



# Technical Meeting

*Type A Water Licence Application*



# Presentation Outline

- Project Overview
- The Project
- Type A Water Licence Application
- Outstanding Topics Identified
- Management Plans and Monitoring Plans
- Aquatic Effects Monitoring Program Framework
- Surveillance Network Program
- Environmental Effects Monitoring
- DFO Authorization Monitoring
- Closure and Reclamation
- Security Bonding



# Our Team

Baffinland Representative	Role
Erik Madsen	Vice President Sustainability, Environment, Health and Safety
Greg Missal	Vice President Corporate Affairs
Joe Tigullaraq	Northern Affairs Manager
Jim Millard	Senior Environmental Superintendent
Oliver Curran	Director, Sustainable Development
Brad Armstrong	Legal Counsel
Fernand Beaulac	Senior Environmental Engineer
Richard Cook	Knight Piesold, Senior Consultant
John Binns	Hatch, Environmental Engineering
Jamie Keech	Hatch, Environmental Engineering



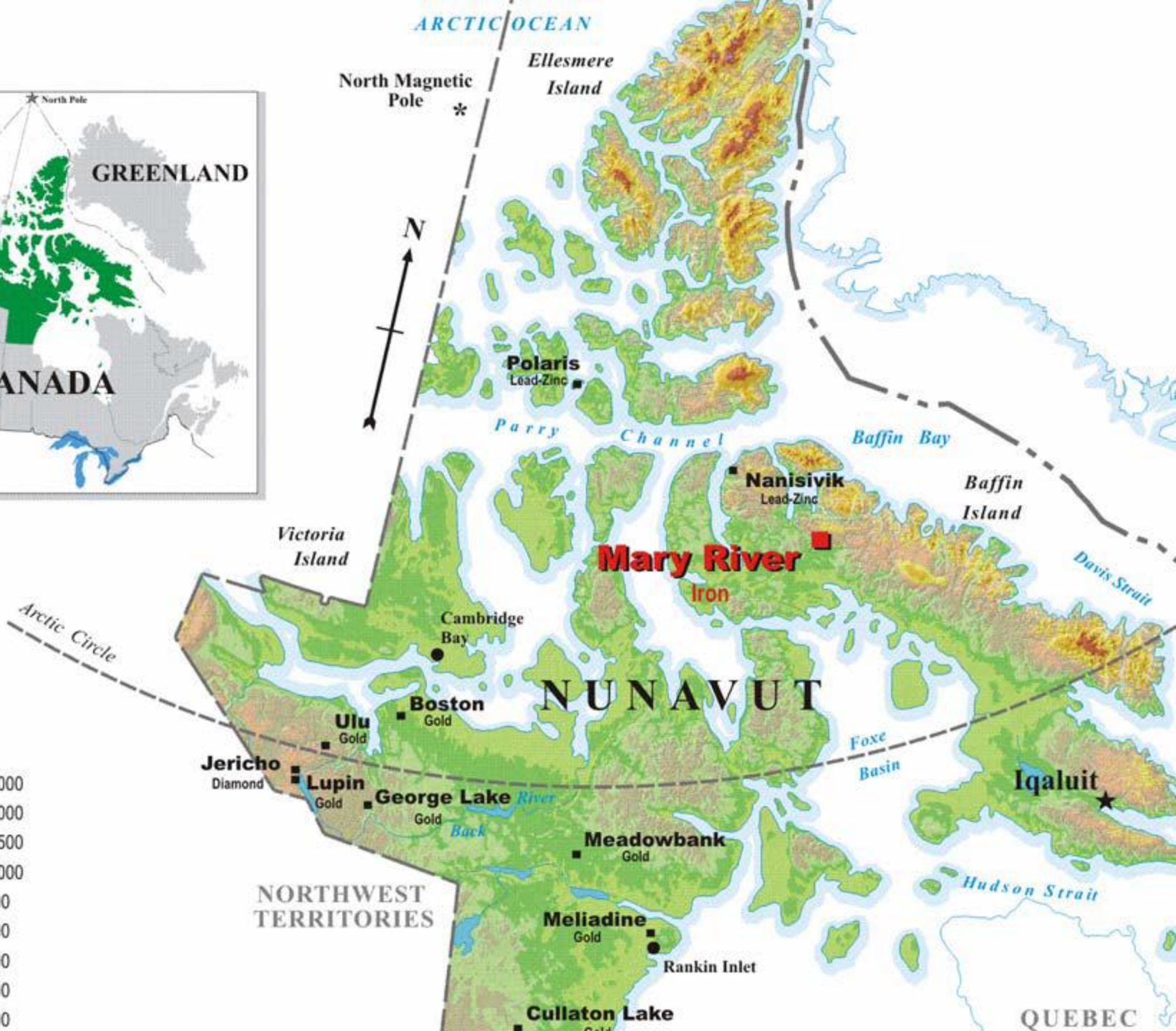
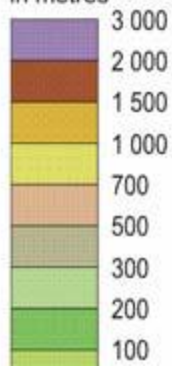


# Project Overview





RELIEF  
in metres





# Water Management Areas





# Mary River Project

- Four year construction Project
- An open pit mine with mine life of 21 years
- Operations consist of mining, ore crushing and screening, rail transport, port operations and marine shipping
- No secondary processing; no tailings produced
- An 150 km railway from mine to Steensby port
- The port will accommodate vessels capable of year-round shipping



Mining



Rail Transport



Ship Transport





# The Project



# Early Revenue Phase

- Announced in Pond Inlet on Jan 9, it does not affect the scope of this technical meeting or the Type A Water Licence Application submitted in February 2012.
- The Nunavut Impact Review Board will determine the process for the ERP, and any potential amendments to the Type A Water Licence will be sought in due course.



# The Project

- Scope of the Water Licence Application as submitted with the FEIS has not changed
- Design criteria and technical specifications are included in the application
- As detail design progresses and site design is optimized, changes may be introduced to configuration of facilities, location, of specific facilities
  - Drawing issued for construction submitted to NWB
- Additional changes may occur during construction
  - NWB inspector informed of such changes
  - As-built drawings submitted to NWB
- All facilities will remain within the PDA (potential development area) identified in FEIS



# Detailed Design Considerations

- Milne Port
  - Number of fuel storage tanks in tank farm
- Mine Site
  - Optimization of ore loading facilities based on material movement
  - Optimization of waste rock stockpile configuration
- Steensby Port
  - Location of air strip
  - Number of tanks and location of tank farms relative to freight dock



# Detailed Design Considerations

## Railway

- Number and specific locations of temporary construction camps based on optimized construction methodology and schedule (i.e. potential local discharges)
  - Location of temporary storage for construction material
  - Temporary water usage from river at bridge construction sites

## Quarry Sites

- Many quarry sites identified along railway corridor
- Not all quarry sites will be exploited





# Type A Water Licence Application



# Key Aspects Related to Type A

- Water Usage (No Processing/No Tailings)
- Water and Waste discharges
- Surface water runoff management
- Waste management
- Crossing/encroachment of streams and lakes
- Monitoring and Management Plans
- Closure and Reclamation
- Security Bonding



# Scope of Water Licence – Milne Port

- Use of water from Philips Creek and 32 km Lake
- Quarrying materials from specified locations
- Construction and operation of bulk fuel storage facilities including:
  - Arctic diesel fuel depot and fuel dispensing system;
  - Jet-A diesel fuel depot and fuel dispensing system; and
  - Use of temporary fuel storage systems
- Construction and operation of port facilities, including:
  - Temporary dock;
  - Lay down areas for equipment and materials;
  - Equipment maintenance shops;
  - Offices; and
  - Warehouse



# Scope of Water Licence – Milne Port (Cont'd)

- Construction and operation of camp including:
  - 150 person camp;
  - Sewage treatment plant; and
  - Incinerator
- Construction and operation of oily water treatment facility including:
  - Mobile oily water treatment unit
- Use and storage of pre-packaged explosives
- Construction and Operation of waste management facilities including:
  - Waste sorting facility;
  - Land farm;
  - Waste transfer facilities (for hazardous waste); and
  - Solid waste transfer facility (for non-hazardous landfill waste)
- Upgrade of airstrip



# Scope of Water Licence – Tote Road

- Realignment and improvements of sections of the Tote Road
- Replacement and upgrade of water crossings
- On-going maintenance of the road
- Quarry materials from specified locations
- Install shelters at strategic locations along the Tote Road



# Scope of Water Licence – Mine Site

- Use of water from Camp Lake
- Quarrying materials from specified locations;
- Construction and operation of accommodation facilities for workers including:
  - Existing exploration camp;
  - Temporary construction camp;
  - Permanent camp;
  - Sewage treatment plants; and
  - Incinerators
- Construction and operation of Mine Site facilities including:
  - Lay down areas for equipment and materials;
  - Equipment maintenance shops;
  - Offices;
  - Warehouses;
  - Oily water treatment facility; and
  - Mobile oily treatment unit



# Scope of Water Licence – Mine Site (cont'd)

- Construction and operation of fuel depots including:
  - Arctic diesel fuel depot and fuel dispensing system;
  - Jet-A diesel fuel depot and fuel dispensing system; and
  - Use of temporary fuel storage systems
- Construction and operation of waste management facilities including:
  - Waste sorting facility;
  - Land farm;
  - Waste transfer facilities (for hazardous waste); and
  - Solid waste disposal (landfill)
- Operation of the open pit mine including:
  - Heavy equipment maintenance shops;
  - Open pit mine;
  - Waste rock stockpile with associated runoff water management facilities;
  - Ore crushing facilities;
  - Ore stockpiles; and
  - Waste rock test pile



# Scope of Water Licence – Mine Site (cont'd)

- Construction and operation of explosives storage and manufacture facilities including:
  - Use and storage of pre-package explosives;
  - Bulk storage of ammonium nitrate;
  - Explosives manufacturing facilities;
  - Mobile explosives manufacturing facilities; and
  - Explosive truck wash facility
- Construction and operation of the Mine Site railway terminal including:
  - Ore loading facilities;
  - Railcar unloading facilities including bulk fuel rail cars
- Upgrade of Mary River Airstrip



# Scope of Water Licence – Railway

- Use of water at specified locations for the construction of the railway
- Construction of the railway embankment and railway including:
  - Construction and use of construction camps with associated sewage treatment facilities and incinerators, at specified locations along the railway corridor;
  - Establishment of temporary laydown areas along the railway corridor as required for the construction;
  - Construction of all associated temporary or permanent water crossing along the railway corridor (bridges and culverts);
  - Construction of temporary roads and airstrips;
  - Extraction and use of quarry materials from specified locations along the railway corridor;
  - Construction of the railway embankment, railway tunnel and railway;
  - Temporary storage of supplies, material, wastes, fuel as required for the duration of the construction period of the railway; and
  - Use of temporary fuel storage systems (iso-containers)
- Construction of temporary and permanent shelters along the railway corridor



# Scope of Water Licence – Steensby

- Use of water from 3 km Lake and 10 km Lake
- Quarrying materials from specified locations
- Construction and operation of accommodation facilities for workers including:
  - Existing exploration camp;
  - Temporary construction camp;
  - Permanent camp;
  - Sewage treatment plants; and
  - Incinerators
- Construction and operation of Steensby Port facilities including:
  - Temporary construction docks;
  - Permanent freight dock;
  - Lay down areas for equipment and materials;
  - Equipment maintenance shops;
  - Offices;
  - Warehouses; and
  - Mobile oily treatment unit
- Construction and operation of bulk fuel depots including:
  - Arctic diesel fuel depot and fuel dispensing system;
  - Jet-A diesel fuel depot and fuel dispensing system;
  - Marine diesel fuel depot and fuel dispensing system; and
  - Use of temporary fuel storage systems



# Scope of Water Licence – Steensby (Cont'd)

- Construction and operation of bulk fuel depots including:
  - Arctic diesel fuel depot and fuel dispensing system;
  - Jet-A diesel fuel depot and fuel dispensing system;
  - Marine diesel fuel depot and fuel dispensing system; and
  - Use of temporary fuel storage systems
- Construction and operation of waste management facilities including:
  - Waste sorting facility;
  - Land farm;
  - Waste transfer facilities (for hazardous waste); and
  - Solid waste disposal (landfill)
- Operation of railway terminal:
  - Railway / Heavy equipment maintenance shops;
  - Rail yard;
  - Fuel tanker car loading system; and
  - Oily water treatment facility



# Scope of Water Licence – Steensby (Cont'd)

- Construction and operation of explosives storage and manufacture facilities including:
  - Use and storage of pre-package explosives;
  - Bulk storage of ammonium nitrate;
  - Explosives manufacturing facilities;
  - Mobile explosives manufacturing facilities; and
  - Explosive truck wash facility
- Construction and operation of the ore unloading terminal including:
  - Ore unloading facilities;
  - Ore stockpile;
  - Ore reclaiming system; and
  - Ore dock
- Construction and operation of permanent Steensby Port airstrip



# Contents of the Type A Water Licence Application

- Attachment 1 – Type A Water Licence Application
- Attachment 2 – Baffinland Commercial Documents
- Attachment 3 - Project Wide Documents
- Attachment 4 – Site Specific Documents
- Attachment 5 – Management Plans
- Attachment 6 – Quarry Documents
- Attachment 7 – Water Crossings
- Attachment 8 – Explosives
- Attachment 9 – Drawings
- Attachment 10 – Preliminary Mine Closure and Reclamation Plan
- Attachment 11 – Maps
- Attachment 12 – Correspondence with NPC



# Type A Review Process

- NIRB guidelines for Coordinated Joint Review in Nov. 2009
- Application was submitted as Appendix 3B of the FEIS (Feb. 2012)
- Baffinland has responded to a number of information requests as part of the FEIS review process (April 2012)
- Agencies submitted technical comments on June 22<sup>nd</sup>, 2012
- On-going discussion with QIA
  - May workshop on acceptable terms and conditions for Type A
  - Second meeting in December to review/update draft
- Pre-Technical Meeting – teleconference in Oct 2012
  - BIM response submitted on October 31st
- AANDC letter dated December 11, 2012
  - BIM response submitted in December 21, 2012
  - EC submits addendum to technical comments on Jan 9, 2013
  - Baffinland will respond to these comments at this technical meeting





## Outstanding Topics Identified



# Outstanding Topics

Topic	Description of Topic	Mechanism for Addressing Topic
1. Pit Lake Water Quality Post Closure	<ul style="list-style-type: none"> <li>- Time for filling with water</li> <li>- Post closure water quality</li> </ul>	<ul style="list-style-type: none"> <li>- Ongoing geochemical evaluations</li> <li>- Contingency for accelerated filling of open pit with water</li> </ul>
2. Sewage at Rail Construction Camps	<ul style="list-style-type: none"> <li>- Transportation</li> <li>- Treatment</li> </ul>	<ul style="list-style-type: none"> <li>- Storage ponds (contingency)</li> <li>- Transportation on ice roads and rail embankment</li> </ul>
3. Quarry Material Selection	<ul style="list-style-type: none"> <li>- Screening for ARD potential</li> </ul>	<ul style="list-style-type: none"> <li>- Protocol for quarry selection</li> </ul>
4. Aquatic Effects Monitoring Plan	<ul style="list-style-type: none"> <li>- Validating effects predictions</li> </ul>	<ul style="list-style-type: none"> <li>- Development of monitoring program in consultation with NWB, QIA, EC, AANDC and DFO</li> </ul>
5. Update of Management Plans	<ul style="list-style-type: none"> <li>- Timing</li> <li>- Information</li> </ul>	<ul style="list-style-type: none"> <li>- Updates prior to construction when information becomes available</li> </ul>
6. Blasting Management Plan	<ul style="list-style-type: none"> <li>- Ammonia Source Control</li> </ul>	<ul style="list-style-type: none"> <li>- Rigorous management plans and best practices</li> </ul>
7. Security Bonding	<ul style="list-style-type: none"> <li>- Double bonding</li> <li>- Phased approach</li> </ul>	<ul style="list-style-type: none"> <li>- Company will review work plan annually and post annually based on additive liability</li> </ul>



# Pit Volume, Timeframe to Fill

- Maximum Pit fill volume: 43,400,000 m<sup>3</sup>
- Based on precipitation data the pit is expected to take between 85 – 147 years to fill naturally
- Pit water quality modelling is ongoing



# Contingency for Pit Filling – If Required

- Volume of Mary Lake (main basin):  
112,000,000 m<sup>3</sup>
- Annual volume available for pit filling: 10% ~ 11,200,000 m<sup>3</sup>
- Pit fill time ~ 4 years



# Sewage Management – Rail Camps

- Treated sewage effluent will be transported to either the Mine Site or Steensby Port.
- In the winter treated effluent will be transported via ice roads.
- In the summer treated effluent will be transported via the railroad embankment or access roads.
- Storage ponds will be constructed at each of the rail camps for the purpose of contingency.



# Quarry Material Selection


Potential quarry sites along the corridor will be subject to an Acid Rock Drainage (ARD) Protocol in order to reduce or eliminate the potential for ARD to occur.

ML/ARD assessment work will be in accordance with industry standard methods and guidance provided in MEND 2009 to confirm that aggregate materials used will have low potential for ML/ARD.

The Project approach for initial ML/ARD assessment at proposed quarry sites will consist of the following steps:

- Review existing geological information and data (surface geological maps, borehole logs and any available test results) applicable to the site;
- Conduct site reconnaissance including further geological inspection and sampling of surface materials if appropriate;
- Develop priority list of potential quarry sites for further assessment, based on the geochemical, geometrical and geotechnical assessments;





# Type A Licence Management Plans



# Related Management Plans and Monitoring Programs

- The Management Plans will require updating to ensure that these management plans incorporate the requirements outlined in the terms and conditions of the Project Certificate and Type A Water Licence.
- These management plans cannot be finalized until Baffinland has further refined its Project execution strategy and has retained major contractors to execute the work as has been identified to applicable regulatory agencies.
- It was noted in a recent Nunavut Water Board (NWB) conference call (October 18, 2012) that the majority of these plans meet the requirements of the NWB and are considered acceptable for the time being.



# Related Management Plans and Monitoring Programs

- Emergency Response & Spill Contingency Plan
- Oil Pollution Emergency Plan
- Surface Water and Aquatic Ecosystems Management Plan
- Fresh Water Supply, Sewage and Wastewater Management Plan
- Waste Management Plan
- Waste Rock Management Plan
- Hazardous Material and Hazardous Waste Management Plan
- Environmental Monitoring Plan
- Preliminary Mine Closure and Reclamation Plan
- Explosives Management Plan (Blasting Management Framework)
- Aquatic Effects Monitoring Program
- Air Quality and Noise Abatement Management Plan
- Conceptual Ammonium Nitrate Blasting Management Framework



Management Plan	Timeframe for Submission of the updated Management Plan
Environmental Protection Plan	<p>The Licensee shall submit to be Board for review, sixty (60) days prior to start of construction, an updated and consolidated Environmental Protection Plan. In recognition of the fact that the Environmental Protection Plan is a “living document” additional Operational Standards prepared within the framework of this Environmental Protection Plan by the Licensee or his contractors, as required throughout the construction period, shall be submitted to the Board (Inspector) for review prior to their implementation.</p>
Emergency Response and Spill Contingency Plan	<p>The Licensee shall submit to the Board for review, sixty (60) days prior to start of construction, a revised and consolidated “Emergency Response and Spill Contingency Plan”. The updated Emergency Response and Spill Contingency Plan shall cover the activities included in the scope of the Licence. The Emergency Response and Spill Contingency Plan shall be reviewed and updated annually. Periodic updates or revisions to the Emergency Response and Spill Contingency Plan shall be submitted to the Board.</p>



<b>Management Plan</b>	<b>Timeframe for Submission of the updated Management Plan</b>
Blasting Management Plan	The Licensee shall implement best management practices for the use of explosives for blasting. The Licensee shall submit to the Board for review, a Blasting Management Plan sixty (60) days prior to start of blasting operations.
Hazardous Material and Hazardous Waste Management Plan	The Licensee shall submit to the Board for review, sixty (60) days prior to start of construction, an updated Hazardous Material and Hazardous Waste Management Plan.
Surface Water, Aquatic Ecosystems, Fish and Fish Habitat Management Plan	The Licensee shall submit to the Board for review, sixty (60) days prior to start of construction, an updated Surface Water, Aquatic Ecosystems, Fish and Fish Habitat Management Plan.
Waste Water Management Plan	The Licensee shall submit to the Board for review, sixty (60) days prior to start of construction, an updated Waste Water Management Plan.



Management Plan	Timeframe for Submission of the updated Management Plan
Waste Management Plan	<p>The Licensee shall submit to the Board for review, sixty (60) days prior to start of construction, an updated Waste Management Plan which include:</p> <ol style="list-style-type: none"> <li>1. Landfarm management plan;</li> <li>2. Landfill management plan; and,</li> <li>3. Incineration management plan.</li> </ol>
Borrow Pits and Quarry Management Plan	<p>The Licensee shall submit to the Board for review, sixty (60) days prior to start of construction, an updated Borrow Pits and Quarry Management Plan. The Borrow Pits and Quarry Management Plan will include criteria that will be used to distinguish ARD from non-ARD rocks.</p>
Environmental Monitoring Plan	<p>The Licensee shall submit to the Board for review, sixty (60) days prior to start of construction, a consolidated and updated Environmental Monitoring Plan.</p>
Waste Rock Management Plan	<p>The Licensee shall upon issuance of this licence implement the Waste Rock Management Plan submitted in the Water licence application. The Licensee shall submit to the Board for review, an update of this management plan sixty (60) days prior to start of mine pre-stripping operation.</p>



Management Plan	Timeframe for Submission of the updated Management Plan
Aquatic Effects Monitoring Program (AEMP) Framework	<p>The Licensee shall upon issuance of this licence implement the Aquatic Effects Monitoring Program (AEMP) Framework presented at the NWB Final Hearing and subsequently modified based on the results of ongoing workshops with stakeholders scheduled to commence in November 2012.</p> <p>The Licensee shall implement Phase 1 of the AEMP sixty (60) days prior to start of construction (section applicable to construction camp operations).</p> <p>The Licensee shall implement Phase 2 of the AEMP sixty (60) days prior to start of the mine pre-stripping operations.</p>
Preliminary Closure and Reclamation Plan	<p>The Licensee shall upon issuance of the water licence implement the Preliminary Closure and Reclamation Plan submitted in the Water Licence application.</p> <p>The Licensee shall submit to the Board for review, sixty (60) days prior to start of mine pre-stripping operation an Interim Closure and Reclamation Plan. The Interim Closure and Reclamation Plan will include updates on pit water quality modelling, as well as an updated closure cost estimate for the project.</p>



# Related Management Plans (Other Authorizations)

Oil Pollution Emergency Plan (OPEP) – Milne Port – this plan will be submitted to Transport Canada (TC) on an annual basis as per regulatory requirements.

Oil Pollution Emergency Plan (OPEP) – Steensby Port - this plan will be submitted to Transport Canada (TC) on an annual basis as per regulatory requirements.

Explosives Management Plan - The Explosives Management Plan will be submitted for review by NRCAN.

Air Quality and Noise Abatement Management Plan – As part of conditions in the Project Certificate

Health and Safety Management Plan – This management plan will be submitted as part of the Nunavut Mines Safety Act.



# Blasting Management Plan (BMP)

- Ammonium Nitrate (AN) Blasting Management Framework first submitted to NWB in November 2012
- Final BMP will be developed in concert with EPCM and blasting contractor
- Explosives will be used to develop quarries and the open pit
  - Explosive use in quarries short term mainly during construction
  - Explosive use in open pit is longer term
- Potential risk is Ammonium Nitrate dissolution in water and potential impacts to aquatic life
- Key objectives of the BMP:
  - To implement explosives management measures to minimize losses.
  - To ensure no acute toxicity impacts or change in trophic status of downstream water bodies that support aquatic life
- BMP will incorporate best management practices for explosives use



# BMP – Performance Monitoring

- A site specific drainage plan will be developed for each quarry
- Performance monitoring targets may include the following key elements:
  - Blast performance monitoring to optimize blasting efficiency.
  - Monitoring and auditing of field operations to ensure acceptable field implementation of procedures and delivery of associated training.
- In event performance monitoring targets are not being met, corrective actions and additional monitoring to be implemented

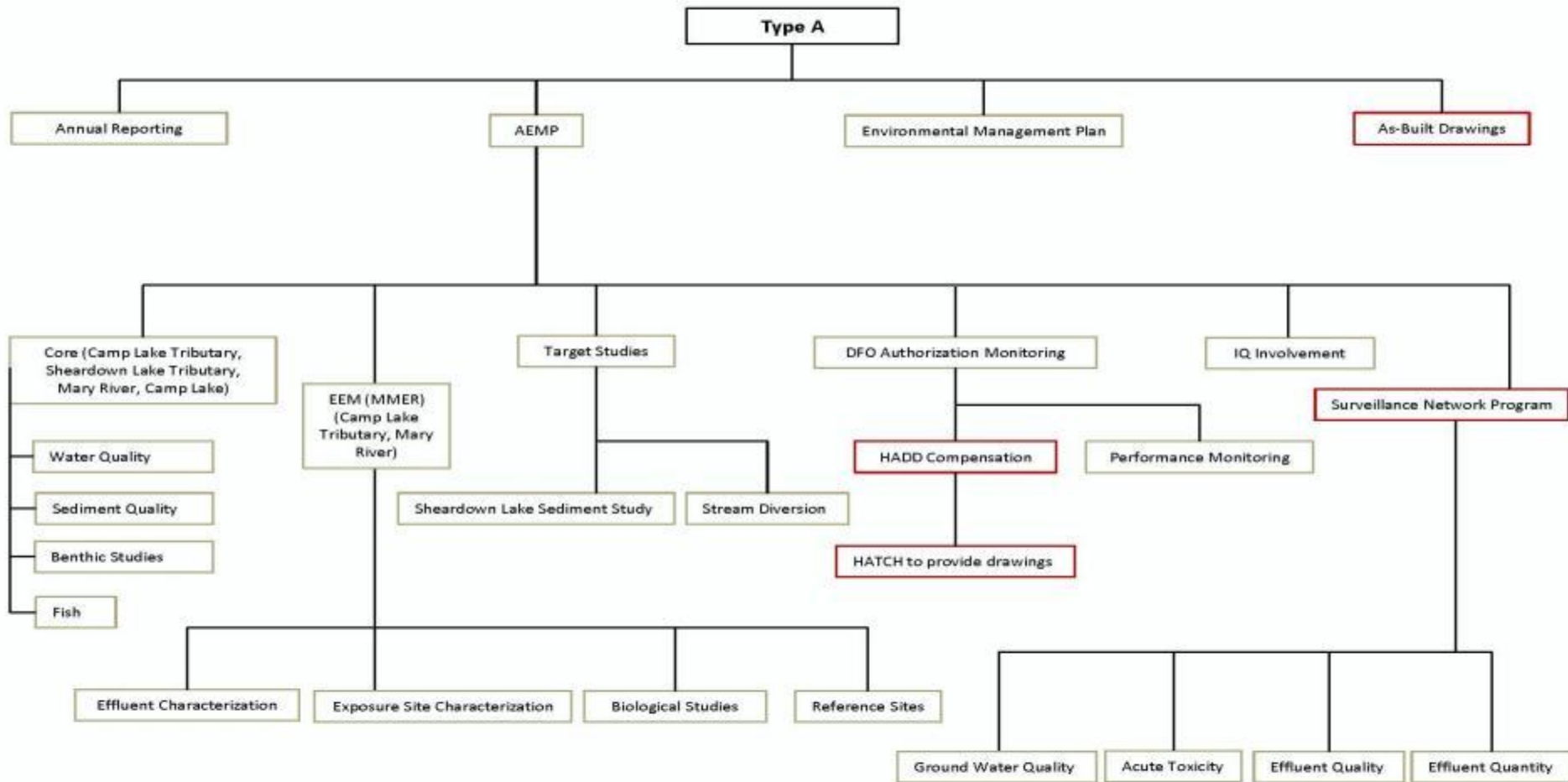




# AEMP Components



# AEMP Components







# Aquatic Effects Monitoring Framework



# AEMP Framework

- Validate Predictions in FEIS and mitigate effects if required
- Metal and Mining Effluent Regulations (MMER)
- The framework is Required in the Type A Water Licence by Nunavut Water Board
- A Draft AEMP Framework has been developed in consultation with agencies and provided for information





# Surveillance Network Program



# SNP – Surveillance Network Program

- SNP Stations are located primarily at the end-of-pipe (EOP) locations
- There is overlap between some SNP and MMER locations (stations associated with contact mine water)
- SNP results are integrated into interpretation and recommendations of the annual AEMP program



# SNP Components

- ***Water Quantity*** – *water uptake from freshwater bodies*
- ***Effluent Quality*** – periodic sampling provides data on effluent quality that are compared to Water Licence Criteria
- ***Effluent Quantity*** – daily monitoring of effluent volumes discharged to receiving environment
- Effluent quantity and quality together provide concentration and loadings data for downstream receiving environments

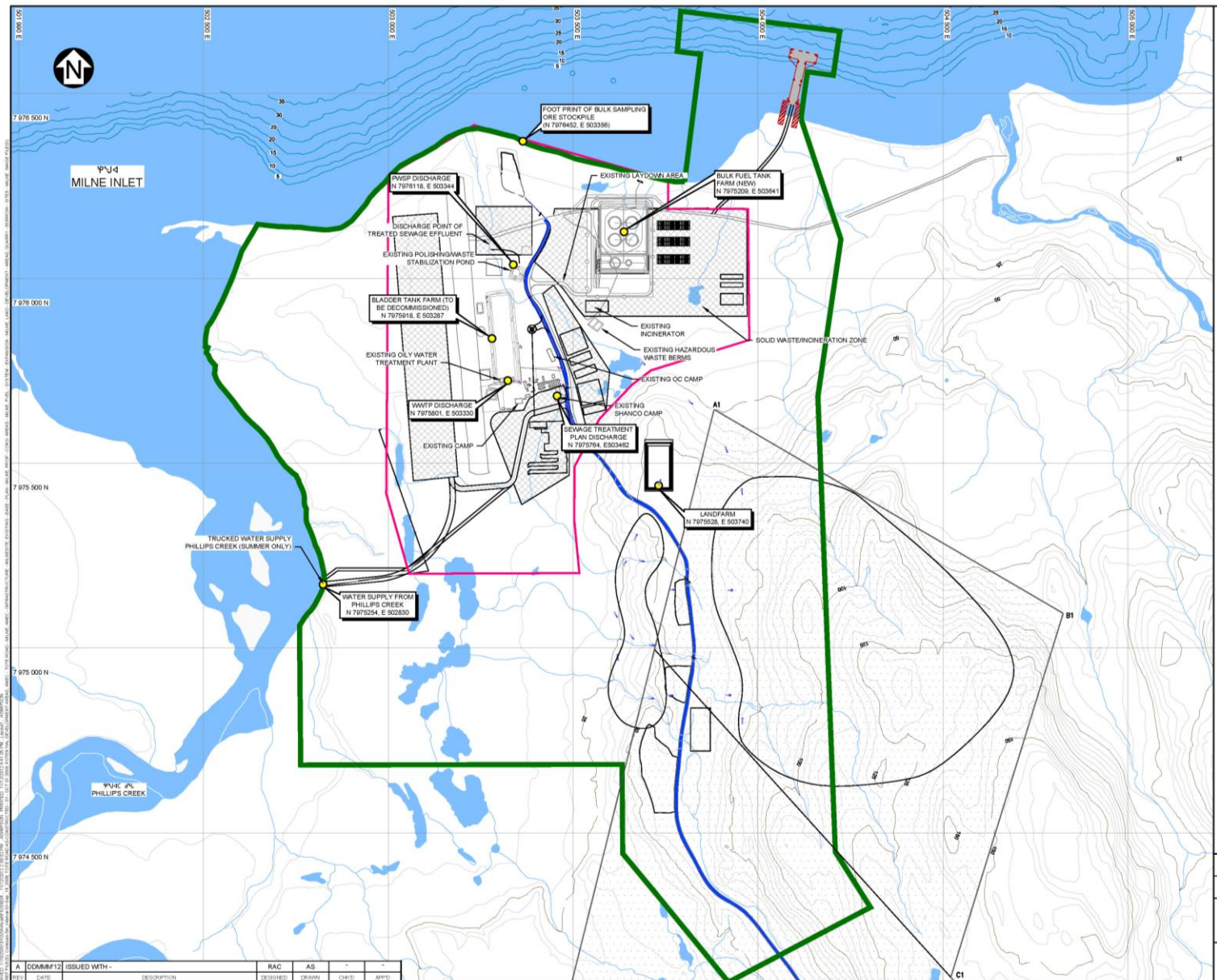


## SNP Components (cont.)

- Acute Toxicity – periodic acute toxicity testing for EOP treated sewage effluent discharge locations provides data on possible acute impacts to effluent exposure areas.
- Groundwater Monitoring

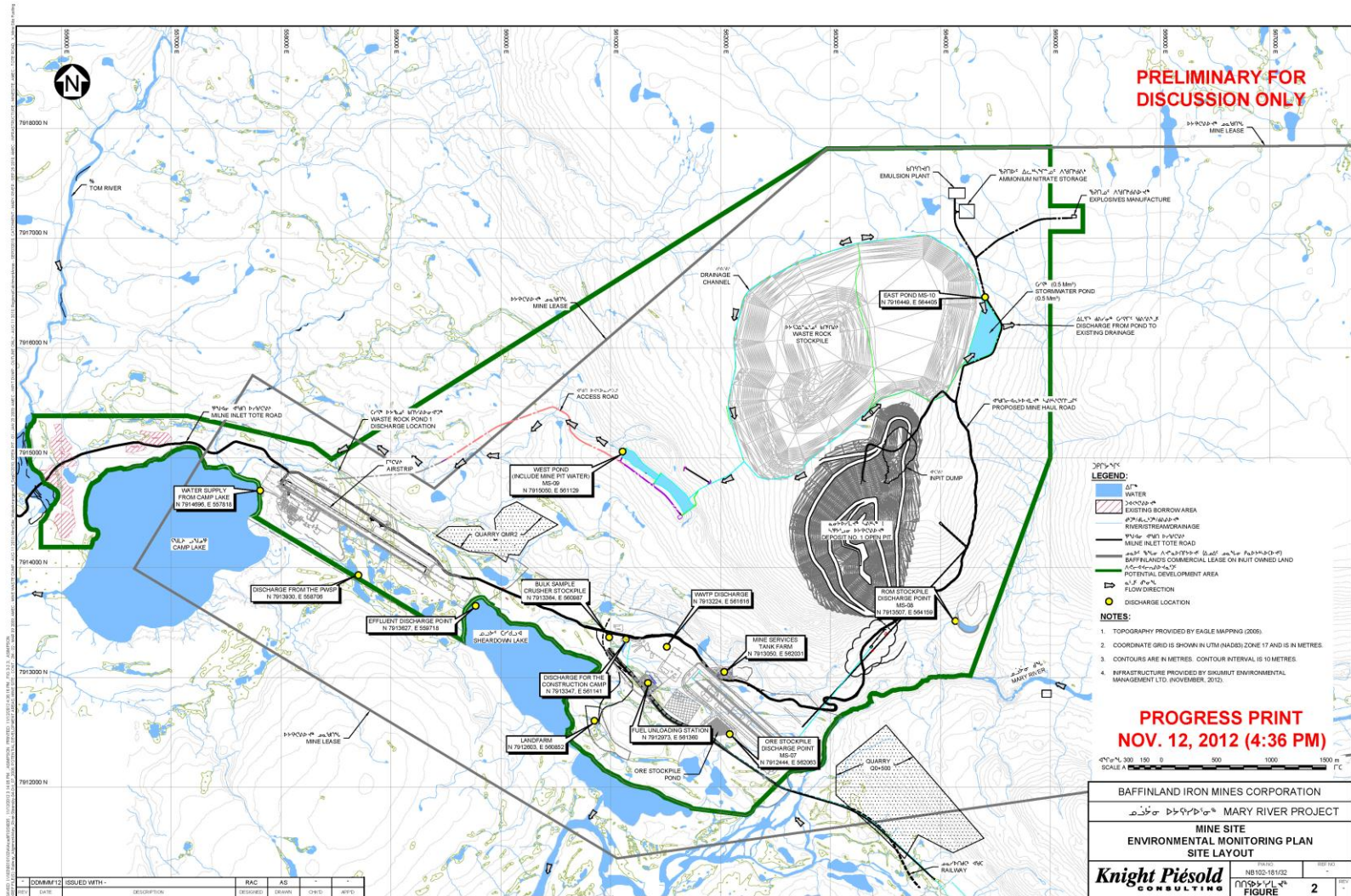


# Milne Port Site Layout



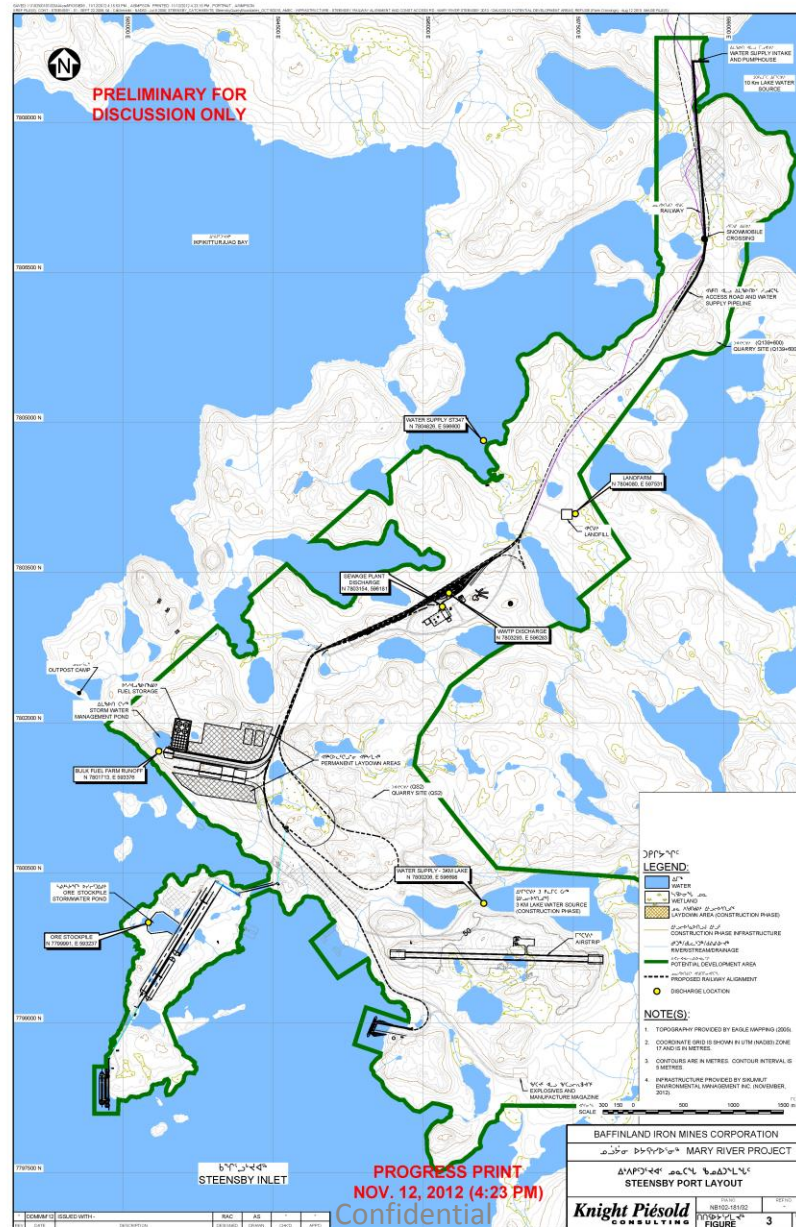


# Mine Site Layout






# Steensby Site Layout





A photograph of an environmental monitoring site. In the foreground, there are large, dark, jagged rocks. In the middle ground, five people wearing high-visibility orange and yellow safety vests and hard hats are working on a grassy, rocky slope. They are surrounded by numerous small orange survey flags. To the left, a calm blue lake is visible, and in the background, there are dark, rocky hills under a clear blue sky.

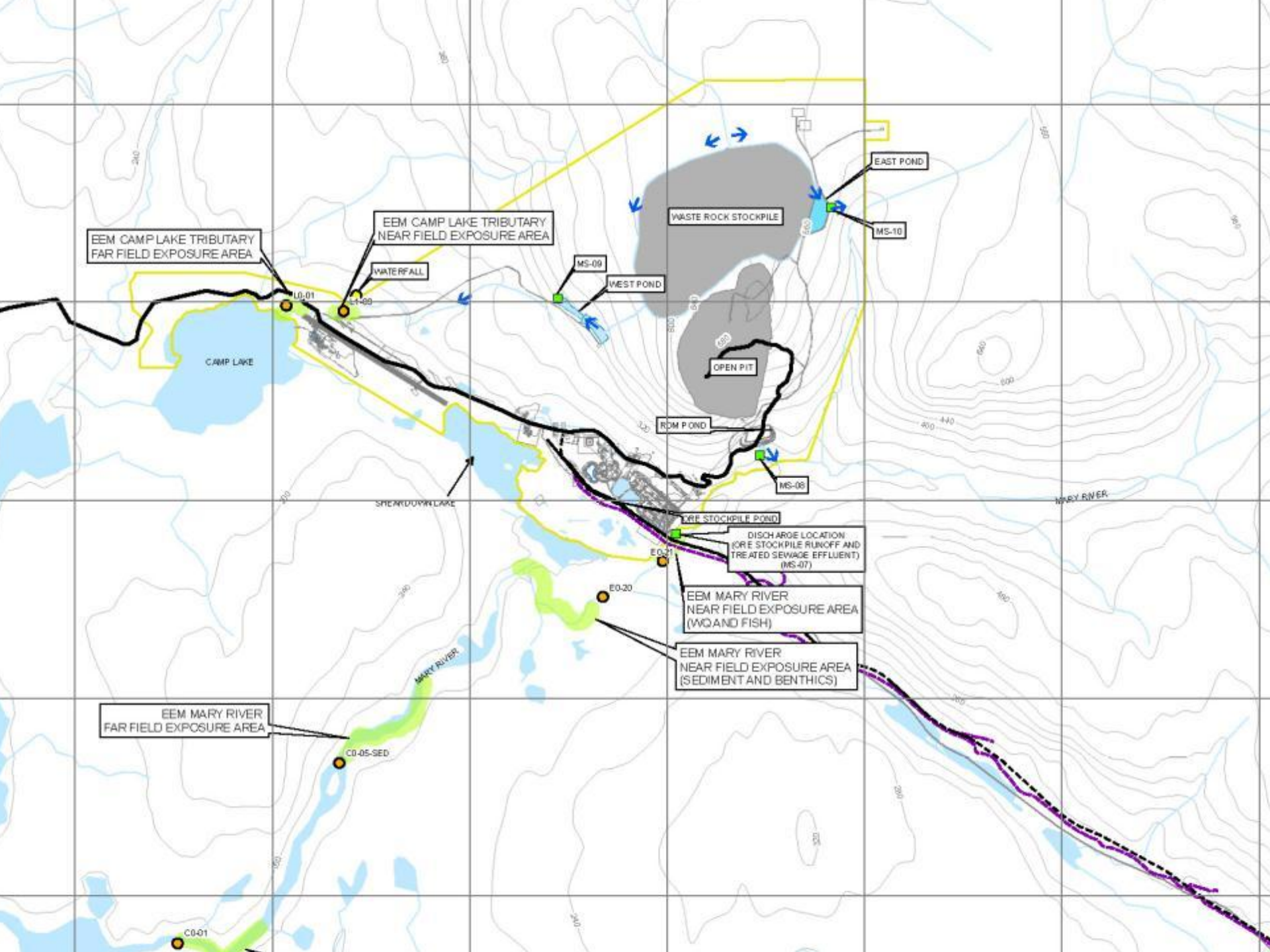
# Environmental Effects Monitoring (MMER)



# EEM Study Design - Overview

- Draft study design in-progress
- Two freshwater exposure areas
  - Camp Lake Tributary L0
  - Mary River (3 discharges)
- No marine exposure areas (MMER)
- Sampling and data analysis protocols prescribed
- Characterization of exposure areas in 2012
- Discretion required in selection of exposure areas for monitoring









# DFO Authorization Monitoring



# DFO Authorization Monitoring

- Monitoring during stream crossing and lake encroachment construction (TSS/turbidity)
- Salvage fishery will be conducted if required during construction
- Followup monitoring to assess fish passage (i.e., performance) at stream crossings
- Monitoring of performance/integrity of crossing structures
- Monitoring of performance of habitat compensation works.



An aerial photograph of a wetland landscape at sunset. The sun is low on the horizon, casting a warm orange glow across the sky and reflecting on the water. The landscape is a mosaic of dark, silhouetted land patches and lighter, reflective water areas. A solid red vertical bar runs along the left edge of the image.

# Closure and Reclamation



# Mine Closure and Reclamation Plans (MC&RP)

- Phased approach to mine reclamation and closure over the life of mine, MC&RP is a “living” document
- Preliminary MC&RP submission in FEIS – primarily conceptual in nature
- Interim MC&RP – a series of submissions starting in advance of commencement of mining activities and on scheduled basis thereafter
- Final MC&RP is prepared in advance of scheduled permanent closure and cessation of mining activities



# Applicable Mine Closure Policies, Guidelines and Lease Requirements

- QIA Commercial Lease
- A&R Policy for IOL (QIA)
- Mine Site Reclamation Guidelines for NWT (AANDC 2007)
- Mine Site Reclamation Policy for Nunavut (AANDC 2002)
- Mine Site Reclamation Policy for the NWT (AANDC 2002)
- Guidelines for Abandonment and Restoration Planning for Mines in the NWT (1990)



# Preliminary Mine Closure and Reclamation Plan (as submitted in the FEIS)

- Describes different mine closure scenarios and their associated implementation, maintenance and reclamation measures.
- Progressive rehabilitation of the Project.
- Short-term and long-term temporary closure scenarios
- Site inspection programs and schedules are also included.
- Final mine closure and reclamation measures.
- Post-closure monitoring activities
- Expected site conditions following final closure.
- Preliminary reclamation costs for final closure



# Key Closure Objectives

- Closure objectives will be consistent with locally valued ecosystem components and regional planning objectives.
- Water quality at closure shall meet accepted standards as determined by the MMER
- Ensure the physical, chemical and biological stability of the mine site for environmental, human, and wildlife safety.
- Remediation of sources of contamination that may have been created during the development and operation of the mine site in order to protect humans, wildlife, and environmental health (as determined by site audit at closure).
- Meet applicable federal and territorial public health and safety requirements.
- Incorporation of best management principles



# Closure and Reclamation – Post-closure

- Closure activities are expected to take 3-5 years
- Post closure monitoring will continue until closure objectives have been met
- The facilities remaining after closure will be the open pit, waste rock stockpile, and railway embankment
- No long-term active maintenance of any of the facilities is expected to be required



# Mine Closure and Reclamation Plan – Ongoing Studies over Life of Mine

- Geological and Geochemical Characterization Program (first phase is 2012-2014)
  - Refinement of water quality modeling results used to predict runoff from waste rock storage areas and pit water quality.
- Re-vegetation research to determine best reclamation approaches for north Baffin Island
- Monitoring results over the life of mine will inform best selection and design of reclamation measures and monitoring scope and schedule for final closure.





# Security Bonding



# Security Deposit

- The issues for Baffinland are related to double bonding and phased approach to bonding
- Baffinland proposes to prepare a work plan for each year of construction that includes a cost estimate for decommissioning infrastructure contained within that workplan
- Baffinland proposes to increase the security deposit annually based on the additional Project components to be constructed
- Baffinland remains committed to the overall bond estimate of \$519 million outlined in the Preliminary MC&RP