



Reasons for Decision
and
Report of
Environmental Assessment
EA0405-002

Canadian Zinc Corporation
Phase 3 Drilling Program
Prairie Creek Mine Area

December 22, 2005

Mackenzie Valley Environmental Impact Review Board
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PART 1

Review Board Decision

To make its decision in this Environmental Assessment, the Mackenzie Valley Environmental Impact Review Board (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 Review 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 Environmental Assessment, and the commitments made by Canadian Zinc Corporation, 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.

Gabrielle Mackenzie-Scott

December 23, 2005

Gabrielle Mackenzie-Scott

DATE

Chair of the Mackenzie Valley
Environmental Impact Review Board

PART 2

Report of Environmental Assessment

Summary

This is the Mackenzie Valley Environmental Impact Review Board's Report of Environmental Assessment for the Phase 3 Drilling Program, which Canadian Zinc is planning in the Prairie Creek area. This section summarizes in plain language why the Review Board feels that as long as Canadian Zinc's commitments and the additional mitigation described in this report are carried out, the Review Board finds that the drilling program is not likely to cause significant environmental damage or public concern.

Prairie Creek is located in the Mackenzie Mountains, north west of Nahanni Butte (see map 1 of the report). It is upstream and close to the Nahanni National Park Reserve, which is a world heritage site.

Canadian Zinc wants to explore for minerals in order to find more resources to one day start-up the Prairie Creek mine, which already exists, but does not operate. To do this exploration, Canadian Zinc plans to drill holes at up to 60 locations within their mineral claims and leases in the Prairie Creek area (see map 3 of the report). Canadian Zinc would get to some of the drill hole locations by road from the mine site. Most of the roads already exist from previous projects. The developer would only have to build short additions to those existing roads. Other drill hole locations would be reached by helicopter. Canadian Zinc made some commitments (see section 2.2.3) that will reduce the impacts of its drilling program during the environmental assessment. For example they promised to do a field survey in spring of 2006 and to create a flight management plan to avoid disturbing Dall's sheep.

The Mackenzie Valley Land and Water Board referred this development to Environmental Assessment in June of 2004. Canadian Zinc Corporation submitted a Detailed Development Description in January of 2005. The Mackenzie Valley Environmental Impact Review Board held scoping sessions (public meetings) during March and April, 2005 in Fort Liard, Fort Simpson and Wrigley. In April the Review Board issued a Terms of Reference. The developer submitted its Developer's Assessment Report in May, 2005. Organizations that participated in the assessment sent in their Technical Reports by the end of August, 2005. A public hearing in Fort Simpson took place on October 6, 2005. Five government agencies, two first nations and one non-governmental organization participated in this environmental assessment.

The Review Board found that seven issues emerged from this proceeding. They are listed later in this section. For each of them the Review Board considered all the information available to see if the project is likely to have:

- significant impacts on the environment by itself;
- significant impacts on the environment together with other projects that have happened in the past, are happening, or will likely happen in the future; and

- significant public concern.

The Review Board found that there have been a lot of small projects in the Prairie Creek area over the years which are adding up, and the Review Board believes there will likely be more in the future. The Review Board found that Canadian Zinc is the only company that is active in that area. The Review Board also found that all of the projects happening now and likely to happen in the future are connected to each other. Because of this, Canadian Zinc has a chance to properly manage the environment and avoid effects over the long term.

The Review Board has the following conclusions for the seven issues it identified. Section 5 of the report lists all measures and suggestions.

Reclamation: As long as Canadian Zinc carries out all of its commitments, the Review Board finds that the drilling program is not likely to introduce foreign species or remove a significant amount of vegetation. In addition to the commitments, the Review Board makes two suggestions to further reduce the environmental effects of the project.

Wildlife: As long as Canadian Zinc carries out all its commitments, the Review Board finds that the drilling program is not likely to affect grizzly bears or Dall's sheep. It is also not likely to affect any wildlife that is listed under the Species At Risk Act. In addition to the commitments, the Review Board makes two suggestions to further reduce the environmental effects of the project.

Fish: As long as Canadian Zinc carries out all its commitments, the Review Board finds that the drilling program is not likely to affect bull trout or other fish. In addition to the commitments, the Review Board makes two suggestions to further reduce the environmental effects of the project.

Water Quality: The Review Board finds that the drilling program is likely to cause environmental damage from its drill waste sumps. The Review Board created a measure to avoid this impact, which Canadian Zinc will have to follow. This is in addition to the commitments from Canadian Zinc. The Review Board also makes one suggestion to further reduce the environmental effects of the project.

Economy: The Review Board finds that the drilling program is not likely to affect the economic well being of residents of the Mackenzie Valley. The Review Board makes one suggestion to improve the opportunities for residents of the Mackenzie Valley.

Cultural Resources: The Review Board finds that the drilling program is not likely to affect archeological or cultural resources.

Public Concern and Cumulative Effects: The Review Board finds that some public concern exists about the development. The concern comes from the possibility of real impacts on the environment. The Review Board finds that there would not be a concern if the public is kept up-to-date about the environmental protection measures Canadian Zinc will be using. The Review Board makes one measure to have a community environmental monitor, and one measure to have an overall monitoring program for all of Canadian Zinc's activities at Prairie Creek. In addition to these measures, the Review Board makes another suggestion to further reduce potential public concern.

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List of Abbreviations

COSEWIC	Committee on the Status of Endangered Wildlife in Canada
CPAWS	Canadian Parks and Wilderness Society
DAR	Developer's Assessment Report
DFN	Dehcho First Nations
DFO	Department of Fisheries and Oceans
DIAND	Department of Indian Affairs and Northern Development
E³	Environmental Excellence in Exploration
GNWT	Government of the Northwest Territories
MVEIRB	Mackenzie Valley Environmental Impact Review Board
MVLWB	Mackenzie Valley Land and Water Board
MVRMA	Mackenzie Valley Resource Management Act
NWTWB	Northwest Territories Water Board
PDAC	Prospectors and Developers Association of Canada
PKFN	Pehdzeh Ki First Nation
SARA	Species at Risk Act
UNESCO	United Nations Educational, Scientific and Cultural Organization

1 Introduction

This is the Mackenzie Valley Environmental Impact Review Board's (MVEIRB or Review Board) *Report of Environmental Assessment* for the proposed Phase 3 Drilling Program in the Prairie Creek area of the Northwest Territories by Canadian Zinc Corporation (Canadian Zinc or developer). The proposed development was referred to Environmental Assessment by the Mackenzie Valley Land and Water Board pursuant to s. 125(1) of the *Mackenzie Valley Resource Management Act* (MVRMA).

The purpose of this report is to satisfy the reporting requirements of MVRMA s. 128(2) and 128(4) and to convey the Review Board's decision on whether the proposed development is likely to cause significant adverse impacts on the environment, or be a cause of significant public concern.

Section 2 describes the setting for the proposed development, including a description of the physical, biological and socio-economic environment of the Prairie Creek area and the proposed development. Section 3 provides an overview of the environmental assessment process, including a description of the assessment milestones and the scope of the assessment. Section 4 summarizes the evidence heard, considered and found to be relevant by the Review Board. It also presents the Review Board's findings for the individual issues. Section 5 summarizes the Review Board's conclusions, measures, and suggestions. Section 6 provides a listing of all public record documents as well as any other references cited in this document.

References to the Public Record are indicated as [999] where 999 is the public registry item as listed in section 6.1.

2 Setting

2.1 Environment Description

The development area is located in the southwestern Northwest Territories within the South Nahanni River watershed (see map 1). The Nahanni River watershed, also referred to as the Greater Nahanni Ecosystem, is part of the Boreal Taiga Cordillera, Taiga Plain, and Boreal Cordillera ecozones. The area within the Taiga Plain can be further subdivided into the Nahanni Plateau, Peel River Plateau, Sibbeston Lake Plateau, and Hay River Lowlands (see map 2). (Environment Canada, 2005) Approximately 15 % of the Nahanni watershed is included in Nahanni National Park Reserve. The development area itself is entirely within the Nahanni Plateau and approximately 25 km upstream of the park boundary.

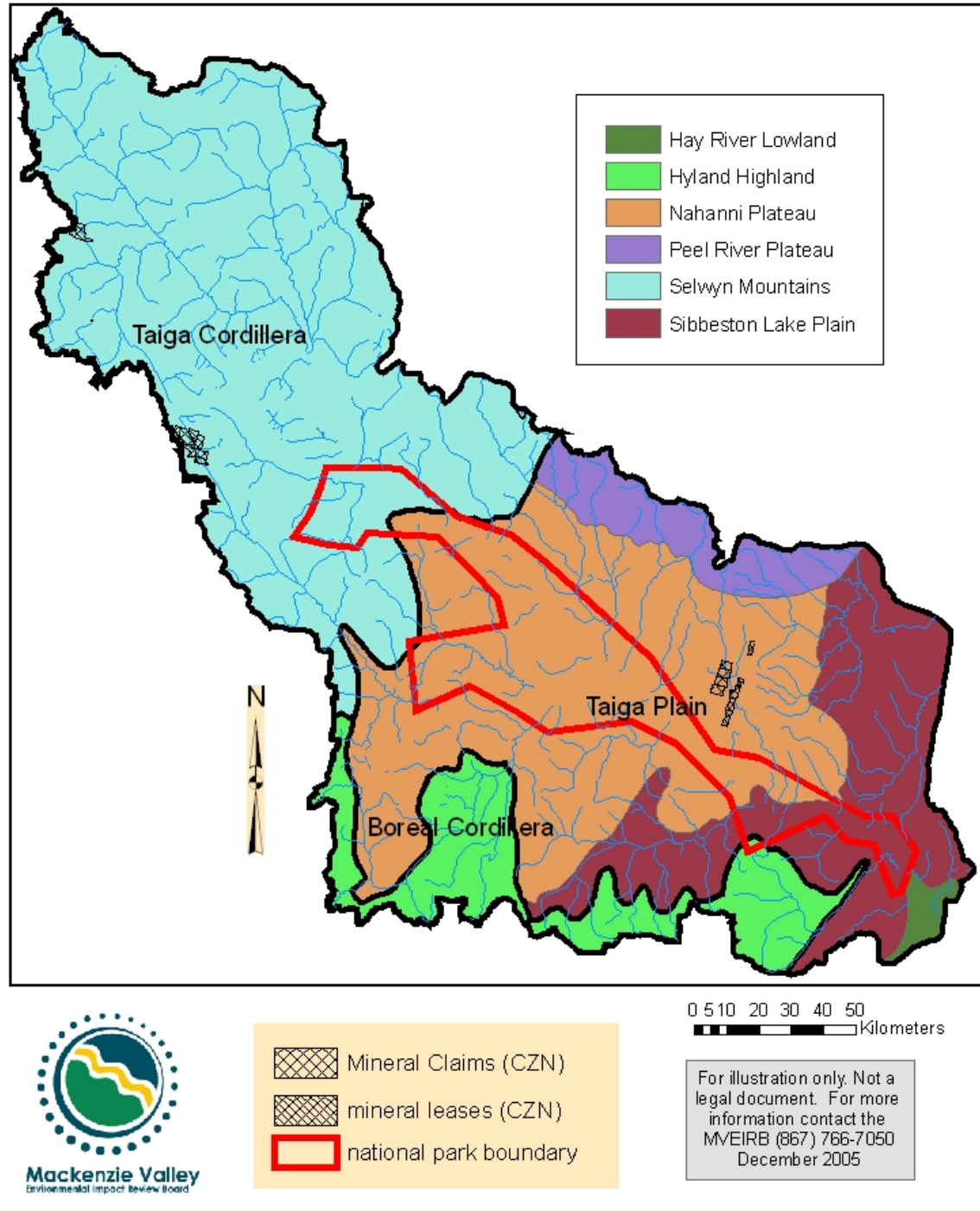
The Nahanni Plateau is characterized by cool summers and cold winters, with an average annual temperature of -5 degrees Celsius. Annual precipitation is between 400 mm in the east and 500 mm in the west. The region is described as having a low subarctic ecoclimate. According to Environment Canada (2005) permafrost within the Nahanni Plateau is extensive and discontinuous with low ice content. According to the developer, permafrost is not widespread within the development area itself [25].

Altitudes in Nahanni National Park range from 180 metres to 2,700 metres above sea level (Parks Canada, 2005). The *Detailed Development Description* places the Prairie Creek mine site at 850 metre elevation and describes the surrounding topography as one of low mountains and narrow valleys with an average relief of 300 metres. The United Nations Educational, Scientific and Cultural Organization (UNESCO) describes the Nahanni area as a “combination of geological processes unique in the world”, including, tufta mounds, hot springs, karst topography, and the 99 metre high Virginia Falls (UNESCO, 1978).

Much of the Nahanni Plateau is characterized by open stands of black spruce with dwarf birch, Labrador tea, lichen and moss as under story (Environment Canada, 2005). The developer’s *Detailed Development Description* [25] describes the development area as having an average annual precipitation of 400 mm, mostly as rain, and stunted fir with limited undergrowth and open areas dominated by lichens. Nahanni National Park Reserve is home to about 900 species of plants, 170 species of birds, including peregrine falcon, and 40 species of mammals including grey wolf, grizzly bear, woodland caribou, and Dall’s sheep (UNESCO, 1978). Grizzly (*Ursus arctos*), woodland caribou (*Rangifer tarandus caribou*), and Dall’s sheep (*Ovis dalli dalli*) are known to frequent the development area [81].

In 1978, Nahanni National Park Reserve became the first site in the world to be granted World Heritage status by UNESCO. The World Heritage Site designation highlights the international significance of the park's natural heritage. The original proposal for world heritage status recommended inclusion of all upstream areas although they are not included in the National Park (UNESCO, 1978). The section of the South Nahanni River within the park was proclaimed a Canadian Heritage River in 1987, in recognition of its outstanding wilderness character and recreational value (Parks Canada, 2005).

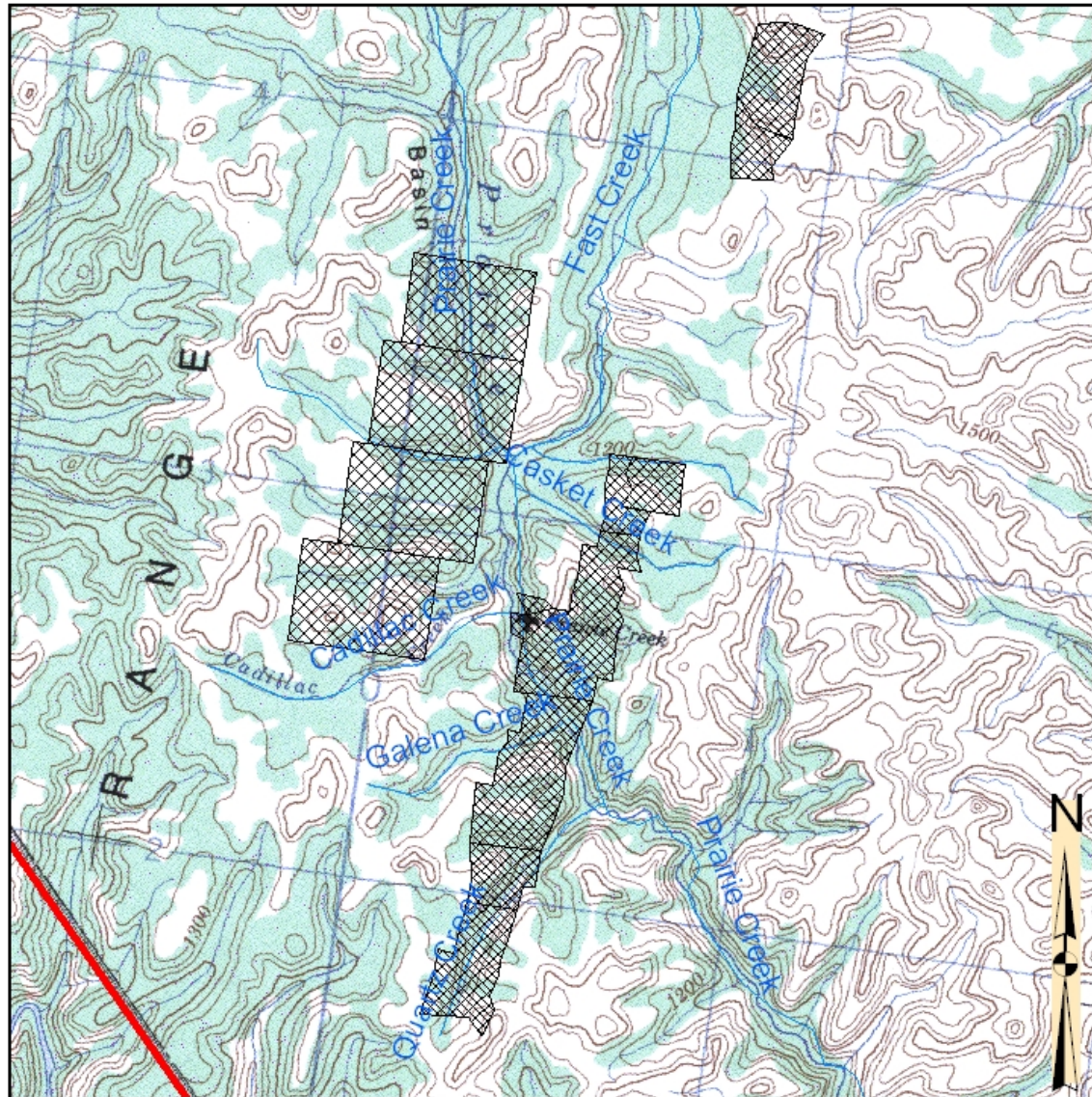
The development area is entirely within the Prairie Creek sub-watershed, which drains into the South Nahanni River approximately 80 air and 110 river kilometers below Virginia Falls. In addition to Prairie Creek, Funeral Creek, Casket Creek, Galena Creek and Quartz Creek are subjected to the proposed development (see map 3). Bull trout have been identified in Funeral Creek but are suspected to be present throughout the Prairie Creek system, where suitable habitat exists [62].






Map 2: Greater Nahanni Ecosystem Overview

Development Area

EA0405-002



Mackenzie Valley
environmental impact review board

-  Mineral Claims (CZN)
-  mineral leases (CZN)
-  national park boundary

00.51 2 3 4 5
Kilometers

For illustration only. Not a
legal document. For more
information contact the
MVEIRB (867) 766-7050
December 2005

Map 3: Development Area Overview

2.2 Proposed Development

2.2.1 Development Description Sources

The Review Board based its environmental assessment on the description of the proposed development from the following sources:

- The *Detailed Development Description* dated December, 2004, and submitted by the developer in January, 2005 [25];
- The *Developer's Assessment Report* dated May, 2005 [81]; and
- The various commitments made by the developer throughout the environmental assessment process are listed below under Environmental Assessment Amendments.

Where a discrepancy exists among these sources for the scope of the development, the *Developer's Assessment Report* prevails over the *Detailed Development Description*. The commitments made by the developer during the assessment process prevail over the *Developer's Assessment Report*. The Review Board's conclusions apply to the development as amended including the developer's commitments.

2.2.2 Original Development Scope

The developer proposes to explore the Prairie Creek area for mineral resources to expand the known resources for a possible mine. The *Terms of Reference* [61] for this Environmental Assessment described the scope of the development as follows:

- Surface-based diamond drilling activities for mineral exploration that use various types of drill rigs, including ground and helicopter transported drill rigs;
- Activities in support of drilling, including drill and helicopter pad construction, sump construction and operation, water use and hydrocarbon use and storage;
- Re-establishment of portion of an old road network, road construction, road maintenance, alteration of drainage patterns, erosion prevention activities, excavation and stockpiling of soils;
- Clearing of vegetation; from both undisturbed and previously disturbed areas;
- Use of the camp and infrastructure as required for the purposes of the Drilling Program that are separate from support for already permitted activities;
- All aspects of transportation to and from the drilling locations, including use of heavy equipment, steel skids to drag drill rigs from site to site, trucks, ATVs and helicopters;
- Transportation of equipment and supplies to and from the mine site, as required for the purposes of the Drilling Program;
- Stream crossings; and
- Efforts to reclaim areas and infrastructure disturbed by the above activities.

For details on the original development scope, please refer to the *Detailed Development Description* [25] or the *Developer's Assessment Report* [81].

2.2.3 Environmental Assessment Amendments

Regardless of any statement made in the Detailed Development Description or the DAR, the Review Board has determined pursuant to subsection 117(1) of the MVRMA that the following actions and commitments by the developer should be included as amendments to the development description. Any activity at variance with these commitments will be outside of the scope of the development as assessed.

During the course of the environmental assessment the developer committed to:

- hiring a local person to act as environmental monitor and to check proposed road alignments and drill locations for archeological resources [114];
- adhering to the Prospectors and Developers Association of Canada (PDAC) Environmental Excellence in Exploration (E³) guidelines [81];
- when phase 3 drilling operations are in progress to sample water quality at three locations on a weekly basis [81];
- maintaining a log of wildlife sightings [148];
- hiring an environmental monitor if an appropriate individual can be found [148];
- having a qualified biologist conduct a field survey in the spring of 2006[148];
- developing a seed mix for re-vegetation based on this survey [148];
- restoring any roads and drill pads utilized by CZN during the course of the drilling program once the company is confident that it has no further use for them [148];
- double stripping soil from spur roads and drill pads, separating top soil and subsoil where possible, and stockpiling the soil for spreading across affected areas during reclamation [25];
- a no hunting policy for all staff [151];
- surveying presence and habitat of species at risk in spring 2006 [151, 148];
- avoiding working in any area the GNWT regional biologist finds problematic, until appropriate mitigation has been devised [151, 148];
- creating a wildlife management plan that includes mountain caribou [151];
- creating a flight management plan, based on the “Flying in Sheep Country” guidelines and in consultation with the GNWT’s regional biologist [151];
- revising its Health and Safety Plan in accordance with the GNWT’s “Preventing and Responding to Bear Encounters” guidelines [148];
- using Harrison Creek road to access drill sites near Casket Creek instead of the road parallel to Casket Creek [149, 151];

- using the Little Quartz road network to access zones eight and nine instead of Big Quartz road [149, 151];
- relocating Galena Creek road to reduce the number of crossings from three to one [149, 151];
- assuming the presence of bull trout wherever suitable habitat exists [25];
- implementing erosion prevention measures throughout drilling program, including regular road inspection [25];
- cleaning equipment prior to crossing Prairie Creek [151]; and
- not crossing Prairie Creek before June 15th each year [151].

This is a summary only, for more details refer to section 4 or the references provided.

3 Environmental Assessment Process

On April 20, 2004, Canadian Zinc applied to the Mackenzie Valley Land and Water Board (MVLWB) for an amendment to its previously approved Land Use Permit MV2001C0022. The original Land Use Permit allows a 60-hole mineral exploration drilling program within 1,000 meters of the Prairie Creek mine site facility. The amendment was submitted in order to obtain permission to drill these 60 holes on all lands of the Prairie Creek property. The MVLWB determined that the application was not within the scope of MV2001C0022, based on the significantly altered location and geographic scope. [1]

On June 1, 2004, following a Preliminary Screening, the MVLWB referred the proposed development to Environmental Assessment pursuant to MVRMA s. 125(1). The MVLWB cited “public concern about the cumulative effects of this project on the South Nahanni Watershed” as the reason for the referral.

In conducting this Environmental Assessment the Review Board considered all of the requirements of the MVRMA

3.1 Environmental Assessment Participants

The Terms of Reference for this Environmental Assessment outlined the roles and responsibilities of the various participants in the assessment as follows:

Developer

The developer was responsible for producing the information necessary for the Board and for other parties to evaluate the potential impacts the proposed development may have. Documents requested by the Review Board included a development description at the outset of the process, the *Developer’s Assessment Report*, as well as responses to information requests. The developer also participated and made presentations during the scoping sessions and the public hearing. The developer was given opportunity to present additional information at any time until the closure of the public record. The developer made use of this opportunity, e.g. in form of a letter responding to the Dehcho First Nations comments after the public hearing.

The developer was encouraged to continue consulting all potentially affected communities and organizations during the proceedings. Such consultation outside the actual assessment process resulted in agreement between the developer and the Department of Fisheries and Oceans (DFO), as well as between the developer and the Government of the Northwest Territories (GNWT) on a number of issues. While this bilateral consultation did not result in all issues being resolved, the Review Board notes that it greatly reduced the number of measures the Review Board felt necessary to prevent significant adverse impacts on the environment.

Other Parties

Five government agencies, two first nations and one non-governmental organization were parties to this assessment. All parties provided the Review Board with information relevant to the EA, or were asked by the Review Board to provide any relevant information they may have via information requests. The Review Board did not hire independent expert advisors for this environmental assessment. Table 3 provides a brief overview of the participation of parties to this assessment.

Party	Scoping ToR	IR gene- ration	IR resp.	Tech. Report	Hearing present.
Canadian Zinc Corporation (developer)	✓		✓		✓
Dehcho First Nations and Nahanni Butte Dene Band (DFN)	✓	✓		✓	✓*
Pehzeh Ki First Nation (PKFN)	✓				
Parks Canada / Nahanni National Park Reserve	✓	✓	✓	✓	✓
Department of Fisheries and Oceans (DFO)	✓		✓	✓	✓
Canadian Parks and Wilderness Society (CPAWS)	✓	✓		✓	✓
Department of Indian Affairs and Northern Development (DIAND)	✓		✓		
Government of the Northwest Territories (GNWT)	✓	✓	✓	✓	✓
Environment Canada	✓			✓	✓

✓ = actively participated in this step of the environmental assessment

* written comments after the hearing in lieu of presentation and questioning

Table 1 – Parties

3.2 Environmental Assessment Milestones

This Environmental Assessment was conducted in accordance with the MVEIRB's *Environmental Impact Assessment Guidelines* and its *Rules of Procedure*. It followed the MVEIRB's standard approach for environmental assessment proceedings with one notable exception. For the first time MVEIRB staff held scoping sessions to facilitate developing the Terms of Reference. At these sessions, interested parties and members of the public could ask questions and provide MVEIRB staff with their view of what the main issues with the proposed development were.

The following are some key dates and milestones for the assessment. Figure 1 presents the same information in graphic form:

Referral to Environmental Assessment	01 Jun '04
EA Notification	08 Jun '04
Request for Detailed Development Description	22 Jun '04
Submission of Detailed Development Description	11 Jan '05
Scoping Sessions	06 Apr '05
Draft Terms of Reference issued	29 Mar '05
Terms of Reference Comment Period	29 Mar '05
Final Terms of Reference Issued	22 Apr '05
DAR submitted	20 May '05
Conformity Statement issued	31 May '05
Information Request Submissions	22 June '05
Information Requests issued	12 July '05
Developer Responses to IR submitted	12 Aug '05
DIAND Responses to IR submitted	04 Aug '05
GNWT Responses to IR submitted	24 Aug '05
DFO Response to IR submitted	24 Aug '05
Parks Canada Response to IR submitted	05 Aug '05
Technical Report submissions	07 Sept '05
Pr-Hearing Conference	12 Sep '05
Public Hearing	06 Oct '05
Closure of Public Record	21 Oct '05

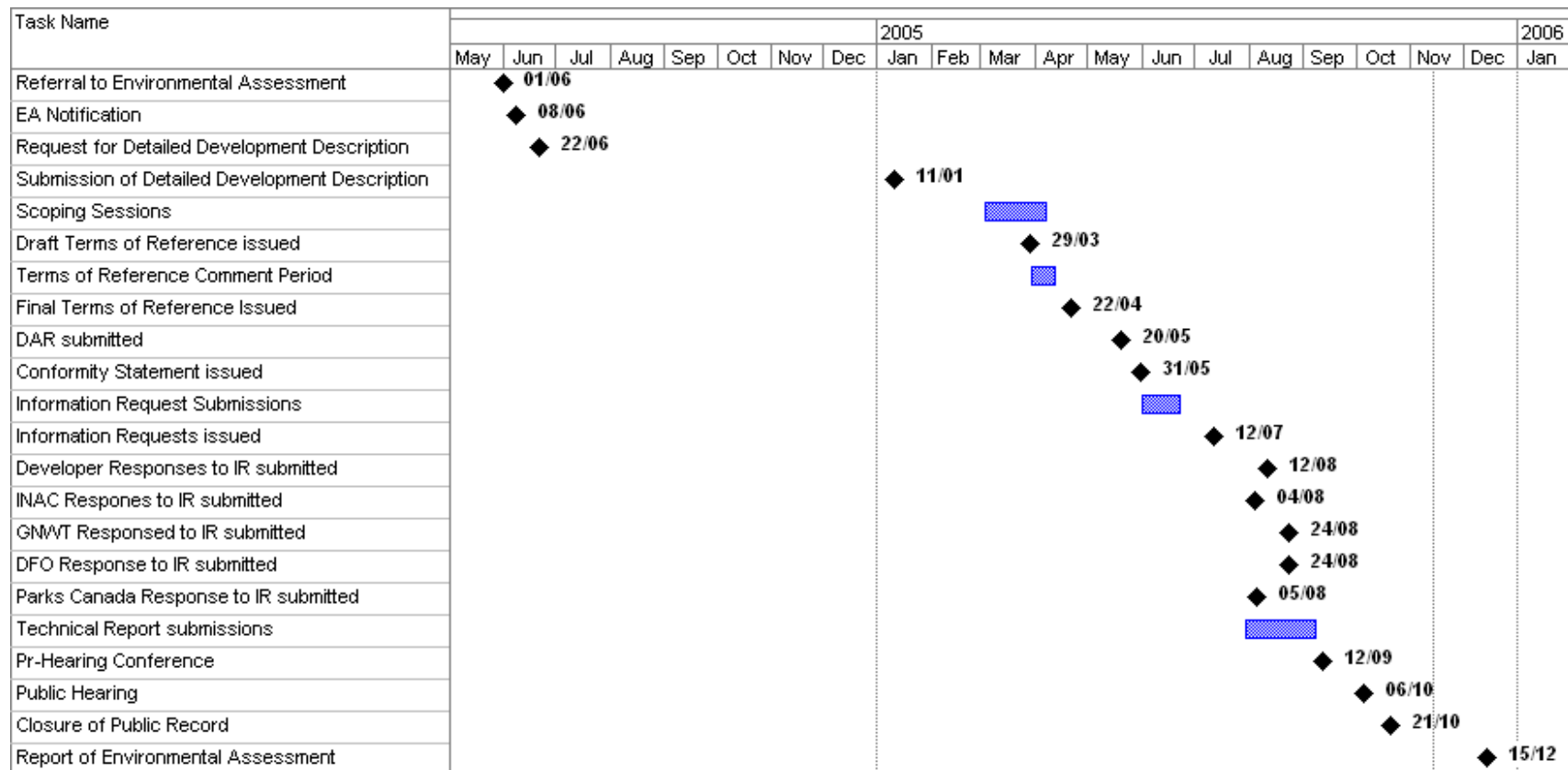


Figure 1: EA Milestones

3.3 Environmental Assessment Scope

3.3.1 Review Board's Scope Determination

In setting the scope of this assessment the Review Board considered its own Report of Environmental Assessment of the Phase 2 Drilling Program at Prairie Creek mine by the same developer (EA01-003). The Phase 2 proposal consisted of up to 60 drill holes within 1,000 metres of the mine site and did not include helicopter drilling or crossing of Prairie Creek. In EA01-003 the Review Board concluded that the proposed development was not likely to cause significant adverse impacts on the environment or be cause of significant public concern. (MVEIRB, 2001)

Consequently the Review Board limited the scope of Environmental Assessment EA0405-002 to examining:

- activities that were not proposed in Phase 2; and
- any activity at locations that were not included in Phase 2.

This limitation applied to the assessment of impacts from the proposed development only, not to the assessment of cumulative impacts. For assessing impacts on the biophysical environment, the geographical scope of this assessment included the CZN mineral lease and mining claim areas, the portions of the Prairie Creek and Nahanni River watersheds downstream of the proposed development, the ranges of wildlife using the area, and the areas potentially affected by transportation activities. The geographical scope for assessing impacts on the human environment included the communities of Nahanni Butte, Wrigley, Fort Liard, and Fort Simpson. [61]

In its deliberations the Review Board took note of the fact that the development was referred to environmental assessment because of public concern over cumulative effects. The Review Board examined the evidence and deliberated on each of the issues and impacts presented in section 4 below in regards to impacts from the proposed development alone and in combination with those of past, present and reasonably foreseeable future human activities.

The Review Board was also aware that the proposed development is situated in close proximity to, and upstream of, a world heritage site. The Review Board's Environmental Impact Assessment Guidelines list "proximity to protected or sensitive areas" as one criterion for deciding what level of scrutiny a proposed development should receive (MVEIRB, 2004). The Review Board is of the opinion that proximity to and the potential for a downstream impact on a protected area of world standard must also be among the criteria for determining the significance of an adverse impact on the environment.

3.3.2 Land Use Planning Issues

The Dehcho First Nations and CPAWS repeatedly raised the issue of conformity of the proposed development with the draft Dehcho Land Use Plan or its goals. Continued mineral exploration is seen as having the potential to reduce the area's value as a

conservation area. There is currently no land use plan in effect for the development area. The draft Dehcho Land Use Plan identifies the area as a conservation zone but explicitly allows the development of Prairie Creek mine as a pre-existing right. Similarly, most of the development is outside the area withdrawn under the Dehcho process. Parks Canada proposes an expansion of Nahanni National Park Reserve. A boundary for this expansion has not yet been proposed.

The purpose of an environmental assessment is to determine whether or not a specific development is likely to have a significant adverse impact on the environment or be cause for significant public concern. Environmental assessment is not the appropriate tool to determine whether or not a particular area should be accessible for development. That is the purpose of land use planning. The Review Board determined that non-conformity with the goals of a draft land use plan or a possible park expansion, in itself does not constitute a significant adverse impact on the environment, or a significant public concern.

For these reasons, neither of these issues, conformity with the draft land use plan or potential impacts on a future park expansion, is considered any further in this *Report of Environmental Assessment*.

3.4 Valued Components

The Review Board scoped the assessment and identified issues, or valued components that may be affected, initially through scoping sessions. Issues and valued components were refined throughout the process and finalized during the pre-hearing conference. As much as possible the Review Board encouraged the parties to address issues among themselves during the environmental assessment process. After the pre-hearing conference the following issues, or possibly affected valued components, had been identified:

- Reclamation of roads and drill pads and the possibility of introducing invasive species;
- Wildlife, including grizzly bear and Dall's sheep, as well as several species at risk;
- Fish, particularly the bull trout population;
- Water quality;
- Economic opportunities;
- Cultural resources; and
- Public concern over potential cumulative effects.

This report focuses on these seven issues and the evidence relevant to them, rather than presenting an exhaustive review of the entire public record.

4 Analysis

This section provides a summary discussion of the evidence and the Review Board's views on the main issues. The Review Board examined the public record for evidence of possible significant adverse impacts on the environment from the proposed development. The Review Board also examined the public record for evidence of cumulative effects from this development in combination with other, past, present and reasonably foreseeable future developments. The Review Board also examined the public record for evidence of public concern.

4.1 *Development History in the Prairie Creek Area*

The Prairie Creek watershed has been subject to mineral exploration since the 1920s with drilling programs taking place in the 1960s, 1970s and 1980s prior to Canadian Zinc's involvement. In the early 1980s Prairie Creek mine was constructed by Cadillac Enterprises. After the bankruptcy of Cadillac, Canadian Zinc, then known as San Andreas Resources, acquired a surface lease for the Prairie Creek mine site, as well as mineral leases and claims as shown in map 3, in 1991 [25]. The mineral leases and claims do not provide Canadian Zinc with any surface rights. Table 1 lists authorizations issued to various operators in regards to the Prairie Creek mine area since 1980.

Currently Canadian Zinc has authorizations for a 60 hole diamond drilling program within 1,000 metres of the mine, underground exploration activities, including drilling, and the operation of a pilot plant for processing ore. Canadian Zinc has been successful in obtaining a court decision that exempts a proposed winter access road from part 5 of the MVRMA. Authorization and subsequent operation of the winter road is reasonably foreseeable. Moreover, Canadian Zinc has made repeated public statements that the company intends to open the Prairie Creek mine (e.g. Canadian Zinc 2005, Canadian Zinc 2001, Dickson 2005). Further exploration and eventually an application for a full scale mine are also reasonably foreseeable. In the Review Board's view, incremental development in the Prairie Creek area is likely to continue and is likely to increase rather than decrease in the foreseeable future.

The public record does not contain evidence of any other current or reasonably foreseeable future developments in this area by any other developer than Canadian Zinc. The public record does include evidence that the various present and reasonably foreseeable developments by Canadian Zinc are interconnected. For example, all these developments utilize the same camp facilities, share vehicles, equipment and personnel, and are aimed at eventually opening the existing mine or extending its life. The winter access road is expected to carry supplies for all currently permitted and for future developments.

Since Canadian Zinc started operating in the Prairie Creek area, three environmental assessments have concluded in addition to this assessment. Table 1 indicates that there has been considerable development in the Prairie Creek area over time. This development has been incremental rather than through large individual developments. While each development may not have had a significant adverse impact, as table 2 shows,

the incremental nature of development in the area gives rise to concerns about cumulative effects.

Type	Purpose	Year	Issuing Agency
LUP	Winter Road	1980	DIAND
LUP	Expl DDH & u/g dev	1980	DIAND
WL	Mining & Milling	1980	NWTWB
QP	Gravel quarry	1981	DIAND
LUP	All weather road*1	1982	DIAND
LUP	Expl DDH	1986	DIAND
LUP	Expl DDH	1987	DIAND
LUP	Expl DDH	1992	DIAND
LUP	All weather road*1	1994	DIAND
LUP	Expl DDH	1995	DIAND
LUP	Expl DDH (6-7)	2000	MVLWB
LUP	Cat camp cleanup	2000	MVLWB
LUP	Expl DDH (50-60)	2001	MVLWB
LUP	U/G Decline	2001	MVLWB
WL	Pilot Plant	2001	MVLWB
LUP	Winter Road*2	2003	MVLWB
LUP	Expl DDH (amend)	2004	MVLWB

*1 authorization not issued *2 under judicial review at beginning of this assessment
 DIAND = Department of Indian Affairs and Northern Development; NWTWB = Northwest Territories Water Board; MVLWB = Mackenzie Valley Land and Water Board; Expl DDH = Exploratory Diamond Drill Holes; U/G = underground

Table 2: Regulatory History Since 1980

Source: Canadian Zinc's presentation at Yellowknife scoping session, March 3, 2005

Every development contributes in some way to cumulative effects. There has already been considerable development in the Prairie Creek watershed and development is likely to increase. On the other hand, all present and reasonably foreseeable future

developments are by the same developer, are in close proximity, and are operated, if not as one development, in a coordinated and overlapping fashion. This provides Canadian Zinc with an opportunity to effectively manage cumulative effects through responsible environmental management of its activities in each of the developments in the area. More information on cumulative effects is contained in the sections on individual issues in the remainder of section 4.

Development	Year	Authority	Results
All weather road (entire mine development scoped in by authority)	1994	DIAND under the Canadian Environmental Assessment Act	Developer withdrew application, assessment cancelled
Phase 1 Drilling Program (seven holes in vicinity of mine site)	2000	MVEIRB pursuant to MVRMA referral by MVLWB	No significant adverse impact on the environment or public concern
Cat Camp Clean Up	2000	MVEIRB pursuant to MVRMA referral by MVLWB	DIAND carried out the clean up in response to inspector's orders from Environment Canada; assessment cancelled
Phase 2 Drilling (60 holes in vicinity of mine site)	2001	MVEIRB pursuant to MVRMA referral by Parks Canada	No significant adverse impact on the environment or public concern
Underground Decline and Pilot Plan (separate applications scoped as one development)	2001	MVEIRB pursuant to MVRMA referral by Parks Canada	Significant adverse impact on the environment likely; approval subject to additional mitigation; no significant public concern
Winter access road	2003	MVEIRB pursuant to MVRMA referral by Parks Canada	Judicial review concluded that development was not subject to part 5 of the MVRMA
Phase 3 Drilling	2004	MVEIRB pursuant to MVRMA referral by MVLWB	Subject of this report

Table 3: Environmental Assessment History of Canadian Zinc Developments

The remainder of section 4 provides a summary of the evidence on the public record followed by the Review Board's conclusion on the likelihood of significant adverse impacts on the environment for each valued component identified in section 3.5. It also lists the commitments by the developer, as well as any additional measure, the Review Board finds necessary to prevent significant adverse impacts. These are followed, where applicable, by suggestions the Review Board has to further reduce the environmental effects of this development, alone or in combination with other developments.

4.2 Reclamation

The Review Board identified two main issues related to road and drill pad reclamation in the project area. The first is the seed mix to be used for re-vegetation. The second is related to the question of who is responsible for reclaiming the existing road network and when reclamation should start.

Evidence Summary

The developer claims the impact from vegetation removal will be insignificant because the affected area is small and because the impact is fully reversible. The developer expects a total of 1.8 ha (4.4 acres) to be disturbed; with the existing disturbance being 44 ha (109 acres). The developer committed to double stripping soil (where possible) and stock piling it so it can be spread over the affected area once it will be reclaimed. Once re-vegetated, the developer will monitor areas for one year or until the vegetation is self-sustaining (80% of plants have survived one year). [81] Several parties have expressed concern over the monitoring commitments.

DIAND researched the availability of appropriate seed mixes for northern environments. There is no supplier in the NWT, but there is one in the Yukon [111]. Seed mixes must be carefully planned and cannot be purchased off the shelf. According to Parks Canada the seed available from the Yukon does not contain many of the species listed in previous studies of the area. [120] Use of an inappropriate seed mix could introduce invasive species to the area.

The developer committed to conducting an environmental survey in spring of 2006. The developer also committed to creating a seed mix based on the results of this survey. Moreover, the developer committed to creating test plots for road reclamation. [151, 148] Parks Canada recommended that a final reclamation plan, a seed bank, and an adequate security deposit should be in place prior to any work commencing on the development. [120]

Canadian Zinc stated it intends to reclaim drill pads or sections of road only when it is certain there will be no further need for them. In the developer's opinion poor road conditions should not be a factor in deciding when to reclaim, as poor roads could be repaired. Also, the developer stated there are some roads in excess of 30 years old that do not show major signs of erosion. Thus it concludes reclamation is not really urgent. [151] CPAWS provided photographic evidence of the lack of natural re-vegetation in the development area and resulting erosion. During the hearing CPAWS and the DFN

continued to be of the opinion that not enough information is available to adequately evaluate the developer's planned efforts to reclaim roads and drill pads. Both urged the Review Board to re-issue relevant information requests. [124, 125]

The developer accepts responsibility only for those portions of road they actually use in this development [114]. According to DIAND the developer is responsible for all road portions they use under a land use permit until they receive final clearance on the permit. DIAND's response to information request IR0405-002-8 seems to indicate that the developer is only responsible for restoring the existing roads they use to the state they found them in. [111]

Parks Canada submitted that park visitors flying over the area consistently comment on the scarring of the landscape. Parks Canada is interested in reclamation as soon as possible [120]. The DFN is of the opinion that sections of road that will not be used for the development (see section 4.4) should be reclaimed immediately as part of the development [125]. The developer responded that entering some areas only to reclaim roads may cause more harm than good [127].

Another question raised during scoping sessions and the pre-hearing conference is that of road building material. DIAND's response to IR0405-002-1 could be interpreted as the developer being able to extract as much material as they want, as long as they stay within the right of way of an existing road. The developer subsequently determined that existing stockpiles at the mine site are more than sufficient. [127]

The GNWT and CPAWS concluded in the hearing that the developer's commitments must all be implemented to prevent significant adverse impacts on the environment [151].

Review Board Conclusion

The Review Board finds that use of an inappropriate seed mix has the potential to introduce foreign plant species, as evidenced by Cody et al. (2000). Each development carries with it a risk of introducing invasive species and the likelihood increases with each additional development. To address this problem in the greater cumulative setting any effort to manage cumulative effects by preventing introduction of foreign species should be harmonized throughout Canadian Zinc's developments in the area. Any seed mix that may introduce foreign species should not be used.

Road and drill pad construction adds to the already existing scarring of the landscape. Given the relatively small amount of construction proposed and its limitation to pre-disturbed areas, the Review Board finds that a significant adverse environmental impact can be avoided if all of the developer's commitments are implemented.

The cumulative nature of impacts resulting from incremental development could be further reduced by expanding the test plots and by restoring those road sections that DFO advised the developer not to use and any other sections that will not be used.

To prevent significant adverse impacts on vegetation the Review Board finds it necessary that the developer implement its commitment to:

- having a qualified biologist conduct a field survey in the spring of 2006;
- developing a seed mix for re-vegetation based on this survey;

- establishing test plots for re-vegetating roads; and
- restoring all newly constructed roads and drill pads, as well as existing roads and drill pads used in this development, as soon as they are no longer required.

To further reduce the environmental effects of this, as well as other past or present developments, the Review Board makes the following suggestions:

Suggestion (1): Government and regulatory authorities, within their area of responsibility or their jurisdiction, should ensure that the developer's commitments that mitigate or prevent impacts on vegetation are implemented.

Suggestion (2): DIAND should ensure progressive reclamation of road sections that are no longer in use, or that DFO has advised against using.

4.3 Wildlife

Wildlife issues raised during the assessment include potential impacts on species at risk, disturbance to Dall's sheep, and grizzly bears habituation to garbage or camps.

Evidence Summary

Several species requiring special attention may be encountered in the area. These are grizzly (*Ursus arctos*), wolverine (*Gulo gulo*) (western population), Dall's sheep (*Ovis dalli dalli*), woodland caribou (*Rangifer tarandus caribou*) (northern mountain population), and peregrine falcon (*Falco peregrinus anatum*). Environment Canada identified a requirement to assess possible impact on species covered under the *Species at Risk Act* (SARA) in their Technical Report. At the time Environment Canada recommended that the Review Board require an assessment of impacts on SARA species prior to concluding the EA. The start up of the EA pre-dated the coming in to force of SARA but assessing potential impacts on SARA species has now become a regulatory requirement and must be dealt with within or outside the EA. [133]

During the hearing Environment Canada clarified the status of SARA species that may be encountered in the project area. These are:

- Peregrine Falcon (*anatum* subspecies) – threatened;
- Woodland Caribou (boreal population) – threatened;
- Yellow Rail (*Coturnicops noveboracensis*) -special concern;
- Woodland Caribou (northern mountain population) - special concern;
- Western Toad (*Bufo boreas*) - special concern; and
- Short-eared Owl (*Asio flammeus*) - special concern.

Wolverine and grizzly bear are being considered for inclusion on schedule 1 of SARA, both as special concern, which is the lowest risk level. Both are currently listed as special concern by the Committee on the Status of Endangered Wildlife in Canada (COSEWIC) (COSEWIC, 2005a). In 2003 the SARA re-established COSEWIC as “an independent body of experts responsible for identifying and assessing species considered to be at risk”. A listing by COSEWIC is a step towards listing under SARA (COSEWIC, 2005b).

Species at risk will be addressed specifically in the proposed spring 2006 survey, conducted by the developer in cooperation with the GNWT [148, 151]. Environment

Canada is satisfied that with this commitment the requirement of the SARA can be addressed in the regulatory phase. Environment Canada and the GNWT are working on an agreement specifying who will be responsible for SARA species in the future. Environment Canada will likely only retain responsibility over birds, while the GNWT will take over responsibilities for mammals. [141] The GNWT disputed the developer's conclusion that mountain caribou frequent the development area only rarely. The GNWT cited a report, prepared in 1981 in connection with the construction of Prairie Creek mine that listed fairly frequent caribou sightings [151].

Disturbance to Dall's sheep from helicopter traffic is an issue all parties agree on. The public record contains several research papers detailing possible impacts. It also includes evidence describing the distances and elevations at which sheep are likely to flee aircraft activity. It is noteworthy that the sheep do not get used to helicopters or fixed wing aircraft over time. Helicopters are significantly more disturbing than fixed wing aircraft [68]. Sheep remain disturbed for a significant amount of time after the helicopter has passed. Repeated disturbance causes animals to expend more energy, while having less time to eat, and can lead to increased mortality over the winter. Mortality may also increase if an animal is injured while fleeing. The public record also contains guidelines on minimizing disturbance, developed in the Yukon, based on the same research [70].

The GNWT listed a number of specific habitat types that are of special interest/concern but did not provide information on the distribution of such habitat. According to the developer, sheep are only present in two locations in the development area. One is a ridge to the east of the mine site and an area identified as "further to the north". The first area is in close proximity to the mine site and drilling in that location may already be permitted under land use permit MV2001C0022. The majority of the phase 3 drilling program will be conducted well away from any areas where sheep congregate. [151]

The developer explained that four to five helicopter flights per day will be average. The developer committed to developing a flight management plan, which will be based on the Yukon guidelines [151, 144], and to provide the GNWT regional biologist with an opportunity to review the plan and provide feedback for revisions. The GNWT regional biologist committed to provide immediate feedback on the flight management plan. [151]

According to Weaver [36] the Prairie Creek area has a moderately high abundance of grizzlies. At least one grizzly is known to visit the mine from time to time. There is evidence that some bears in the Prairie Creek area also include the Nahanni National Park Reserve in their range. Parks Canada expressed concern that bears accustomed to garbage from the development will become a danger to park visitors because they lose their natural fear of humans. Ultimately more bears may be killed following bear-human encounters. Parks suggested a number of mitigation measures. Parks Canada also expressed that clearing of vegetation could remove food sources for grizzlies. [112]

During the hearing the GNWT confirmed the need for a plan to avoid bear-human conflicts and provided the developer with relevant information. The GNWT stated the bear issue could be addressed in the regulatory phase and was not a requirement prior to concluding the assessment. The developer committed to revising and expanding its Health and Safety Plan for Prairie Creek accordingly. [148]

Environment Canada raised the issue of migratory birds in its technical report [133]. Environment Canada also proposed a number of mitigation measures, mainly restricting activities to outside the breeding season which is May 1 to August 15, or checking proposed roads/drill pads for bird nests. During the hearing Environment Canada clarified that the development area is not considered prime migratory bird habitat. Environment Canada concluded that migratory birds related issues can be addressed with standard mitigation in the regulatory phase. [151]

Review Board Conclusion

The Review Board finds no evidence for a significant adverse impact on a species listed by SARA by the proposed development alone. Both governments responsible for implementing the SARA, Environment Canada and the GNWT, stated during the hearing that any remaining issue regarding species at risk can be addressed through the regulatory regime. Moreover, the developer committed to the following:

- prevent any hunting by staff;
- address species at risk specifically in the spring 2006 survey, including mountain caribou; and
- not to start work in areas where a listed species is present, until after appropriate mitigation has been devised by the developer in consultation with the GNWT's regional biologist.

Consequently the Review Board finds that a significant adverse impact on species at risk is not likely from the proposed development by itself, as long as all commitments are implemented.

Repeated disturbance of Dall's sheep may result in increased mortality. There is evidence of important Dall's sheep habitat and of sizable Dall's sheep congregations in the development area. The developer committed to minimizing disturbance by developing a flight management plan modeled after the "Flying in Sheep Country" Guidelines [70], in consultation with the regional biologist of the GNWT. The developer further stated that the average number of daily flights will not exceed five (5). In addition the developer's committed to creating an overall wildlife management plan in consultation with the regional biologist and to prevent hunting by staff. Subject to all commitments being implemented, and based on the fact that the majority of the drilling program will be conducted outside known sheep congregation areas, the Review Board finds that the impact of the proposed development is not likely to be significant.

Habituation of bears to garbage, or human contact in general, may lead to increased human-bear encounters in Nahanni National Park Reserve. Such encounters may result in injuries or death to humans and are likely to result in increased bear mortality as nuisance bears will be destroyed. Standard mitigation is available for this issue, e.g. through the GNWT's "Preventing and Responding to Bear Encounters" guidelines [116]. The developer committed to revising its Health and Safety Plan accordingly. The removal of food sources through road and drill pad construction is small. The probability

of introducing foreign species and thus indirectly affecting bear habitat is low given the mitigation outlined above in section 4.2.

The Review Board finds that the impact on bears is not likely to be significant, as long as all commitments are followed through.

Considering Environment Canada's statement that the project area is not considered important migratory bird habitat, the overall small footprint of the development, and also Environment Canada's statement that any remaining issues regarding migratory birds can be addressed through the regulatory regime, the Review Board finds that significant adverse impacts on migratory birds are not likely.

To prevent significant adverse impacts on wildlife the Review Board finds it necessary that the developer implement its commitment to:

- a no hunting policy for all staff;
- a survey to determine presence and habitat of species at risk in spring 2006;
- avoid working in any area the GNWT regional biologist finds problematic, until appropriate mitigation measures have been devised;
- create a wildlife management plan that includes mountain caribou;
- create a flight management plan, based on the "Flying in Sheep Country" guidelines and in consultation with the GNWT's regional biologist; and
- revise its Health and Safety Plan in accordance with the GNWT's "Preventing and Responding to Bear Encounters" guidelines;

The GNWT committed to have its regional biologist available for input into the survey, wildlife management plan, and flight management plan in spring of 2006.

To further reduce the environmental effects of the proposed development, the Review Board makes the following suggestions:

Suggestion (3): Government and regulatory authorities, within their area of responsibility or their jurisdiction, should ensure that the commitments that mitigate or prevent impacts on wildlife are implemented.

Suggestion (4): In addition to implementing the GNWT's "Preventing and Responding to Bear Encounters" guidelines the developer should also consult with Nahanni National Park Reserve staff when revising its Health and Safety Plan.

Notwithstanding the conclusion that this particular development in isolation is not likely to pose a significant threat to wildlife, it will, like any development, contribute to cumulative effects. Section 4.1 describes the incremental development in the Prairie Creek watershed that has been ongoing for some time and is likely to continue and expand.

The Board recognizes the sensitivity of certain species in the area. Woodland Caribou and Grizzly Bear are SARA and COSEWIC listed species, and the GNWT and developer have agreed on the particular sensitivity of Dall's sheep to disturbance due to human activity and helicopter overflights. Wildlife is likely affected by the combined impacts of

these developments, arising from the construction of multiple roads, use of the existing mine site, drill pad construction and operation, ground and air traffic, industrial noise, a camp and waste dump, and other human activities associated with all of Canadian Zinc's activities in the area. In the Board's view, the combined effects of these activities are cumulative impacts on wildlife that are likely, adverse, and collectively significant.

Consequently, the Review Board finds that the proposed development, in combination with other developments, is likely to cause significant adverse cumulative impacts on wildlife. However, these cumulative impacts can be mitigated through appropriate environmental management, which requires a comprehensive monitoring program to be in place. The Review Board finds that a comprehensive monitoring program is required. See section 4.8 for a measure regarding a comprehensive monitoring program.

4.4 Fish

The major fish related issue raised during this assessment was the impact the development might have on the bull trout (*Salvelinus confluentus*) population in the Prairie Creek system. Potential impacts range from destruction of fish eggs during creek crossings, to killing fish through water intakes, to the introduction of harmful substances either during creek crossings, from sumps, or via erosion.

Potential impacts related to changes in water quality will be addressed in section 4.5.

Evidence Summary

According to the developer, fish studies do not suggest any lasting impact from previous development activities. Consequently the developer predicts that the proposed exploration program will not have any impact either. Arctic Grayling (*Thymallus arcticus*) are suspected to spawn in Prairie Creek and the developer committed to not crossing the creek until after June 15 each year. [81]

The public record shows that bull trout are present in the Prairie Creek system, particularly in Funeral Creek [62]. The public record further shows that this population is at the edge of the species' distribution, is very small (at or below the threshold considered necessary for long term survival), and individuals grow very slowly. It is likely to be a very vulnerable population. A study on bull trout in the area concluded that at the time Funeral Creek was the most important habitat but that it is likely bull trout use large areas throughout their life history. According to this study any development should be limited to between August 1 and August 15. [62]

Bull trout, as well as mountain whitefish (*Prosopium williamsoni*), which is an important food source for bull trout, spawn after August 30th [151]. They are therefore not covered by the developer's commitment to not cross Prairie Creek until after June 15th. Crossing Prairie Creek after August 30th may result in the direct destruction of bull trout eggs. DFO stated that if the developer wants to cross water bodies after August 30th with any equipment or vehicles, a fisheries authorization will be required, unless studies show that the proposed crossing locations are definitely not used for spawning. [150] An authorization will only be granted if DFO finds that there will not be a significant impact on fish [150].

DFO confirmed that although bull trout is not listed under SARA, the population in the Prairie Creek system must be considered as vulnerable [151]. The exact distribution of bull trout is not known, but DFO assumes it to be present wherever suitable habitat exists. The developer has agreed to the assumption and will apply mitigation as if bull trout were present throughout the Prairie Creek system, e.g. additional erosion control measures [151].

DFO inspected the development area and identified portions of the road network the developer is not to use. Also, DFO requested that the developer move one section of road away from Galena Creek. [136] DFO concluded that the proposed creek crossings are not likely to generate sediment in the creeks because the substrate consists largely of cobbles. [151]

The developer committed to following all advice issued by DFO during the July 19, 2005 site visit, which includes:

- using Harrison Creek road to access drill sites near Casket Creek instead of the road parallel to Casket Creek;
- using the Little Quartz road network to access zones eight and nine instead of Big Quartz road; and
- relocating the Galena Creek road to reduce the number of crossings from three to one.

The developer further committed to assuming the presence of bull trout wherever suitable habitat exists, to implement erosion prevention measures throughout the drilling program (including regular road inspection), and to clean equipment prior to crossing Prairie Creek. [151]

The Rico claim access road has to be rehabilitated before it can be used. DFO concluded that this rehabilitation would constitute a “harmful alteration, disruption, or destruction of fish habitat”. A fisheries authorization may be required for this work [151]. The developer stated that no decision had been made whether to use road access or helicopter based drilling for the Rico claims [151].

DFO further explained that unscreened water intakes could be fatal to all life stages of bull trout. In addition to screened water intakes, DFO recommended to limit water withdrawal to no more than 5% of the flow volume of any creek. With all recommended measures and adequate erosion control in place, DFO is not concerned about the impact of the development overall. [151] During the hearing DFO also stated that they expect all equipment to be inspected and, if necessary, cleaned, prior to any creek crossing, not only prior to crossing Prairie Creek [151].

The DFN requested that the Board order more studies [142]. The DFN is also not convinced that the developer has shown that the proposed mitigation will be effective.

Review Board Conclusion

Introduction of sediment or other harmful material can be detrimental to bull trout in all life stages, as can excessive water withdrawal. Unscreened water intakes may be fatal to

bull trout in all life stages. Creek crossings after August 30th may be fatal to bull trout eggs. Given the vulnerability of the bull trout population in the Prairie Creek system, the Review Board finds that any of the above impacts would be significant. Their likelihood, however, can be minimized.

Screening of water intakes and limiting withdrawal to 5% of the flow are standard regulatory requirements. The developer committed to following all advice issued by DFO during the July 19, 2005 site visit, to assuming the presence of bull trout wherever suitable habitat exists, to implement erosion prevention measures throughout drilling program (including regular road inspection), and to cleaning equipment prior to crossing Prairie Creek.

Crossing of tributaries without cleaning equipment is likely to introduce some harmful substances into the Prairie Creek system. This can harm fish eggs directly, and fish populations indirectly. Crossing of Prairie Creek, which has been identified as suitable habitat, or any other creek that may provide suitable habitat, after August 30th, is likely to destroy fish eggs. The Review Board recognizes that further studies may show bull trout and mountain whitefish are not spawning at the proposed crossing locations and crossings may be allowed in the future. The Review Board further recognizes that the developer is prohibited from crossing Prairie Creek after August 30th without a fisheries authorization.

In the Review Board's opinion significant adverse impacts on bull trout can be prevented if the developer's commitments are implemented, no crossing of Prairie Creek after August 30th takes place without Fisheries Authorization, and no harmful substances are allowed to enter water during any creek crossing. This determination is subject to any measures outlined in section 4.5 Water Quality as bull trout are sensitive to changes in water quality as well. Since bull trout is the most vulnerable species in the Prairie Creek watershed, the Review Board is confident that any mitigation sufficient to prevent significant impacts on bull trout is also sufficient to prevent significant impacts on other aquatic resources.

To prevent significant adverse impacts on fish the Review Board finds it necessary that the developer implement its commitment to:

- use Harrison Creek road to access drill sites near Casket Creek instead of the road parallel to Casket Creek;
- use the Little Quartz road network to access zones eight and nine instead of Big Quartz road;
- relocate Galena Creek road to reduce the number of crossings from three to one;
- assume the presence of bull trout wherever suitable habitat exists and implement erosion prevention measures throughout drilling program, including regular road inspection;
- clean equipment prior to crossing Prairie Creek; and
- not cross Prairie Creek before June 15th each year.

To further reduce the environmental impacts of the proposed development, the Review Board makes the following suggestions:

Suggestion (5): Government and regulatory authorities, within their area of responsibility or their jurisdiction, should ensure that the developer's commitments that mitigate or prevent impacts on fish are implemented.

Suggestion (6): Government and regulatory authorities should pay particular attention that the developer does not allow any harmful substance to enter the Prairie Creek system through any creek crossing.

4.5 Water Quality

Issues relating to water quality revolve around the introduction of harmful substances through erosion, which may be caused by road or drill pad construction, through drill waste disposal in sumps, and through creek crossings.

Evidence Summary

The public record contains several papers on aquatic resources of the Nahanni watershed and their protection. Information relevant to this EA includes:

- Prairie Creek has naturally high levels of dissolved metals but low sediment (by an order of magnitude compared to the Nahanni River) [64];
- the flow of Prairie Creek is low compared to the Nahanni. This means that Prairie Creek itself is quite vulnerable to pollution (not enough dilution) but also that it cannot influence the water quality of the Nahanni River to any great extent [64]; and
- water quality objectives set for Prairie Creek were exceeded in 1997, although it is unknown whether this was due to natural causes or related to mining development. [65].

While this is not evidence for a specific impact, it suggests the system is vulnerable, and it indicates a need for monitoring water quality before, during and after development.

Environment Canada noted that the developer committed to maintaining water clarity in compliance with the Canadian Council of Ministers of the Environment (CCME) (1999) *Guidelines for the Protection of Freshwater Aquatic Life* for total particulate matter. [123] The *Developer's Assessment Report* [81] (p. 26) commits the developer to limit any increase of the suspended sediment concentration in Prairie Creek during low flow condition to no more than 25 mg/L above the background concentration. The DFN pointed out that this is the threshold for short term exposure. The DFN is of the opinion that a long term exposure threshold, which is considerably lower, should be adhered to at all times. [125]

During the hearing CPAWS, as well as DFO, presented visual evidence of erosion from previous drilling activities in the area [151].

DIAND submitted that mitigation should be preventive rather than reactive (i.e. it must be put in place prior to reaching a threshold). [111]

The developer committed to weekly monitoring of the road network, as well as monitoring after storms [81]. During the hearing the developer re-confirmed the

commitment to following PDAC's E³ guidelines. The developer further re-confirmed its commitment to putting additional drainage control in place, to relocate Galena Creek road, to take weekly water samples, and to undertake daily visual inspections [151]. In its final submission the developer qualified the water sampling commitment stating that "three locations will potentially be sampled" [147].

Parks Canada and Environment Canada have suggested adding more frequent in-field measurements of turbidity [151]. Environment Canada recommends that baseline samples be collected in advance of any surface activity, such as site access or pad preparation. Samples taken in connection with drilling operations should be timed for shortly after drilling commences, and/or following rain events [151]. For management of suspended solids, Environment Canada recommended that field turbidity measurements be used to support lab measurements of suspended solids, with immediate information available to site managers [151]. Parks Canada requested that the developer measure turbidity after each creek crossing [120].

DFO has inspected the road section proposed for use and has determined the roads adjacent to Casket Creek and Big Quartz Creek should not be utilized. Moreover, DFO advised the developer to relocate the road along Galena Creek to remove two stream crossings [150]. DFO further concluded that because of the creek bed material at the proposed crossing sites, creek crossings are not likely to be a source of sediment or cause of rutting [151].

In previous environmental assessments of diamond drilling programs sumps were not a significant issue. However, several parties submitted information requests regarding the toxicity of drill wastes and the impermeability of the sumps receiving them. CPAWS and DFN do not consider the responses of the developer to those information requests as adequate [124, 125]. The developer repeatedly stated the drilling mud is non-toxic, listed drilling mud components with a brief description, and stated drilling wastes will not be permitted to enter streams [25, 81, 145]. The developer did not, however, explain how sumps will prevent waste from reaching streams. The developer did state that sumps will not have an impermeable liner [151].

The developer stated that it has not encountered any problems in the past and that once the bore hole is advanced beyond the collar there is no longer any return of drill water. Absorbent pads will be used to prevent any hydrocarbons from escaping [151]. Environment Canada submitted that the proposed drilling practices are industry standard, but also that industry standard may not be sufficient in this steep terrain. Environment Canada made a number of specific recommendations regarding sumps and fuel storage, including constructing sumps in such a manner as to prevent the contents from entering any water body frequented by fish. [133]

As requested at the hearing, the developer submitted a letter describing the drill additives [145]. This letter did not provide any information not already contained in either the detailed development description or the DAR. The developer re-iterated that drill water return is only expected in the early stage of each drill hole and that the total amount of drilling waste deposited into a sump is small.

The developer has committed to washing drill rigs and vehicles at the mine site prior to moving them across Prairie Creek [81]. On the return trip the developer committed to

wiping equipment down with absorbent pads to prevent hydrocarbons or other material from entering Prairie Creek. The DFN recommended to clean vehicles and equipment prior to each stream crossing, not just prior to crossing Prairie Creek [125]. The developer states that crossings of other creeks will be near their headwaters and cleaning should not be required [151].

Review Board Conclusion

The introduction of harmful substances, including suspended sediment, fluids from vehicles, or drill waste components, has the potential to negatively affect aquatic life in Prairie Creek, particularly the vulnerable bull trout population. Whether a substance is introduced into Prairie Creek directly or into one of its tributaries is a matter of equal concern to the Board. The developer proposes to minimize the likelihood of any harmful substances entering water bodies by using helicopter drilling in steep areas, by following PDAC's E³ guidelines, and by cleaning equipment prior to crossing Prairie Creek. The developer further committed to taking weekly water samples at potentially three locations while drilling operations are in progress, and to undertake visual inspections.

In the Review Board's opinion the developer did not provide sufficient evidence that the drilling mud is not harmful to aquatic resources and/or that the proposed drill waste disposal methods will be effective in preventing harmful substances from entering water bodies. This view is based in part on the evidence from Environment Canada outlined above. The steep terrain, limited soil development (i.e. little filtering capacity), and absence of widespread permafrost will likely allow drill waste components to travel faster and further from disposal sites than for similar developments in other areas in the Mackenzie Valley. Moreover, drilling locations are unknown at present and some drill holes may be in close proximity to a water body.

The Review Board concludes that significant adverse impacts on water quality from erosion can be prevented if all of the developer's commitments are implemented. The Review Board further concludes that the proposed development is likely to have a significant adverse impact on water quality if additional mitigation against drill waste entering water bodies is not implemented. Due to the relatively small amounts of drill waste and the small flow volume of Prairie Creek compared to the Nahanni River, the Review Board finds that impacts from this development will be limited to the Prairie Creek watershed.

To prevent the proposed development from having a significant adverse impact on water quality, the Review Board finds it necessary that the developer's commitments to adhere to PDAC's E³ Guidelines and to sample water at three locations on a weekly basis are implemented. In addition to the developer's commitments, the Review Board finds the following mitigation measure is required:

Measure (1): Government and regulatory authorities, within their area of responsibility or their jurisdiction, are to ensure that all drill waste is disposed of in a manner that does not allow any harmful substance to enter surface waters.

To further reduce the environmental impacts of the proposed development, the Review Board makes the following suggestions:

Suggestion (7): Government and regulatory authorities, within their area of responsibility or their jurisdiction, should ensure that the developer's commitments to mitigate or prevent impacts on water are implemented

Possible impacts resulting from creek crossings have already been addressed in section 4.4.

Concern over impacts on water quality in the Nahanni River from upstream mineral development was already expressed in UNESCO's original recommendation for world heritage status of Nahanni National Park Reserve in 1978 (UNESCO, 1978). Since then, considerable exploration activity has been ongoing in the Prairie Creek watershed and is reasonably foreseeable to be ongoing for some time (see section 4.1). In the past, water quality objectives in Prairie Creek have not always been met. [65].

The proposed development has the potential to contribute to cumulative effects in three ways: through introduction of sediment from erosion connected to road or drill pad construction, through introduction of harmful substances in connection with creek crossings, and through seeping of harmful substances from drill waste sumps. The Review Board has heard and seen evidence of erosion from past developments.

Similar to its conclusion under wildlife, the Review Board finds that this development is likely to contribute to cumulative effects on water quality. As with wildlife, the Review Board is of the opinion that these effects can be mitigated through proper environmental management, which requires sound environmental monitoring. To prevent the proposed development in combination with other developments from having significant adverse cumulative impacts on water quality, the Review Board finds that a comprehensive monitoring program is required. See section 4.8 for a measure regarding a monitoring program.

4.6 Economic

Evidence Summary

The public record does not contain much information on economic issues. According to the developer the project is seasonal and short term. The total workforce is expected to be about 12 people for a two to three month period over several years. The developer targets a minimum of 30% local hiring, depending on availability of qualified candidates. Contract opportunities (e.g. catering) exist as well. According to the developer the economic impact of this exploration program will be positive, but not significant. The developer expects local employment opportunities to involve Nahanni Butte, Fort Liard, and Fort Simpson. In 2004 the developer provided employment to ten northerners and spent 30% (\$700,000) of the total expenses in northern wages and contracts [81]. The DFN has raised the issue of economic impacts during the IR process but has not provided evidence of a negative impact or an unfair distribution of impacts and benefits.

Review Board Conclusion

The Review Board concludes the proposed development is not likely to result in an impact on the economic well being of residents of the Mackenzie Valley in a significant way. That is not to say that the opportunities for employment or contract work that the development will create are not important for those individuals in the affected communities who choose to participate in the wage economy.

The Review Board makes the following suggestion:

Suggestion (8): The developer should implement its commitment to maximize employment and contract opportunities for residents of the affected communities.

4.7 Cultural

Evidence Summary

An archeological database search through the Canadian Museum of Civilization, conducted on August 18, 2000, did not reveal any known archeological sites within the development area [25]. The developer has not found any evidence of archaeological or heritage sites during past exploration activities [81]. The probability of encountering archeological sites is considered low [81]. Consequently the developer is not prepared to hire an archeologist but is open to hiring an environmental monitor, who would also be tasked with checking proposed drill sites and road construction areas for signs of traditional use.

The Chief of the Nahanni Butte Dene Band stated at the hearing that his community is opposed to the development for “cultural reasons” [151]. No other evidence has been brought forward. The Nahanni Butte Dene Band has chosen not to participate actively in the environmental assessment citing ongoing litigation with the developer. CPAWS and the DFN recommended the use of an independent community monitor. [124, 125, 151]

Review Board Conclusion

The Review Board concludes that the development is not likely to cause significant adverse impacts on archeological resources. To minimize any potential impact, the Review Board suggests the developer follow through with its goal to employ an environmental monitor to inspect road alignments and drill pad locations for artifacts prior to any disturbance. With this mitigation in place, the Review Board concludes that the proposed development is not likely to impact the cultural well being of residents of the Mackenzie Valley in a significant way. See section 4.8 for more information regarding an environmental monitor.

4.8 *Public Concern and Cumulative Effects*

Evidence Summary

The Review Board provided the general public with two specific occasions to make its concerns known. Scoping sessions took place in individual communities, and a public hearing took place in Fort Simpson. The DFN and CPAWS submitted that their constituents have significant concerns with the proposed development [124, 125, 151]. Also, the Review Board received unsolicited submissions from members of the public expressing concern. The proposed development was referred to environmental assessment because of “public concern about the cumulative effects of this project on the South Nahanni Watershed”. To assess the significance of this public concern the Review Board examined the public record for evidence of public concern being expressed, as well as for evidence of cumulative effects as the root cause of the concern. In the Review Board’s opinion, public concern can be addressed by mitigating the cumulative effects on which the concern is based. This section describes the Review Board’s consideration of cumulative impacts and the related public concern.

The developer identified road and drill pad construction as having a potential for cumulative effects. In the developer’s opinion, there will be no significant cumulative effects because the affected area is small, and because the effects are reversible over time. Similarly, the developer found the potential impacts from erosion will be minimal because appropriate mitigation will be in place. The developer stated that any residual impact will not be cumulative because the impact will be of short duration. The developer suggested that wildlife disturbance would not contribute to any cumulative impact because the impact is temporary and there are no other disturbances that would add to those of this development. The developer identified cumulative economic effects that are expected to be positive. [81]

Continued industrial activities in close proximity to Nahanni National Park Reserve have the potential to negatively affect the park over time. The developer concludes, however, that given the distance to the park, the fact that effects will be limited to the project area, the reversibility of any effects, and the overall small effects on the environment, there will be no impact on the park by this development and therefore no cumulative impacts [81]. Parks Canada submitted that park visitors flying over the area consistently comment on the scarring of the landscape. In Parks Canada’s opinion adding to the road network has a cumulative effect on the value of the park [151].

CPAWS is of the opinion that the developer failed to conduct a proper cumulative effects assessment. CPAWS recommended that cumulative effects indicators and thresholds, as well as seasonal restrictions identified in the draft Deh Cho Land Use Plan should be assessed and managed by the developer. CPAWS further suggested that the Review Board look at other developments that are going on at the mine site during the same time. [124] The GNWT suggested that Canadian Zinc develop thresholds for acceptable development and include them in an environmental protection and monitoring plan [116]. The GNWT cautioned, however, that while numerical thresholds may be a valid concept, their practical application is still problematic [151].

CPAWS and the DFN recommended the use of an independent, community based environmental monitor to ensure that the developer lives up to the commitments it has made [124, 125]. CPAWS further explained that such a monitor would provide the affected communities with a sense of involvement and would be an important step towards building trust between communities and the developer [151]. The developer has stated that they are open to hiring an environmental monitor, if a qualified individual can be found. In the developer's view the environmental monitor should be an individual that the company can use for various tasks, such as water sampling required for this and other developments at the mine site. [151] In CPAWS's view, the environmental monitor should be specific to the development, should be independent from the developer and should not be utilized by the employer for unrelated tasks [151].

In the GNWT's view the developer's commitments are "the majority of what is necessary to ensure that the project will not have any significant environmental impacts on wildlife". In addition, the GNWT recommended an integrated long term monitoring program for all developments in the Prairie Creek area [143]. In the developer's opinion monitoring should be directed at potential impacts from this specific development. The developer did commit to maintaining a wildlife log at the mine site that will include recommendations by the GNWT regarding the type of information recorded [148].

CPAWS expressed concern that the regulatory regime frequently requires plans or reports of developers but that follow up is not always guaranteed. CPAWS is concerned that there may be plans and/or reports required of the developer, as a form of mitigation, but that there is no approval process for these plans and reports. Moreover, CPAWS is concerned that parties, such as communities, will not be privy to the plans and/or reports [151].

Review Board Conclusion

The Review Board finds that there is sufficient evidence on the public record to conclude that some public concern over cumulative effects on the Nahanni watershed exists. The number and nature of submissions does not however convince the Board that the level of this concern is significant enough to warrant an environmental impact review to consider the impacts of the proposed development.

The public concern that currently exists is, at least partially, based on the possibility of real adverse impacts on the environment, as described above. In the Review Board's opinion this concern would be greatly diminished if the public had assurance that the developer's commitments and the additional measures recommended by the Review Board would be effectively implemented. The best way for the public to receive this assurance is through an independent environmental monitor who reports back to the affected communities.

The Review Board finds that this area is likely to experience cumulative, significant environmental impacts on fish, water and wildlife resulting from past, present and future developments (see section 4.1). The Board has now assessed four developments in this immediate area within the last four years. The developer has publicly announced plans to open a mine. A winter road to the area is likely to be re-opening soon. There are many

compelling indications that development will expand and escalate in this area in the future. This will cause significant adverse impacts on the environment unless appropriate environmental management occurs.

To properly manage the environment in the Prairie Creek area, the developer needs information on the actual combined effects of past and present developments. The Review Board is of the view a cumulative impacts monitoring program for the Prairie Creek watershed is required in order to prevent significant adverse cumulative impacts by the proposed development in combination with other developments. Effects on vegetation, fish and wildlife, as well as water quality in Canadian Zinc's lease and claims area as well as a portion of Prairie Creek downstream should be monitored, evaluated, and managed through one program, rather than through disjointed programs for individually permitted developments.

The developer has made no commitment regarding a comprehensive monitoring program for all developments at the Prairie Creek property. On the contrary, the developer has stated its intention to focus any monitoring on the proposed development only.

The Review Board is of the view that the full responsibility for monitoring, evaluation and management should not necessarily rest on the developer alone. Expert agencies of the government, such as DIAND, Environment Canada, DFO, and GNWT-ENR should be involved cooperatively in the design of this comprehensive monitoring program. They should also be involved in the conduct of monitoring for this program. In particular, expert government agencies should have a role in the evaluation of monitoring results.

The Review Board recognizes that the development of such a monitoring program may take some time and that it would be unreasonable to require it to be in place prior to issuing authorizations for the proposed development.

In the Review Board's view the program to monitor, evaluate and manage key indicators, described above, would not only enable the developer to conduct quality environmental management, it would also contribute to the mitigation of the impacts that cause the public concern.

To prevent the proposed development, in combination with other past, present, and reasonably foreseeable future developments, from having significant adverse impacts on the environment, the Review Board finds the following measures necessary:

Measure (2): The developer shall make every reasonable effort to employ a local person, selected in consultation with the Dehcho First Nations, as a community environmental monitor, who will independently report back to the Dehcho First Nations.

Measure (3): DIAND shall ensure that a comprehensive program to monitor selected key indicators for evaluating and managing cumulative impacts on fish, wildlife, vegetation, and water quality is implemented, no later than nine (9) months after acceptance of this report by the federal Minister. Design and implementation of this program shall take place in cooperation with the developer, relevant federal government departments, the GNWT, and the Dehcho First Nations. The monitoring program is to cover Canadian Zinc's lease and claims area as well as a portion of Prairie Creek downstream.

To further address existing public concerns over environmental impacts of this development the Review Board makes the following suggestion:

Suggestion (9): The developer should report annually on the implementation of each of the commitments listed in section 2.2.3 to the Parties of this Environmental Assessment.

5 Environmental Assessment Conclusions

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 Environmental Assessment and the commitments made by Canadian Zinc Corporation the proposed development is not likely to have a significant adverse impact on the environment, or be cause for significant public concern. It should therefore proceed to the regulatory phase or approvals.

The remainder of this section summarizes the Review Board's main findings and lists the measures it deems necessary to prevent the proposed development from being a likely cause of significant adverse impacts on the environment. It also lists the Review Board's suggestions to further reduce possible impacts on the environment, and it describes the areas within or outside the Mackenzie Valley the development is likely to have an effect on.

5.1 *Significant Adverse Impacts and Public Concern*

The Review Board finds that the proposed development by itself is likely to have a significant impact on the environment if certain commitments by the developer as well as additional mitigation are not implemented.

In the Review Board's opinion the proposed development is likely to cause significant adverse impacts on the environment, without additional mitigation, through the introduction of harmful substances from drill waste disposal. For all the other issues that it examined, the Review Board concludes that significant adverse impacts on the environment from the proposed development by itself can be prevented as long as the developer's commitments are being implemented and maintained over the duration of the development.

While the public record contains various suggestions for timeframes during which development should be prohibited, the Review Board finds that the only reasonable time restrictions are the prohibition of crossing Prairie Creek, or other creeks with suitable habitat, prior to June 15 and after August 30th.

The Review Board recommends that approval of the proposed development be made subject to mitigation measures (1) to (3), listed below. The Review Board further recommends that suggestions (1) to (9), listed below, be implemented. For a complete list of all developer commitments see section 2.2.3, for a complete list of measures and suggestions see section 5.2.

Cumulative impacts refer to impacts that result from the proposed development in combination with all other past, present or reasonably foreseeable future developments. A variety of industrial developments have occurred in the Prairie Creek area, and developments continue in the area (see section 4.1). The Review Board found that several aspects of the proposed development are likely to cause significant adverse cumulative impacts on the environment, in combination with impacts from other past,

present, or reasonably foreseeable future developments. The sensitivity of the environment in which the proposed development is situated contributed to this determination.

The Review Board finds that significant adverse cumulative impacts on the environment can be prevented with adequate environmental management. The Review Board further finds that sound environmental monitoring is a prerequisite for environmental management. Such environmental management and monitoring is made easier in this area because all developments in the area are owned and operated by the same company and are intrinsically linked to each other. Because of this, the environmental management of all of these developments can be effectively harmonized to avoid cumulative impacts.

The Review Board therefore concludes that in order to avoid significant cumulative impacts on the environment from this development, in combination with other past, present and reasonably foreseeable future developments, a comprehensive monitoring program is required to enable Canadian Zinc to conduct effective environmental management of the cumulative impacts caused by its activities. The Review Board therefore recommends that approval of the proposed development be made subject to the three (3) mitigation measure listed below.

The Review Board finds that the proposed development is not likely to be cause for significant public concern as long as all of the developer's commitments (see section 2.2.3) and all of the Review Board's measures (see section 5.2) are implemented. In addition to measures designed to prevent or minimize individual impacts, the Review Board concluded that a comprehensive monitoring program as well as an independent environmental monitor are required to avoid cumulative effects from generating significant public concern.

5.2 Measures and Suggestions

The measures listed below are the actions necessary to prevent or mitigate environmental impacts that the Review Board has identified in this report of Environmental Assessment. These measures will reduce the likelihood of significant adverse impacts on the environment so that the proposed development may proceed. Without the implementation of these measures, the Review Board's conclusion about the significance of the impacts and the acceptability of the Canadian Zinc development would be invalid.

Measure (1): Government and regulatory authorities, within their area of responsibility or their jurisdiction, are to ensure that all drill waste is disposed of in a manner that does not allow any harmful substance to enter surface waters.

Measure (2): The developer shall make every reasonable effort to employ a local person, selected in consultation with the Dehcho First Nations, as community environmental monitor, who will independently report back to the Dehcho First Nations.

Measure (3): DIAND shall ensure that a comprehensive program to monitor selected key indicators for evaluating and managing cumulative impacts on fish, wildlife, vegetation, and water quality is implemented, no later than nine (9) months after

acceptance of this report by the federal Minister. Design and implementation of this program shall take place in cooperation with the developer, relevant federal government departments, the GNWT, and the Dehcho First Nations. The monitoring program is to cover Canadian Zinc's lease and claims area as well as a portion of Prairie Creek downstream.

Suggestions represent mitigation the Review Board finds helpful in further reducing the environmental impact of the proposed development. Their implementation is not a pre-requisite for development approval.

Suggestion (1): Government and regulatory authorities, within their area of responsibility or their jurisdiction, should ensure that the developer's commitments that mitigate or prevent impacts on vegetation are implemented.

Suggestion (2): DIAND should ensure incremental reclamation of road sections that are no longer in use, or that DFO has advised against using.

Suggestion (3): Government and regulatory authorities, within their area of responsibility or their jurisdiction, should ensure that the commitments that mitigate or prevent impacts on wildlife are implemented.

Suggestion (4): In addition to implementing the GNWT's "Preventing and Responding to Bear Encounters" guidelines, the developer should also consult with Nahanni National Park Reserve staff when revising its health and safety plan.

Suggestion (5): Government and regulatory authorities, within their area of responsibility or their jurisdiction, should ensure that the developer's commitments that mitigate or prevent impacts on fish are implemented.

Suggestion (6): Government and regulatory authorities should pay particular attention that the developer does not allow any harmful substance to enter the Prairie Creek system through any creek crossing.

Suggestion (7): Government and regulatory authorities, within their area of responsibility or their jurisdiction, should ensure that the developer's commitments to mitigate or prevent impacts on water are implemented.

Suggestion (8): The developer should implement its commitment to maximize employment and contract opportunities for residents of the affected communities.

Suggestion (9): The developer should report annually on the implementation of each of the commitments listed in section 2.2.3 to the Parties of this Environmental Assessment.

5.3 Other Considerations

Pursuant to s. 128 (4) of the MVRMA the Review Board determines that the development by itself is likely to have significant adverse impacts on the Prairie Creek watershed within the developer's mineral leases and claims, as well as on a portion of Prairie Creek downstream of the development. The Review Board further determined that the proposed development in combination with other past, present and reasonably

foreseeable future developments is likely to have a cumulative impact on the same area as well as on the Nahanni River watershed to the extent that the ranges of the various affected animal species are concerned. In the Review Board's opinion the proposed development is not likely to have any impacts on the environment outside the Mackenzie Valley.

Section 79 of the SARA requires any person conducting an environmental assessment to notify the competent Ministers in writing if the proposed development is likely to affect a listed species or its critical habitat. (Canada, 2004) Environment Canada and the GNWT are responsible for SARA in the NWT. Both Ministers were parties to this assessment. The Review Board followed their advice in determining whether an adverse impact on a listed species is likely. The Review Board finds that the proposed development itself is not likely to have significant effects on a species protected under SARA. The Review Board is of the view that this report meets its responsibilities under SARA.

6 References

6.1 Public Record

Registry Item No.	Document Name	Date Received	Originator
1a	Request for amendment LUP	20/04/2004	Alan Taylor, Can Zinc Corp.
1b	Board Decision amendment request	01/06/2004	M. McLeod-MVLWB
2	Maps/claims & leases	03/05/2004	Sarah Baines-MVLWB
3	Comments redraft abandonment & restoration	07/05/2004	Jennifer Morin, CPAWS
4	Request for amendment LUP	10/05/2004	Karen Felker West Point First Nation
5	Phase II Drilling amendment request	11/05/2004	J. David Tyson, DFO
6	Phase II Drilling amendment request	18/05/2004	Laura Pitkanen, DCFN
7	Phase II Drilling amendment request	14/05/2004	Edward Hornby, DIAND
8	Phase II Drilling amendment request-review	19/05/2004	Chuck Blyth, Parks Canada
9	Phase II Drilling amendment request-review	20/05/2004	Anne Wilson-Environment Canada
10	Blank No.		none
11	EA0405-02 CZN Expansion	08/06/2004	Alan Ehrlich, MVEIRB
12	CZN expansion EA distribution list	08/06/2004	Alan Ehrlich, MVEIRB
13	CORRECTION-deadline error	11/06/2004	Alan Ehrlich, MVEIRB
14	EA drilling expansion	22/06/2004	Alan Ehrlich, MVEIRB
15	Follow-up to June 8 & 22 correspondence	03/08/2004	Kimberley Cliffe-Phillips, MVEIRB
16	Email inquiry forward to Martin	09/08/2004	Bill Atwell
17	Requested visit	29/10/2004	Heidi Wiebe, DC Land Use Planning Committee
18	Park management plan - Nahanni National Park Reserve	16/10/2004	Herb Norwegian, DFN
19	Nahanni Butte Park Extension and MVEIRB response	03/11/2004	Vern Christensen, MVEIRB
20	Development description	04/08/2004	Alan Taylor, Can Zinc Corp.
21	CPAWS submission re screening procedures	20/10/2004	Greg Yeoman, CPAWS
22	Intention to submit project description	22/12/2004	David Harpley, Canadian Zinc
23	Fuel Spill contingency plan	04/01/2005	Canadian Zinc
24	Detailed development description & CD	06/01/2005	David Harpley, Can Zinc
25	Detailed development description	01/12/2004	Canadian Zinc
26	Possible MVEIRB Scoping Session	08/02/2005	Mary Tapsell, MVEIRB
27	Correspondence w/developer participation in scoping	08/02/2005	David Harpley, Canadian Zinc
28	CZN Scoping session-response	09/02/2005	Laura Pitkanen, DCFN
29	Process update	11/02/2005	Martin Haefele, MVEIRB

30	Misc correspondence re scoping sessions	14/02/2005	David Harpley, Canadian Zinc
31	Meeting notes Info session March 3/05	02/03/2005	Patrick Duxbury, MVEIRB
32	Support letter for Canadian Zinc	14/03/2005	Mayor Michaud, Mayor of Fort Simpson
33	Response to Item #32	15/03/2005	Mary Tapsell, MVEIRB
34	List of attendees YK scoping meeting	03/03/2005	Patrick Duxbury, MVEIRB
35	Conservation concerns	04/02/2005	John Weaver, Wildlife Conservation Society
36	Addendum to Item #35	04/02/2005	John Weaver, Wildlife Conservation Society
37	Scoping sessions schedule	18/02/2004	Mary Tapsell, MVEIRB
38	Proposed phase 3 surface drill exploration	22/02/2005	Mayor Michaud, Mayor of Fort Simpson
39	Community visits	24/02/2005	Patrick Duxbury, MVEIRB
40	Comments	15/03/2005	Ken Leishman, DIAND
41	Comments redraft abandonment & restoration	15/03/2005	Ernie Watson, DFO
42	Note to distribution list re additions to PR	23/03/2005	Martin Haeefe, MVEIRB
43	Draft Terms of Reference & Work Plan	29/03/2005	MVEIRB
44	DVD Video presentation information	31/03/2005	Alan Taylor, Can Zinc
45	Scoping session report	11/04/2005	Patrick Duxbury, MVEIRB
46	Scoping meeting cancellation-Nahanni Butte	04/04/2005	Chief Eric Betsaka, NB Dene Band
47	Nahanni Watershed	11/04/2005	Laura Pitkanen, DCFN
48	Scoping session report to distribution list notice	12/04/2005	Patrick Duxbury, MVEIRB
49	Note of meeting Jonas Antoine/Martin	12/04/2005	Martin Haeefe, MVEIRB
50	Draft ToR and Work Plan	12/04/2005	Chuck Blyth, Parks Canada
51	Comments on ToR/Draft Work Plan	12/04/2005	Laura Pitkanen, DCFN
52	ToR/ Work Plan comments	12/04/2005	Anne Wilson-Environment Canada
53	Comments draft ToR/Work Plan	12/04/2005	Alan Taylor, Canadian Zinc
54	Draft ToR and Work Plan-comments	12/04/2005	Shannon Ward, DIAND
55	Draft ToR/Work Plan-comments	12/04/2005	Ernest Watson, DFO
56	Comments-draft ToR/Work Plan	12/04/2005	RP Bailey, GNWT
57	Proposed expansion Nahanni National Park Reserve	13/04/2005	Andy Scott, DIAND
58	Comments Draft ToR/Work Plan	13/04/2005	Ernest Watson, DFO
59	Addition to distribution list	01/02/2005	Laura Pitkanen, Dehcho First Nations
60	Developers comments on draft ToR	12/04/2005	Alan Taylor, Canadian Zinc
61	ToR distribution letter	25/04/2005	Martin Haeefe, MVEIRB
62	Bull trout/life history/habit requirements in South/central Mackenzie Valley	04/05/2005	Neil J. Mochnacz
63	Mineral & Surface Lease Maps	04/05/2005	MVEIRB

64	Protecting the waters of Nahanni National Park Reserve	04/05/2005	Environment Canada
65	Protecting the Aquatic Resources of Nahanni National Park Reserve	04/05/2005	Environment Canada
66	Overview of River Conditions	04/05/2005	Environment Canada
67	Hypotheses and preliminary experimental design for investigating impact of helicopter disturbance on Dall's sheep.	01/11/1996	Alejandro Frid, Boreal Research Associates
68	Fleeing decisions by Dall's sheep exposed to helicopter over flights	01/11/1999	Alejandro Frid, Boreal Research Associates
69	Behavioral responses by Dall's sheep to over flights by fixed wing aircraft	01/11/1999	Alejandro Frid, Boreal Research Associates
70	Govt of Yukon MERG report "Flying in Sheep Country"	05/05/2005	Fish & Wildlife Branch
71	Land Use Guidelines recommended	23/05/2001	Fish & Wildlife Branch
72	Additions to CZN public registry notice	04/05/2005	Martin Haefele, MVEIRB
73	Further additions to public registry	04/05/2005	Martin Haefele, MVEIRB
74	CBC Public Announcements community visits	01/04/2005	MVEIRB
75	Water Quality data for Prairie Creek	03/05/2005	MVEIRB
76	Approval of Geotech report	04/05/2005	MVLWB
77	Distribution list interested parties notice	05/05/2005	Martin Haefele, MVEIRB
78	Parks Standing requests	16/05/2005	Parks Canada
79	Mining guidelines Yukon & BC	18/05/2005	Lorraine Seale, DIAND
80	Confidentiality aerial photographs	20/05/2005	MVEIRB/Canadian Zinc
81	DAR Phase 3 drilling exploration	16/05/2005	Dave Harpley/Alan Taylor, Canadian Zinc
82	DAR Conformity/IR	31/05/2005	Patrick Duxbury, MVEIRB
83	Conformity check	07/06/2005	Martin Haefele, MVEIRB
84	Permission authorization	24/05/2005	Neil Mochnacz
85	Aerial photographs	31/05/2005	Martin Haefele/Alan Taylor
86	DAR/IR opportunity	01/06/2005	Patrick Duxbury/Martin Haefele
87	Additions to CZN public registry notice	06/06/2005	Martin Haefele, MVEIRB
88	IR Response from Dehcho First Nations and Nahanni Butte Dene Band	21/06/2005	Laura Pitkanen, Decho First Nations
89	IR Response from GNWT	22/06/2005	RP Bailey, GNWT
90	IR Response from DIAND	22/06/2005	Lorraine Seale, DIAND
91	IR Response from Parks Canada	22/06/2005	Chuck Blyth, Parks Canada
92	CZN IRs	22/06/2005	Anne Wilson-Environment Canada
93	CPAWS -NWT IRs	23/06/2005	Jennifer Morin, CPAWS
94	IR submissions of parties	12/07/2005	various
95	Submission of IRs	12/07/2005	Canadian Zinc
96	Site visit announcement	05/07/2005	Martin Haefele,

			MVEIRB
97	Letter	14/07/2005	Canadian Zinc
98	Request for Ruling letter for EA 0405-002	15/07/2005	Martin Haefele, MVEIRB
99	Reason for decision on Request for ruling re CPAWS	25/07/2005	Gabrielle Mackenzie-Scott, MVEIRB
100	Request for Ruling letter for EA 0405-002	19/07/2005	Herb Norwegian, DFN
101	Response to developers recent request for ruling	20/07/2005	Martin Haefele, MVEIRB
102	CPAWS-NWT party status in CZN	19/07/2005	Devon Page, Sierra Legal Defence
103	CPAWS status as intervener letter	19/07/2005	R.P. Bailey, GNWT
104	Request for ruling response	19/07/2005	Chuck Brumwell, Environment Canada
105	Request for ruling response	19/07/2005	Chuck Blyth, Parks Canada
106	Request for MVEIRB response letter	21/07/2005	Martin Haefele, MVEIRB
107	Original letter of item #102	19/07/2005	Devon Page, Sierra Legal Defence
108	Response to telecon D.Harpley(July28/05)	28/07/2005	Martin Haefele, MVEIRB
109	Technical Analysis Report	29/07/2005	Martin Haefele, MVEIRB
110	Status of CPAWS opposed to Canadian Zinc	02/08/2005	John F. Kearney, CZN
111	Response to IRs re EA of CZN	04/08/2005	David Livingstone, DIAND
112	Response to IRs re grizzly activity	05/08/2005	Chuck Blyth, Parks Canada
113	Response to IRs EA 0405-02	12/08/2005	Alan Taylor, Canadian Zinc
114 115	Info request responses conference	12/08/2005 19/08/2005	Canadian Zinc Corp Martin Haefele, MVEIRB
116	Response to Round 2 IR	24/08/2005	RP Bailey, G NWT
117	Response to Round 2 IR	24/08/2005	Ernest Watson, DFO
118	Additions to public registry	24/08/2005	Martin Haefele, MVEIRB
119	Non-Tech summary Phase III surface drilling	01/08/2005	Kim Schlosser, Parks Canada
120	Phase III technical Report	01/08/2005	Kim Schlosser, Parks Canada
121	Pre-hearing conference worksheet	06/09/2005	Environment Canada
122	Request for technical reports	07/09/2005	David Livingstone, DIAND
123	Tech report for pre-hearing conf	07/09/2005	Chuck Brumwell, Environment. Canada
124	Summary of concerns	05/09/2005	CPAWS
125	Submission of concerns	06/09/2005	Laura Pitkanen, DCFN
126	Pre-hearing worksheet	09/09/2005	Martin Haefele, MVEIRB
127	Response to comments	27/09/2005	David Harpley, CZN
128	Info feasibility studies	27/09/2005	Kevin McNamee, Parks Canada

129	Additional info guideline documents	26/09/2005	Erica Janes, CPAWS
130	Hearing Presentations	28/09/2005	Jennifer Morin, CPAWS
131	Parks Canada presentation -CZN hearing	28/09/2005	Kim Schlosser-Parks Canada
132	Request for Submission PH -Simpson	28/09/2005	David Livingstone, DIAND
133	Environments Canada submission for PH	28/09/2005	Peter Blackall, Environment Canada
134	Digital files of Greater Nahanni Ecosystem	28/09/2005	Steve Catto, Parks Canada
135	EA CZN Drilling Phase II-follow up pre-hearing Conference	05/10/2005	David Livingstone, DIAND
136	DFO Tech Rpt-CZN Phase II Drilling	05/10/2005	Ernest Watson, DFO
137	Hearing Presentations-CZN Drilling	06/10/2005	Dehcho First Nations
138	Participation sign-in listing-CZN Hearing	06/10/2005	MVEIRB
139	CZN Hearing Fort Simpson, Oct 6-05	06/10/2005	MVEIRB
140	Prairie Creek Mine- an untapped resource...		Canadian Zinc Corp
141	Environment Canada letter on undertaking 1 from hearing	12/10/2005	Environment Canada
142	Dehcho FN additional comments after hearing	18/10/2005	DFN
143	GNWT letter re undertaking 2 from hearing	18/10/2005	GNWT
144	CZN letter re undertaking 2 from hearing	18/10/2005	GNWT
145	CZN letter re undertaking 3 from hearing	19/10/2005	CZN
146	Hearing Presentation - Parks Canada	07/10/2005	Parks Canada
147	Letter to MVEIRB. Oct 20. GNWT-DCFN reply.doc	20/09/2005	CZN
148	CZC Letter to GNWT. Oct11 05.pdf	19/10/2005	GNWT
149	CZN letter to DFO re commitments	18/10/2005	CZN
150	DFO - Prairie Creek Crossing - CZN Phase III Drilling (2005 -10-21)	20/10/2005	DFO
151	CZN- Phase 3 Drilling-Public hearing transcript	06/10/2005	Digitran

6.2 Other References

Canada (2002): “Species At Risk Act”; [2002, c. 29]; Consolidated Statutes of Canada, Canadian Legal Information Institute, Department of Justice, Ottawa, 2002.

Canadian Zinc (2005): “Interim Report and Financial Results for Third Quarter and Nine Months ended September 30, 2005” Press Release by Canadian Zinc Corporation November 10, 2005, Vancouver; retrieved from www.canadianzinc.com

Canadian Zinc (2001): “Prairie Creek Mine, Northwest Territories, Scoping Study” Canadian Zinc Corporation, January 29, 2001, Vancouver; retrieved from www.canadianzinc.com

Cody, WJ; MacInnes, KL; Darbyshire, SJ (2000): “Alien and invasive native vascular plants along the Norman Wells Pipeline, District of Mackenzie, Northwest Territories.”, Canadian Field Naturalist, 2000, vol. 114, no. 1, pp. 126.

COSEWIC (2005a): “Species Search”, retrieved from
http://www.cosewic.gc.ca/eng/sct1/index_e.cfm.

COSEWIC (2005b): “COSEWIC and the Species at Risk Act”, retrieved from
http://www.cosewic.gc.ca/eng/sct6/sct6_6_e.cfm

Dickson, Ellesworth (2005): “Canadian Zinc Proceeding Toward Production” in
Resource World Magazine, retrieved from www.canadianzinc.com

Environment Canada (2005): “Terrestrial Ecozones of Canada” retrieved
http://www.ec.gc.ca/soer-ree/English/Framework/NarDesc/canada_e.cfm

MVEIRB (2001): “Report of Environmental Assessment on the Canadian Zinc
Corporation Phase II Mineral Exploration Drilling Program”, Mackenzie Valley
Environmental Impact Review Board, Yellowknife.

MVEIRB (2004): “Environmental Impact Assessment Guidelines”, Mackenzie Valley
Environmental Impact Review Board, March 2004, Yellowknife.

Parks Canada (2005): “Nahanni National Park Reserve”, retrieved from
http://www.pc.gc.ca/pn-np/nt/nahanni/index_e.asp

UNESCO (1978): “Advisory Body Evaluation: Nahanni, Canada” United Nations
Educational Scientific and Cultural Organization, retrieved from
<http://whc.unesco.org/en/list/24>