

## Freshwater

### Phase 2 Proposal

Final Hearing Iqaluit and Pond Inlet November 2019

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## Presentation Overview

- Public Consultation and Inuit Knowledge
- Description of assessment
- Mitigation and monitoring
- Technical Review Summary
- Project Certificate Conditions
- Conclusion



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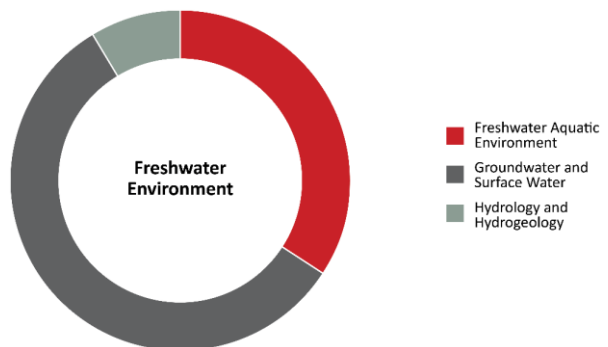
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## Community Feedback

- A total of 35 comments or questions related to the Freshwater Environment
  - 20 related to Groundwater and Surface water
  - 12 related to Freshwater Aquatic Environment
  - 3 related to Hydrology and Hydrogeology



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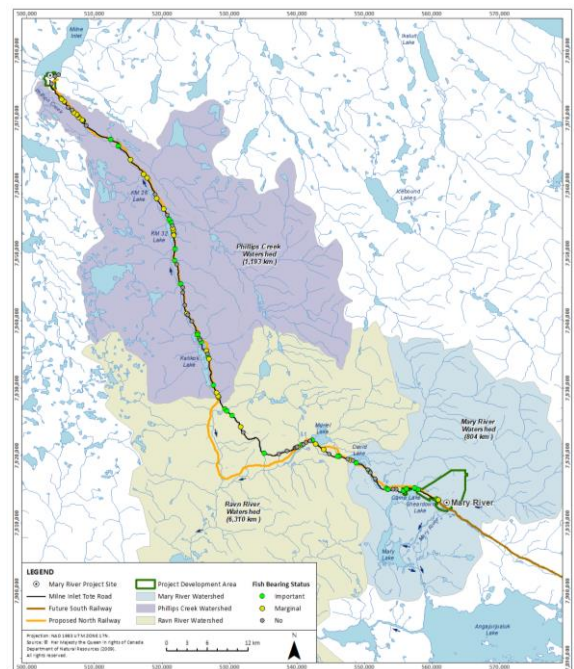




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## Existing Conditions – Overview

- Project components in three major watersheds:
  - Phillips Creek
  - Ravn River
  - Mary River
- Two freshwater fish species present:
  - Arctic char
  - Ninespine stickleback
- Baffinland currently has several existing monitoring programs for the Approved Project



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## Methodology

- Methodologies consistent with Final Environmental Impact Statement
- Water Quantity
  - Water withdrawals
  - Stream diversions
- Water Quality
  - Effluent discharges
  - Dust deposition and sedimentation
- Freshwater biota and habitat
  - Fisheries surveys and passage
  - Habitat loss/alteration



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## Select Examples – Additional Assessment Information

- Updated fisheries package
- Additional Information on Fish Habitat Interactions
- Geochemical Evaluation of Railway Quarry Materials
- Geotechnical Investigations - Acid Rock Drainage Assessment

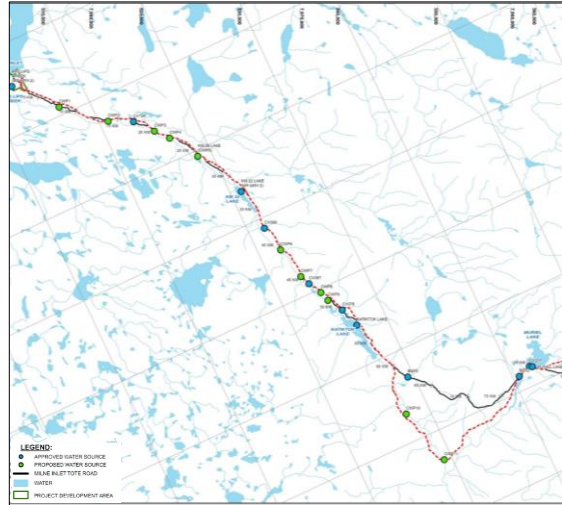
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## Phase 2 Interactions with Freshwater Quantity

- 13 additional water sources for dust suppression
- 10 stream diversions along North Railway



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## Phase 2 Interactions with Water Quality

- Mine Plan and Waste Rock Disposal
  - Mine plan unchanged
- Quarries and rock cuts
  - Testing shows risk of acid rock drainage and metal leaching is negligible to low
- Effluent discharges
  - Mine - minor increase in ore stormwater discharged to Mary River



Waste Rock Facility – Summer 2019



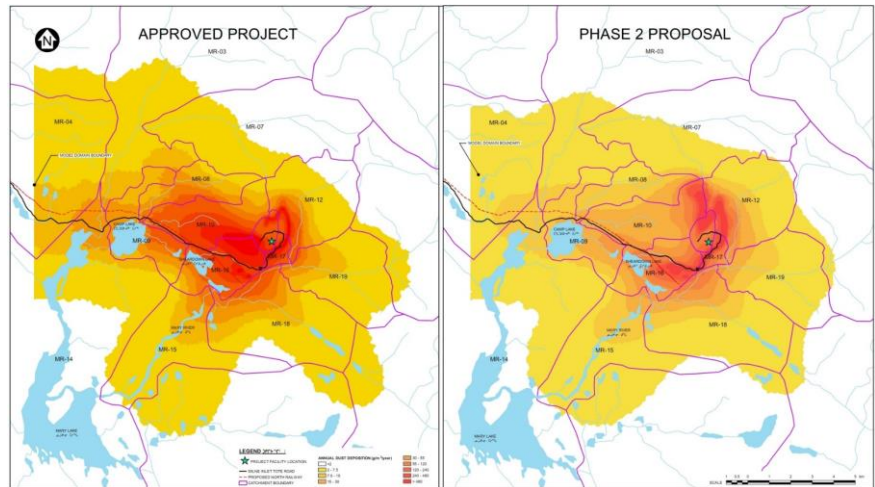
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## Phase 2 Interactions with Water Quality

### Dustfall Effects

- Mine
  - Decrease relative to the Approved Project
- Transportation Corridor
  - Overall reduction
- Milne Port
  - Ore Stockpiling



Mine Site Predicted Annual Dustfall



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## Phase 2 Interactions – Freshwater Biota and Habitat

### Potential Effects to Fish and Fish Habitat

- Direct loss/alteration of fish habitat
  - Crossings
  - Cuts/diversions
  - Pond encroachments or infilling
- Indirect loss of fish habitat
  - If fish passage is obstructed in culverts
- Indirect effects to Arctic char health
  - Water withdrawals
  - Changes in water quality



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## Project Mitigation – Water Quantity and Quality

- Mitigation through design
- Regulatory requirements
- Existing Management Plans implemented and updated
  - Dust Mitigation Action Plan
  - Sedimentation Mitigation Action Plan
  - Tote Road Earthworks Execution Plan
  - Snow Management Plan
  - Surface Water and Aquatic Ecosystems Management Plan
  - Fresh Water Supply, Sewage and Wastewater Management Plan
  - Borrow Pit and Quarry Management Plan
  - Phase 1 Waste Rock Management Plan

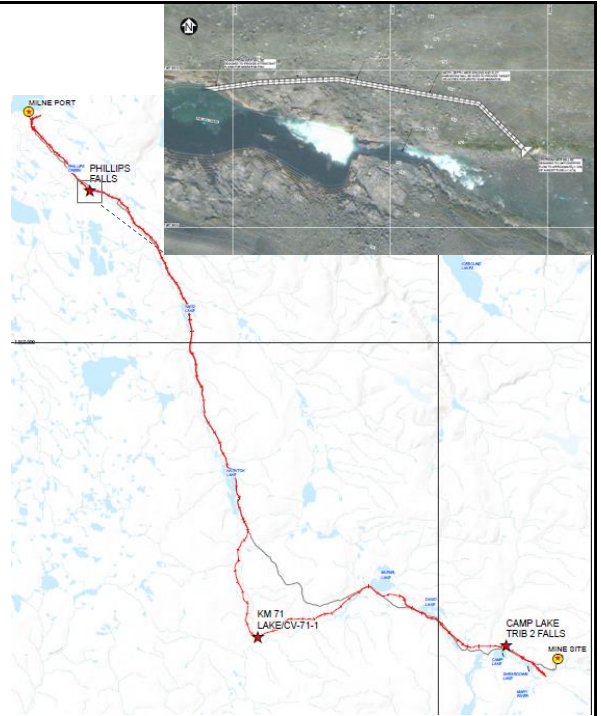


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## Project Mitigation – *Freshwater Biota and Habitat*

- Mitigation by design
- Surface Water and Aquatic Ecosystems Management Plan
- Freshwater offsetting plan
- Future *Fisheries Act* Authorization for North Railway



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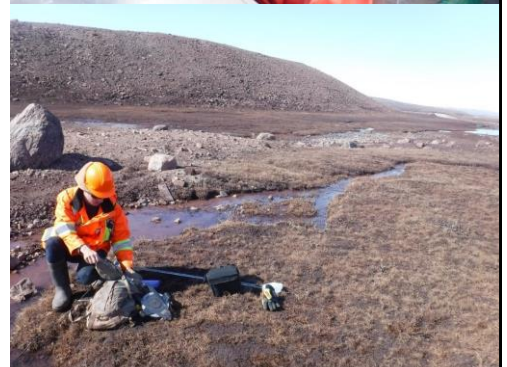
## Project Monitoring

### Established Monitoring Programs

- Aquatic Effects Monitoring Program
- Environmental Effects Monitoring Program
- Surveillance Network Program
- Lake Sedimentation
- Hydrology
- Fisheries Authorization monitoring
- Tote Road Monitoring Program
- Water crossing installation/modification guideline

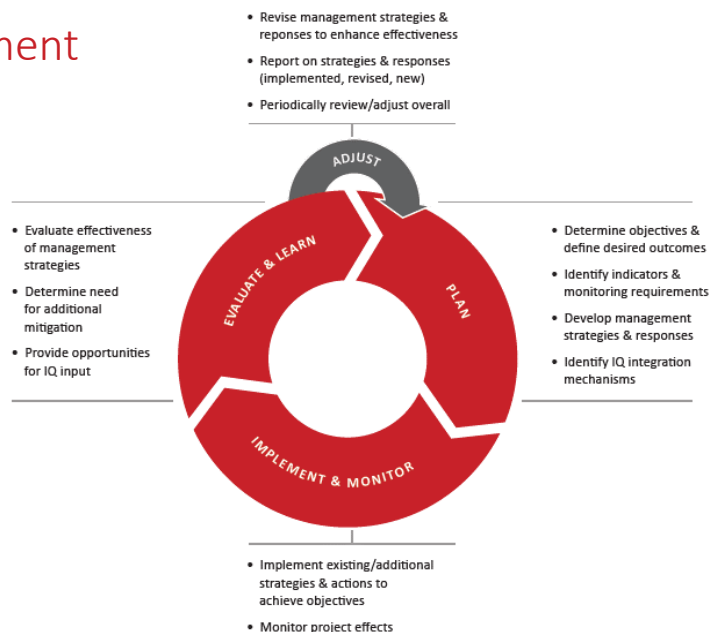
### New or Expanded Monitoring Programs

- Detailed water withdrawal plan
- Tote Road Monitoring Program to incorporate North Railway
- Fish passage monitoring to incorporate North Railway
- Stream diversion monitoring



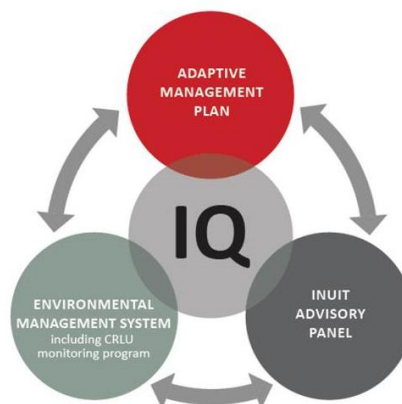
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## Adaptive Management



## Adaptive Management

- Systematic approach to respond to monitoring results
- Incorporates Inuit Qaujimajatuqangit Framework
- Incorporated in existing monitoring programs:
  - Tote Road Monitoring Program
  - Guidelines for water crossing installations
  - Aquatic Effects Monitoring Plan





## Incorporating Lessons Learned

- Comprehensive data set
- Continue to implement adaptive management practices
- Integrating feedback
  - Tote Road Monitoring Program and water crossing construction monitoring developed in collaboration with the Qikiqtani Inuit Association



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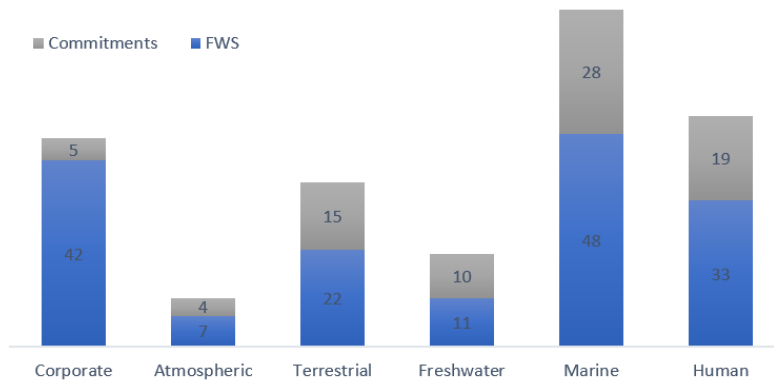
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## Final Written Submissions

### Final Written Submissions and Commitments



## Select Examples – Commitments

- Updated Assessment of Proposed Water Withdrawals
- Baffinland will work with DFO to determine need for, and locations of, new hydrological monitoring stations
- Rationale for the selection of crossing infrastructure for fish bearing watercourses
- Evaluate fish passage along the alternative rail line
- An updated Phase 1 Waste Rock Management Plan will be submitted December 31, 2019



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## Project Certificate Conditions

- No Changes requested
  - 41 – 100 metre vegetated buffer to quarries with ARD/ML potential
- Recommend removal (duplicative of licence/authorization)
  - 42 – 30 metre buffer between operations and water bodies
  - 43 – Drainage and silt control plan
  - 44 – Blasting thresholds and residues
  - 45 – No-Net-Loss Principal
  - 46 – Ensure runoff meet discharge requirements
  - 47 – Maintain movement of water in fish bearing streams and rivers
  - 48 – Develop project specific blasting thresholds
  - 48 (a) – Arctic char surveys and ongoing monitoring of Arctic char health



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## Key Conclusions

- Phase 2 Proposal involves similar interactions as Approved Project
- Robust management and monitoring programs in place and will be expanded



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Questions?  
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