right and in light of any related determinations made about the significance of the impacts caused by the development. Significant public concern is also a test under which the Review Board could refer the development to environmental impact review (EIR).

The Review Board's analysis and the reasons for its determination of the significance of the impacts, which are likely to result from the Paramount development are described in detail in sections 3. Public Concern, and 4. Impacts on the Environment.

2.4. Scope of the Proceeding

2.4.1. Scope of the Proposed Development

The scope of the development includes the elements of the proposed development that will be considered in the EA. The scope of development takes into account both principal and accessory development activities.

The scope of the development for this EA was limited to the description presented in the DAR and the developer's presentation at the public hearing, as amended in response to the questions of the Review Board and parties. The scope of the development assessed determines the activities of which can be undertaken, pursuant to any subsequent land use permit or other regulatory instruments. These may not exceed the scope of the EA without the need for further preliminary screening.

Based on the developer's evidence, the Review Board identified the principal development components to be as follows:

- Where access does not yet exist, an access route will be cleared and a winter road constructed.
- One or more drilling rigs will be moved on location and set up.
- The well will be drilled.
- The drilling equipment will be moved out or moved to another well site.
- A service rig will be moved in if the well is successful.
- The well may be completed.
- The service rig will be moved out or to another well site.
- The well may be flow tested to determine its economic viability by evaluating reservoir parameters including permeability, need for, or effectiveness of wellbore stimulation, well deliverability, and potential reservoir size.

If a well proves to be economically viable it will be tied into the gathering system, which involves the following:

- A right-of-way will be cleared for flow lines if existing corridors cannot be used.

- Oil, gas and water gathering & injection systems and well site facilities will be constructed and operated at each of the selected wells.
- The existing central battery located in H-03 117 0 30', 60 0 10' may be modified (already permitted).
- A water disposal pipeline may be constructed.
- A fuel gas pipeline distribution system and/or electrical distribution system may be constructed to the oil well.
- Test satellite facilities (location to be determined based on future drilling) will be constructed, including a test separator, flare knockout drum, flare stack, chemical tanks and pumps, and antenna.

Additional development components include:

- Use of an existing winter access road, approximately 33 km in length from Indian Cabins, Alberta on Highway 35, to a point approximately 10 km into the NWT.
- Air access via helicopter and fixed wing aircraft, likely to sites already permitted.
- Construction of snow fills and/or ice bridges.
- Temporary 20 to 50 person camps for drilling and 100 to 200 person camps for pipeline construction and well tie in. The camp locations will take advantage of previous camp or airstrip locations already permitted. New wells for potable water may have to be drilled. Alternatively potable water can be hauled in.
- Withdrawal of drilling water from a lake near the well site and, if required, from the shallow water source wells.
- Disposal of drill waste in remote sumps. Some clearing and leveling will be required for the sumps.
- Construction and use of borrow pits as required. Soil excavated from the borrow pit will be used during the closure of the drilling fluid and sewage sumps using the mix/bury/cover method.
- During production operations access to the wells via all-terrain vehicles (ATV) or helicopter in summer and regular vehicles and/or snowmobiles in winter.

- Installation of ATV bridges, potentially with flowlines suspended from them.
- The liquids pipeline from the central battery to the Bistcho plant in Alberta may require upgrading.
- Other undertakings in support of or in conjunction with the principle developments or accessory developments and activities.

Any developments details omitted from the above list were assessed as proposed by the developer in its development description on the public record.

2.4.2. Scope of the Environmental Assessment

The scope of assessment covers the components of the environment that will be evaluated for impacts from the proposed development. In determining the scope of assessment, the Review Board was conscious of its obligation under subsection 117(2) of the *MVRMA* to consider:

- the impact of the development on the environment including the impacts of malfunctions or accidents;
- any cumulative effects that are likely to result from the development in combination with other developments; and,
- comments submitted by members of the public.

After considering the relevant information available on the public record, the Review Board decided on the scope of assessment. The scope of the assessment focused on the cumulative effects of drilling, testing and tie-in of up to 50 additional wells over a period of 10 years, production of oil and gas over 15 to 20 years, and abandonment and reclamation of the entire development.

3. PUBLIC CONCERN

3.1. APPROACH

Public concern is not defined under the *MVRMA*. The *MVRMA* nevertheless requires the Review Board to consider public concern, and if a determination of significance is made under paragraph 128(1)(c), the Board must order an environmental impact review (EIR).

Under the *MVRMA*, no distinction is made between public concern expressed by Aboriginal people and the general public. These concerns are given equal weight although the Board makes an effort to interpret the concerns of Aboriginal people in a culturally appropriate manner while remaining within the legal context of the *MVRMA*.

The Review Board's approach to public concern includes consideration of the submissions of the parties to this environmental assessment (EA), analysis of public concern within the context of the *MVRMA*, and the Board's determination of the significance of public concern.

3.2. SUBMISSIONS OF THE PARTIES

The Review Board has heard from many Aboriginal organizations, represented by Elders and individuals, about the importance of the Cameron Hills area. As noted previously, this application was referred to EA by the MVLWB on the basis of public concern and significant environmental impacts related to cumulative effects. There is no doubt, in the Review Board's opinion, that the evidence in this proceeding provides a firm foundation for the concerns expressed about this area, particularly in relation to the possible effects of the proposed development on the traditional activities important to the KTFN, KFN, DGGFN, NWT Métis, WPFN and FPMC.

3.3. ANALYSIS

Part 5 of the *MVRMA* makes provision for the Review Board to address public concern, which arises in the context of environmental impact assessment processes. When such evidence is heard in an EA, the Review Board must decide how to respond. This analysis explains the approach adopted by the Board to address the evidence of public concern heard in this proceeding.

The *MVRMA* provides a legal framework within which public concern can contribute to the decision-making about developments in the Mackenzie Valley. It is necessary to examine the treatment of public concern through the environmental impact assessment process set out in part 5 of the *MVRMA* in order to determine the appropriate approach to a decision about public concern.

Preliminary screeners exercising their decision-making authority under paragraph 125(1)(a) of the *MVRMA* can make a referral to the Review Board if, in their opinion, the development might be a cause of public concern. That is what happened in the case of Paramount Resources Ltd. proposal for an extension to the Cameron Hills development. The test for public concern in paragraph 125(1)(a) is a low one. Unfortunately, the *MVRMA* does not give any direction to preliminary screeners or the Review Board about how to measure public concern. As Parliament has provided the screening decision-makers with a subjective test and a low threshold for public concern, the Review Board then

concludes that the EA process is intended to address any public concern which results in a referral from the preliminary screening stage.

The context in which public concern is raised in paragraph 125(1)(a), like the context in section 128(1), leads to the inference that the *MVRMA* is talking about public concern about the impacts on the environment that might result from a development. Part 5 is about environmental impact assessment and the process therein is directed at the identification and, if possible, mitigation of significant adverse environmental impacts. When the broad scope of the definition for the term “impact on the environment” in section 111 of the *MVRMA* is considered, it is clear that public concern about impacts on the environment can encompass a wide range of issues, including effects on the social and cultural environment and on heritage resources.

Paragraph 128(1)(c) of the Act continues the *MVRMA*’s focus on the theme of public concern and makes this matter a determinant in a decision of whether or not an Environmental Impact Review (EIR) should be ordered by the Review Board. There must however be “significant public concern” before the Review Board can exercise its discretion to order an EIR. This establishes a higher threshold before an EIR can be ordered on the basis of public concern.

Paragraph 117(2)(c) of the *MVRMA* requires the Review Board to consider the public’s comments on a proposed development. Thus, in the Review Board’s view, the statute anticipates that the EA process will address public concern that has led to a referral or that will arise during an EA process. The result is an EA process that includes a review, analysis and determination by the Board of public concern, as well as on the other factors set out in subsection 117(2).

Upon review of the statutory scheme, good environmental impact assessment process and the evidence in this EA, it is clear to the Board that mitigation measures to alleviate adverse environmental impacts should also alleviate public concern about those same impacts. Some of these measures, in addition to the community engagement process required by an EA, may address public concern directly, but the Review Board is also of the view that mitigation measures to reduce impacts on the environment should reduce public concern.

If an attempt to address the public concern through proposed mitigation measures is not sufficient, another possible outcome is a referral to EIR on the basis of significant public concern under paragraph 128(1)(c). This may also become an option if the EA process brings further issues to light that cause concern and if the public concerns remaining at the end of the EA process are deemed significant.

3.4. CONCLUSIONS

There were issues raised before the Board that related to concerns about the process of Aboriginal consultation, Impact and Benefits Agreements, Harvester Compensation Plans and Socio-Economic and Environmental Agreements. These concerns are categorically different than public concerns about the potentially adverse impacts on the biophysical environment considered in the EA.

The Review Board has addressed issues related to the impacts and benefits of this development, harvester compensation and environmental impacts in this Report of EA. It is the Review Board's opinion that these concerns are adequately dealt with in the Socio-Economic and Cultural Environment subsection of Section 4, and that any outstanding public concern is not significant. The Review Board's specific findings on public concern are set out in part 4 below.

4. IMPACTS ON THE ENVIRONMENT

4.1. APPROACH

4.1.1. Structure of Analysis

The impact analysis covers the biophysical, social and cultural environment. The analysis of topics below is organized under the following headings:

- Approach;
- Study Area;
- Submissions of Parties;
- Analysis; and,
- Conclusions.

Project-specific and cumulative effects on the biophysical environment are discussed under section 4.2.4.

4.1.2. Issues Identification

The Review Board's *Report of Environmental Assessment* is based on an analysis of issues raised through the Environmental Assessment (EA) process. The Board's approach to identifying the issues considered in this *Report of Environmental Assessment* follows.

A comprehensive listing of the issues was developed based on the evidence and comments submitted by the parties.

Some issues are not discussed in this *Report of Environmental Assessment* include: issues considered as beyond the scope of the EA, issues resolved by the parties or during the EA process, or issues perceived by the Board as irrelevant or not of sufficient weight to warrant further explanation or analysis.

The Review Board's analysis of the evidence divided issues into the following categories:

- The evidence indicated that the issue was resolved to the satisfaction of the developer and the parties to the EA or it was determined to have been resolved by the Review Board after reviewing all the evidence in the Environmental Assessment;
- The issue was raised but not pursued or carried forward to the public hearing by any of the parties;
- The issue was resolved by way of a commitment made by the developer;
- The issue was without foundation in the evidence on the public record; or
- The issue was not addressed and resolved by the developer or the parties.

As part of its analysis, the Review Board has considered all the issues raised in this Environmental Assessment. Issues that the Review Board finds to be evidently and adequately addressed by the material on the public record are not discussed in this report. The only issues discussed in detail in this *Report of Environmental Assessment* are those for which the Review Board decided further consideration was warranted.

4.1.3. Developer's Commitments

The developer made a series of mitigation commitments throughout the EA process. The Review Board has compiled a table listing these commitments, based on an examination of the public record. This table is presented in Appendix A.

The Review Board considered the developer's commitments in drawing its conclusions about environmental impacts and their significance, and in setting out its suggestions and recommendations. The Board's decision has been made on the assumption that the developer will fulfill all of its commitments. The Review Board's determination of impacts and the significance of those impacts depend on these commitments. A failure by the developer to fulfill these commitments would affect the determination of the significance of the adverse residual environmental impacts.

R-1 The Review Board recommends that regulatory authorities include in their authorizations those items set out in the Developer's commitments, outlined in Appendix A, that are within their jurisdiction.

R-2 ***The Review Board recommends that Paramount prepare a report within 12 months and thereafter, annually, until the developments on the SDL are abandoned and restored, for distribution in plain language to the parties in this EA. This report will outline the implementation status of each commitment made during the course of this EA, as set out in Appendix A.***

4.2. BIOPHYSICAL ENVIRONMENT

4.2.1. Air Quality

4.2.1.1. Approach

Paramount has used a modeling approach to predict and analyze potential air quality issues. There are three scenarios used by Paramount in assessing potential air quality impacts:

1. The *baseline case* assesses the impacts from the existing and approved emission sources in Cameron Hills.
2. The *application case* assesses the impacts from existing and approved emission sources, in addition to the proposed Cameron Hills Extension Project.
3. The *planned development case* assesses the impacts from the existing, approved, Cameron Hills Extension project and all remaining emission sources including proposed wells and facility. In order to render the assessment a little more conservative, the emissions modeled in this case will be at maximum.

An additional air quality evaluation has been conducted to assess impacts during well testing only, as these are generally short term, high intensity emissions.

In the DAR, Paramount identified the key indicators on which their air assessments are based on as the ambient levels of sulphur dioxide (SO₂) and nitrogen dioxide (NO₂). Brief discussion was also provided to address any potential effects from hydrogen sulphide (H₂S), fine particulate matter (PM_{2.5}) and the deposition of acid forming compounds. The DAR also attempted to quantify greenhouse gas emissions (GHGs).

The dispersion model selected for the air quality assessment presented in the DAR was the Industrial Source Complex (ISC3) and a modified version of it, described as the Ozone Limiting Method (OLM). This model is widely accepted for use in Alberta and the Northwest Territories. The ISC3 runs simulations based on real meteorological data, in this case, data from Fort Smith, NT.

4.2.1.2. Study Area

In order for Paramount to make predictions on the air quality of their Cameron Hills operations and of the Significant Discovery License (SDL) in general, baseline data on the regional climate and meteorological conditions were obtained. However, the data were obtained from meteorological stations outside of Paramount's operations area, in Fort Smith, Fort Liard, Fort Simpson and Fort Nelson. Data had to be obtained from outside the immediate operations area, as there is not a history of recorded information for Paramount's SDL. Fort Smith, a community 250 km to the east of Paramount's SDL was selected as the main station to be used as the baseline for the predictions.

The actual Air Study Area (ASA) utilized in Paramount's Air Assessment includes all of the Significant Discovery License (SDL), roughly an area of 51 by 52 kilometers (see figure 3). Paramount believes this area is large enough to capture the results of any air quality modeling and to capture the majority of any air quality effects that are expected to occur as a result of the project. Paramount has also included six community receptors, in order to evaluate any possible effects from air emissions on the closest human settlements. These six communities are: Enterprise, Hay River, Kakisa and Trout Lake in the Northwest Territories and Steen River and Indian Cabins in the province of Alberta.

4.2.1.3. Submissions of Parties

In the DAR, Paramount summarizes the results of their Cameron Hills Air Quality Assessment:

Modeling of emission dispersion emphasizes the need to reduce the use of sour fuel and promote the use of cleaner energy alternatives where economically and practically reasonable (DAR p.8).

The developer proposes four main mitigation measures that include:

- Taller stacks to enhance dispersion of emissions over a greater area;
- Use of electric drive chemical injection pumps;
- Avoidance of raw gas venting; and
- Use of low, to no, sulphur fuels in some cases.

In the case of SO₂, the GNWT and Environment Canada questioned the accuracy of the air dispersion modeling in the DAR (EC TAR Feb 4, 2004). The parties expressed concern that in effect, the DAR shows that NWT emissions standards for SO₂ are met, but just barely. The parties do not accept that Paramount's modeling of ground level SO₂ represents the actual potential worst-case scenario. The parties further argue that even if the DAR modeling predicts the absolute worst-case scenario (98 percent of NWT ambient air quality

standards for SO₂), levels could and should be greatly reduced by applying better practices.

The use of sour gas at the Cameron Hills has also raised concern with the parties, as the by-product of sour gas combustion is SO₂. The developer has introduced the use of an amine sweetening unit at the central battery during the modeling of the *planned development case* scenarios (DAR Appendix III), which has assisted in the reduction of predicted emissions in the modeled outcomes.

In the developer's modeling inputs, an average stack height of 3 metres for pumpjacks, in the case of oil, and an average stack height of 6.1 metres for line heaters, in the case of natural gas, were assumed as per industry standard. The GNWT pointed to the fact that Paramount has had to repeat their model iterations, increasing the stack heights to 19 metres for a line heater and up to 8.5 metres for a pumpjack (DAR Appendix III, Tables III-8, 10, 24, 26) in order to meet the NWT standards in some instances. The GNWT discussed the principle of 'polluting up to a limit', whereby the developer does not strive to use best practices or apply newer and more efficient technologies, so long as the standards are met.

In their February 4, 2004 submission, the GNWT and Environment Canada have stated that the use of best available technology (BAT) in the Cameron Hills operations can reduce SO₂ emissions to negligible levels (EC TAR Feb 4, 2004).

Paramount's analysis of nitrogen dioxide (NO₂) emissions at the Paramount Cameron Hills extension project was based on a comparison to the Canadian standards, as developed by the Canadian Council of Ministers for the Environment (CCME). The Northwest Territories does not have its own standard or guideline for NO₂. Paramount's results indicated that predicted NO₂ concentrations are so low, and fall so far below the Canadian standards, the environmental consequence is negligible to low (DAR p.153). Submissions from the other parties to the EA did not contest Paramount's NO₂ predictions and analysis.

No routine compliance ambient air quality monitoring is undertaken in the Northwest Territories to confirm adherence to standards and guidelines, as heard by the Board during the Public Hearing (Hearing Transcripts vol.1, p 262.). There was a concern expressed that although there are NWT emissions standards, no one is actually monitoring and reporting to ensure that the limits are not being exceeded. When parties were questioned by the Board as to who is responsible for the enforcement of NWT standards, responses were vague and indicative that responsibility for enforcement in the NWT is not clear (Hearing Transcripts vol.2, p 11).

4.2.1.4. Analysis

The Review Board accepts the summary statements made by Paramount in the DAR (p.8) with respect to the issue of air quality. The Review Board also recognizes the concern over air quality expressed by the First Nations in this EA, as well as the technical points raised by the GNWT and Environment Canada.

The Board acknowledges that modeling is a tool used to predict possible occurrences, and that no model can precisely predict real-world scenarios. However, the Review Board notes that the developer has applied a widely accepted model and methodology to predict ambient air quality in the Cameron Hills, but recognizes that modeling will need to be repeated to reflect new or different situations as they arise, in order to continually ensure compliance with the NWT and federal emissions standards. The Review Board believes that the developer has factored likely worst-case scenarios into their modeling approach, although agrees with GNWT that not all worst-case scenarios have been explored through modeling.

The Review Board has particularly noted that the developer has factored an amine fuel sweetening unit into the emissions modeling for Cameron Hills, as outlined in the DAR (Appendix III-19). This technology upgrade was referred to by Paramount at the public hearing:

-the earliest that it could be installed would be 2005. Paramount would endeavour to install this technology at a time in which it would maximize shareholder value (Hearing Transcripts vol.1, p72).

The Review Board notes that increasing stack heights of pumpjacks and line heaters in order to meet the NWT and Canada air quality standards is a 'dilution to pollution' approach and is not an effective mitigation measure, as proposed by the developer. The Review Board agrees with the GNWT and Environment Canada that in the application of better practices, better emissions targets can be achieved, and that industry should be continually striving to improve environmental performance. The GNWT has referenced the Keep Clean Areas Clean Strategy, adopted by the Federal Government, which commits to protect vast areas of Canada that do not currently have an acid rain problem (2002 Annual Progress Report on the Canada-Wide Acid Rain Strategy for Post-2000). The Review Board therefore applauds Paramount's commitment to apply best available technology (BAT) by installing an amine fuel sweetening unit, as discussed in the *planned development case*, and further believes installation of this unit could assist in reducing SO₂ emissions sooner, if installed as part of the application case.

The Review Board recognizes the Northwest Territories air quality standards, and notes the continuing lack of an enforceable framework for air quality. The

Review Board has addressed this issue with a recommendation made in its Report of Environmental Assessment and Reasons for Decision on the *Ranger Oil Limited, Canadian Forest Oil Limited and Chevron Canada Resources Limited Integrated P-66A/N-61/K29 Gas Wells and Pipeline Tie-In Fort Liard, NWT*, December 7, 1999 (the Ranger-Chevron EA). That Report recommended, and the governments of Canada and the NWT accepted, the following recommendations:

7. **Air Quality** – The Review Board recommends that the GNWT and Environment Canada, working with the industry and affected communities, develop enforceable air quality guidelines or standards for oil and gas industry operation in the NWT, or adapt regulations from adjoining jurisdictions as appropriate. These guidelines should include the use of latest technologies and good industry practices, and a system of monitoring that would be sufficient to build a baseline database over the long term and to demonstrate the maintenance of existing environmental quality.

...

The Review Board recommends that the GNWT and Environment Canada outline a work plan to satisfy this recommendation within four months of this decision.

(Some portions of this recommendation have been excluded. The Chevron-Ranger report of EA is available from the Review Board).

It appears from the evidence put forward from the GNWT and Environment Canada in the Paramount proceedings that little or no progress has been made to satisfy the Review Board's 1999 recommendation.

More concerted efforts are required to protect the air quality of the Northwest Territories, especially as the pace of oil and gas development quickens. The Review Board believes that continuous monitoring of emissions at the Cameron Hills operations is required by the developer in order to be effectively aware of emissions and to observe trends through time. Continuous monitoring would also provide an element of transparency to Paramount's operations, allowing for data sharing with relevant government agencies and the public. Although SO₂ emissions appear to be the biggest concern with the Cameron Hills operations, continued monitoring of NO₂ emissions is also necessary to ensure the Canadian standards are being met as sources are being added. The oil and gas sector has already developed industry-wide best practices that should be promoted in the North not only to meet, but to exceed both NWT and Canada-wide emissions standards.

In the absence of mitigation, the Review Board is of the opinion there is a risk the development may have significant local adverse impacts on air quality, and that NWT air quality guidelines may be exceeded.

Conclusions

To prevent significant adverse impacts on air quality the Review Board recommends the following measures:

- R-3** *The Review Board recommends that prior to the issuance of any further licenses or permits Paramount install a meteorological station (at minimum must monitor wind speed, wind direction and temperature) in the Cameron Hills SDL to gather baseline data related to its development. Meteorological data will be provided annually to air quality staff of GNWT-RWED and Environment Canada along with a detailed re-modeling of Paramount's various development scenarios to ensure onsite meteorological conditions are reflected in the modeled outputs.*
- R-4** *The Review Board recommends that Paramount install a continuous gas analysis monitoring system to track ambient air quality (at minimum 1 hour SO₂ and NO₂) and provide the data to the general public via website, to be updated no less than monthly if a live connection is not available. Annual reports on the status of the air quality at Cameron Hills will be provided by Paramount to all potentially affected communities and government in a plain language document throughout the life of the Paramount operations at Cameron Hills.*
- R-5** *The Review Board recommends that Paramount install an amine fuel sweetening unit at the Central Battery (H-03) location prior to bringing any further wells online or pipe in sweet fuel from outside Cameron Hills, as per Paramount's original development plan.*
- R-6** *The Review Board recommends that any further combustion engines being installed for line heaters and pumpjacks at the Cameron Hills operation must use the sweetened fuel or an alternate source of no sulphur fuel.*
- R-7** *The Review Board recommends that the Government of Canada (INAC and Environment Canada) and the Government of the Northwest Territories, implement recommendation 7 from the Ranger-Chevron EA by June 2005.*

4.2.2. Water Quality

4.2.2.1. Approach

Paramount conducted an aquatics study, within the larger context of their cumulative effects assessment. The cumulative effects assessment was designed to consider the pre-development setting of the Cameron Hills (dating to the 1960s), as well as the *baseline case*, the *application case* and the *planned development case*.

The study was broken down into surface water and ground water and the environmental setting for both was described in detail. The VECs identified to assess and evaluate the cumulative environmental impacts of the Cameron Hills developments on surface water were water quantity and water quality. The following indicators were used to assess both the water quality and quantity:

- Change in flows in the receiving streams;
- Change in lake water balance;
- Changes in sediment yields in the receiving streams; and
- Changes in concentrations of various water quality parameters.

Standard parameters were used to measure any changes in water hydrology and quantity:

- Mean annual discharge for flows;
- Mean water level for lake water balance;
- Total suspended solids (TSS) and turbidity for sediment yield;
- Routine parameters (pH, temperature, dissolved oxygen and conductivity);
- Ions (hardness, alkalinity, calcium, magnesium, etc.)
- Nutrients (different forms of phosphorous and nitrogen);
- Metals (total and dissolved); and
- Organic compounds (hydrocarbons, phenols etc.)

However, Paramount has noted in the DAR (p.191) that due to data limitations, only qualitative assessments of some water quality parameters were made. The method used to arrive at an analysis was to assign quantitative or qualitative values to the potential effects and to possible mitigation, for each of the various activities: seismic exploration, site construction and drilling, pipeline construction and production operations.

4.2.2.2. Study Area

The Aquatic Study Area (ASA) used by Paramount in both the surface and ground water quality assessment measures 1,987 km². This area was selected to include the entire Cameron River watershed (1,387 km²) along with the drainage of an unnamed small creek (approximately 600 km²) that flows south from Cameron Hills towards Hay River. Refer to figure 3 – Cumulative Effects Study Areas for a map of the Aquatic Study Area.

The Cameron Hills watershed drains north to Tathlina Lake. It is estimated that 90 percent of the watershed is level wetland areas, with a steep section located in the middle of the watershed. Multiple small, irregular-shaped and overall shallow lakes are scattered south of the Cameron River proper, lending to the wetland pattern (DAR p181).

4.2.2.3. Submissions of Parties

Paramount's results indicated that any residual effects on surface water and groundwater quality resulting from activities associated with seismic, drilling, pipeline, operations and water withdrawal are of negligible to low environmental consequence (DAR p 205,211).

The Department of Fisheries and Oceans (DFO) raised the issues of winter water withdrawal, erosion, pipeline crossings and temporary winter access crossings in their Technical Analysis Report (January 29, 2004). DFO's mandate as it relates to the *Fisheries Act* and the *Navigable Waters Protection Act*, is mainly concerned with fish and fish habitat.

Winter water withdrawal for oil and gas activities in the NWT follows a DFO protocol. This protocol requires that any water source lakes to be used during the project be reviewed and approved by DFO. The concern expressed by DFO in this case relates to the uncertainty of future drilling locations, and therefore uncertainty with future water source requirements. Paramount has committed to seeking DFO review and approval if any other source lakes are proposed for winter water withdrawal (Response to TAR March 4, 2004).

The KTFN raised the issue of water quality in general and are concerned with the health and cleanliness of the watershed, upon which their subsistence activities rely on. Concern was expressed over the possibility of spills in the Cameron Hills, which could eventually lead to pollution of the surface and below ground water sources.

The KTFN pointed out that there have been hydrocarbon spills at the Paramount site in Cameron Hills in the recent past, and questioned the reporting procedures as to why they were never directly notified of such occurrences on their traditional lands (Final Kakisa Meeting Notes, March 15, 2004). The KTFN have

clearly requested to be notified of any spills that are being reported to the NWT Spill Line occurring in Paramount's Cameron Hills SDL. Paramount acknowledged that their spill incident rate is above the industry average (response to TAR March 11, 2004), but responded that they were in compliance with the spill reporting procedures, outlined by the NEB and the GNWT, and that the reason for not notifying communities directly, was to not alarm them.

In order to clarify the question as to whether the company has a responsibility to inform the community of spills on their traditional lands, at the Public Hearing the GNWT was asked to file their internal process for spill response procedures. The GNWT subsequently filed this document on the Public Record prior to its closure.

The KTFN expressed concern in both the Public Hearing proceedings and in their Technical Analysis Report questioning the current spill reporting procedures. The KTFN believe that the direct connection to their traditional lands warrants respect by any person or organization undertaking work on their traditional territory. To the KTFN, this includes being notified of any pipeline break or spill that may or may not have the potential to affect the environment, and the water quality in particular. The KTFN notes that there have been occurrences of spills at Paramount's operations in the Cameron Hills, and that they were never directly notified of these occurrences through the spill reporting procedures that are currently in place (KTFN TAR March 2, 2004).

The KTFN have also expressed concern in the Technical Analysis Report (March 2, 2004), with regards to the potential for sedimentation of the watershed, and particularly Tathlina Lake. The concern is that any erosion due to Paramount's development of the Cameron Hills plateau may increase sedimentation to a point where it may affect fish habitat and populations in the greater watershed. DFO voiced a similar concern about erosion in their January 29, 2004 submission. DFO acknowledged the corrective efforts applied by Paramount in the past and stated that further monitoring of the erosion prevention measures in place will be necessary. DFO have committed to continue site visits in order to determine if impacts on fish or fish habitat are occurring.

4.2.2.4. Analysis

The Review Board notes the KTFN's concern over wanting to be informed of spills in Paramount's operations in the Cameron Hills.

The Review Board also notes that the potential for sedimentation of the watershed due to erosion problems at Paramount's worksite is of concern. The Board acknowledges that Paramount has experienced erosion problems at Cameron Hills in the recent past, and that although Paramount has implemented a number of measures to address it, communities remain concerned.

The Review Board finds that the points noted in DFO's Technical Analysis Report (March 2, 2004) are well researched and precautionary with respect to winter water withdrawal, erosion, pipeline crossings and temporary winter access crossings and therefore accepts DFO's recommendations.

4.2.2.5. Conclusions

In reviewing the evidence, the Review Board finds that there is a potential for significant adverse environmental impacts to water due to the potential for spills and sedimentation of waterways from erosion as a result of Paramount's operations in the Cameron Hills. The Review Board believes that the application of the following recommendations and suggestions will mitigate these potential impacts:

- R-8** *The Review Board recommends that Paramount modify its spill reporting procedures for the Paramount Cameron Hills developments to include notice of spill occurrences to potentially affected communities. Spills must be reported according to the NWT Spill Reporting Procedures.*

- R-9** *The Review Board recommends that Paramount continue to monitor all work sites for erosion, and take appropriate measures in advance to avoid such problems. The Review Board recommends appropriate erosion mitigation measures be identified in advance and authorized by the NEB and INAC inspectors, and that any remediation of sites be documented and reported to regulators and the Ka'a'Gee Tu First Nation on a quarterly basis.*

- R-10** *The Review Board recommends that Paramount, in the case of an isolated water crossing, maintain downstream water flow at pre-in-stream work levels. All in-stream work must be completed as expeditiously as possible to mitigate disruption of fish movements.*

- R-11** *The Review Board recommends that the Department of Fisheries and Oceans conduct regular site visits to the Cameron Hills to inspect for determine if any impacts to fish or fish habitat. Reports of these inspections must be made publicly available via DFO and also be sent directly to the Ka'a'Gee Tu First Nation, in a plain language version.*

- S-1** *The Review Board suggests that a member of the K'a'Gee Tu First Nation be invited by DFO to accompany its inspectors while conducting inspections in the Cameron Hills operations area.*

S-2 ***The Review Board suggests the agencies responsible for water resource management and protection increase their monitoring and enforcement efforts commensurate with the increase in the scope of Paramount's development in the Cameron Hills area.***

4.2.3. Boreal Caribou/Wildlife

4.2.3.1. Approach

The objective of Paramount's wildlife assessment was to identify direct and indirect effects on wildlife as a result of the various development scenarios of the Cameron Hills project. The wildlife assessment is a key component of the cumulative effects assessment, which is discussed in greater detail in section 4.2.4.

Paramount conducted its wildlife assessment of the Cameron Hills SDL, having selected a number of valued ecosystem components (VECs): moose, boreal caribou, marten and forest songbirds. The VECs were selected based on economic, recreational, ecological, and traditional importance. Four main issues were closely examined:

- Direct habitat loss and alteration due to clearing;
- Sensory disturbance potential;
- Habitat fragmentation; and
- Increased access and potential for increased predation/hunting/trapping

The effects on wildlife were categorically addressed by project component, including drilling, seismic, pipeline construction and production operations.

4.2.3.2. Study Area

The terrestrial study area (TSA) utilized by Paramount in their wildlife assessment is based on the home range of a female boreal caribou (identified as 70,000 ha), in combination with natural features including drainages, contour lines and lake boundaries; the resulting TSA was approximately 96,200 ha. A boreal caribou home range was selected as it is the terrestrial valued ecosystem component that may be affected to the maximum geographic extent from development-related disturbances.

4.2.3.3. Submissions of Parties

Paramount's wildlife assessment came to several conclusions, and proposed a series of measures to mitigate effects of disturbance on wildlife. Effects on wildlife were predicted due to seismic, drilling, construction, and production operations include direct habitat loss due to clearing, sensory disturbance, fragmentation, increased access and wildlife/human encounters. The developer notes that a large portion of these activities are conducted during periods of frozen ground only, which limits the frequency of some direct wildlife disturbances. Furthermore, wherever present and feasible, existing disturbances such as seismic lines and right of ways (ROWs) will be reused. Appendix A contains a complete list of specific mitigation measures Paramount has committed to in response to the potential effects outlined in the wildlife assessment (DAR p.223). All residual impacts predicted from exploration and production activities have been assessed both quantitatively and qualitatively as part of the developer's cumulative effects assessment for the Cameron Hills project.

Paramount has identified several species that have been described by the Committee on the Status of Endangered Wildlife in Canada (COSEWIC) as either threatened or of special concern, that are potentially located within the Cameron Hills. These species pose a need for special management considerations: Peregrine falcon, Wood bison, Boreal caribou, Wolverine, Short-eared owl, Grizzly bear and the Yellow rail (DAR p.221).

Parties' response to the wildlife assessment was very focused on cumulative effects, especially in relation to boreal caribou. The GNWT Wildlife and Fisheries group maintain that the status of boreal caribou in the Cameron Hills should be considered to be uncertain but also of concern (TAR March 2, 2004 p.7). The GNWT also point to the original research used by Paramount in conducting the wildlife assessment as being outdated and not necessarily reflective of the actual situation.

In the GNWT's technical analysis report, several specific issues were raised with regards to Paramount's wildlife assessment conclusions. In summary, their issues were:

- Boreal caribou designated as Threatened species under the federal Species at Risk Act (SARA)
- Inadequate baseline information
- Under-estimating boreal caribou habitat changes
- Inadequacy of impact predictions for boreal caribou – Predation Risk
- Inadequacy of impact predictions for boreal caribou – Indirect Habitat Loss

- Significance of Cumulative Effects on boreal caribou and critical habitat
- Long-term loss of boreal caribou habitat

The Deh Gah Got'ie First Nation (DGGFN), the K'atlodeeche First Nation (KFN) and the Ka'a'Gee Tu First Nation (KTFN) submissions all indicate that they are in agreement with and support the measures proposed by the GNWT to address concerns over the status of boreal caribou in the region (PR #197, 198, 199). These First Nations have all stated that hunting and trapping are fundamental to the communities' way of life and have expressed their wildlife concerns in the Cameron Hills:

“The concerns with respect to moose and caribou include over-hunting related to access, and changes in populations related to the intensity of the project’s activities on our traditional territories.”

Paramount acknowledges that the Cameron Hills SDL contains high quality habitat for caribou (Response to TAR, March 7, 2004). In response to concerns related to the potential for increased access of the Paramount Cameron Hills work area by road, Paramount has committed to keeping a locked gate on the main road into the site during the work season, when the road is accessible (Hearing Transcripts vol. 1, p 38).

Further concerns about wildlife expressed by the DGGFN, the KFN and the KTFN pertain to wolves and wolverine. The communities have pointed out that neither wolves nor wolverine were considered in the assessment, both very valuable species to hunters and trappers. They especially view wolverine to be a sensitive species requiring mitigative measures (PR#197, 198, 199).

4.2.3.4. Analysis

The Review Board acknowledges that it will have responsibilities under the Species At Risk Act (SARA), which will come into force June 2004, with respect to the protection of the critical habitat and residences of listed species. The Review Board is aware that there are seven species that have been listed by COSEWIC as either threatened or of special concern, with ranges that include the Cameron Hills area. The Review Board's responsibilities in fulfilling SARA (section 79) will soon include:

- Notifying the competent ministers in writing if a project is likely to affect a listed species or its critical habitat;
- Ensuring that adverse effects of the proposed project on listed species and their habitat are identified;

- Ensuring that if the project is carried out, measures are taken to avoid or lessen adverse effects on listed species and their critical habitat. The measures must be consistent with any recovery strategy or action plan for the species; and
- Ensuring that if the project is carried out, measures that are consistent with any recovery strategy or action plan for the species are taken to monitor adverse effects on listed species and their critical habitat.

Although SARA legislation is not yet officially in force, it is the Review Board's opinion that through this EA process it has notified the competent ministers of the potential for Paramount's Cameron Hills Extension project to affect a listed species or its critical habitat. Environment Canada and the Department of Fisheries and Oceans as well as the GNWT have been registered parties to this EA, and have participated in all of its aspects. None of the staff appearing on behalf of those ministers have indicated to the Review Board that the project has the potential to affect a listed species or its critical habitat or residence.

The Review Board notes however, that in the Northwest Territories, the GNWT will play a role with the upcoming application of the SARA legislation. The GNWT is intending to develop legislation that is complementary to the federal SARA. The Review Board acknowledges the direction taken by GNWT in drafting NWT Species at Risk legislation to protect listed species.

The Review Board accepts the communities' concern over lack of information and baseline data for wolf and wolverine populations in the Cameron Hills area. The Review Board agrees that Paramount could have better selected the Valued Ecosystem Components based on the consultation that took place with resource users in the potentially affected communities.

The Review Board accepts the recommendations proposed by the GNWT, and echoed by the DGGFN, KFN and KTFN and has addressed these under section 4.2.4 of this report.

4.2.3.5. Conclusions

The Review Board finds that the balance of the evidence does not suggest there are wildlife concerns related to the proposed development that would be cause for any significant adverse environmental impact, except in the case of boreal caribou. In order to mitigate the potential for significant adverse environmental impacts on the boreal caribou population of the southern NWT, the Review Board has made recommendations in section 4.2.4, which addresses Cumulative Biophysical Effects.

4.2.4. Cumulative Biophysical Effects

Cumulative effects occur when the effects of independent activities overlap in space or time to produce unintended effects on plants, animals, or people.

4.2.4.1. Approach

Spatial Boundaries

The Paramount DAR adopted a spatially-explicit approach where the location of all reasonably foreseeable activities to extract oil and gas from the Cameron Hills Significant Discovery License Area were defined. The DAR concludes that this approach was appropriate because Paramount is the only operator in the Cameron Hills area and is able to reasonably project the extent and location of future activities (DAR p119).

The Cumulative Effects Study Areas (CESA) utilized by Paramount (see figure 3) were set according to the environmental component being assessed, rather than using a common study area. Three CESA areas were used in the DAR:

- The 1,987 km² Aquatics Study Area, which is composed of the maximum extent of potentially affected watersheds and extends from drainages that originate within Paramount's SDL, to Tathlina Lake (north), the Hay River (east) and Johnson Lake (south).
- The 962 km² Terrestrial Study Area selected for the wildlife assessment is based on the home range of a female boreal caribou, in combination with natural features including drainages, contour lines and lake boundaries.
- The 2,652 km² Air Study Area selected to capture any measurable change in ambient air quality due to emissions from the project.

Temporal Boundaries

Paramount developed spatially-based models of future well locations and associated infrastructure and activities to evaluate potential cumulative effects at three points in time:

- 1) Application Case (5 wells and approximately 15 km of flowline proposed for 2003/2004);
- 2) Planned Development Case (maximum predicted extent of Paramount's operations between 2013 and 2023, including up to 48 wells and associated flowlines and facilities; i.e., 20 years from present); and
- 3) Far Future Case (assuming full reclamation of disturbances in 2073, i.e., 70 years from present or 50 years after project completion). Projected

conditions for these three development cases were compared to those that existed prior to development around 1960, described as the environmental setting, and to existing conditions as of June 2003 (Baseline Case).

Impact Prediction

Cumulative effects assessment (CEA) conclusions are based on defined criteria (DAR p126) intended to provide a “clear and transparent system” for rating impacts and significance (Hearing Transcript p116).

4.2.4.2. Submissions of Parties

The primary cumulative environmental issues identified during the review were the potential for adverse effects on air quality, water quality, and terrestrial wildlife, particularly boreal caribou. This discussion focuses on the cumulative effects assessment for terrestrial wildlife.

Paramount concluded that direct habitat loss due to clearing and disturbance could increase from 2% of the Terrestrial Study Area at present to 2.2% under the Planned Development Case. This conclusion is based on the assumption that 50% of the potential ‘direct footprint’ will take place in existing or approved clearings, rights-of-way, and cut lines. They also concluded that indirect effects of sensory disturbance could occur over a much larger area. For caribou for example, the ‘indirect footprint’ would increase from 22% of the Terrestrial Study Area at present to 30.5% under the Planned Development Case, a change of 8.9%. For marten, the indirect footprint would increase from 19% of the Terrestrial Study Area at present to 19.7% under the Planned Development Case, a change of 0.6%. Most of the direct and indirect footprint for both species is predicted to occur in Moderate and High Quality habitat (IR 1.1.22) for both species.

The DAR states that these model projections represent a worst case scenario because conservative assumptions and methods were used. Paramount also notes that mitigation measures used on caribou ranges in Alberta have been applied to reduce the risk of indirect cumulative effects.

Paramount concludes that 99% to 100% of Baseline Case habitat would be returned under the Far Future Case. Combined cumulative effects were ultimately concluded to be of Moderate consequence (IR 1.2.125) for all four wildlife VECs (caribou, moose, marten, and songbirds). Indirect habitat loss associated with sensory disturbance was identified as the primary contributor to cumulative effects for all species.

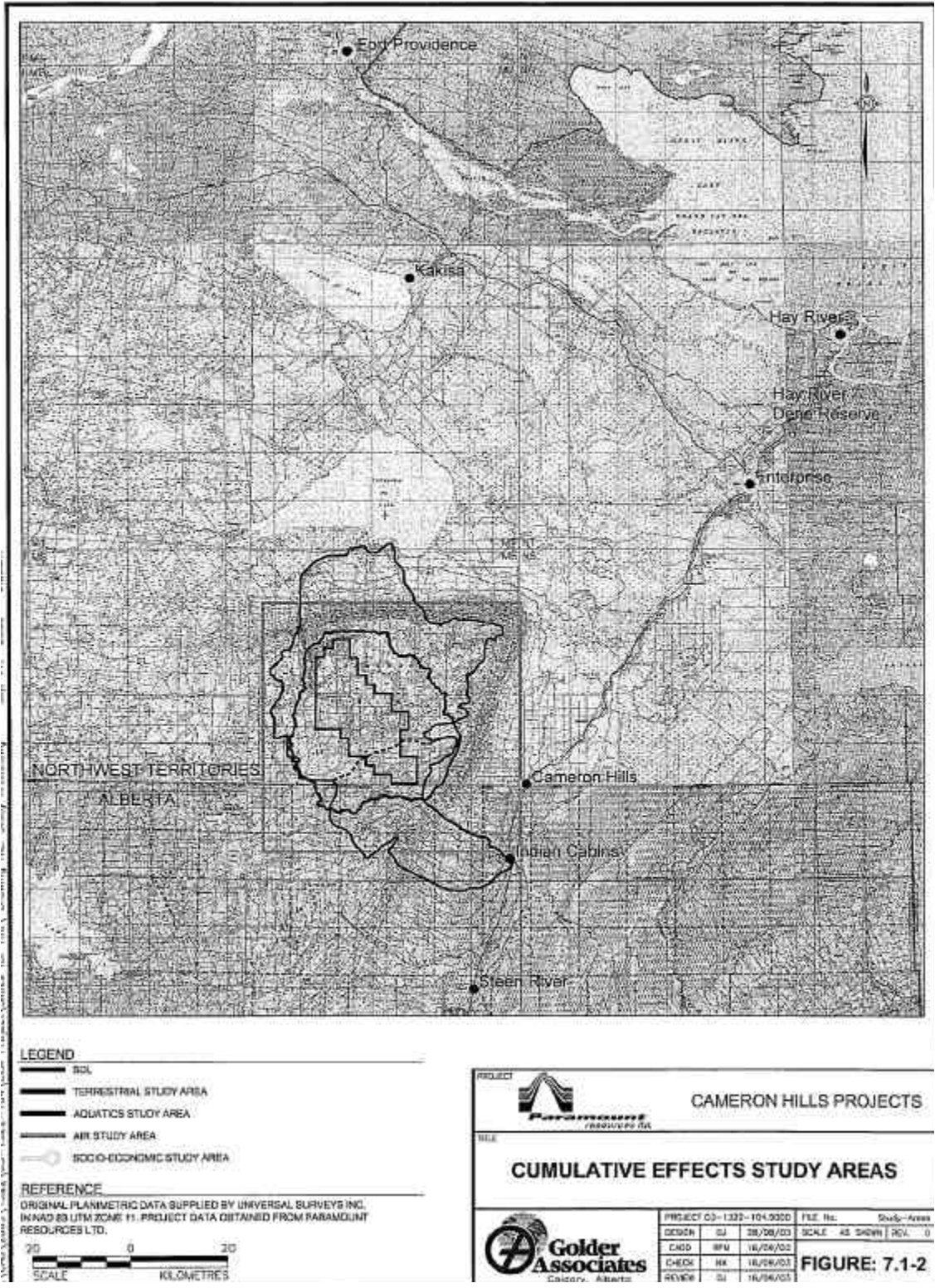


Figure 3 – Paramount Cumulative Effects Study Areas (CESA)

The GNWT focused its comments on boreal caribou and indicated that it did not agree with DAR conclusions on potential cumulative effects for this species. RWED indicates that the status of boreal caribou and caribou habitat in the Terrestrial Study Area should be considered as uncertain and of concern. The GNWT is currently developing requirements for the protection of boreal caribou and their habitat in accordance with SARA, and recommends that a specific plan be developed for the Cameron Hills area. They note that current development levels in this area are approaching or exceed the level at which population declines could occur. The GNWT also questioned the assumptions used to model indirect effects on boreal caribou and indicated that predictions may underestimate actual effects. They concluded that the assessment was not conservative because maximum reported zones of influence were not used.

In the GNWT's technical analysis report, several specific issues were raised. In summary, their issues were:

- Boreal caribou designated as Threatened species under the federal Species at Risk Act (SARA)
- Inadequate baseline information
- Under-estimating boreal caribou habitat changes
- Inadequacy of impact predictions for boreal caribou – Predation Risk
- Inadequacy of impact predictions for boreal caribou – Indirect Habitat Loss
- Significance of cumulative effects on boreal caribou and critical habitat
- Long-term loss of boreal caribou habitat

The GNWT also questioned the assumption that vegetation on disturbed areas will reach pre-disturbance conditions 70 years after reclamation, given that regrowth is very slow in this area (IR 1.2.6).

The Deh Gah Got'ie First Nation (DGGFN), the K'atlodeeche First Nation (KFN) and the Ka'a'Gee Tu First Nation (KTFN) submissions all indicate that they are in agreement with and support the measures proposed by the GNWT to address concerns over the status of boreal caribou in the region (PR #197, 198, 199). Further concerns about wildlife expressed by the DGGFN, the KFN and the KTFN pertain to wolves and wolverine.

The KTFN expressed concern that amendments to existing and future applications might cause cumulative impact predictions to be inaccurate (IR 1.2.54) and sought assurances that existing disturbance will be used wherever possible. The KTFN also questioned the way in which the assessment criteria were applied, particularly those relating to the duration, frequency, and magnitude of potential impacts.

4.2.4.3. Analysis

Future Project Scenarios

The challenge facing proponents in any CEA is to provide a realistic projection that reflects the most likely development scenario. The challenge facing regulators and reviewers is to understand the uncertainty surrounding the development scenario, and the potential risk activities and associated impacts might ultimately exceed those documented in the CEA. Ideally, CEA projections should include a range of realistic forecasts that help describe best case, most likely and worst-case scenarios so that forecasting risk can be explicitly evaluated. The Paramount DAR assesses only a 'most likely' scenario, although Paramount did provide a range of how many new wells might be drilling in the SDL (response to IR Number 1.1.3).

The spatially-explicit future development projections provided by Paramount are an accepted CEA method, particularly for projects such as mines that have a well-defined footprint. Nonetheless, a fundamental concern with spatially-explicit forecasts of oil and gas development activities is that they imply levels of accuracy and certainty that do not exist. As Paramount notes: "As more seismic and drilling results are acquired, changes, most of which are unforeseen, are inevitable." (response to IR 1.2.54). This is not a criticism of Paramount or other operators, rather it reflects the reality that the exact location and sequence of petroleum development activities cannot be accurately predicted. In all probability therefore, the predicted locations of future well sites *will* be wrong.

Unfortunately, comparatively small changes in spatial orientation can cause dramatic changes in indirect footprint and potential impacts. Provision of a single 'snapshot of the future' therefore carries a high risk of being wrong, however well informed. To address this uncertainty, Paramount has committed to siting and routing measures to reduce the overall development footprint and indicated that 50% of future development (e.g., access roads) will take place on existing or approved disturbed areas.

Seismic lines are presently the dominant industrial feature in the Cameron Hills SDL. The largest projected future development disturbance in the Terrestrial and Aquatic Study Areas is the approved, but not yet constructed, 3D seismic program. The potential for an additional 200 km of reconnaissance 2D or 3D seismic lines was mentioned, but not specifically evaluated in the DAR (response to IR 1.2.2). The direct footprint projections also excluded emergency access (response to IR 1.2.106 and 1.2.121).

Paramount indicated that low-impact seismic lines (=3 m wide) would be used for the approved seismic programs in areas of sensitive terrain, while conventional source lines (6 m wide) and receiver lines (4 m wide) would be used elsewhere (response to IR 1.1.1). Although outside the scope of this review, this design

does not appear to represent current industry 'best practice'. Information included on the Canadian Association of Petroleum Producers' website concludes that in 2002, over 80% of all seismic in Alberta's boreal forest was considered low impact or better (=3 m wide), and conventional seismic practices were the exception (<http://www.capp.ca>).

Effects on Vegetation

The DAR considers potential effects of vegetation clearing and associated habitat loss, not in comparison to pre-disturbance conditions, but in relation to a point where self-sustaining vegetation become established. Because potential impacts are not considered relative to pre-disturbance conditions, the duration of potential effects is underestimated. In addition, this approach may not adequately reflect the environmental consequence of clearing or disturbance. Ideally, potential impacts should be considered in relation to pre-disturbance vegetation communities. This would provide a more realistic evaluation of trade-offs, for example: clearing of mature forest reduces habitat quality for marten, but increases habitat quality for moose over a twenty year period.

The Far Future vegetation projection assumed that "vegetation cover on disturbed areas will likely reach similar levels ... for all vegetation types 70 years after reclamation." (response to IR 1.2.6). Regeneration of disturbed areas cannot begin until use ceases or they are abandoned – in a number of cases this will not occur until 2023. For these features, only 50 years will be available for revegetation prior to the Far Future projection date. However, the response to IR Number 1.2.118 indicates that at least 60 to 80 years will be required for recovery of mature forest communities. Thus, recovery of pre-disturbance mature forest communities cannot occur on all disturbed sites by 2073, as assumed in the Far Future vegetation projection, and Far Future projections of wildlife habitat suitability for species associated with mature forest are based on unrealistic assumptions of vegetation recovery. As noted in the response to IR Number 1.2.126, this represents a small portion of the regional study area, and should not affect assessment conclusions. However, the additive effect of natural environmental disturbances such as fires over the 70 year assessment period was not considered in the CEA, and this is known to be critical for species such as caribou.

Inconsistent Application of Assessment Criteria

The predicted consequence of potential residual impacts is considered relative to pre-defined criteria in order to provide a "clear and transparent system". Although Paramount initially indicated that pre-defined assessment criteria had not been modified to reflect VEC-specific factors relating to sensory disturbance (response to IR 1.1.23), information responses and hearing testimony demonstrated that this had occurred (Hearing Transcript page 141). As a result, assessment criteria appear to have been inconsistently applied, and the assessment rationale was not always clear and transparent.

For example, on DAR page 127 a local impact is defined as one that is confined within the lease boundary and/or right-of-way (e.g., clearing or soil disturbance). Sensory disturbance effects occur outside the lease boundary or right-of-way, and therefore should be considered Regional in extent. This is why the projected indirect footprint is larger than the direct footprint. However, this rating criteria was variably applied during the EA process:

- The impacts of sensory disturbance on caribou and moose are concluded to be *Regional* in DAR Table 7.6-16.
- The impacts of sensory disturbance on marten and songbirds are concluded to be *Local* in DAR Table 7.6-16.
- The impacts of sensory disturbance on all wildlife species from all activities are concluded to be *Local* in response to IR Number 1.1.21 b) (3rd paragraph on page 30 of 59).
- The impacts of sensory disturbance from cutlines on caribou are concluded to be *Regional* in response to IR Number 1.1.21 c) (5th paragraph on page 30 of 59).
- The impacts of sensory disturbance on caribou and moose are concluded to be *Local* in the second paragraph of response to IR Number 1.1.21 b).
- In the response to IR Number 1.2.124 a), *Local* was redefined on the basis of marten and songbirds home range; it was noted that this was not consistent with the pre-defined rating scheme.

Clearer information on the assessment criteria used for each species would have improved the transparency of the DAR.

Effects on Boreal Caribou

Both Paramount and RWED conclude that the Cameron Hills area includes high quality habitat for caribou and that caribou are present in the Terrestrial Study Area. Traditional knowledge also confirms that caribou use this area, however no site-specific information on population dynamics or abundance is available. While Paramount acknowledges that there is not a good link between boreal caribou habitat availability and use, they indicate that using habitat as an indicator is the best approach for range planning and environmental assessments (IR 1.2.10; response to RWED TAR).

The DAR, IRs and responses, and TARs make numerous references to Alberta research that represents the best available information for boreal caribou (response to IR Number 1.2.84). This work has documented population declines on 4 of 6 boreal caribou ranges, including the Caribou Mountains range located less than 100 km from the Cameron Hills Terrestrial Study Area. Declines appear to be related to low calf survival and predation is an important limiting factor (McLoughlin et al. 2003). The rate of population growth appears to be inversely

related to the industrial footprint and area of young forest (BCC 2003), although clear cause-effect relationships have not been established and caution must be used when applying these results. In Alberta, the Boreal Caribou Committee (BCC) is conducting work to develop habitat (footprint) targets, activity targets, range plans, and conduct research to speed the recovery of linear disturbances and other features. The BCC is also researching the efficiency of 'best practices' such as cutting low-impact seismic lines (=3 m wide), as opposed to traditional seismic lines (=5 m wide; McLoughlin et al. 2003).

Information provided in the DAR and subsequent submissions suggests that the Cameron Hills SDL will function as a sub-regional 'sink' for caribou until land use features are sufficiently revegetated, i.e., that combined disturbance will have *High* magnitude and *Regional* effects on this species within the Terrestrial Study Area for at least 20 years. This would change the predicted environmental consequence rating to *High*.

- The boreal woodland caribou is considered to be Threatened (COSEWIC 2003) and listed under the *Species at Risk Act (SARA)*. Evidence from southern boreal caribou herds indicates that intensive industrial development is likely to cause decline in numbers.
- Modeling results provided in the DAR demonstrate that although the incremental increase in the direct industrial footprint in the Terrestrial Study Area (2.2% under the Planned Development Case) is projected to be small, the associated increase in indirect industrial footprint (30.5% under the Planned Development Case) is over 40 times greater. This areal extent is consistent with BCC findings that the indirect footprint (area within 250 m of industrial disturbance) is a good indicator of the probability of population persistence. The predicted indirect footprint represents a High magnitude effect (>20% change in the endpoint) of Regional extent, and Medium- to Long-term duration (>10 years) using the rating criteria provided in the DAR.
- Preliminary RWED research findings in the South Slave area document lower adult female survival than observed in the declining population on the Caribou Mountains range (McLoughlin et al. 2003).
- Current corridor densities in the Cameron Hills Terrestrial Study Area, and particularly the SDL, are well above average values calculated for ranges where boreal caribou populations are declining (response to IR 1.2.84). However, the long-term effect of seismic lines on boreal caribou habitat effectiveness and predation rates in the Cameron Hills area is considered to be unknown. A direct relationship between predation rates and linear disturbance density has been hypothesized but not demonstrated. In addition the current condition of cut lines in the Terrestrial Study Area is unknown. The uncertainty associated with long-term seismic line effects is

critical because they are the dominant industrial feature in the Terrestrial Study Area.

Industrial guidelines have been developed for activities on caribou range in Alberta (BCC 2001), and these are routinely employed by Paramount for their activities there (Hearing Transcripts p. 136). Companies working on caribou ranges are required to submit Caribou Protection Plans that describe the industrial activities that are proposed for the coming year. These plans then become an integral part of any approval via an administrative condition placed on that approval. The industrial guidelines note that proponents should strive to encourage natural regrowth, reduce opportunities for access by predators and humans, and reduce the number, length, and width of linear corridors.

The GNWT recommended that additional linear development in the Cameron Hills area be minimized until a clearer picture of boreal caribou status and habitat is obtained (GNWT TAR page 15).

Paramount indicated that they have made a commitment through the DAR to implement best practices in the Cameron Hills area, including gated access, meandering seismic lines, and avoidance cutting on seismic lines (Hearing Transcripts p. 137). Paramount committed to undertake a one season study to provide information on seismic line revegetation patterns in the SDL that will help quantify the long-term effect of seismic lines. However, as noted previously, Paramount does not intend to use low-impact seismic lines (=3 m wide), the current industry 'best practice' in Alberta.

The GNWT indicated that it is willing to work with Paramount and aboriginal groups to establish a Deh Cho Boreal Caribou Working Group, and Paramount has indicated that it is willing to participate in such a group and provide in-kind support for field studies in the area. The GNWT and KTFN recommended that a Boreal Caribou Range Plan including monitoring and mitigation methods be developed for the Cameron Hills area. Paramount concluded that this should be developed by the GNWT (Paramount Response to RWED TAR).

The Review Board notes that in Alberta, the adjacent jurisdiction, boreal caribou are managed in part by the Alberta Boreal Caribou Committee. The Review Board further notes that if such a committee were created in the Deh Cho region, valuable activities for it might include:

- Identify and justify the identification of critical habitat in the Cameron Hills region.
- Develop a Boreal Caribou Range Plan for the Cameron Hills area. The range plan would establish local strategies for remedying deficiencies in baseline data, and develop adaptive mitigation strategies. The range plan would identify the current status of

habitat and boreal caribou population trends and work towards developing and refining thresholds of human and natural disturbances. This plan would also describe methods and priorities for habitat restoration.

- Develop a monitoring system to measure changes in boreal caribou population status, recovery of altered habitats and number and distribution of predator levels in relation to altered habitats.
- Develop specific adaptive mitigation measures including the restoration and remediation practices that will, within specified timeframes, reduce the effects of habitat changes on boreal caribou (such as reducing the attractiveness of cut lines and other linear developments as travel routes for predators). 'No net access creation' should be explicitly considered as a mitigation measure, as this would encourage data collection on current corridor revegetation status.
- Develop a research program to determine vegetation recovery patterns for various types of disturbance activities across different habitat types.

Develop a cumulative effect model for the Cameron Hills and surrounding area to identify target levels for human and natural disturbance that permit use of natural resources but with acceptable levels of risk to boreal caribou.

Effects on Other Wildlife

Paramount concludes that marten are the wildlife species most likely to be adversely affected by oil and gas development activities in the Cameron Hills area (response to IR 1.2.124). No follow-up studies were proposed to monitor actual effects on this species.

The DGGFN, the KFN and the KTFN expressed concern about potential effects on wolves and wolverines. Information on predator numbers and distribution was also identified as an important component of boreal caribou by the GNWT (TAR page 9).

4.2.4.4. Conclusions

Cumulative effects assessment is an evolving practice that tries to consider overall impacts on indicators or resources of interest. Notwithstanding progress that has been made over the last 20 years, proponents, regulators, stakeholders and practitioners are still searching for the most appropriate method (or suite of methods) that can be consistently and economically applied to development proposals such as the Cameron Hills project. The Paramount Cameron Hills CEA meets this primary criterion, identifies key potential cumulative environmental

issues adequately, and identifies appropriate indicators for these issues. The Review Board concludes that the approach adopted by Paramount is reasonable and consistent with the DAR Terms of Reference.

Ideally, as noted by the DGGFN, the KFN and the KTFN, community representatives and other interested stakeholders should be provided meaningful opportunities to provide input on appropriate indicators. Wolves and wolverine should be explicitly considered for future CEAs in this area.

The spatially-explicit future development projections provided by Paramount are reasonable, but necessarily introduces uncertainty into assessment conclusions. Additional uncertainty was introduced because some anticipated features were excluded or there were classification and analysis discrepancies (response to IR 1.2.121).

The projected direct footprint of all foreseeable petroleum development activities in the Cameron Hills SDL is comparatively small at the regional scale, and significant adverse cumulative effects are unlikely to be caused by this direct footprint. However, the cumulative indirect footprint covers a large area (12% of the Terrestrial Study Area for songbirds, 21% of the regional study area for moose and marten, and 30% of the regional study area for caribou), and will contribute to effects on wildlife species and traditional harvest intermittently to continuously over the long-term (>20 years).

The Review Board has considered the significance of potential cumulative environmental in the context of surrounding habitat and land use objectives, the probability of adverse effects, as well as the concept of sustainability identified by the proponent (response to IR Number 1.2.59). The proponent was asked to provide a rating scheme for significance (IR Numbers 1.1.8, 1.2.59, and 1.2.119), but chose not to do so. Using information provided in the DAR and TARs, the Board concludes that the environmental consequence of the combined direct and indirect footprint of the Planned Development Case is *High* (potentially significant) for boreal caribou and marten. The following factors are considered by the Review Board to be relevant to a determination of significance:

- Petroleum development in the Cameron Hills SDL has been encouraged by sale of land tenures and approval of prior activities. Ongoing resource development is obviously considered to be an appropriate use of this area.
- The primary source of adverse cumulative effects on caribou and marten appears to be the indirect footprint of seismic lines that have already been constructed or approved. Proposed and likely future activities represent a small incremental disturbance whose footprint can be minimized by utilizing existing linear features.
- The additive effect of natural environmental disturbances such as fires over the 70 year assessment period was not considered in the CEA.

- Although available information suggests that the Cameron Hills Terrestrial Study Area will function as a sub-regional 'sink' for caribou until land use features are sufficiently revegetated, nearby areas with low development intensity could function as a 'source' of caribou until suitable habitat is restored in the SDL. This assumes that caribou in these areas are stable to increasing, although data on population dynamics or abundance is unavailable, and preliminary information suggests the population may be declining.
- The Board must rely on applicable data from research in other areas because of the lack of boreal caribou data for the Cameron Hills area. This increases the uncertainty associated with assessment conclusions.
- The estimate of potential effects on marten is considered to be overly conservative as this species is considered to have higher ecological resilience than caribou.
- Unlike many other areas in the boreal forest, Paramount is the only petroleum operator in the Cameron Hills, and much of the existing and proposed direct and indirect footprint is attributable to its activities. Paramount is implementing several measures to reduce the direct and indirect footprint of development activities.
- Current best practices (low -impact lines =3 m wide) are not proposed for the approved but not yet constructed seismic program although this would ultimately reduce both the direct and indirect footprint and likely reduce the predicted environmental consequence of combined activity.

Based on available information and the concern expressed by parties to the review, the Review Board concludes that significant adverse effects on boreal caribou could occur in the Cameron Hills Significant Discovery License Area as a result of all reasonably foreseeable activities by Paramount Resources. In order to mitigate this potential, the Review Board recommends the following:

R-12 *The Review Board recommends that RWED will, within the next six months, initiate the formation of a Deh Cho Boreal Caribou Working Group (DCBCWG). The Working Group will, among other things, consider: habitat identification, range plan development, thresholds, monitoring systems, adaptive mitigation, research programs and cumulative effects models. In addition, it will coordinate its activities with similar working groups in Alberta and British Columbia.*

R-13 *The Review Board recommends that the MVLWB adopt an average linear disturbance target of 1.8 km per km squared as a boreal caribou disturbance threshold for the entire Cameron Hills, NT area, in order to prevent significant adverse environmental impacts on boreal caribou populations whose*

range includes the Paramount SDL and surrounding area. This shall be considered in all future land use applications for the area.

- R-14** ***The Review Board recommends that Paramount locate at least 50% of all proposed and planned development in the Cameron Hills SDL, as described in Paramount's Developer's Assessment Report, on areas that are currently disturbed (as of the date of Ministerial approval of this Report of Environmental Assessment). This requirement should be included as a condition in land use permit MV2002A0046.***
- S-3** ***The Review Board suggests that the MVLWB and NEB specify low-impact seismic lines (currently =4.5 m wide average, maximum =5 m wide, maximum line of sight =200 m) as the current standard for geophysical programs in boreal caribou habitat, as outlined in the MVEIRB 2003 draft document: Reference Bulletin - Preliminary Screening of Seismic Operations in the Mackenzie Valley.***
- S-4** ***The Review Board suggests that RWED determine the need for cooperative research to document the impacts of the Cameron Hills development on marten, wolf, and wolverine populations.***

4.3. SOCIO-ECONOMIC AND CULTURAL ENVIRONMENT

4.3.1. Socio-Economic Considerations

4.3.1.1. Approach

The Terms of Reference for the DAR indicated a need for information and assessment of impacts to health and social indicators as well as economic factors. The baseline data presented by Paramount in the DAR is repeated from the 2001 EA, with updates from newly acquired census information. Community profiles were presented for Enterprise, Hay River, Hay River Dene Reserve, Kakisa and Fort Providence. General socio-economic trends were highlighted for the Northwest Territories as a whole, in addition to the study area itself.

Issues to be addressed as potential benefits were identified by Paramount as a result of their 20 year history of operations in the area, literature reviews and secondary data:

- Employment of northern residents;
- Contracting opportunities for northern businesses;
- Enhancement of northern individual and business capacity to participate in the economic benefits of large projects; and
- Benefits to the economy of the Northwest Territories, including increased revenue flows and economic diversification.

Paramount also identified several areas of concern, which are expected to require further consideration during project planning:

- Continued accessibility to resources for traditional economic activity;
- Retention of traditional skills and values;
- The potential for area population increases;
- Health and safety of project workforces; and
- The potential for impacts on social service infrastructure.

The socio-economic impacts of the issues identified above have been addressed by the developer in a broad sense, and are discussed in terms of:

- Direction and magnitude;
- Geographic extent;
- Duration; and
- Consequence

Paramount used qualitative methods to predict and analyze potential traditional harvesting issues. Without data on harvesting, trapping and fishing levels for the

Cameron Hills, quantitative changes to traditional harvesting could not be determined for the three development scenarios considered by Paramount.

This qualitative assessment of traditional harvesting activities in the past and the predicted effects of the Cameron Hills project on wildlife and their habitat, described in the DAR were used as the basis for considering Paramount's three development scenarios:

1. The *baseline case* assesses the impacts from the existing and approved direct footprint of the development in Cameron Hills.
2. The *application case* assesses the impacts from existing and approved direct footprint of the development, in addition to the proposed Cameron Hills Extension Project.
3. The *planned development case* assesses the impacts from the existing, approved, Cameron Hills Extension project and all remaining disturbance due to the direct footprint of the development including the proposed wells and facility.

4.3.1.2. Study Area

Paramount has selected a Socio-Economic Study Area (SESA) based on human settlements within 150 km range of the proposed development area. Another criterion used in the identification of the SESA was to target communities whose members may potentially pursue traditional activities in the Cameron Hills or whose members may be in a position to benefit from economic impacts of the proposed development. These communities or settlements identified by the developer are: Hay River, Enterprise, Hay River Dene Reserve, Kakisa and Fort Providence. The total potentially affected population is estimated at 4,600, 80% of which reside in Hay River, Northwest Territories.

The baseline temporal boundary considered in this assessment is the year 2001, when the latest census data is available for. For the application case, the year 2013 was selected as the production is projected to cease on 8 wells. For the planned development case, the year 2023 was selected, as the operational life of the wells is not expected to continue beyond (DAR p. 303).

4.3.1.3. Submissions of Parties

Paramount's socio-economic assessment concluded by committing to implement undertakings made in the Benefits Plan (1991 and 2001) to enhance employment of northerners, and particularly that of directly affected communities. The strategy for enhancing these opportunities is outlined in the Annual Reports submitted to INAC (PR#234) and includes appropriate advertisement of

opportunities, identification of key individuals, training, and a community investment plan.

Paramount's assessment further committed to contracting opportunities for northern businesses, with a strategy of Project Update distribution, Contractor Profile distribution and equal opportunity contracting, outlined in the Annual Reports (PR#234).

In the DAR, Paramount clearly summarizes the results of their assessment of traditional harvesting:

The effects of the planned development and activities leading up to it are low, negligible and low respectively (DAR p.10).

Paramount indicated that the majority of traditional harvesting does not occur in the project area and by avoiding primary harvesting areas, the impact will be negligible. Nevertheless, the developer proposes two main mitigation measures that include:

- ongoing communication with trappers during construction to avoid conflicts; and
- DFO guidelines will be followed to protect potential fish habitat.

Paramount and the Aboriginal communities debated traditional harvesting in the Cameron Hills area. Paramount submits that few people currently hunt, trap or fish in the area. The Aboriginal communities suggest the perception of traditional use being limited to current use fails to acknowledge the long term changes in patterns of use by Aboriginal communities. This is emphasized in submissions by the parties that note that the two trappers that have not used the Cameron Hills area recently have done so because they did not get as many animals as previously and believed the animals were avoiding the area due to the increasing development on the plateau (Hearing Transcripts vol.2, p 131).

The Ka'a'Gee Tu First Nation emphasized that Cameron Hills, although a secondary source of harvesting, is an important management area from a long-term strategic harvesting perspective. Other communities emphasized that the project area is within their traditional lands as well. According to elders, avoidance of this area by harvesters was due to its importance as a source of wildlife and communities felt that Paramount's activities may diminish harvesting opportunities by affecting the resource.

"It is not yet known what impact this project will have on migratory patterns, and the long-term effects on the ability of the communities to sustain themselves and their children" (PR#197, 198, 199).

The lack of a community-accepted, process for compensating impacted resource harvesters prompted the Review Board to specify measures for a wildlife and resource harvesting compensation plan as described in the Review Board's *Report of Environmental Assessment on the Paramount Resources Ltd. Cameron Hills Gathering System and Pipeline Development* (EA01-005). The two measures modified in consultation with the federal Minister were measures 13 and 15:

- Measure 13: Paramount is to discuss, develop and implement a wildlife and resource harvesting compensation plan with potentially affected First Nation communities. Deh Gah Got'ie Dene Council, Fort Providence Métis Council, Ka'a'Gee Tu, K'atlodeeche First Nation and West Point First Nation. The scope of the plan is to include compensation for hunting, trapping, fishing and other resource harvesting activity losses resulting from the development as agreed to by Paramount and the communities. Paramount is to commence the consultations as soon as possible with a draft plan submitted to the communities within 60 days of the EA report acceptance by the DIAND minister and a final plan submitted to the communities with 90 days of EA report acceptance. The plan is to apply retroactively to impact arising from the start of construction of the gathering facilities and pipeline. If requested by Paramount or any of the communities the GNWT and DIAND are facilitate the discussions on the plan.
- Measure 15: Paramount and the communities are to co-operate to the fullest extent possible in developing the wildlife and resource harvesting compensation plan. If the parties are unable to come to an agreement on the contents of the plan within the 90 day period, an independent arbitrator shall be jointly appointed within 30 days by the GNWT and DIAND. The arbitration process shall conclude within 30 days of the appointment of the arbitrator.

At the Public Hearing, the implementation of these measures was discussed. Information filed by INAC after the Public Hearing indicates that Paramount drafted a wildlife and resource harvesting compensation plan and circulated it to the potentially affected Aboriginal communities (PR 203). During discussions about the plan, Aboriginal communities were not satisfied that their concerns were being heard. A mediator was assigned to resolve the impasse between Paramount and the Aboriginal communities. Aboriginal communities stated that mediation failed due to the lack of an enforcement mechanism to ensure that Paramount came to agreement and indicate that company's policy was to negotiate and sign the same agreement with all parties (PR 198). In response, the Aboriginal communities ended their participation.

The Paramount wildlife and resource harvesting compensation plan for the Cameron Hills SDL has never been completed. The Aboriginal parties to this EA have requested that no irreversible steps be authorized for this new Paramount development before such agreements are in place. The Aboriginal communities

emphasize that the compensation plans must address economic, as well as cultural components, and not merely lost revenue from harvesting (Hearing Transcripts vol.2, p101).

Overall, Paramount concluded their socio-economic assessment by stating that the results indicate that benefits of their project will be wide-ranging, at least 60 km from the project area. Paramount determined that any negative impacts of the project on the socio-economics of the region will be of negligible to low consequence.

The KTFN, DGGFN and KFN were all in favor of a negotiated socio-economic agreement that would assign employment targets, and other benefits to the communities in a more comprehensive and prescriptive fashion than the current Northern Benefits Plan, as required under section 5.2 of the *Canadian Oil and Gas Operations Act* (COGOA). The GNWT Hay River Health Services Authority stated that socio-economic agreements are common mitigation measures used in the NWT, and outlined the general terms that often compose such as agreements: reporting of employment and recruiting efforts made in each community, reporting of training efforts made in each community and the ongoing consultation with communities and governments (Hearing Transcripts vol.1, p154). The Deh Cho First Nations Consultation principles have been submitted to the Public Record (PR#197, 198, 199) and referred to throughout the EA process as a desired guiding document for anyone wishing to undertake meaningful consultation with Deh Cho communities (Appendix D). It is the communities' request that any further consultation with Paramount adhere to these principles (PR#197, 198, 199).

At the hearing, the KTFN expressed concern about the use of drugs and alcohol in Paramount's industrial camps on KTFN traditional lands (Hearing Transcripts vol.1, p106). In their Technical Analysis Report (March 12, 2004), the KTFN said they wish to see a commitment on behalf of the NEB and INAC to include any drug or alcohol observations in their inspection reports.

The GNWT Hay River Health and Social Services Authority reported on their concern over the lack of dialogue or consultation with Paramount during their presentation at the Public Hearing (Hearing Transcripts vol.1, p154). The GNWT stated that Paramount had, at no time, consulted with the Hay River Health and Social Services Authority as to their emergency response plan, which indicates that in the event of an emergency, the employees may well be air lifted or medically evacuated to the Hay River hospital. The GNWT-HRHSSA and Paramount have since entered into dialogue and are confident that their respective expectations can be clarified, in advance of any emergency medical services being required (Hearing Transcripts vol.1, p156).

The GNWT (Response to IR 1.2.22 (c)) have identified a possible oversight by the developer with respect to timber in the Cameron Hills. The GNWT requires

that a Forest Management Authorization be obtained prior to any use of salvageable timber for corduroy or other such purposes, and additionally that timber cutting and reforestation dues be paid. The KTFN, DGGFN and the KFN (PR#199, 198, 197) have raised concern with this issue, as it appears no such authorizations have been issued to Paramount.

4.3.1.4. Analysis

Harvester Compensation

The Review Board accepts the importance of the proposed project area in sustaining hunting, trapping and fishing of First Nations communities.

The community relies on a year round basis on the land. Chief Chicot estimates that three quarters of the food consumed by the Ka'a'Gee Tu comes from the land through hunting, trapping, fishing and gathering roots and berries (Hearing Transcripts vol.2, p100).

The Review Board recognizes the challenges of achieving a wildlife and resource harvesting compensation plan through a mediated process where parties do not agree on the intent of the plan and therefore may not wish to subscribe to the results of the mediation. This issue of the plan has remained unresolved from the previous EAs for this area. Further delay is not acceptable in light of the proposed expansion of the development for which the original plan was recommended. A more focussed approach to dealing with this issue is needed based on a clear understanding of the intent of the Review Board. The Review Board heard evidence that the scope of the Cameron Hills Wildlife and Resources Harvesting Compensation Plan should include:

Compensation for all project related activities of Paramount, including those for which permits and authorizations have already been granted, that have had a provable adverse impact on traditional harvesting including direct losses of equipment, wildlife rendered into possession and reduction of harvest success resulting from Paramount's activities.

Based upon an analysis of INAC's submission regarding the mediated process for the consultation plan, the Review Board notes disagreement between the parties on the interpretation of the breadth of concerns associated with traditional harvesting, suitable compensation, and the level of authority of Aboriginal communities in operational planning should concerns about infringement on treaty rights arise. This disagreement must be resolved in order to ensure reasonable and fair compensation for damages incurred relative to the Paramount's activities.

Socio-Economic Agreement

The Review Board supports the communities' requests for a socio-economic agreement with Paramount. The Review Board also concurs with the GNWT on the effectiveness of socio-economic agreements to aid in assessing the impact on the social and the cultural aspects of northern development (Hearing Transcripts vol.1, p154). The Review Board further acknowledges the efforts of the Deh Cho First Nation in establishing the Deh Cho First Nation Consultation Principles (see Appendix D), and supports the use of these principles as guidelines to conducting meaningful consultation with Deh Cho communities.

Health Issues

The Review Board has noted the KTFN's concern over the use and/or abuse of drugs and alcohol in the Paramount Cameron Hills work camps. The Review Board believes that Paramount's current policy of zero tolerance for drugs and alcohol, combined with a 'no firearms allowed in camp' policy, is sufficient to address any drug or alcohol-related problems that may arise with workers in camp. There is no further evidence that has been presented to the Review Board on this matter that would suggest otherwise.

The Review Board notes the concern expressed by the GNWT - Hay River Health and Social Services Authority (HRHSSA) with regards to the lack of dialogue with the developer and lack of understanding as to what services might be expected in the event of an emergency at the Cameron Hills worksite. The Review Board is satisfied that recent discussion on these matters has been undertaken between the GNWT-HRHSSA and Paramount. The Review Board is of the belief that no outstanding issues remain, as there is a commitment on behalf of Paramount to continue dialogue with the GNWT-HRHSSA in the direction of clarifying each other's expectations in responding to emergency needs of workers (Hearing Transcripts vol. 1, p157).

Timber Use

The Review Board acknowledges the KTFN, DGGFN and KFN concern over Paramount's plans for use of any salvaged timber at the Paramount Cameron Hills operation. The Review Board believes Paramount should comply with any required authorizations or regulations with respect to the use of timber on the Cameron Hills SDL.

4.3.1.5. Conclusions

In order to prevent significant adverse socio-economic impacts on the environment, further mitigation is needed. These potential impacts relate to the viability of the Cameron Hills as a source of harvesting critical to the preservation of harvesting opportunities over the long term.

- R-15** *The Review Board recommends that Paramount and the other parties to the unfinished Cameron Hills Wildlife and Resources Harvesting Compensation Plan developed in response to measures 13 and 15 of EA01-005 complete the compensation plan. If a compensation plan cannot be completed by these parties within 90 days of the federal Minister's acceptance of this report, this matter will proceed to binding arbitration, pursuant to the NWT Arbitration Act. A letter signed by the parties, indicating agreement to the compensation plan or in the case of arbitration, the arbitrator's decision must be filed with NEB and MVLWB prior to the commencement of Paramount's operations under land use permit MV2002A0046.*
- R-16** *The Review Board recommends that the GNWT develop a socio-economic agreement with Paramount in consultation with affected communities before operations proceed under the land use permit MV2002A0046. The socio-economic agreement is to address issues such as employment targets, educational and training opportunities for local residents and a detailed ongoing community consultation plan.*
- S-5** *The Review Board suggests that the discussion and drafting of the community investment plan be resumed between the KTFN and Paramount, with a target date of completion and implementation of November 30, 2004.*
- S-6** *The Review Board suggests that Paramount continue discussions with the Hay River Health and Social Services with regards to services (emergency or other) that may be utilized by the company in certain instances.*

4.3.2. Cultural Considerations

4.3.2.1. Approach

Paramount conducted a Heritage Resources Assessment for the Cameron Hills SDL in order to evaluate whether or not there were heritage resources present and if so, if there was a potential to impact these resources. The VEC selected by Paramount for this section of the assessment was the individual heritage resources. Background information was reviewed, including known resources and their locations, past land use patterns, past heritage resource inventories, Traditional Knowledge and heritage resource monitoring results in order to determine the potential for any future proposed development activities to affect these resources.

4.3.2.2. Study Area

The study area used was the Cameron Hills Significant Discovery License (SDL), over a time period of the various development cases utilized throughout the DAR: baseline case, application case, planned case.

4.3.2.3. Submissions of Parties

Paramount's heritage resources assessment concluded that although some areas of moderate potential would be affected through development activities, no heritage resources appeared to be present in areas examined. Paramount's consultations with local traditional land users yielded no major concerns over the potential for known sites to be affected, other than the identification of a single trapper's cabin (DAR p284).

Upon examination of the Deh Cho Interim Measures Agreement and the Interim Resource Development Agreement (DAR p.302), Paramount further concluded that their Cameron Hills operations area is not subject to any interim land withdrawals of cultural or spiritual significance to the Deh Cho.

First Nation parties expressed concern over the potential for Paramount to encounter any archaeological or heritage resources in the Cameron Hills SDL (PR#199. 198, 197). The KTFN have requested to be notified directly if any heritage resources are suspected or encountered throughout construction or operations in the Cameron Hills SDL (PR#199, Hearing Transcript vol.1, p109), in addition to Paramount's current practice of involving the regulators and PWNHC. Paramount responded to this request through the IR process and again at the hearing by stating that they are in compliance with the regulations on reporting suspected or known heritage resources, and that they are not allowed

to make those sites public prior to notifying regulators (Hearing Transcripts vol.1, p109).

4.3.2.4. Analysis

The Review Board supports the KTFN's request to be notified directly if any heritage resources are encountered or suspected by Paramount whilst pursuing oil and gas development activities in the Cameron Hills, the traditional territory of the KTFN.

The Review Board finds that any other cultural considerations brought forth in the evidence have either been addressed through traditional harvesting or are not sufficient for a determination on cultural impacts in the Cameron Hills area.

4.3.2.5. Conclusions

In order to avoid any future potential of significant adverse impacts on the cultural environment, the Review Board recommends the following:

R-16 The Review Board recommends the KTFN be notified directly if any heritage resources are suspected or encountered during Paramount's activities in the Cameron Hills.

5. SUMMARY OF RECOMMENDATIONS AND SUGGESTIONS

Recommendations

- R-1** *The Review Board recommends that regulatory authorities include in their authorizations those items set out in the Developer's commitments, outlined in Appendix A, that are within their jurisdiction.*
- R-2** *The Review Board recommends that Paramount prepare a report within 12 months and thereafter, annually, until the developments on the SDL are abandoned and restored, for distribution in plain language to the parties in this EA. This report will outline the implementation status of each commitment made during the course of this EA, as set out in Appendix A.*
- R-3** *The Review Board recommends that prior to the issuance of any further licenses or permits Paramount install a meteorological station (at minimum must monitor wind speed, wind direction and temperature) in the Cameron Hills SDL to gather baseline data related to its development. Meteorological data will be provided annually to air quality staff of GNWT-RWED and Environment Canada along with a detailed re-modeling of Paramount's various development scenarios to ensure onsite meteorological conditions are reflected in the modeled outputs.*
- R-4** *The Review Board recommends that Paramount install a continuous gas analysis monitoring system to track ambient air quality (at minimum 1 hour SO₂ and NO₂) and provide the data to the general public via website, to be updated no less than monthly if a live connection is not available. Annual reports on the status of the air quality at Cameron Hills will be provided by Paramount to all potentially affected communities and government in a plain language document throughout the life of the Paramount operations at Cameron Hills.*
- R-5** *The Review Board recommends that Paramount install an amine fuel sweetening unit at the Central Battery (H-03) location prior to bringing any further wells online or pipe in sweet fuel from outside Cameron Hills, as per Paramount's original development plan.*

- R-6** ***The Review Board recommends that any further combustion engines being installed for line heaters and pumpjacks at the Cameron Hills operation must use the sweetened fuel or an alternate source of no sulphur fuel.***
- R-7** ***The Review Board recommends that the Government of Canada (INAC and Environment Canada) and the Government of the Northwest Territories, implement recommendation 7 from the Ranger-Chevron EA by June 2005.***
- R-8** ***The Review Board recommends that Paramount modify its spill reporting procedures for the Paramount Cameron Hills developments to include notice of spill occurrences to potentially affected communities. Spills must be reported according to the NWT Spill Reporting Procedures.***
- R-9** ***The Review Board recommends that Paramount continue to monitor all work sites for erosion, and take appropriate measures in advance to avoid such problems. The Review Board recommends appropriate erosion mitigation measures be identified in advance and authorized by the NEB and INAC inspectors, and that any remediation of sites be documented and reported to regulators and the Ka'a'Gee Tu First Nation on a quarterly basis.***
- R-10** ***The Review Board recommends that Paramount, in the case of an isolated water crossing, maintain downstream water flow at pre-in-stream work levels. All in-stream work must be completed as expediently as possible to mitigate disruption of fish movements.***
- R-11** ***The Review Board recommends that the Department of Fisheries and Oceans conduct regular site visits to the Cameron Hills to inspect for determine if any impacts to fish or fish habitat. Reports of these inspections must be made publicly available via DFO and also be sent directly to the Ka'a'Gee Tu First Nation, in a plain language version.***
- R-12** ***The Review Board recommends that RWED will, within the next six months, initiate the formation of a Deh Cho Boreal Caribou Working Group (DCBCWG). The Working Group will, among other things, consider: habitat identification, range plan development, thresholds, monitoring systems, adaptive mitigation, research programs and cumulative effects models. In addition, it will coordinate its activities with similar working groups in Alberta and British Columbia.***

- R-13** *The Review Board recommends that the MVLWB adopt an average linear disturbance target of 1.8 km per km squared as a boreal caribou disturbance threshold for the entire Cameron Hills, NT area, in order to prevent significant adverse environmental impacts on boreal caribou populations whose range includes the Paramount SDL and surrounding area. This shall be considered in all future land use applications for the area.*
- R-14** *The Review Board recommends that paramount locate at least 50% of all proposed and planned development in the Cameron Hills SDL, as described in Paramount's Developer's Assessment Report, on areas that are currently disturbed (as of the date of Ministerial approval of this Report of Environmental Assessment). This requirement should be included as a condition in land use permit MV2002A0046.*
- R-15** *The Review Board recommends that Paramount and the other parties to the unfinished Cameron Hills Wildlife and Resources Harvesting Compensation Plan developed in response to measures 13 and 15 of EA01-005 complete the compensation plan. If a compensation plan cannot be completed by these parties within 90 days of the federal Minister's acceptance of this report, this matter will proceed to binding arbitration, pursuant to the NWT Arbitration Act. A letter signed by the parties, indicating agreement to the compensation plan or in the case of arbitration, the arbitrator's decision must be filed with NEB and MVLWB prior to the commencement of Paramount's operations under land use permit MV2002A0046.*
- R-16** *The Review Board recommends that the GNWT develop a socio-economic agreement with Paramount in consultation with affected communities before operations proceed under the land use permit MV2002A0046. The socio-economic agreement is to address issues such as employment targets, educational and training opportunities for local residents and a detailed ongoing community consultation plan.*
- R-17** *The Review Board recommends the KTFN be notified directly if any heritage resources are suspected or encountered during Paramount's activities in the Cameron Hills.*

Suggestions

- S-1** *The Review Board suggests that a member of the K'a'Gee Tu First Nation be invited by DFO to accompany its inspectors while conducting inspections in the Cameron Hills operations area.*
- S-2** *The Review Board suggests the agencies responsible for water resource management and protection increase their monitoring and enforcement efforts commensurate with the increase in the scope of Paramount's development in the Cameron Hills area.*
- S-3** *The Review Board suggests that the MVLWB and NEB specify low-impact seismic lines (currently =4.5 m wide average, maximum =5 m wide, maximum line of sight =200 m) as the current standard for geophysical programs in boreal caribou habitat, as outlined in the MVEIRB 2003 draft document: Reference Bulletin - Preliminary Screening of Seismic Operations in the Mackenzie Valley.*
- S-4** *The Review Board suggests that RWED determine the need for cooperative research to document the impacts of the Cameron Hills development on marten, wolf, and wolverine populations.*
- S-5** *The Review Board suggests that the discussion and drafting of the community investment plan be resumed between the KTFN and Paramount, with a target date of completion and implementation of November 30, 2004.*
- S-6** *The Review Board suggests that Paramount continue discussions with the Hay River Health and Social Services with regards to services (emergency or other) that may be utilized by the company in certain instances.*

FIGURES AND TABLES

Figure 1 – The Cameron Hills Project Location Map

Figure 2 – EA03-005 Environmental Assessment Diagram

Figure 3 – Paramount Cameron Hills Cumulative Effects Study Areas (CESA)

LIST OF ABBREVIATIONS

ASA	Air Study Area
ASA	Aquatics Study Area
BAT	Best Available Technology
CCME	Canadian Council of Ministers of the Environment
CEA	Cumulative Effects Assessment
CEAA	Canadian Environmental Assessment Act
CESA	Cumulative Effects Study Area
COGOA	Canadian Oil and Gas Operations Act
COSEWIC	Committee on the Status of Endangered Wildlife in Canada
DAR	Developer's Assessment Report
DCBCWG	Deh Cho Boreal Caribou Working Group
DCFN	Deh Cho First Nation
DGGFN	Deh Gah Got'ie First Nation
DFO	Department of Fisheries and Oceans
DOT	Department of Transportation
EA	Environmental Assessment
EC	Environment Canada
EIR	Environmental Impact Review
FPMC	Fort Providence Metis Local 57
FPRMB	Fort Providence Resource Management Board
GHG	Greenhouse Gas
HADD	Habitat Alteration, Disruption or Destruction
HRHSSA	Hay River Health and Social Services Authority
ISC	Industrial Source Complex (dispersion model)
INAC	Indian and Northern Affairs Canada
KCAC	Keeping Clean Areas Clean
KFN	K'atlodeeche First Nation
KTFN	Ka'a'Gee Tu First Nation
LSA	Local Study Area
MVLUR	Mackenzie Valley Land Use Regulations
MVLWB	Mackenzie Valley Land and Water Board
MVRMA	Mackenzie Valley Resource Management Act
NEB	National Energy Board

NWT	Northwest Territories
NWT Métis	NWT Métis Nation
OLM	Ozone Limiting Method
PWNHC	Prince of Whales Northern Heritage Centre
ROW	Right of Way
RSA	Regional Study Area
RWED-GNWT	Resources, Wildlife and Economic Development, Government of Northwest Territories
SARA	Species At Risk Act
SDL	Significant Discovery License
SESA	Socio-Economic Study Area
TAR	Technical Analysis Report
TK	Traditional Knowledge
TSA	Terrestrial Study Area
VC	Valued Component
VEC	Valued Ecosystem Component
WPFN	West Point First Nation

Appendix A – Developer’s Commitments

Paramount Cameron Hills EA - Developer's Commitments	
Source	Commitments/Mitigations
DAR p. 8	Mitigative Measures include: taller stacks to enhance dispersion, use of electric drive chemical injection pumps, avoidance of raw gas venting and use of low to no sulphur fuels, in some cases.
DAR p. 10, 57	If a heritage resource were discovered, procedural guidelines are in place to assure its preservations and a member of the local aboriginal com. Is on site during all pipeline construction to assist in the ID of any unearh traditional/heritage resource. MVLWB, PWNHC(Museum), DIAND will be notified
DAR p. 4	Complete removal of all temporary construction buildings and equipment at the end of each season
DAR p. 4	Pipelines crossing the Cameron River and its major tributary, above ground crossings are constructed by hanging the pipe from bridges. Secure crossings-leak detection.
DAR p. 13	Paramount will continue to use best available technology and will rely on the following to guide operations past 2012. Referring to Kyoto.
DAR p. 58	Paramount prefers to rely on natural encroachment to revegetate disturbed areas. When natural Encroachment is not progressing quickly or in especially erosion prone areas seeding will be undertaken. Only certified Canada #1 seed will be used. The seed mix will be Regreen sheet X wheatgrass 15%, Awned wheat grass 25%, Fall rye 50%, Slender Wheatgrass 10%.
DAR p. 58	Applicable regulators and the two identified trappers will be kept apprised of all construction schedules through Paramount’s published updates.
DAR p. 58	The local communities will be notified with the published project updates so that anyone using the area will be aware of construction activities and to ensure appropriate avoidance or precautionary measures can be implemented.
DAR p. 58	In the event that weather conditions create wet or thawed soils conducive to rutting, construction will postponed, equipment travel will be suspended or construction alternative will be implemented to minimize disturbance to the soil and terrain. Paramount defines winter ground conditions as frozen ground, which adequately supports construction equipment to effectively operate in wet terrain. As a general guideline, if rutting persists to a depth of approximately 30cm or more, then construction activities will be suspended or terminated until ground conditions improve, or low ground pressure equipment may be used to mitigate rutting.
DAR p. 59	All construction activities will be restricted to the designated ROWs and approved extra workspace. Construction traffic will be restricted to the ROWs, existing roads and appropriate detours. All safety and road closure regulation will be adhered to by construction traffic.
DAR p. 59	Paramount’s operating guidelines for working in permafrost areas will be adhered to when areas of permafrost are encountered. These guidelines are included in Appendix II
DAR p. 59	The recreational use of all-terrain vehicles and snow machines by constructions personnel will not be permitted in the project area.

DAR p. 59	All contractors and subcontractors will ensure that all construction equipment that arrives on the job site is clean (free of mud and weed seeds) and in good working order (no oil or hydraulic fluid leaks).
DAR p. 59	Efforts will be made to minimize interface with existing land uses (e.g., trap lines) through route selection and timing of construction activities. The two trappers will be notified of the construction schedule at least two weeks prior to clearing. If possible, agreements will be made to have the trap line owners clearly identify trapping access routes and equipment (e.g., remove their traps and snares) in the vicinity of the ROW prior to industrial activity to ensure that they are protected during construction.
DAR p. 59	Surface disturbances, such as grading and vegetation clearing, will be kept to a minimum, recognizing the sensitivities associated with wetlands and wildlife habitat.
DAR p. 59	All construction and operations personnel will be instructed to record on Paramount wildlife sighting cards any sightings of wolves, caribou, moose, bison and cougars.
DAR p. 59	All personnel involved with field activities on the project will be prohibited from carrying firearms (except with written permission from Paramount) and being accompanied by dogs.
DAR p. 60	When secondary containment is installed for the tanks (e.g., lined berm or secondary wall on the tank), a spare, empty emergency pump to tank will not be provided.
DAR p. 60	Vehicle and equipment operators will be instructed to maintain appropriate speeds, and to be aware of potential encounters with wildlife while on access routes, and to allow any animals the opportunity to disperse from the route before proceeding.
DAR p. 60	Equipment operators will be careful to avoid gouging or otherwise disturbing banks or lake/stream bottoms.
DAR p. 60	At no time shall any waste fluid, treated or otherwise, be discharged to surface waters.
DAR p. 60	Winter access will be completed by packing snow with a bladed Nodwell, or similar equipment to drive frost into the ground.
DAR p. 61	Use of the existing linear disturbances whenever practical. Additional clearing along seismic lines, to widen them, is anticipated to be minimal.
DAR p. 61	Light-weight tracked vehicles, snowmobiles and all terrain vehicles will be used initially to compact the snow and surface vegetation on the access ROWs. Ideally, this operation would be initiated in the late fall to ensure that a satisfactory base has been prepared for the ensuing winter road construction and use.
DAR p. 61	Low-lying areas will require induced frost penetration only. Snow ploughing in these areas is expected to be limited and a minimum of 4 cm of snow will be left to protect the surface vegetation.
DAR p. 61	When required and when feasible, natural openings will be utilized for push-outs or passing lanes. Push-outs may add an extra 3 to 6 m of width to the ROW edge and will be approximately 20m long. Ideally, push-outs will be located every 300 m along the access route. If brush clearing is required at push-outs will be located every 300 m along the route. If brush clearing is required at pull-out sites, brush will be mowed with a hydroax or cut with a dozer blade to minimize disturbance to the surface organic layer. Generated debris and slash will be windrowed and utilized for roll back.

DAR p. 61	Construction of a compacted winter snow road will be consistent with the methodology and guidelines identified in the Department of Transportation (DOT) handbook (GNWT 1993).
DAR p. 61	Due to the low slope profile, grading on access routes is not anticipated.
DAR p. 62	Paramount will ensure frost penetration is sufficient on access ROWs to support the weight of relevant equipment and traffic prior to access into the project area.
DAR p. 62	Water required for winter road construction will be obtained from the preferred water source Lake and/or the drilled water wells.
DAR p. 62	Depending on snowfall and other climatic conditions during the winter season, a built-up, ice capped snow pad may be required at specific locations along the ROWs to further mitigate site -specific surface disturbances and to ensure the travel lane will carry the anticipated loads.
DAR p. 62	The work schedule will be adhered to, to take advantage of frozen ground and frozen drainage crossings wherever practical.
DAR p. 62	The access routes were selected to employ crossing locations that have been used in previous seismic and/or drilling operations.
DAR p. 63	Ice bridges as described in the DOT handbook (GNWT 1993) will be constructed over those drainages not frozen to the bottom at the time of access construction. This is expected to be relevant to the crossings of the Cameron River and its major tributaries.
DAR p. 63	Special attention will be made to avoid introducing foreign material into the stream.
DAR p. 63	Clean snow and ice will be used to construct the ice bridges to the extent feasible. Should any soil or other material be accidentally introduced onto the ice of the watercourse, it will be removed before spring break-up so that no deleterious materials are allowed into the water. Depending on snow conditions, logs may be placed in the channel to facilitate ice bridge construction to ensure safe vehicle operation. If this method is used, all logs would be removed prior to spring break-up.
DAR p. 63	The crossing will either be removed completely, or "V: notched to allow flow during the spring break-up.
DAR p. 63	No refueling of vehicles will be allowed within 100 m of any watercourse.
DAR p. 63	Vehicles will be checked for oil and/or fuel leaks, and if faulty will be taken out of service until it is repaired.
DAR p. 63	If banks of a drainage are disturbed during construction, a pre-disturbance bank profile will be re-established which may include using rock riprap, organic cribbing, bundled logs, or other stabilization measures.
DAR p. 64	No clearing or grading will be required on existing well sites as only access. Will be don by grading snow to create a snow/ice surface. Minimal disturbance is anticipated at these locations. ...If marketable timber is not present, the lease will be cleared using a hydroax, or dozer with cutter blade, to minimize the disturbance of the surface duff.
DAR p. 64-65	Mitigative measures for minimizing disturbances resulting from the construction of the satellite and well sites include: 1-8. Can be found on page 64 & 65.
DAR p. 65-66	Factors considered are found in number:1,2,3
DAR p. 66-67	Pipelines crossing will be done by one of the following four methods: 1. Open cut, 2. Aerial Crossing, 3.Horizontal Directional Drilling, 4. Isolated. Details can be found on page 66-67

DAR p. 68	Mitigative measures for minimizing disturbances at water crossings include: 1-10. Details can be found on page 68.
DAR p. 69	The ROW with will take into consideration constraints corridor from H-03 to A05, 30m of clearing
DAR p. 69	The flowlines will be hydrostatically tested using methanol.
DAR p. 70	Paramount will install heavy-walled pipe where the Inspector identifies permafrost.
DAR p. 70	The organic layer will be replaced over the trench, following backfilling and rollback of slash.
DAR p. 70-73	Mitigative measures for minimizing disturbances for the construction phase of gathering flowlines and the water disposal pipeline include: 1-22. Details can be found on pages 70-73.
DAR p. 74	Mitigative measures for minimizing disturbances for the construction of pits include: 1-2. Details can be found on page 74.
DAR p. 74-75	Mitigative measures for minimizing disturbances associated with the use of proposed water sources include: 1-7. Details can be found on pages 74-75.
DAR p. 75	The preferred campsite locations will take advantage of previous campsite use or airstrip clearings on relatively level terrain and will maintain a 100 m buffer from any watercourse.
DAR p. 75-76	Mitigative measures for minimizing disturbances from the construction and operation of temporary campsites include: 1-6. Details can be found on pages 75-76.
DAR p. 76	The topsoil and overburden piles will be allowed to revegetate and will consequently be protected from erosion. On abandonment, the side slopes will be contoured to provide a stable slope revegetating by natural encroachment.
DAR p. 78	Mitigative measures for minimizing disturbances from the construction of the airstrip include: 1-4. Details can be found on pages 78.
DAR p. 78	Paramount will work closely with contractors to ensure that all regulatory conditions are followed.
DAR p. 78	Line widths will be minimized and avoidance cutting techniques will be utilized where possible in order to reduce the impact of the disturbance of the standing cover. Line cutting will focus on establishing a route through the area in a direct manner without cutting a straight line.
DAR p. 79	Receiver lines will be cleared utilizing small cats (D3 or D4), to a width of approximately 4 m.
DAR p. 79	In areas of sensitive terrain, no source lines will be cut and receiver lines will be hand cut to a maximum of 1.5 m to minimize surface disturbance.
DAR p. 79	Seismic operations will conducted on frozen ground conditions only.
DAR p. 79	Existing seismic trails and roads will be utilized as much as possible and practical.
DAR p. 79	Line widths will be kept to a minimum and equipment operators will be instructed not to disturb the duff layer.
DAR p. 80	Paramount will adhere to the Canada Oil and Gas Geophysical Operations Regulations 27.1 (1) and Mackenzie Valley Land Use Regulations 12 regarding heritage resources (archaeological, burial and historic sites). The NEB Conservation Officer and the MVLWB or DIAND Resource Management Officer will be notified in addition to suspending operations in the vicinity of the discoveries.

DAR p. 80	Low ground pressure vehicles, 4x4 trucks, tracked units, quads and snowmobiles will be used to move personnel and equipment as well as to acquire data. Heavier equipment (vibrators) will be buggy mounted on low-ground pressure tires.
DAR p. 80	Equipment and vehicles will not be moved unless the ground surface is fully capable of supporting equipment and vehicles without rutting and gouging.
DAR p. 80	All snow/ice fill will be constructed using clean snow only; no dirt or other material that could adversely affect the watercourse will be used.
DAR p. 80	All watercourses will be crossed at a 90-degree angle where the shoreline slope is shallow.
DAR p. 81	Vibrators will be used on ice only where lakes are frozen to bottom otherwise they will be stacked on either side of the waterbody.
DAR p. 83-84	Mitigative measures for minimizing ground disturbances in response to impact indicators listed on page 83 will be employed progressively or individually in consultation with DIAND representatives. Measures include: 1-5. Details can be found on pages 83-84.
DAR p. 84	Sensitive, low-lying areas, to the extent slash inventories will allow, will have will have a corduroy road for ATV traffic during unfrozen conditions.
DAR p. 84	Where the disturbance track expands to greater than 2 m in width, a temporary log bridge may be placed over the crossing or gravel may be deposited to stabilize the ford.
DAR p. 86	Mitigative measures for minimizing disturbances from waste handling include: 1-6. Details can be found on pages 86.
DAR p. 87	Mitigative measures for minimizing disturbances from drilling fluid include: 1-5. Details can be found on pages 87.
DAR p. 88	Sewage and greywater will be stored in camp sumps and treated with lime, as required.
DAR p. 88	Combustible garbage will be burned in a diesel-fired incinerator.
DAR p. 88	Non-combustible garbage will be contained in garbage bins and removed to an approved landfill.
DAR p. 88	Garbage will be collected and stored properly.
DAR p. 88	Sewage sumps will be treated with lime, backfilled and compacted.
DAR p. 97	Sumpless drilling techniques will be used for drilling operations at Cameron Hills.
DAR p. 110	Facility maintenance contracts, trucking and day-to-day subsistence goods and services, and a wide variety of other goods and services will be required from the local economy.
DAR p. 111	All pipeline routes were selected after consideration of local residents and area trappers.
DAR p. 151, 159, 166	Avoid venting gas to the atmosphere that contains hydrogen sulfide.
DAR p. 152, 159, 166	Well and produced gases are used as fuel to minimize GHG emissions, where possible.
DAR p. 152, 159, 166	Virtually all of the well and produced gas that is used as fuel is burnt in engines, compressors or turbines that effectively convert all of the hydrogen sulfide present into sulfur dioxide.

DAR p. 152, 159	Use of propane at the gas well G-48 and sweet fuel at the oil well D-78 to ensure that predicted sulfur dioxide concentrations are less than the NT standards.
DAR p. 152, 159, 166	Stack heights are of sufficient height to ensure that predicted sulfur dioxide concentrations are less than NT standards.
DAR p. 166	Reducing the flow rate through a down hole choke.
DAR p. 166	Using propane as fuel at the wells.
DAR p. 166	Using sweet gas as fuel at the wells.
DAR p. 167	Using electrical power at oil wells and satellites.
DAR p. 167	Using sweet fuel at the battery.
DAR p. 179	Prompt reclamation using stockpiled topsoil and revegetation are the primary mitigations for soil and terrain impacts.
DAR p. 193	Crossings of larger water bodies will also use snow and ice bridges or existing bridges wherever feasible.
DAR p. 193	Surface water hydrology is related to increased runoff potential in cleared areas as compared to forested areas. This effect will be minimized by leaving ground vegetation intact.
DAR p. 193	Standard mitigation measures such as diversion ditches and berms, silt fence installation and revegetation will be implemented in areas of erosion potential.
DAR p. 193	Water will be withdrawn from identified watersource lakes to aid in the construction of a snow/ice surface layer for wellsites and winter access roads, to provide make-up water for well drilling fluid and for well control.
DAR p. 193-194	Drilling wastes will be stored in on-site tanks, and waste volume will be minimized by re-using clear fluids.
DAR p. 194	Drilling waste solids will be disposed of by a mix-bury-cover methods on-site or at a remote pit locations to be determined by suitable soil and groundwater conditions.
DAR p. 194	Waterbody crossings will be located in areas with minimum topographic relief to minimize impacts to banks.
DAR p. 194	Should flow be present at the time of crossing, an effective isolation method (dam/pump) or a trenchless technique (horizontal directional drill) would be used.
DAR p. 194	Waterbody bed material will be replaced in such a manner as to ensure that the substrate replaced onto the trench will not dam water.
DAR p. 194	Pipeline ROWs will follow existing or recently constructed access roads, where possible, to minimize the total cleared area and the number of waterbody crossing points.
DAR p. 195	Access roads will be frozen down each winter season by the application of water to prevent damage to vegetation and soil.
DAR p. 195	Water withdrawal during the operations phase will be limited to access road maintenance and potential amine make-up water if fuel sweetening is required.
DAR p. 195	During open water conditions, large waterbodies, such as the Cameron River and larger tributaries, will be crossed via permanent bridges and small waterbodies will be forded.
DAR p. 195	Bridge and plank installation will be used where appropriate and feasible to reduce sediment disturbance and bank deterioration.

DAR p. 195	Regular maintenance of wells and facilities requiring the access of heavy equipment will be scheduled during frozen ground conditions.
DAR p. 196	Camps will be located at least 100 m from waterbodies and waterbodies.
DAR p. 209	Camps sumps and drilling wastes will be installed with low permeability sediments (silts and clays) to minimize potential for vertical migration of pit or sump fluids to any shallow aquifers.
DAR p. 209	In the event of accidental surface contamination, Paramount will implement spill response plan according to steps described on page 209.
DAR p. 211	Paramount will take steps to mitigate potential impacts associated with pits, including location, low permeability sediments or installation of a liner.
DAR p. 211	Chemicals will be stored in accordance with legal and regulatory requirements.
DAR p. 222	Mitigations to wildlife and wildlife habitat are described in Table 7.6-7, pages 223-224.
DAR p. 256	Best management practices for erosion and sediment control and site reclamation near the waterbody crossings and by the use of temporary or permanent bridge crossings.
DAR p. 267	Mitigation measures for vegetation effects include use of appropriate equipment (balloon tired ATVs), driving on winter roads, responsible ATV operation and the construction of corrugated and/or board trails over wetland areas.
DAR p. 267	Avoidance of high potential rare plant habitat to limit potential during project planning.
DAR p. 270	Paramount will continue to require that all construction equipment be thoroughly cleaned before entrance into the project area.
DAR p. 301	DFO guidelines will be followed to protect the potential fish habitat in water source lakes.
DAR p. 316	Paramount committed to compensate for any demonstrable loss (to trappers) that might occur in the future.
DAR p. 331	Paramount maintains employment and procurement records, works with contractors to do the same and supplies information annually.
Transcripts Vol 1 p. 28: 9-10	We continue to be committed to working with stakeholders in the pursuit of sustainable resources.
Transcripts Vol 1 p. 29: 23-24	... we will continue to encourage qualified northerners to apply for production operator positions as they become available.
Transcripts Vol 1 p. 31: 11-13	[In response to GNWT question: Is there a willingness on the part of Paramount to take a look at some of the needs of northern workers and balance that, particularly those who do wish to continue practicing traditional lifestyles as well as work on a work site such as the oil facilities at Paramount?] Paramount will certainly consider and try to accommodate those things on an individual basis at the time when the issue arises.
Transcripts Vol 1 p. 34:15-16	[In response to GNWT question: Will Paramount report on northern employment, recruitment and training efforts?] ... we do track the information, and we will continue to track and to report this similar type of information in the future.
Transcripts Vol 1 p. 44: 9-11	[In response to GNWT question re: willingness to expand participation in woodland caribou management plan for Alberta into the NWT] ... we are willing to participate in discussions with the NWT or the GNWT into how we could participate with a plan for the Northwest Territories.

Transcripts Vol 1 p. 45: 9-10	[In response to GNWT question: What measures has Paramount taken to identify critical habitat for boreal caribou?] ... as Paramount currently sits on the BCC they will work and glean information from that process.
Transcripts Vol 1 p. 50:25-51:6	[In response to GNWT question: Will Paramount undertake to set up permanent sample plots and develop growth curves for regeneration of forest vegetation on various habitat types in the Cameron Hills?] Paramount has an adaptive management philosophy, in which we will continue to change the methods in which we are analyzing and -- and looking at the data [...] on an as needed basis. So, we would be committed to consider that -- continue that adaptive management process and determine at a later date if in fact a change in the way we're doing it is required.
Transcripts Vol 1 p. 62:23-63:1	Paramount will com -- commit to continue to submit on an annual basis water summary reports to the Mackenzie Valley Land and Water Board and also to DFO that summarizes our water use per water source location.
Transcripts Vol 1 p. 77:17-78:1	Every time and every year when changes or new wells are being proposed, modeling would be completed to demonstrate that the maximum concentrations are less than the ambient air quality standards. At such a time that that model predicted there was a potential to exceed the standard under worst case conditions, Paramount has shown a willingness already to take mitigative actions to reduce the ground level concentrations, minimize the emissions where possible, and ensure that compliance is achieved.
Transcripts Vol 1 p. 103:14-16	... we will continue to consult with the communities that we have been consulting with on this project in the past.
Transcripts Vol 1 p. 177:7-10	Paramount's corporate compliance manager and Hay River's representative, Wes Droge (of Hay River Health Authority), did agree to provide informational support to one another on an as-needed basis in the future
Transcripts Vol 1 p. 185:16-18	Paramount is willing to continue its efforts in working with Deb (GNWT Wildlife Biologist) on her studies, as we did last year and look forward to talking to her again, when she's in the area.
Transcripts Vol 2 p.138:12-15	The main concern of the communities has been and continues to be the health of the watershed. Paramount has, and will continue, to guard this valuable resource.

Appendix B – Public Registry Index

Paramount Resources Ltd. <i>Cameron Hills Extension</i> MVEIRB Ref. No. EA-03-005			
Item #	Description	Originator	Date Received/Sent
1	Referral Letter, Reasons for Decision and Preliminary Screening Report	MVLWB	28-May-03
2	Land Use Permit, Water License Cameron Hills 5 Well Drilling and Tie-In Project	Shirley Maaskant, Paramount	
3	Notice of Paramount's Referral to EA (to Shirley Maaskant of Paramount Resources Ltd.)	Martin Haefele, MVEIRB	29-May-03
4	Notice of Paramount's Referral to EA and Request for response from interested parties for Paramount EA (sent to Distribution List)	Martin Haefele, MVEIRB	30-May-03
5	Requests to remain on Paramount Distribution List	Martin Haefele, MVEIRB	9-Jun-03
6	Amendment to Land Use Permit for Paramount Resources	MVLWB	28-May-03
7	Project Scope for Paramount - Cameron Hills	Shirley Maaskant, Paramount	23-Jun-03
8	Cameron Hills Gathering System Ext. EA - Draft Terms of Reference	Martin Haefele, MVEIRB	30-Jun-03
9	Review Comments of the Terms of Reference and Work Plan for Paramount Cameron Hills EA	Wade Romanko, Environment Canada	7-Jul-03
10	Public hearing in Kakisa	Allan Landry, Ka'a'gee Tu First Nation	8-Jul-03
11	Re: Public Hearing in Kakisa (Refer to Item 10)	Martin Haefele, MVEIRB	10-Jul-03
12	Comments on Paramount Draft Terms of Reference	Bruce Hanna, DFO	8-Jul-03
13	Response to Draft Terms of Reference and Work Plan for Cameron Hills EA	Shirley Maaskant, Paramount	10-Jul-03
14	Extension of Deadline for comments on Draft Terms of Reference to July 18th, 2003	Martin Haefele, MVEIRB	15-Jul-03
15	Comments on Paramount Draft Terms of Reference	Jason McNeill, RWED	18-Jul-03
16	Comments on Paramount Draft Terms of Reference	Gillian Calder, Mandell Pinder	21-Jul-03
17	Request for extension to Cameron Hills EA comment period	Chief Berna Landry, Deh Gah Got'ie Dene Council	22-Jul-03
18	Comments on Cameron Hills EA	Chief Berna Landry, Deh Gah Got'ie Dene Council	24-Jul-03
19	Paramount Resources EA Information Session	Shirley Maaskant, Paramount	7-Aug-03

20	Final Terms of Reference and Workplan	Martin Haefele, MVEIRB	8-Aug-03
21	Paramount CEA Discussion Paper	Shirley Maaskant, Paramount	11-Aug-03
22	Paramount EA - Recent Additions to the Public Registry	Martin Haefele, MVEIRB	14-Aug-03
23	Paramount EA Terms of Reference	Martin Haefele, MVEIRB	8-Aug-03
24	Re: Yellowknife Meeting with Paramount	Shirley Maaskant, Paramount	14-Aug-03
25	Re: one or two public hearings	Shirley Maaskant, Paramount	14-Aug-03
26	Copy of the Paramount Presentation	Daryl Johannensen	15-Aug-03
27	Public hearing in Kakisa	Martin Haefele, MVEIRB	15-Aug-03
28	To the Distribution List - Additions to the Public Registry re: Paramount's response to NWT Metis Nation	Martin Haefele, MVEIRB	21-Aug-03
29	To the Distribution List - Additions to the Public Registry re: NWT Metis response to Paramount's Aug 21 letter	Martin Haefele, MVEIRB	25-Aug-03
30	To distribution list - notes from Paramount information session August 13, 2003.	Martin Haefele, MVEIRB	2-Sep-03
31	Environmental Assessment	Martin Haefele, MVEIRB	9-May-03
32	Notes from. Aug 13 Info Session - Paramount Cameron Hills Ext.	Gavin More, GNWT	9-Jul-03
33	Environment. Assessments EA03-005	Golder Assoc.	23-Sep-03
34	Developers Assessment Report	Golder/Paramount/AINorth	23-Sep-03
35	EA-DAR and role identification	Martin Haefele, MVEIRB	24-Sep-03
36	Cameron Hills Project	Melody McLeod, MVLWB	24-Jul-03
37	Paramount Conformity	Alan Ehrlich, MVEIRB	10-Jun-03
38	EA - DAR and Role Identification	Martin Haefele, MVEIRB	10-Feb-03
39	Environmental Assessment EA03-005	Martin Haefele, MVEIRB	26-Sep-03
40	EA- Notes from Site Visit	Martin Haefele, MVEIRB	10-Aug-03
41	EA- Notes from Site Visit	Martin Haefele, MVEIRB	10-Sep-03
42	Identification of Parties	Martin Haefele, MVEIRB	23-Oct-03
43	Developers Assessment Report	Martin Haefele, MVEIRB	24-Oct-03
44	Paramount Cameron Hills Ext. EA - Info Request	Martin Haefele, MVEIRB	29-Oct-03
45	NWT Metis Nation Participants	Martin Haefele, MVEIRB	17-Oct-03
46	Telecon with Joe Acorn, Advisor to Deh Cho Nation	Martin Haefele, MVEIRB	5-Nov-03
47	Additional Information Requests	Martin Haefele, MVEIRB	5-Nov-03
48	Binders - Extras, Developers Assessment Report	Martin Haefele, MVEIRB	12-Nov-03
49	Information Request 1.1.27 - DFO Response	Bruce Hanna, DFO	18-Nov-03
50	Information Responses - Paramount Resources Ltd.	Shirley Maaskant, Paramount	19-Nov-03
51	INCA'S response to information request	Marie Healy, INAC	19-Nov-03
52	Response to Information Requests	Martin Haefele, MVEIRB	20-Nov-03
53	Second Round of Information Requests	Martin Haefele, MVEIRB	21-Nov-03
54	IR for Paramount Resources Cameron Hills Ext.	Marie Healy, INAC	2-Dec-03

55	request to extend deadline for IR submissions	Ka'a'Gee Tu First Nation	1-Dec-03
56	request to extend deadline for IR submissions	Mandell Pinder	1-Dec-03
57	Request for Ruling re removal of T. Burlingame from EA	Ka'a'Gee Tu First Nation	2-Dec-03
58	Distribution of Request for Ruling	Martin Haefele, MVEIRB	5-Dec-03
59	KTFN Request for Removal of Todd Burlingame	Vern Christensen, MVEIRB	5-Dec-03
60	EA - IR	Allan Landry, Ka'a'gee Tu First Nation	5-Dec-03
61	KTFN Request for Removal of Todd Burlingame	Vern Christensen, MVEIRB	8-Dec-03
62	GNWT - IRs	Gavin More, GNWT	8-Dec-03
63	IR for Fort Providence Metis Council - Local. No. 57	Martin Haefele, MVEIRB	8-Dec-03
64	Request for Ruling re removal of T. Burlingame from EA	Martin Haefele, MVEIRB	5-Dec-03
65	GNWT - IRs	Gavin More, GNWT	8-Dec-03
66	DFO IRs	Bruce Hanna, DFO	9-Dec-03
67	Request for ruling	Shirley Maaskant, Paramount	8-Dec-03
68	Request and extension until Dec. 10, 2003	Berna Landry, DGGDC	8-Dec-03
69	Call for a ruling in the Paramount EA	Berna Landry, DGGDC	10-Dec-03
70	Telecon with Joe Acorn, Advisor to Deh Cho Nation	Alan Ehrlich, MVEIRB	11-Mar-03
71	Land Use Permit, Water License Cameron Hills	Stephen Mathyk, MVLWB	12-Nov-03
72	Issuance Letter, Conditions	Melody McLeod, MVLWB	8-Dec-03
73	Removal of Todd Burlingame, Paramount	Albert J. Lafferty, Ft. Prov Metis	4-Dec-03
74	Removal of Todd Burlingame, Paramount	Mandell Pinder, KTFN counsel	12-Dec-03
75	Paramount Ruling	Alison De Pelham	12-Dec-03
76	Request for ruling	Shirley Maaskant, Paramount	8-Dec-03
77	Response to Request for ruling	Martin Haefele, MVEIRB	12-Dec-03
78	Response to Request for ruling	Martin Haefele, MVEIRB	15-Dec-03
79	KTFN Request for Ruling	Kimberley Cliffe-Phillips, MVEIRB	18-Dec-03
80	Reasons for Decision	Kimberley Cliffe-Phillips, MVEIRB	23-Dec-03
81	Public Hearing in Hay River	Kimberley Cliffe-Phillips, MVEIRB	30-Dec-03
82	Notice for the door - Indian Cabins, AB	Alan Ehrlich, MVEIRB	19-Dec-03
83	Information Requests - 2	Kimberley Cliffe-Phillips, MVEIRB	29-Dec-03
84	Information Requests - 2	Kimberley Cliffe-Phillips, MVEIRB	30-Dec-03
85	148 pg fax only cover received	Kimberley Cliffe-Phillips, MVEIRB	30-Dec-03

86	Information Request - 2	Kimberley Cliffe-Phillips, MVEIRB	30-Dec-03
87	Upcoming Hearing and other dates to Note	Kimberley Cliffe-Phillips, MVEIRB	6-Jan-04
88	Request for hearing date change by KTFN	Kimberley Cliffe-Phillips, MVEIRB	8-Jan-04
89	Request for hearing date change by KTFN	Allan Landry, Ka'a'gee Tu First Nation	8-Jan-04
90	EA03-005 noise monitoring reports	Paramount	19-Jan-04
91	Cameron Hills Satellite Image - Map & CD	Paramount	19-Jan-04
92	Cameron Hills Caribou Habitat Buffers	Paramount	19-Jan-04
93	Cameron Hills Attachment Benefit Plan	Paramount	19-Jan-04
94	Cameron Hills - Annual Reports 02/03	Paramount	19-Jan-04
95	Cameron Hills -Erosion Survey & Mitigation Plan	Paramount	19-Jan-04
96	Cameron Hills-Wildlife Monitoring 2003 Winter	Paramount	19-Jan-04
97	Cameron Hills-EA & Remediation Plan	Paramount	19-Jan-04
98	Cameron Hills-2003 Revegetation, Permafrost & Access	Paramount	19-Jan-04
99	Cameron Hills-Environmental Protection Plan	Paramount	19-Jan-04
100	Round 2 - Info Request Responses	Paramount	19-Jan-04
101	Paramount Cameron Hills Ext. EA - Info Request	Wade Romanko, Environment Canada	7-Jan-04
102	Paramount Cameron Hills EA extension	Ft Prov Metis Council	8-Jan-04
103	EA Information Requests	Ft Prov Metis Council	8-Jan-04
104	Corrections Round 2 Info requests	Kimberley Cliffe-Phillips, MVEIRB	9-Jan-04
105	Additions to Public Registry	Kimberley Cliffe-Phillips, MVEIRB	20-Jan-04
106	Community Meeting Kakisa	Vern Christensen, MVEIRB	20-Jan-04
107	Request to Schedule Paramount PH-Hay River	Vern Christensen, MVEIRB	20-Jan-04
108	Round 2 Addition info requests- Paramount	Vern Christensen, MVEIRB	20-Jan-04
109	Paramount responses to Round 2 info requests	Kimberley Cliffe-Phillips, MVEIRB	21-Jan-04
110	Paramount EA Extension	Ka'a'gee Tu First Nation	21-Jan-04
111	MVEIRB response to KTFN & FPMC	Kimberley Cliffe-Phillips, MVEIRB	26-Jan-04
112	Environment Canada extension request for Technical Analysis Reports to Feb. 4/04.	Kimberley Cliffe-Phillips, MVEIRB	26-Jan-04
113	Technical Analysis Reports Request for extension	Wade Romanko, Environment Canada	22-Jan-04
114	PreHearing Conference -Draft Agenda	Kimberley Cliffe-Phillips, MVEIRB	26-Jan-04
115	PreHearing Conference Summary of Issues	Kimberley Cliffe-Phillips, MVEIRB	28-Jan-04

116	Response to KTFN & Ft. Prov Metis Council	Fraser Fairman, INAC	29-Jan-04
117	Information Request (1.2.113)	Kelly Pennycook, Deh Cho First Nations	26-Jan-04
118	Paramount EA Additional IR Responses (To Paramount EA Distribution List)	Kimberley Cliffe-Phillips, MVEIRB	29-Jan-04
119	EA-03-005 Cameron Hills Ext. Round Three responses 1.2.131-1.2.135	Shirley Maaskant, Paramount	29-Jan-04
120	Pubic Service Announcement-CBC	Kimberley Cliffe-Phillips, MVEIRB	30-Jan-04
121	PreHearing Conference -List of confirmed parties sent to Paramount EA distribution list	Kimberley Cliffe-Phillips, MVEIRB	30-Jan-04
122	Paramount EA Info Requests Round 2 to INAC re. Ft Prov. Metis Council & Ka'a'Gee Tu First Nation & Deh Cho First Nation	Kimberley Cliffe-Phillips, MVEIRB	30-Jan-04
123	GNWT-IR response 1.2.61 - Paramount/Cameron	Gavin More, GNWT	3-Feb-04
124	New addition to PR Paramount EA	Kimberley Cliffe-Phillips, MVEIRB	3-Feb-04
125	Confirmation of Round 2 IR's Paramount Res.	Shirley Maaskant, Paramount	3-Feb-04
126	Response from Alberta Government	Jeff Sansom, Alberta Gov't	22-Jan-04
127	Deh Cho First Nations	Calendar	26-Jan-04
128	INAC comments on Environment Can. Request for the Paramount EA technical Report extension	Fraser Fairman, INAC	27-Jan-04
129	Prehearing conference rep. attendance KGTFN	Mandell Pinder, KTFN counsel	27-Jan-04
130	Paramount Hearing Presentation	Paramount	1-Feb-04
131	Hearing Dates Re; Paramount	Mandell Pinder, KTFN counsel	3-Feb-04
132	Paramount Speaking notes EA-03-005	Shirley Maaskant, Paramount	4-Feb-04
133	Paramount Slide Presentation PH	Kimberley Cliffe-Phillips, MVEIRB	5-Feb-04
134	Additions to Public Registry	Kimberley Cliffe-Phillips, MVEIRB	5-Feb-04
135	Changes to submission dates Paramount	Vern Christensen, MVEIRB	5-Feb-04
136	Notice of pre-hearing conf. participation.	Chief Roy Fabian- Hay River Reserve	27-Jan-04
137	Notice of pre-hearing conf. participation	Fraser Fairman & Ed Hornby, INAC	28-Jan-04
138	Pre-conference hearing worksheet	Shirley Maaskant, Paramount	29-Jan-04
139	Notice of pre-hearing conf. participation	Bruce Hanna, DFO	29-Jan-04
140	Notice of pre-hearing conf. participation.	Shirley Maaskant, Paramount	29-Jan-04
141	Additions to PR EA03-005 (Ka'a'Gee Tu First Nation)	Kimberley Cliffe-Phillips, MVEIRB	29-Jan-04
142	Prehearing conference worksheet	Northwest Territory Metis Nation	30-Jan-04
143	Prehearing conference worksheet	Fraser Fairman, INAC	30-Jan-04
144	Prehearing conference worksheet	Gavin More, GNWT	30-Jan-04

145	Prehearing conference worksheets - Completed	Kimberley Cliffe-Phillips, MVEIRB	2-Feb-04
146	Draft pre-conf. hearing Agenda	Kimberley Cliffe-Phillips, MVEIRB	2-Feb-04
147	Prehearing conf. participants list.	MVEIRB	2-Feb-04
148	Draft Agenda-Public Hearing-Hay River	MVEIRB	3-Feb-04
149	INAC-TAR	Fraser Fairman, INAC	29-Jan-04
150	DFO- Technical Report	Bruce Hanna, DFO	29-Jan-04
151	e-mail Joe Acorn to Fraser Fairman/INAC	Joe Acorn	30-Jan-04
152	Paramount Expert Witness CV's (several)	Jody Irish, Paramount	3-Feb-04
153	Environment Canada. Technical Report for EA 03-005	Wade Romanko, Environment Canada	4-Feb-04
154	To Paramount copies of Technical Analysis Reports	Kimberley Cliffe-Phillips, MVEIRB	9-Feb-04
155	e-mail Joe Acorn to Paramount re Ft Prov Metis	Joe Acorn	9-Feb-04
156	From Paramount, respond to Joe Acorn	Shirley Maaskant, Paramount	9-Feb-04
157	Hearing Materials	Kimberley Cliffe-Phillips, MVEIRB	9-Feb-04
158	Deadline for Filing RE Paramount public registry	Kimberley Cliffe-Phillips, MVEIRB	9-Feb-04
159	INAC-Cameron Hills Ext 1.2.71	Fraser Fairman- INAC	10-Feb-04
160	e-mail to Joe Acorn	Kimberley Cliffe-Phillips, MVEIRB	9-Feb-04
161	Expert witnesses from. Paramount Feb.18/19 Public H	Jody Irish, Paramount	9-Feb-04
162	Info requests from Ft. Prov . Metis	Joe Acorn	10-Feb-04
163	e-mail correspondence Joe Acorn	Joe Acorn	10-Feb-04
164	KTFN Counsel Re. Hearing Presentation	Gillian Calder, Mandell Pinder, KTFN counsel	10-Feb-04
165	Katloodeeche Request Materials	Rosalie Tambour, KFN	10-Feb-04
166	e-mail Joe Acorn re IR from Ft Prov Metis Council	Joe Acorn	10-Feb-04
167	e-mail Joe Acorn	Joe Acorn	10-Feb-04
168	GNWT CV's	Deborah Johnson, GNWT	10-Feb-04
169	e-mail to KTFN counsel	Kimberley Cliffe-Phillips, MVEIRB	11-Feb-04
170	Katloodeeche Presentation	Rosaline Tambour, KFN	11-Feb-04
171	Deh Gah Gotie Dene Council Ft Providence	Chief Berna Landry, DGGFN	10-Feb-04
172	Kaa Gee Tu First Nation	Kimberley Cliffe-Phillips, MVEIRB	10-Feb-04
173	Community Meeting Kakisa-Ad Post	Kimberley Cliffe-Phillips, MVEIRB	10-Feb-04
174	BC Oil/Gas-Cumulative Effects Report	Joe Acorn	10-Feb-04
175/176	Multi fax report	MVEIRB	
177	PH-Hay River KTFN/FPMC Questions	KTFN/FPMC issues for hearing	18-Feb-04

178	INAC northern benefits requirements	Fraser Fairman & Ed Hornby, INAC	
179	participation form Paramount Hearing-Hay River	MVEIRB	18-Feb-04
180	INAC IR1.2.136 & 1.2.137	Fraser Fairman, INAC	5-Feb-04
181	Paramount air modeling files	Dave Fox, Environment Canada	12-Feb-04
182	Hearing materials	Kimberley Cliff-Phillips, MVEIRB	13-Feb-04
183	INAC's response to IR's 1.2.136 & 1.2.137	Fraser Fairman, INAC	13-Feb-04
184	fax cover hearing materials	Kimberley Cliffe-Phillips, MVEIRB	13-Feb-04
185	Supplementary Questions for GNWT	Shirley Maaskant, Paramount	20-Feb-04
186	fax cover additions to registry	Kimberley Cliffe-Phillips, MVEIRB	23-Feb-04
187	DCFN Interim Measures Agreement	DCFN	19-Feb-04
188	DCFN IRDA (FDA)	DCFN	19-Feb-04
189	KTFN Video	KTFN	19-Feb-04
190	Hearing Transcript Volume 1	Digi-Tran	18-Feb-04
191	Hearing Transcript Volume 2	Digi-Tran	19-Feb-04
192	Kakisa Community Meeting-MVEIRB. Paramount	Kimberley Cliffe-Phillips, MVEIRB	1-Mar-04
193	Kakisa Community Notes-Paramount	Kimberley Cliffe-Phillips, MVEIRB	17-Feb-04
194	Attendees-Kakisa Community Meeting-Paramount	Kimberley Cliffe-Phillips, MVEIRB	17-Feb-04
195	Technical Report EA 03-005 DAR	RWED	2-Mar-04
196	EC TAR amendment	Dave Fox, Environment Canada	2-Mar-04
197	KFN-TAR	Rosaline Tambour, KFN	2-Mar-04
198	FPRMB Tar	Rick Sanderson, Ft. Prov RMB	2-Mar-04
199	KTFN TAR	Ka'a'Gee Tu First Nation	2-Mar-04
200	fax cover -TAR (part I)	Kimberley Cliffe-Phillips, MVEIRB	3-Mar-04
201	fax cover-TAR (part II)	Kimberley Cliffe-Phillips, MVEIRB	3-Mar-04
202	fax cover-GNWT TAR	Kimberley Cliffe-Phillips, MVEIRB	4-Mar-04
203	Final Report Mediation of Cameron	Gartner Lee Limited, INAC	1-Jul-03
204	Paramount re. KTFN TAR	Paramount response	11-Mar-04
205	Paramount RE. DGGFN TAR	Paramount response	11-Mar-04
206	Paramount re. KFN TAR	Paramount response	11-Mar-04
207	Paramount re. GNWT TAR	Paramount response	10-Mar-04
208	Kakisa Meeting Notes Feb. 17-04	Shirley Maaskant, Paramount	2-Mar-04
209	MVEIRB-Paramount	Shirley Maaskant, Paramount	25-Feb-04
210	Spill Reporting Procedures	Jason McNeill, GNWT	1-Mar-04
211	Paramount re. DFO/TAR	Lloyd Doyle, Paramount	4-Mar-04
212	FPMC-TAR	Ft Prov Metis Council	8-Mar-04
213	Paramount re ENV. CAN TAR	Lloyd Doyle, Paramount	8-Mar-04

214	new additions to Registry fax cover	Kimberley Cliffe-Phillips, MVEIRB	9-Mar-04
215	fax cover additions to Registry	Kimberley Cliffe-Phillips, MVEIRB	9-Mar-04
216	Paramount's TAR distribution	Paramount	no date specified
217	fax cover Closure of Registry	Kimberley Cliffe-Phillips, MVEIRB	15-Mar-04
218	e-mail Joe Acorn	Joe Acorn	9-Mar-04
219	Kakisa Meeting Notes Feb. 17-04 - Final		17-Mar-04
220	Kakisa Meeting Final Attendance list	Kakisa Community	17-Feb-04
221	e-mail Kakisa participants	Shirley Maaskant Paramount	2-Mar-04
222	S02 Article	Edmonton Journal, Joe Acorn	8-Mar-04
223	Paramount Undertakings	Lloyd Doyle, Paramount	8-Mar-04
224	INAC re: Questions at PH	Fraser Fairman, INAC	11-Mar-04
225	EA03-005 response to Technical Reports	Lloyd Doyle, Paramount	8-Mar-04
226	EA03-005 Response to Technical Report by DFO	Lloyd Doyle, Paramount	4-Mar-04
227	INAC Final Submission	Kimberley Cliffe-Phillips, MVEIRB	17-Mar-04
228	Environment Canada - IR 1.2.1	Vanessa Charlwood, Environment Canada	16-Feb-04
229	FPMC Hearing Presentation	Albert Lafferty, Ft. Prov Metis Local	10-Feb-04
230	West Point First Nation PH	Laura Pitkanen, DCFN	19-Feb-04
231	GNWT Spill Response Info	Jason McNeill, GNWT	20-Apr-04
232	Follow-up to item #231	Kimberley Cliff-Phillips, MVEIRB	22-Apr-04
233	Paramount Annual Reports fax cover	Kimberley Cliff-Phillips, MVEIRB	31-Mar-04
234	Paramount Annual Reports July 2001-June 2003 (2yrs)	Andrew Graw, INAC	23-Mar-04

Appendix C – MVEIRB Authority to Make Recommendations and Suggestions

Legal consequences flow from the Review Board's determinations. Where the Review Board determines that a significant adverse impact on the environment is likely or that mitigative or remedial measures are required to prevent a significant adverse impact on the environment, it may make recommendations for consideration by the federal and responsible Ministers. This authority is based on section 128 of the *MVRMA* and provisions in the *Gwich'in and Sahtu Dene and Métis Comprehensive Land Claim Agreements*. If the federal and responsible Ministers accept the Review Board's recommendations, "a first nation, local government, regulatory authority or department or agency of the federal or territorial government affected by a decision made under this section shall act in conformity with the decision to the extent of its authority" (*MVRMA*, subsection 130(5)).

During the EA, the Review Board can consider the effects of a development in light of government activities, policies and operations. The Board also considers the development in relation to other developments. Even where significant adverse environmental impacts are not identified, the EA process may result in insights about the development, the development process, or the potential response to the development by government agencies and others. In such instances, the Review Board may make non-binding suggestions to government and other authorities. These suggestions are intended to help government and others affected to encourage a more comprehensive response to the development. Implementation of suggestions is not mandatory even if the federal and responsible Ministers accept this *Report of Environmental Assessment*.

The Review Board's legal authority to make recommendations to mitigate the impacts of the proposed development is based on the *MVRMA* and on the language of subsections 24 and 25, respectively, of the *Gwich'in and Sahtu Dene and Métis Comprehensive Land Claim Agreements*. The Board's interpretation of these authorities is set out below. Subsection 128(1) of the *MVRMA* outlines the Review Board's options upon completion of an EA as follows:

128. (1) On completing an environmental assessment of a proposal for a development, the Review Board shall,

- (a) where the development is not likely in its opinion to have any significant adverse impact on the environment or to be a cause of significant public concern, determine that an environmental impact review of the proposal need not be conducted;*
- (b) where the development is likely in its opinion to have a significant adverse impact on the environment,*

- (i) order that an environmental impact review of the proposal be conducted, subject to paragraph 130(1)(c), or*
 - (ii) recommend that the approval of the proposal be made subject to the imposition of such measures as it considers necessary to prevent the significant adverse impact;*
- (c) where the development is likely in its opinion to be a cause of significant public concern, order that an environmental impact review of the proposal be conducted, subject to paragraph 130(1)(c); and*
- (d) where the development is likely in its opinion to cause an adverse impact on the environment so significant that it cannot be justified, recommend that the proposal be rejected without an environmental impact review.*

The Review Board's authority to make recommendations arises in the context of subparagraph 128(1)(b)(ii) of the Act. A reading of paragraph (b) and subparagraph (ii) indicates that the Review Board has the authority to recommend measures to mitigate impacts when the Board has found a significant adverse environmental impact.

The language in these provisions also seems to require that any recommendations made must be directly linked to the finding of a significant adverse environmental impact. A strict interpretation of this paragraph could prevent the Review Board from recommending measures to prevent adverse environmental impacts from becoming significant. In other words, a strict reading of paragraph 128(1)(b) and subparagraph (ii) could arguably indicate that if an adverse environmental impact is not already significant then the Review Board has no authority to recommend measures to reduce or prevent a significant adverse impact (this is called the "restrictive interpretation" below). This result is not consistent with good EA practice.

One of the important benefits of an EA is the opportunity to minimize all identified adverse impacts through the imposition of mitigative measures. Consequently, the Review Board has adopted a more remedial interpretation of 128(1)(b). This interpretation is in keeping with the overall purpose of *MVRMA* and the land claims upon which the Act is based. There is clear authority for such an interpretation of paragraph 128(1)(b) and subparagraph (ii). The Board's reasons are outlined below.

Any measures recommended by the Review Board under paragraph 128(1)(b) are considered by the federal and responsible Ministers under paragraph 130(1)(b) of the *MVRMA*. If the recommended measures are adopted, they must be carried out by responsible Ministers to the extent of their jurisdiction under subsection 130(5) and by the Land and Water Boards under section 62. The EA process is linked to the regulatory process and adopted by the appropriate

decision-makers and must be carried out by regulatory authorities. The result is the “integrated system of land and water management” referred to in the long title of the *MVRMA* and required by the Gwich’in and Sahtu land claims.

The interpretation of paragraph 128(1)(b) will determine whether the Review Board has the authority to recommend measures to mitigate any adverse environmental impacts which might become significant, or only those which have already been determined to be significant. This distinction is important and strikes at the heart of the EA process under the *MVRMA*. If the restrictive interpretation prevailed, the EA process may fail to achieve these statutory goals expressed in section 115 of the *MVRMA*. This section speaks to the need to protect the environment and the social, economic and cultural wellbeing of residents of the Mackenzie Valley. The Review Board’s view is that ignoring evidence of adverse impacts which can be mitigated because the impacts are not yet significant is not consistent with the *MVRMA* or with the Review Board’s duty to protect the environment. The Review Board has considered this issue and has decided that it has the authority to recommend measures to reduce the effect of a significant adverse environmental impact below the level of significance and measures to prevent an adverse environmental impact from becoming significant.

The authority for this interpretation is based in section 24.3.5 (a) of the *Gwich’in Comprehensive Land Claim Agreement* and in section 25.3.5 (a) of the *Sahtu Dene and Metis Comprehensive Land Claim Agreement*. These sections are identical so the relevant portion of Sahtu claim only is reflected below:

25.3.5 (a) subject to 25.3.3(a), a development proposal shall be assessed by the Review Board in order to determine whether the proposed development will be likely to have a significant adverse impact on the environment or will likely be a cause of significant public concern. In making its determination the Review Board may consider terms and conditions to the proposed development which would prevent significant adverse impact on the environment and may recommend the imposition of such terms and conditions to the Minister. Such terms and conditions shall be subject to review pursuant to 25.3.14.

This provision clearly intended that the Review Board be able to recommend terms and conditions (measures) to the Minister to “prevent significant adverse impact on the environment”. This authority goes beyond the restrictive interpretation of paragraph 128(1)(b) discussed above. It does not require that an impact already be determined to be significant before the Review Board can recommend measures. Instead the Review Board can recommend measures to prevent an impact which is not yet significant from becoming so.

In this regard, the restrictive interpretation of paragraph 128(1)(b) of the *MVRMA* is not consistent with these paragraphs of the Gwich’in and Sahtu land claims.

The Review Board is therefore of the view that the interpretation of paragraph 128(1) (b) should be more liberal in order to make it consistent with the land claims and with section 115 of the *MVRMA* as well.

Section 3.1.18 of the Sahtu Land Claim (3.1.19 of the Gwich'in claim) specifies that the Agreement may be used as an aid to interpretation where there is any doubt in respect of any legislation implementing the provisions of the Agreement. Section 3.1.22 of the Sahtu land claim (3.1.23 of the Gwich'in) and part 5 of the *MVRMA* specify that when there is an inconsistency or conflict between any law and a land claim agreement that the land claim agreement applies to the extent of the inconsistency or conflict. This legal hierarchy is clear. The land claim provisions are paramount. Consequently, the Review Board has the authority to recommend measures both to reduce significant adverse environmental impacts below the level of significance and to prevent adverse environmental impacts from becoming significant. This finding is in keeping with good EA practice and is consistent with both the Gwich'in and Sahtu land claims.

Appendix D

DEH CHO FIRST NATIONS

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Consultation Principles

- 1. Government Agencies have a Duty to Consult.** Federal and territorial government agency activities routinely infringe, or have the potential to infringe, on Deh Cho communities' constitutionally protected treaty and aboriginal rights. These agencies have a fiduciary duty to consult the Deh Cho communities on their activities. The Crown cannot use consultations undertaken by a project proponent as a substitute for Crown consultations.
- 2. Co-ordination by the Government Agencies is Critical.** A multiple agency approach to consultations could result in either significant subject gaps or unnecessary overlaps that will tax the communities' limited resources. The agencies must ensure that their activities are properly planned and co-ordinated to minimize subject gaps and the impacts on community resources.
- 3. Project Proponents Have a Duty to Consult.** A proponent may have a duty to consult if it receives a benefit (eg. approval to use Deh Cho land) from the Crown and this benefit might infringe Deh Cho communities' aboriginal and treaty interests. The proponent cannot use consultations undertaken by Crown agencies as a substitute for proponent consultations: e.g., see *Haida* decision of British Columbia Court of Appeal.
- 4. Negotiations Must Be Part of the Consultations.** The term "consultation", as noted by the Supreme Court of Canada, is just the minimum component in fulfilling the fiduciary duty when aboriginal and treaty rights are infringed. This duty is a very broad one encompassing not only meaningful and focussed dialogue on rights and title, but also negotiations in circumstances where there is a need to accommodate First Nation and Métis interests. (See *Delgamuukw*.)
- 5. Deh Cho Leaders Must be Respected.** The Deh Cho leaders have the primary responsibility for participating in consultations and negotiations. While proponents and the Crown should inform local Deh Cho communities, the deep consultations required by the Courts must be conducted with Deh Cho leaders. The proponents and the Crown must acknowledge Deh Cho self-governing rights by respecting the Deh Cho leaders, the leaders' decisions and positions, Deh Cho protocols for dialogue and Deh Cho communities' internal decision-making processes.

6. Deh Cho Consultations are more than mere “Public” Consultations. The consultations with Deh Cho leaders are not limited to stakeholder consultations and public reviews, which the proponent and the Crown must conduct to fulfill regulatory and legislative requirements. The proponent’s and the Crown’s duty to consult is a constitutional obligation, over and above any regulatory and legislative requirements. The Deh Cho consultations must consist of something beyond the notification and information exchange process conducted with other stakeholders, eg. *Mikisew Cree* decision of Federal Court. Information sessions organized by the proponents and the Crown are not sufficient consultations as required by the Courts, eg. *Taku Tlingit*, *Delgamukw*, *Haida*.

7. Proponents and the Crown Must Involve the Deh Cho Leaders at the Early Planning Stage. Both the Crown and the proponent must consult at the project’s early planning stage. The Crown and proponents often seek discussions and consultations too late in the planning process, resulting in inordinate and urgent demands on community resources.

8. Consultations Must Analyze the Impact on Deh Cho Rights. The consultations with Deh Cho leaders must, at an early stage, do the following:

- a. provide Deh Cho leaders with all relevant information about a project, including the complete regulatory basis of a project;
- b. identify the full nature of Deh Cho rights that may be infringed; and
- c. conduct a specific analysis of which project impacts will infringe which Deh Cho rights. (See, for example, *Delgamuukw*, *Sparrow* and *Marshall* decisions of the Supreme Court of Canada.)

This process is not straightforward and takes time, resources and a serious commitment on behalf of all parties.

9. The Crown and the Proponent Must Accommodate Deh Cho Rights. On the basis of Principle 8, the Crown and the proponent must consult and negotiate with Deh Cho leaders in good faith to seek a workable accommodation on the Deh Cho treaty and aboriginal rights, including aboriginal title, that will be infringed. This means that the Crown and the proponent must propose a process in which it will listen to what Deh Cho leaders identify as Deh Cho rights and provide a response that fully and expressly recognizes, addresses and accommodates those rights. (See *Delgamuukw* and B.C. Court of Appeal decision in *Haida*).

10. Project Approval Depends on Accommodation. Project approval depends on Deh Cho leaders providing consent where Deh Cho rights are substantially infringed. The Deh Cho leaders will carefully scrutinize consultation efforts with the view to taking whatever action is necessary if a project proceeds without proper consultation. Some infringed rights may be so integral to the Deh Cho communities that the Deh Cho leaders have a legal right to veto the project.

11. Communities Must Have the Capacity to Consult. Meaningful consultation can only be achieved if the Deh Cho communities have the resources to meet the heavy demand for consultations. The Deh Cho communities have very limited resources. There is a real danger that core programs would have to be sacrificed to meet proponent and Crown requests for comments and meetings without financial assistance.

12. Community Representatives May Participate in Discussions on a Without Prejudice Basis. The Crown and the proponents typically plan many information meetings. To the extent that the Deh Cho communities have available resources, leaders and staff will attend such information sessions to become more familiar with a project. Participation by Deh Cho representatives (leaders or staff) at these information sessions should not be deemed to be consultation. Any comments, opinions and ideas expressed at these sessions are without prejudice to any future position of the Deh Cho leaders. Any formal position of the Deh Cho leaders can only be provided to the Crown or a proponent either in writing or in person at a Deh Cho consultation meeting and only after we have received full information disclosure, have had adequate time to review the material and have been provided with adequate financial and human resources to conduct our own analysis and develop our positions.

13. “Consultation” as Defined in the Interim Measures Agreement (“IMA”) is not Adequate. The narrow definition of “consultation” in the IMA is not adequate consultation for many projects. The current law on consultation and the fiduciary duty is much broader than the IMA definition of “consultation”. As well, the IMA is not legally enforceable (Section 70) and is without prejudice to any legal position the Deh Cho First Nations take on fulfillment of the fiduciary duty and consultation (Section 73). Section 72 also provides that the document will not create or deny rights with respect to consultation or fiduciary duties when our rights are at stake.

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1. 2002 Annual Progress Report on the Canada-Wide Acid Rain Strategy for Post-2000. March 2004. Government of Canada.
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