



KivIA IR#

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Topic

Storage Options for IVR Waste Rock

Thermal Monitoring of WRSF

Climate Change and Project Timeline

Uncertainty in Waste Rock Seepage Estimates

Uncertainty in Ground Water Inflows to Whale Tail Pit

Sludge and Brine Management

Addressing Changing Climate in Project Design

Water Management - Fate of Groundwater Inflows

Flow of Low Grade Ore

Inuit Input Into Closure Objectives

Overburden for Closure

Fate of Equipment

IVR High Pit Walls As Mitigation

As and ARD Mitigation on Whale Tail Pit Wall

Road Decommissioning

Hunting Pressure at Closure

Haul Road PAG Uncertainty

Water Quality Contingencies

Field vs Lab Filtration

Cross Contamination of Groundwater Samples

Acceptable QA/QC Limits for RPD

Fuel Storage

Whale Tail Dike Seepage Diffuser

Post Closure Pit Flooding

High TSS Concentrations During Construction

TSS Monitoring During Construction of Dikes

TSS Guideline Comparison

Trigger Value for Water Quality Parameters Below Detection Limit

Early Warning Trigger Development (schedule to develop)

Predicted Hg Concentrations in Water and Fish

Cryo-concentration in water quality model assumptions

Removal of Pit Walls from water quality model predictions

Loading rate and mass release rate

Climatic inputs for water quality model

Guideline exceedance prevention

Footprint and Underground Area
Freshwater Requirements

Mine Development Sequence and key activities

Waste Asbestos

Landfill Leachate

Sewage Sludge
Incinerator Ash Leachate Guidelines

Total Particulate Matter Generated by Incinerator

Dust Suppression

Impacts to Permafrost

Conceptual changes to permafrost around IVR Pit

Implications of rock fracturing on groundwater volumes

Time of Seepage Monitoring

Exclusion of perimeter groundwater monitoring wells

WRSF Design

Assessment of ARD/ML Potential at the Whale Tail Pit - sampling design

WHALE TAIL EXPANSION PROJECT WATER LICENCE AMENDMENT APPLICATION

NWB Water Licence 2AM-WTP1826 Review of AEM Response to KIA Information Requests

AEM confirms Table 1.4.1 timing is correct and will update Section 4.3.1 of Thermal Monitoring Plan with correct mining schedule

AEM summary The need for additional thermistor installation will be determined on the basis of their 2019 results - i.e. if the WRSF does not behave in a manner consistent with numerical modelling results then near surface monitoring will be triggered.

Baseline based on 63 years from Baker Lake 1946-2015 with some data editing. Climate change not considered due to short project timeline but they consider their water management is conservative in face of changing climate.

"For further conservatism in the design, Agnico Eagle is considering running a wet year scenario for the water balance to ensure the water management can handle extreme annual flows"

AEM provided verbal and graphical comparison of 2019 weather records with those used to develop the model and concluded that *"All flood routing charts indicate that extreme events can be managed within the infrastructures with adequate freeboard"*

AEM provided the necessary clarification of storage capacity of GSPs based on estimates of peak groundwater flows

AEM clarified that brine will be stored in the GSP-1 and treated by the S-WTP at closure and that only sludge from the O-WTP will be disposed in the WRSF or land farm where the relative volume (0.01% of WR) would not influence freezing. They did not provide the fate of sludge from the S-WTP.

AEM provided the requested comparisons of climate data and showed that the precipitation values used were within the range predicted under a changing climate. They provided Figure KivIA-WL-IR7-6 which shows that the temperature normals and measured temperatures are less than those predicted under a changing climate but did not address the IR request *"What safety factors, contingencies and capacity allowances have been considered in the design of project infrastructure for managing ...any changes in permafrost between project development and final closure?"*

AEM provided clarification

"Low-grade ore will be incorporated into the existing WRSF and covered with a 4.7 m thermal cover system at closure. No low-grade ore will be left on the site."

AEM cited Table 2-D-2 of FEIS Addendum 2-D and how Inuit concerns on water quality and fish were addressed. They stated *"At this stage, the water quality within the open pits will be non-toxic to fish."*

Agnico Eagle estimates that approximately 0.1 Mt of overburden other than bed lake sediments would be available for revegetation and road footprint area and that 5.5 Mt of lake bed sediments are not considered adequate for revegetation.

Agnico Eagle will commit to consultation on this matter during operations and prior to the preparation of Final Closure and Reclamation Plan (FCRP). However, the Approved Project ICRP was reviewed by KivIA and its consultants. The Expansion Project ICRP is an extension of the Approved Project and further discussions with KivIA related to the proposed ICRP and associated security will continue during the NWB process.

Agnico Eagle is currently working on a conceptual design of this mitigation measure for the IVR pit high walls and would like to defer the discussion of the outcome of this design to the technical phase of the project.

As and ARD will be mitigated by water cover - options for treatment, increased rate of pit filling to reduce exposure time or delayed reconnection are described and can be addressed in Water Licence terms.

Adaptive management strategies proposed by Agnico Eagle, as well as existing monitoring programs during operations, will be used to better inform and define caribou interactions with the Haul Road. Prior to implementing mitigation, Agnico Eagle will also consider how other roads that caribou interact with have been successfully mitigated at closure/decommissioning to inform mitigation designs that could be applied.

Final approach for the Haul Road decommissioning process will be included in the final closure plan and the KivIA will have a collaborative input on this process

Agnico Eagle only has the ability to influence access, which includes reducing access during closure and post-closure. It has no control over what activities the public chooses to do after the closure. The GN has the responsibility to determine sustainable harvest levels of caribou and implement conservation measures intended to conserve caribou populations at sustainable levels.

Pre development and development phase sampling confirmed no PAG would be used or exposed, will monitor any additional rock needed as well as water in borrow pits.

AEM replied that O-WTP could treat As to 0.1 mg/L at 1600 m³/hr. This means that it could not treat pit water to CWQG levels and so it is only feasible to treat source terms - this contingency for treatment is not feasible unless they can isolate source terms (pit walls).

The acceptable delay for filtration for dissolved metals is 48 hrs and this criterion will be used to determine if field vs lab filtration is required

The current practice is to have one sampling tube, a Waterra and a pump per well, as this would eliminate the possibility of cross-contamination between wells

RPD of 20% for concentrations of field and duplicate samples that both exceed 10x the method detection limit (MDL) is considered notable... Agnico Eagle will update the QA/QC Management Plan to include these details about the acceptable limits.

The fuel tanks referred to by the KivIA in the IR-22 were part of the Exploration Camp and need to be decommissioned in 2019 to complete the construction of the Permanent Camp as per the Approved Project. The final locations are being finalized.

Intent is to isolate seepage from South Basin to prevent contact with attenuation Pond and need for treatment. Pumping to attenuation pond and Treatment by O-WTP identified as contingency

Problem related to misnaming of a figure. The sequence and timeline shown in Table 1.4.1 in the Main Application Document is correct and aligned with what is presented in the two layouts. Agnico Eagle will resubmit Site Layout 190516 2AMWTP1826 Appl 10 with the correct pdf name

Short-term, with respect to TSS compliance assessment, means not greater than 24 hours. ... based on a single TSS monitoring value that exceeds the STM concentration. Spawning and larval habitat well defined and discharge locations will avoid these - any changes would tend to be localized (i.e., in close proximity to the construction area or dewatering discharge locations) and of short duration, such that the vast majority of fish, as well as the plankton and benthic invertebrate community assemblage, in the receiving lake would not be affected, and be recoverable. Provided reference to derivation documents.

Additionally, trigger concentrations have also been built into the Water Quality Monitoring and Management Plan for Dike Construction and Dewatering for a 7-day check and a 30-day average TSS concentrations at each monitoring station. Should maximum TSS concentrations in the water column at any station exceed the trigger values during dike construction, a response, or series of responses will be activated.

IR Response describes their approach as requested

Clarification Provided - 50 mg/l in Table 3.1 to stop construction, 30 mg/L (Table 3.2) to stop dewatering

The setting of two times the detection limit (DL) as the trigger for parameters that had 95% of measurements below the DL during baseline monitoring applies only to parameters without effects-based thresholds ...this trigger is sufficient to provide an indication of an increasing concentration based on an annual mean concentration ... that requires an evaluation of cause. Although there would be no risk to the aquatic biota in the receiving environment under such a trigger, the trigger would still generate a response for Agnico Eagle to review and identify the cause.

Water quality trigger and threshold values screening values will be developed for the Whale Tail Expansion Project. These will be derived from the recently completed 2018 Core Receiving Environment Monitoring Program (CREMP) – Meadowbank Mine and Whale Tail Project (Azimuth 2019), so that all relevant baseline data can be included in the derivation.

Need to review updated information expected ~ August 5 (as per June 2019 technical hearings). AEM will have document for technical review period

AEM will update the model as requested for the technical review period

Pit wall is one face and no small particles so less reactive The prediction for the bench assumes the entire surface area of 1 m deep reacts, which is an overestimate as not all the rock fragments will have a high surface area and therefore the small load from the vertical face is expected to be more than accounted for in the prediction by including only the surface area of the pit benches in the pit.

Release rate equation provided with an explanation of all required terms.

AEM will have decision tree available for the technical review period.

Back-calculation of required TSS concentrations to meet total chromium and total aluminum authorized monthly mean concentrations was completed. Results indicate a value between 18 and 37 mg/L. This comment is linked to ECCC-TC17 of the NIRB process.

Requested map provided distinguishes underground (purple) from surface (red) activities

Requested summary provided in Response to DFO IR2

AEM explains colour coding of mine sequence in Table 1-4-1 and commits to better clarity in future

Clearly explains source (brake pads and clutches in machinery- no asbestos in buildings), and describes safe disposal practice and georeferencing of location in WRSF

Describes expectations of quality. Leachate reports to attenuation pond and can be treated. References Water Quality and Flow Monitoring Plan for more detail - also notes that thermistors will track WRSF performance for flow attenuation (landfill is in WRSF)

Fate of sludge described - incineration will be considered along with other options

Metal guidelines derived from GN guidance - link provided

Provided estimate based on data from identical incinerator used at main Meadowbank site - concluded dust collection not needed as incinerator = 0.04% of project source

Provided expected increase in water from Nemo Lake needed for suppression along widened haul road. Same volume shown in Table 1 (DFO IR2)

Provided requested analysis with reference to where thermal modelling results could be found

Provided requested summary with figures showing conceptual models and reference to detailed thermal report

AEM provide a description but no reference - description says that fracturing is not a major controlling factor vs GW gradient

AEM provide the requested rationale for why the pit seepage survey would be carried out in August (active layer of permafrost is melted then) and describe the survey

AEM provide their rationale for monitoring sumps vs perimeter wells

Requested report on thermal monitoring provided as Appendix A

AEM provide rationale for their proposed sampling of 1 in 4 holes

Status	Follow up
Resolved	
Resolved	
Partially Resolved	Please provide the water balance results for the wet weather scenario as described.
Resolved for IR stage. Subject to Technical Review	
Resolved	
Not Resolved	Please provide the fate of the sludge and reject water waste stream from treatment of brine by S-WTP that is stored in GSP-1.
Partially Resolved	Please comment on how estimates of the development and maintenance of permafrost beneath water bodies and in the WRSF may change post closure under the increased temperatures indicated in Figure KivIA-WL-IR7-6.
Resolved for IR stage. Subject to Technical Review	

Resolved

Partially Resolved

Table 5.2.2. in the ICRP states "Prior to breaching the Mammoth Dike and the Whale Tail Dike, the water quality will be profiled to confirm it is suitable for release. Treatment options will be investigated, if necessary (e.g., in-situ treatment or through the O-WTP)" p. 67 of the ICRP states "...predicted concentrations of major ions, nutrients (except phosphorus), and metals in Mammoth Lake, and downstream environments, for post-closure are predicted to be lower than aquatic life guidelines." The Response to KivIA IR 10 states a commitment that water will be "non-toxic to fish". There is uncertainty in what water quality objectives are proposed for the pits prior to breaching the dikes post closure. Please confirm that water quality in the pits will meet CCME criteria for Protection of Aquatic Life prior to breaching dikes.

Not Resolved

Overburden of tills and organic matter is a valuable resource for facilitation of revegetation of scarified areas (roads, camp site etc.) during closure and contribute to the closure goal of "self sustaining ecosystems." Please explain why lake bed sediments are not considered adequate for revegetation

Resolved for IR stage.
Subject to Technical Review

Resolved for IR stage.
Subject to Technical Review

Resolved for IR stage.
Subject to Technical Review

Will need to make sure this is covered in Water Licence Conditions - technical questions on effectiveness

Resolved

Resolved Need a question to GN at WL hearings

Resolved for IR
stage.
Subject to Technical
Review Need to ensure that these commitments are reflected
in a management plan

Not Resolved The response does not indicate that pit water could be
treated to levels protective of aquatic life. Please
describe how any high As loadings from pit walls could
be isolated and treated in order to maintain pit water
quality within CWQG levels.

Resolved

Resolved

Resolved

Resolved No concerns - just addressing an omission

Resolved for IR
stage.
Subject to Technical
Review

Resolved

Resolved for IR
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Subject to Technical
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NJH- Note that pit wall is considered major source of As
isn't it?

Resolved for IR stage.	This appears to contradict previous response as it says that they are modelling release from pit walls, not the benches - need to clarify this
Subject to Technical Review	
Resolved for IR stage.	
Subject to Technical Review	
Resolved for IR stage.	
Subject to Technical Review	
Resolved	
Resolved	
Resolved	
Resolved	
Resolved for IR stage.	
Subject to Technical Review	
Resolved	
Resolved	
Resolved for IR stage.	What contaminants are associated with 2.8 kg/day of incinerator dust? Other dust sources used for comparison are native materials (rock and road dust).
Subject to Technical Review	
Resolved	
Resolved for IR stage.	
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