Hutchinson
Environmental Sciences Ltd.

MELIADINE TYPE A WATER LICENSE

Public Hearings
February 10-11, 2015,
Rankin Inlet, NU

Kivalliq Inuit Association

Overview

- This presentation accompanies our submission to the Nunavut Water Board on December 17, 2015
  - *“R151217_J150077_Meliadine WL A Public Hearing Technical Submission”*
  - That submission documents our concerns and resolutions as of the submission date
- Our review was comprised of 27 separate information requests and technical comments

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Overview

- Our technical comments addressed issues regarding:
  - Saline and freshwater discharges to the receiving environment,
  - Modelling,
  - Waste management,
  - Dust management, and
  - Environmental monitoring

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Guiding Principles

- Our review is guided by
  - Nunavut Water Board's (NWB) water quality framework:
    - *"protect, manage and regulate freshwaters in Nunavut in a manner that will provide the optimum benefits for the residents of the territory in particular and Canadians in general"*
  - The Nunavut Land Claims Agreement, and
  - The right of Kivalliq Inuit to minimal changes to the environment
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Resolutions

- We have worked with the proponent to resolve issues raised by the KIA

- At the conclusion of the pre-hearing technical meetings, 22 of our issues had been fully resolved and 3 issues were resolved pending our review of documents AEM was required to submit prior to the Public Hearings
  - Resolutions prior to and during the Pre-Hearing Conference resulting in commitments are documented in the Pre- Hearing Conference Report and in our final written submission

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RESOLVED UPON REVIEW OF AEM'S SUBMISSIONS

Three Issues

KIA-WL-01: Segregation of Overburden

Issue

- AEM intends to store *"about 0.1 Mt"* in the temporary stockpile for use *"as TSF closure cover material"*.
- We are concerned that the segregated overburden is only intended for use as part of the TSF closure strategy
  - Overburden is a source of native plant material that can also be used in the closure of roads, pads and other site infrastructure

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- Inuktitut

KIA-WL-01: Segregation of Overburden

Resolution

- AEM committed to:
  - Minimize the loss of overburden wherever possible to allow for its use as closure material,
  - Investigate storage options for segregated overburden,
  - Include a section in the next iteration of the closure and reclamation plan indicating other uses for overburden at closure in addition to capping the TSF, and
  - Investigate whether the 0.1 Mt of overburden is sufficient to cap the TSF and support the closure of other site infrastructure

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KIA-WL-01: Segregation of Overburden

Resolution

- AEM provided the KIA with a technical memo on January 7, 2016
  - This outlined their investigations of whether additional overburden could be stored for use at closure and the potential uses of that overburden
- AEM has demonstrated to our satisfaction that additional overburden storage is not feasible within the constrains of the Meliadine project
- We encourage AEM to explore additional storage sites and uses for overburden in closure and reclamation

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KIA-WL-10: Quality Control Responses

Issue

- AEM had not provided a response framework for duplicate samples with medium and low analytical precision
- We are concerned low quality data may be incorporated into the assessment of mine related impacts
- This may reduce the capacity for the Aquatic Environment Monitoring Program to identify and mitigate impacts to the receiving environment

Inuktitut

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KIA-WL-10: Quality Control Responses

Resolution

- We requested that AEM provide a response framework for low and medium precision data that included:
  - Validation of sample collection techniques and precision,
  - Validation of analytical precision, and
  - Whether all samples from the suspect field event or those collected from a given field team be excluded from the dataset
- AEM provided an updated QA/QC plan in December 2015 which included a significantly more detailed response framework for handling low and medium precision data
- We consider this issue resolved

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KIA-WL-15: Sample Station Categorization

Issue

- AEM categorized MEL-05, MEL-06 and MEL-07 as *“verification samples”*
- Verification samples are *“for operational and management purposes by Agnico Eagle”*
- General Aquatic samples are *“subject to compliance assessment to confirm sampling was carried out using established protocols, included quality assurance/quality control provisions, and addresses identified issues.”*
- KIA were concerned that these stations drain to Meliadine Lake and any problems detected should trigger management action

Inuktitut

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KIA-WL-15: Sample Station Categorization

Resolution

- The Nunavut Water Board prehearing decision report included a satisfactory commitment from AEM outlining:
  - Sampling frequency at MEL-05, MEL-06 and MEL-07,
  - Reporting requirements for those sites, and
  - The Low Action Level response framework should monitoring indicate changes in water quality at those locations
- We consider this issue resolved

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UNRESOLVED ISSUES

Two Issues

These issues have now been resolved prior to the Public Hearings

KIA-WL-07: Mixing Zone Water Quality Monitoring

- We have worked to resolve this issue with AEM through:
  - Our submission of a technical memorandum
  - Technical discussions via teleconference
  - Review of a technical memorandum submitted by AEM
- We present our proposed resolutions as two separate issues and requests

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KIA-WL-07: Mixing Zone Water Quality Monitoring

(1) Issue

- AEM has proposed 5 sites in the near-field exposure area as part of the Aquatic Effects Monitoring Program, but no sites are proposed to triangulate effluent from the diffuser
- AEM has indicated
  - The plume will be characterized through a delineation study required through the Environmental Effect Monitoring (EEM) component of the Metal Mining Effluent Regulations (MMER)

(2) Inuktitut

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KIA-WL-07: Mixing Zone Water Quality Monitoring

(1) Issue

- The focus of MMER and the associated Plume Delineation Study is ensuring that the effluent is not toxic to aquatic life
- The focus of our concern is to ensure the integrity of the receiving environment is maintained and the predictions presented in the Environmental Impact Statement are validated
- Concerns with relying on the EEM Plume Delineation study are:
  - Wind, flow and other mixing zone dynamics which vary over time limits its capacity to characterize the mixing zone and assimilative capacity of Meliadine Lake under all conditions
  - It may not provide sufficient data to compare the plume's behaviour with predictions from the Environmental Impact Statement

(2) Inuktitut

- Inuktitut

KIA-WL-07: Mixing Zone Water Quality Monitoring

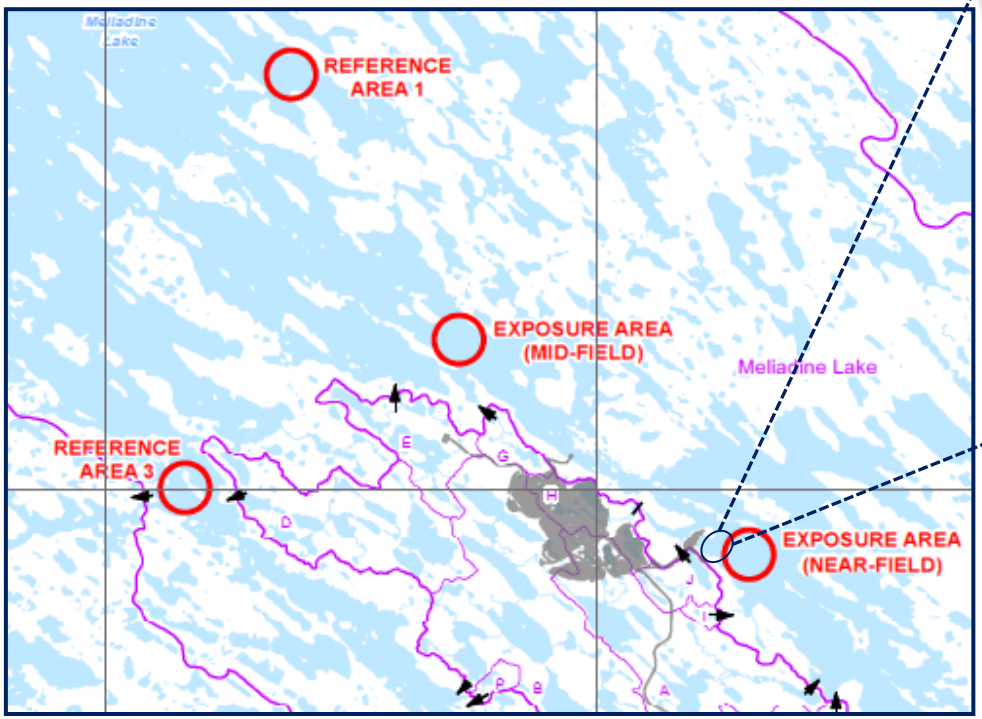
(1) Request

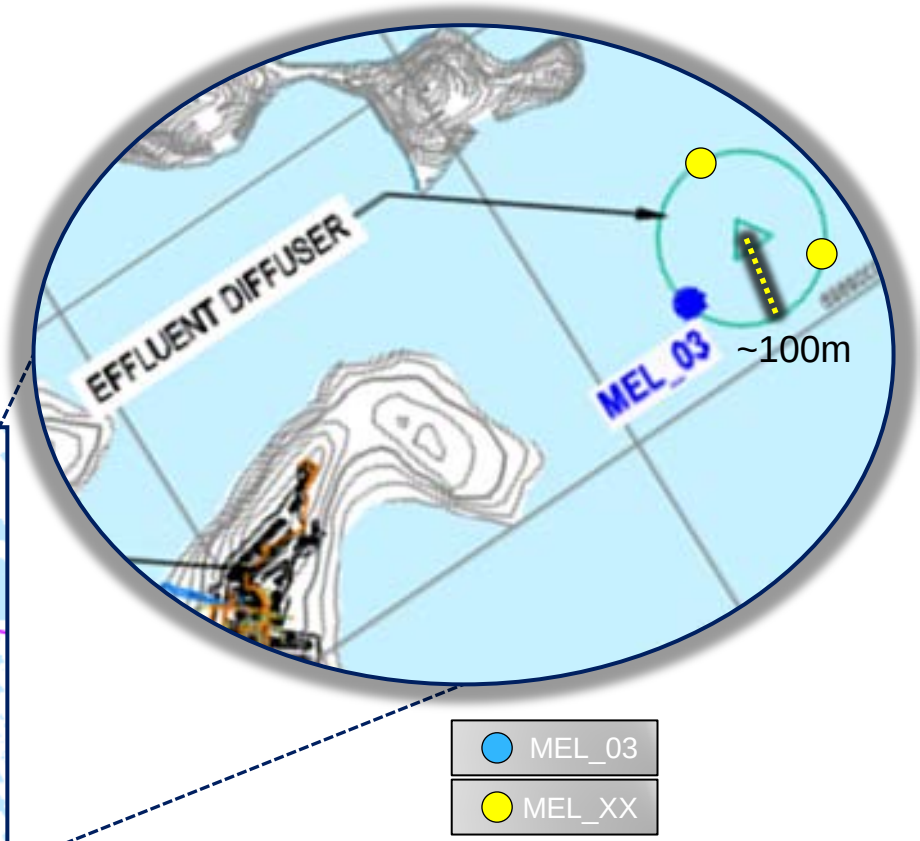
- We requested that AEM allocate 3 of the near-field exposure area sites around the diffuser to triangulate the predicted mixing zone boundary 100 m from the diffuser
  - i.e. sites at 120^{o}, 240^{o} and 360^{o}, 100m from the center of the diffuser
  - Samples should be collected from the highest point of conductivity as determined by a water column profile

(1) Inuktitut

- Inuktitut

KIA-WL-07: Issue 1
Site Locations





KIA-WL-07: Mixing Zone Water Quality Monitoring

(1) Request

- AEM has committed in their December 21, 2015 memo to:
  - Collect water quality data from three triangulated stations at approximately 100 m from the diffuser during the period of discharge for two years once discharge starts
- This commitment addresses the majority of our concern but does not include sampling frequency
- AEM has confirmed in an email on January 20, 2016 that *"The three "diffuser" stations will be sampled on the same schedule as the AEMP* [(Aquatic Effects Monitoring Program)] *stations for the two year target program; sampling during the under-ice period will be done only if ice conditions are safe."*
  - The AEMP frequency is once under ice (when safe) and then monthly during the discharge period
  - This frequency and duration is sufficient to triangulate the plume under varying environmental conditions
- This issue is now resolved

(1) Inuktitut

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KIA-WL-07: Mixing Zone Water Quality Monitoring

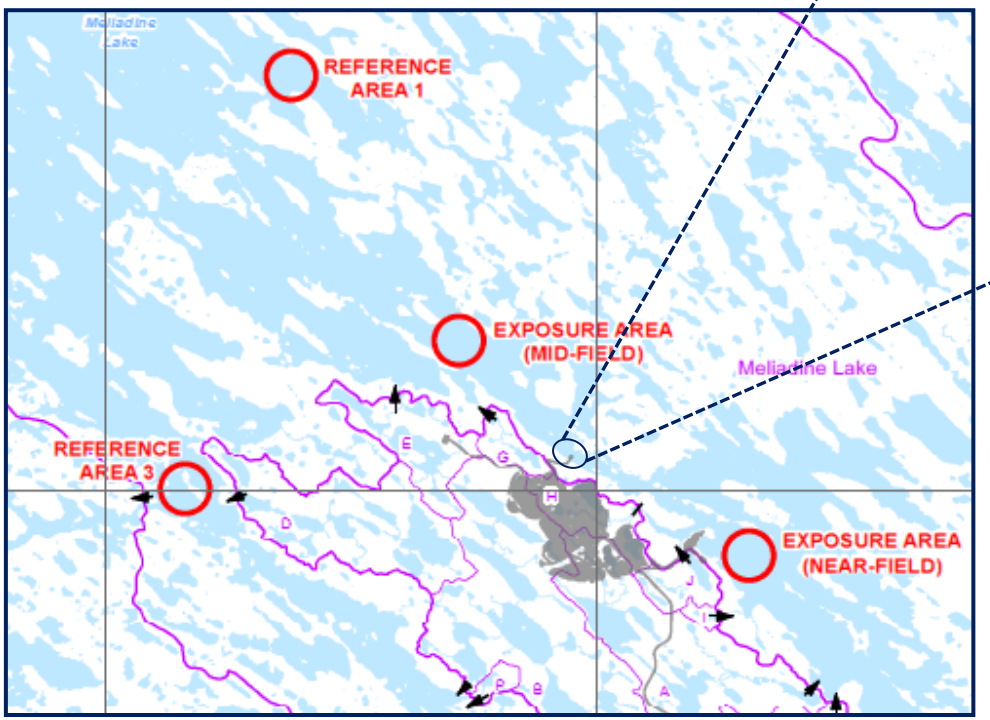
(2) Issue

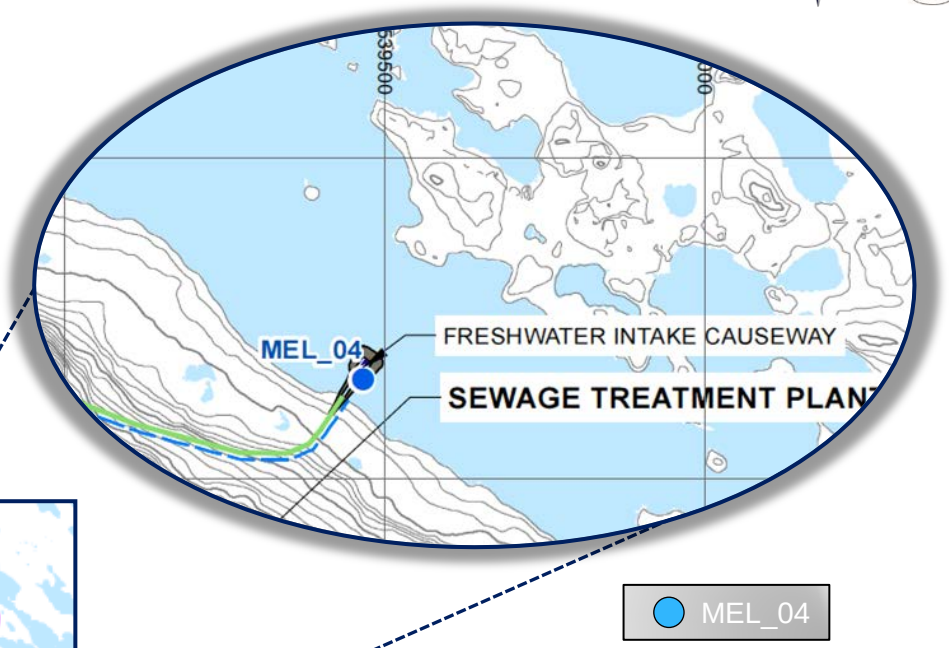
- The KIA is also concerned with tracking the effect of the effluent downstream of the diffuser in Baker Lake
- There is a significant proportion of Meliadine Lake that may be influenced by effluent but has no associated AEMP water quality stations
  - MEL_04 is the only station in the “narrows” of Meliadine Lake

(2) Inuktitut

- Inuktitut

KIA-WL-07: Issue 2
Site Locations





KIA-WL-07: Mixing Zone Water Quality Monitoring

(2) Request

- The KIA and AEM have agreed to a resolution discussed via teleconference and presented in AEM's December 21, 2015 technical memorandum
- AEM has committed to a Low Action Level response to establish new water quality stations in the narrows if the plume is moving faster and farther than expected from the near-field exposure area
  - AEM clarified their definition of *"faster and further than expected"* in an email on January 20, 2016 – comparison of water quality will be made to Environmental Impact Statement predictions, guidelines, benchmarks and baseline concentrations relying on the plume dispersion model generated through CORMIX
- This issue is now resolved

(2) Inuktitut

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KIA-WL-16: Detection Limits

Issue

- AEM has indicated no accredited laboratory will be located on site
- Proposed the use of six analytical laboratories for analysis of water quality samples
  - Concerned for interlab variability
- AEM did not provide detection limits that will be used at the laboratories

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KIA-WL-16: Detection Limits

Issue

- During the pre-hearing conference, AEM committed to work with the KIA to achieve acceptable detection limits for all laboratories and parameters
  - Limits would be based on those proposed in our written submission
  - The agreed upon limits will be included in the Quality Assurance / Quality Control Plan
  - Detection limits will apply to all AEMP samples and specific sites indicated in our submission
- AEM submitted an updated Quality Assurance / Quality Control Plan in December 2015

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KIA-WL-16: Detection Limits

Request

- The new Quality Assurance / Quality control plan included detection limits as requested
- Most detection limits are acceptable
  - They are lower than the associated federal water quality guidelines for the protection of aquatic life
  - Allow for adequate characterization of the aquatic environment and detection of biologically relevant changes
- AEM has accepted a 3 mg/L TSS detection limit
  - AEM will use a TSS detection limit of 1 mg/L in a special 2016 baseline study

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SECURITY

Security Amount

- The Kivalliq Inuit Association, Indigenous and Northern Affairs Canada, and AEM have agreed without prejudice to a security estimate of $49,554,667
  - This amount is sufficient to complete the required reclamation as outlined in the AEM Closure and Reclamation Plan

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Security Management Agreement

- The Kivalliq Inuit Association and Indigenous and Northern Affairs Canada are working to finalize a Security Management Agreement which will avoid double bonding for the proponent

- The current draft agreement supports a 50:50 split in the security to be held equally by the Kivalliq Inuit Association and Indigenous and Northern Affairs Canada

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Security Management Agreement

- AEM will provide evidence to the Nunavut Water Board of the security amounts paid to KIA and Indigenous and Northern Affairs Canada
- The security will be reviewed and adjusted periodically, to take into account material changes to the project or risk of environmental damage
- If the Security Agreement is terminated, not less than 90 days' notice will be given to the Nunavut Water Board

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QUESTIONS?