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MEMORANDUM

File:	**Environmental Monitoring Advisory Board – Diavik Diamond Mine Closure and Reclamation Workshop**
To:	**Environmental Monitoring Advisory Board**
Attention:	**Mr. John McCullum (Executive Director)**
Subject:	**Workshop Final Report**
Author:	**Joe Murdock, Jamie VanGulck, Ph.D., P.Eng.**
Page Total:	**12 + Annexes**
Date:	**February 4th, 2009**

Preamble

Further to the Environmental Monitoring Advisory Board (EMAB) November 7th, 2008 issued *Terms of Reference*, Arktis Solutions Incorporated (ASI) was retained to provide approximately ten (10) person days of service to organize, develop, present and report on a *Closure and Reclamation Workshop* (hereafter referred to as the "*Workshop*"). The Workshop aimed and achieved in introducing Workshop participants to the first principles of mine closure and reclamation, the definitions of closure objective and closure criteria, and provided an outlet for community members to vocalize generalized concern. The Workshop also allowed for participant input on how communities believe they can best be involved in the review of Rio Tinto Limited's Diavik Diamond Mine Interim Closure and Reclamation Plan (ICRP).

This *Memorandum*, to be submitted within three (3) weeks following the Workshop closing, provides a summary of the Workshop, held January 13th, 2009 – January 15th, 2009 at the Explorer Hotel, Yellowknife and at the Diavik Diamond Mine. The Workshop was coordinated by Mr. John McCullum and was attended by EMAB board members and staff, community members, federal and territorial government employees, and representatives from Rio Tinto Limited.

1.0 - Introduction

EMAB was created pursuant to **Article IV** of the Environmental Agreement[1] ("*Agreement*") and mandated[2], in short, to implement an integrated and co-operative approach to achieve *Agreement* purposes and implement the *Agreement* guiding principles as per **Article I**. Signatories to the *Agreement* include the Government of Canada, Government of the Northwest Territories, Diavik Diamond Mines Inc., Tlicho Government, Lutsel K'e Dene First Nation, Yellowknives Dene First Nation, North Slave Métis Alliance and the Kitikmeot Inuit Association. To fulfill its responsibilities, EMAB serves as a public regulatory watchdog offering recommendations to the Minister of DIAND on matters including wildlife harvesting, the participation of Aboriginal Peoples through environmental training initiatives and monitoring programs and the need for and design of traditional knowledge and other studies. EMAB also acts as a vehicle to provide a meaningful role for each of the Aboriginal Peoples[3] in the review and implementation of Diavik Diamond Mine environmental monitoring plans. Finally, EMAB functions as an independent advisory body (apart from the *Agreement* Signatories), who provides an unbiased review of environmental documents. These reviews form interventions filed and considered by Institutes of Public Government (i.e., Wek'eézhíí Land and Water Board) as per federal legislation. An EMAB hosted Workshop also satisfies EMAB's mandate to facilitate programs and disseminate information to community members and the general public on matters relating the state of the environment.

This *Memorandum* serves to develop recommendations related to participant and the group development of closure objectives and closure criteria, ways in which communities can be involved in the development and review of the, yet to be submitted, third iteration of the ICRP. This *Memorandum* will also report on generalities from the workshop. As explicitly scoped, this project was to engage and inform participants on introductory mine closure and reclamation first principles and was not geared towards the specifics of the Diavik Diamond Mine. ASI exercises did include elements of the Diavik Diamond Mine, but as stated to EMAB and all participants, these elements were to be considered hypothetical in nature and viewed in similar light to any other mine development. Participants were to be exposed to the commonalities found in general mine closure and reclamation scenarios, with the concepts of closure objectives and criteria explained in detail and reinforced through instruction and applied exercises. The hypothetical exercises were to support delivered concepts and give participants experience in forming their own mine closure objectives and criteria.

ASI has not interpreted or evaluated Rio Tinto Limited's specific plans and strategies for the closure and reclamation of the Diavik Diamond Mine, nor has ASI reported or commented on participant opinions of how Diavik should be reclaimed. These aspects lie outside of the

[1] Created March 8th, 2000 and found at http://www.emab.ca/pdfs/diavik_enviro_agree.pdf.
[2] For a more thorough and accurate portrayal of EMAB's mandate, the Reader is referred to **Part 2** of **Article IV** in the *Agreement*.
[3] As defined under **Article III** of the *Agreement*.

scope of this Workshop and are to be completed through successive efforts by Rio Tinto Limited and the Wek'eézhíí Land and Water Board. Outlets under these groups may prove to be a more responsible forum to discuss and evaluate Diavik Diamond Mine closure and reclamation specifics. EMAB is also staging an independent review of the next iteration of the ICRP at a later date.

2.0 – Workshop Objectives

ASI's primary objective was to successfully engage participants into a discussion centered towards closure and reclamation principles. Workshop material and delivery format was developed to satisfy the following Workshop objectives set out in the ASI's *Proposal for Consulting Services*:

i. Discussions on the basic concepts of closure and reclamation and associated scientific first principles and Traditional Knowledge related to closure and reclamation engineering and strategy;
ii. A review of closure and reclamation elements through aerial photographs, schematics, other visual materials and resulting discussions. Regulatory elements and discussion can also be examined;
iii. Roundtable discussions on closure objectives and closure criteria with aim and intent to establish individual participant viewpoints and opinions on the subjects;
iv. Roundtable discussions identifying potential community and participant concern over closure and reclamation practices and future development. This discussion will aim to understand how communities may be involved in the development and review of a revised Diavik ICRP; and,
v. Presentations from Rio Tinto Limited, Department of Indian Affairs and Northern Development (DIAND), Wek'ézhíí Land and Water Board (WLWB) with accompanying question and answer periods.

As reported in **3.0 Workshop Summary**, a series of ASI and guest lectures, alongside interactive applied breakout sessions, formed the backbone of material delivery.

3.0 – Workshop Summary

On December 3rd, 2008 a project initiation meeting between ASI and Mr. John McCullum confirmed Workshop objections and direction. A draft Workshop agenda was then created and presented to EMAB on December 12th, 2008 for approval. Frameworks for breakout session exercises were then developed and provided to Mr. John McCullum for review on December 15th, 2008 – December 19th, 2008.

ASI contacted DIAND and WLWB on December 16th, 2008 to request their involvement in the Workshop and seek out their respective interest in presenting material. Both parties consented to providing a presentation to participants. Rio Tinto Limited was also contacted, on December 17th, 2008, to provide two Workshop presentations. Rio Tinto Limited agreed to present history of closure at the site and associated techniques employed to date and future Diavik reclamation plans such as those proposed in the third iteration of the ICRP.

On December 23rd, 2008, ASI met with Mr. Doug Ashbury, of Rio Tinto Limited, at his Yellowknife office to view photographs of Diavik made available for ASI breakout session exercises. Although initially considered, and offered by Rio Tinto Limited, ASI determined that the use of the Rio Tinto Limited large scale magnet model and/or conceptual physical model would not adequately complement Workshop material. These models were not used in the Workshop.

ASI met with EMAB on January 7th, 2009 to provide a general update on progress and solicit other visual materials for the Workshop. A final agenda, adopted for use, was provided to participants via email January 7th, 2009 and a pre-Workshop meeting was held on January 12th, 2009 between ASI and EMAB staff to outline ASI presentation materials and seek Client input.

The following ASI materials were provided for the Workshop and are annexed to this *Memorandum*:

i. Workshop Agenda (**Annex A**)
ii. Breakout Session *Briefing Notes* (**Annex B**)
iii. Breakout Session Instructions (**Annex C**)
iv. Breakout Session Participant Notes (**Annex D**)
v. Rio Tinto Limited, DIAND and WLWB PowerPoint Presentations (**Annex E**)
vi. Registered Participant List (**Annex F**)

The Workshop format included two *in-class* activity days that sandwiched a site visit to the Diavik Diamond Mine. A summary of each day of activities is provided below.

[Day One – January 13th, 2009]

Day One of the Workshop was held in Katimavik A of the Explorer Hotel in Yellowknife, NT. The Workshop began with general opening remarks from ASI facilitator Mr. Joe Murdock, EMAB Chairman Mr. Doug Crossley and an opening prayer led by Tlicho community member Mr. Michel-Louie Rabesca. Roundtable introductions followed where Workshop participants outlined expectations, desired outcomes and their personal conceptions on mine closure and reclamation.

The importance of terminology, definitions and translation was discussed and reiterated throughout the entire Workshop. Even though this was not a translation workshop, participants were given the opportunity to flag any topic that is not completely understood

with respect to language translation. This was done to ensure that Workshop elements were not lost in translation. During the breakout session exercises, ASI provided additional attention to groups where technical translation was most needed.

Workshop participants were eased into the concept of mine closure through an ASI-led lecture module that introduced the mine life cycle, along with, mine operations and typical infrastructure found at mine sites. This included a ten (10) minute excerpt from the Natural Resources Canada-Ontario Ministry of Northern Development and Mines joint video production[4] which demonstrated mineral extraction and processing activities.

Participants were given an overview of the four (4) main phases of mining (exploration, development, operation and closure) and on the importance of incorporating the idea of closure throughout the entire mining cycle. Mine operations, through the stages of excavation, separation/milling and the production of end products, were discussed and participants acknowledged that mine by-products generally exist as waste that must be managed and considered at the mine end-of-life.

Participants were then lectured on, and provided examples of, various mine infrastructure that generally exist at site. Familiarizing participants with infrastructure generally found at mines serves a twofold reason. Firstly, an infrastructure review allowed for visualization of various mine components and activities that may be viewed during the Diavik Diamond Mine site visit and, secondly, introduced participants to the concept that the type of infrastructure at site, or to be installed in the future at site, plays a role in the development of closure objectives and criteria. The understanding and knowledge of infrastructure inventory and quantities and qualities of waste at site assists those in determining appropriate paths of action through closure criteria and closure objectives. Elements of a reclamation plan, reclamation stages, and the topic of mine financial assurance/security were also discussed.

Mr. Gord Macdonald and Ms. Colleen English (Rio Tinto Limited) provided participants with a general facilities overview and a history of closure and reclamation at the Diavik Diamond Mine Site. During the latter, Rio Tinto Limited outlined the decision path in evaluating and determining a selected alternative for such aspects as mining method, infrastructure siting and infrastructure design (water management and treatment, processed kimberlite containment area), and outlined past closure objectives stated in earlier iterations of the ICRP. PowerPoint slides for these presentations have been attached to this *Memorandum* via **Annex E**.

Throughout the Workshop, participants referred to the phrase "*the land and site should return to how it was before a mine*" when communicating closure objectives and criteria. The rationale behind Breakout Session One (1) allowed participants to examine and communicate their personal perspective on this commonly used phrase and offer a definition through illustration and/or a listing of spatially delineated characteristics/trends

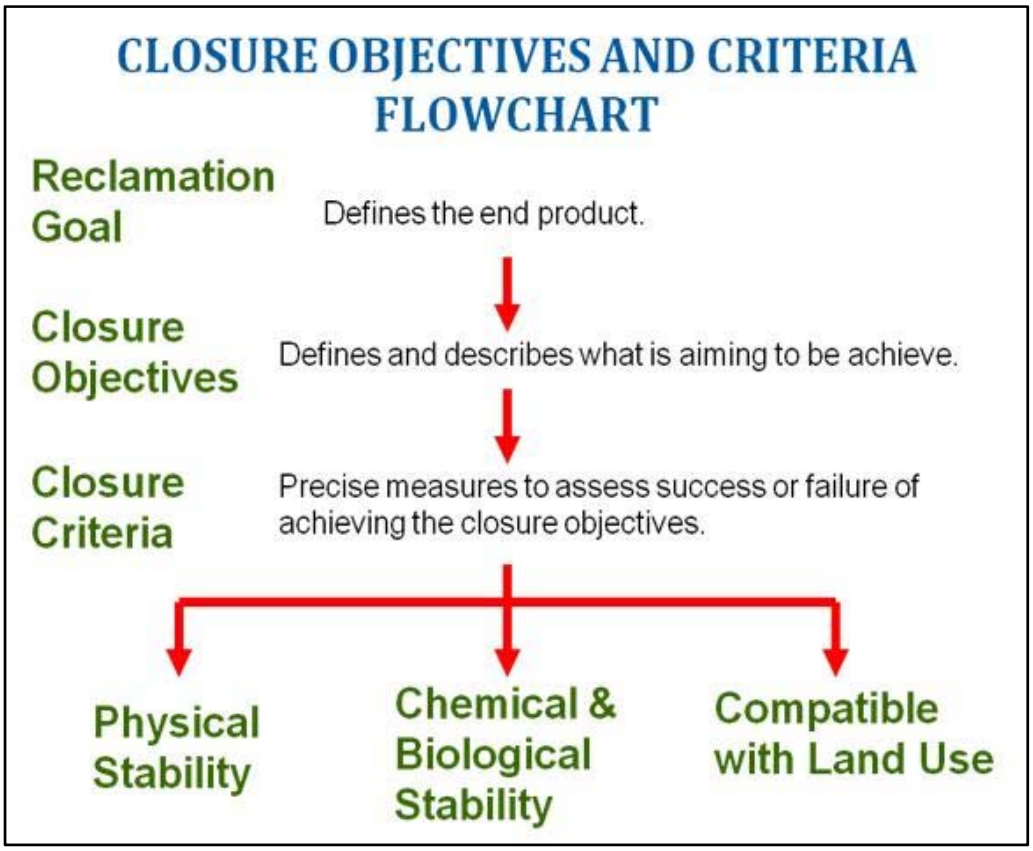
[4] NRCAN "Our Community... Our Future: Mining and Aboriginal Communities" (2005)

with respect to the Diavik Diamond Mine site and surrounding area. Participants were instructed to use personal experiences, Traditional Knowledge or Western Science through small group discussion. The framework for the breakout session is provided in **Annex B** and supplemental instructions provided to participants in **Annex C**. Example plots generated through Breakout Session One (1) are depicted in **Annex D**. Hardcopies of the participant plots have been provided to EMAB for future reference. Participants were then asked to share information they may have learned through the exercise. It was noted that participants observed a loose correlation between cabin location and traditional caribou migration in the area. Participants also expressed that there was a demonstrated knowledge of the land through their small group discussions and acknowledged that consideration, at a grand scale, should be given to other mining developments when considering the Diavik development.

Dr. Jamie VanGulck (ASI) provided an instructional session on environmental impacts through the definition of environment and compartmentalized environmental components of concern (ECC). ECC's include, but are not limited to, hydrology, water and air quality, noise, groundwater, fish and fish habitat, soils and landforms, vegetation and wildlife. These ECC subgroups assist an assessor to evaluate environmental impact. Participants were lectured on the definition of closure objective and closure criteria and their relationship within the closure process. As highlighted in **Figure 1**, participants were introduced to the concept of a reclamation goal. The reclamation goal, often referred to as reclamation vision, typically contains general *soft* statements that can not be quantifiably evaluated. Participants were shown that closure objectives provide a macroscopic definition on what is aimed to be achieved. Typically objectives include a definitive statement focussed towards specific infrastructure. Participants were asked to discretely consider each piece of infrastructure when defining closure objectives. Closure criteria were defined as the precise measures, or *goalposts*, used to assess the success or failure in achieving a closure objective. An effluent limit set out in a water licence would be an example of such criterion. Participants were also lectured on how environmental impact can be minimized by ensuring that mine components are physically, chemically and biologically stable, and compatible with end land use. In determining closure criteria participants were asked to establish goals that aim to achieve physical, chemical and biological stability, and the compatibility of end land use with respect to ECC's.

Unfortunately, due to time constraints imposed by active discussion throughout the day by workshop participants, Breakout Session Two (2) was not conducted on Day One (1) of the Workshop. This session was developed to engage participants in an applied exercise where participants in a small group arrangement, would review pre and post closure photographs of a mine component (from an unnamed mine). During this exercise, participants would develop possible closure objectives and criteria for various mine components and share findings through roundtable discussion. Instructions and a framework for this session can be found in **Annex C** and **B**.

Figure 1 – Flowchart Identifying the Process of Determining Closure Objectives and Criteria



[Day Two – January 14th, 2009]

Day Two involved a site visit to the Diavik Diamond Mine. The tour, led under the direction and plan of Mr. Gord Macdonald (Rio Tinto Limited), allowed participants the opportunity to visualize infrastructure and the Diavik site as a whole. Some participants had visited the site before, so the site visit allowed these participants to view how things have changed since their last visit. For other participants, the site visit acted as their first time viewing of the Diavik Diamond Mine. To feed into Day Three (3) events, Workshop participants were reminded to review site infrastructure in light of the concepts of closure objectives and criteria learned in Day One (1). Following in-house health and safety orientation, the mine site tour generally followed the route provided by Rio Tinto Limited, which is included in **Annex E** (Title: *Interim Closure and Reclamation Plan – Site Visit, January 14th, 2009*). This route provided an opportunity to view Diavik specific infrastructure. The tour bus made stops allowing participants to exit the vehicle and view infrastructure. Unfortunately visibility was limited in the tour bus due to frosted windows. Mr. Gord Macdonald and Ms. Colleen English (Rio Tinto Limited) addressed site specific questions posed by participants and Mr. Joe Murdock (ASI) was available to field participant general questions and concerns. ASI was also tasked, by EMAB, to create a photographic record of participant activity and engagement during the site visit.

[Day Three – January 15th, 2009]

The Workshop recommenced in Katimavik A of the Explorer Hotel with general opening remarks by Mr. Joe Murdock (ASI) and an opening prayer led by Tlicho community member Mr. Michel-Louie Rabesca. Participants provided general remarks on the Day Two (2) site visit through a roundtable discussion.

Day Three (3) provided a series of presentations including one from Mr. Nathen Richea of DIAND Water Resources Division. The DIAND presentation explained the Crown's role in mine closure and reclamation. This included defining the Minister's responsibilities, through appropriate legislation, in approving mines in the Northwest Territories and his role in providing expert advice on technical and regulatory matters related to mine closure before Administrative Tribunals such as the WLWB. Mr. Richea discussed the role of financial security and how the WLWB would set the monetary amount under a water licence through testimony and/or interventions provided by Interested Parties. He outlined that DIAND, under its responsibilities, would file a security estimate, through an intervention, that represents the *actual* cost to reclaim a mine site. Mr. Richea also explained that security amounts are held by, and furnished in a form deemed acceptable to, the Minister. He also explained that security held in trust by the Minister is legislatively available for the purpose of mine site reclamation only. Mr. Richea discussed DIAND's 2002 Mine Reclamation Policy and its main objectives and guiding principles and presented a series of guidance documents, including Mine Site Reclamation guidelines, prepared by DIAND to assist proponents in developing, operating and closing a mine site. PowerPoint slides for this presentation have been attached to this *Memorandum* in **Annex E**.

Mr. Ryan Fequet of the WLWB presented a background on the Board's mandate, and provided a comprehensive discussion on how community members could be involved and participate in the review of the Diavik Diamond Mine ICRP. This included reviewing material listed on the WLWB public registry, attending public hearings, and filing written interventions. The WLWB provided a WLWB definition of *closure objective* and *closure criteria* and provided examples for an open pit and waste rock pile. Mr. Fequet briefly outlined proposed closure and reclamation guidelines that are being developed under a working group formed by the Mackenzie Valley Land and Water Board. The WLWB has a seat on this working group and is contributing to the development of a guidance document. PowerPoint slides for this presentation have been attached to this *Memorandum* in **Annex E**. Mr. Fequet also circulated the inaugural version of The Wek'ézhíí News, a WLWB publication, and a Diavik ICRP work plan schedule to Workshop participants for their reference.

The definitions for closure objectives and criteria were re-examined as a group to prepare participants for the third breakout exercise. Breakout Session Three (3) was an interactive participant driven exercise where Workshop participants had a small group forum to vocalize viewpoints on closure objectives and criteria for specific infrastructure at the Diavik Diamond Mine. The exercise gave participants an opportunity to apply the definitions of

closure objectives and criteria learned during the ASI lecture module to infrastructure they may encounter through the review of the Diavik ICRP. Although the infrastructure viewed was found at the Diavik Diamond Mine in the past, participants were instructed that the exercise was still hypothetical in nature and the objectives and criteria developed in small group discussion may or may not be considered by Rio Tinto Limited. The framework for the breakout session is provided in **Annex B** and supplemental instructions provided to participants in **Annex C**. Example plots generated through Breakout Session Three (3) are depicted in **Annex D**. Hardcopies of the participant plots have been provided to EMAB for future reference. In general, group discussions to develop objectives and criteria followed the framework of examining each piece of infrastructure and identifying the ECC. For each ECC, specific closure criteria were developed. A wide variety of discussions developed between various groups. Some focused on water quality impacts, others on caribou and fish impacts, or landform configuration. The diversity of the discussions and level of detail of the closure criteria developed is reflective of the various backgrounds of the workshop participants. Participants shared their results, generated through their small group discussions, to all Workshop participants.

Mr. Gord Macdonald of Rio Tinto Limited closed off the set of presentations with a concise presentation on future closure planning of the Diavik Diamond Mine. Here he briefly discussed an anticipated schedule for closure planning, Rio Tinto defined closure objectives, and outlined plans where additional closure planning work is required. PowerPoint slides for this presentation have been attached to this *Memorandum* via **Annex E**.

An ASI presentation on reclamation research planning was prepared but not presented due to time constraints imposed by active discussion throughout the day by workshop participants. This lecture aimed at providing participants with an understanding of the information typically found in a reclamation research plan, components of the research program and how the plan determines a scientific pathway needed to achieve set closure criteria.

Day Three (3) was closed off with concluding comments from Mr. Joe Murdock (ASI) and EMAB's Chair Mr. Doug Crossley. Mr. Francis Williah, a Tlicho community elder, provided the closing prayer to end the Workshop.

4.0 – Recommendations

The following recommendations and associated commentary reflect ASI's observations and opinions:

[Recommendation #1]

To avoid any confusion community members may have in future regulatory or industry sessions on closure and reclamation, EMAB should adopt a definition for closure objective and closure criteria and request that all parties (WLWB, Rio Tinto Limited etc.) accept and use these definitions in their future dealings. In some instances a reclamation goal/vision was viewed as a closure objective; however, a goal/vision lacks a definitive description on what is being achieved. At times reclamation goals that are misinterpreted as closure objectives are presented as *feel good* statements which are broadly based and can not be appropriately gauged and evaluated. For example ASI would classify a statement such as "*Ensuring that land and water is safe for people, wildlife and aquatic life*" as a closure goal/vision for it lacks a specific tag to mine infrastructure and is too broad based to develop clear focussed closure criteria. To avoid possible ambiguity and to allow for greater consistency in future discussions, EMAB, as a watchdog, should develop and endorse what they view as appropriate definitions for closure vision, closure objective and closure criteria and state complementary standards or guidance in how to develop these closure statements.

[Recommendation # 2]

Rio Tinto Limited should consider hosting another site visit during spring freshet and/or the summer season. Snow covering parts of the site made it difficult for participants to differentiate infrastructure components and other important features, such as water management (flows, spatial and temporal dimensioning), wildlife observation, and dust suppression/management. To concentrate efforts and allow for a more focussed discussion, these site visits should not include a wide range of participants, but rather specific smaller groups at a time. For example, a site visit accommodating only community members may allow for better scoped discussion on community concerns. This information may also pose useful to Rio Tinto Limited when integrating community input into future closure plans.

[Recommendation #3]

The Workshop participants, en masse, had a wide range of backgrounds, experiences and skill sets. Corralling together the views, concerns, knowledge and efforts of various internal stakeholder parties, with an aim to achieve outcomes that are beneficial to both Industry and the communities hosting the mine site, allows for a more effective mine closure plan. The following discussion provides some context to this statement.

As expressed by EMAB Chair Mr. Doug Crossley, through his general remarks, community involvement is imperative. As per participant testimony, there was an expressed sensitivity to mine closure and reclamation by community members. This mindset may be in large part due to legacy environmental practices carried through at Rae Rock, Colomac, Giant and Port Radium mines; these sites were discussed by workshop participants. Community members exhibited a desire to communicate their history and lessons learned from past mining experiences in the Workshop forum.

Workshop participants, particularly elder community members, expressed concern and the need for a precautionary approach in developing reclamation plans for mines and demonstrated an interest in working with Rio Tinto Limited through community engagement exercises. Rio Tinto Limited acknowledged community opinion and thanked participants for sharing their thoughts and feelings; however, numerous workshop participants repeatedly stated that information sessions, breakout exercises, and associated discussions should be held within affected communities so greater community input and participation can be sought out. This seemed to be the preferred community method in participating in the Diavik mine closure process. Additional effort could be made to integrate greater community input and opinion into Diavik specific closure options through a series of community meetings/presentations. These sessions could act as a resource base for Rio Tinto Limited, with the Crown[5], and/or EMAB. Additionally these sessions could allow community members to outlet their concerns, identify preferred closure options and environmental practice, and provide an update into the proposed changes set within the next iteration of the ICRP. Community meetings may have been completed in the past by various parties, but given the dynamic and ongoing nature of mine operation and closure, community concern and opinion should be of significant value. Understandably there are planned community sessions through the WLWB plan and mandate; however, consideration could be given to a separate set of community sessions where community members can be engaged and informed by Rio Tinto Limited and/or EMAB.

[Recommendation # 4]

From a community member perspective, there lacks a clear public understanding of what regulatory mechanisms exist with respect to mine reclamation and financial security. Terms and conditions related to reclamation water use, impacts to water through the deposition of waste in a reclamation effort, and the mine financial security amount, are dictated through the water licence instrument. Since the WLWB is a quasi-judicial administrative tribunal, it must adhere to the rules of procedural fairness and natural justice and thus it may only consider the evidence presented by Interested Persons before it during a public hearing or through written intervention. If community members, Aboriginal Governments/Organizations, First Nations and other Interested Persons do not participate in the WLWB process then their opinions, concerns, testimony and evidence will not be included and/or considered in the water licence. Even though this fact was presented during the DIAND and WLWB presentations and may be re-communicated by these organizations in the future, EMAB should reinforce this important fact through its community communications and meetings.

[Recommendation # 5]

EMAB, Aboriginal Governments/Organizations and First Nations, should consider conducting an evaluation of the Diavik ICRP and mine financial security assessment. This evaluation can form a WLWB intervention, with respect to closure and reclamation, which

[5] DIAND had stated that they may join Rio Tinto Limited on a community tour if the company undertakes this task.

combines Western Science technical opinions with Traditional Knowledge, community and personal experience and social will.

5.0 – Closing

ASI was pleasantly surprised with the conversation generated on the topic of mine closure and reclamation and believes the main focus of the Workshop, to generate participant discussion and lessons so participants can make more informed choices in the future, was satisfactorily accomplished. Although participant discussion did at times steer the group away from the planned agenda, it was considered appropriate and respectful to allow discussion on personal experiences and how previous mining developments have affected communities and individuals. The Workshop did not achieve a full consensus amongst participants on closure outcomes. This was not the intent nor was this an aim to be achieved. The Workshop did prepare, at an introductory level, the basic concepts of closure and stirred discussion and primed participants for future discussions through other regulatory and/or industry efforts.

ASI would like to thank EMAB for the opportunity to provide these services. Should you have any questions whatsoever about its contents please feel free to contact the undersigned at 867.446.0036 or murdock@arktissolutions.com.

Sincerely,

Joe Murdock,
Chief Executive Officer

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ANNEX A – Workshop Agenda

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BRIEFING NOTE

File:	**001-EMAB- Closure and Reclamation Workshop**
To:	**Environmental Monitoring Advisory Board**
Attention:	**Mr. John McCullum, Executive Director**
Subject:	**Final Agenda for Closure and Reclamation Workshop**
Authors:	**Joe Murdock, Jamie VanGulck**
Page Total:	**2**
Date:	**January 12th, 2009**

Final Agenda

Further to the to the draft agenda filed with EMAB through the December 9th, 2008 *Briefing Note*, ASI has prepared a final agenda for the January 13th-15th, 2009 workshop to be held in Katimavik A of the Explorer Hotel, Yellowknife, NT and at the Diavik Diamond Mine. The three day workshop will sandwich a site visit to the Diavik Diamond Mine on Day 2 between Day 1 and Day 3 presentation seminars at the Explorer Hotel.

DAY 1 – January 13th, 2009

Time (MT) (approximate)	Presentation/Event	Speaker
9:00-9:30	Introduction to EMAB's Closure and Reclamation Workshop and Introduction Exercise	Joe Murdock/Jamie VanGulck (ASI)
9:30-9:45	Welcoming Remarks from EMAB	Doug Crossley (EMAB)
9:45-10:15	Closure and Reclamation Community Perspective, Concerns, Observations and Expectations[1]	Workshop Participants
10:15-10:30	**Coffee Break**	
10:30-12:00	An Introduction to Closure and Reclamation	Joe Murdock/Jamie VanGulck (ASI)
12:00-13:00	**Lunch**	
13:00-14:00	An Overview of the Diavik Diamond Mine Operations and Site Layout and a Brief History on Closure and Reclamation Performed to Date	Gord MacDonald (DDMI)
14:00-15:00	**Breakout Session**: Examination of the Diavik Diamond Mine Area and Site History Prior to Development	Workshop Participants
15:00-15:45	The Establishment of Closure Objectives and Criteria	Joe Murdock/Jamie VanGulck (ASI)
15:45-16:00	**Coffee Break**	

16:00-17:15	**Breakout Session**: Setting Closure Criteria and Objectives	Workshop Participants
17:15-17:30	Day 1 Closing Remarks	Joe Murdock/Jamie VanGulck (ASI)

DAY 2 – January 14th, 2009

DIAVIK DIAMOND MINE SITE VISIT

DAY 3 – January 15th, 2009

Time (MT) (approximate)	Presentation/Event	Speaker
9:00-9:20	Day 1 Recap, Highlights and Discussion with Q&A Session	Joe Murdock/Jamie VanGulck (ASI)
9:20-9:30	Outline for Day 3	Joe Murdock/Jamie VanGulck (ASI)
9:30-10:15	Department of Indian Affairs and Northern Development's Role in Closure and Reclamation of the Diavik Diamond Mine	Nathen Richea (DIAND)
10:15-10:30	**Coffee Break**	
10:30-11:15	Wek'eezhii Land and Water Board's Role in Closure and Reclamation of the Diavik Diamond Mine[1]	Ryan Fequet (WLWB)
11:15-12:00	The Closure and Reclamation Research Plan	Joe Murdock/Jamie VanGulck (ASI)
12:00-13:00	**Lunch**	
13:00-14:30	The Interim Closure and Reclamation Plan (ICRP) for the Diavik Diamond Mine[1]	Gord MacDonald (DDMI)
14:30-14:45	**Coffee Break**	
14:45-16:00	**Breakout Session**: The Closure and Reclamation of Diavik Diamond Mine Site Components	Workshop Participants
16:00-16:15	Final Workshop Comments and Roundtable Discussion on Workshop	Joe Murdock/Jamie VanGulck (ASI) and Workshop Participants
16:15-16:30	Closing Remarks from EMAB	Doug Crossley (EMAB)

[1] Workshop Participants will have an opportunity to provide input to DDMI and WLWB about how communities feel it would be best to involve them in the ICRP review process.

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Annex B – Breakout Session *Briefing Notes*

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BRIEFING NOTE

File:	**001-EMAB- Closure and Reclamation Workshop**
To:	**Environmental Monitoring Advisory Board**
Attention:	**Mr. John McCullum, Executive Director**
Subject:	**Breakout Session I – An Overview of the Diavik Diamond Mine Operations and Site Layout**
Author:	**Joe Murdock**
Page Total:	**3**
Date:	**December 17th, 2008**

BREAKOUT SESSION I

Preamble

Further to the Arktis Solutions Inc. (ASI) *Briefing Note* dated December 9th, 2008, ASI was to produce and present additional *Briefing Notes* on the individual Breakout Sessions planned for the Environmental Monitoring Advisory Board (EMAB) Closure and Reclamation (C+R) Workshop. The function of this *Briefing Note* is to dually serve as an instructional framework for the exercise and provide EMAB the exercise rationale.

Further to **Section 2(d)(ii)** and **Section 2(d)(iv)** of the EMAB accepted *Proposal for Consulting Services (PCS)*, ASI proposed to develop an exercise which examines C+R elements through aerial photographs, site plans and other visual materials and roundtable discussions identifying potential community and participant concern and opinion.

Breakout Session I aims to satisfy the provisions of the *PCS* through an interactive participant driven exercise where workshop participants have an opportunity to review the Diavik Diamond Mine site and associated operations through visual aid and provide comment on personal experience.

Objective

Building on the Diavik Diamond Mine Inc. (DDMI) introductory presentation on the Diavik Diamond Mine site and operation, this exercise (completed in small groups) will familiarize workshop participants with the mine site and surroundings (Lac de Gras area) and also allow participants to vocalize their understanding of the current and past state of the site and surrounding area. **Breakout Session I**, through a desktop examination of the site and engaged discussion, will prepare participants for the Day 2 Site Visit and provide

EMAB and ASI with participant perspectives on the mine site area prior to, during, and after closure.

Participants

This exercise will involve all workshop participants. Work groups can be created once a final list of workshop participants is developed and made available by EMAB.

Outline

Duration: One hour (1:00h).
Group Organization: Ideally groups of three (3) or four (4) individuals will be formed.

Pre-chosen, before workshop start, groups will break away and assemble at separate tables where they will be provided with a short instruction sheet outlining directions for the exercise. This will be reinforced with verbal instructions communicated by ASI facilitators. ASI will illustrate, through a demonstration for all groups, how the exercise can be completed.

Workshop participants will be asked to observe site plans and aerials of the Diavik Diamond Mine and the surrounding areas (appropriately scaled to allow for discussion of areas proximal to the mine site) and offer discussion on their experiences and knowledge of the site prior to and during the operation of the Diavik Diamond Mine. Workshop participants will also be asked to highlight land, water, air, wildlife, fish, vegetation, topography aspects that may be impacted as a result of mine construction and operations and where they feel appropriate attention could be focused during closure and reclamation. Each group will be provided with an individual set of site visuals (aerial photographs, site plans) and will be advised that illustrations (such as denoting migration routes or identifiable areas of concern) on site plans and aerials are welcomed.

Mr. Joe Murdock and Dr. Jamie VanGulck will circulate around the room fielding questions and interacting with groups. If groups are having difficulty in getting started one of the Facilitators will join the group to initiate group discussion. Groups will have forty (40) minutes to engage in the exercise and five (5) to ten (10) minutes to present point form notes on individual group discussion to all workshop participants.

Required Materials

To best carry out this exercise the following materials are required:

i. Table-top versions (large sized) of mine site plans and aerial figures.
ii. Writing instruments (markers) and large chart paper for group presentation.

Closing

Should you have any questions whatsoever about the contents of this *Briefing Note* or if revisions are needed please feel free to contact the undersigned at 867.446.0036 or murdock@arktissolutions.com. ASI will continue to move forward with the development of this breakout session and other exercises as committed to in the *PCS*.

Sincerely,

Joe Murdock,
Chief Executive Officer

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BRIEFING NOTE

File:	**001-EMAB- Closure and Reclamation Workshop**
To:	**Environmental Monitoring Advisory Board**
Attention:	**Mr. John McCullum, Executive Director**
Subject:	**Breakout Session II – The Establishment of Closure Objectives and Criteria**
Author:	**Joe Murdock**
Page Total:	**3**
Date:	**December 18th, 2008**

BREAKOUT SESSION II

Preamble

Further to the Arktis Solutions Inc. (ASI) *Briefing Note* dated December 9th, 2008, ASI was to produce and present additional *Briefing Notes* on the individual Breakout Sessions planned for the Environmental Monitoring Advisory Board (EMAB) Closure and Reclamation (C+R) Workshop. The function of this *Briefing Note* is to dually serve as an instructional framework for the exercise and provide EMAB the exercise rationale.

Further to **Section 2(d)(i)** and **Section 2(d)(iii)** of the EMAB accepted *Proposal for Consulting Services (PCS)*, ASI is to build awareness on the basic concepts of C+R, scientific first principles and Traditional Knowledge related to C+R engineering and strategy and hold roundtable discussions on closure objectives and criteria.

Breakout Session II aims to introduce workshop participants, in a small group setting, to closure objectives and criteria through observation and discussion of mining closure scenarios at anonymous mining sites.

Objective

Following ASI's presentation on setting mining closure objectives and criteria, workshop participants will be tasked to review photographs of a mine site or mine infrastructure (not including Diavik), such as waste rock piles, open pits, etc., that illustrate the site activities pre- and post-closure. Participants will be given the opportunity to discuss and collectively establish closure objectives for the presented case and detail how these objectives could be achieved (closure criteria). This exercise will aid in developing capacity by exposing participants to past C+R situations and having them understand terminology and define objectives and criteria.

Breakout Session II, through a review of real life closure scenarios and engaged discussion, will ease participants into **Breakout Session III**, where they will examine Diavik specific infrastructure and establish hypothetical closure criteria and objectives.

Participants

This exercise will involve all workshop participants. Work groups can be created once a final list of workshop participants is developed and made available by EMAB.

Outline

Duration: One hour (1:15h).
Group Organization: Ideally groups of three (3) or four (4) individuals will be formed.

Groups will break away and assemble at separate tables where they will be provided with a short instruction sheet outlining directions for the exercise. This will be reinforced with verbal instructions communicated by ASI facilitators. ASI will illustrate, through a demonstration for all groups, how the exercise can be completed.

Workshop participants will be asked to review photographs from C+R programs conducted at mine sites (not including Diavik). At minimum, the photographs will include a pre- and post-closure depiction of a site or infrastructure at site (e.g., waste rock pile). The participants will be asked to detail differences in the photographs that relate to reclamation (e.g., differences in land topography, vegetation cover, etc.), as well as, hypothesize how the post-closure case would impact the environment (e.g., wildlife, fish, water quality) compared to the pre-closure case. From the discussion results, the participants will be asked to summarize the objective of the closure scenario and detail what criteria may have be used to attain the closure condition. Each group will be assigned three to six pre- and post-closure photographs. All groups will be assigned the same set of figures.

Mr. Joe Murdock and Dr. Jamie VanGulck will circulate around the room fielding questions and interacting with groups. If groups are having difficulty in getting started one of the Facilitators will join the group to initiate group discussion. Groups will have forty (40) minutes to engage in the exercise and five (5) to ten (10) minutes to present point form notes on individual group discussion to all workshop participants.

Required Materials

To best carry out this exercise the following materials are required:

i. Large coloured photographs of mining C+R examples (chosen by ASI).
ii. Writing instruments (markers) and large chart paper for group presentation.

Closing

Should you have any questions whatsoever about the contents of this *Briefing Note* or if revisions are needed please feel free to contact the undersigned at 867.446.0036 or murdock@arktissolutions.com. ASI will continue to move forward with the development of this breakout session and other exercises as committed to in the *PCS*.

Sincerely,

Joe Murdock,
Chief Executive Officer

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BRIEFING NOTE

File:	**001-EMAB- Closure and Reclamation Workshop**
To:	**Environmental Monitoring Advisory Board**
Attention:	**Mr. John McCullum, Executive Director**
Subject:	**Breakout Session III - The Closure and Reclamation of Diavik Diamond Mine Site Components**
Author:	**Joe Murdock**
Page Total:	**3**
Date:	**December 15th, 2008**

BREAKOUT SESSION III

Preamble

Further to the Arktis Solutions Inc. (ASI) *Briefing Note* dated December 9th, 2008, ASI was to produce and present additional *Briefing Notes* on the individual Breakout Sessions planned for the Environmental Monitoring Advisory Board (EMAB) Closure and Reclamation (C+R) Workshop. The function of this *Briefing Note* is to dually serve as an instructional framework for the exercise and provide EMAB the exercise rationale.

As explicitly stated in **Section 2(d)(iii)** of the EMAB accepted *Proposal for Consulting Services (PCS)*, ASI proposed to develop an exercise which includes:

"*Roundtable discussions on closure objectives and closure criteria with aim and intent to establish individual participant viewpoints and opinions on the subjects.*"

Breakout Session III, the final breakout session on Day 2, aims to satisfy this commitment through an interactive participant driven exercise where workshop participants have a forum to vocalize viewpoints on closure objectives and criteria for specific infrastructure at the Diavik Diamond Mine.

Objective

The main focus of this exercise is to have participants act in the role of "*Decision Maker*" and institute the lessons learned through **Breakout Session I** and **II** where participants examine the Diavik Diamond Mine area and operation and set closure objectives and criteria. In this breakout session, participants will be provided two infrastructure components (e.g., waste rock pile, processed kimberlite containment, road networks) to restore into a form they deem acceptable for closure. This will be completed through small group discussion and

presentation. This exercise allows participants to apply the concepts developed during the workshop and mine site visit, and will act as an appropriate closing exercise to the workshop session.

Participants

It is preferable if all Workshop Participants, DDMI Representatives and Government Officials partake in this session. To encompass differing viewpoints, each group should have one DDMI Representative or Government Official. Work groups can be created once a final list of Workshop participants is developed and made available by EMAB.

Outline

Duration: One hour and fifteen minutes (1:15h).
Group Organization: Ideally groups of three (3) or four (4) individuals will be formed.

Groups will break away and assemble at separate tables where they will be provided with a short instruction sheet outlining directions for the exercise. This will be reinforced with verbal instructions communicated by ASI facilitators. ASI will provide a sample run through of a piece of infrastructure to give participants and example on how they may complete the exercise.

Each group will assigned two pieces of infrastructure and will be tasked to answer the following question:

"*If you were the C+R Specialist at the Diavik Diamond Mine how would you restore the **(insert piece of infrastructure)** for closure?*"

Mr. Joe Murdock and Dr. Jamie VanGulck will circulate around the room fielding questions and interacting with groups. If some groups are having difficulty in getting started, one of the Facilitators will join the group to initiate group discussion. The groups will have forty (40) minutes to develop closure objectives and criteria specific to the infrastructure assigned. They will be asked to take point form notes and list: what their closure objectives are and their reasoning; when this objective should be achieved; and, why and how this objective will be completed (what criteria). Finally, each group will have the opportunity to present their points to all others in the workshop.

Required Materials

To best carry out this exercise the following materials are required:

i. Table-top versions (large scaled) of mine site plans and photographic figures of specific mine infrastructure[1].
ii. Writing instruments (markers) and large chart paper for group presentation.

Closing

Should you have any questions whatsoever about the contents of this *Briefing Note* or if revisions are needed please feel free to contact the undersigned at 867.446.0036 or murdock@arktissolutions.com. ASI will continue to move forward with the development of this breakout session and other exercises as committed to in the *PCS*.

Sincerely,

Joe Murdock,
Chief Executive Officer

[1] A list of Diavik specific infrastructure will be provided to EMAB and DDMI following a more comprehensive review of the ICRP. ASI will contact EMAB and DDMI in the intermediate future.

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Annex C – Breakout Session Instructions

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BREAKOUT SESSION INSTRUCTIONS

File:	001-EMAB- Closure and Reclamation Workshop

BREAKOUT SESSION I

- Examine the large sized maps and satellite image of the area in and around the Diavik Diamond Mine.
- Ask yourself "*What do I know about the area on the map and mine site*?". This can include personal experiences at the mine site, on the land, through technical and other readings and other discussions you have had with people.
- Label areas on the figures (in marker) where you have personal knowledge of the site. On the chart paper write (in marker) your knowledge of these areas. Think of the following:
    - Where have you or friends and family personally visited? Are there any items of significance?
    - Is there any history that others may not know about on the areas on these maps? Are there protected or heritage areas? If so let others know.
    - How have things changed over time?
- Label areas on the figures (in marker) where you have an understanding of specifics of the site and region. On the chart paper provided write (in marker) your understanding of the area. Think of the following:
    - location and access;
    - climate and permafrost;
    - geology and the terrestrial environment (i.e. land types, topography, vegetation);
    - water quality and physical features (i.e. water depth, flow);
    - wildlife (i.e. migration and habitat types);
    - aquatic environment;
    - surface waters; and
    - anything else that comes to mind.
- Have you been to the Mine site before? Have you read about features of the mine site in reports? Label key features of the mine site (waste rock piles, dykes, lakes) on the satellite image of the mine with the markers provided.

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BREAKOUT SESSION II

- Examine the package of figures provided in envelope.
- Match up "before" and "after" reclamation photo sets. There is one "before" and one "after" photo in each set. There are 4 sets total.
- Examine the photo sets and develop the closure objectives and criteria. Discuss in your group and write down on the chart paper. This is a hypothetical exercise.

As previously defined in the workshop presentation,

OBJECTIVE: Defines and describes what is aimed to be achieved. This can be general in nature and include big general statements.

CRITERIA: Precise measures to assess success or failure of achieving the closure objectives. This could be a test that is performed.

BREAKOUT SESSION III

- Examine the large site figures and 11" x 17" figures of specific infrastructure. There is a large schematic listing the location of the infrastructure on the site.
- This is a hypothetical exercise. Develop closure objectives and criteria for the following pieces of infrastructure:
    - North Country Rock Pile
    - Processed Kimberlite Containment (PKC) Area and the PKC West Dam
    - Open Pit
- Discuss in your group and write down objectives and criteria. Feel free to add illustrations on the diagrams if you would like.

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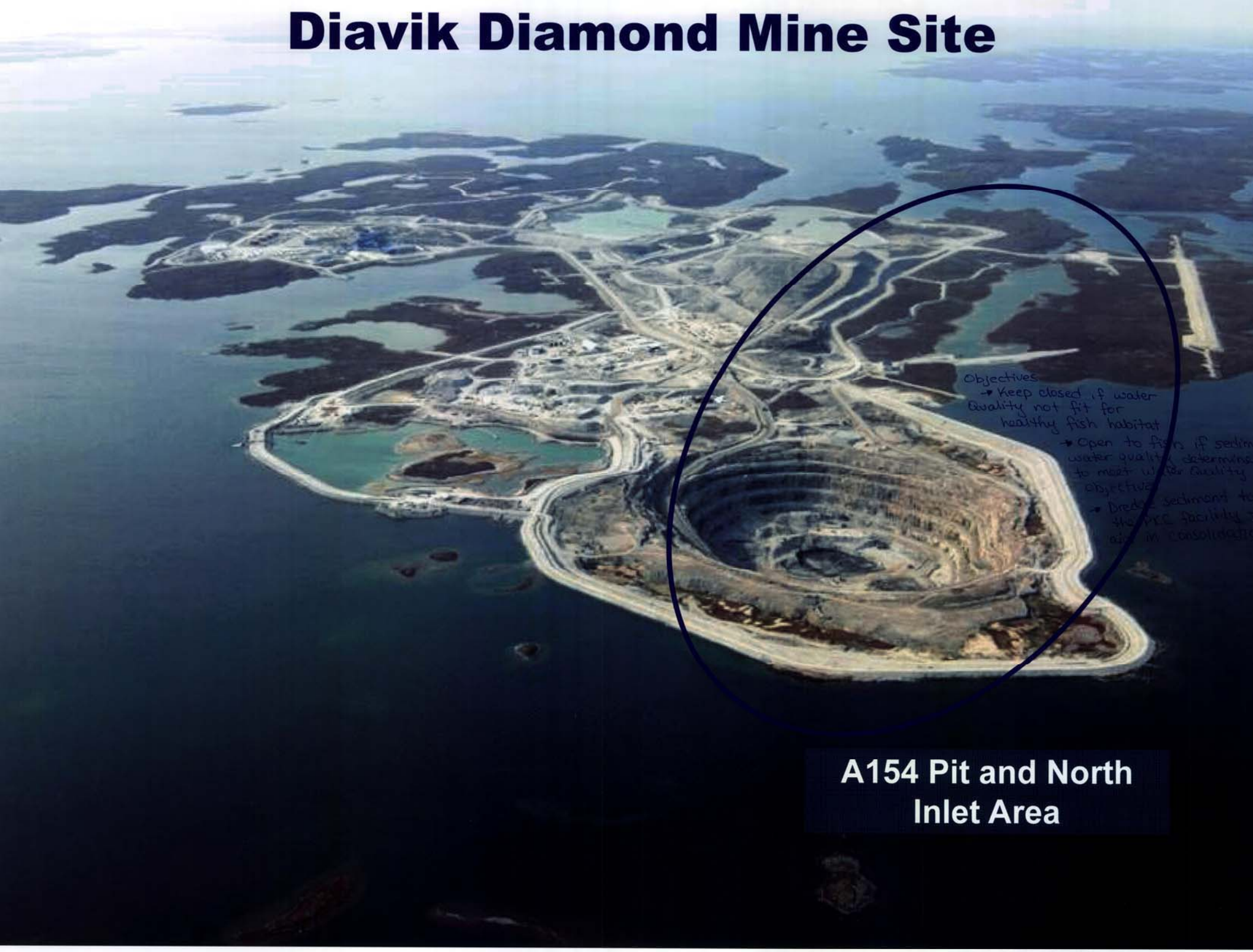
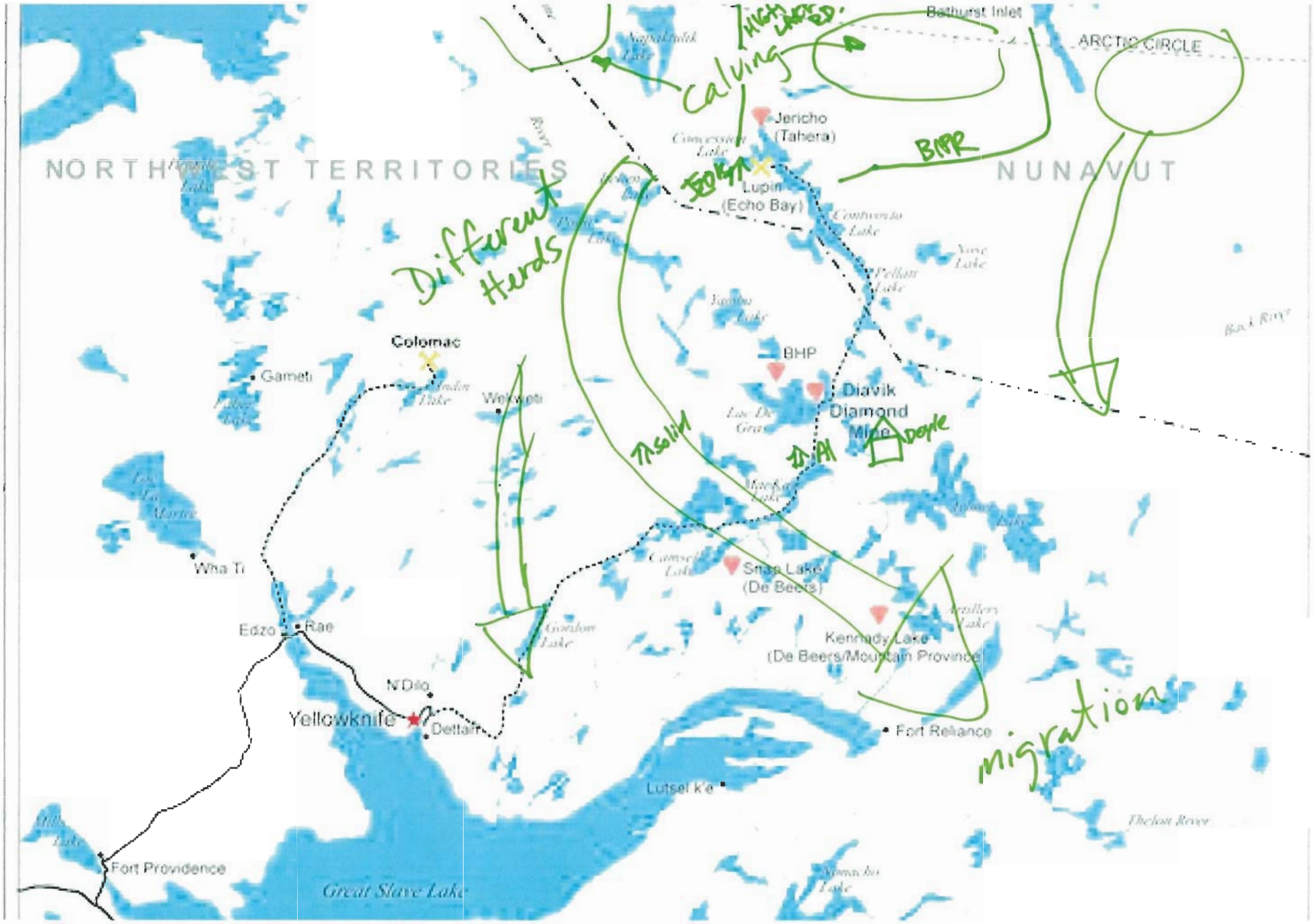
Annex D – Breakout Session Participant Notes

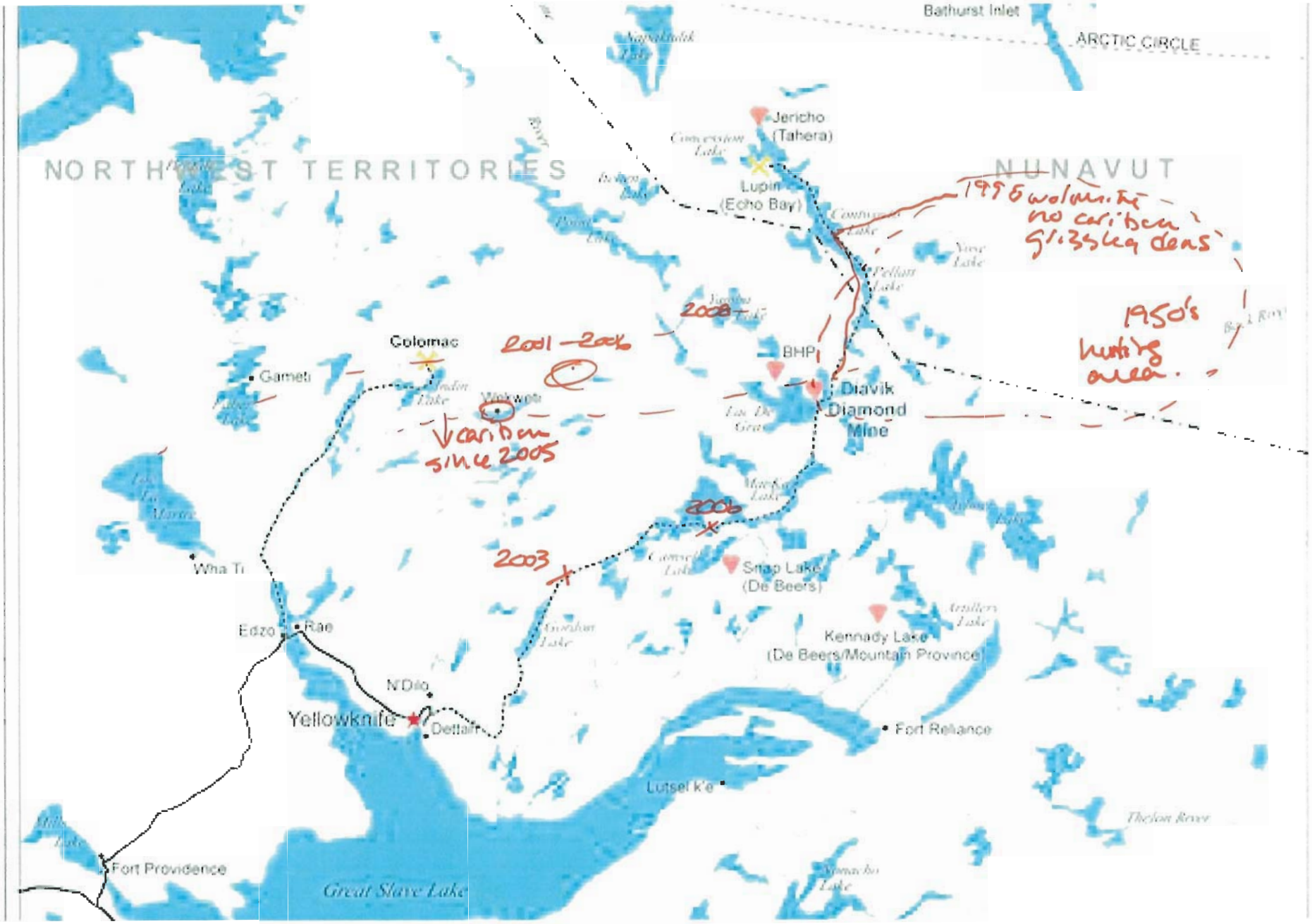

AN storage
Emulsion
A21 Waste rock
FRC cap
Waste Rock
Dust Suppressant
Fuel
Temp. Accomodation wolverine habitat
Revegetation Plots
Pot. Fish Habitat
Pot. Fish Habitat

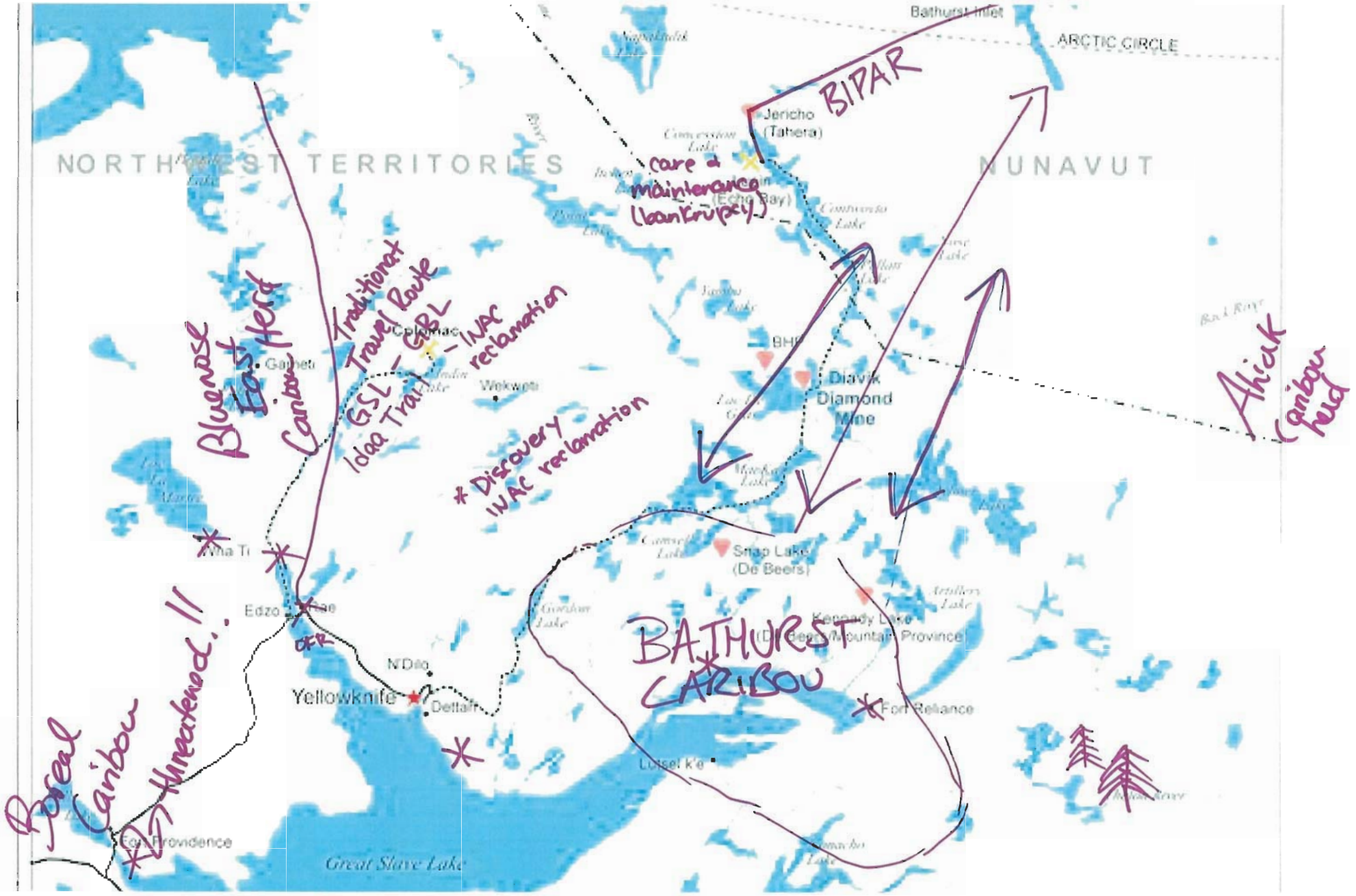
Diavik Diamond Mine Site

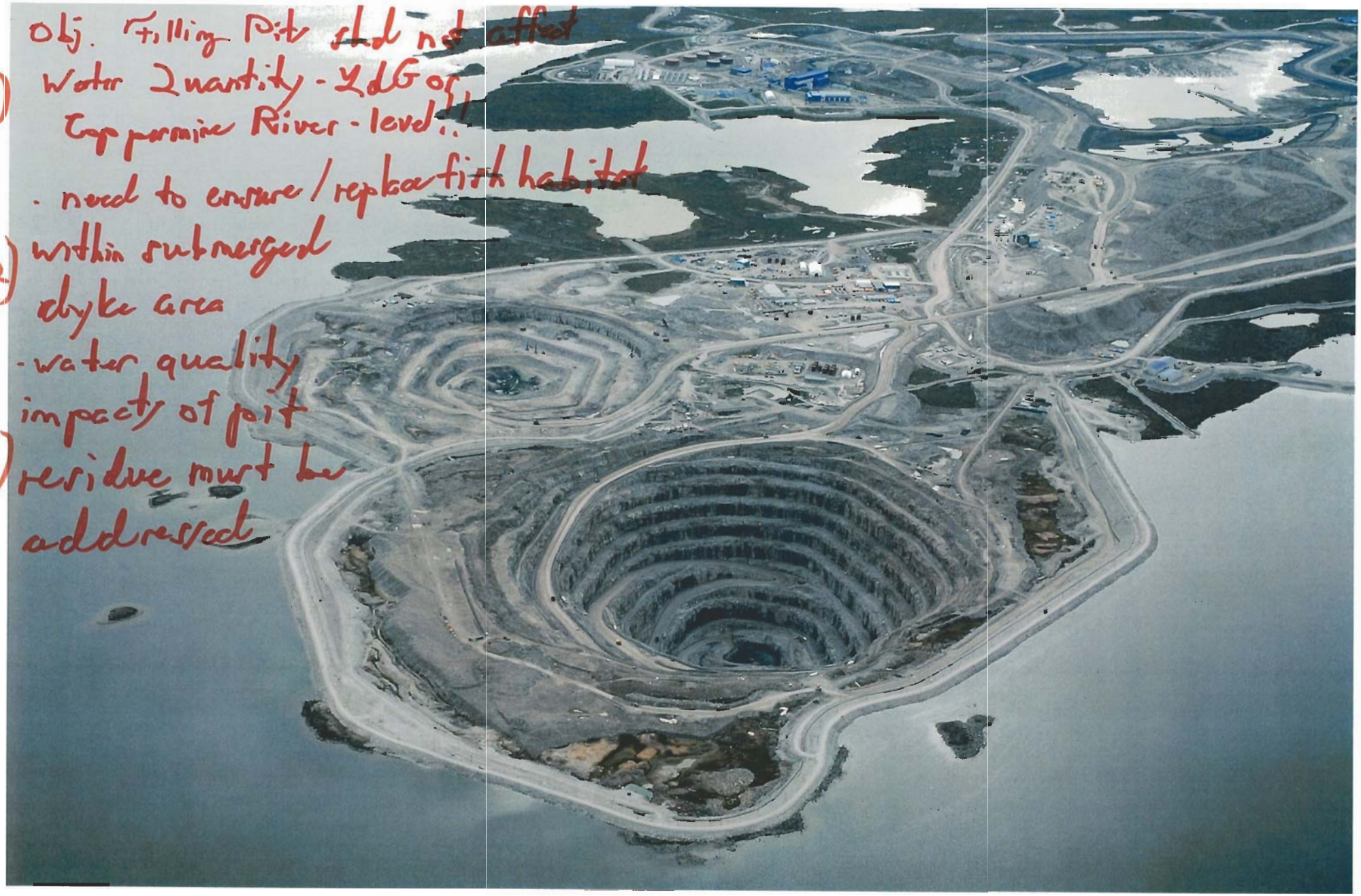


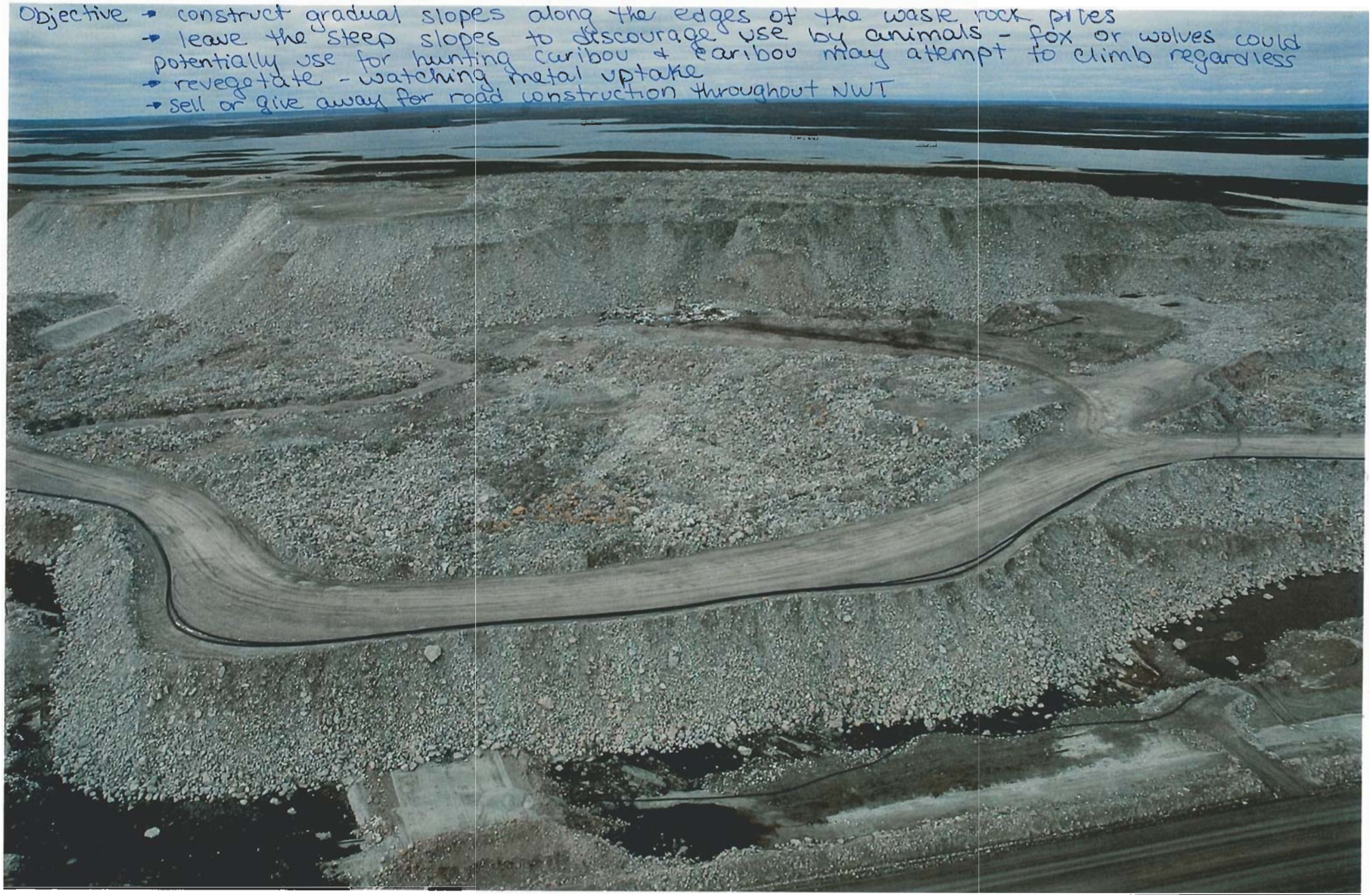
A154 Pit and North Inlet Area

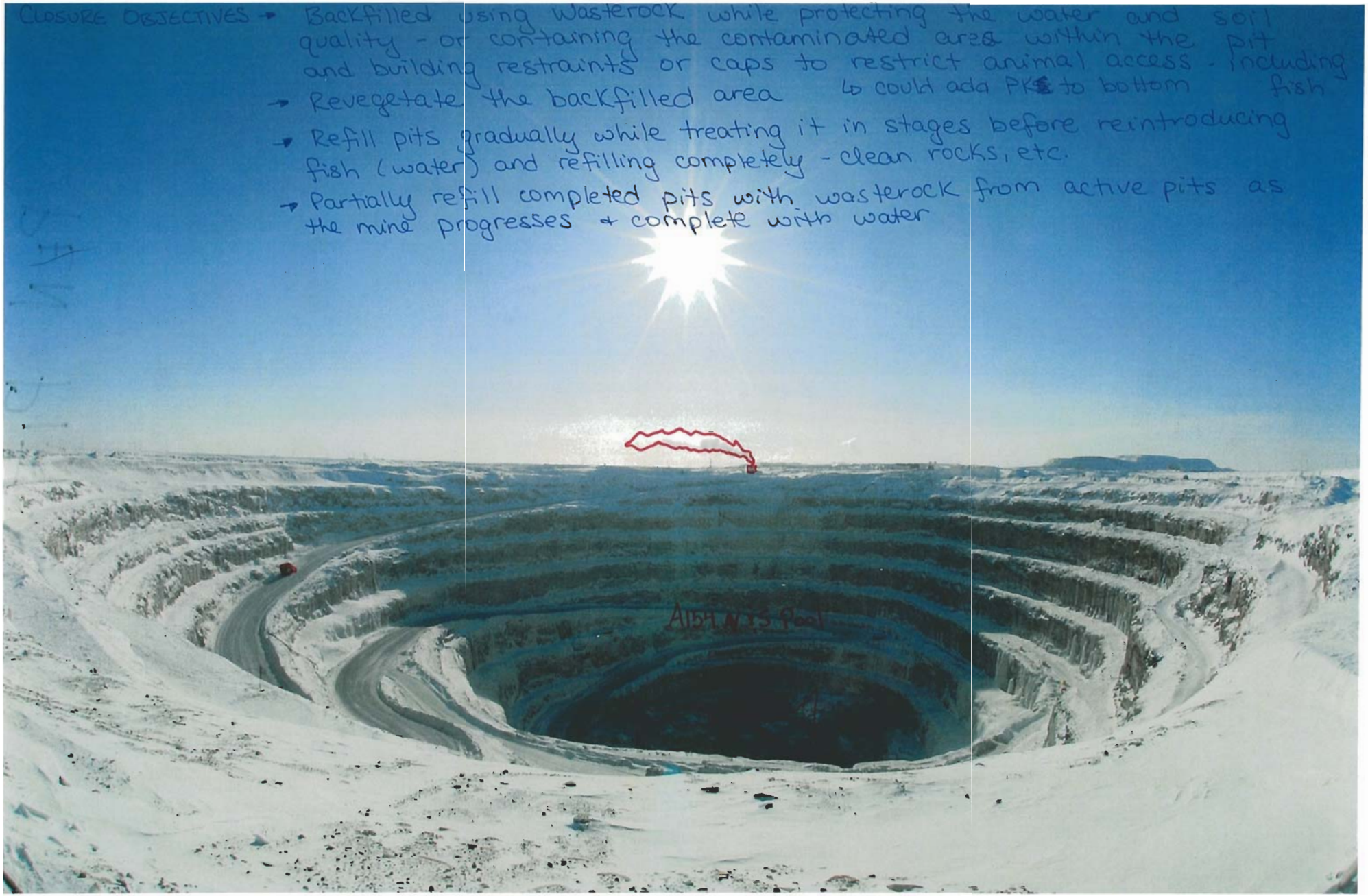

Bathurst Inlet
ARCTIC CIRCLE
calving
Jericho
(Tahera)
BIPR
NORTHWEST TERRITORIES
NUNAVUT
Lupin
(Echo Bay)
Different Herds
Colomac
Gameti
BHP
Diavik
Diamond
Mine
Doyle
Wha Ti
Snap Lake
(De Beers)
Edzo
Rae
Kennady Lake
(De Beers/Mountain Province)
N'Dilo
Yellowknife
Dettah
Fort Reliance
migrations
Lutsel k'e
Fort Providence
Great Slave Lake

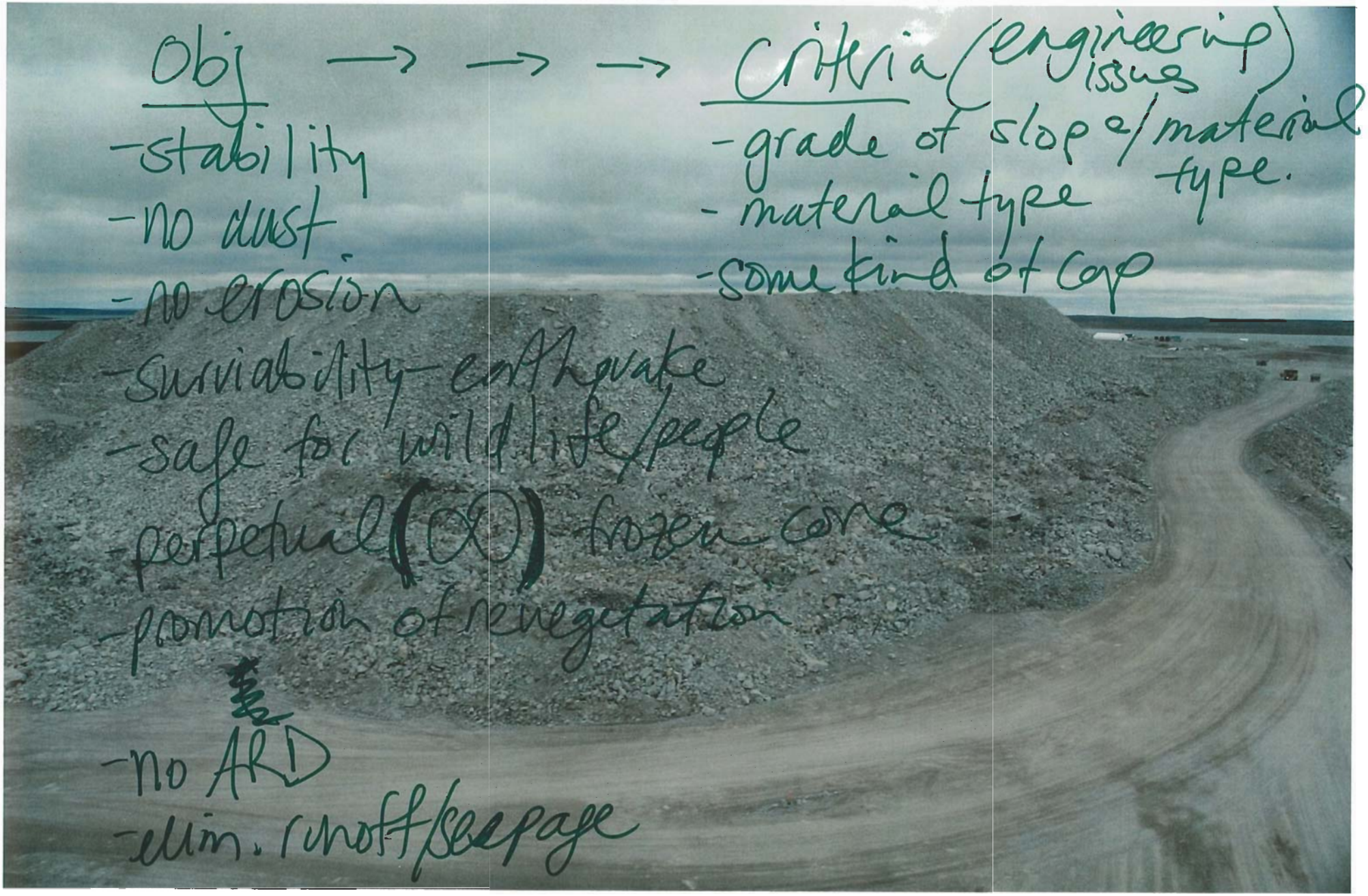

Bathurst Inlet
ARCTIC CIRCLE
NORTHWEST TERRITORIES
NUNAVUT
Jericho
(Tahera)
Lupin
(Echo Bay)
1996 wolverine
no caribou
glissade deas
1950's
hunting
area.
2008
2001 - 2006
Colomac
Gameti
Wekweeti
caribou
since 2005
BHP
Diavik
Diamond
Mine
2006
2003
Wha Ti
Snap Lake
(De Beers)
Edzo
Rae
Kennady Lake
(De Beers/Mountain Province)
N'Dilo
Yellowknife
Dettah
Fort Reliance
Lutsel k'e
Fort Providence
Great Slave Lake


Bathurst Inlet
ARCTIC CIRCLE
BIPAR
Jericho
(Tahera)
NORTHWEST TERRITORIES
NUNAVUT
care & maintenance (bankruptcy)
Bluenose East Herd
Caribou
Traditional Travel Route
GSL – GBL
Idaa Trail
– INAC reclamation
Colomac
Gahcho
Wekweti
BHP
Diavik Diamond Mine
* Discovery INAC reclamation
Ahiak Caribou Herd
Wha Ti
Edzo
Rae
OFR
Snap Lake (De Beers)
Kennady Lake (De Beers)
Mountain Province
BATHURST CARIBOU
N'Dilo
Yellowknife
Dettah
Fort Reliance
Lutsel k'e
Boreal Caribou
Threatened!!
Fort Providence
Great Slave Lake


Obj. Filling Pit should not affect
1) Water Quantity - YDG of Coppermine River - level
- need to ensure / replace fish habitat
2) within submerged dyke area
- water quality impacts of pit
3) residue must be addressed


Objective → construct gradual slopes along the edges of the waste rock piles
→ leave the steep slopes to discourage use by animals - fox or wolves could potentially use for hunting caribou & caribou may attempt to climb regardless
→ revegetate - watching metal uptake
→ sell or give away for road construction throughout NWT


CLOSURE OBJECTIVES → Backfilled using wasterock while protecting the water and soil quality - or containing the contaminated area within the pit and building restraints or caps to restrict animal access - including
→ Revegetate the backfilled area
to could add PKS to bottom fish
→ Refill pits gradually while treating it in stages before reintroducing fish (water) and refilling completely - clean rocks, etc.
→ Partially refill completed pits with wasterock from active pits as the mine progresses & complete with water
ABT N 15 feet


Obj → → → Criteria (engineering issues)
-stability
-no dust
-no erosion
-survivability - earthquake
-safe for wildlife/people
-perpetual (∞) frozen core
-promotion of revegetation
-no ARD
-min. runoff/seepage
-grade of slope & material type.
-material type
-some kind of cap


potentially use for hunting caribou & caribou may attempt to climb regardless
→ revegetate - watching metal uptake
→ sell or give away for road construction throughout NWT

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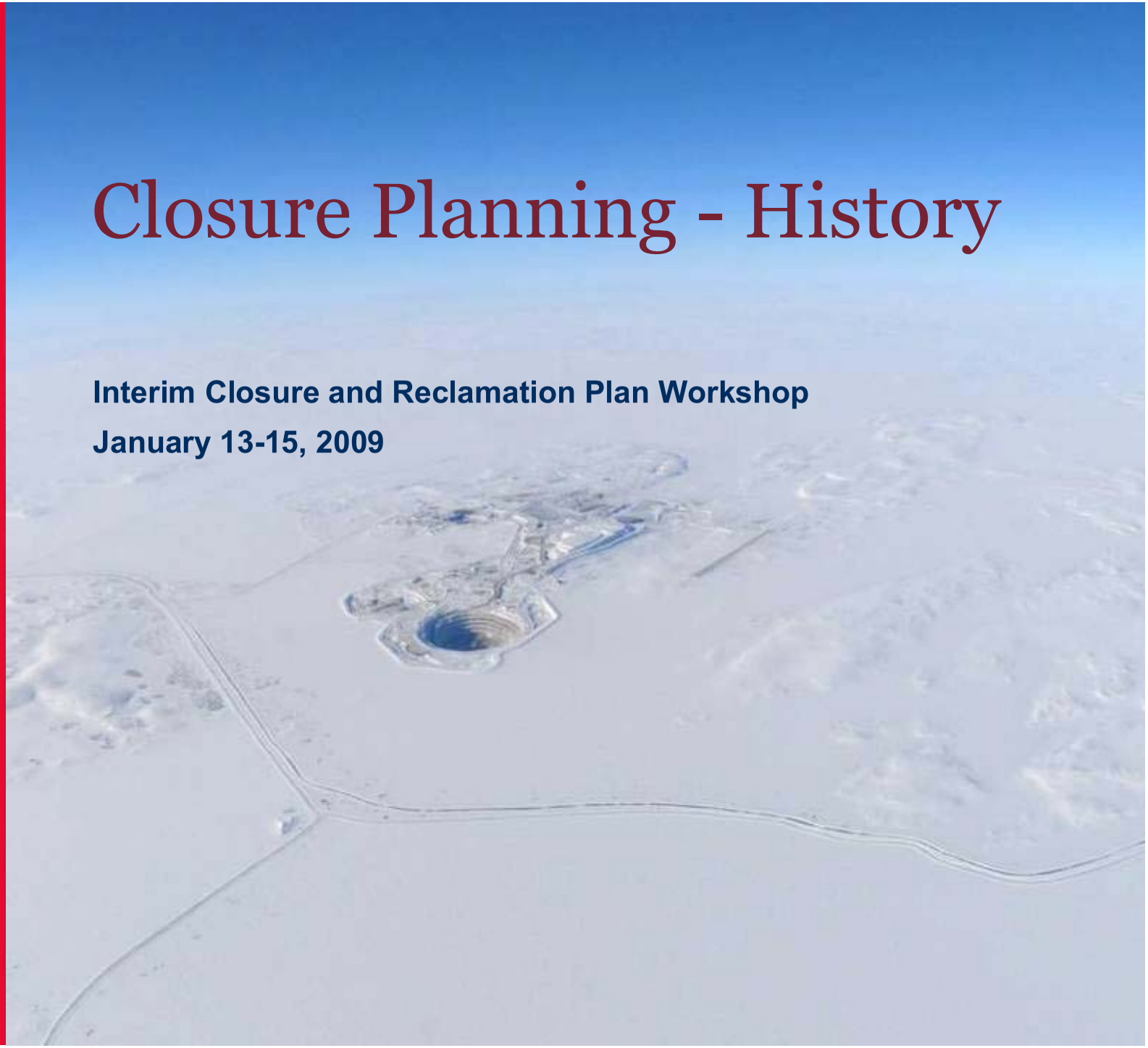
Annex E – Rio Tinto Limited, DIAND and WLWB PowerPoint Presentations

Rio Tinto

Closure Planning - History

Interim Closure and Reclamation Plan Workshop

January 13-15, 2009



RioTinto

Presentation Outline

1. Closure Vision and Objectives
2. Closure Alternatives – Mine Design
3. Socio-economic Aspects
4. Underground, Open Pits and Dikes
5. Wasterock Area
6. Processed Kimberlite Containment
7. Buildings and Roads
8. North Inlet

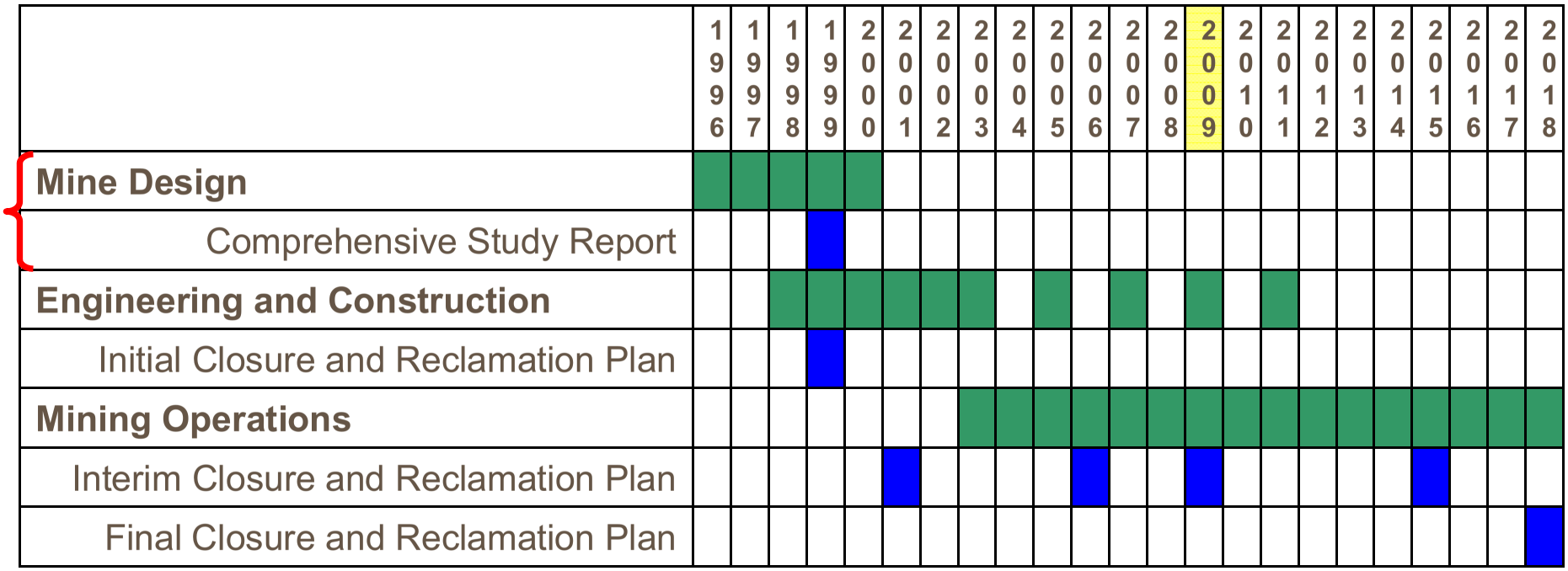
Vision Statement:

- We will close the Diavik Mine responsibly and progressively, leaving a positive community and environmental legacy.

Closure Objectives:

- Land and water that is safe for people, wildlife and aquatic life.
- Enhanced capacities for northerners and northern businesses.
- No long term care and maintenance.

Closure Planning - Schedule and Phases



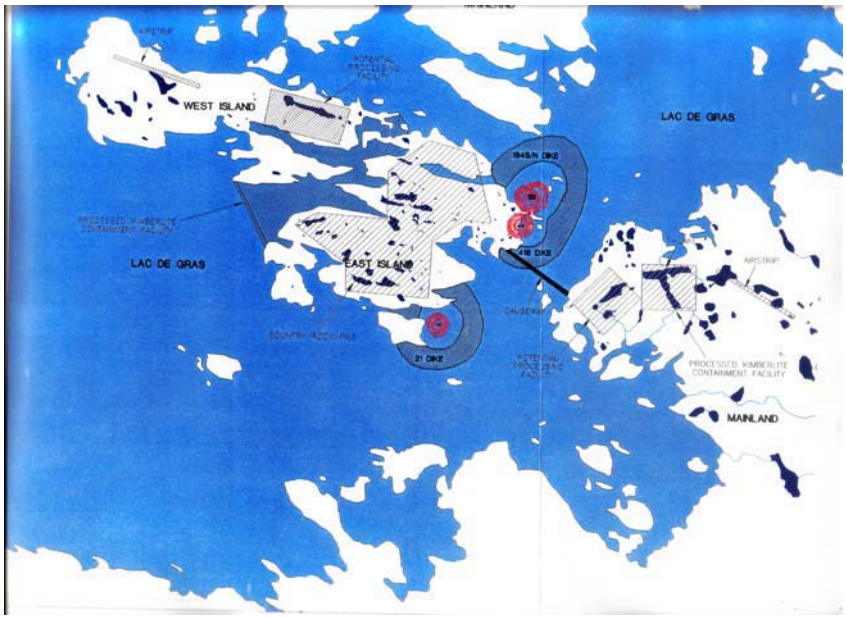
Closure Alternatives – Mine Design Phase

Human Resources Options

Mining Method Options

Siting Options

- PKC
- Wasterock



Design Options

- Water management
- Water treatment
- Processed kimberlite containment

Human Resources Alternatives

#1: southern head office – employing northerners opportunistically.

- Minimal northern socio-economic impacts at closure because of limited involvement

✓ **#2 – northern head office** – actively seeking northern involvement

- Greater socio-economic impact at closure but mitigated through progressive participation and capacity building

Mining Method Alternatives

#1: All underground – not economical, technically risky and shorter mine life

- Easier closure option due to smallest environmental disturbance.

#2: Smaller open pits & underground – more underground mining, fewer northern opportunities, reduced economics

- Moderate closure – less wasterock than #3

✓ **#3: Larger open pits & underground** – best balance of economics and environment

- Moderate closure – more wasterock.

Figure 4-1 Schematic representation of three mining alternatives.

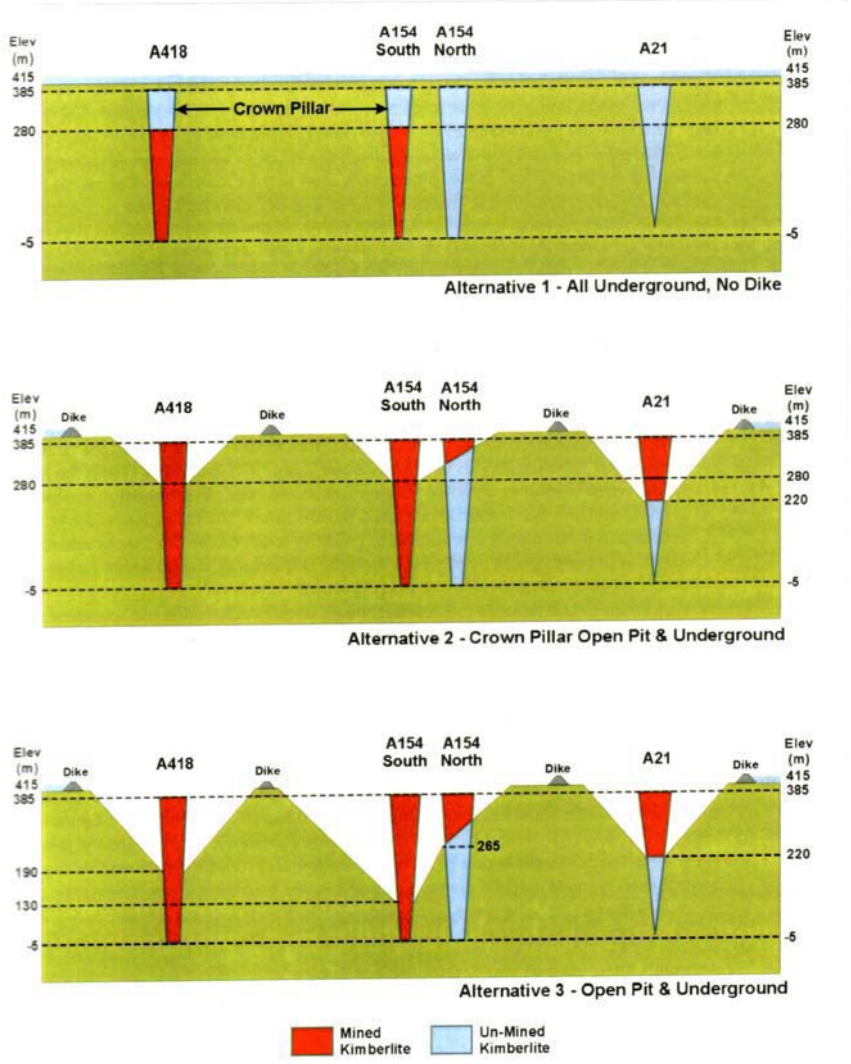
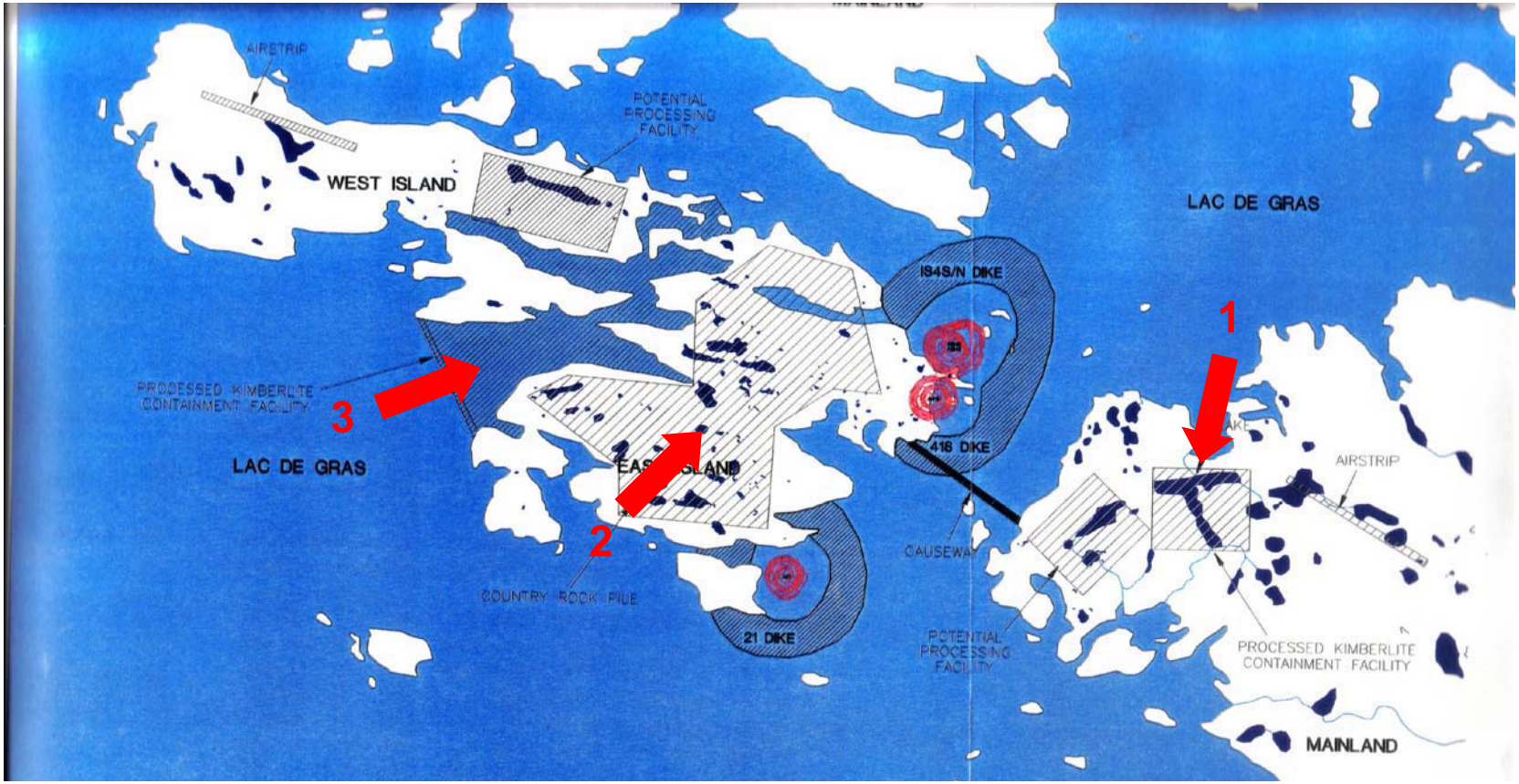


Figure 4 - 1

May 3, 1999

Siting Alternatives - PKC



#1: T-Lake on mainland – causeway and larger footprint

- Better closure option than #2 due to location.

✓ **#2: East Island valley** – closest to mine

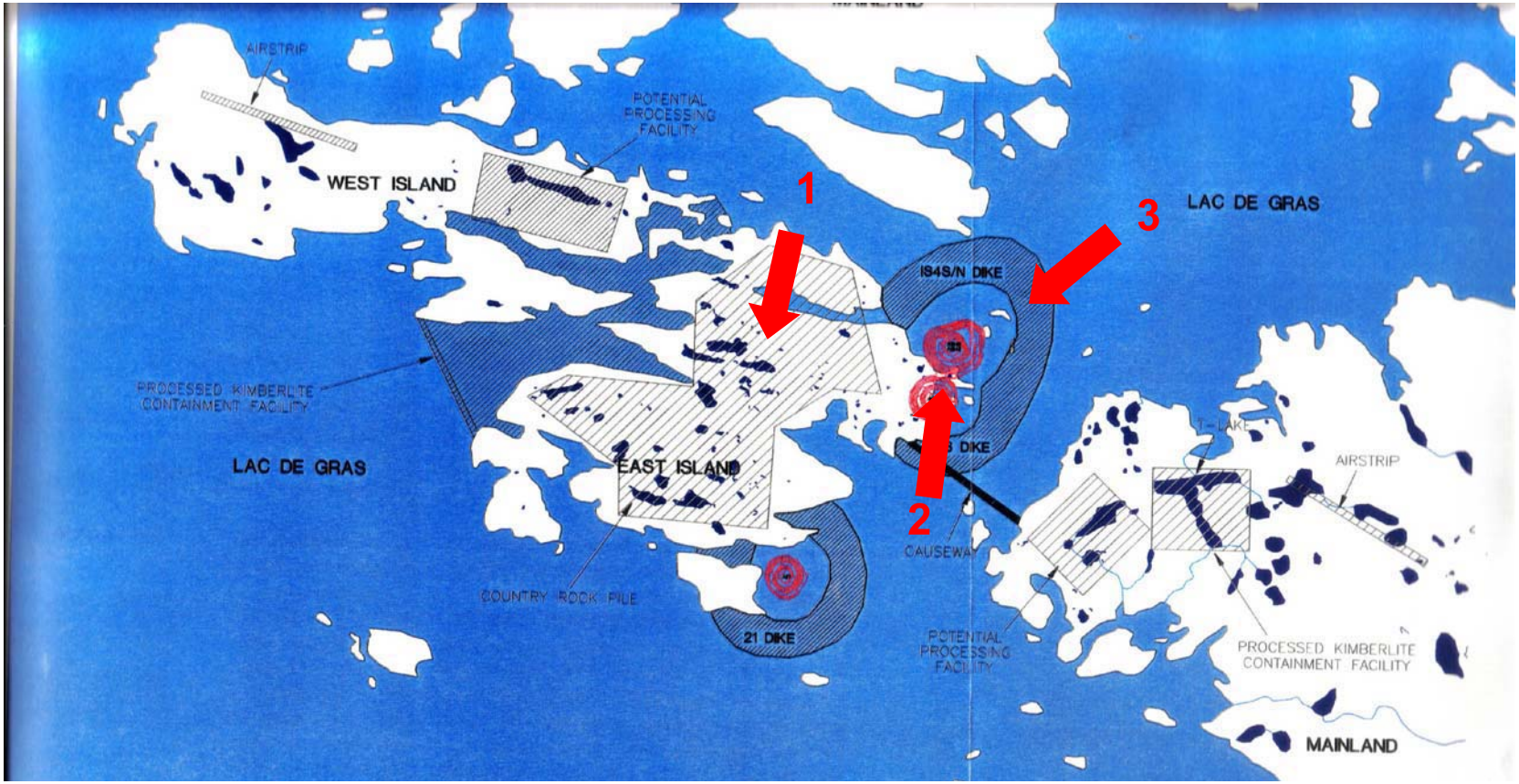
- Most technically challenging closure

#3: Lac de Gras – preferred geochemical option – unacceptable from communities perspective.

- Technically most secure closure option.

RioTinto

Siting Alternatives - Wasterock



- **#1: Near open pits** – most practical
- **#2: Backfill completed pits** – mining sequence issue, geochemical problems, double handling
- **#3: Lac de Gras** – widening of dikes – best geochemical control – fish habitat and communities concerns.

- More difficult closure option.
- Better closure option if placed directly into flooded pits.
- Technically most secure closure option.

Design Alternatives – Water Management

#1: treat and release PKC water – use mine water for make-up

- Better option for closure due to minimal water remaining in PKC

#2 – treat and release mine water – use PKC as make-up water as it is the poorer quality water.

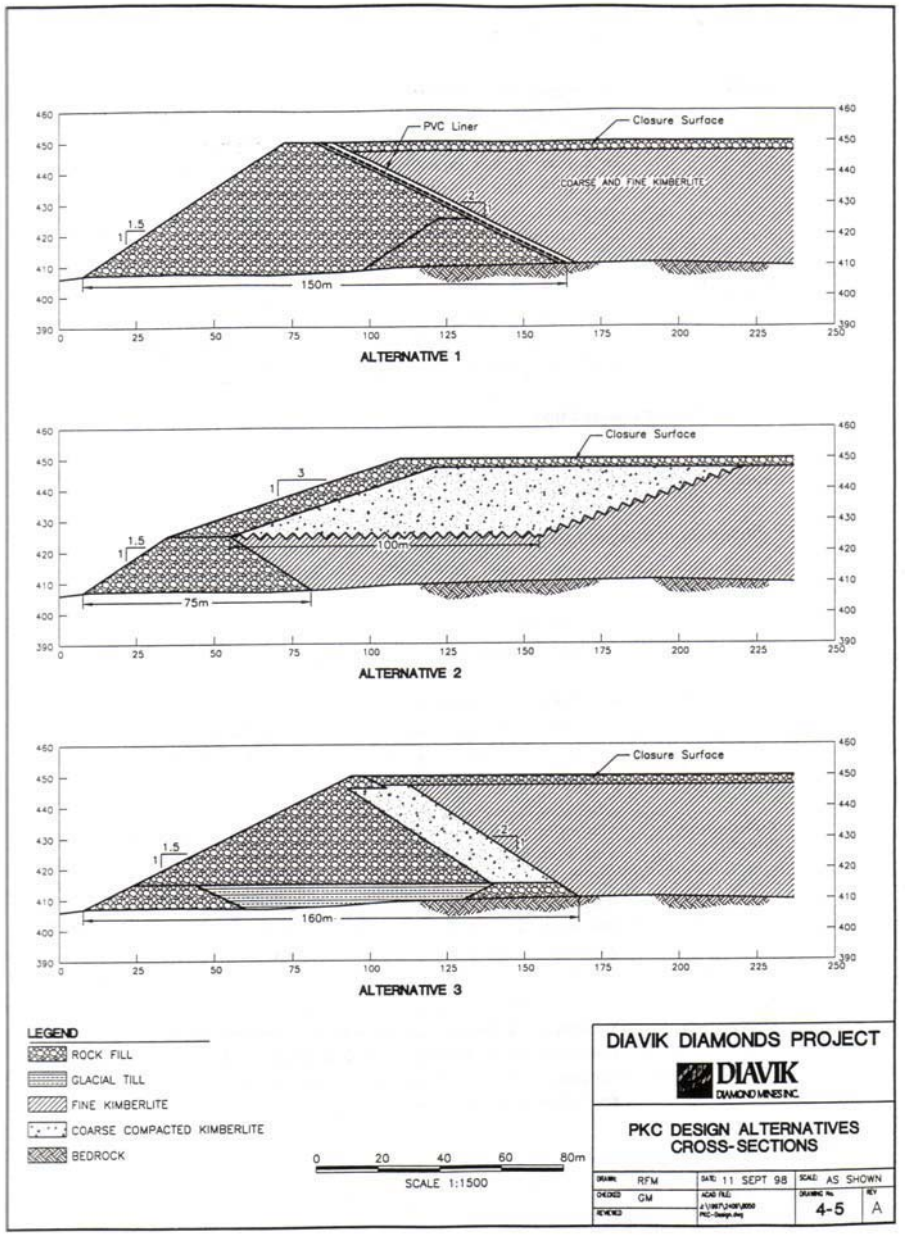
- More difficult closure option

Design Alternatives – Water Treatment

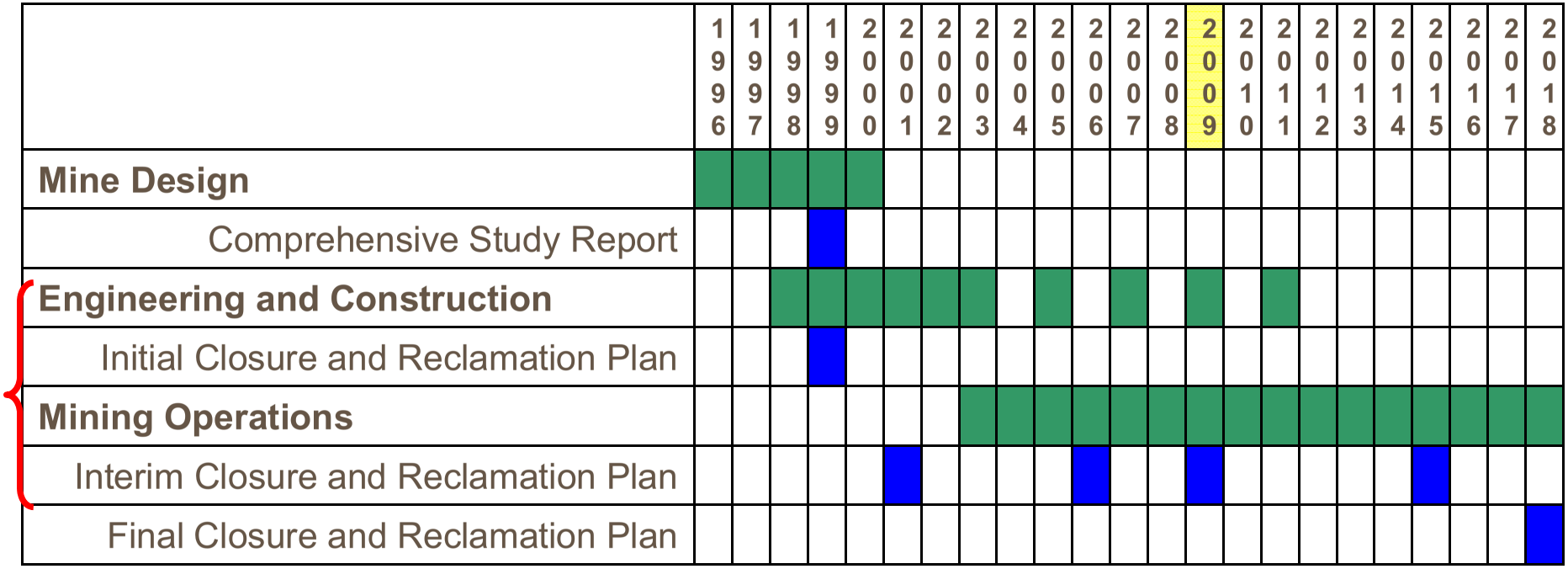
#1: settling ponds – variable performance	• Minimal closure issues – settled solids
✓ **#2: clarification/filtration** – low chemical use/waste – good performance – limited parameters.	• Minimal closure issues – settled solids and backwash
#3: hydroxide/sulphide precipitation – adds metals treatment but uses chemicals and generates waste.	• Increased closure issues – removed metals precipitates
#4: reverse osmosis – excellent treatment performance but high waste generation	• Significant closure issues – large waste volumes
#5: ion exchange – good treatment performance but high waste generation	• Significant closure issues – large waste volumes

Design Alternatives - PKC

- **#1: rock dam with PVC liner** – most expensive – best operational seepage control
  - Possible long-term/closure seepage if liner degrades
- **#2: upstream construction with coarse PK liner** – no PVC liner, smaller footprint and capacity
  - Smaller closure area and better long-term/closure seepage management
- **#3: rock with PK liner** – seepage managed during operations with collection ponds
  - Best long term/closure seepage management



Closure Planning - Schedule and Phases



Socio-economic Aspects

Proposed Closure Objectives:

- Capacity building during operations to enable communities to best adapt to post closure socio-economic conditions.
- Sustainable capacities in communities

Existing Closure Plan:

- Implement participation agreements
- Implement socio-economic agreements
- Communicate

Underground, Open Pit and Dike

Proposed Closure Objectives:

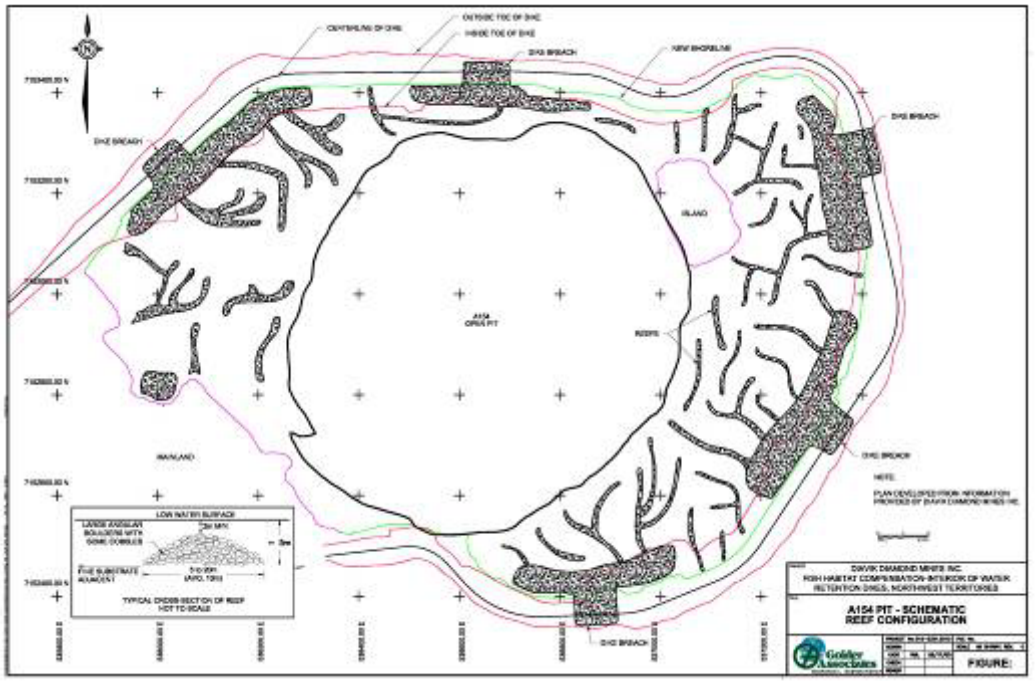
- Provide sustainable water quality in flooded pit areas for aquatic life.
- Develop physical habitat that enhances lake-wide characteristics.
- Enable safe small craft navigation.
- Ensure geotechnical stability.
- Eliminate public and wildlife access to underground.

Underground, Open Pit and Dike

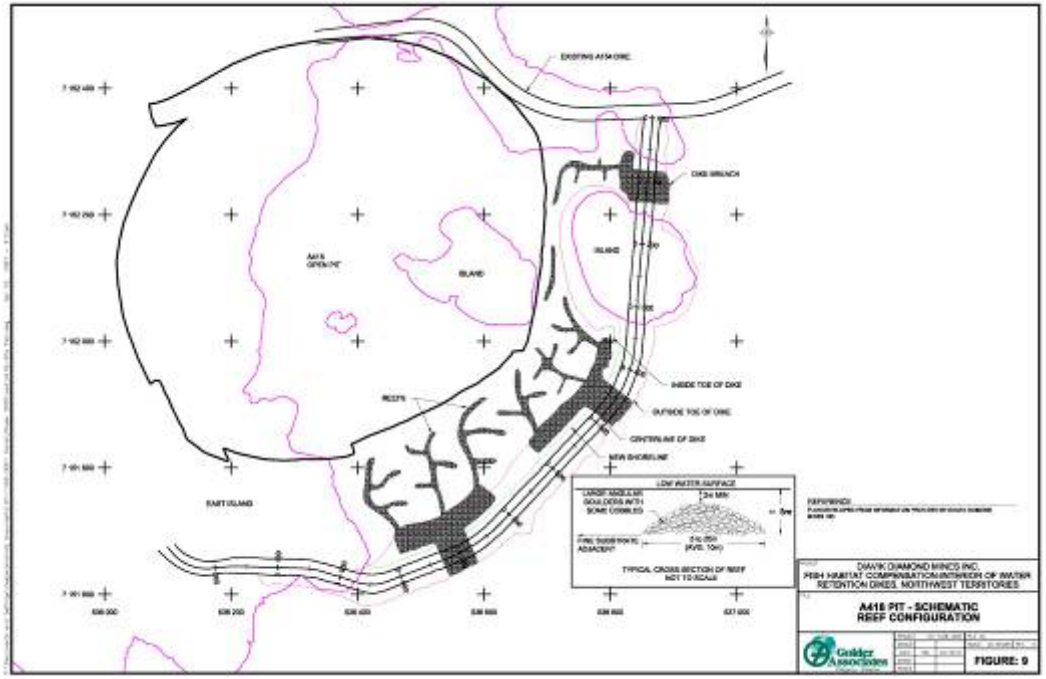
- Existing Closure Plan
  - Construct fish habitat reefs on pit crest.
  - Remove mobile mining equipment, seepage wells, unused AN, explosives, fuel, lubricants, thermosyphons, mounted instruments, and pit dewatering system.
  - Fixed UG equipment that cannot be salvaged will be cleaned an left in place – piping, wiring, ventilation.
  - Ventilation raises and decline access closed with cement plug.
  - Flood pit by controlled siphons to minimize erosion.
  - 7 cuts (30m wide x 2m deep) in dike once water quality is acceptable.

RioTinto

A154



A418



Wasterock Area

Proposed Closure Objectives:

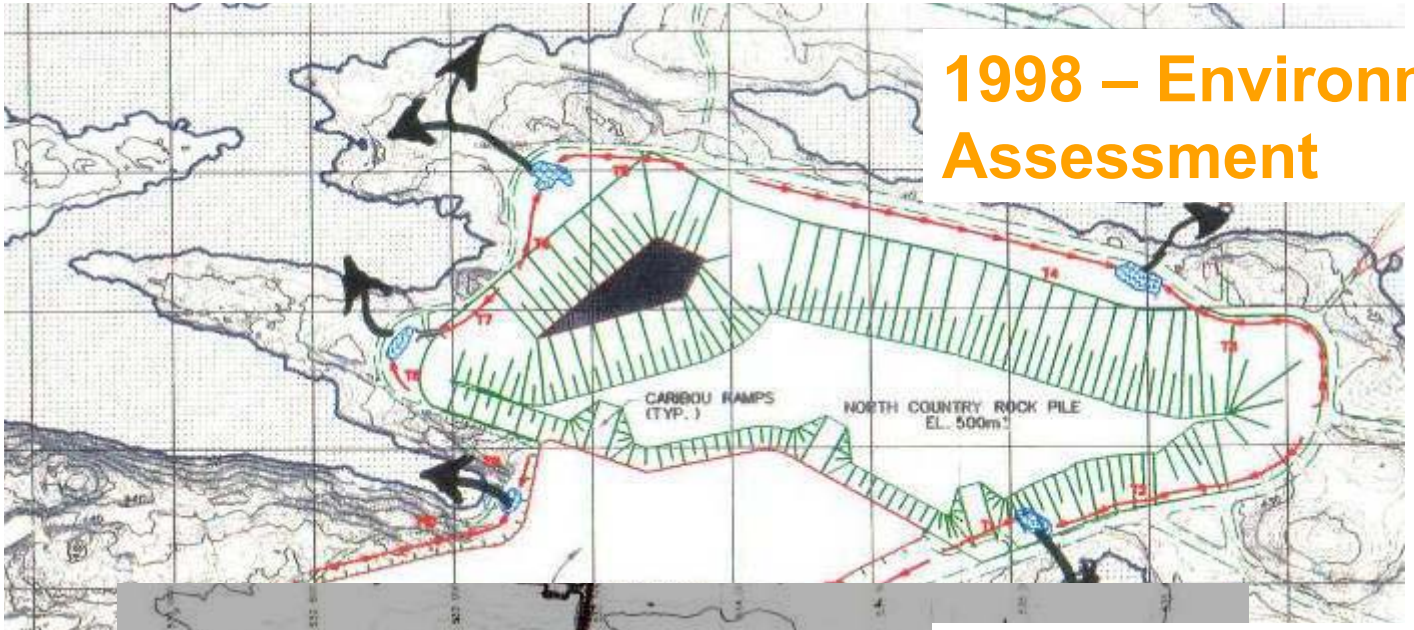
- Freeze Type III rock – no active zone.
- Keep drainage quality safe for human/wildlife and no significant adverse effects on water uses in Lac de Gras.
- Ensure geotechnical stability.
- No water retaining structures.
- Provide safe passage for caribou but not attract caribou.
- Incorporate practical wildlife habitat features in final landscape.

Wasterock Area

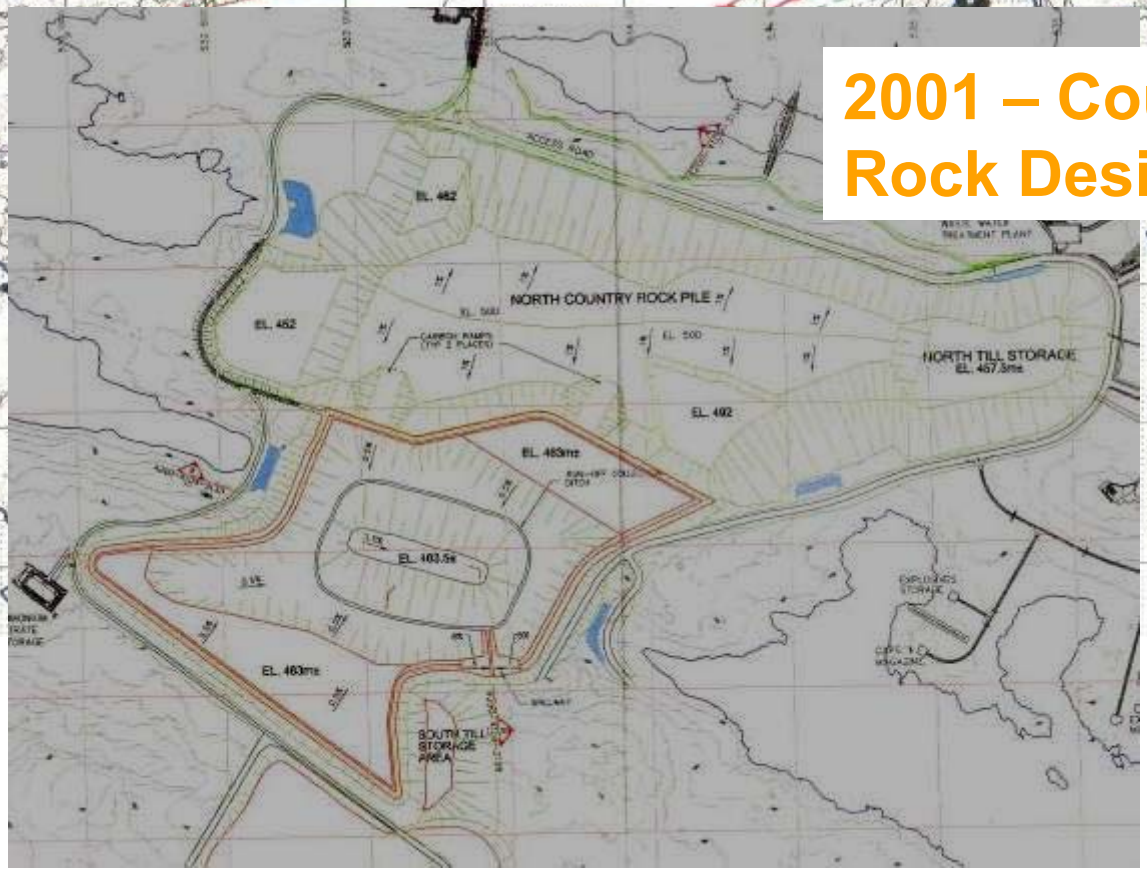
- Existing Closure Plan
  - A418/A154 wasterock segregation and storage into six drainage basins.
  - Grading of outer slopes to produce a stable final slope.
  - Type III covered with 1.5m till and 3m Type I rock.
  - Type II covered with 4m Type I rock.
  - Till contoured with erosion protection – flow breaks and rock lined ditches.
  - Ponds 1,2,3 converted to sediment settling ponds with spillways converted to discharge channels
  - South side and north side caribou ramps – 40-80m wide maximum 4:1 slope

RioTinto

1998 – Environmental Assessment



2001 – Country Rock Design



2006 – ICRP

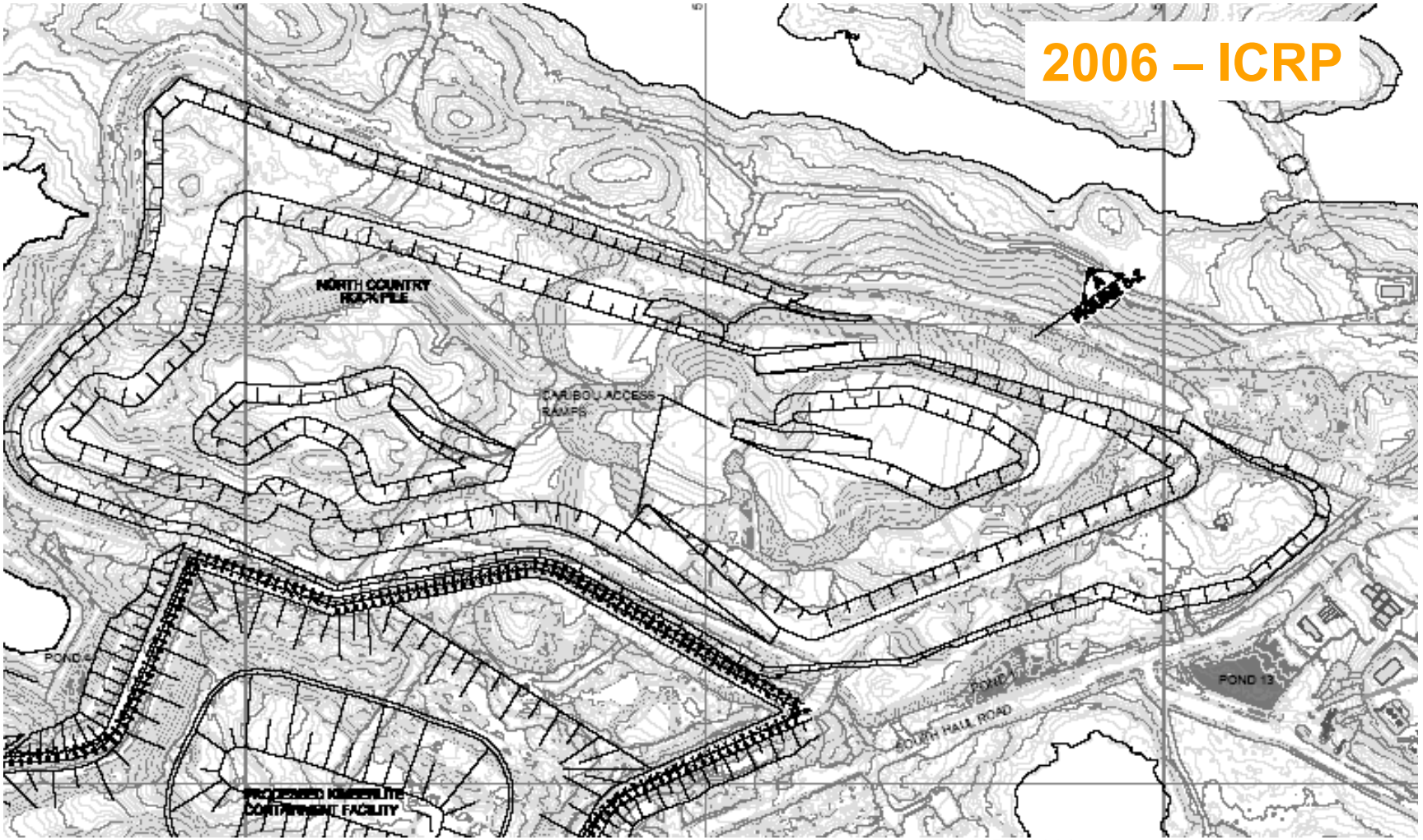


Figure 8-1 - ICRP 2006

Processed Kimberlite Containment

Proposed Closure Objectives:

- Maximize freezing of processed kimberlite.
- Keep drainage quality (runoff and seepage) safe for human/wildlife and no significant adverse effects on water uses in Lac de Gras.
- Ensure geotechnical stability.

Processed Kimberlite Containment

- Existing Closure Plan
  - Minimize pond size towards end of operations then pump out
  - Pond area filled hydraulically with coarse PK and/or beach material
  - Pond area then pre-load with 5m thick rock spacer to cause consolidation over 2-years
  - Final pond cover of 1m till and 3 m rock over spacer dome
  - Processed kimberlite (coarse and fine) covered by 0.5 m thick till and 3m thick Type I rock cap graded to direct any surface runoff.
  - Surface runoff will exit the PKC area through a channel in the southern area via ponds 6,7 and/or 12 which will act as sedimentation ponds.
  - Ponds 4,5,6,7,12 transformed to sediment ponds with outlets to LDG.

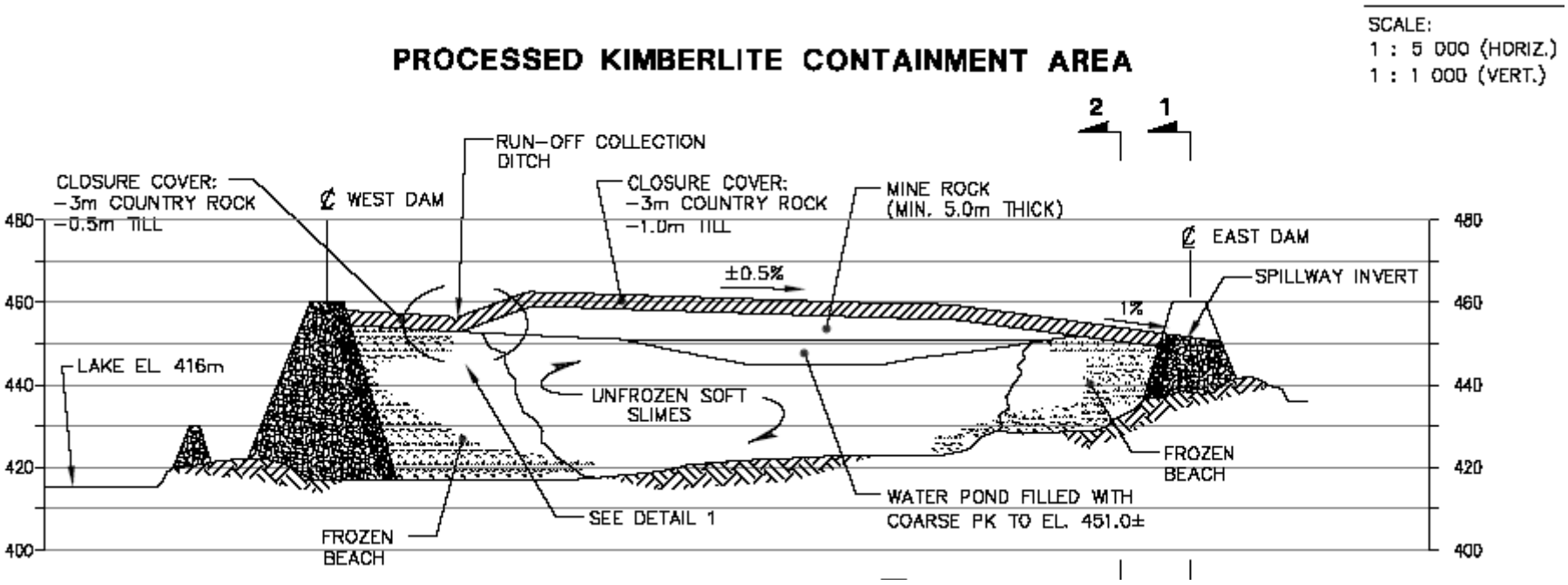


Figure 8-2 ICRP 2006

RioTinto

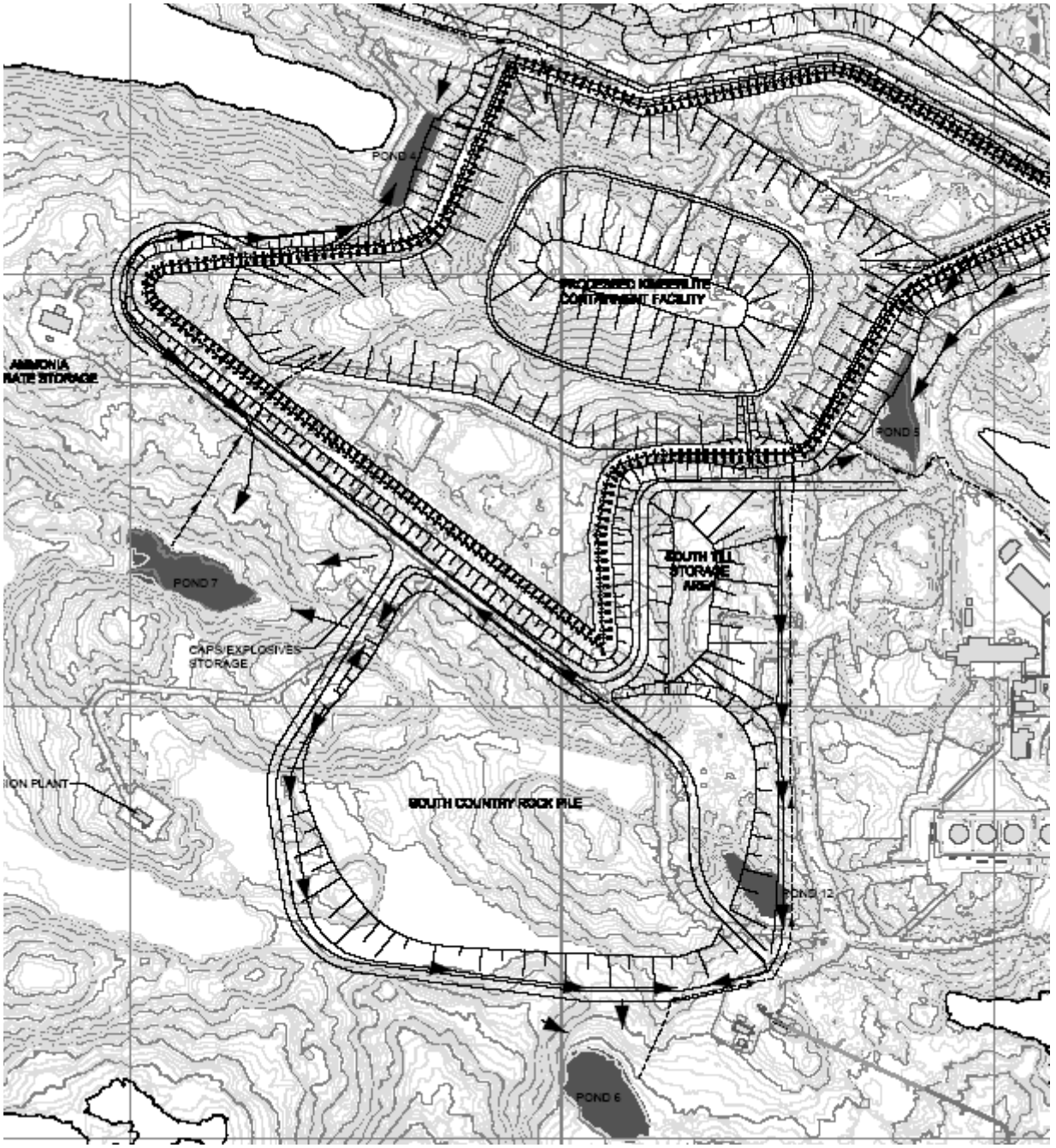


Figure 8-1 ICRP 2006

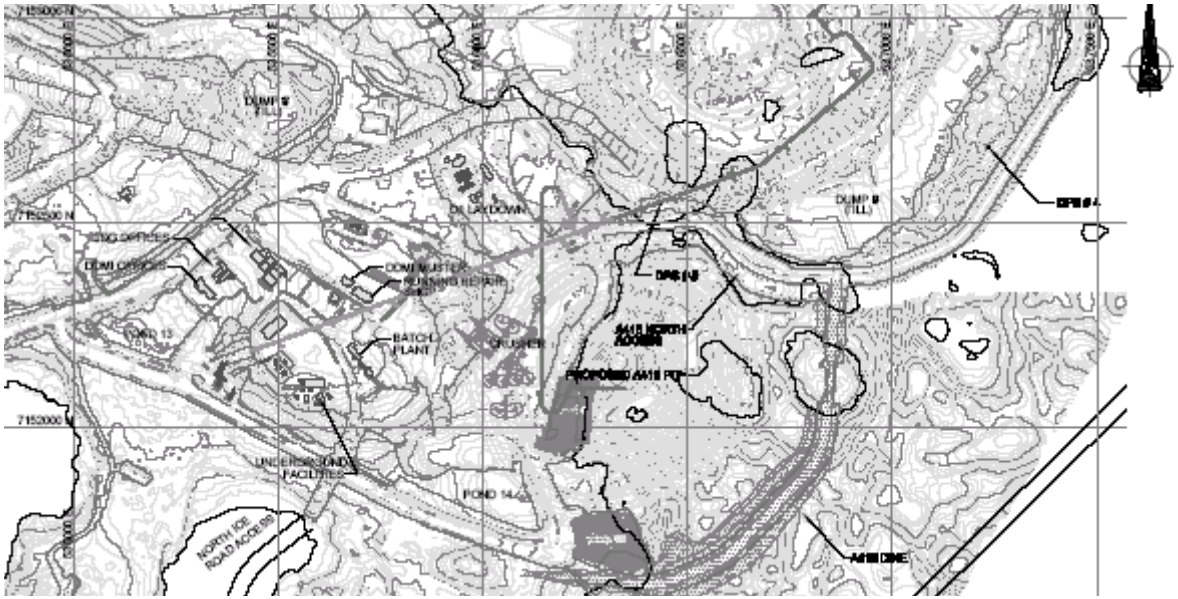
Buildings and Roads

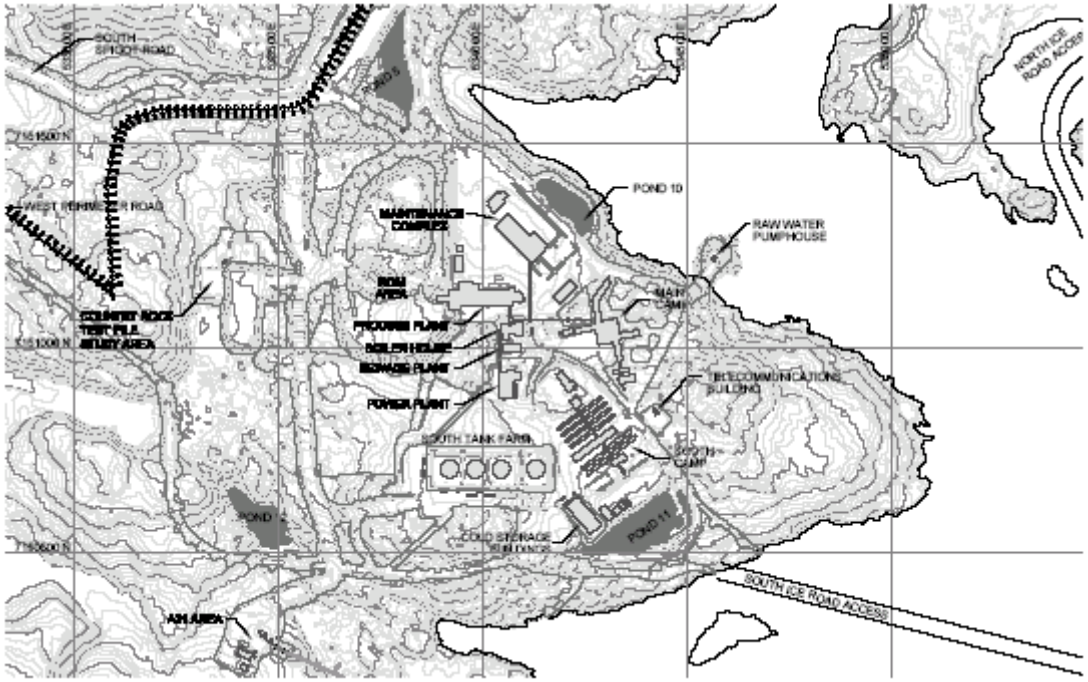
Proposed Closure Objectives:

- Maximize use of assets for regional benefits.
- Maximize use of on-site disposal.
- Provide a final landscape with restored drainage patterns and enhancements to encourage indigenous vegetation.
- Incorporate practical wildlife habitat features in final landscape

Buildings and Roads

- Existing Closure Plan
    - Demobilization of major buildings to near ground level.
    - Concrete demolished to foundation level.
    - Demobilization/dismantling for off-site disposal or recycling.
    - Inert material for disposal either *in-situ* or in approved landfill area.
    - Sale of intact items to northern and southern-based enterprises, Donation of intact items for regional development, sale or donation to demolition and reclamation contractors
    - Contaminated soil placed within coarse PK and covered.
    - Hazardous material packaged and shipped off-site for disposal
    - Re-establishment of drainage – removal of culverts – scarify surfaces and targeted re-establishment of indigenous vegetation.





Figures 5-8 and 5-9 ICRP 2006

North Inlet

Proposed Closure Objectives:

- Water quality safe for human/wildlife and no significant adverse effects on water uses in Lac de Gras.
- Hydrologic connectivity to keep levels equal to Lac de Gras.
- Evaluate opportunities to reconnect for fish habitat.

North Inlet

- Existing Closure Plan
    - Evaluate suitability of sediment and water quality for sustainable aquatic life in north inlet.
    - Hydrologic connection (through permeable rock fill section in east dam) to Lac de Gras to manage water levels.
    - Option to breach east dam and have full connection for fish and water.

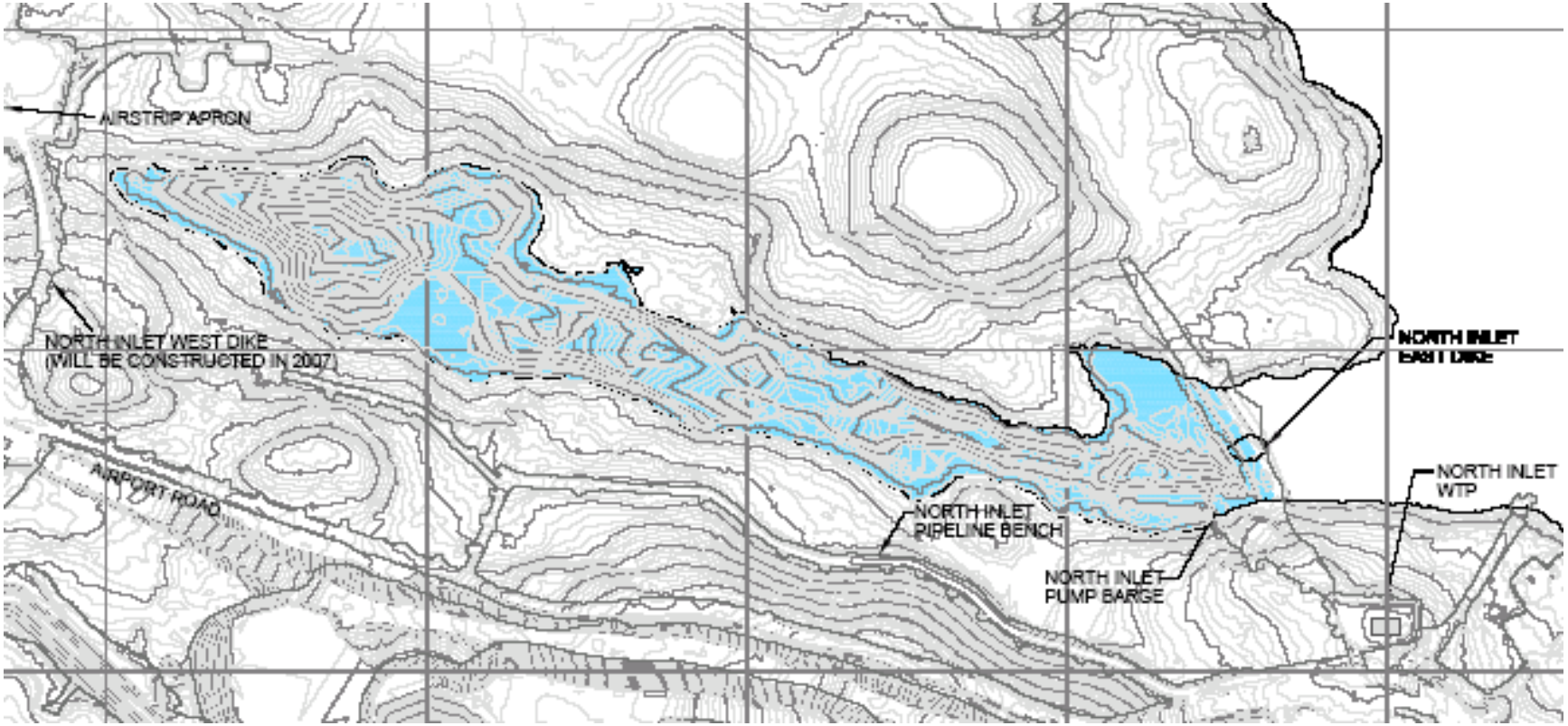


Figure 5-6 ICRP 2006

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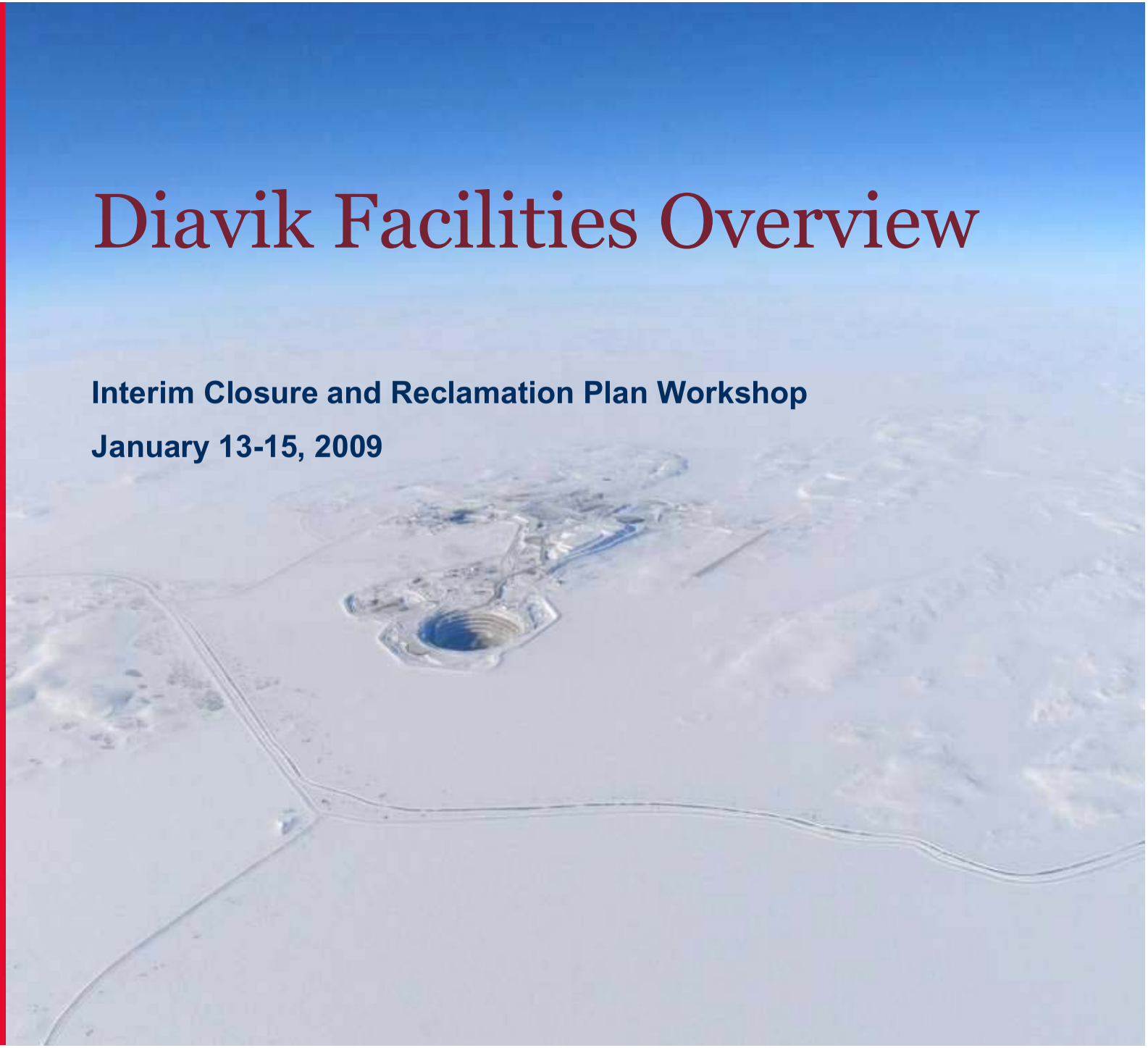
Questions?

Rio Tinto

Diavik Facilities Overview

Interim Closure and Reclamation Plan Workshop

January 13-15, 2009

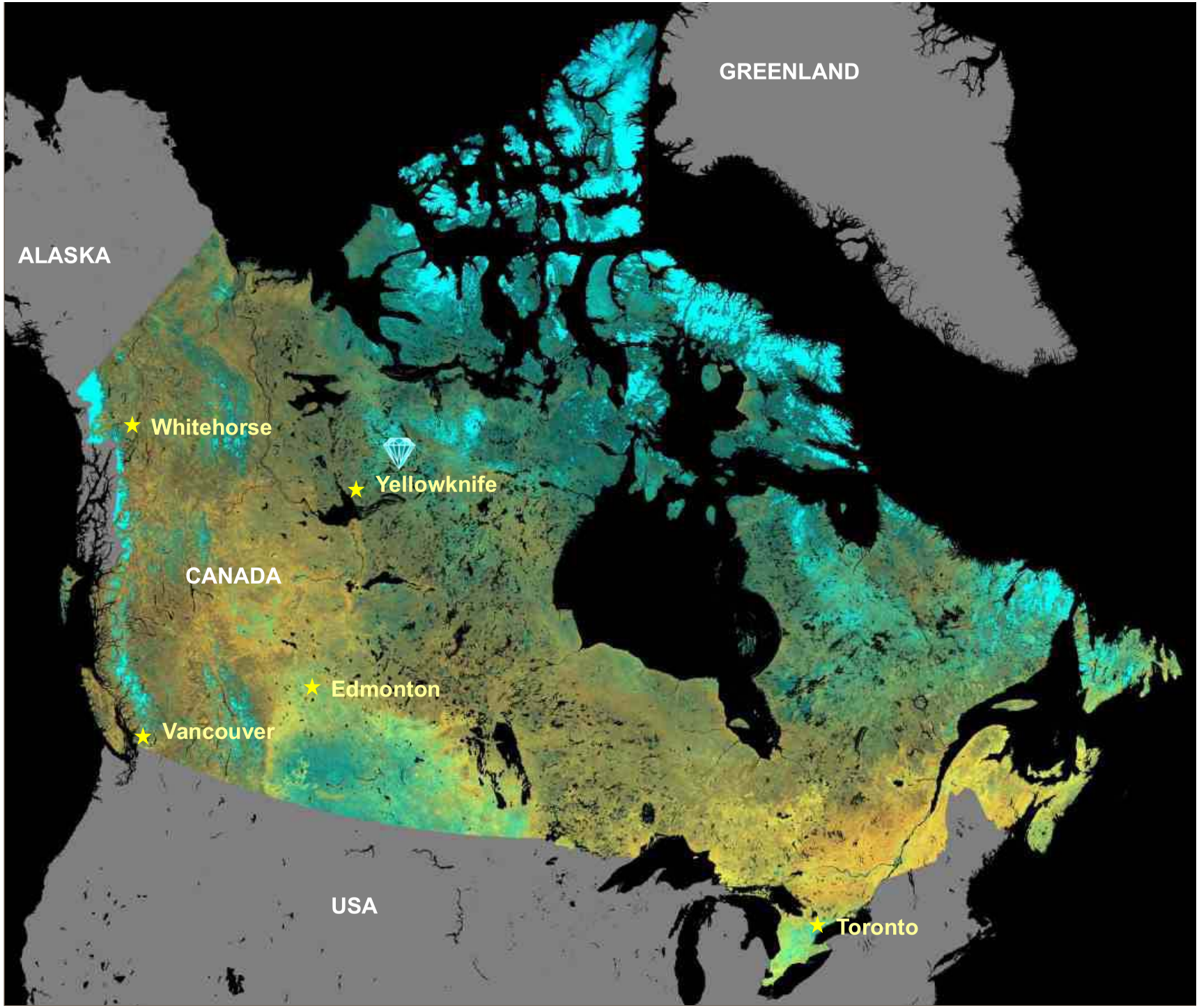


Rio Tinto

Overview

1. General Site Layout
2. Main Camp and Support Facilities
3. Processed Kimberlite Containment Area & Collection Ponds
4. A154, A418 and A21 Pits
5. Country Rock Piles and Test Piles
6. Underground and Support Facilities
7. North Inlet and Water Treatment Plant
8. General Support Facilities (AN & Emulsion, WTA, Airstrip)
9. Current Re-vegetation Study

Rio Tinto

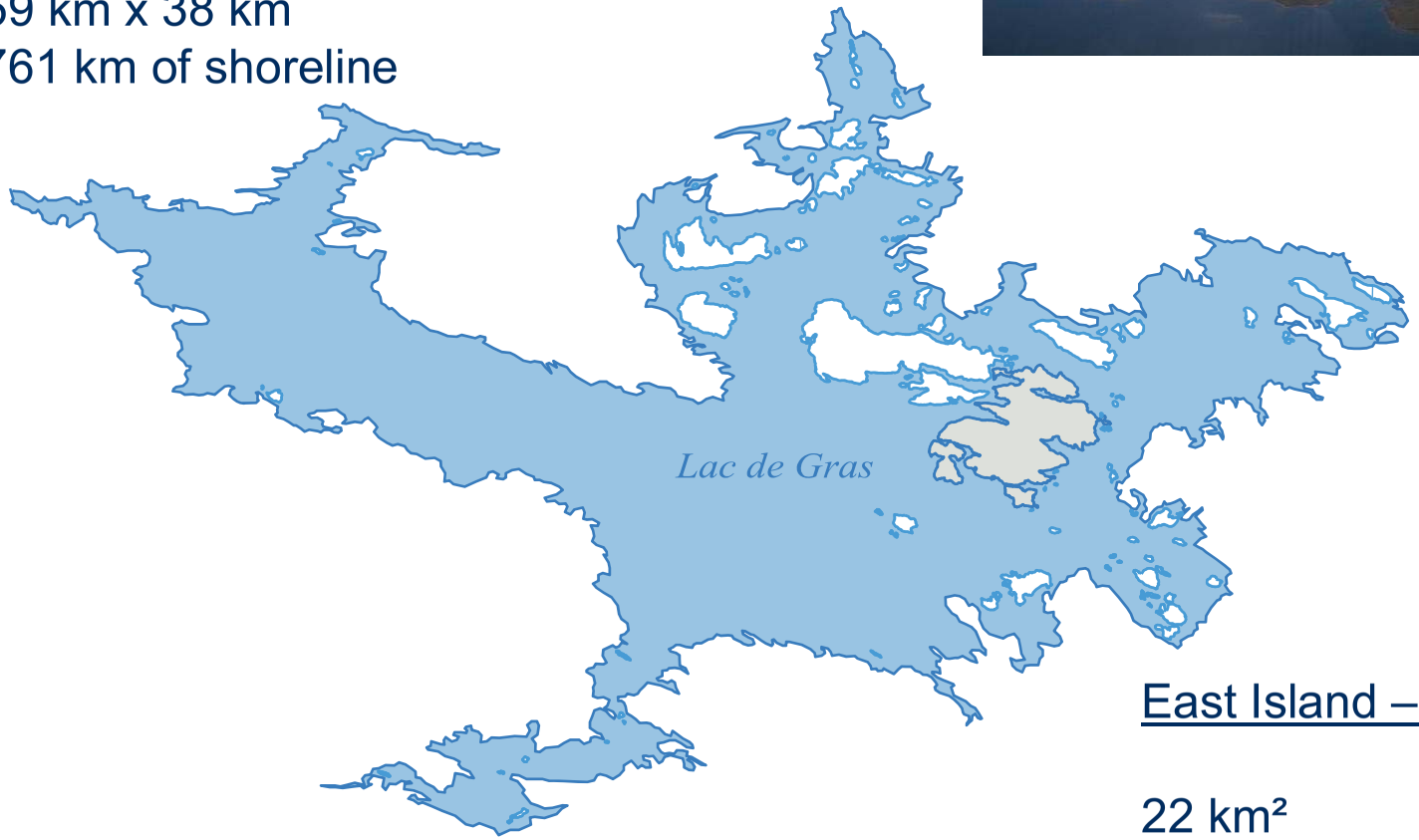

GREENLAND
ALASKA
Whitehorse
Yellowknife
CANADA
Edmonton
Vancouver
USA
Toronto

Rio Tinto

Lac de Gras

Headwaters of
Coppermine River

570 km²
59 km x 38 km
761 km of shoreline



East Island – Diavik

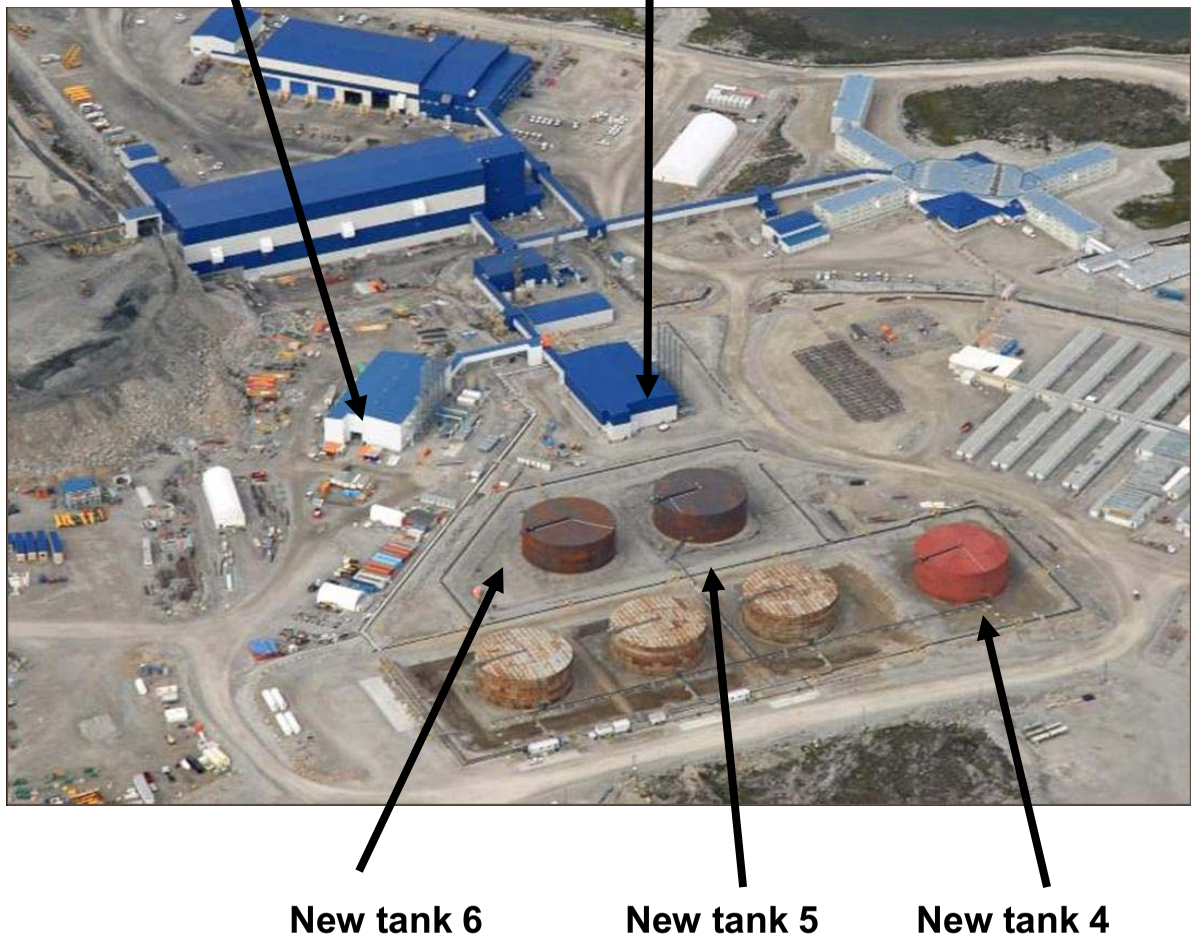
22 km²
9.4 km² of
Infrastructure

Rio Tinto

General Site Layout

Main Camp

- Accommodation Complex
- South Camp
- Maintenance Shop
- South Tank Farm
- Sewage Treatment Plant
- Power Plants
- Boiler House
- Fresh Water Intake
- Run of Mine
- Process Plant



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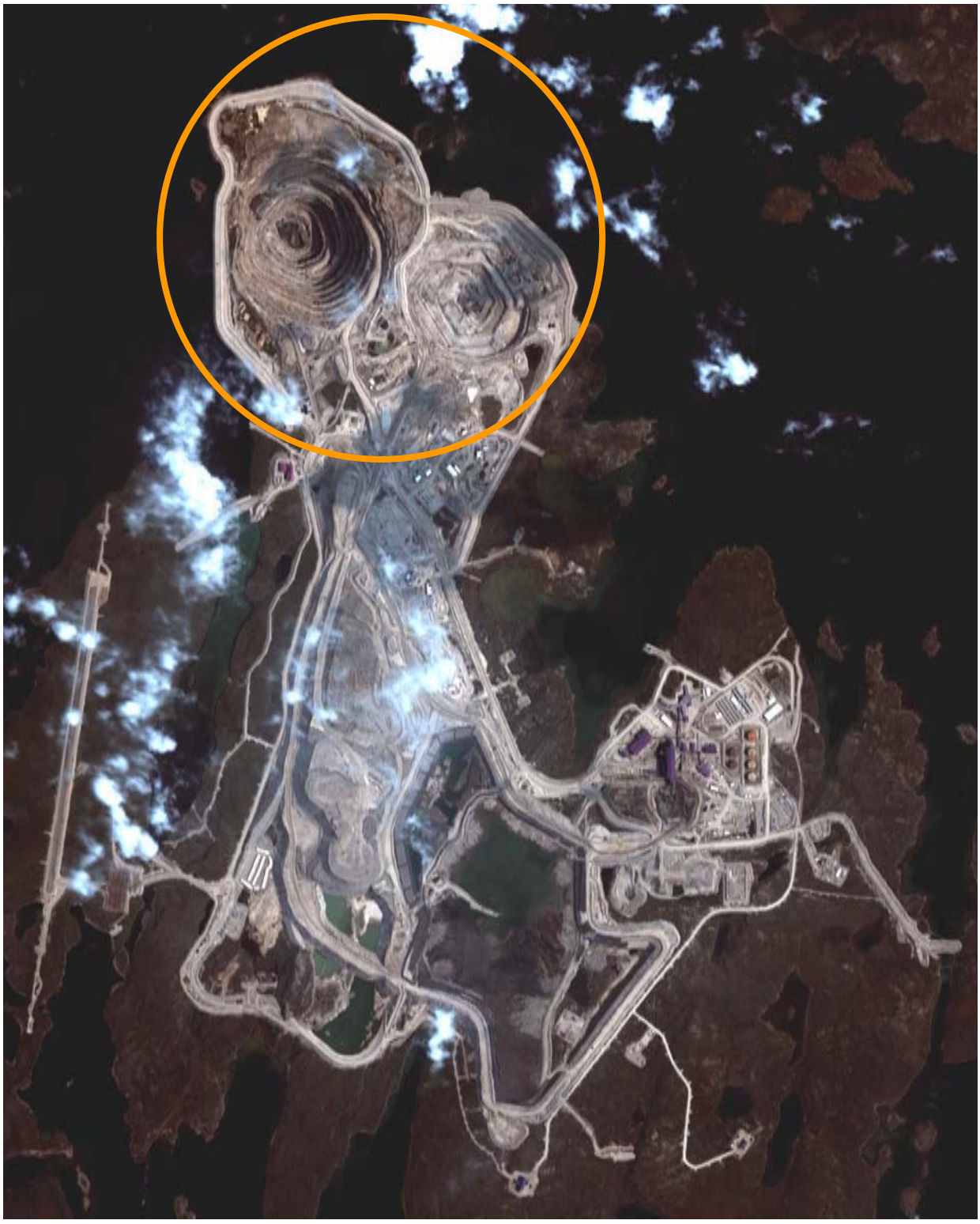
PKC and Collection Ponds

- Coarse Processed Kimberlite (PK)
- Fine PK
- Process Water
- Treated sewage effluent (liquid)
- Snow dump
- Former Waste Transfer Area
- Expanded in 2007
- Future Pipeline Connection to NI
- Collection Ponds



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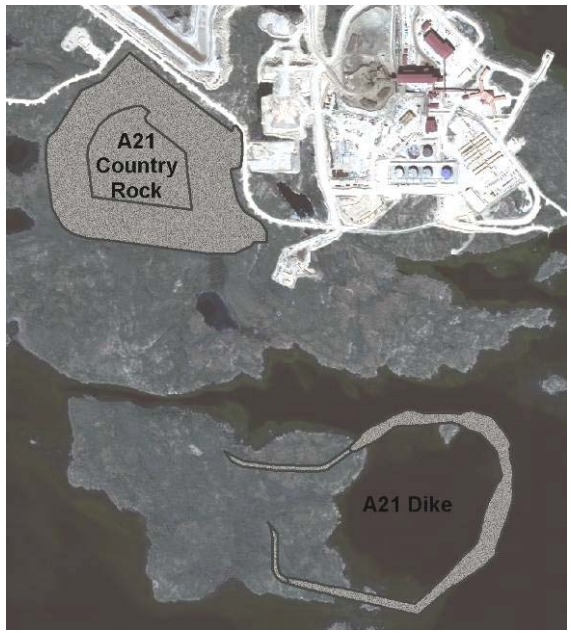
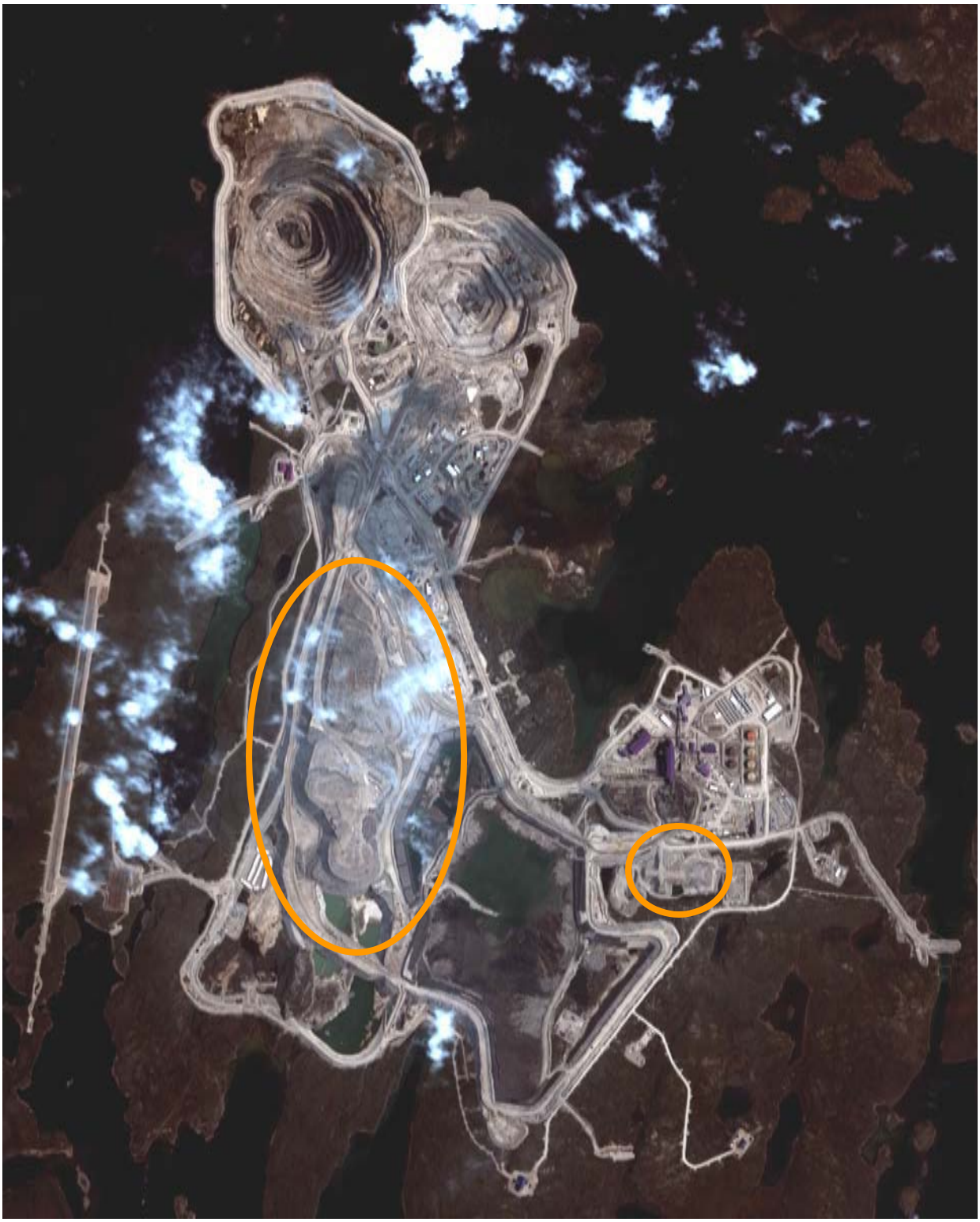
A154 and A418 Open Pits

- A154 Pit – North and South Pipes
- A418 Pit
- A21 Development
- Pit Sumps – water collection
- Seepage Stations
- Pipe Caps
- Fish Habitat Compensation





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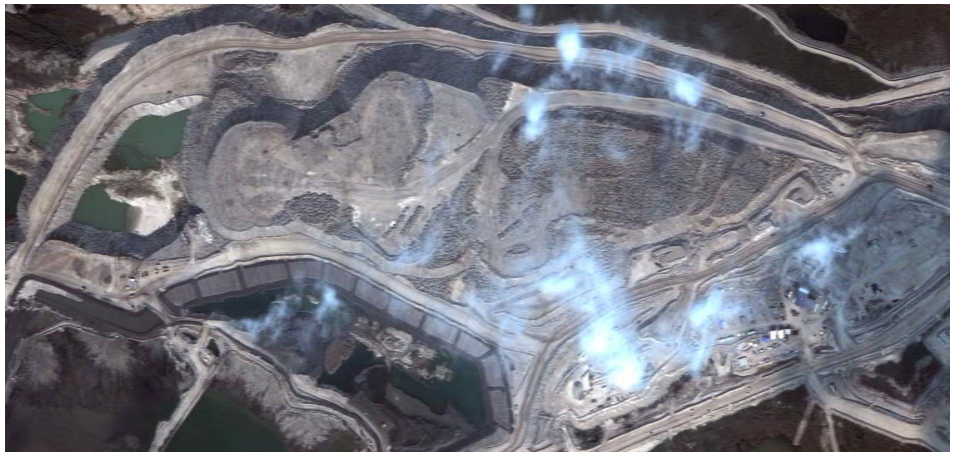
Country Rock Piles and Test Piles

- Type I, II and III segregation
- Main Haul Road
- Dump Plans
- LDG Crusher
- Test Piles Study



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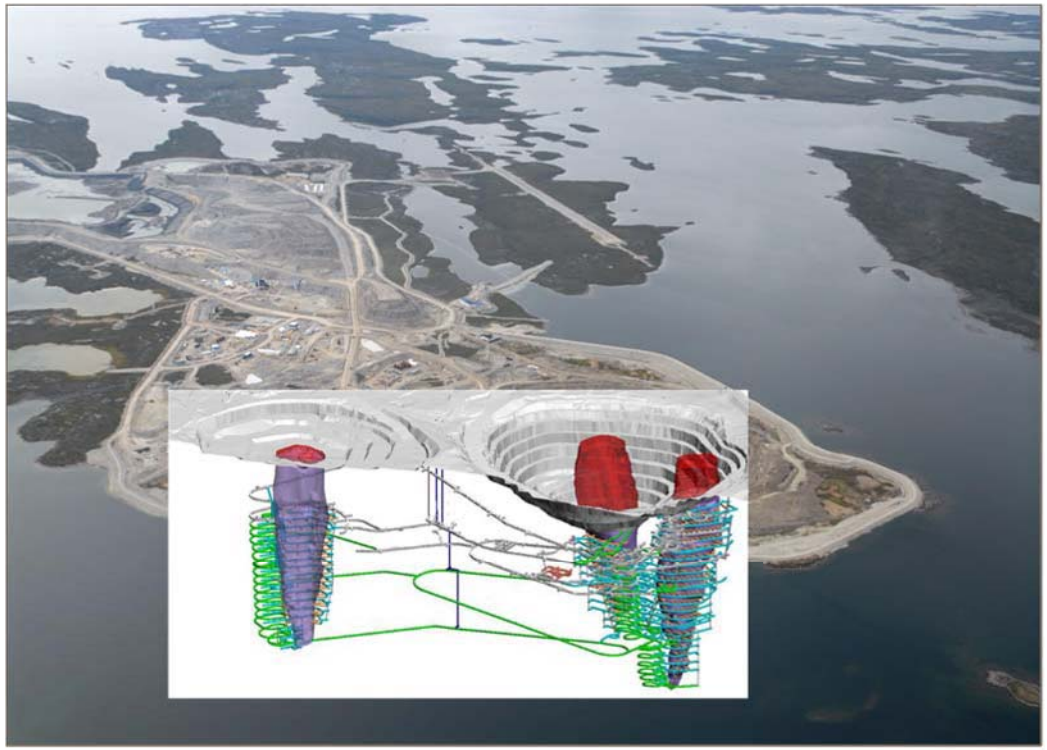
Underground Development

- A154/418 Portal
- Mine Air Heaters
- Underground Dry
- Batch Plant
- Supporting Infrastructure
  - Crusher and Paste Plants
  - Powerhouse Expansion
  - NIWTP Expansion
  - Accommodation Expansion
  - Fresh Air and Vent Raises



Rio Tinto

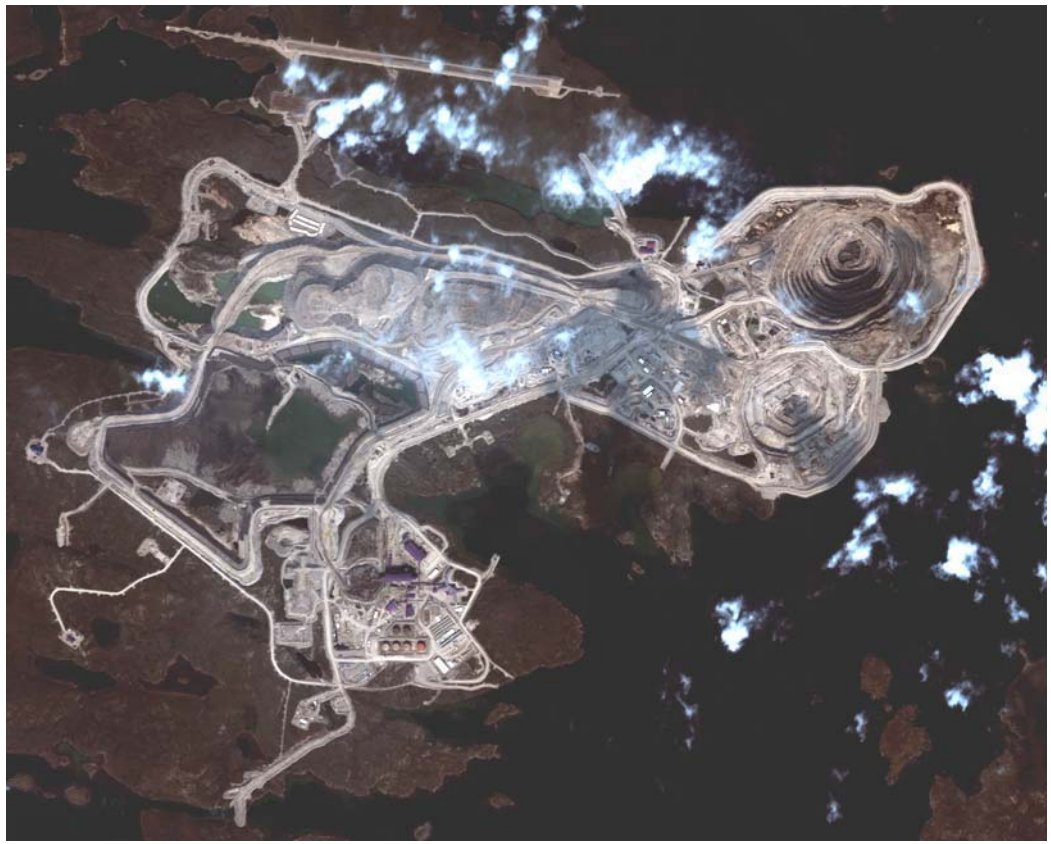
RioTinto

North Inlet and Water Treatment Plant

- NI Dike and Dam
- Additional Storage Capacity (2007)
- Ammonia Uptake Study
- Capacity: 45,000 m^3
- Expansion
- Discharge Line(s)
- Sulphuric Acid Dosing System
- Chemical Storage

General Support Facilities

- AN Storage Building
- Emulsion Plant
- Waste Transfer Area (WTA)
- Airstrip



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Re-vegetation Study

- Increase knowledge of soil and plant characteristics and processes on disturbed and reference sites at the mine
- Develop ecologically and economically effective methods to restore tundra communities following mine closure
- 5 year study

Rio Tinto

Questions?

RIO TINTO

Interim Closure and Reclamation Plan – Site Visit

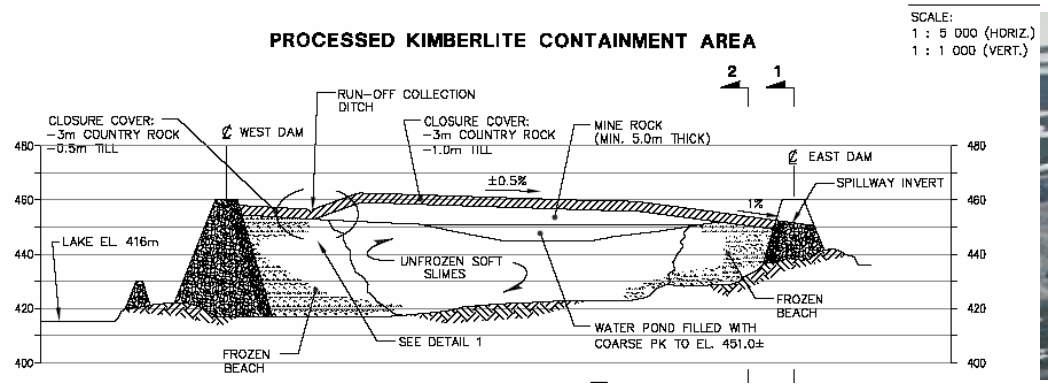
January 14, 2009

Visitors

1	Francis Williah - Tlicho
2	Peter Huskey - Tlicho
3	Michel Louie Rabesca - Tlicho
4	Florence Catholique – LKDFN Representative – EMAB
5	Charlie Catholique _ LKDFN
6	James Marlowe - LKDFN
7	Geoff Clarke - KIA
8	Stanley Anablak - KIA
9	Doug Crossley – KIA Representative – EMAB Member
10	Lawrence Goulet – YDFN Representative - EMAB
11	Jennifer Drygeese - YDFN
12	Bertha Drygeese - YDFN
13	Grant Beck – NSMA Representative – EMAB Member
14	Shannon Hayden - NSMA
15	George Mandeville - NSMA
16	Joe Murdock - EMAB Consultant
17	Nathan Richea - INAC
18	Erica Nyyssonen - GNWT
19	Ryan Fequet - WLWB
20	Gord Macdonald – Colleen English DDMI

Tour Route

1. Processed Kimberlite Containment



- Closure Objectives:
  - Maximize freezing of processed kimberlite.
  - Keep drainage quality (runoff and seepage) safe for human/wildlife and no significant adverse effects on water uses in Lac de Gras.
  - Ensure geotechnical stability.
  - Other?

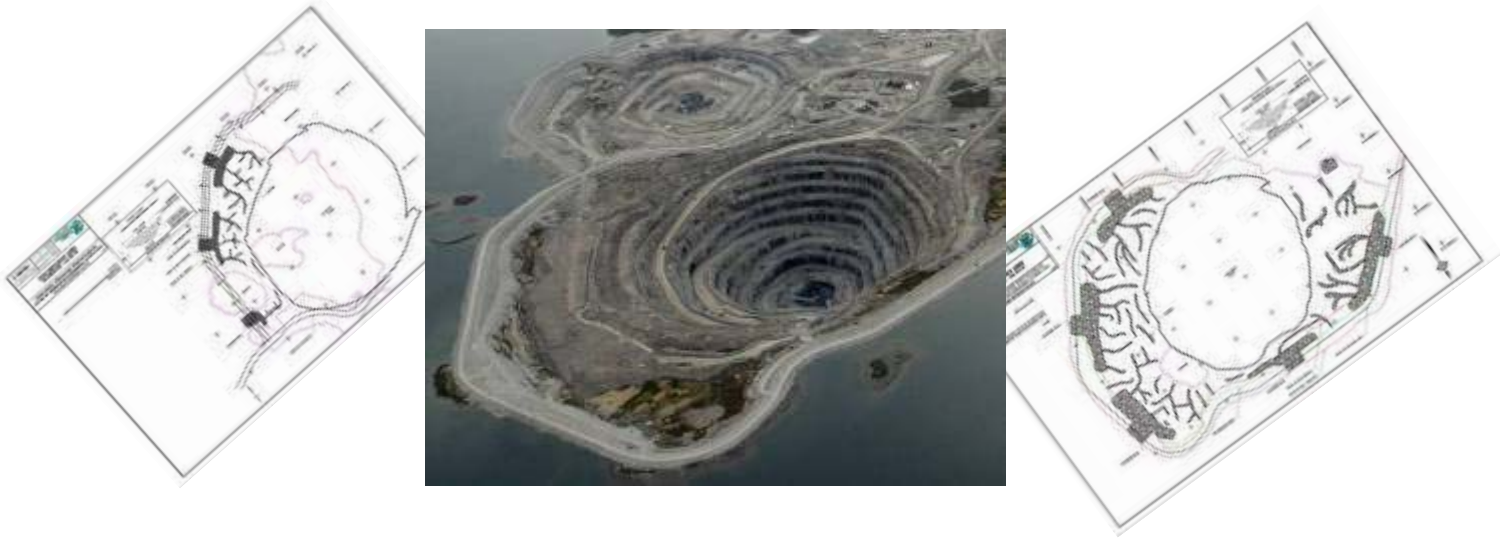
2. Wasterock Area

- Closure Objectives:
  - Freeze Type III rock – no active zone.
  - Keep drainage quality safe for human/wildlife and no significant adverse effects on water uses in Lac de Gras.
  - Ensure geotechnical stability.
  - No water retaining structures.
  - Provide safe passage for caribou but not attract caribou.
  - Incorporate practical wildlife habitat features in final landscape.
  - Other?

3. North Inlet

- Closure Objectives:
  - Water quality safe for human/wildlife and no significant adverse effects on water uses in Lac de Gras.
  - Hydrologic connectivity to keep levels equal to Lac de Gras.
  - Evaluate opportunities to reconnect for fish habitat.
  - Other?

4. Underground, Open Pit and Dike



- Closure Objectives:
  - Provide sustainable water quality in flooded pit areas for aquatic life.
  - Develop physical habitat that enhances lake-wide characteristics.
  - Enable safe small craft navigation.
  - Ensure geotechnical stability.
  - Eliminate public and wildlife access to underground.
  - Other?

5. Buildings and Roads

- Closure Objectives:
  - Maximize use of assets for regional benefits.
  - Maximize use of on-site disposal.
  - Provide a final landscape with restored drainage patterns and enhancements to encourage indigenous vegetation.
  - Incorporate practical wildlife habitat features in final landscape
  - Other?

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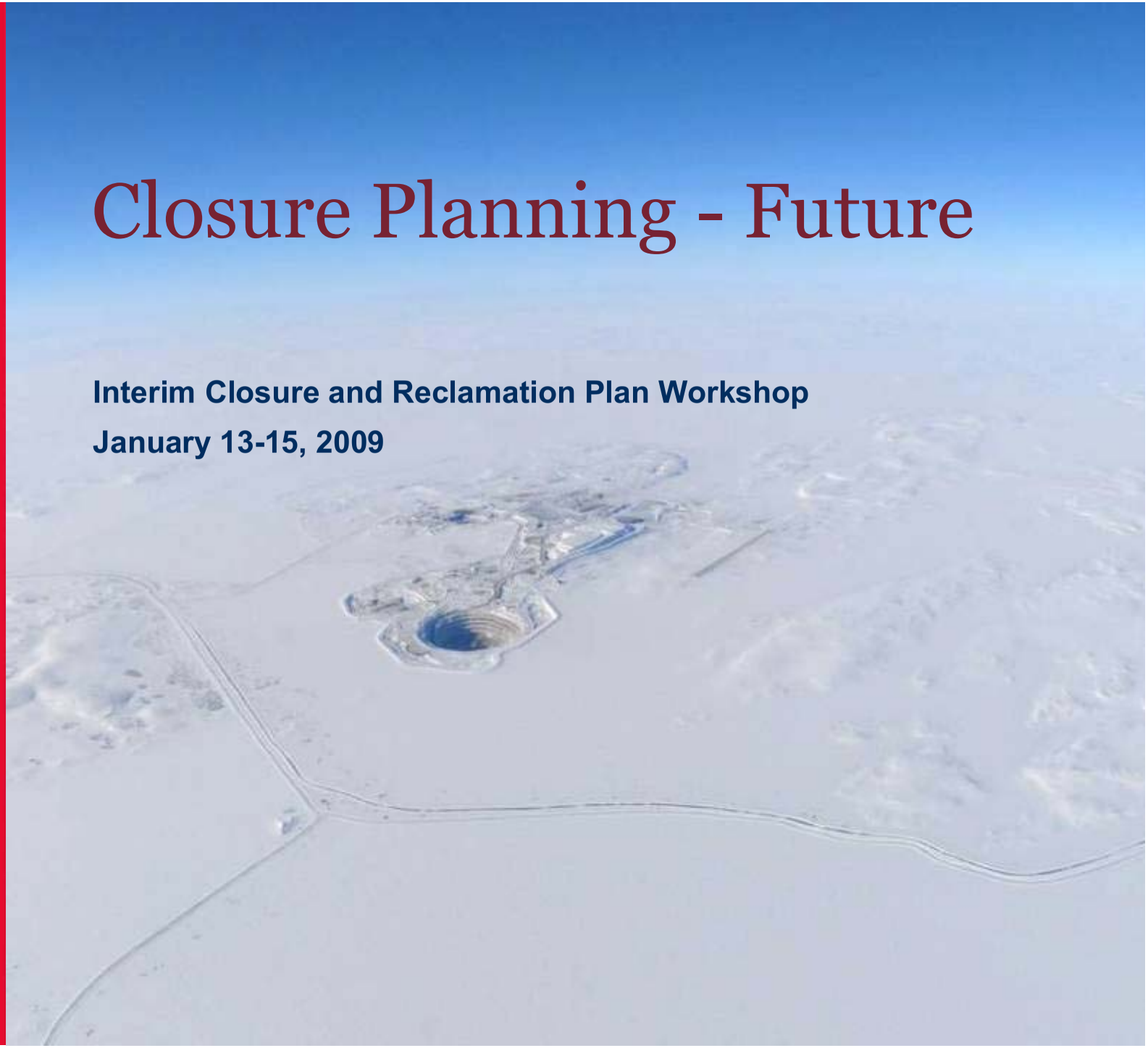
Closure Planning - Future

Interim Closure and Reclamation Plan Workshop

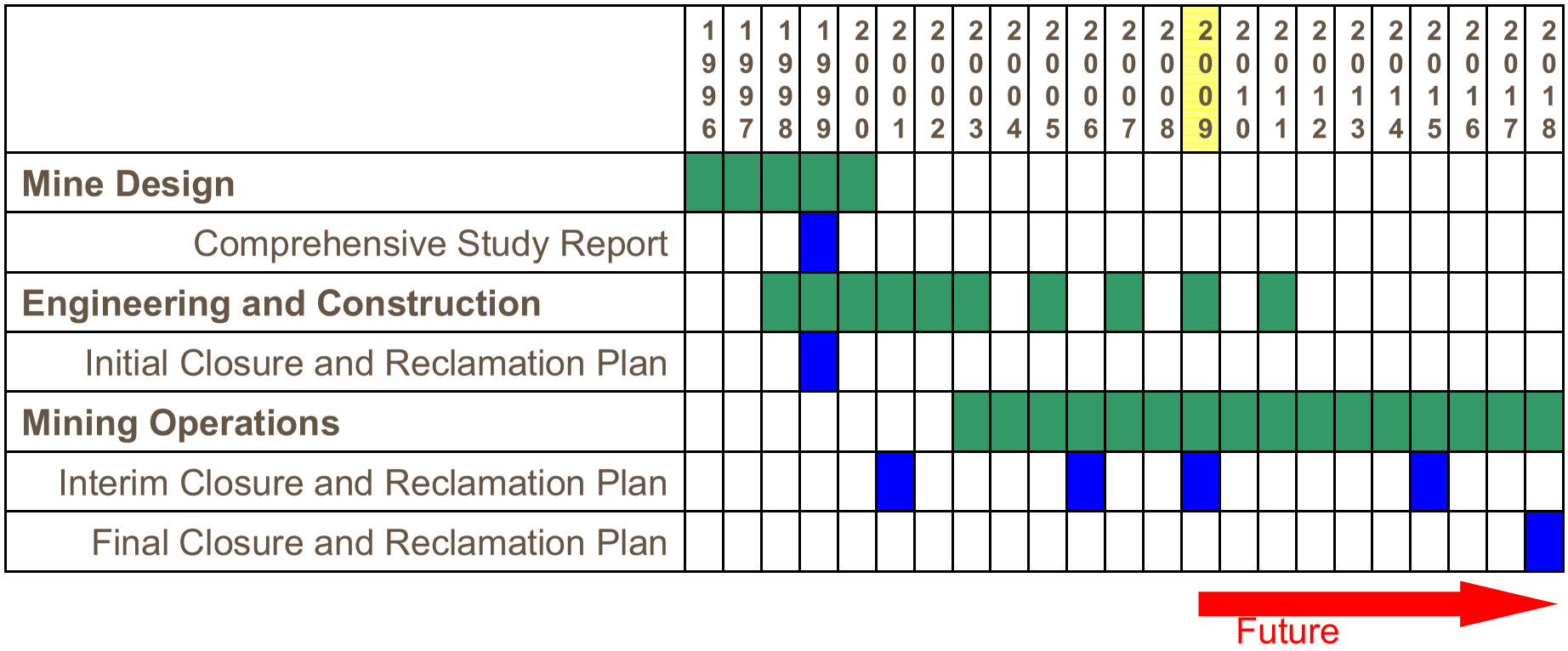
January 13-15, 2009



Presentation Outline

Discussion on future closure planning directions.
1. Closure Vision and Objectives
2. Socio-economic Aspects
3. Underground, Open Pits and Dikes
4. Wasterock Area
5. Processed Kimberlite Containment
6. Buildings and Roads
7. North Inlet

Closure Planning - Schedule and Phases



Vision Statement:

- We will close the Diavik Mine responsibly and progressively, leaving a positive community and environmental legacy.

Closure Objectives:

- Land and water that is safe for people, wildlife and aquatic life.
- Enhanced capacities for northerners and northern businesses.
- No long term care and maintenance.
- Other?

Socio-economic Aspects

Closure Objectives:

- Capacity building during operations to enable communities to best adapt to post closure socio-economic conditions.
- Sustainable capacities in communities.
- Other?

Future Closure Planning :

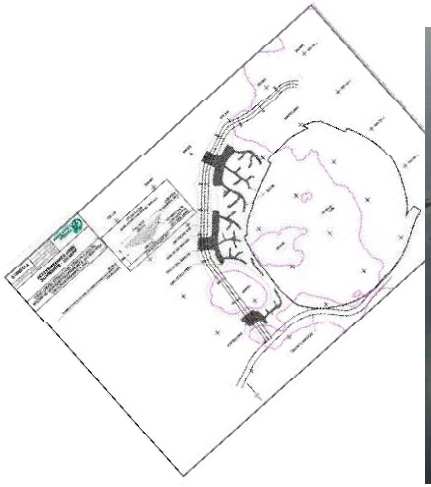
- Specifics in agreements are well defined
- Need to work on:
  - Timing and method of socio-economic aspects of closure communication
- Other?

Underground, Open Pit and Dike

Closure Objectives:

- Provide sustainable water quality in flooded pit areas for aquatic life.
- Develop physical habitat that enhances lake-wide characteristics.
- Enable safe small craft navigation.
- Ensure geotechnical stability.
- Eliminate public and wildlife access to underground.
- Other?

Underground, Open Pit and Dike



- Future Closure Planning
  - Plans are generally well advanced for this area – there are no significant new alternatives currently being considered.
  - Need to work on:
    - Details of what makes sense to place in pit area/underground before flooding.
    - Design details of siphon system.
    - Update forecast of flooded water quality.
    - Details of closure specific monitoring programs.
    - Water quality criteria for breaching dike.
    - Caribou access/exclusion on dike.
  - Other?

Wasterock Area

Closure Objectives:

- Freeze Type III rock – no active zone.
- Keep drainage quality safe for human/wildlife and no significant adverse effects on water uses in Lac de Gras.
- Ensure geotechnical stability.
- No water retaining structures.
- Provide safe passage for caribou but not attract caribou.
- Incorporate practical wildlife habitat features in final landscape.
- Other?

Wasterock Area

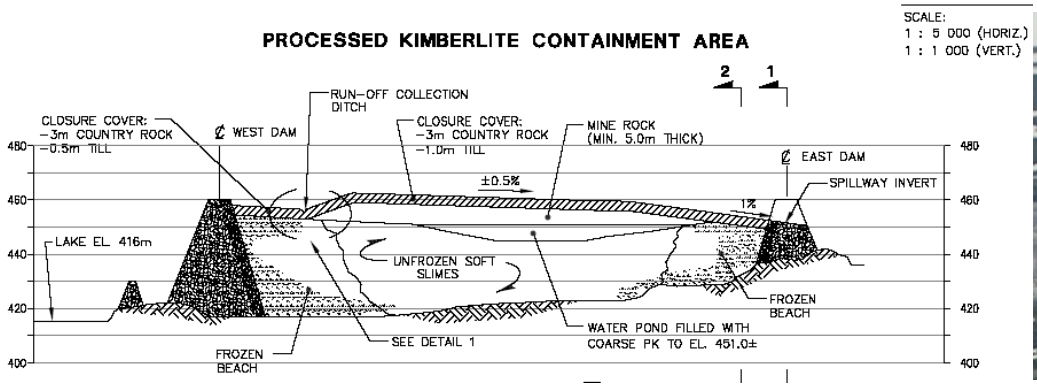
- Future Closure Planning
  - First area that will be available for significant progressive closure.
  - Closure design alternatives under review.
  - Need to work on:
    - Details for safe caribou travel – traditional knowledge input
    - Re-forecasting thermal conditions to guide cover design
    - Geotechnical analysis of final slope designs
    - Integration with final years of open-pit mining and use of wasterock for underground backfill.
    - Progressive reclamation opportunities
    - Seepage and runoff water quality criteria.
    - Options for other wildlife habitat.
    - Details of closure specific monitoring programs
  - Other?

Processed Kimberlite Containment

Closure Objectives:

- Maximize freezing of processed kimberlite.
- Keep drainage quality (runoff and seepage) safe for human/wildlife and no significant adverse effects on water uses in Lac de Gras.
- Ensure geotechnical stability.
- Other?

Processed Kimberlite Containment



- Future Closure Planning
  - Existing plan is conceptual – practical alternatives to be considered
  - Need to work on:
    - Possible operational changes to facilitate closure – deposition planning, water management, dam raise construction
    - Alternative closure designs
    - Caribou travel routes
    - Continue to investigate properties of deposited processed kimberlite and kimberlite water
    - Progressive reclamation opportunities and material availability
    - Seepage and runoff water quality criteria
    - Details of closure specific monitoring plans
  - Other?

Buildings and Roads

Closure Objectives:

- Maximize use of assets for regional benefits.
- Maximize use of on-site disposal.
- Provide a final landscape with restored drainage patterns and enhancements to encourage indigenous vegetation.
- Incorporate practical wildlife habitat features in final landscape
- Other?

Buildings and Roads

- Future Closure Planning
  - Existing plan is appropriately at concept level.
  - Need to work on:
    - Options for regional uses for assets
    - On-site disposal planning
    - Progressive closure using back-hauls
    - Final landscape designs – drainage, re-vegetation, scarified roads
    - Re-vegetation procedures
    - Wildlife habitat opportunities – process plant wall?
  - Other?

North Inlet

Closure Objectives:

- Water quality safe for human/wildlife and no significant adverse effects on water uses in Lac de Gras.
- Hydrologic connectivity to keep levels equal to Lac de Gras.
- Evaluate opportunities to reconnect for fish habitat.
- Other?

North Inlet

- Future Closure Planning
  - Existing plan is appropriately at concept level.
  - Need to work on:
    - Design options for both hydrologic and fish connectivity to Lac de Gras
    - Water and/or sediment criteria for determining connectivity
  - Other?

RioTinto

Questions?

Indian and Northern Affairs Canada
Affaires indiennes et du Nord Canada

INAC's Role in Closure and Reclamation Planning

EMAB Closure and Reclamation Workshop

January 15th, 2009

Nathen Richea
Water Resources Division

Canada

Outline

- INAC's Responsibilities
- INAC's Mine Site Reclamation Policy
- Policy Objectives
- INAC's Mine Site Reclamation Guidelines
- Primary Stages of Reclamation Planning
- INAC's Roles
- Review

INAC's Responsibilities

- It is the Minister of the Department of Indian Affairs and Northern Development that is responsible for approving mines in the NWT

- Approvals require that mines are closed and restored to appropriate conditions to remove both environmental and financial risks

INAC's Responsibilities (2)

- The Minister's authority comes from the Territorial Lands Act (TLA) and Regulations; the Northwest Territories Waters Act (NWTWA) and Regulations; and, the Mackenzie Valley Resource Management Act (MVRMA).

- The MVRMA, NWTWA, and TLA also establishes the authority of the Inspector.

INAC's Responsibilities (3)

INAC has many hats……



- Review water licences to
  - ensure compliance with Act & Regs
  - ensure adequate provisions for closure and reclamation
  - ensure adequate security is required
- Regulate water licences
  - approval of the water licence by Minister
  - must be compliant with Act & Regs
- Inspect water licences to
  - ensure compliance with Licence Conditions
  - provide enforcement if out of compliance

INAC's Responsibilities (4)

Shared Responsibilities

- Security
  - INAC provides a security estimate to the Board
  - the Board sets the amount of security
  - security is submitted to INAC
- Mine Site Reclamation
  - the Board request reclamation plans
  - the Minister may taken reasonable measures to reclaim a site and recover any costs incurred
- Powers of the Board & Inspector
  - the Board has regulatory powers
  - Inspectors have regulatory & enforcement powers

INAC's Responsibilities (5)

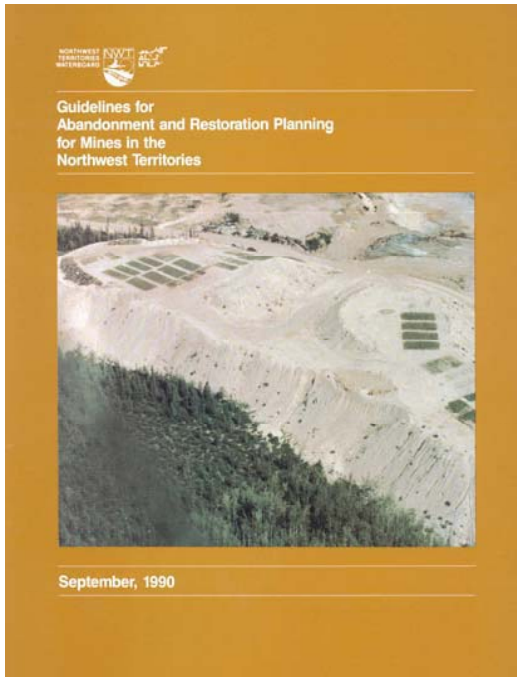
Need for Guidance

- As requirements for Closure and Reclamation Plans became the norm in water licences, companies and reviewers wanted to know what was actually required in the plan?

- In order to assist the company and others involved in the process, INAC developed a series of earlier versions of guidance documents.

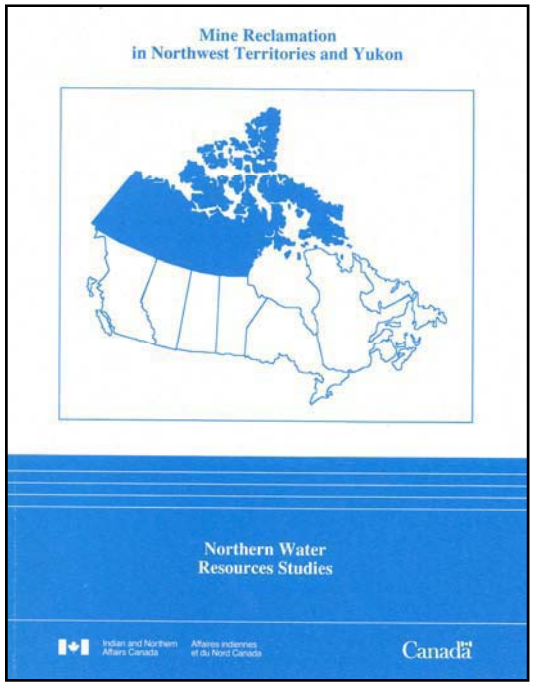
INAC's Responsibilities (6)

- In an effort to expand on the Act, Regulations and the requirement of reclamation plans in the Licence, INAC developed a series of earlier guidance documents.
  - Guidelines for Abandonment and Restoration Planning for Mines in the Northwest Territories (September, 1990)



INAC's Responsibilities (7)

- In an effort to expand on the Act, Regulations and the requirement of reclamation plans in the Licence, INAC developed a series of earlier guidance documents.
  - Mine Reclamation in Northwest Territories and Yukon (April, 1992)

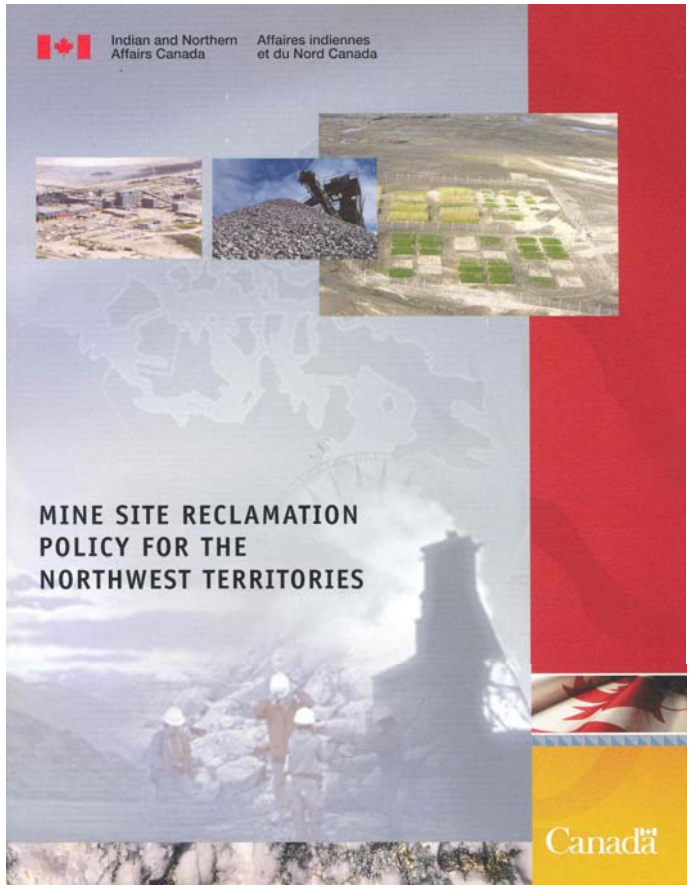


Mine Site Reclamation Policy

- INAC recognized the need for further direction on mine closure to support sustainable development.
- A Policy was developed to establish a clear standard and to provide clarity and certainty.
- The Policy recognized the growing number of abandoned mines which left significant environmental liabilities for the government.

Mine Site Reclamation Policy (2)

- Policy was issued by the Minister in 2002
- It outlines the expectations of the federal government for mine site reclamation
- Was intended to expand on the reclamation process and procedures



Mine Site Reclamation Policy (3)

- The Policy was developed to ensure a strong resource management base in the Northwest Territories while reducing the impacts on the environment and human health.

- The Policy resulted from a consultation process that involved representatives from Aboriginal, Federal and Territorial governments, Regulatory Boards, Industry and interested parties.

Mine Site Reclamation Policy (4)

Four Main Objectives

- Minimize the impact of mining on the environment and health and safety
- Reduce the environmental liability that falls to the government
- Provide industry and the public with the government's expectations
- To build positive and supportive relationships with regulatory authorities

Mine Site Reclamation Policy (5)

Key Principles

- Reclamation Planning
- Elements of Closure Plans
- Standards of Reclamation
- Financial Security
- Progressive Reclamation
- Progress Reporting
- Co-ordination among Regulators

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Mine Site Reclamation Guidelines

- New guidelines were developed to build on the principles and objectives laid out in the Mine Site Reclamation Policy.
- Guidelines were first issued in 2006 by INAC.
- Resulted from a broad-based consultative process.


MINE SITE RECLAMATION GUIDELINES
FOR THE NORTHWEST TERRITORIES

Indian and Northern Affairs Canada
Yellowknife, NWT

January 2007 Version

NWT Region

Canada

Mine Site Reclamation Guidelines (2)

- The Mine Site Reclamation Guidelines are intended to provide guidance on how to develop, operate and close mine sites in a manner that promotes effective reclamation.
- They were also developed to assist and inform all parties involved in the mine application, regulatory and approval processes in the NWT.
- The intent of the guidelines was to further clarify the requirements for Closure and Reclamation Plans.

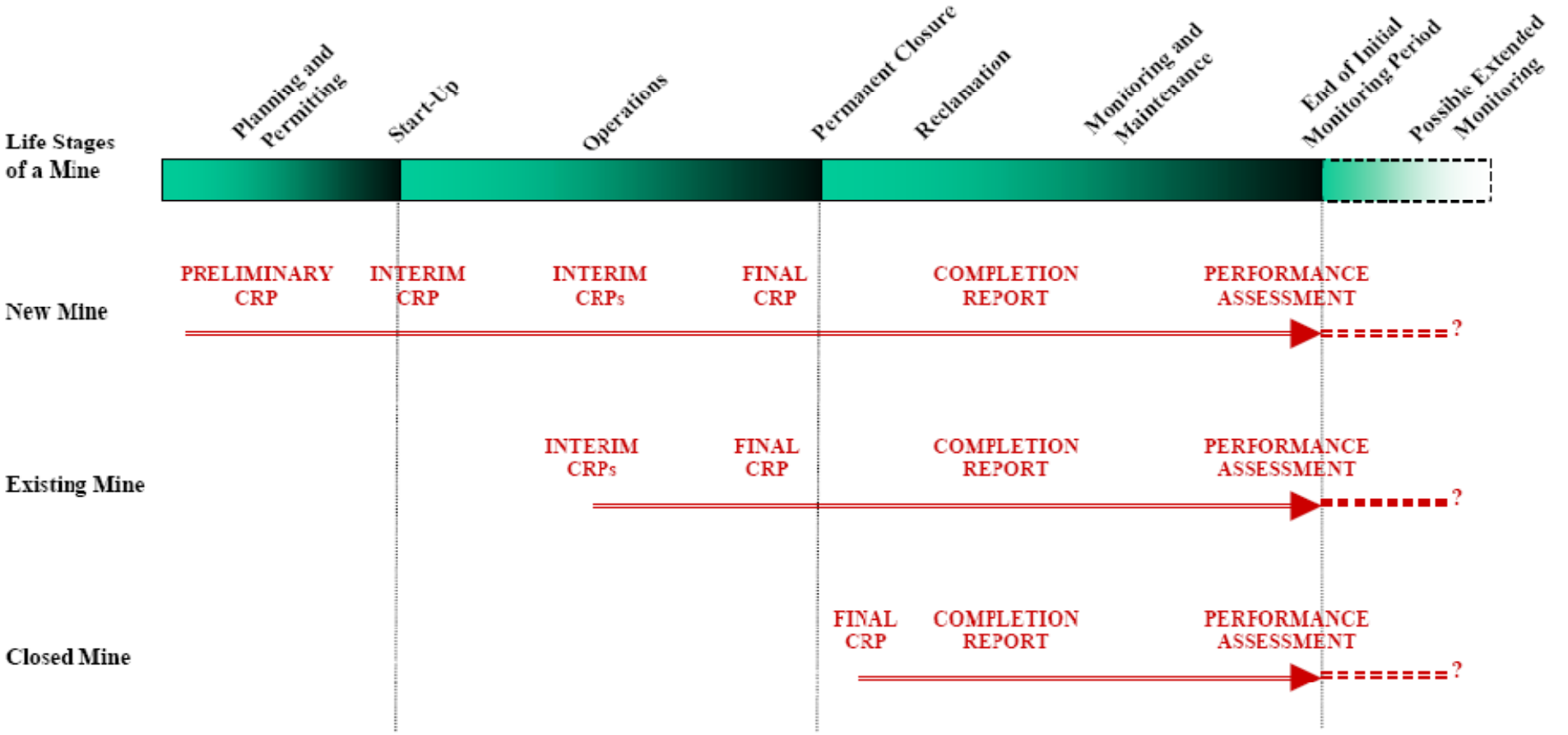
Mine Site Reclamation Guidelines (3)

Primary Stages

- Preliminary Closure and Reclamation Plan
- Interim Closure and Reclamation Plan(s)
- Final Closure and Reclamation Plan

Follow-Up

- Reclamation Completion Report
- Performance Assessment Report


Planning and Permitting
Start-Up
Operations
Permanent Closure
Reclamation
Monitoring and Maintenance
End of Initial Monitoring Period
Possible Extended Monitoring
Life Stages of a Mine
New Mine
PRELIMINARY CRP
INTERIM CRP
INTERIM CRPs
FINAL CRP
COMPLETION REPORT
PERFORMANCE ASSESSMENT
?
Existing Mine
INTERIM CRPs
FINAL CRP
COMPLETION REPORT
PERFORMANCE ASSESSMENT
?
Closed Mine
FINAL CRP
COMPLETION REPORT
PERFORMANCE ASSESSMENT
?

Canada

Mine Site Reclamation Guidelines (4)

Guidelines Outline

- Mine components should be designed and constructed such that they achieve or can easily achieve the reclamation objectives and closure criteria.
- Reclamation planning should interact with the operation and future planning of the mine.
- Reclamation activities should be incorporated into the mine design.
- The need for co-operation among Aboriginal, Federal, Territorial governments; landowners; local communities; regulators and mining companies to ensure appropriate closure objectives, criteria and activities are developed.

Mine Site Reclamation Guidelines (5)

- The guidelines require a clear statement of closure objectives

- Based on the objectives, specific closure criteria are to be developed.

Clear reclamation objectives and closure criteria allow for:

1. the evaluation and selection of reclamation activities
2. assessments of the success of reclamation activities
3. reclamation costing and an appropriate security

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Mine Site Reclamation Guidelines (6)

Guidelines Require Consultation

- Consultation with Aboriginal, Federal and Territorial governments; land owners; local communities; regulators; mining companies and other affected parties in the development of Preliminary, Interim and Final Closure Plans is key to the acceptability and effectiveness of these plans.

- Achieving consensus is desirable through this process but it is realized that it may not be achievable in all cases.

Mine Site Reclamation Guidelines (7)

Key Reclamation Concepts

- Closure Objectives & Criteria
- Closure Options
- Reclamation Research
  - Environmental Considerations
  - Designing for closure in perpetuity (i.e. walk-away)
- Progressive Reclamation
- Post Closure Monitoring
- Completion Reporting and Performance Assessments

INAC's Roles

- INAC, Land and Water Divisions, will actively participate in the review and development of the various Closure and Reclamation Plans.
- INAC will ensure that the financial security is kept up to date with changes the Mine Plan and or revisions to the Closure and Reclamation Plan.
- INAC will ensure that the impact of mining on the environment and human health and safety is minimized, consistent with its Mandate.

INAC's Roles (2)

- INAC Inspectors will also be involved in the review and assessment of closure planning, particularly on the development of measureable closure criteria.

- The Inspectors will conduct the final closure assessments once reclamation activities have been completed on behalf of the Minister and in accordance with the Closure and Reclamation Plan.

INAC's Roles (3)

- Once the Minister is satisfied the operator has met the requirements for decommissioning under the relevant legislation and the objectives of the plan have been fully met, the Minister will provide the company with written acknowledgement to that effect.

- At such time the Minister may release to total security held or hold back an appropriate amount to cover any long-term care and maintenance.

Review – Reclamation Policy

- Issued in 2002, the Policy was developed to inform industry and other parties of the Minister's expectations in terms of Reclamation Planning and the provision for reclamation in the licences submitted for Ministerial approval.

- The Policy was also developed to inform other parties and northerners of these same expectations.

- The intent of the Policy is to 'fix the goal posts' and thus reduce any case-by-case interpretation.

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Review – Reclamation Guidelines

- The Mine Site Reclamation Guidelines were developed to build on the principles and objectives laid out in the Mine Site Reclamation Policy.
- The Guidelines are intended to provide guidance on how to develop, operate and close mine sites in a manner that promotes effective reclamation.
- The Guidelines indentify the key goals and objectives for Closure Reclamation Planning and the preparation of Closure and Reclamation Plans.

Canada

Review – Reclamation Guidelines

- The Guidelines also identify the various stages of reclamation planning and how reclamation planning should be linked with the Life of Mine Plan.

- The Guidelines assist Aboriginal, Federal and Territorial governments; land owners; local communities; regulators; mining companies and other affected parties in the review and assessment of closure and reclamation plans.

Review – INAC's Roles

- The Minister provides approval for mining activities in the Northwest Territories.
- INAC is mandated to ensure that the impact of mining on the environment and human health and safety is minimized.
- INAC actively participates in the development and review of closure and reclamation plans.
- INAC also ensures that the appropriate amount of financial security is held to cover reclamation costs.

Review – INAC's Roles

- INAC Inspectors will conduct final inspections following the completion of closure activities on behalf of the Minister.

- INAC will make a decision as to the success of the decommissioning of the site and a determination regarding the release of security.

Indian and Northern Affairs Canada | Affaires indiennes et du Nord Canada

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4914-50th Street
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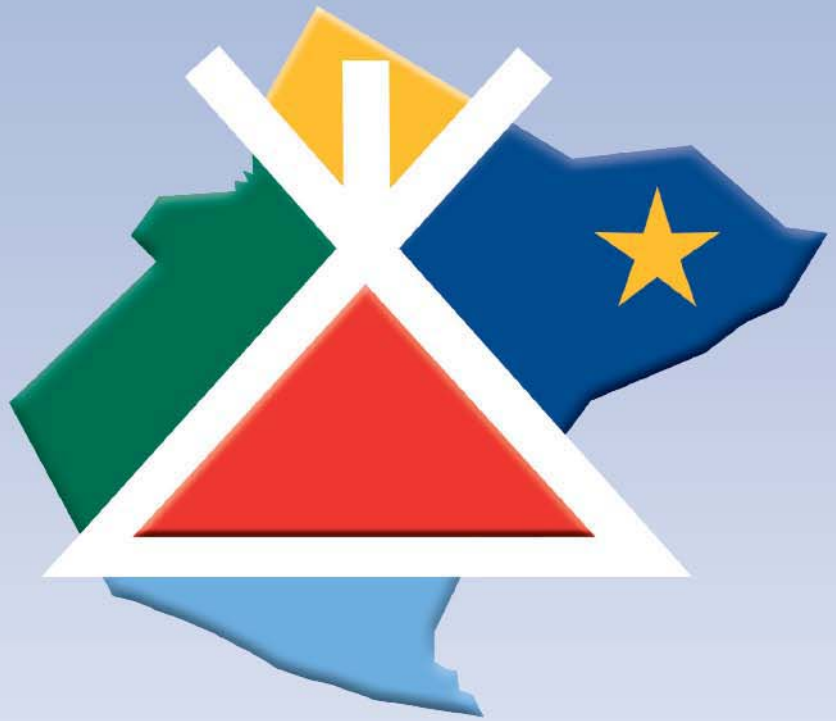
Personal Line 669-2657

Questions?

NWT Region

Canada



Wek'èezhìı
Land and Water Board

Wek'èezhìı
Land and Water Board

This is Who We Are

A regulatory agency

Appointed by the Federal and Tlicho governments

A decision-making authority

Wek'èezhìı
Land and Water Board

This is What We Do

Combine traditional and scientific knowledge

Manage land and water responsibly

Conduct fair and thorough reviews

Give water licences and land use permits

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This is Where We Work

Between Great Bear and Great Slave Lake

In the Wek'eezhii Management Area, which includes:

Tlicho lands

Community lands

Crown lands

This is where we work!

For illustrative purposes only

Wek'èezhìi
Land and Water Board

This is Who We Work With

Industry

Communities

Tlicho Government

Aboriginal Organizations

Federal & Territorial government

Other regulators

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This is How We Make Decisions

Accept and review written submissions

Listen to traditional knowledge

Hire technical staff or consultants

Maintain a public registry

Hold public hearings

Hold board meetings

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The WLWB's toolbox to protect the environment

Wek'eezhii Forum

Community Tours

Public Hearings and/or Workshops

Website and online public registry

Terms and Conditions in Water Licences and Land Use Permits

Management Plans

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Management Plans

Outline what the company will do:

Operations on site
Research
Monitoring
Reporting

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Common Management Plans

Waste Management Plans

Spill Contingency Plans

Closure and Reclamation Plans

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Common Management Plans

Waste Management Plans

Spill Contingency Plans

Closure and Reclamation Plans

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Diavik's Water Licence Interim Closure & Reclamation Plan (ICRP) requirements

Identifies mine components

i.e. Open pits, infrastructure, waste rock piles, underground workings,

Identifies specific closure and reclamation objectives

Identify measurable performance criteria

Include an evaluation of options

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Closure Objectives

What are we trying to achieve after the mine closes?

- Land
- Water
- Wildlife
- Air
- Community

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Closure Criteria

How do we know we've achieved our objectives?

Mine Component = Open Pit

Closure Objective:

To ensure that if pits will be flooded that the water quality is safe for fish and wildlife

Closure Criteria:

Water quality parameters (chloride, heavy metals etc) are below water licence limits

Mine Component = Waste Rock Piles

Closure Objective:

To ensure that the waste rock piles don't present a safety hazard for wildlife

Closure Criteria:

The side slopes of the waste rock piles are no steeper than a 20 degree angle

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Diavik's Water Licence Interim Closure & Reclamation Plan (ICRP) requirements

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Include an evaluation of options

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Diavik's Closure & Reclamation Work plan

Identify Reviewers

EMAB workshop

Diavik submits DRAFT "Closure Objectives"

WLWB hosts workshop on "Closure Objectives"

Diavik hosts "Closure Options" workshop

Diavik submits updated ICRP

WLWB reviews updated ICRP

WLWB may host workshop

WLWB approves ICRP or asks for changes

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Land and Water Board

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WLWB may host workshop

WLWB approves ICRP or asks for changes

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This is how you can get involved

Check the public registry

Attend public hearings

Submit written comments

Provide traditional knowledge

Thank You, Masi

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George Mandeville NSMA
Nathen Richea DIAND
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Jennifer Potten, DIAND
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Gord Macdonald DDMI
Colleen English DDMI
Steve Bourne DDMI