Agnico Eagle Mines Limited – Meadowbank Division

Whale Tail Pit Waste Rock Management Plan
RESPONSES TO REGULATORS REVIEW

October 26 2018

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ENVIRONMENT AND CLIMATE CHANGE CANADA (ECCC)

Interested Party:	**Environment and Climate Change Canada (ECCC)**	**Rec No.:**	**ECCC#1**
Re:	**Water Management During Closure**		

Comment:

According to the Waste Rock Management Plan, the contact water management system for the Whale Tail Waste Rock Storage Facility (WRSF), which includes the WRSF Dike and WRSF Pond, will remain in place until mine closure activities are completed and monitoring results demonstrate that water quality conditions from the Whale Tail WRSF are acceptable for discharge with no further treatment required. Water quality will be monitored as per the Whale Tail Pit Water License requirements. Once water quality meets the discharge criteria established through the water licensing process, the contact water management system will be decommissioned to allow the surface runoff and seepage water from the Whale Tail WRSF to naturally flow to the outside environment.

ECCC notes that untreated contact water from the Project, including the Whale Tail WRSF, will have to consistently meet discharge criteria over a sufficient period of time to provide confidence in the consistency of discharge and seepage quality.

Recommendation:

ECCC recommends the Proponent ensure that untreated contact water consistently, over a sufficient period of time, meets discharge criteria in order to provide confidence in discharge and seepage quality.

Agnico Eagle's Response to Recommendation:

Agnico Eagle does not agree with ECCC's recommendation. Agnico Eagle will monitor untreated contact water during the Closure phase to provide confidence in the consistency of discharge and seepage quality as per Water Licence monitoring requirements. These will be established prior to the Closure phase in collaboration with ECCC and the Nunavut Water Board (NWB).

Interested Party:	Environment and Climate Change Canada (ECCC)	Rec No.:	ECCC#2
Re:	Closure and Post-Closure		

Comment:

As per Section 2.5, the most recent set of climate model projections (CMIP5) predict an Arctic-wide year 2100 multi-model mean temperature increase of +13 degrees Celsius in late fall and +5 degrees Celsius in late spring under the Intergovernmental Panel on Climate Change (IPCC) "business as usual scenario" (RCP8.5). IPCC climate change mitigation scenario RCP4.5 results in a year 2100 multi-model Arctic wide prediction of +7 degrees Celsius in late fall and +3 degrees Celsius in late spring. The Proponent concludes that, due to the short duration of the proposed Project, climate change related effects to the Project are likely negligible.

ECCC notes that although the Project operations are of relatively short duration, the remaining structures will be there in perpetuity.

Per Section 9.5, a series of subsurface thermistors will be installed to monitor the temperature within the Whale Tail WRSF as freezing progresses. The thermistors will be monitored regularly throughout the operational period as well as during closure and post-closure according to the Whale Tail Water Licence and as described in the Thermal Monitoring Plan. The results will be used to evaluate the predicted thermal response of the facility, and will allow for revision of the thickness of the final cover if required.

ECCC concurs with ongoing monitoring and evaluation of closure plans for the WRSF.

Recommendation:

ECCC recommends that the Waste Rock Management Plan include a description of the effects that climate change under the "business as usual" scenario could have on the chemical and physical stability of the Whale Tail WRSF and on seepage water quality and quantity, during closure and post-closure.

Agnico Eagle's Response to Recommendation:

Agnico Eagle does not agree with ECCC's recommendation. For the Whale Tail Pit Project, selected RCPs have been grouped into two unique scenarios (Golder 2018):

- Scenario 1: ensemble of all RCP 4.5 and RCP 8.5 model runs considered representative of a RCP 6.0 scenario.
- Scenario 2: ensemble of all RCP 4.5 model runs.

This modelling approach was evaluated and approved as part of the NIRB Project Certificate and NWB Water License process.

RCP 4.5 is representative of intermediate emissions levels with greenhouse gas reduction and RCP 8.5 is representative of high emissions levels with no reduction in greenhouse gas emissions. The blend of RCP

4.5 and RCP 8.5 is considered representative of a future with intermediate to high emissions levels, where there have been some reductions in greenhouse gas emissions but not as ambitious as those required by RCP 4.5. The range of projections for Scenario 1 very likely covers the range of projections from RCP 6.0.

General circulation models have inherent limitations that are important to bear in mind when evaluating variability and the rate of climate change, (i.e., when comparing future projections to historical observations). These limitations are dependent on the research institution's approach to overcoming model uncertainty. Since no one model or climate scenario can be viewed as completely accurate, the Intergovernmental Panel on Climate Change (IPCC) recommends that climate change assessments use as many models and climate scenarios as possible. For this reason, the multi-model ensemble approach described above was used to account for these uncertainties and limitations.

The WRSF was designed to be physically and chemically stable under above-mentioned Scenario 1. Agnico Eagle will continue to monitor and validate these findings during Operations and Closure phase as per the Thermal Monitoring plan, Waste Rock Management Plan, ARD-ML Sampling and Testing Plan, Water Quality and Flow Monitoring Plan, and Water Management Plan.

Agnico Eagle will continue to use industry standard practices to evaluate the impacts of climate change on the WRSF in collaboration with ECCC and NWB.

Citation:

Golder Associates Ltd (Golder) 2018, Whale Tail Pit Project Waste Rock Storage Facility Cover Thermal Assessment, Technical Memorandum Prepared for Agnico Eagle Mines Limited. Golder reference No. 1789310_177_TM_Rev0, 16 p. and Appendix.

Interested Party:	Environment and Climate Change Canada (ECCC)	Rec No.:	ECCC#3
Re:	Onset of Acid Rock Drainage (ARD)/Metal Leaching (ML)		

Comment:

As per Section 5.1, "The ore and waste rock from the central greywacke and chert units are PAG. Chert and central greywacke represent 21% of waste rock to be generated by mining (19.1 Mt). They are silicified and, compared with the other greywacke waste rock, have a lower buffering capacity and/or a slightly higher sulphur content which results in a PAG classification of this material. The PAG waste rock also leaches arsenic but at concentrations that are well below the EQC. Kinetic leaching tests, mineral depletion calculations and consideration of the scale and site differences between laboratory tests and field conditions suggest a time lag to possible ARD development at site of more than a decade. Upper tier ARD materials (high sulphur/low buffering capacity greywacke or chert waste rock) generated acidic drainage earlier under laboratory conditions but without the benefit of added buffering capacity from mixing with other NPAG rock piles. The delay to onset of ARD from the bulk of PAG waste rock and ore is expected to be substantially longer than the seven years of mine construction and operations."

It is not readily clear to ECCC how the Proponent determined that the delay of onset of ARD/ML will be more than a decade when there is little or no buffering capacity given that this determination is a function of sulphide content and rate of reaction. ECCC acknowledges the proposed use of monitoring results (as compared to water quality criteria in the water licence) to determine when to discharge, however, the plan did not indicate how long this monitoring and application of adaptive management will last.

Recommendation:

ECCC recommends that the Proponent explain or show how they determined that the delay of onset of ARD/ML will be more than a decade or substantially longer than seven years of mine construction and operation.

Agnico Eagle's Response to Recommendation:

For clarification, the estimated field time equivalency of laboratory weathering tests is explained in the Final Environmental Impact Statement (FEIS) Appendix 5E Sections 2.2.4.2 and 3.5.1.1 as follows:

From Section 2.2.4.2

The 1-kg HCT is an accelerated weathering test meant to speed up the process of sulphide mineral oxidation to facilitate the measurement of weathering and its products on a shorter time scale than might occur in reality. This is achieved by forcing a rapid succession of alternating wet and dry cycles, and by actively flushing out the weathering products through the use of a high liquid to solid ratio (1:1 water to rock proportion by weight). The HCT test method (ASTM D 5744-07), is typically observed to be many times faster than rates inferred from field observations of drainage from the toe of waste rock piles (e.g., Malstrom et al., 2000).

In practice, many factors will influence weathering characteristics of the exposed mined materials and the rate of chemical release at site. Of importance are site climate on mineral reaction rates, availability of liquid water to transport weathering products, and pile hydrology (wetting and flow of water in pile pore spaces) which in turn also affects the water-to-solid contact and the rate of chemical reactions.

The Whale Tail and IVR waste rock will be piled and will be exposed to far less precipitation than both HCT and leaching columns. The average annual rainfall is 145 mm over 4 frost-free months (average of 36 mm/month), while each of the HCTs receive the equivalent of 127mm/week (508 mm/month), and the leaching columns receive the equivalent of between 63 and 122 mm/week (254 and 488 mm/month). Each weekly cycle represents more flushing than one average summer month at site. Thus conservatively, one leaching cycle can be said to represent 1 month of leaching at site. Comparatively, a 10-fold weathering rate acceleration (estimated from findings in Malstrom et al., 2000) would equate to 1 weekly leach cycle representing 2.5 months of weathering in the field.

In addition, as observed at Meadowbank, freezing conditions prevail for 8 months of the year in the surficial active thaw depth of the rock storage facility. The deeper portion of the pile remains frozen. The frozen winter conditions are not represented in laboratory leaching cycles. Laboratory tests simulate frost-free periods only (the four summer months).

Consequently, 4 leaching cycles can be considered to represent the four months of active water ingress into the waste rock pile, or one year at site, insofar as 4 months in the field constitutes the frost-free summer period where water can seep through the waste rock pile. By extension, a 20-cycle kinetic test would represent approximately 5 years at site.

From Section 3.5.1.1

Mineral depletion calculation results are in general agreement with the static ABA results indicating that the ultramafic, iron formation, mafic volcanic and intermediate intrusive lithologies will remain buffered with carbonate minerals, and largely outlast the time required for complete oxidation of sulphide minerals in these samples.

Conversely, the chert samples could acidify in the HCT in another year, and in 2 years in the leaching column. The PAG greywacke leaching column would be amenable to acidification in more than 4 years under laboratory conditions. This time frame for the laboratory leaching columns (1.5 to 5 years or 78 to 260 weeks) represents more than a decade in the field (Section 2.2.4.2). Furthermore, this period of time could be underestimated because it does not consider 1) the buffering capacity afforded by the other waste rock with which it will be mixed in the pile, 2) slower sulphide mineral oxidation kinetics at lower site temperatures (according to Arrhenius equation) and 3) the 8 months of freezing conditions and lower rock to liquid ratio in the field that slows the rate of buffering mineral dissolution (consumption).

In summary, the calculated delay to the onset of ARD in PAG samples is substantially longer than the 7 years of mine construction, operations and closure, with the possible exception of the upper tier high sulphur – low buffering capacity greywacke or chert rock.

Citations:

Agnico Eagle Mines Ltd. 2016. Whale Tail Pit Project – Meadowbank Mine Final Environment Impact Statement and Type A Water License Amendments, Volume 5, Appendix 5-E. Evaluation of the Geochemical Properties of Waste Rock, Ore, Tailings, Overburden and Sediment from the Whale Tail Pit and Road Aggregate Materials. Report Prepared by Golder Associates for Agnico Eagle Mines Ltd. 493 p. June 2016

Malstrom, M.E., Destouni, G., Banwart, S.A. and Stromberg, B.H. 2000. Resolving the scale-dependence of mineral weathering rates, Environ. Sci. Technol., 34, 1375–1378.

CROWN-INDIGENOUS RELATIONS AND NORTHERN AFFAIRS CANADA (CIRNAC)

Interested Party:	**Crown-Indigenous Relations and Northern Affairs Canada (CIRNAC)**	**Rec No.:**	**Background, Results of Review**
Re:			

A. BACKGROUND

On July 11, 2018, the Minister of Crown-Indigenous Relations and Northern Affairs Canada (CIRNAC) approved Agnico Eagle Mines Limited's (AEM) Whale Tail Pit Project Type 'A' Water Licence No. 2AM-WTP1826 application. The Whale Tail Pit Project is a gold deposit located near Baker Lake, Nunavut.

The Waste Rock Management Plan is to be reviewed by interested parties and approved by the Nunavut Water Board (NWB) as per Part B Item 15 of Water Licence 2AMWTP1826, prior to operation of the Whale Tail Pit.

In addition, the Waste Rock Management Plan is one of three management plans to be updated prior to operation of the Starter Pit (i.e. Quarry 2) within the Whale Tail Pit area, and construction of the Waste Rock Storage Facility (WRSF) Berm. This is stated in Part B Item 15 of the Whale Tail Pit Water Licence which states "that commitments made with respect to submissions received during the technical review of the Application, as well as final submissions and issues raised during the 2017-2018 Public Hearing process are to be taken into account." Table 1 is in CIRNAC's March 19, 2018 final submission. AEM subsequent March 26, 2018 submission agreed to Table 1. In accordance with Table 1, the Waste Rock Management Plan was reviewed with particular attention paid to the steps involved in waste rock segregation. For clarity, many aspects of waste rock management are/will-be also addressed in CIRNAC's review of the Whale Tail Pit Water Quality and Flow Monitoring Plan, and Acid Rock Drainage (ARD) and Metal Leaching (ML) Plan.

B. RESULTS OF REVIEW

CIRNAC recommends the NWB not approve the September 2018 Version 3 Waste Rock Management Plan for the Whale Tail Pit Project until the outstanding concerns are appropriately addressed.

CIRNAC has overall outstanding concerns regarding the quality of post-closure seepage from the WRSF. It is incumbent on AEM to alleviate these concerns and demonstrate that the Whale Tail Project is able to proceed without post-closure long-term treatment.

CIRNAC has repeatedly indicated that AEM's assumption that the WRSF, and the WRSF cover material, will be constructed solely of "clean" waste rock with low ARD/ML potential may be overly optimistic.

AEM has relied heavily on the data and experience it has obtained from its Meadowbank Gold Mine Project in carrying out its assessment of the Whale Tail Pit Project. However, there is little evidence to suggest that the geology, hydrogeology and waste rock geochemistry of the Whale Tail Pit are similar to that of the Meadowbank Gold Mine Project pits. On the contrary, laboratory tests show that the average leachable arsenic of the Whale Tail Pit waste rock is about 0.86 mg/L while that of the Meadowbank Gold Mine Project is 0.002 mg/L (i.e. 429 times greater).
AEM's model predictions on the post-closure WRSF seepage water quality show that the 4.7-metre "clean" cover needs to be almost contaminant-free to avoid long-term postclosure water treatment for arsenic. While CIRNAC acknowledges the steps that AEM is taking to reduce this risk, there continues to be high uncertainty regarding the robustness of the waste rock segregation program to provide "clean" construction and cover material for the WRSF – and therefore feasibility to achieve no long-term treatment of post-closure seepage water from the WRSF.

Furthermore, the Waste Rock Management Plan does not explicitly address current uncertainties related to the post-closure quality of seepage from the WRSF, and provide mitigation strategies for the still probable but less favourable modelling outcomes.

AEM's model results indicate that if 2% of the cover material is arsenic leaching material, long-term water treatment may be required. CIRNAC recommends the NWB not approve the September 2018 Version 3 Waste Rock Management Plan for the Whale Tail Pit project until it contains a waste rock segregation program that demonstrates with a higher degree of confidence that non ARD/ML waste rocks are being used as WRSF cover material.

Agnico Eagle's Response to Background and Results of Review Sections:
The relevant items set out in Table 1 "*Tasks and Timeline to Address CIRINAC's concerns related to Arsenic concentrations within the reflooded Whale Tail Lake*" (as presented in CIRNAC submission of March 16, 2018 and revised by Agnico Eagle's final submission of March 26, 2018) are as follows:

Task	*Start Date*	*Finish Date*	*Note*
Update Management Plans - … (iii) Whale Tail Pit - Waste Rock Storage Facility Management Plan detailing the steps involved in waste rock segregation; include location of thermistor and management of	*May 15, 2018*	*May 15, 2018*	*60 days prior to operation of Quarry 2 (if required) and prior to the construction of the WRSF Berm*
Operation of Quarry 2 (if required)	*July 1, 2018*	*February 15, 2019*	*Note Receipt of licence expected on May 16, 2018*
Waste Rock Storage Facility Berm Construction	*July 1, 2018*	*February 15, 2019*	*Note: Receipt of Licence on May 16, 2018. Following a 30 day notice of berm construction,*

			operation will begin
Whale Tail Pit Pre-stripping		*Q12019*	*As early as February 2019*
Whale Tail Pit operations		*Q32019*	*Target date is July 2019*

Agnico Eagle has addressed these comments and provided additional clarification during the October 17 & 18 2018 meeting with CIRNAC in Iqaluit plus Agnico Eagle's responses to CIRNAC'S recommendations noted below in this response package.

In addition, Agnico Eagle has included the presentation of the October 17 2018 meeting (Appendix A). Based on this, Agnico Eagle feels the Waste Rock Management Plan should be approved in a timely fashion by NWB.

Interested Party:	**Crown-Indigenous Relations and Northern Affairs Canada (CIRNAC)**	**Rec No.:**	**CIRNAC#1**
Re:	**S.2.5**		

Finding:

The long-term environmental performance of the WRSF is dependent on maintaining all waste rock with elevated ARD/ML within the frozen core of the facility (i.e., below the maximum depth of the active zone). AEM's initial designs were based on the assumption the cover would only be 2 m thick. Responding to CIRNAC's request, AEM conducted additional thermal modelling that included climate change predictions. Based on that modelling, it was determined that the cover thickness would need to be increased to 4.7 m to control potential ARD/ML. There is currently uncertainty regarding the accuracy of climate change predictions and, by extension, the required cover thickness may change in the future as additional information becomes available.

Recommendation:

To ensure the environmental protection of the site, we recommend that the long-term thermal performance of the WRSF be re-modelled every 10 years after the end of the closure phase (i.e., after cover placement). The modelling should incorporate all site-specific monitoring data and the most up-to-date climate change predictions available at the time.

Agnico Eagle's Response to Recommendation:

Agnico Eagle does not agree with this recommendation. Agnico Eagle will follow the Interim Closure and Reclamation Plan as submitted and signed off by CIRNAC and KIA and their respective consultants Arcadis and GeoVector Management. Long term monitoring and bond has already been negotiated and agreed upon by CIRNAC and KIA and is part of the Security Management Agreement entered into between Agnico Eagle, CIRNAC and KIA.

In addition, Agnico Eagle will intend to address this uncertainty during Operations by increasing the volume of NPAG and NML material in the Whale Tail WRSF which could be extracted from the southwall of the Whale Tail Pit. This could be included in an updated Waste Rock Management Plan.

Interested Party:	**Crown-Indigenous Relations and Northern Affairs Canada (CIRNAC)**	**Rec No.:**	**CIRNAC#2**
Re:	**S.2.5**		

Finding:

The Plan states: "However, due to the short duration of the proposed Project, climate change related effects to the Project are likely negligible." The statement does not apply to the waste rock that will be stored on site in perpetuity. The waste rock will be exposed to potential climate change related effects long after the short operational phase of the project.

Recommendation:

The text should be modified to clarify that the waste rock represents a permanent source of potential contamination and that it will be subjected to climate change effects.

Agnico Eagle's Response to Recommendation:

Agnico Eagle has provided the revised version of the Waste Rock Management Plan enclosed with this response package. It has been updated to include:

> *"However, due to the short duration of the proposed Project, climate change related effects to the Project are likely negligible. The WRSF, which will be a permanent infrastructure, was designed using the appropriate climate change model scenario to mitigate potential climate change related effects."*

However, Agnico Eagle refers CIRNAC to Agnico Eagle response to recommendation ECCC#2 for details regarding the selection of climate change model scenarios for this project.

Interested Party:	**Crown-Indigenous Relations and Northern Affairs Canada (CIRNAC)**	**Rec No.:**	
Re:	**Table 3.4**		

Finding:

Table 3.4 provides the projected waste rock tonnages used for pad and road construction as well as for water management structures. However, no projected tonnages for the construction of WRSF (waste rock storage facility) cover are given.

Recommendation:

CIRNAC recommends that the projected tonnages of waste rocks used for the construction of WRSF cover be provided.

Agnico Eagle's Response to Recommendation:

The revised version of the Waste Rock Management Plan enclosed with this response package has been updated to include:

> *The NPAG waste rock tonnage required for the construction of the Whale Tail WRSF for the 4.7 m thermal cover is 8,883,000 tonnes.*

Interested Party:	**Crown-Indigenous Relations and Northern Affairs Canada (CIRNAC)**	**Rec No.:**	**CIRNAC#3**
Re:	**S.5.1**		

Finding:

The closure phase, which is scheduled to end in 2029, will be followed by 18 years of post-closure monitoring (i.e., until 2047). Importantly, the Plan states: "Kinetic leaching tests, mineral depletion calculations and consideration of the scale and site differences between laboratory tests and field conditions suggest a time lag to possible ARD development at site of more than a decade." Further, the Plan indicates: "The delay to onset of ARD from the bulk of PAG waste rock and ore is expected to be substantially longer than the seven years of mine construction and operations." Both of these statements emphasize the uncertainty and extended time-frame associated with the on-set of contaminated seepage from the WRSF. This justifies the need for an extended period of post-closure monitoring to confirm the site is chemically stable.

Recommendation:

We support the current assumption that post-closure monitoring continue to 2047 (i.e., 18 years after closure). However, we recommend that AEM prepare and submit a comprehensive review of all monitoring data and other evidence at least 3 years prior to making final decisions regarding the end of site monitoring.

Agnico Eagle's Response to Recommendation:

Agnico Eagle does not agree with this comment. However, Agnico Eagle will follow the Interim Closure and Reclamation Plan as submitted and signed off by CIRNAC and KIA and their respective consultants Arcadis and GeoVector Management. Long term monitoring and bond has already been negotiated and agreed upon by CIRNAC and KIA and is part of the Security Management Agreement entered into between Agnico Eagle, CIRNAC and KIA.

Interested Party:	**Crown-Indigenous Relations and Northern Affairs Canada (CIRNAC)**	**Rec No.:**	
Re:	**Table 5.1**		

Finding:

The Plan states that "Most of the waste rock lithologies to be disturbed by mining are NPAG including komatiite, iron formation, basalt, southern greywacke and diorite units. Together, these lithologies comprise approximately 68% of the waste rock (41.8 Mt). These units will not require means to control ARD." The above statement is inaccurate as CIRNAC notes that although in Table 5.1, komatiite south, iron formation, and diorite are classified as having no ARD potential, Table A.1 of AEM's Operational ARD-ML Sampling and Testing Plan shows that only 71% of komatiite south, 69% of iron formation, and 70% of diorite are actually predicted as having no ARD potential.

Recommendation:

CIRNAC recommends that quantitative data, if available, be used to avoid possible confusion and more importantly, misplacement of any PAG and/or ML material in the WRSF cover or as construction.

Agnico Eagle's Response to Recommendation:

Quantitative analytical data has indeed been used to define the PAG and ML properties of the material to be placed in WRSF or used for construction. Both statements are accurate: the first statement refers to the bulk property of the lithologies stated (bulk carbonate neutralization potential ratio or Bulk CaNPR), as shown in FEIS Appendix 5E, Section 3.3.1, Table 15; the calculation explained in the same Section. The bulk properties for these lithologies is still considered NPAG even if a small number of samples contain higher sulphide to be PAG. Conversely, the next statement, Table A.1 of the ARD-ML Sampling and Testing Plan refers to the number of samples that tested as PAG and NPAG for each lithology, not considering the bulk properties of the lithology.

The identification and segregation of PAG and/or ML rock will be made on the basis of additional quantitative analytical results on total sulphur, total inorganic carbon and total arsenic obtained during operation as explained in the ARD-ML Sampling and Testing plan and compared to criteria stated in that plan, in order to ensure that all PAG or potentially ML rock is deposited in the appropriate location.

Citation:

Agnico Eagle Mines Ltd. 2016. Whale Tail Pit Project – Meadowbank Mine Final Environment Impact Statement and Type A Water License Amendments, Volume 5, Appendix 5-E. Evaluation of the Geochemical Properties of Waste Rock, Ore, Tailings, Overburden and Sediment from the Whale Tail Pit and Road Aggregate Materials. Report Prepared by Golder Associates for Agnico Eagle Mines Ltd. 493 p. June 2016

Interested Party:	**Crown-Indigenous Relations and Northern Affairs Canada (CIRNAC)**	**Rec No.:**	
Re:	**S.5.1**		

Finding:

The Plan states that "All waste material will be sampled and tested during operations to confirm their ARD and ML potential in support of waste segregation. Based on results to date, a sulphur content of 0.1 wt% appears to be a suitable threshold to identify PAG material." CIRNAC notes that no result is presented or provided to prove or substantiate the suitability of using the 0.1 wt% sulfur as a suitable threshold to identify PAG material and that the MEND (2009) guideline emphasizes that "It is important to note that a % S cut-off should NOT be used as the only means of assessing ARD potential unless the minimum NP value is known. Even low levels of sulphide can lead to ARD if the NP is insufficient to neutralize the resulting acid."

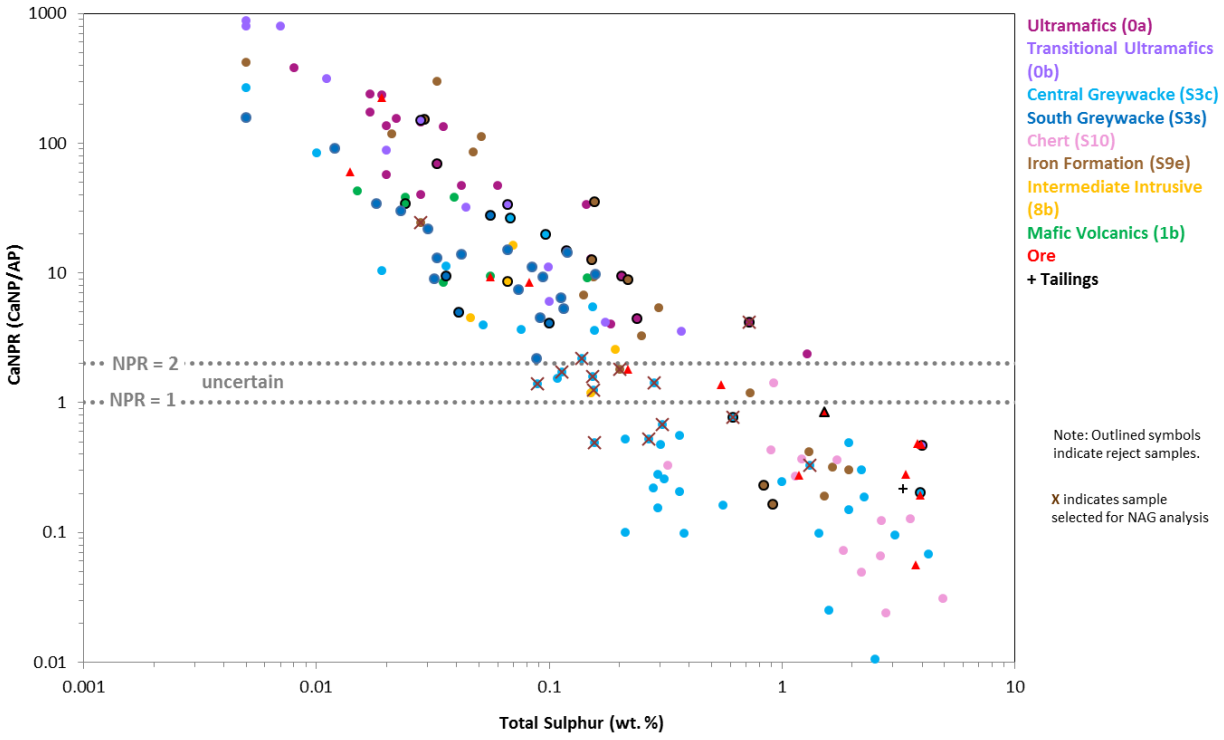
Recommendation:

CIRNAC recommends that the suitability of using the 0.1 wt% sulfur as threshold be substantiated with data and analysis before it could be applied.

Agnico Eagle's Response to Recommendation:

The proposed sulfur threshold is indeed substantiated with analytical data. Figure 9 (copied below) in Sections 3.3.1 of the FEIS Appendix 5-E (Agnico Eagle, 2016) provides a comparison of % S, carbonate neutralization potential (carbonate minerals are the main source of neutralization) and MEND (2009) guideline for ARD classification. The figure illustrates that samples that have a sulphur content less than 0.1 wt% are non PAG based on their ratio of Carbonate neutralisation potential ratio. As such, the sulfur content is not the only means by which ARD potential is being assessed but happens to identify an appropriate cutoff below which all samples are NPAG according to MEND (2009).

This cut off value is used in the ARD-ML Sampling and Testing Plan and has been approved as part of the Project Certificate and Water License.



(source: FEIS Appendix 5-E, Section 3.3.1, Figure 9)

Agnico Eagle has built upon cut-off determination experience gained at the Meadowbank Mine over the past ten (10) years where it has successfully applied chemical composition and CaNPR cutoff and is confident in the ability to do the same at the Whale Tail Pit project.
It is industry practice to use a cut off value for sulfur or other chemical content to classify and segregate ore from waste and PAG from NPAG mine wastes. The following are two examples:

- The Duluth Complex Mine Waste Drainage (MDNR 2004): Long-term Duluth Complex testwork shows silicate rocks lacking carbonate with less than 0.22% have not generated acid. The sample dataset lacks materials in between 0.22 and 0.4%, and the results have been interpreted to support that 0.3% may be closer to the threshold of sulphide that would not produce ARD in the absence of carbonates.
- The Diavik Mine in Northwest Territories (Smith et al, 2013): This study showed that samples lacking carbonate with less than 0.1% sulphur did not generate ARD.

Citations:

Agnico Eagle Mines Ltd. 2016. Whale Tail Pit Project – Meadowbank Mine Final Environment Impact Statement and Type A Water License Amendments, Volume 5, Appendix 5-E. Evaluation of the Geochemical Properties of Waste Rock, Ore, Tailings, Overburden and Sediment from the Whale

Tail Pit and Road Aggregate Materials. Report Prepared by Golder Associates for Agnico Eagle Mines Ltd. 493 p. June 2016

MDNR 2004. Duluth Complex Mine Waste Drainage. MN Dept. Natural Resources, Division of Lands and Minerals, Reclamation Section, St. Paul, MN. March 2004.

MEND, 2009. Prediction manual for Drainage Chemistry from Sulphidic Geologic Materials. Mine Environment Neutral Drainage (MEND) Program. Document No.1.20.1. December 2009.

Smith et al. 2013. The Diavik Waste Rock Project: Particle size distribution and sulfur characteristics of low-sulfide waste rock. Applied Geochemistry 36; 200-209.

Interested Party:	**Crown-Indigenous Relations and Northern Affairs Canada (CIRNAC)**	**Rec No.:**	
Re:	**S.5.1**		

Finding:

The Plan states that "Arsenic leaching material will be evaluated based on a strong correlation between total and leachable arsenic in the current results, which indicates that material below 75 mg/kg is not expected to result in waste rock contact water quality above the EQC." CIRNAC notes the absence of data to substantiate the above claim.

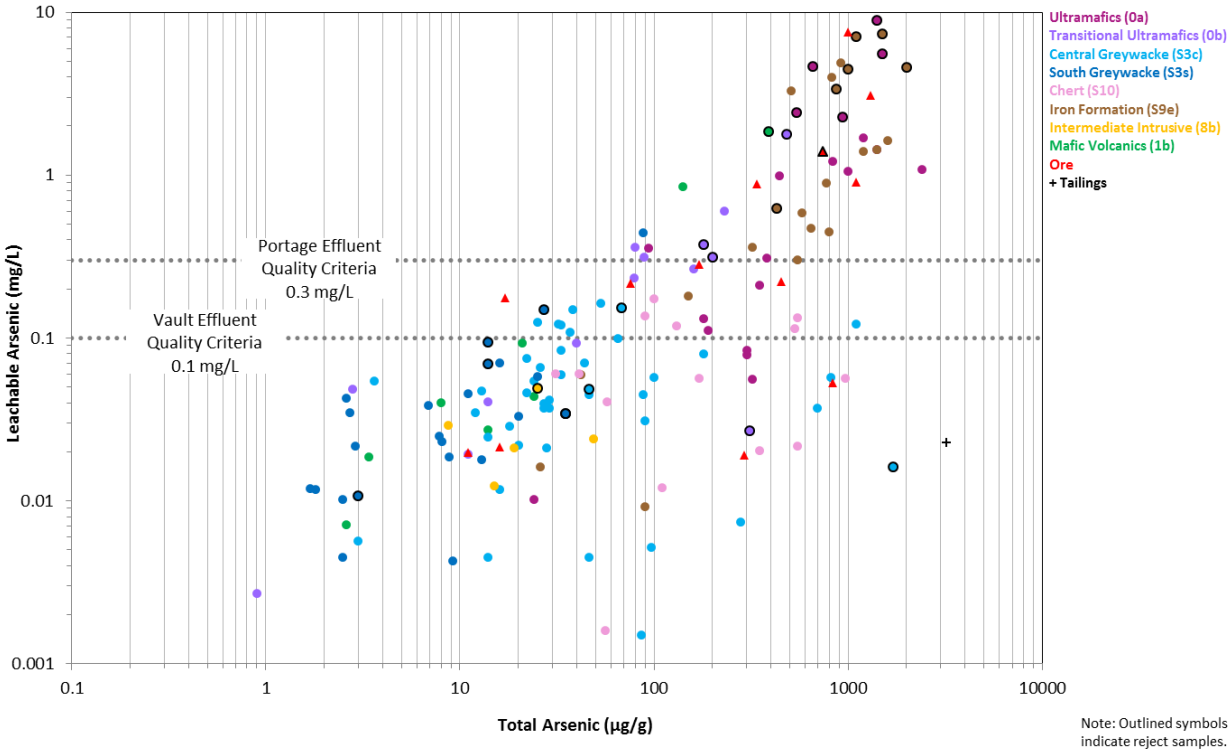
Recommendation:

CIRNAC recommends that the suitability of using total arsenic content as proxy for leachable arsenic be substantiated with data and analysis before it could be applied.

Agnico Eagle's Response to Recommendation:

The proposed total arsenic content threshold proxy for leachable arsenic is substantiated with analytical data on chemical composition, static and kinetic leaching test data. The proxy arsenic value is used per the ARD-ML Sampling and Testing Plan which has been approved in the Project Certificate and the Water License.

Figure 13 (copied below) from Sections 3.4.1.1 of the FEIS Appendix 5-E (Agnico Eagle, 2016) provides a comparison of total arsenic versus leachable arsenic (static SFE leaching tests) from core samples collected at site, for each rock type to be disturbed by mining. This graph illustrates how, as an example, the Southern greywacke and Intermediate volcanics has been identified as suitable material for the thermal cover. The scaled-up leaching test (kinetic test cells on 1-kg humidity cells and large leaching columns, results summarized in Table 19, Section 3.5.1 of the same document) corroborate the findings on leachability from static tests. This information is then used for mining activities planning.



(source: FEIS Appendix 5-E, Section 3.3.1, Figure 9)

During Operations, the identification and segregation ML rock will be made on the basis of additional quantitative analytical results on total arsenic obtained as explained in the ARD-ML Sampling and Testing Plan and compared to criteria stated in that plan. As an example, material segregation for the thermal cover will not be based on the rock type, as it is the case during the planning phase, but rather on the quantitative analytical results on the total arsenic. These testing results are also used to confirm the assumptions made during the planning phase. Agnico Eagle will use the experience it has gained in cut off use at the Meadowbank Mine over the past ten (10) years to implement and validate the arsenic content cut off at the Whale Tail Pit Project.

Citation:

Agnico Eagle Mines Ltd. 2016. Whale Tail Pit Project – Meadowbank Mine Final Environment Impact Statement and Type A Water License Amendments, Volume 5, Appendix 5-E. Evaluation of the Geochemical Properties of Waste Rock, Ore, Tailings, Overburden and Sediment from the Whale Tail Pit and Road Aggregate Materials. Report Prepared by Golder Associates for Agnico Eagle Mines Ltd. 493 p. June 2016

Interested Party:	**Crown-Indigenous Relations and Northern Affairs Canada (CIRNAC)**	**Rec No.:**	
Re:	**S.5.1**		

Finding:

The Plan states that "As part of the planning and execution of the waste rock management strategy, waste rock presenting geological characteristics leading to metal leaching such as arsenic will be managed in the Whale Tail WRSF in order to ensure their encapsulation and geochemical stability. Certain type of waste rock material or lithology will be placed in specific locations within the WRSF in order to provide sufficient cover of NPAG/NML waste rock material to prevent metal leaching and ensure geochemical stability." CIRNAC finds this waste rock management execution plan too vague to be practical. For example, the specific locations for certain type of waste rock material or lithology need to be specific (both the locations and the types of waste rock).

Recommendation:

CIRNAC recommends that specific details be included to make the plan implementable.

Agnico Eagle's Response to Recommendation:

Agnico Eagle does not agree with this recommendation and refers CIRNAC to the ARD-ML Sampling and Testing Plan Appendix B "*Flow Chart for Waste Rock delineation and segregation*" shown below. Step 4: Rock segregation and management gives implementable details on how the two (2) different types of waste (i.e. NPAG and NML and PAG and/or ML) will be disposed of during Operations. Agnico Eagle would like to clarify that waste rock segregation is not based only on rock type or lithology but rather on operational ARD-ML testing results.

Moreover, Agnico Eagle refers CIRNAC to the technical memo "*Waste Rock Material Segregation Methodology and Management at Meadowbank*" presented in Appendix B for additional clarification on waste rock management practices.

ARD/ML Plan Attachment B: Flow Chart

1789310/3000
May 2018

STEP 1: SAMPLE COLLECTION[1,2]
Responsibility: Geology Superintendent

1. Identify rock types to be excavated using block model
2. Define sample frequency per Table
3. Plan and map sample locations to ensure an even distribution throughout the planned blast area, sufficient for packet definition
4. Collect each sample from drill cuttings (>1 kg) and label using production drill hole numbers
5. Document for each sample:
   - Date
   - Blast pattern / GPS location
   - Sample ID
   - Rock Type
6. Submit samples to Assay Lab Manager for analysis.
   - Include documentation (Step 2)
   - CC the Environmental Coordinator on submission

Rock Type	Rock Unit Code	Sampling Frequency
Komatiite North	V4a – 0a	Every 4th hole
Komatiite South	V4a – 0b	Every 4th hole
Greywacke Central	S3C – 3b	Every 4th hole
Greywacke South	S3S – 3b	Every 4th hole
Chert	S10 – 3b	Every 4th hole
Iron Formation	S9E – 3b	Every 4th hole
Basalt	V3 – 1b	Every 4th hole
Diorite	I2 – 8b	Every 4th hole

STEP 2: LABORATORY ANALYSIS[1,2]
Responsibility: Assay Laboratory

1. Prep samples (crush and homogenize)
2a. Initiate on-site analysis:
   - Total Sulphur (S)
   - Total Inorganic Carbon (TIC)
   - Total Arsenic
3. Quarterly analysis (minimum of 75 duplicate samples). Send subset of samples to off-site laboratory for QA/QC:
   - Tests: ABA, Bulk Metals, SFE
   - Include Chain of Custody

Copy Environmental Coordinator on COC

STEP 3: DATA EVALUATION AND ROCK CLASSIFICATION[1]
Responsibility: Geology Superintendent

1. Compile on-site data with sample information:
   - Total Sulphur
   - Total Inorganic Carbon
   - Total Arsenic
   - Sample documentation
2. Compare Total Sulphur with Cut-off (0.1%)
3. Calculate NPR from Total Sulphur (S) and Total Inorganic Carbon (TIC) to determine ARD potential:

   NPR = [TIC%*16.67] / [S%*31.25]
4. Evaluate arsenic leaching potential with Total Arsenic (As)

- Total S < 0.1% **= NPAG**
- Total S > 0.1% *and* NPR>2 **= NPAG**
- Total S > 0.1% and 1≤ NPR<2 **= Uncertain**
- Total S > 0.1% and NPR<1 **=PAG**
- Total As < 75 ppm **=NML**
- Total As > 75 ppm **= ML**

Send compilation to Environmental Coordinator

NPAG/NML Samples | Uncertain Samples | PAG/ML Samples

Data QA/QC See Page 2 (reverse)

STEP 4: ROCK SEGREGATION AND MANAGEMENT[1]
Responsibility: Geology Superintendent, Engineering, Environmental Coordinator, Construction Supervisor

1. Log results in database. Map the distribution of samples and define the groups of material for each blast

NPAG and NML Material
- ≤1 PAG sample per 8 NPAG samples
- ≤1 Uncertain sample per 8 NPAG samples
- Average total arsenic <75 ppm

PAG and/or ML Material
- ≥2 PAG samples per 8 NPAG samples
- ≥2 Uncertain samples per 4 NPAG samples
- Average total arsenic >75 ppm

2. Field Segregation of Waste Types:
   - Outline dig limits using stakes, wire flags, and flagging tape
   - Track in WENCO
3. Record the following with each Packet:
   - Packet number
   - Sample Results (Total S, TIC, As, NPR)
   - Block model rock type
   - Final location in WRSF

No Restrictions for Re-Use as Construction and/ or Cover Material

Not Approved for Re-Use; must be managed to control ARD/ML

Suitable for the following:
- Pads
- Roads
- Dykes
- WRSF sides and cover material

Disposal and Management Requirements:
- Encapsulated within NPAG/NML rock that hosts the thawed layer, and encouraged to freeze
  - Placed on a pad of NPAG/NML rock
  - Placed in centre of the pad (≥4m from edge)
  - Covered with ≥4 m of NPAG/NML rock
- Placed away from permanent water contact
- Monitor temperature and seepage quality

License B WRSF
Whale Tail WRSF

Page 1

ARD/ML Plan Attachment B: Flow Chart

AGNICO EAGLE GOLDER 1789310/3000 May 2018

STEP 3a. DATA QA/QC – EXTERNAL LABORATORY
Responsibility: Geology Superintendent / Environmental Coordinator

1. Confirm ARD Potential using external lab results (ABA). Calculate NPR using the Total Sulphur and Total Inorganic Carbon reported by external lab to compare directly with Meadowbank assay lab data.

↓

2. Confirm arsenic leaching potential using external lab results.

Arsenic leaching potential is considered high if:
- Total arsenic > 75 mg/kg

and
- Leachable arsenic (SFE) > 0.1 mg/L

↓

3. Complete QA/QC of data against onsite results by calculating an RPD value. RPD values below 35% are considered acceptable[3].

↓

4. If the ARD and/or ML designation determined by the external lab data are different than that determined by the onsite lab, a more rigorous QA/QC program is required and refinements must be considered in the block model designation.

↓

5. If required, revisit the cut-off criteria for total arsenic based on updated leach test data.

LIST OF ACRONYMS

ARD: acid rock drainage
PAG: potentially acid generating
NPAG: not potentially acid generating
NPR: net potential ratio
ML: metal leaching
NML: not metal leaching
ABA: acid base accounting
Bulk metals: total metals by ICP
WRA: whole rock analysis
SFE: metal leaching by shake flask extraction
XRF: x-ray fluorescence
ppm = parts per million
S = sulphur
C = carbon
As = arsenic

LIST OF ANALYTES AT EXTERNAL LAB

ABA: acid base accounting by Modified Sobek method. Includes paste pH, Bulk NP, analysis of total S and Total C by C/S analyzer (LECO Furnace), Acid Leachable Sulphate and Sulphide by difference.

Bulk metals: trace metals scan by aqua regia digest and analysis by ICP-MS and ICP-OES. Includes Ag, Al, As, B, Ba, Be, Bi, Ca, Cd, Co, Cr, Cu, Fe, K, Li, Mg, Mn, Mo, Na, Ni, P, Pb, Sb, Se, Si, Sn, Sr, Ti, Tl, U, V, Zn

WRA: whole rock analysisor major oxides by Borate Fusion XRF. Includes SiO_2, Al_2O_3, Fe_2O_3, MgO, CaO, Na_2O, K_2O, TiO_2, P_2O_5, MnO, Cr_2O_3, V_2O_5, LOI

SFE: metal leaching by shake flask extraction, 24 hr leach extraction using DI water at 4:1 L/S ratio, and filtered leachate through 0.2 micron filter. Analysis of leachate includes pH, alkalinity, conductivity, anions (Cl, SO_4, NO_2, NO_3, Br), ortho-phosphate, fluoride, mercury (by CVAAS), and trace metals by ICP-MS and ICP-OES (Ag, Al, As, B, Ba, Be, Bi, Ca, Cd, Co, Cr, Cu, Fe, K, Li, Mg, Mn, Mo, Na, Ni, P, Pb, Sb, Se, Si, Sn, Sr, Ti, Tl, U, V, Zn).

Interested Party:	Crown-Indigenous Relations and Northern Affairs Canada (CIRNAC)	Rec No.:	CIRNAC#-4
Re:	S.5.3		

Finding:

The Plan indicates that Final design details for the Whale Tail WRSF will be provided to the regulators for approval at least 60 days prior to construction. The Final design details were not included with this Plan.

Recommendation:

CIRNAC recommends that construction of the WRSF does not begin until after the Final design details are approved by the NWB.

Agnico Eagle's Response to Recommendation:

The Stage 1 WRSF Final design (i.e. 60 days' notice) was approved by the Nunavut Water Board on August 9, 2018. Agnico Eagle will continue to comply with Water Licence 2AM-WTP1826 and will submit 60 days' notice prior to construction of all infrastructure listed under Part D Item 1.

Interested Party:	Crown-Indigenous Relations and Northern Affairs Canada (CIRNAC)	Rec No.:	CIRNAC#-5
Re:	S.5.1		

Finding:

The Section states that the combined duration of construction and operations is 7 years. Elsewhere the document indicates that the duration would be 4 years.

Recommendation:

The text should be modified accordingly.

Agnico Eagle's Response to Recommendation:

Agnico Eagle refers CIRNAC to Table 2.1 of the Waste Rock Management Plan presented below.

Table 2.1 Overview of Timeline and General Activities

Phase	Year	General Activities
Construction	Year -1	• Construct site infrastructure • Develop open pit mine • Stockpile ore
Operations	Year 1 to 3	• Open pit operations • Transport ore to Meadowbank Mine • Stockpile ore • Discharge Tailings in Meadowbank TSF
	Year 4	• Complete transportation of ore to Meadowbank Mine • Complete discharge tailings in Meadowbank TSF
Closure	Year 4 to 11	• Remove non-essential site infrastructure • Flood mined-out open pit • Re-establish natural Whale Tail Lake level
Post-Closure	Year 11 forwards	• Site and surrounding environment monitoring

TSF = Tailings Storage Facility

Interested Party:	**Crown-Indigenous Relations and Northern Affairs Canada (CIRNAC)**	**Rec No.:**	
Re:	**S.7**		

Finding:

The Plan states that tailings from the project will be stored in the Meadowbank TSF (tailings storage facility). CIRNAC notes that AEM has proposed to place tailings from the Whale Tail Project into the Goose and Portage Pits of the Meadowbank project.

Recommendation:

CIRNAC recommends that the alternative tailings disposal option be discussed.

Agnico Eagle's Response to Recommendation:

Agnico Eagle does not agree with this recommendation. The information requested above is covered under Meadowbank Water Licence 2AM-MEA1526 and associated modifications.

Interested Party:	**Crown-Indigenous Relations and Northern Affairs Canada (CIRNAC)**	**Rec No.:**	**CIRNAC#-6**
Re:	**S.9.3**		

Finding:

The Plan indicates that hydrodynamic modelling of the Whale Tail Pit Lake occurred in 2008. Based on our understanding, we believe the modelling was done in 2018.

Recommendation:

The text should be modified accordingly.

Agnico Eagle's Response to Recommendation:

Agnico Eagle agrees with this recommendation and has adjusted the enclosed Waste Rock Management Plan.

Interested Party:	**Crown-Indigenous Relations and Northern Affairs Canada (CIRNAC)**	**Rec No.:**	
Re:	**S.9.3**		

Finding:

Based on recent hydrodynamic modelling (which was requested by CIRNAC) AEM concluded that arsenic loadings from the vicinity of the flooded Whale Tail Pit (post-closure) will not have a significant effect on water quality in the short and long-term. However, we draw attention to the fact that this conclusion was reached without any field data to validate assumptions regarding the hydrogeological flow regime in the vicinity of the pit (i.e. no groundwater well data has been provided to assess groundwater flows). Instead, AEM continues to use water elevations in local lakes to infer likely groundwater flows. This continues to represent an important uncertainty regarding the post-closure water quality in the flooded pit. As indicated during the EA and Water Licencing processes, CIRNAC recommended that AEM install groundwater monitoring wells in 2018 as a means to obtain hydrogeological field data prior construction and operation. However, AEM declined to provide hydrogeological field data to date and, as a result, the uncertainty remains.

Recommendation:

CIRNAC recommends the groundwater field data collected to date be provided to CIRNAC for review, and a strategy for collecting the baseline hydrogeological field be discussed, agreed upon, and implemented between CIRNAC and AEM prior to disturbance of, or excavation below, the Whale Tail Pit project water table.

Agnico Eagle's Response to Recommendation:

Based on discussions at the meeting held between CIRNAC and Agnico Eagle on October 17th 2018 in Iqaluit, Agnico Eagle will measure the hydraulic heads in bedrock and collect groundwater samples in November 2018 using the Westbay Well System that was installed post FEIS in March/April 2016 (Golder 2016) and these data will be provided to CIRNAC and NWB.

Agnico Eagle will continue to advance the project as per approvals.

Citation:

Golder Associates Ltd (Golder). 2016. Westbay System Installation Summary – Whale Tail Pit Project, Nunavut. 7 July 2016.

Interested Party:	**Crown-Indigenous Relations and Northern Affairs Canada (CIRNAC)**	**Rec No.:**	**CIRNAC#-6**
Re:	**General**		

Finding:

The Plan does not address Adaptive Management requirements such as triggers, action levels and management responses that will be used throughout the waste rock management process.

Recommendation:

An Adaptive Management section should be incorporated into the Plan. The section should address credible failure modes and events that could compromise the predicted performance of waste rock management.

Agnico Eagle's Response to Recommendation:

Agnico Eagle agrees with CIRNAC's recommendation and refers CIRNAC to the ARD/ML Sampling and Testing Plan Section 5 "Adaptive Management". Agnico Eagle will address CIRNAC's recommendation regarding the failure modes and events approach in Table 5.1 "Adaptive management actions associated with ARD/ML Plan" within the next version of this Plan planned to be submitted by November 8 2018 as per NWB correspondence.

APPENDIX A
October 17 2018 Meeting – Agnico Eagle presentation

WHALE TAIL PIT

OCTOBER 17 2018
CIRNAC AND AGNICO EAGLE
IQALUIT, NU

PROPOSED AGENDA

AGNICO EAGLE

- 9:00 – Introductions and teleconference set-up,
- 9:15 – 10:00 – Overview current activities and approved operational plan for 2018-2019
- 10:00- 11:00 – Review historical and current data collection that supports our review of hydro-geological model and water quality predictions
- 11:00- 12:00 – Approved Operational Monitoring, Mitigation and Management of Activities
- 12:00- 12:30 – Discussion
- 12:30 – 13:30 – Lunch break and deliberation
- 13:30 – 14:30 – Discussion and next steps

SUMMARY OF MEETINGS TO DATE

In person discussions/ meetings to discuss hydrogeology, water quality predictions, monitoring and management of activities:

1. April 28 – 29th, 2017 – Technical Meeting (May 1-2, 2017 – PHC)
2. June 12, 2017
3. June 29, 2017
4. August 10, 2017
5. September 19- 22nd, 2017 - Final Hearings
6. July 26th, 2018
7. October 17th, 2018
    1. Summarize the instrumentation, field and laboratory data collected to date
    2. Alignment on current understanding of data: hydraulic gradient and GW data

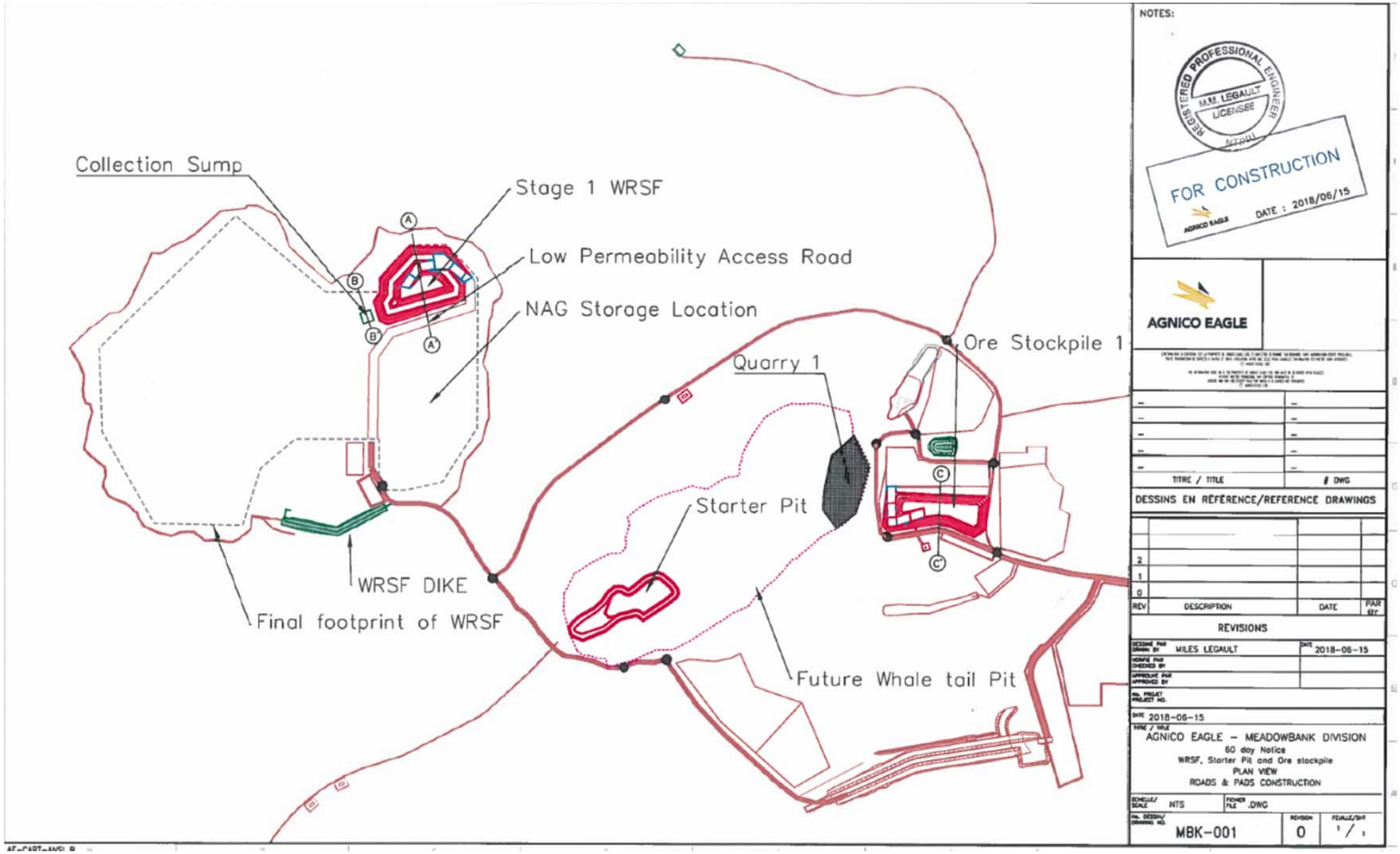
REGULATORY SUBMISSIONS, APPROVAL AND CONSTRUCTION SCHEDULE /TIMELINES

AGNICO EAGLE

- December 1, 2016 Type 2BB – MEA1318 – Amaruq Ramp, bulk sample and Quarry permit received
- May 23rd , 2018 - NWB letter to Minister
- June 1st, 2018 – 30 day notice of dike design to NWB
- June 29th, 2018 – 60 day notice for site layout to NWB (including starter pit and WRSF)
- **July 11th, 2018 - Ministers Decision and NWB Type A Received**
- July 11th , 2018 - Turbidity curtain installation and dike preparation begins on the abutments
- July 25th – DFO Authorization received
- July 25th – Whale Tail dike construction planned to start
- August, 2018 – platform construction
- August to October 2018 – Fishout of North Basin
- August 9th, 2018 – Received authorization to begin Starter pit, WRSF, Roads, WRSF dike, etc approved.

NWB APPROVAL OF 2018- 2019 WHALE TAIL PIT ACTIVITIES

60 DAY NOTICE – SENT JUNE 29TH, 2018; APPROVAL OF BELOW SITE LAYOUT ON AUGUST 9TH, 2018 – WHICH INCLUDES THE STARTER PIT AND WRSF



CURRENT OPERATIONAL TIMELINES

PRESENT TO JULY 2019

- Quarry 1 – activities are ongoing
- Starter Pit (Quarry 2)
  - Nov 5th, 2018 - overburden excavation for the next 20 days
  - Nov 5th, 2018 – February 9th, 2019 (~4 months) exhaust Starter Pit
  - December 2018 onward – begin excavation of larger pit that follows the dewatering schedule
- Construction of the WRSF is beginning based on material availability
- WRSF dike construction
  - Presently, excavating the foundation at the moment (presently, Agnico Eagle doesn't have enough material from Quarry 1; Starter Pit is
  - Plan to finish in March, 2018
- Mammoth Dike – January to March 2018
- Construction of Whale Tail Dike
  - Underway as soon as the permits were received on July 11th, 2018
  - Continue construction January/ beginning in February 2019
- Dewatering beginning of February to July - 3- 5 months to dewater depending on water quality
- West-bay data collection – October - November 2018
- July 2019 - production of larger open pit

NWB APPROVAL UNDER NWB 2AM WTP 1826

QUARRY 2/ STARTER PIT OPERATION/ & WASTE ROCK STORAGE FACILITY OPERATION

↗ Page 6 - Part B – General Conditions Item 14 - 16

14. The Licensee shall, for all Plans submitted under this Licence, implement the Plans as approved by the Board in writing. The Board has approved (or accepted) the following Plans for implementation under the relevant sections in the Licence. Any changes to the plans deemed significant shall be considered as an amendment to the plan(s) or as a modification and must be approved by the Board.

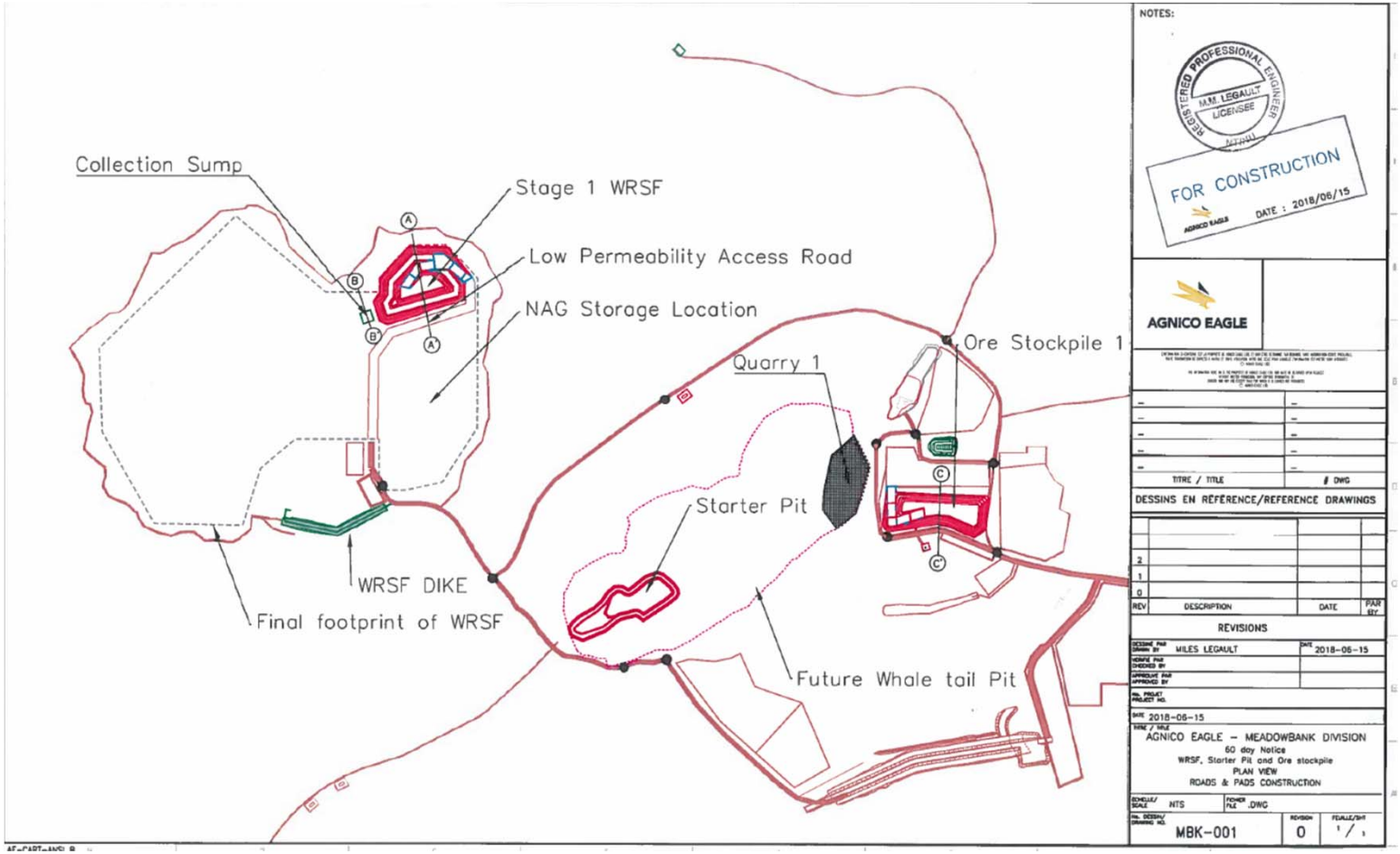
    a. Amaruq Gold Wastewater Treatment System Operation and Maintenance Plan (December 2015)*;
    b. Meadowbank and Whale Tail Bulk Fuel Storage Facilities: Environmental Performance Monitoring Plan, Version WT, (June 2016)^;
    c. Whale Tail Pit Interim Closure and Reclamation Plan, Version WT (June 2016)^;
    d. Whale Tail Pit Landfill and Waste Management Plan, Version 1 (January 2017);
    e. Whale Tail Pit Haul Road Management Plan, Version 1 (June 2016)
    f. Whale Tail Pit Waste Rock Management Plan, Version 1 (January 2017);
    g. Whale Tail Pit Water Management Plan, Version 1 (January 2017);
    h. Whale Tail Pit Water Quality and Flow Monitoring Plan, Version 2 (May 2017); and
    i. Whale Tail Pit Water Quality Monitoring and Management Plan for Dike Construction and Dewatering, Version 1 (January 2017).

AGNICO EAGLE

HYDROGEOLOGICAL AND WATER QUALITY

APPROVED OPERATIONAL MONITORING, MITIGATION AND MANAGEMENT OF ACTIVITIES

NWB 2AM WTP 1826 - OPERATION OF QUARRIES, WRSF AND IMPLEMENT PLANS



NWB 2AM WTP 1826

QUARRY 2/ STARTER PIT OPERATION/ & WASTE ROCK STORAGE FACILITY OPERATION

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NWB 2AM WTP 1826

QUARRY 2/ STARTER PIT OPERATION/ & WASTE ROCK STORAGE FACILITY OPERATION

- Page 6 - Part B – General Conditions Item 14
- Implement the Plans as approved by the board
- Page 9 - Agnico Eagle January 2017– Year 1: 2018 – Whale Tail Pit Waste Rock Management Plan

Table 3.2 Projected Mined Tonnages and Ore Stockpile Balance (2018 – 2022)

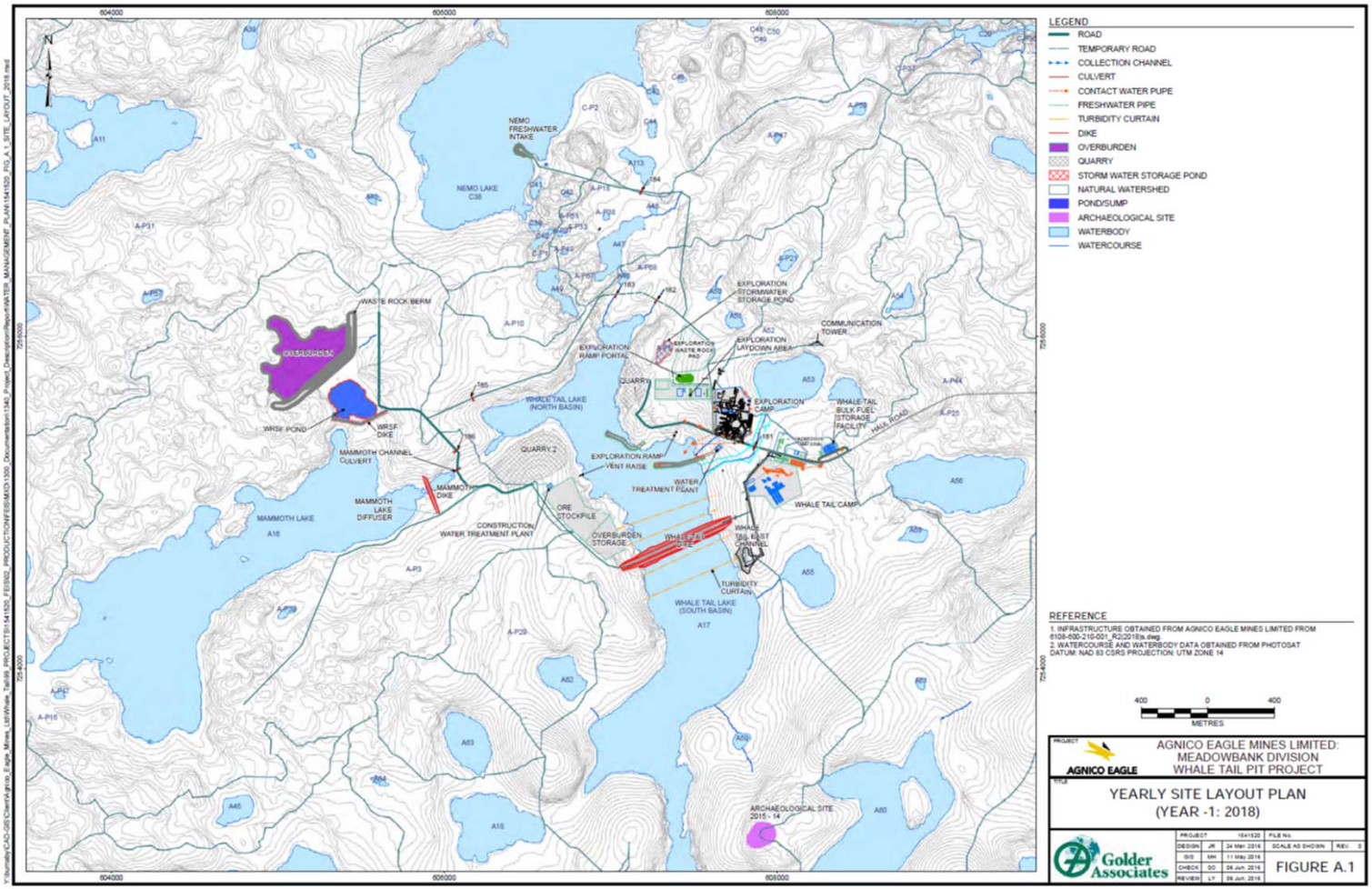
Year	Period	Ore Mined (t)	Waste Rock Excavated (t)	Overburden Excavated (t)	Total Material Excavated (t)	Total Material Excavated (t/day)	Strip ratio	Ore Stockpile Balance (t)
2018	June to Sept.	-	400,782	610,973	1,011,754	8,431	-	-
	Q4	160,020	1,080,812	807,105	2,047,937	22,260	11.80	160,020
	Sub-total	**160,020**	**1,481,594**	**1,418,078**	**3,059,691**	**14,433**	**18.12**	**160,020**
2019	Q1	366,229	1,905,908	820,072	3,092,209	33,980	7.44	526,249
	Q2	610,012	2,299,406	122,351	3,031,769	33,316	3.97	1,136,261
	Q3	418,663	4,307,676	2,350,185	7,076,524	77,764	15.90	733,674
	Q4	895,072	5,284,473	826,373	7,005,917	76,988	6.83	807,495
	Sub-total	**2,289,976**	**13,797,463**	**4,118,981**	**20,206,420**	**55,360**	**7.82**	**807,495**
2020	Q1	800,463	6,111,564	81,160	6,993,187	76,848	7.74	786,709
	Q2	931,458	5,816,680	139	6,748,277	74,157	6.24	896,916
	Q3	763,882	5,120,892	0	5,884,773	64,668	6.70	839,548
	Q4	856,512	4,455,358	0	5,311,869	58,372	5.20	874,809
	Sub-total	**3,352,314**	**21,504,494**	**81,300**	**24,938,107**	**68,324**	**6.44**	**874,809**
2021		**2,476,834**	**9,320,843**	**0**	**11,797,677**	**32,322**	**3.76**	**66,644**
2022		**0**	**0**	**0**	**0**	**0**	**0**	**0**
Total		**8,279,144**	**46,104,394**	**5,618,359**	**60,001,895**		**6.25**	**0**

t = tonne; t/day = tonnes per day.

END OF 2018

PRESENTED IN WHALE TAIL PIT FEIS/ NWB APPLICATION REVIEW - PERMITTED UNDER 2AM WTP 1826

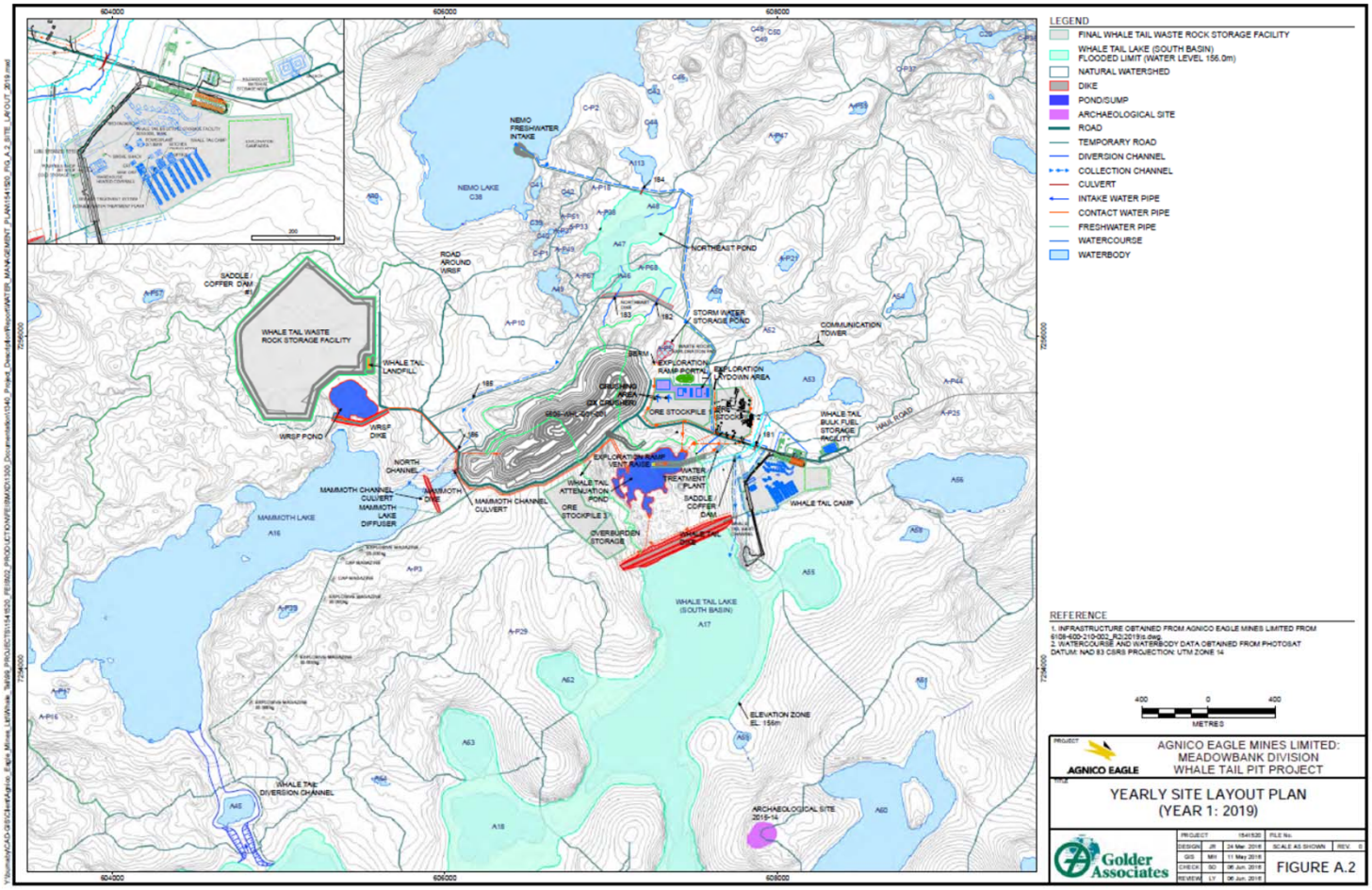
- Agnico Eagle January 2017 - Figure A.1 – Year : 2018 – Whale Tail Pit Waste Rock Management Plan



END OF 2018

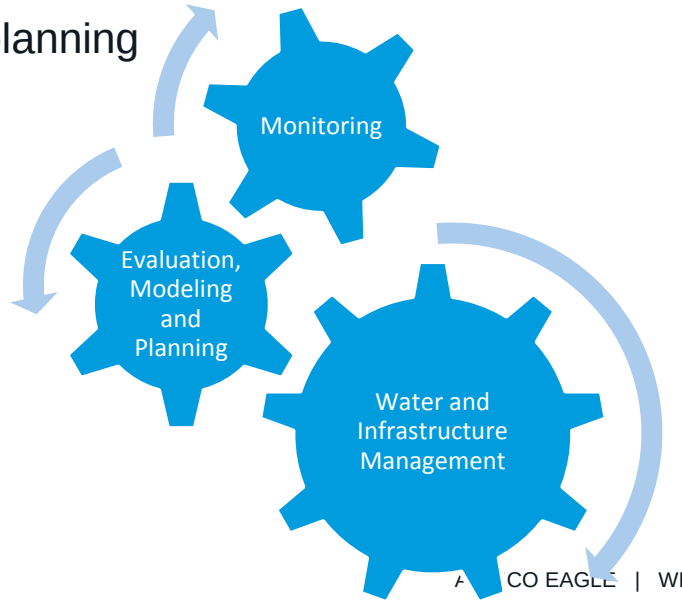
PRESENTED IN WHALE TAIL PIT FEIS/ NWB APPLICATION REVIEW - PERMITTED UNDER 2AM WTP 1826

- Agnico Eagle January 2017 - Figure A.2 – Year : 2019 – Whale Tail Pit Waste Rock Management Plan



WRSF PLAN / CLOSURE AND RECLAMATION PLANNING

- Adhere to ARD/ML Monitoring Plan, WRSF Management Plan, WQ and Flow Monitoring Plan
- Use knowledge/ data gained from Meadowbank (active closure of Vault Pit)
- Proactive Monitoring and Decision Making will ensure post closure goals are met
  - Geochemical
  - Thermistor
  - Water Quality in sumps and pit
  - Modelling
- Establish Triggers
- Continuous evaluation and planning
- Adaptive Management



AGNICO EAGLE

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AEM on TSX & NYSE

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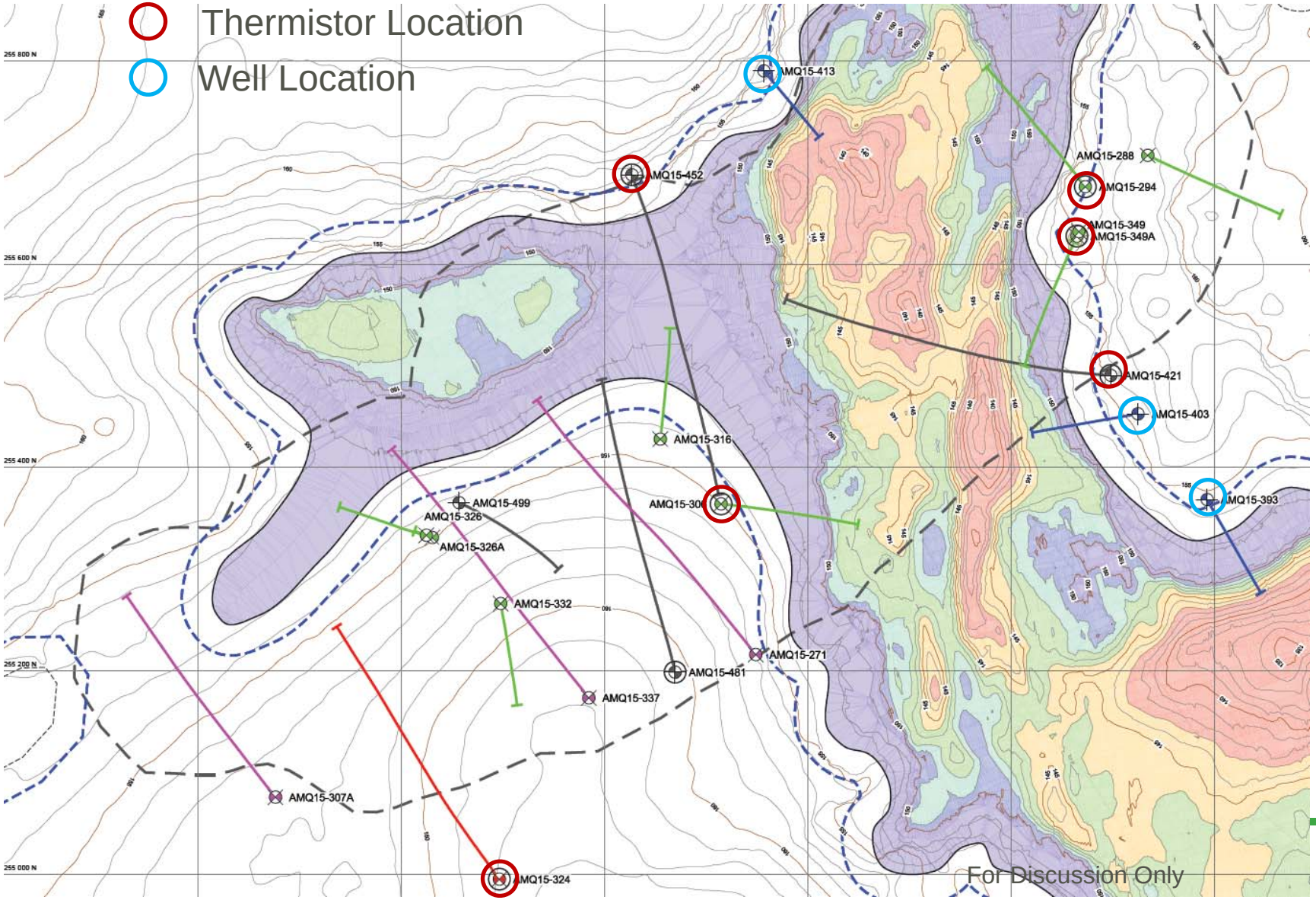
WORLD GOLD COUNCIL

Topics for Discussion / Clarification

- Data Collection / Understanding of Conditions near Quarry 1 / Starter Pit
- Data Collection –FEIS and since
- Pre-development / Post Closure Model Predictions / Hydraulic Gradients
- Whale Tail Flooded Pit Lake Water Quality - Long Term Water Quality

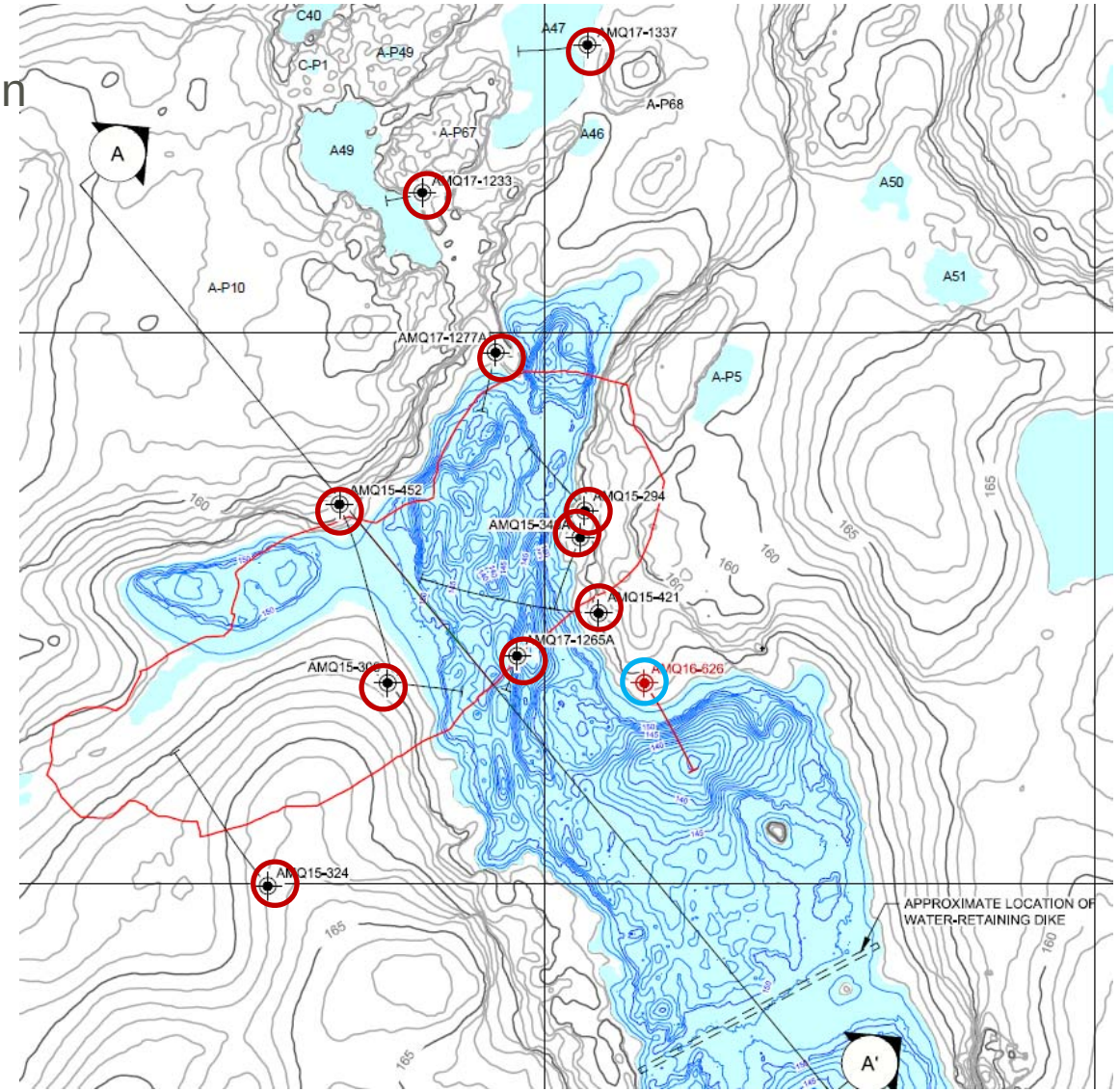
Quarry 1 Pit / Starter Pit – 2015 Data



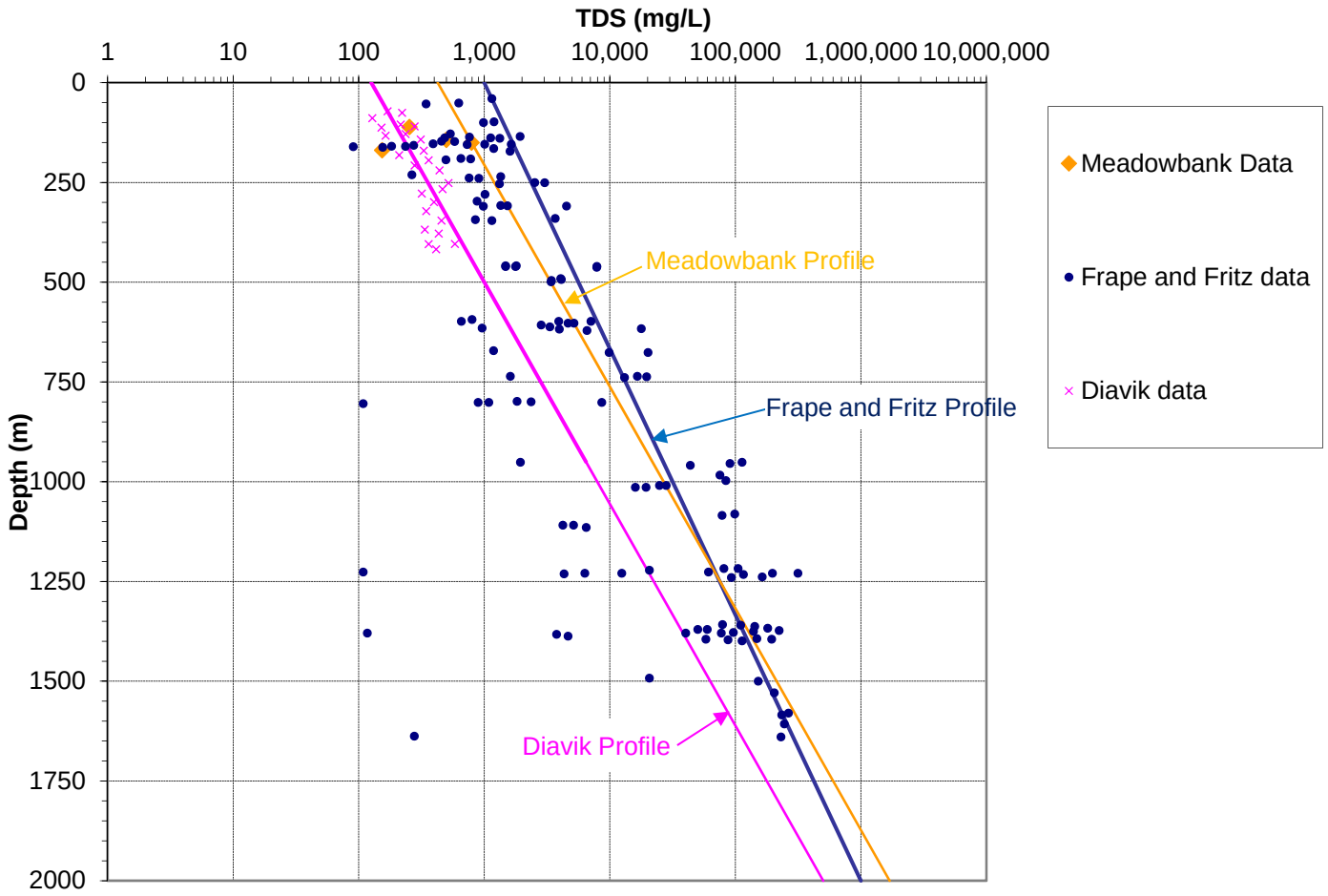
For Discussion Only

Current Network – Thermistors & Wells

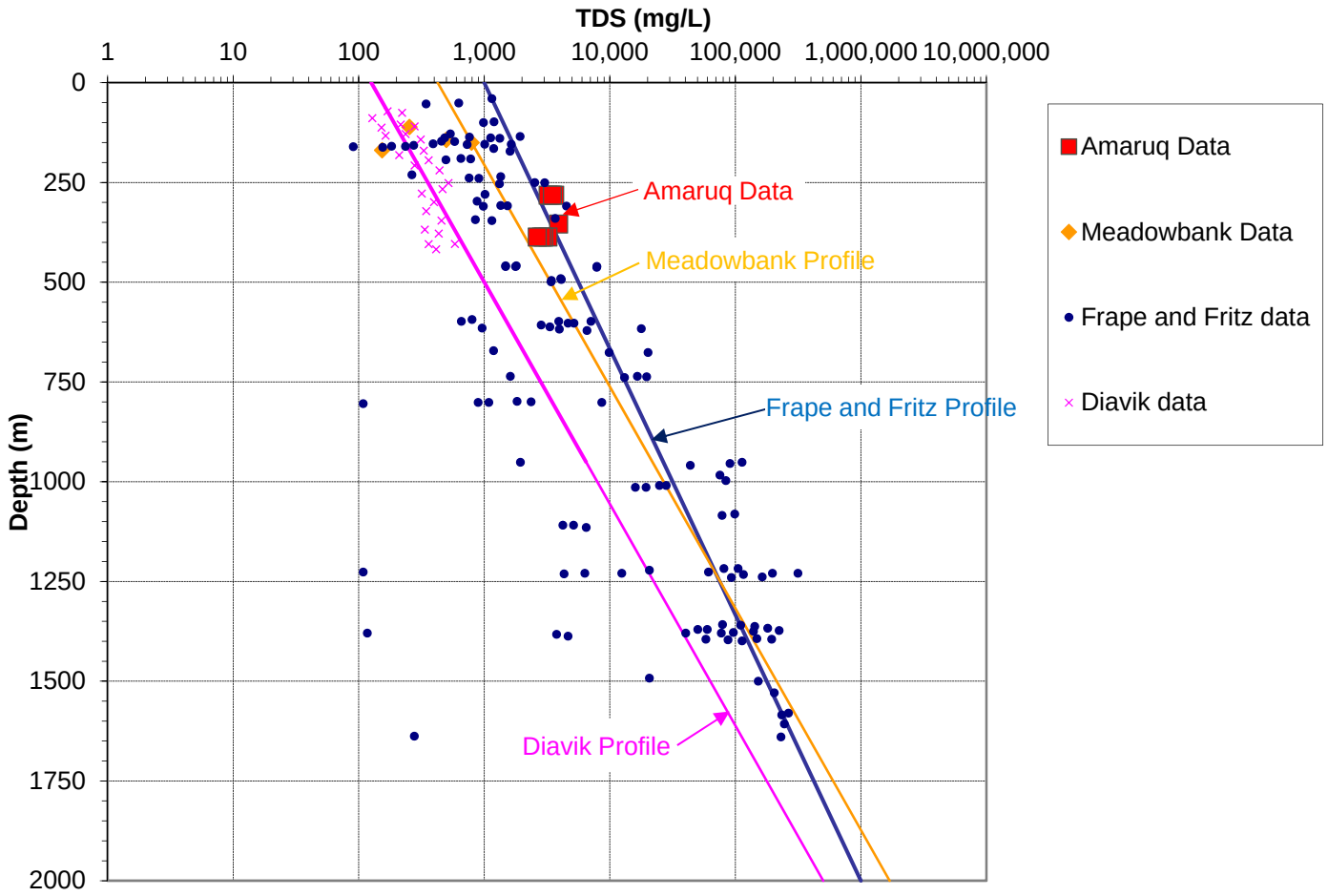
- Thermistor Location
- Well Location



Groundwater Quality - FEIS



Groundwater Quality – Since FEIS



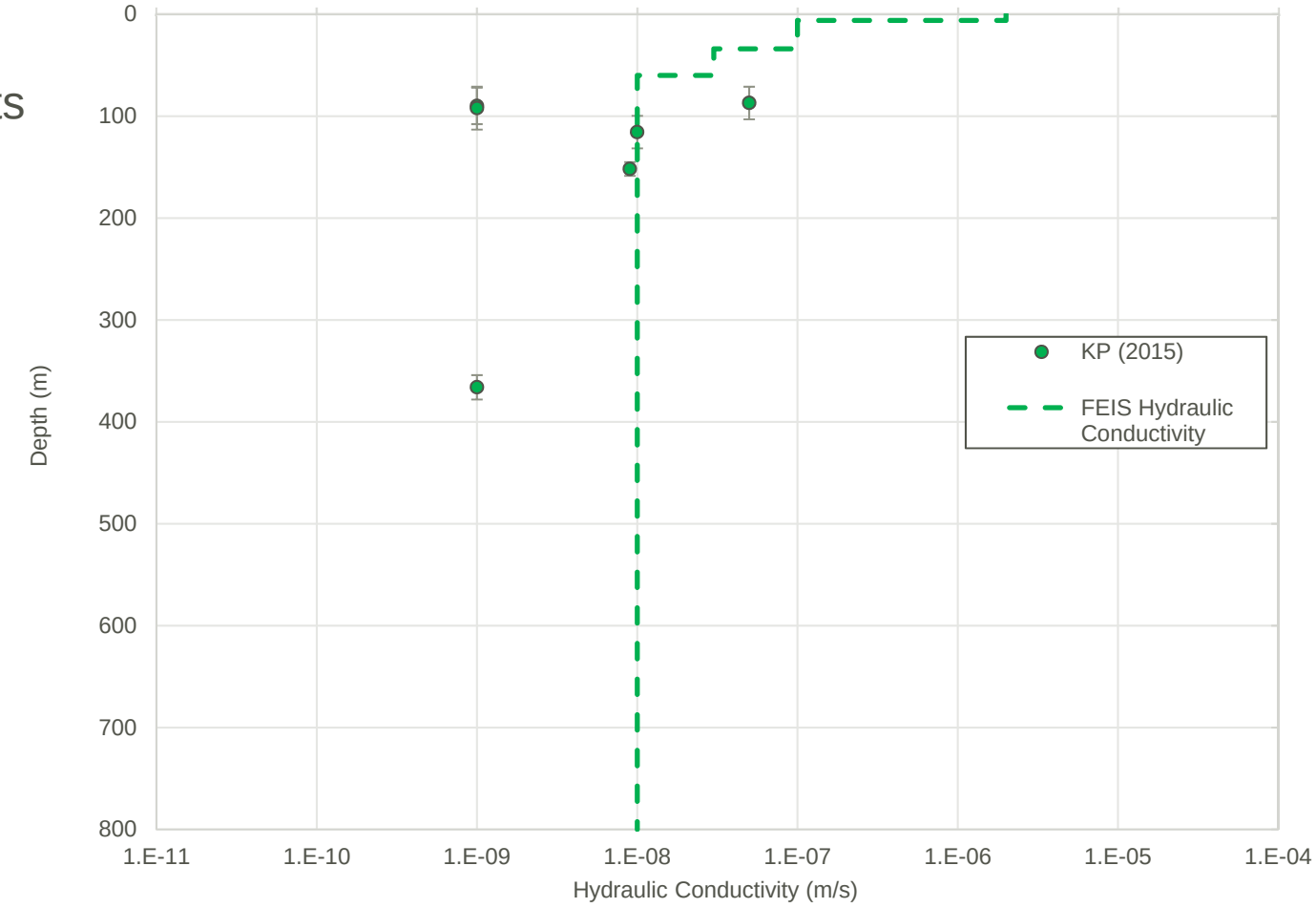
Note - Amaruq Type BB MEA1318 page 5 -

Within its responses to interveners' comments, AEM included a Water Management Plan entitled "*Water Management and Water Balance related to Amaruq Exploration Portal/Ramp Program, Quarry and Advanced Underground Exploration and Bulk Sample Amaruq Exploration Site, Nunavut*" dated November 15, 2016 and completed by Golder Associates Limited (Golder). The Board has approved this Plan under Part C, Item 2 of the Licence.

The Licensee also included in its responses a document entitled "*Groundwater Quality Investigation, Amaruq, Nunavut*" dated November 15, 2016 and completed by Golder. The Board is aware that as part of the baseline studies for the development of Whale Tail Pit Project, groundwater samples were collected from a Westbay monitoring well installed to target the talik zone below Whale Tail Lake, which is the area targeted for the development of the underground ramp to access the ore for bulk sampling. The Licensee is advised to update the Board with groundwater quality investigation's new results whenever new information becomes available.

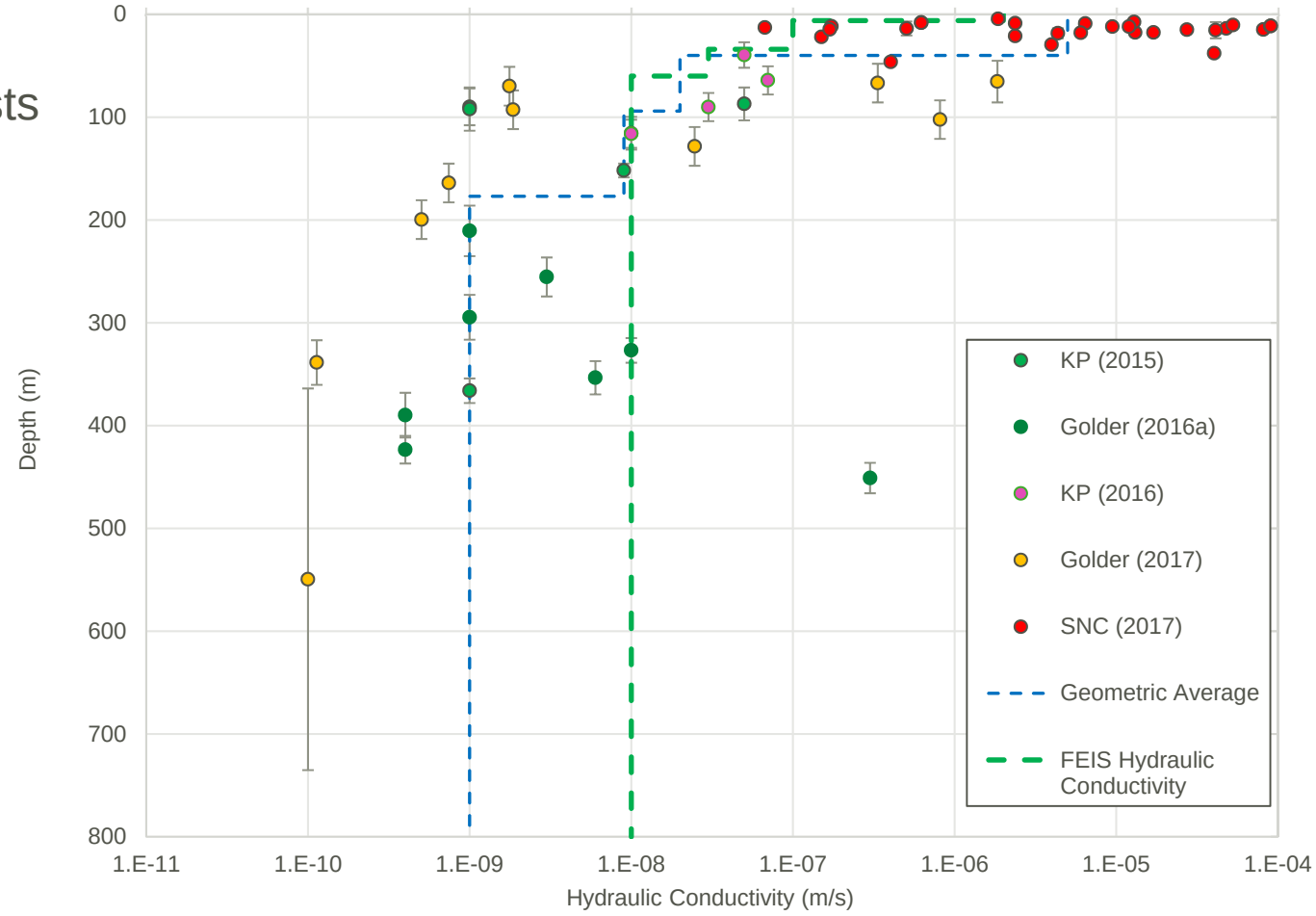
Hydraulic Conductivity - FEIS

6 Tests



Hydraulic Conductivity – Since FEIS

49 Tests



Hydrogeological and Geochemical Modelling Assessments

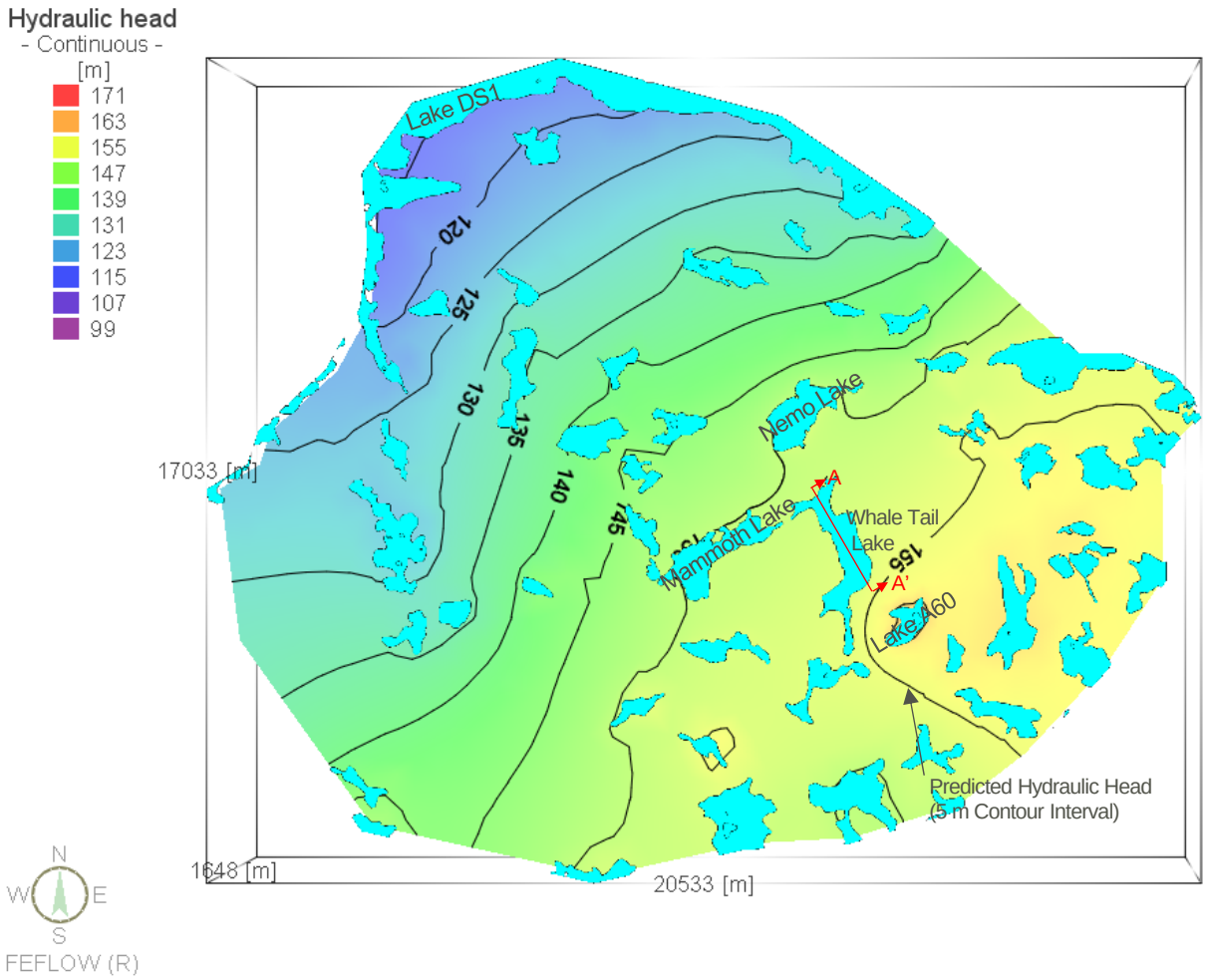
FEIS – Supporting Data

- Data collected for FEIS (Hydraulic Conductivity/Meadowbank Water Quality)
- Lake surface water levels (Hydrology Baseline)
- Contact water - leaching of pit wall from tests on site materials, including arsenic transference from submerged pit from early test

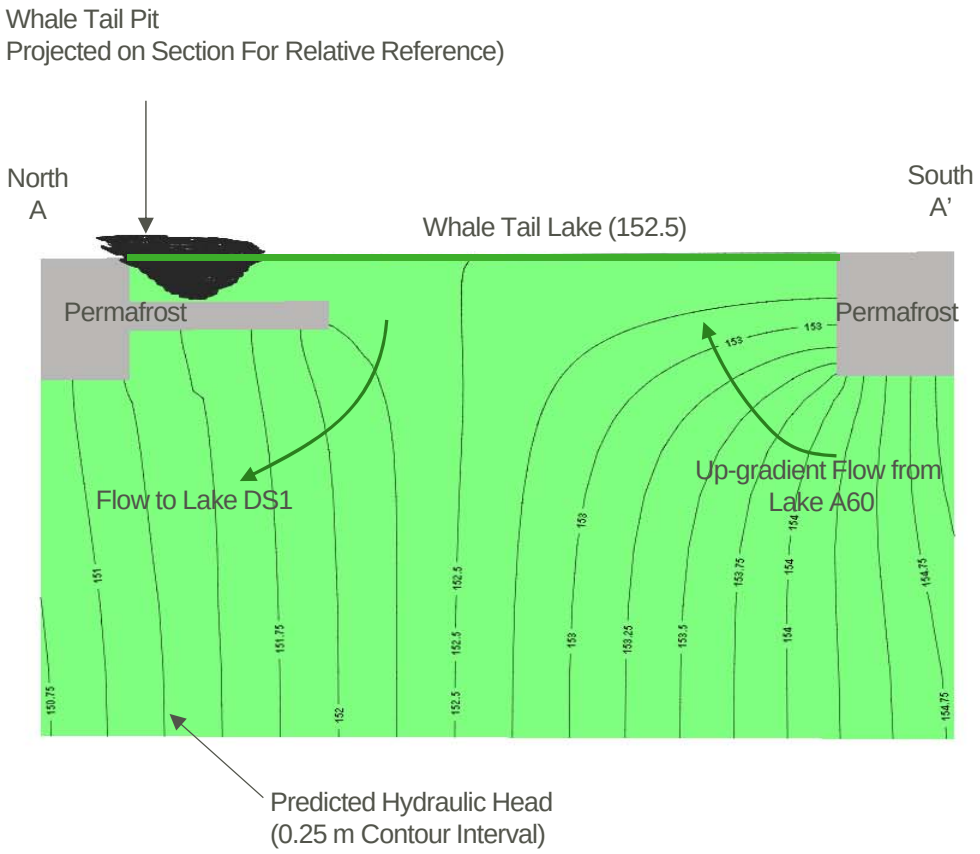
IR Modelling – Post-Closure Hydrogeological Model, Diffusion Model, Hydrodynamic Models for Pit Lake and Mammoth Lake

- Updated thermal analysis – evolution of permafrost below pit
- Used predicted conditions at end of closure as a starting condition for Post Closure.

Hydraulic Gradients – Predicted Baseline

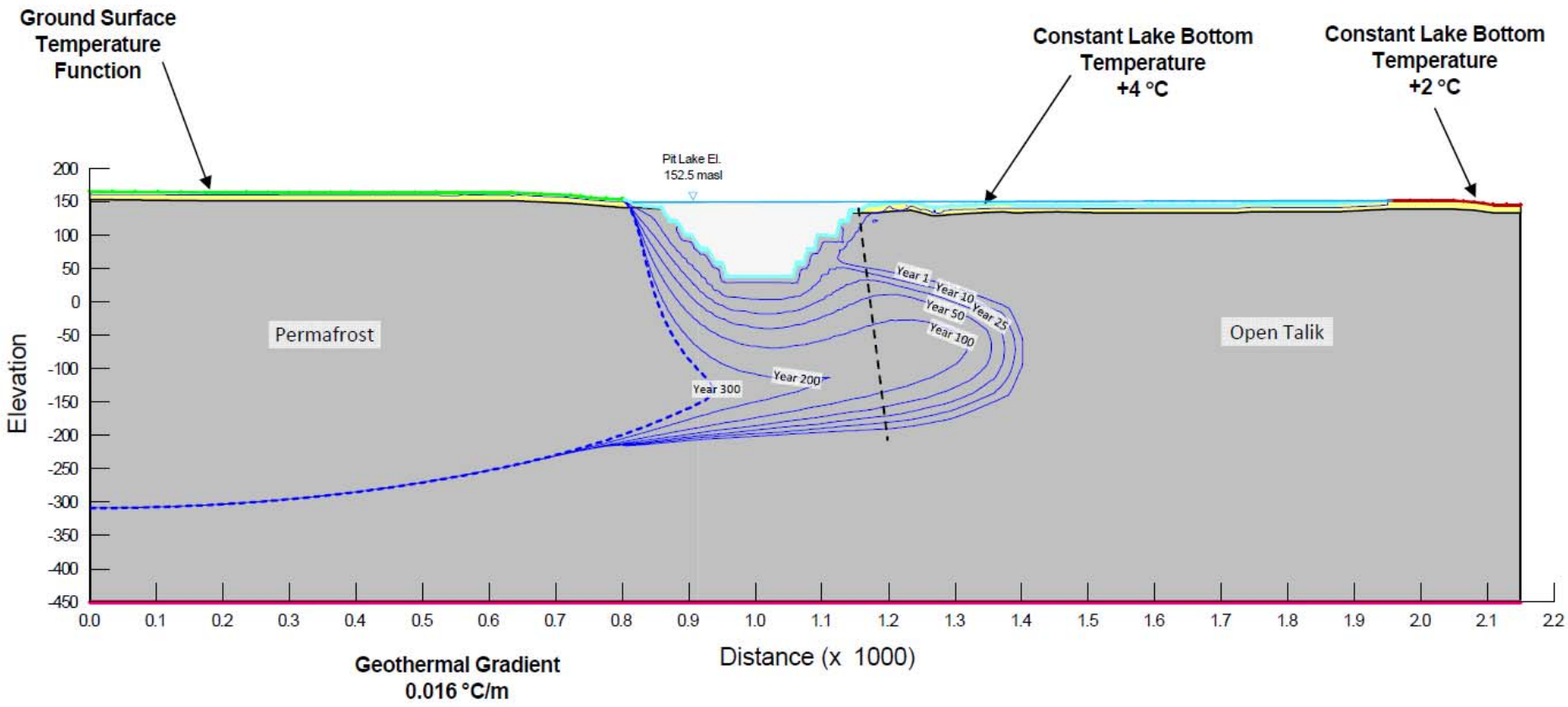


Hydraulic Gradients – Predicted - Baseline



FEFLOW (R)

Post-Closure Thermal Analysis



Post Closure

- 2D Analysis, with 3D closure predictions used as initial condition
- Incorporated thermal analysis that predicted evolution of permafrost
- Considered density dependent flow

Years Following Closure	Groundwater Inflow to Pit Lake (m^3/day)	Pit Lake Outflow to Groundwater (m^3/day)
1	2.2	1.1
10	1.1	0.8
100	0.2	0.8
500	0.1	1.7

Long-term - Predicted Groundwater Recharge Boundary

- TDS Groundwater Quality - from 650 mg/L (Year 1 post-closure) to 77 mg/L (500 years post-closure)

Hydrogeology Summary

- Larger baseline dataset
  - 49 packer tests
  - Site-Specific Water Quality Measurements
  - Ability to measure vertical gradient

- Sufficient testing in Quarry 1 / Starter Pit to confirm permafrost and absence of groundwater during development

Water Quality Discussion Points

Available Site Data

Whale Tail Flooded Pit Lake Water Quality

- Predicted Long Term Water Quality
- Assumptions on Arsenic Transfer to the Flooded Pit

Mammoth Lake Water Quality

Site Data input to the Water Quality Model

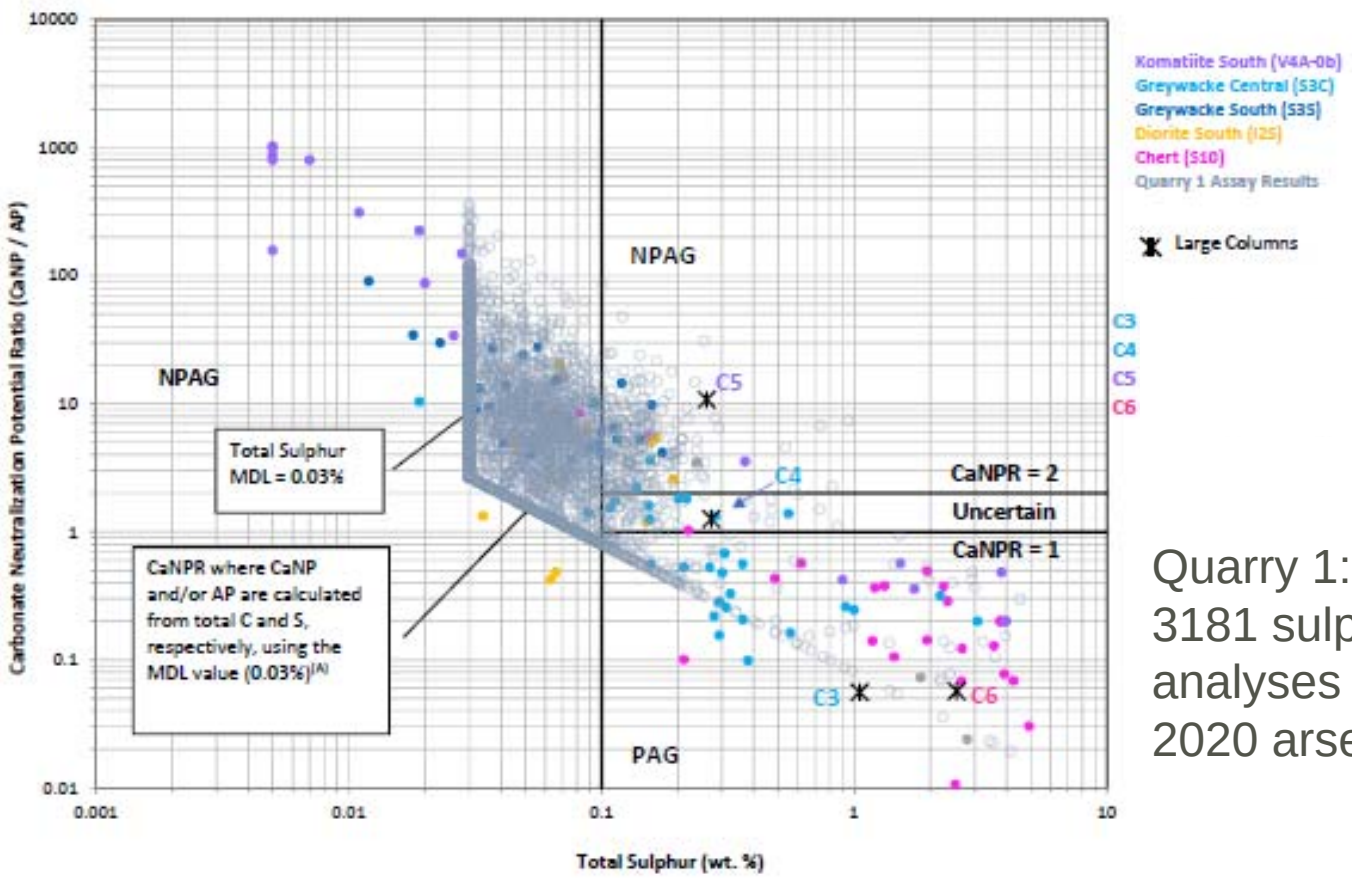
Available Site Data: data collection 2015-2017 – FEIS Baseline and updates

- **296 samples:** Chemical composition of rock, overburden, sediment:
- **328 static tests, 31 kinetic tests, 2 field cells**: leachate quality
- **21 samples** of groundwater
- Site water quality data, flow data, bathymetry, Environment Canada weather data, mine plan.

Site Data

CHEMISTRY OF WASTE ROCK

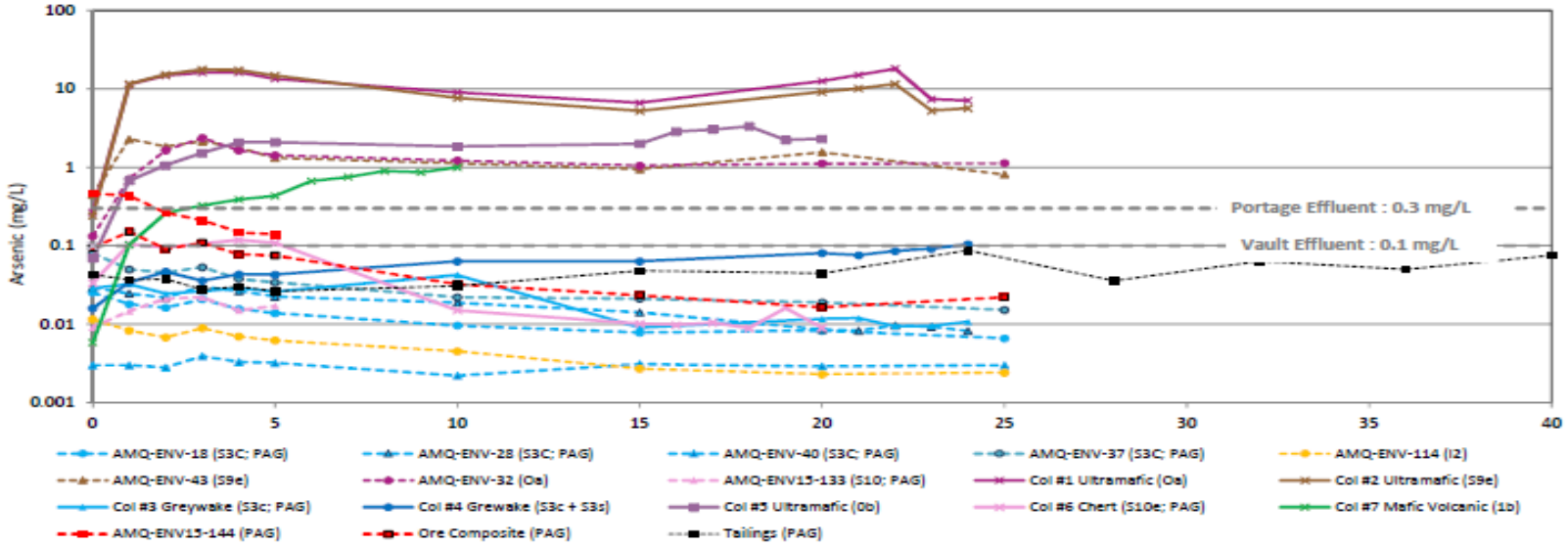
Kinetic test sample representativeness

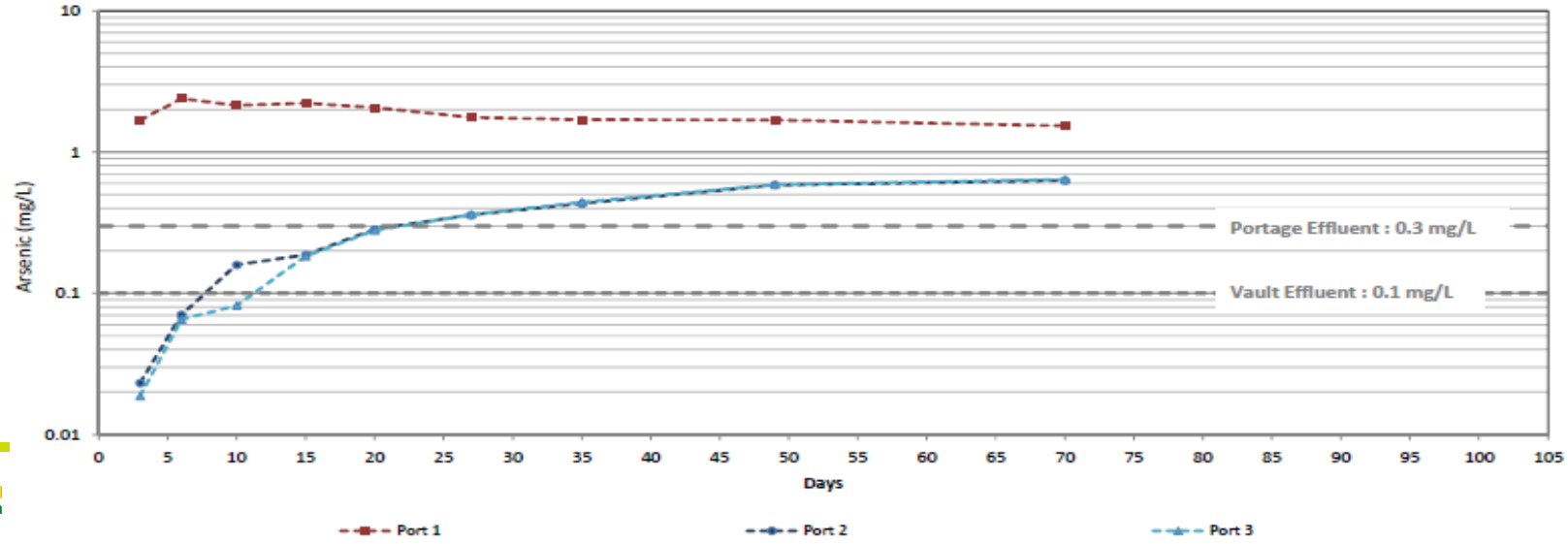


Quarry 1:
3181 sulphur and carbon analyses
2020 arsenic content

Kinetic test results - FEIS

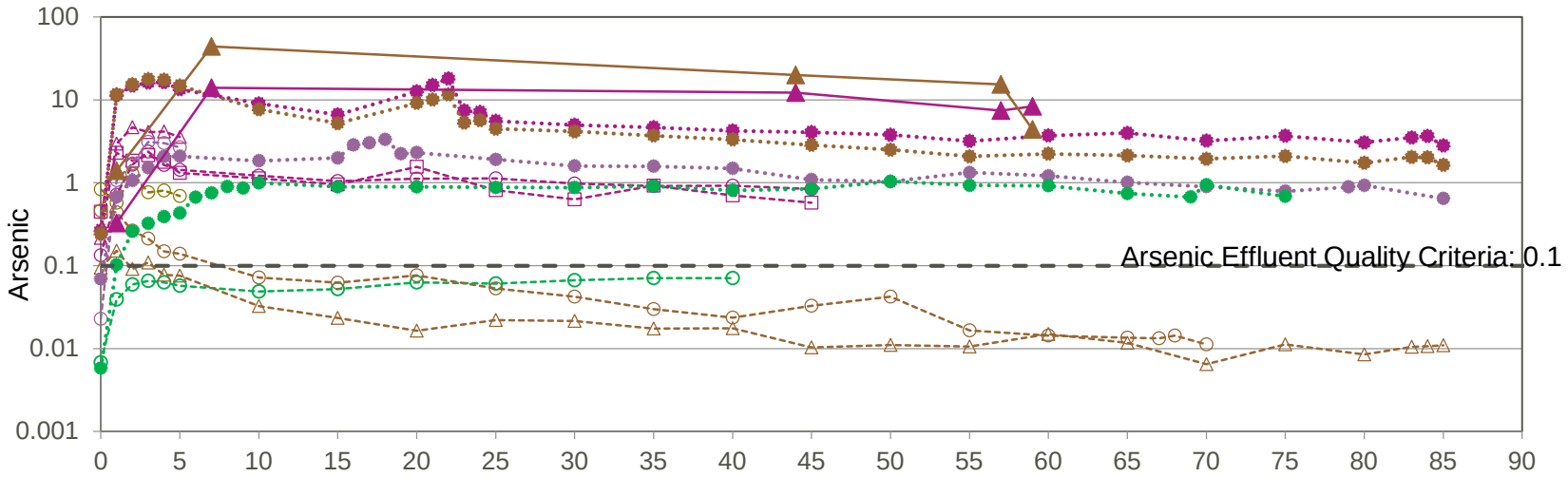
LABORATORY DATA BASED ON SITE SAMPLES

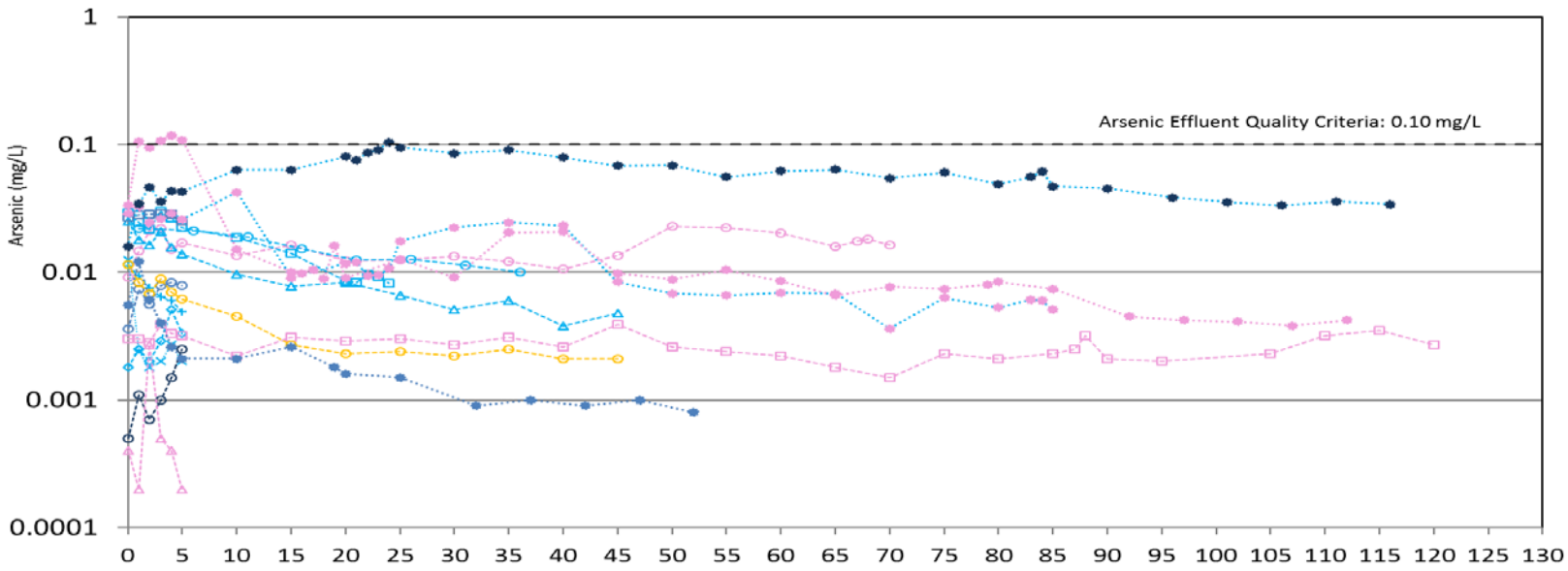




Kinetic test results – since FEIS

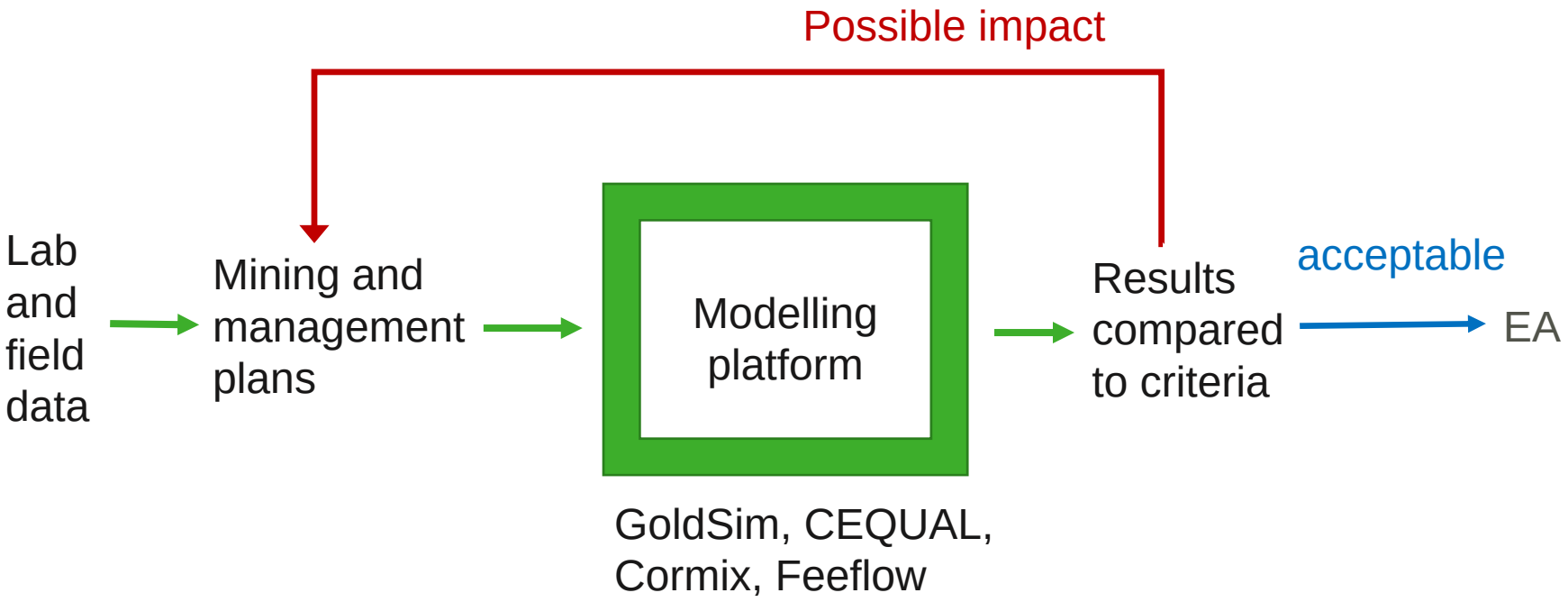
LABORATORY DATA BASED ON SITE SAMPLES





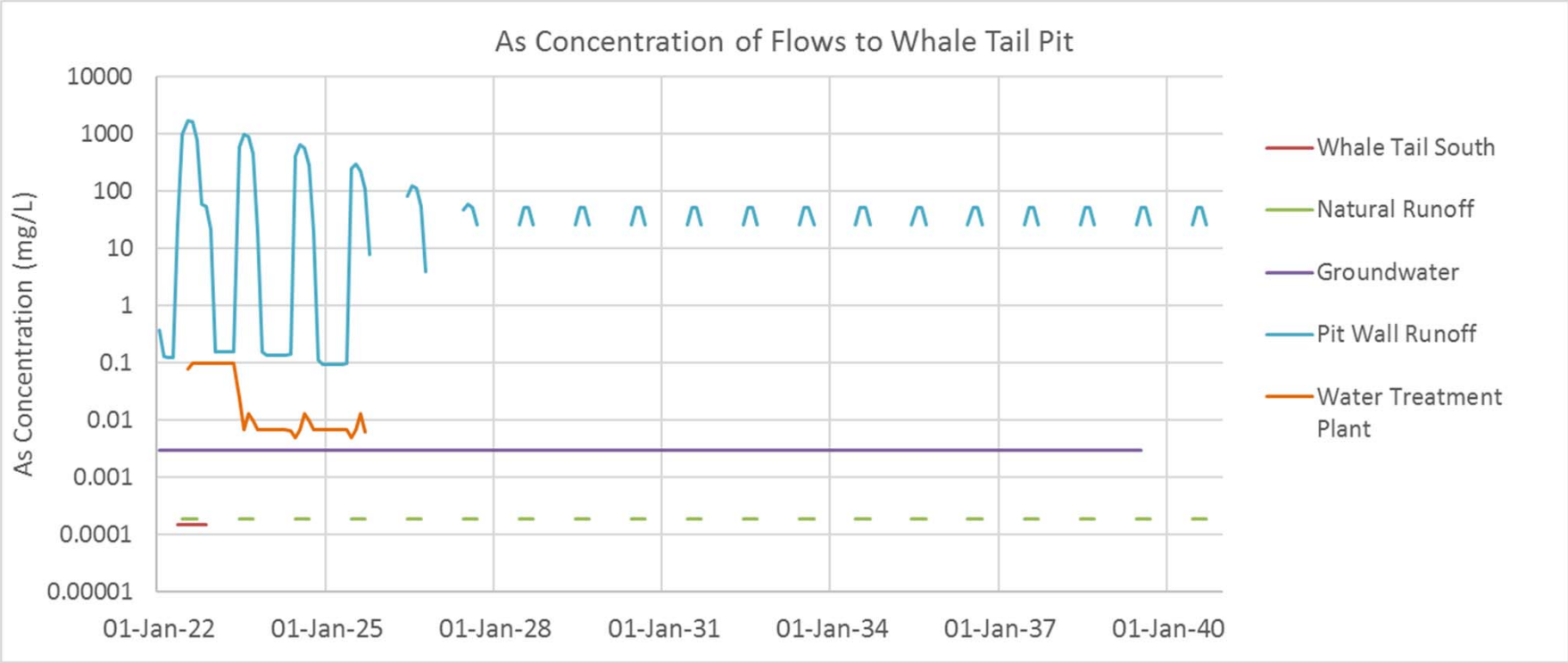
Modelling Method

Modelling approach

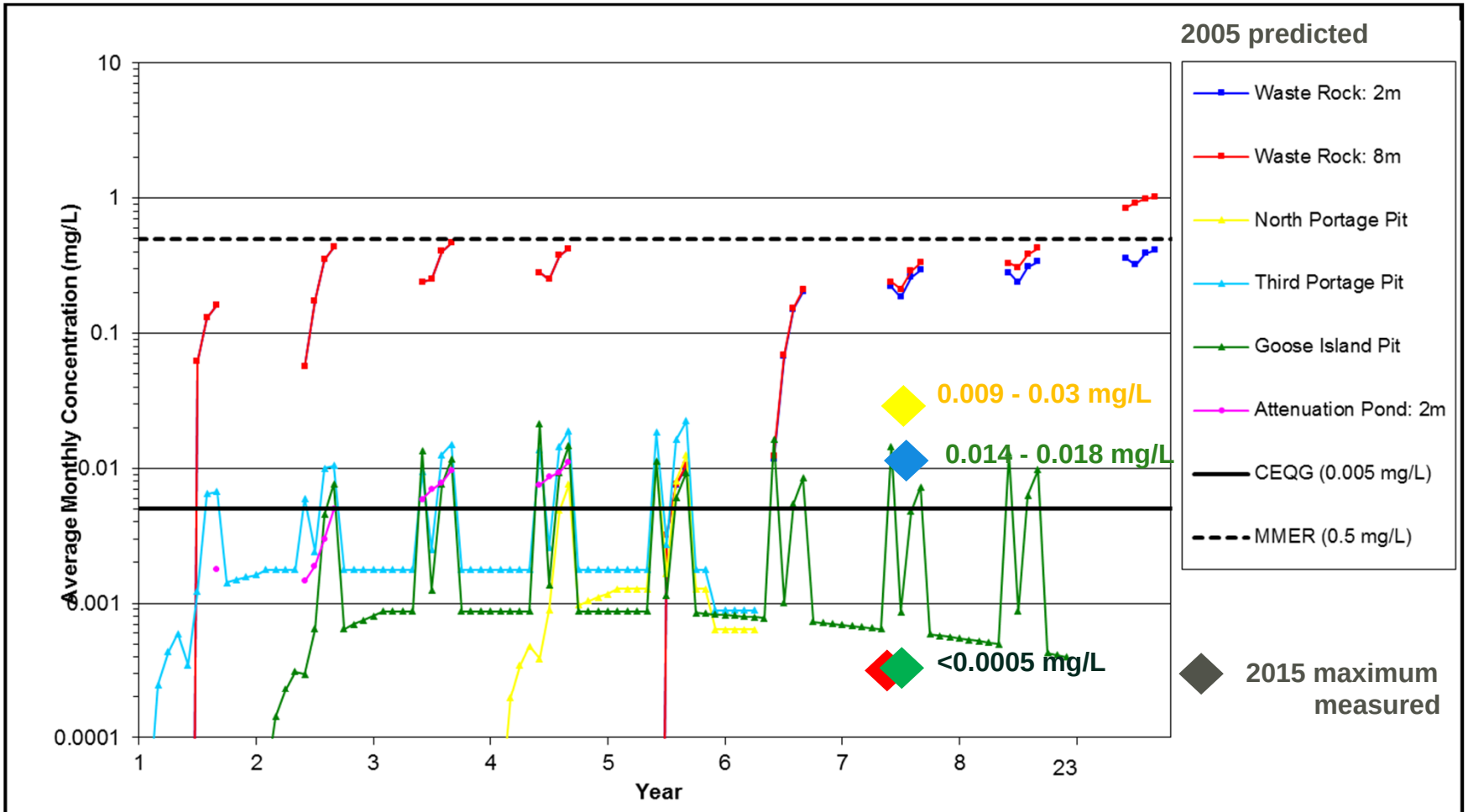


Input to Water Quality Model

ARSENIC SOURCES TO PIT FLOODING



Arsenic at Meadowbank - Portage Area



Golder Associates — Water Quality Predictions	TITLE: Portage: Dissolved Arsenic (Poor-End Case)		
	DRAWN: JMC	DATE: October 2005	JOB NO.: 04-1413-086
	CHECKED: VJB	SCALE: na	DWG. NO.:
	REVIEWED: VJB	FILE NO.:	FIGURE NO.: VIII-4

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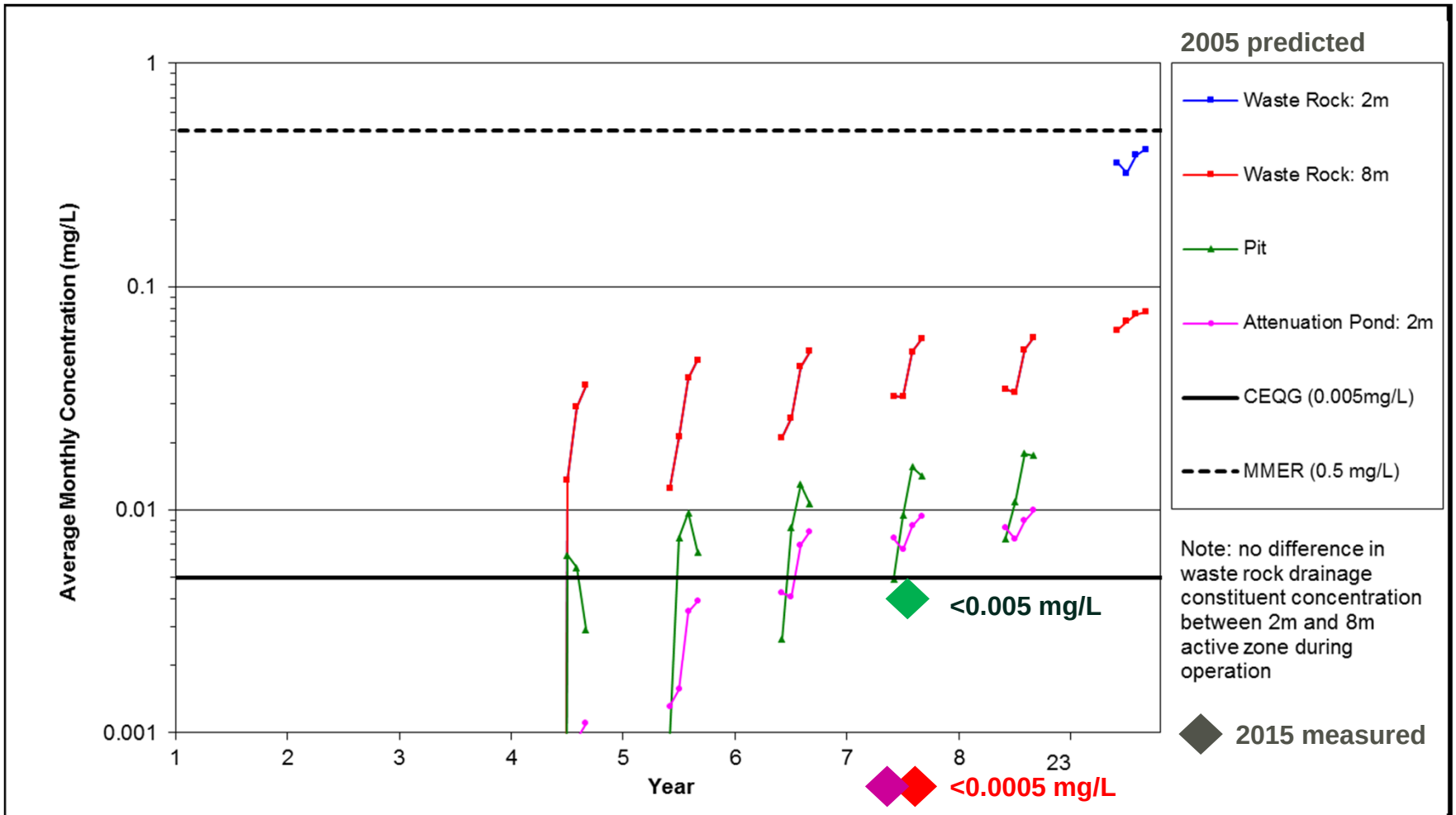
Arsenic at Meadowbank - Vault Area



Golder Associates — Water Quality Predictions	TITLE: Vault: Dissolved Arsenic (Poor-End Case)		
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	CHECKED: VJB	SCALE: na	DWG. NO.
	REVIEWED: VJB	FILE NO.	FIGURE NO.: VIII-1

CUMBERLAND RESOURCES LTD.

GOLDER

Predicted Water Quality

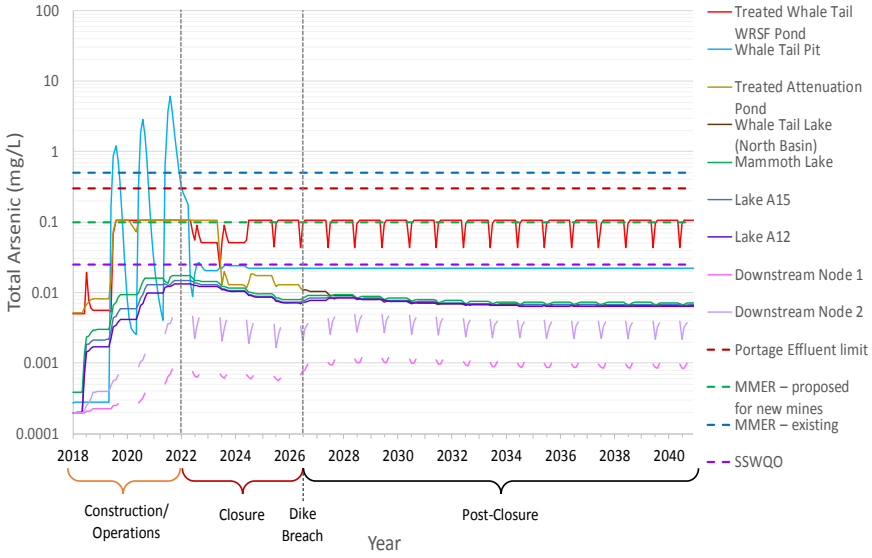
SIMILARITY BETWEEN MEADOWBANK AND WHALE TAIL

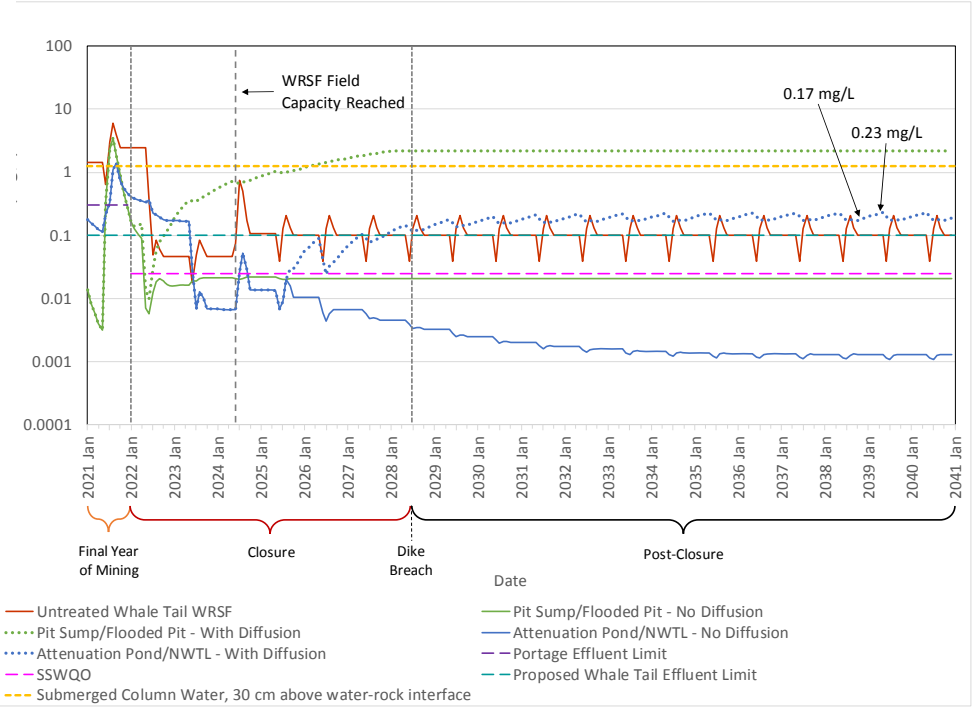
'…On the contrary laboratory tests show that the average leachable arsenic of the Whale Tail Pit waste rock is about 0.86 mg/L while that of the Meadowbank Gold Mine Project is 0.002 mg/L (i.e. 429 times greater)'

Whale Tail Pit Lake Water Quality

Sensitivity Analyses, IR Response, August 2017:
FEIS predictions with north wall push back, no effect from submerged pit walls

No treatment of arsenic from WRSF seepage – does not affect Whale Tail Pit Lake because released to Mammoth Lake

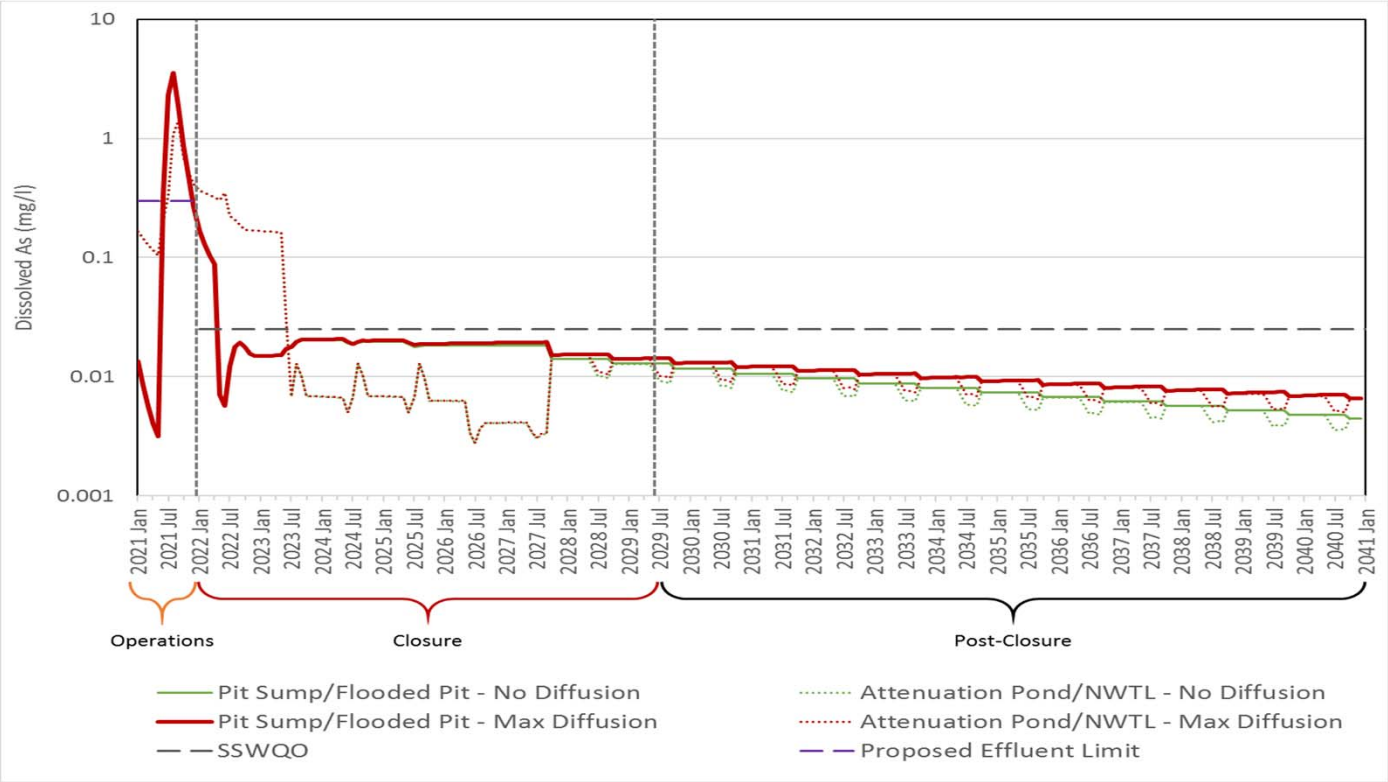




Flooded Pit Lake water quality consistently predicted to be below SSWQO, without maximum release from submerged pit wall

Whale Tail Pit Lake Water Quality

Updated water quality predictions considering updated arsenic diffusion, July 26, 2018

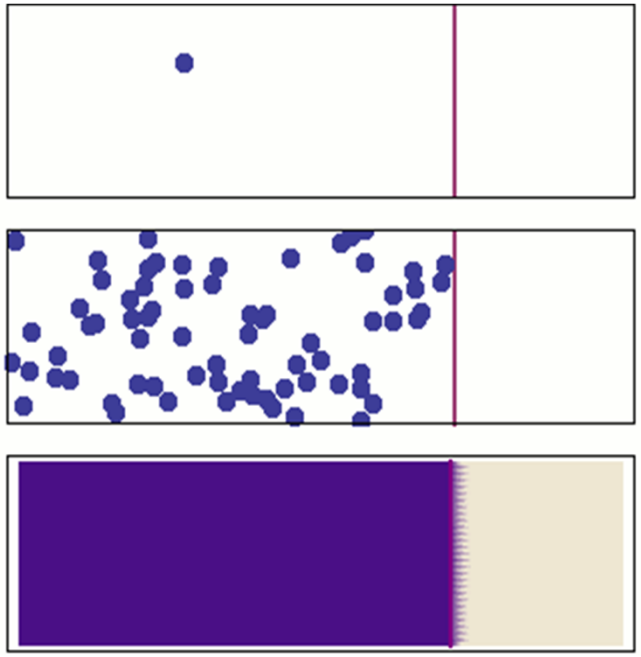


Flooded Pit Lake water quality still predicted to meet SSWQO once pit is fully flooded and decreased arsenic concentration in time.

Arsenic Release from Pit Walls

THEORY AND CONCEPT

- Pit wall contain arsenic-sulfide minerals that oxidize when exposed to air and water, forming mineral salts containing arsenic – laboratory kinetic leaching tests
- Upon flooding of the pit, mineral salts will dissolve, be released to water = first flush effect
- Once flooded, sulfide minerals in the pit walls will stop oxidizing, stop generating mineral salts, supply exhausted
- Diffusion: the slow release of stored salts to the open water – this will decrease in time from the finite quantity of salts



Refinement of Diffusion Model

Inputs:	FEIS, June 2016	Refined Diffusion Model, July 2017
Conceptual Model	Single, unchanging rate. No equation to evaluate potential.	Separate diffusion model to determing rate of mass release based on concentration of arsenic in pit.
Source Data	Submerged column: high arsenic leaching waste rock stagnant water, perpetual 'first flush' = overly conservative double couting	Submerged columns and kinetic tests: multiple samples, steady state release continual oxidation, release of arsenic = conservative mass loading
Affected Areas of Pit	High arsenic lithologies (50% of pit)	High arsenic lithologies, north wall push back (25% of pit)
Arsenic release rate	In perpetuity at first flush rate	In perpetuity at steady state rate
Concentration gradient (dC)	no concentration gradient considered: capped at maximum stagnant HCT result (2.16 mg/L)	Assumed 0 mg/L in flooded pit
Diffusion distance (dz)	Not considered (maximum release)	1 cm (likely in the meter scale)
Formation Porosity (ϕ)	Not considered	0.03 (weathered bedrock)

Predicted Whale Tail Pit Lake Water Quality

ARSENIC DIFFUSION

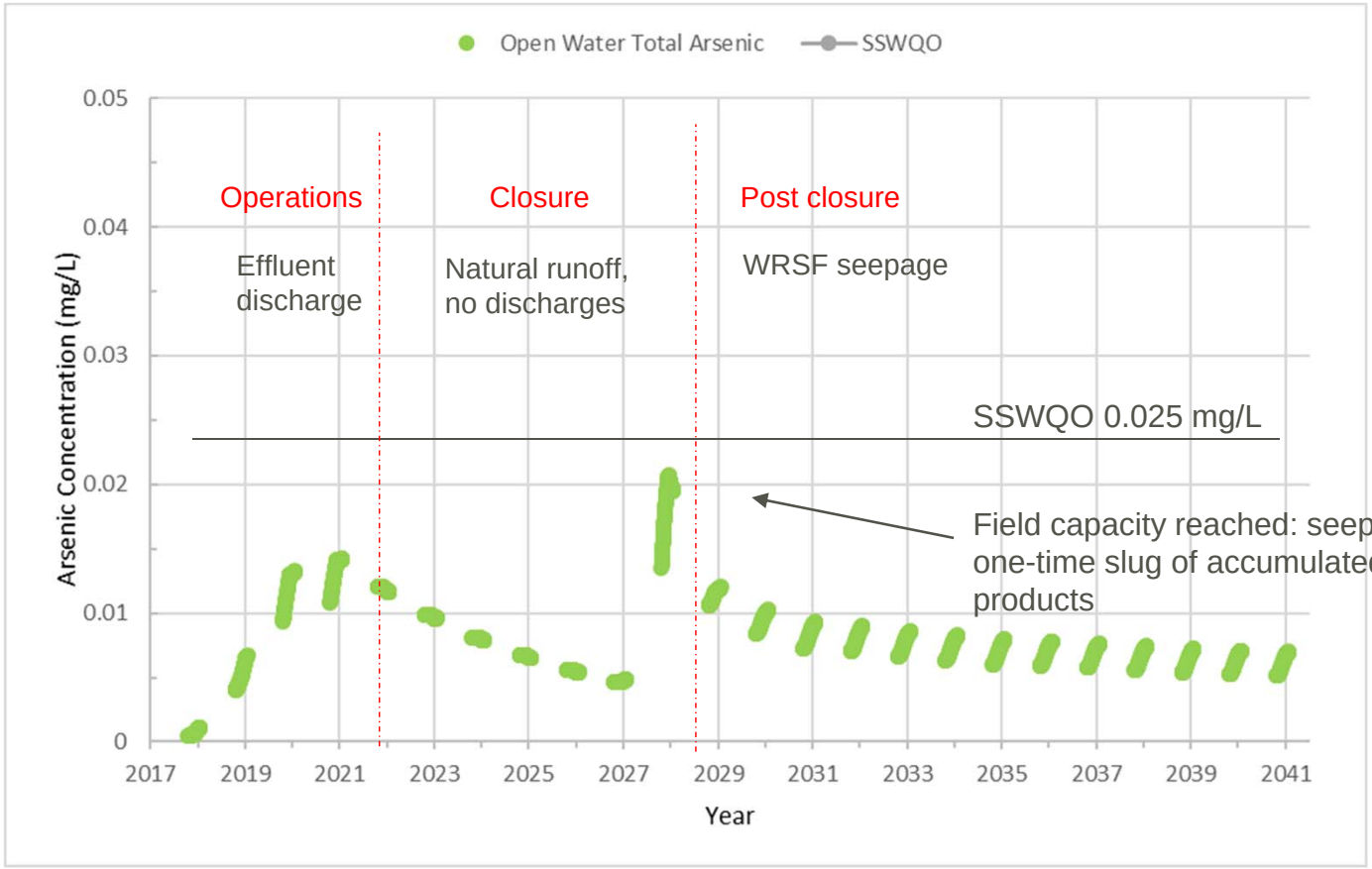
Conclusion on Arsenic Diffusion from Submerged Pit Walls:

Diffusion of arsenic from all pit walls has no significant effect on water quality in short and long-term.

Arsenic transfer to the open pit by diffusion from the submerged pit walls is not significantly affected by the hydrogeological regime/hydraulic gradient to/from the flooded open pit.

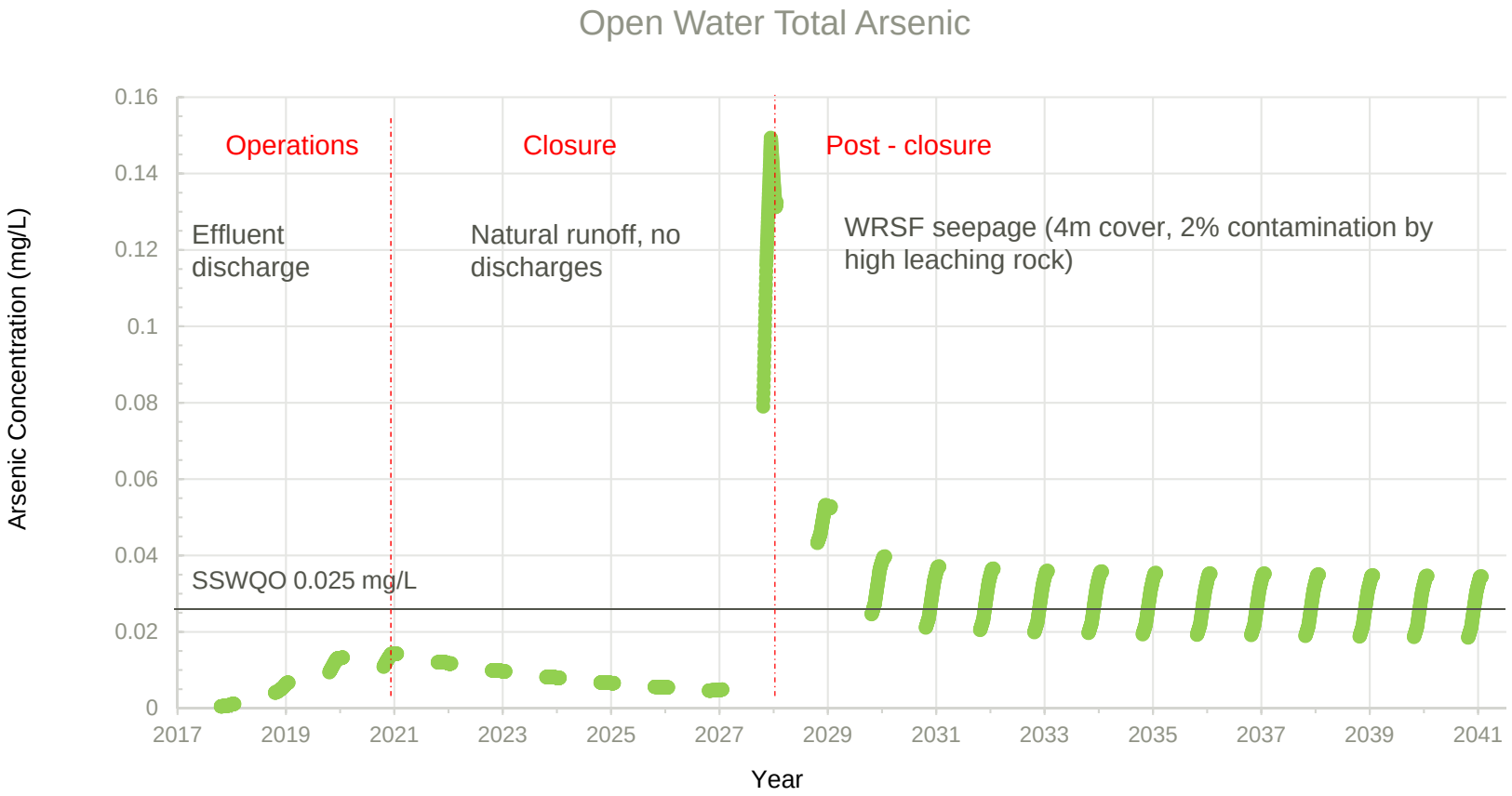
Mammoth Lake Hydrodynamic Model

Arsenic in effluent discharge during operation and arsenic released from cover (4-meter active thaw depth cover with low leaching waste rock).



Mammoth Lake Hydrodynamic Model

Arsenic release from 4-m cover with 2% contamination of high leaching waste rock



Mammoth Lake Water Quality

- Waste Rock Management Plan in place to segregate waste rock, progressive covering – Implemented plans at Meadowbank are effective
- Water Quality Monitoring Plan to validate water quality predictions and manage adaptively, to meet Water Quality Objectives during operations through post-closure:
- 10 years of monitoring for adaptive management and release when demonstrated absence of impact in the receiving lake outside the mixing zone
- Alternatives: release contact water to Whale Tail Pit Lake

APPENDIX B

Waste Rock Material Segregation Methodology and Management at Meadowbank

Technical Memo

Date: August 8, 2017
To: Luiz Manzo, Director of Lands, Kivalliq Inuit Association
From : Jamie Quesnel, Agnico Eagle Mines, Environment Superintendent Nunavut; Erika Voyer, General Supervisor Environment Nunavut, Agnico Eagle Mines

Subject: Waste Rock Material Segregation Methodology and Management at Meadowbank

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SUMMARY

Segregation of ore, waste rock as potentially acid generating (PAG) or non-potentially acid generating (NPAG) material based on operational testing during mining activity to differentiate waste rock type is part of the Meadowbank waste rock management plan. Sampling and testing of waste materials for acid rock drainage (ARD) is conducted during mine operation in order to segregate PAG waste from NPAG waste rock material, so that waste material can be assigned to specific locations or use. This practice has been ongoing since the beginning of the mining operations at Meadowbank, and will continue during the remaining operation period. The same methodology will be put in place during the construction and mining operations at Whale Tail Project, in order to segregate adequately the waste rock material.

Operational sampling and analysis is completed on site during mining activities in order to identified and delineate the material type in the pits during mining. Agnico Eagle sampled approximately 25% of all blast holes and analyzed the percentages of sulphur and carbon. The results from these analyses are used to differentiate the PAG and NPAG materials. Once characterized, the waste rock material is segregated and placed in appropriate location.

The geochemical properties of all Meadowbank mining wastes have been confirmed, by certified laboratory, through both static and kinetic testing on numerous representative samples, by various test methods and through multiple project development stages. These data were used to develop a mine waste management plan that was adequately protective of the environment and was authorized by regulatory agencies.

Information regarding the waste rock characterization is also managed and recorded by the mine dispatch Wenco system, tracking in real time load of material, including waste rock, and their respective destination. The system and the dispatcher in charge, guides the operators and ensures the ore and waste rock material is transported to the appropriate destination. The system displays in real time information about equipment location and destination, as well as pit development information. All production data, including all waste rock haulage to the PAG and NPAG waste rock storage facilities (RSF), as well as construction use are recorded into a database. The Waste Rock Management Plan is updated annually with current production quantities and actual Life of Mine, dictating the production and mining schedule. Waste rock management is also part of the weekly planning of the mine engineering department. Because of the large material requirement for construction and NPAG rock cover as well as the importance for adequate placement of material, waste rock management is a fundamental component of the mining planning at Meadowbank.

The Meadowbank waste rock segregation and management protocol were presented in several mining and environmental conferences and symposiums (*International Conference on Acid Rock Drainage, 2012; Cold Covers Practice, 2014; Quebec Mines Conference, 2014; Symposium sur l'Environment et les Mines, 2015*) as well as presented in technical papers (*The Meadowbank Gold Mine – Reclamation Planning in an Arctic Environment, 2012; Waste Rock Management and Closure Planning in Northern Climate: The Meadowbank Mine, Nunavut, 2015*).

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AGNICO EAGLE

ON SITE WASTE ROCK ANALYSIS

The Draft Guidelines and Recommended Methods for the Prediction of Metal Leaching and Acid Rock Drainage at Mine sites in British Columbia (Price, 1997) provide factors for the conversion of total sulphur and total inorganic carbon to maximum potential acidity (MPA) and carbonate neutralization potential (NP), respectively, which are then used to classify material as PAG/NPAG. Since it was possible to equip the Meadowbank onsite assay laboratory with the equipment required for these analyses, their use as a surrogate for the complete suite involved in traditional ABA testing was assessed and confirmed using exploration drill cores (Golder, 2005a).

As a result of these analyses, the Meadowbank onsite assay lab has been equipped to analyze total sulphur and total inorganic carbon in waste rock, allowing for the characterization of acid generating potential onsite, with overnight turn-around times. The same laboratory and method are planned to be used for the Whale Tail Project.

ON SITE WASTE ROCK CHARACTERIZATION

The most conventional method of characterizing the acid generation potential of waste rock is to classify it as PAG, NPAG or of uncertain acid generating potential (uncertain ARD potential, treated as PAG material) based on its Net Potential Ratio (NPR). The NPR of a material is calculated as the ratio of its measured carbonate neutralization potential (NP) to its calculated maximum potential acidity (MPA). Geology staffs apply the following procedures to characterize the waste rock at Meadowbank.

Samples of drill cuttings are analyzed on-site for total sulphur and total inorganic carbon. The results from these analyses are used to calculate the Net Potential Ratio which defines NPAG from PAG materials. The following steps lead to the calculation of the **NPR**:

i. Total sulphur is converted into a maximum potential acidity (**MPA**) value by multiplying the total S wt% by 31.25 which yields an MPA value in kg $CaCO_3$ equivalent.

ii. Total inorganic carbon is similarly converted into a carbonate neutralization potential (**NP**) by multiplying the total wt% inorganic carbon (reported as $\%CO_2$) by 83.34 which yields an NP value in kg $CaCO_3$ equivalent. NP = ((%C x 100.09)/12.01)x10

iii. The Net Potential Ratio (**NPR**) for the blast hole drill cutting sample is then calculated as **NPR = NP/MPA**.

WASTE ROCK CLASSIFICATION PAG/NPAG

The ARD potential of waste rock, till (overburden) and tailings materials from the Meadowbank mine were previously classified by Golder Associates using the NPR-based guidelines published by INAC (*INAC, 1992. Guidelines for ARD Prediction in the North – Northern Mine Environment Neutral Drainage Studies No. 1*), which are summarized in Table 1 below. The NPR guideline value to differentiate between uncertain and NPAG has been adjusted from 3 to 2 using the criteria described in the INAC reference guide (knowledge of rock chemistry, mineralogy and reactivity of neutralizing minerals). For example, the use of carbonate NP as a surrogate for bulk NP was examined using data obtained from exploration drilling. Carbonate NP and bulk NP correlate well, which suggests that NPR values calculated using carbonate NP would be comparable to NPR values calculated using bulk NP. It also emphasizes that at Meadowbank measured NP is equal to carbonate NP and is thus fully available for neutralization of any acid generated (i.e, there does not appear to be any carbonate that is lost as iron carbonate or other mineral forms that cannot provide neutralization potential).

The NPR ratio adjustment was accepted during the NIRB environmental assessment process.

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Initial Screening Criteria	ARD Potential
NPR < 1	Likely acid generating (PAG)
1 < NPR < 2	Uncertain
2 < NPR	Non-potentially acid generating (NPAG)

Table 1: Summary of ARD guidelines used to classify Meadowbank waste rock and overburden (based on INAC, 1992).

QA/QC PROGRAM

The onsite lab carries out a quality control quality assurance (QA/QC) program that includes the following elements:

- Use of certified reference materials to verify the precision of analytical methods;
- To validate the method used by Agnico Eagle, approximately 300 rock samples (quarterly analysis of a minimum of 75 duplicate samples) of the main rock types from production drill holes are sent annually to an accredited commercial lab (external lab) for acid base accounting (ABA) analysis using the Modified Sobek Method (MEND, 1991) for determination of NP/AP and metal leaching using the Shake Flask Method (Modified ASTM D3987). The results confirmed Agnico Eagle methodology and results to differentiate PAG/NPAG rock. The results are reported to the Geology Superintendent and the Environment staff.

FIELD METHODS – SAMPLING AND DELINEATION OF WASTE ROCK

Field sampling of rock material for use in NPR analyses proceeds according to the following guidelines:

- Drill holes are sampled in accordance with the frequency set out in writing by the Geology Superintendent. The default sampling frequency is the sampling of every fourth drill hole in each drill hole pattern;
- Each sample should weigh no less than 1 kg;
- The sample is labeled using a convention that is readily traceable back to the production drill hole numbers;
- Composite samples are not to be used because they confuse the data and render it more difficult for use in model creation or comparison.

Following laboratory analysis, geology staff will classify waste rock and overburden as NPAG if the NPR value is greater than 2; PAG if the NPR value is less than 1 and uncertain for NPR values between 1 and 2 (Table 1). These criteria can be re-evaluated when judged relevant by the Geology Superintendent in consultation with the Mine Engineer, as additional test data become available. ARD classifications of all samples are logged in Meadowbank's GEMCOM database.

NPR values will be transferred to the mine plans for that specific blast. Once blasting is complete the mine surveyor will use NPAG and NPAG outlines from the drill pattern to outline the respective "dig limits" in the open pit. Different material categories are separated into packets, identified in the field using stakes, wire flags and flagging tape so that each packet can be excavated and sent to the appropriate destination. Packets classified as NPAG should include no more than one

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acid-generating sample (NPR>2) for every 8 non-acid-generating samples (NPR<1). Neither should they include more than one sample of uncertain acid-generating potential (1<NPR<2) for every 4 non-acid-generating samples (NPR<1).

Photo 1 and 2 below illustrates the sampling of the drill holes and the delimitation of the packets in the blasted rock material. Figure 1 presents a schematic view of the packet stakeout in the field after the material has been blasted.

Photo 1: Preparation of the samples from drill cuttings Photo 2: Differentiation of PAG/NAG rock and ore after a blast based on laboratory results and blast pattern

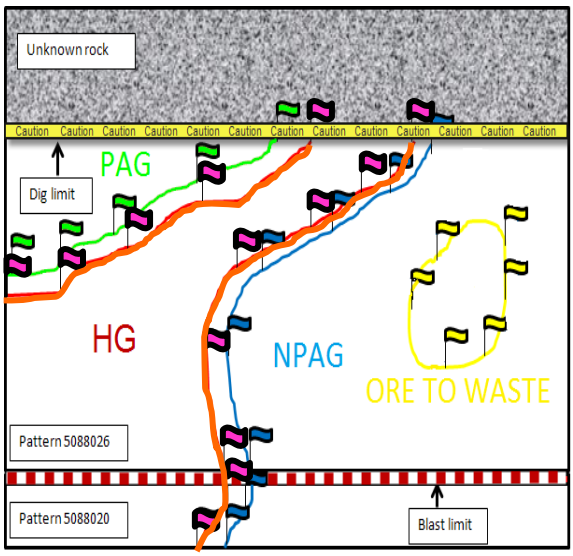

Figure 1: Sample packet stakeout in the field.

MATERIAL TRACKING - FLEET MANAGEMENT SYSTEM AND MATERIAL DATABASE

Information regarding the waste rock characterization is also managed and recorded by the mine dispatch Wenco system, tracking in real time load of material, including waste rock, and their respective destination. The information for each area

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ready to mine prepared by geology is imported in the system. The system and the dispatcher in charge, guides the operators and ensures the ore and waste rock material is transported to the appropriate destination.

Wenco system is a computer system used to manage and control surface mining equipment. The system offers real time fleet management and machine guidance technology that records data related to mining equipment activity, location, time, production, and maintenance. This information is also displayed to machine operators and other mining personnel. The system connects with mobile computers on field equipment such as excavators and haul trucks. For example, operators of loading equipment in the pit have information on screens about the type of material they are excavating. The haul truck drivers also have access to information in their equipment, about what they are hauling and where is the appropriate destination for the material. In fact, the system will even warn a haul truck operator if a load is being misdirected based on GPS movement of the hauling equipment. One of the purposes of this system is to track material, to ensure ore, as well as waste rock PAG and NPAG goes to the appropriate location.

The system displays in real time information about equipment location and destination, as well as pit development information. As shown on Photo 3, the dispatcher in charge constantly follows the evolution of the pit development and production, having access to live maps and tables showing the different equipment and types of material in exploitation. Figure 2 presents an example of a map showing the location of different production equipment within the pit, as well as defined sectors including different types of ore and waste rock, color coded. Figure 3 presents a typical table including the status of different loading equipment, their location, the type of rock material they are working in, as well as production data, such as quantities of material excavated and which haul trucks are assigned to an area.

Dispatchers follow the system during hours of production and will intercept loads of material going into the wrong location. It is also possible with the system to locate where material was placed, in order to recover it, if required due to a misdirected load, and bring it to the right location.

All production data, including all waste rock haulage to the waste rock storage facilities (NPAG and PAG RSF's) and construction use are recorded into a database. This database includes all quantities of material placed in different locations, and is used to confirm quantities of material and follow the waste rock management plan.

Photo 3: Dispatcher in charge of the fleet management system during operations

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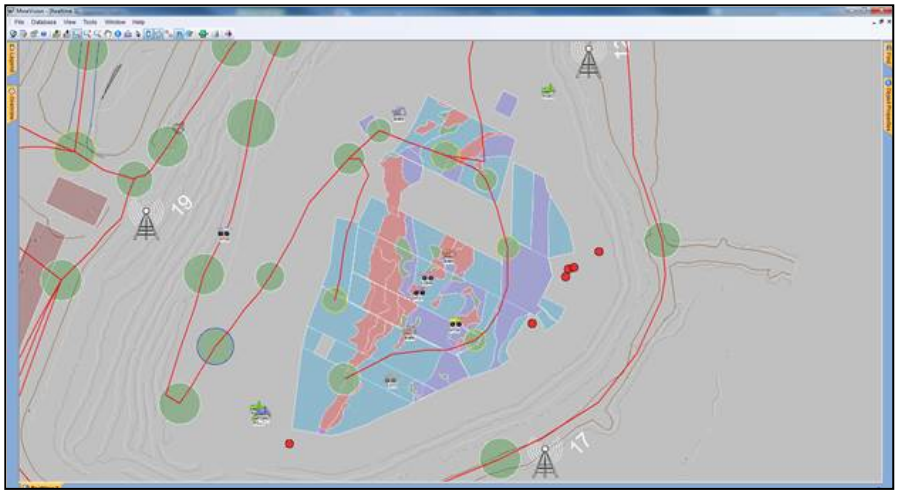

Figure 2: Map showing the location of production equipment within the pit, ore and PAG/NPAG material in color coded zones

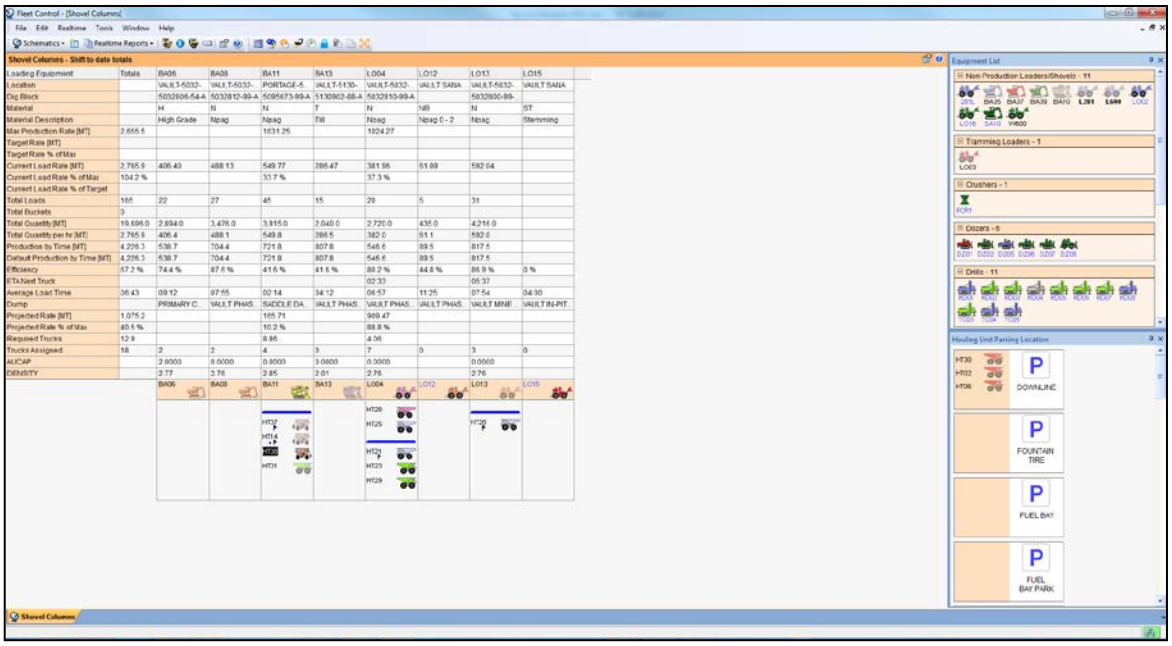

Figure 3: Table including the status of different loading equipment - location, type of rock material and production data.

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WASTE ROCK MANAGEMENT PLANNING

Waste rock and till produced during mining was used in the construction of the mine site infrastructure, including dikes, roads, pad foundations, while some of the NPAG waste rock is being put aside for capping at closure and for underwater structures for fish habitat compensation. The balance of the PAG or NPAG waste rock that will not be used is placed and will remain in the dedicated rock storage facilities for PAG or NPAG material. Figure 2 presents the waste rock storage facilities for Meadowbank, with the specific waste rock type they contain.

As a first step in waste rock management planning, options were developed to define the main use and destination for each rock type based on the results of geochemical testing. The second step required accounting of the quantity and timing of extraction of each waste rock type on an annual basis. This included further refinement of the quantity, type and timing of construction material requirements for each infrastructure project. To this end, the lithology of waste rock was added to the geological block model for each deposit and a detailed account of construction requirements was made based on the most advanced infrastructure designs available at the moment of planning. The Waste Rock Management Plan is updated annually with current production quantities and actual Life of Mine, dictating the production and mining schedule. Planning of the placement of waste rock material is reviewed for each Life of Mine exercise, considering the different waste rock facility locations and capacity, as well as the closure NAG cover requirements.

Waste rock management is also part of the weekly planning of the mine engineering department. Part of the mining planning includes the management of waste rock, to ensure the plan established with the Life of Mine is followed, to ensure material required for construction or closure purposes are properly stored, and also to plan for adequate and permitted storage areas. Figure 5 shows an example of the waste rock management diagram updated and included in the weekly planning discussion between engineering, geology and mine production. Because of the large material requirement for construction and NPAG rock cover, as well as the importance for adequate disposal to meet closure objectives, waste rock management is a key component of the mining planning at Meadowbank.

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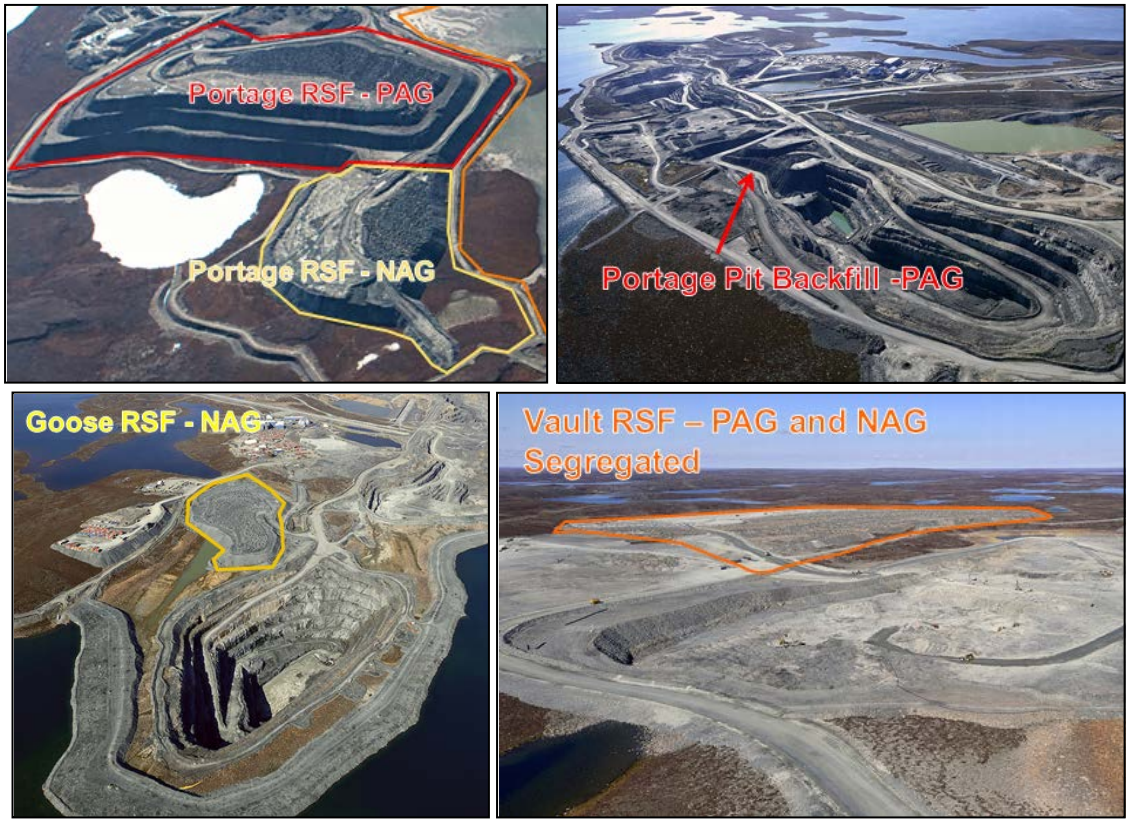

Figure 4: Waste Rock Storage Facilities at Meadowbank

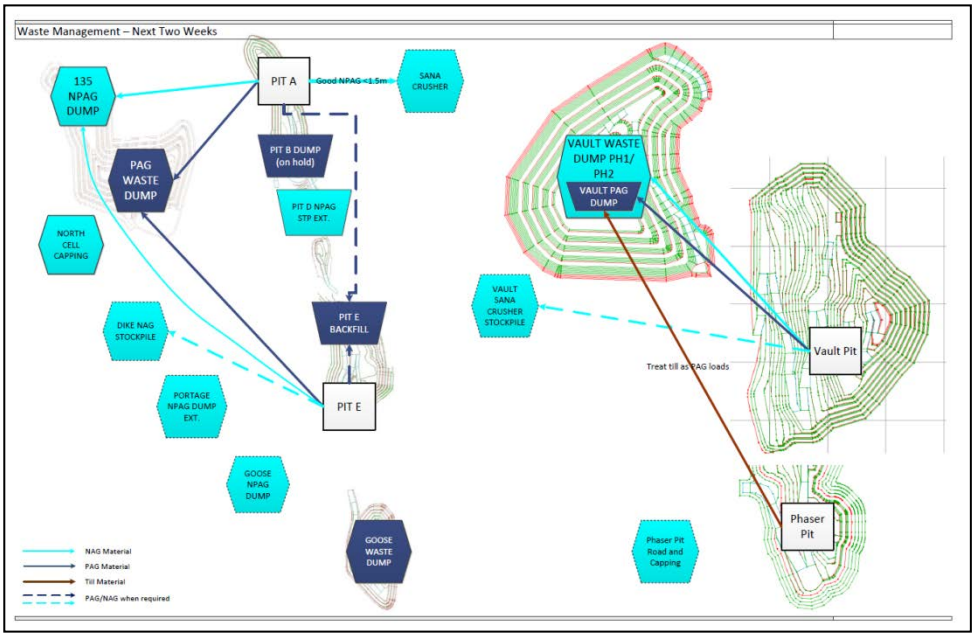

Figure 5: Two Weeks Waste Rock Material Management Diagram

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