

Final CRP 5.2.1.10.1 Site-Specific Climate Change Assessment	Given the uncertainty in climate change projections, it is not clear why only the 50th percentile for the 2120 projections were used in the engineering designs.	Recommend that DDMI also consider the 95th percentile to evaluate the upper end of the predicted modeling. It is important to measure the effectiveness of the designs if the impacts of climate change end up being on the upper end of the predictive modeling.
Final CRP 5.2.1.10.4 Pit Lake and Lac de Gras Water Quality Modelling - Mixing Zones	It is not clear why the mixing zone cell must have water for the entire year for the predictive modeling. This requirement requires the extension of mixing zones beyond the 100 -200 m for C1, C5 and C13.	Can DDMI please clarify why this requirement is necessary.
Final CRP 5.2.1.10.4 Pit Lake and Lac de Gras Water Quality Modelling - Mixing Zones	Meeting AEMP benchmarks at the mixing zone was part of the previous version of the CRP V4.1. It is not clear why DDMI has removed this as a closure criterion. DDMI has predicted water quality to meet the AEMP benchmark at Arc 1 (at least the 95th percentile to meet).	DDMI should return meeting AEMP benchmarks at the mixing zone boundary as a closure criteria for SW2. This will address concerns with potential chronic effects to aquatic life and will monitor the protection of potable water in Lac de Gras
DDMI Response to Technical Session Information Requests IR # 3 Proposed triggers for TSS to be added to the SWALF	Comments pertaining to the proposed TSS values are provided under comments for IR #4	See comment 9 below.
DDMI Response to Technical Session Information Requests IR # 4 and Attachment B: IR#4 Revised SWALF	<p>DDMI changed the approach for assessing whether closure objectives are met for surface water and seepage run off and the protection of human health, wildlife and aquatic life. They have developed a surface water action level framework (SWALF). Following the workshop and based on comments/questions from the workshop, DDMI completed an information request and proposed optional revisions to the SWALF. The following general comments regarding the SWALF and the optional changes to the SWALF are provided:</p> <p>a) The SWALF would benefit to illustrate SW1-1 and SW1-2 separately from SW2 (have human and wildlife separated from aquatic life). It appears that the DDMI is proposing to have the SWALF for humans, wildlife and aquatic life separated. This approach is supported and will add clarity to the process.</p> <p>b) Both the assessment of SW1 and SW2 would benefit from an early warning trigger. Exceedance of this early warning trigger would then result in a completion of the risk assessment and examining causation and potential mitigation measures. The timelines for action, as the SWALF is currently presented in the FCRP, are too long and are constrained by site conditions (e.g., ice). Early warning levels have been added to the SW1-1 and SW1-2 in the proposed changes in the Responses to Information Requests, they should also be added to the SW2 framework.</p> <p>c) for the SW2, stopping the discharge of surface water run-off or seepage water should occur before adverse effects are expected. An IC50 as a trigger level would not confer sufficient protection to aquatic life.</p>	<p>a) Present SWALF separately for human health and wildlife and aquatic life as proposed in the Responses to Information Requests.</p> <p>B) Implement a trigger level before the 10X AEMP or the SW1-1 and SW1-2 exceedance.</p> <p>c) AL3A trigger should be changed to toxicological impairment defined as an IC20 (not an IC50).</p>

<p>DDMI Response to Technical Session Information Requests IR # 4 and Attachment B: IR#4 Revised SWALF</p>	<p>DDMI has provided options for a revised SWALF. DDMI indicates that the SWALF approach may be more appropriate for regulation of a non-waste discharge. Based on the definition of waste provided by the Wek'èizhii Land and Water Board (WLWB) on March 6, 2023 of the technical sessions and based on the Government of Northwest Territories Response to Information Request, surface water and seepage drainage would be considered a waste. Therefore, is DDMI implying that the SWALF is not appropriate for measuring SW1 and SW2 closure objectives?</p>	<p>DDMI should provide clarification of the intended use of the SWALF and the measurement of SW1 and SW2 if it is not intended for a waste discharge.</p>
<p>DDMI Response to Technical Session Information Requests IR # 4 and Attachment B: IR#4 Revised SWALF Prior to reconnection - Collection Pond and updated Attachment D: Updated FCRP v1.0 Appendix X-27 Toxicity Sample Summary of the Surveillance Network Program Data)</p>	<p>The following comments pertain to the prior to reconnection - collection pond.</p> <p>A) It is not clear if the water quality in each pond has to meet these requirements once, or if these requirements need to be demonstrated for multiple sampling events. It is noted that a number of the ponds (i.e., 2, 3, 5 etc) have shown chronic toxicity in the updated SNP data (updated Appendix X-27), and that these results are variable. DDMI will need to demonstrate an understanding of variability.</p> <p>B) TPH &lt; 3 mg /L . 3 mg/L of TPH would result in a sheen on the water. Atlantic RBCA has derived surface water guidelines for Modified TPH (fuel and lube oil) of 100 µg/L (0.1 mg/L) for the protection of aquatic life. It is not clear the basis of the 3 mg/L value.</p> <p>C) TSS&lt;30 mg/L. The basis for this criterion is not presented. CCME indicates that there should be no more than an average increase of 5 mg/L from background levels for inputs that last between 24h and 30 d, or a maximum increase of 25 mg/L from background levels for an input that lasts less than 24 h. Given it is assumed the discharge will be longer than 24h and the median TSS for open water and ice cover is &lt;1 , can DDMI please justify a TSS&lt;30 mg/L.</p> <p>D) Toxicity testing for acute and chronic endpoints should include more than one test species.</p>	<p>A) DDMI should specify that these requirements need to be met for at least two sampling events completed at different times of the year (i.e., freshet and the fall), prior to submission to the inspector.</p> <p>B) DDMI should provide rationale/basis for the 3 mg/L. This value should be based on the protection of human health, wildlife and aquatic life.</p> <p>c) DDMI should consider having a TSS criterion of 5-6 mg/L.</p> <p>D) DDMI should add a fish species to the chronic toxicity testing</p>

<p>DDMI Response to Technical Session Information Requests IR # 4 and Attachment B: IR#4 Revised SWALF Wildlife</p>	<p>The following comments pertain to the proposed changes to the SWALF-wildlife</p> <p>A) The addition of an early trigger is positive and will reduce some concerns regarding the timelines for the response framework.</p> <p>B) Given that the detailed risk assessment could take multiple months to complete, the frequency of monitoring should be increased to confirm the SW1-2 is not exceeded during the completion of the risk assessment.</p> <p>C) the investigation of cause should commence when the 80% of the SW1-2 is measured (i.e., should be a level 1 response)</p> <p>D) It is not clear why measuring chemistry at the mixing zone boundary only makes sense for the protection of wildlife. Wildlife would be consuming water near the shores. As such, sampling in Lac De Gras near the discharge point should also be completed to determine if adverse effects are possible in the near shore waters where terrestrial wildlife could be expected to consume water.</p>	<p>A) Early trigger should be included in the final SWALF.</p> <p>B) Monitoring water quality at the breach location as well as along the path to Lac De Gras should occur weekly at a minimum until such time that the risk assessment is completed, water quality returns for at least three sampling events to below the early warning trigger concentrations or the investigation of cause has identified an issue that has been mitigated and water quality has returned to conditions lower than the trigger.</p> <p>C) Change investigation of cause to a Level 1 response instead of a level 2 response.</p> <p>D) Identify monitoring locations in the bay where discharge is occurring at near shore locations and determine water quality.</p>
<p>DDMI Response to Technical Session Information Requests IR # 4 and Attachment B: IR#4 Revised SWALF Human Health</p>	<p>The following comments pertain to the SWALF-Human Health</p> <p>A) The inclusion of an early warning trigger is a positive addition to the SWALF - Human health.</p> <p>B) Given that the detailed risk assessment could take multiple months to complete, the frequency of monitoring should be increased to confirm the SW1-1 is not exceeded during the completion of the risk assessment.</p> <p>C) the investigation of cause should commence when the 80% of the SW1-1 is measured (i.e., should be a level 1 response)</p> <p>D) Sampling at the mixing zone and at near shore areas should occur as Action Level 3 and compared with SW1-1 and drinking water guidelines (or AEMP).</p>	<p>A) Early trigger should be included in the final SWALF.</p> <p>B) Monitor water quality at a frequency of at least once a week until such time that water quality returns to lower than the early warning trigger.</p> <p>C) Move the "investigate cause" response to a Level 1 Response instead of a Level 2 Response.</p> <p>D) For Action Level 3 Triggers, water quality criteria should not exceed AEMP benchmarks or drinking water quality guidelines at the mixing zone boundary or near shore areas.</p>

<p>DDMI Response to Technical Session Information Requests IR # 4 and Attachment B: IR#4 Revised SWALF Aquatic Life</p>	<p>The following comments pertain to the SWALF for aquatic life:</p> <p>A) Action Response 1 indicates consideration of adjustment of the triggered parameters. It is not clear exactly what is meant by this but it appears that DDMI is suggesting that if there are exceedances of the 10X AEMP benchmark but no toxicity then the AEMP benchmark should be adjusted. This would require a very thorough investigation including looking at dose responses to numerous aquatic species. If DDMI does not think that the AEMP benchmarks are appropriate criteria, then the derivation of Site Specific criteria should have been completed prior to this point, but should definitely be completed and approved prior to closure.</p> <p>B) The investigation of cause should be moved to Action Response 1. As soon as AEMP X 10 benchmarks are exceeded, then acute and chronic toxicity testing and an investigation of cause should be triggered.</p>	<p>A) If AEMP benchmarks are determined not to be applicable, then they should be adjusted to site-specific criteria prior to closure. Adjusting closure criteria during closure and post-closure should be avoided.</p> <p>B) Move investigation of cause to Action Response 1.</p>
<p>DDMI Response to Technical Session Information Requests IR # 4 and Attachment B: IR#4 Revised SWALF Aquatic Life</p>	<p>Cont'd: C) DDMI added three triggers from AEMP monitoring, namely AEMP fish, AEMP plankton &amp; benthic invertebrates and AEMP WQ. i) The critical effects or effects thresholds proposed by DDMI (i.e., 1.5 X or 50% lower or greater than an effects threshold) are much higher than what would be acceptable under the Environment Canada Metal Mining Technical Guidance for Environmental Effects Monitoring (EC 2012) (between 10- 25% difference). A 50% difference from reference concentrations does not result in no effect to aquatic life and therefore does not appear to be a suitable criteria. ii) It is also not clear what CES is being proposed. For example for AEMP fish, Action 2 Trigger is stated to be Near Field (NF) mean is significantly different than reference conditions (RC) mean and magnitude &gt;1.5X Critical Effects size (CES). It is not clear if this includes all the fish health components as specified in Appendix VI of the FCRP including reproduction, survival and condition, or what it is referencing. iii) the criteria proposed to trigger an action level should be measurable, enforceable, with little or no interpretation needed and timely. The inclusion of the AEMP criteria for fish, plankton and benthic and WQ introduces ambiguity and interpretation that will make enforcement and compliance difficult. For example, the interpretation of the AEMP data relies on identifying outliers and removing data as "not representative".</p> <p>D)TSS - &gt;15 mg/L average or 30 mg/L grab is again higher than what would normally be proposed based on guidance from CCME. See comment 9 for additional details.</p>	<p>C) Remove AEMP monitoring triggers from SWALF, add meeting AEMP benchmarks at the mixing zone boundary.</p> <p>D) See comment 9 recommendations for TSS criteria.</p>

DDMI Response to Technical Session Information Requests IR # 4 and Attachment B: IR#4 Revised SWALF Aquatic Life	<p>Cont'd: E) It is unclear the purpose of "confirming biological sampling locations" and "examining ecological significance". These should all be defined in the study design and in the proposed monitoring programs.</p> <p>F) Action level 3 triggers: IC50 at the mixing zone is inappropriate and would not meet closure objectives. There should be no chronic toxicity to more than one species at the mixing zone boundary (IC20). AEMP criteria should be removed from the SWALF. AEMP benchmarks should be added.</p> <p>G) sediment quality within the mixing zone should be added to the SWALF</p> <p>Reference: EC (Environment Canada), 2012. Metal Mining Technical Guidance for Environmental Effects Monitoring</p>	<p>E) Remove reference to evaluating sampling locations and examining ecological significance.</p> <p>F) C.dubia IC50&lt;100% should be replaced with C.dubia IC20 and a fish chronic toxicity test should be added with an IC20 trigger.</p> <p>G) Add sediment quality monitoring and comparison to EQG for sediment to the SWALF in the mixing zones for each discharge point.</p>
DDMI Response to Technical Session Information Requests IR # 8 Hydrodynamic conditions	Based on the figures provided in the response for information requests it appears that there is very little current/movement of water within each of the discharge areas for breaching ponds. With very little current speed in these shallow areas, one would expect sedimentation to occur. It is not clear why closure criteria for sediment have not been included in the FCRP or the SWALF.	Monitoring of sediment quality and the potential impacts to aquatic life should be included in the SWALF and FCRP.
Appendix V of the FCRP Table 2 Surface runoff and seepage water quality criteria	It is not clear why, if available, the BC Recreational Water Quality Guidelines were not used directly. For example BC has recreational guidelines for nitrate and nitrite.	<p>DDMI's response to comment 80 on the WLA was accepted.</p> <p>DDMI should include a comparison of all monitoring data collected to evaluate SW1-1 and all surface water data collected at ARC1 with drinking water guidelines and highlight any exceedances of these guidelines.</p>
Appendix V of the FCRP Table 2 Surface runoff and seepage water quality criteria	While EMAB understands that the risk assessment (X-22) did not predict an exceedance of the criteria protective of potable water at ARC-1, this evaluation is based on modeled and not measured concentrations. Comparison with AEMP benchmarks should be added to the SWALF and closure criteria for SW1-1.	Monitoring of potable water quality should be added to the closure criteria for SW1-1.
Appendix V of the FCRP Table 2 Surface runoff and seepage water quality criteria	DDMI has reduced the consideration of sediment impacts to PHC F3 in the closure criteria. However, the HHRA identifies potential risks to human health from sediment impacts of uranium and arsenic. Sediment monitoring, especially in future discharge areas should be added to the closure plan as closure criteria to meet Closure Objectives.	Sediment monitoring, especially in future discharge areas should be added to the closure plan as closure criteria to meet Closure Objectives.
Appendix VI-1 Section 3.1.4.3 Post-closure Monitoring	There are general concerns with the mixing zones and the mixing under low flow/low currents as well as ice cover. As this may affect deposition into sediments, EMAB is of the opinion that sediment impacts should be monitored.	Diavik should monitor Sediment impacts in mixing zones.

Appendix VI-1 Section 3.1.4.3 Post-closure Monitoring for SW1 and SW2 (Pond Breach)	Diavik indicated that after the completion of closure activities on site, monitoring for chemical and toxicity analysis will be reduced to twice annually. The WL amendment and FCRP should indicate that any proposed reduction in sampling frequency will be subject to board approval.	The WL amendment and FCRP should indicate that any proposed reduction in sampling frequency will be subject to board approval.
Appendix VI-1 Section 3.1.4.3 Post-closure Monitoring for SW1 and SW2 (Mixing Zones)	Mixing zones are proposed to be sampled once annually for two years following decommissioning. Given the uncertainty in the predictive modelling together with the uncertainty in the climate change models, two years of monitoring following decommissioning is likely insufficient.	Triggers for stopping monitoring should be defined (i.e., no significant change for X years, for example) and the WL Amendment and FCRP should include wording to indicate that any change to the monitoring frequency and duration is subject to Board approval.
Appendix VI-1 Section 3.1.4.4 Comparison to Closure Criteria	The text indicates that 5 years of data will be used to determine achievement of SW1 and SW2 and that a weight of evidence approach will be applied. In it's response to EMAB comment 29, Diavik said that the specifics of the weight of evidence approach will be described in the Performance Assessment Report. The WL Amendment and the FCRP would benefit from additional details regarding what will be considered in the weight of evidence approach as well as factors that will be considered to reduce or alter the monitoring requirements.	Diavik should provide details of what will be included in the performance assessment reports for the WLA and the FCRP. The information contained in the performance assessment reports should also be indicated to be subject to board approval.
Appendix VI-1 Section 3.1.4.4 Comparison to Closure Criteria - Surface Water Action Level Framework	<p>The basis for the Action Level 1 (AL1) trigger of 10 X AEMP benchmarks for aquatic life has not been provided in this section. DDMI should provide the basis and assumptions used in the setting of the action level. If DDMI is assuming that more than a 10X fold dilution will occur before ARC1 and therefore the 10X AEMP is a conservative trigger, then it is not clear why they are not setting the closure criteria to meeting the AEMP benchmarks at ARC1. Meeting an IC/EC50 at ARC1 does not confer suitable protection for aquatic life and would not enable DDMI to meet their closure objective of no adverse effect to aquatic life.</p> <p>The proposed amendments to the SWALF, by adding AEMP fish and benthic &amp; plankton, adds ambiguity to the SWALF and should be removed. The trigger levels also for differences between reference conditions and near shore would not be protective of no adverse effect to aquatic life .</p>	<p>Once the dilution factor at each point of discharge is verified with data to be reliable, then DDMI should set a suitable protective early trigger level at each discharge point based on the assumption that the AEMP benchmarks will be met at the end of the mixing zone (ARC1). If AEMP benchmarks are not met, then chronic toxicity testing using multiple species should be the next action level with anything above an IC20 triggering another action level (i.e., stop releasing discharge to Lac de Gras).</p> <p>References to the AEMP fish and AEMP plankton &amp; benthic should be removed and the effect level for AEMP WQ needs to be revised.</p>

<p>Appendix VI-1 Section 3.1.4.4 Comparison to Closure Criteria - Surface Water Action Level Framework</p>	<p>The timeline for an exceedance to be observed and a risk assessment to be completed is too long for discharge at concentrations of concern to continue. As such the trigger levels and action items for human health and wildlife are not acceptable as presented.</p> <p>DDMI has proposed an early action level trigger, whereby the risk assessment would be started when the water quality is 80% of the criteria. This is a positive proposed change to the SWALF. The investigation of causation should also commence at this earlier trigger action level.</p>	<p>DDMI should consider replacing the Action Level 0/1 with an early warning trigger. A fundamental issue with the SWALF is that the first criteria is a level where impacts are expected and the timeframe to confirm and mitigate those effects for human, wildlife and aquatic life is either too long or uncertain. No mitigation measures are in place if that first level is exceeded until such time that additional testing can be safely completed or until a risk assessment can be completed. DDMI should add another "warning level" trigger that would commence action prior to concentrations being that were where adverse effects could be expected. This applies to human health, wildlife and aquatic life.</p> <p>DDMI has proposed optional amendments to the SWALF in the response to Information Request (IR#4) which includes an early trigger. This early trigger concept should be captured in the final SWALF if it is to proceed.</p>
<p>Appendix VI-1 Section 3.1.4.4 Comparison to Closure Criteria - Surface Water Action Level Framework</p>	<p>An exceedance of the current SW1 and SW2 Action Level 0/1 suggests the potential for adverse effects to be occurring, as such mitigation measures need to be implemented immediately to eliminate the potential risk. The time frame required to complete a risk assessment and identify source/mitigation controls is too long when a potential adverse effect is occurring. As such, EMAB recommends that an early warning trigger sign be used (such as a percentage of the SW1/SW2 criteria) to instigate the risk assessment and source investigation.</p> <p>DDMI has proposed an early warning trigger as a potential option in the response to Information Request (IR#4). This early warning trigger together with an investigation of causation would help to alleviate the concern of the timeline. DDMI should commit to a timeline to have these completed in the WLA and FCRP.</p>	<p>EMAB recommends that an early warning trigger sign be used (such as a percentage of the SW1/SW2 criteria) to instigate the risk assessment and source investigation.</p> <p>DDMI has proposed an early warning trigger for SW1 that will help to alleviate concerns with timeframes. DDMI should also incorporate an early warning trigger for SW2 into the SWALF for aquatic life.</p>

<p>Appendix VI-1 Section 3.1.4.4 Comparison to Closure Criteria - Surface Water Action Level Framework</p>	<p>DDMI indicated that meeting an IC25 at an 8 fold dilution would be predictive of meeting an IC50 at 100% at the end of the mixing zone. This may be true, but it would be dependent on the steepness of the dose response curve, and the dose response curve could change depending on the composition of the discharge. In addition, an IC50 at the end of the mixing zone is unacceptable. To meet their closure criteria there needs to be no adverse impact to aquatic life. An IC20 is typically used as a benchmark to indicate that although some impacts will be seen, it is unlikely to cause adverse effects to aquatic life. As such, the threshold criteria at the end of the mixing zone needs to be a criteria to which unacceptable impacts to aquatic life are not anticipated.</p>	<p>EMAB suggests that DDMI 1) confirm the dilution required at the discharge point to the end of the mixing zone at each discharge point using information representing the worst case scenario. The trigger level to the required dilution factor to meet the AEMP at the mixing zone boundary could then be applied (i.e., <math>DF * AEMP</math>), along with no acute toxicity and no chronic toxicity at the IC20 for that dilution factor. If there is an exceedance or toxicity is present, then if weather permits, sampling at the end of the mixing zone should be completed within 7 days. Water quality at the end of the mixing zone should meet the AEMP benchmarks and there should be no chronic effects to at least an invertebrate (<i>C. dubia</i>) and a fish species (rainbow trout) at an IC20 level. If there is chronic toxicity then mitigation measures need to be implemented and discharge to Lac de Gras stopped. If weather does not permit sampling at the end of the mixing zone, then sampling should occur as close to the mixing zone as possible or mitigation measures stopping discharge should be implemented, until such time a repeat of the testing at the discharge location can be completed with confirmatory sampling at the end of the mixing zone occurring within 7 days.</p>
<p>Appendix VI-1 Section 3.1.4.4 Comparison to Closure Criteria - Surface Water Action Level Framework Figure 3-3</p>	<p>The response to EMAB's comment on revision of criteria under SWALF Action Level 0/1 is not clear; what is meant by the phrase "at the threshold of AEMP Benchmarks.." AEMP benchmarks are based on chronic toxicity being at or below IC20. If AEMP benchmarks are met, there should be no toxicity above an IC20 for any test species tested.</p> <p>If DDMI expects AEMP benchmarks to not be suitable criteria, then they should propose site-specific criteria prior to site closure. Criteria shouldn't be changed during closure to meet the actual closure conditions.</p>	<p>The SWALF should be clarified to illustrate the situations where criteria maybe revised and should also indicate that criteria will not be changed without Board approval. If DDMI does not think that AEMP benchmarks are appropriate, then site-specific criteria should be developed and proposed prior to closure.</p>

<p>Appendix VI-1 Section 3.1.4.4 Comparison to Closure Criteria - Surface Water Action Level Framework</p>	<p>The SWALF should clearly identify what toxicity tests are being completed. Currently the level of protection to aquatic life at the mixing zone boundary is not suitable to protect aquatic life in Lac de Gras.</p>	<p>The threshold of toxicity should be an IC20 and not an IC50. An IC50 would mean adverse impacts to 50% of the test organisms and is not an appropriate threshold to protect aquatic life. In addition, more than one species should be tested for chronic effects at the AL2A. Chronic testing of an invertebrate (<i>C.dubia</i>) and a fish (rainbow trout) should be completed at a minimum. Chemistry data should also be collected as part of the AL2A and compared with AEMP benchmarks to help identify the potential constituents causing the toxicity.</p>
<p>Appendix VI-1 Section 3.1.4.4 Comparison to Closure Criteria - Surface Water Action Level Framework Figure 3-3</p>	<p>The action level and response box for AL2A suggests to review the dilution factor at the mixing zone boundary. DDMI has indicated that this review may be necessary if their predictions/expectations are incorrect. The dilution within the mixing zone should be studied and known prior to breaching the ponds.</p>	<p>The SWALF should indicate that no changes to the criteria will be made without approval from the Board. DDMI should also present the information for each discharge point where they determined the required dilution factor. This information should look not only at the average conditions, but also at the "worst case".</p>
<p>Appendix VI-1 Section 3.1.4.4 Comparison to Closure Criteria - Surface Water Action Level Framework Figure 3-3</p>	<p>The closure objective for SW2 is "Surface runoff and seepage water quality that will not cause adverse effects on aquatic life or water uses in Lac de Gras or the Coppermine River. " A mixing zone is based on the understanding that somewhat elevated concentrations can occur in a small area of a receiving water body without significantly affecting the integrity of the water body as a whole. However, at the end of the mixing zone, water quality should meet water quality guidelines protective of aquatic species and the most sensitive use of the water. Water quality guidelines are derived to be "protective of all forms of aquatic life and all aspects of aquatic life cycles" with the goal to protect "all life stages during an indefinite exposure to water" (CCME, 2007). Guidelines are preferentially derived using the lowest observed effect level from a chronic study using a non-lethal endpoint for the most sensitive life stage of the most sensitive species. If a chronic lowest effect level isn't reported, then an Acute to chronic ratio (ACR) can be used (CCME, 2003) As such, federal guidance does not consider an IC50/EC50 to be appropriate as an indicator of no adverse effect to aquatic life.</p> <p>CCME, 2007. A Protocol for the Derivation of Water Quality Guidelines for the Protection of Aquatic Life 2007.</p> <p>CCME, 2003. Guidance on the Site-Specific Application of Water Quality Guidelines in Canada: Procedures for Deriving Numerical Water Quality Objectives.</p>	<p>DDMI should change the Action Outcome of Toxicity impairment IC50 at the mixing zone boundary to Toxicity Impairment IC20 at the mixing zone boundary so as to meet their closure objectives.</p>

Appendix VI-1 Section 3.1.4.4 Comparison to Closure Criteria - Surface Water Action Level Framework	If there is toxicity at the AL2A trigger, then this will trigger a AL3A response which will include re-establishing water collection, conducting additional studies to determine effects, toxicity evaluation and identifying mitigation measures. If no "practical" mitigation measures are identified, then DDMI proposes the completion of an environmental trade-off study. DDMI should at least at a conceptual level indicate what would be considered in a trade-off study and that water treatment will be implemented.	DDMI should provide at a conceptual level what would be involved in a trade off study, who would be consulted, the timeframe and the decision process.
Appendix VI-1 Section 3.2.3.1 Overview of Closure Objectives, Criteria and Monitoring Activities (open pit, underground and dike areas)	It is not clear why the criteria for SW2 is different than the criteria for M1. At the end of the mixing zone, the AEMP should apply.	DDMI should add meeting the AEMP benchmarks to the SWALF as a criteria to be met at the mixing zone boundary.
Appendix VI-1 Section 3.3.3.1 Overview of Closure Objectives, Criteria and Monitoring Activities (Waste Rock Storage and Till Areas)	Closure criteria W3-3 should be based on meeting the closure objective, which is Contaminated soils and waste disposal areas that cannot contaminate land and water.	Modify the TPH criteria to be risk-based and designed to measure the closure objectives.
Appendix VI-1 Section 3.5.2.4 Comparison to Closure Criteria (North Inlet)	The second paragraph refers to the AEMP Effects Benchmarks (FCRP Appendix V) as compliance criteria. The AEMP Effects Benchmarks do not seem to be present in Appendix V of the FCRP. References to the AEMP in Appendix V are present in other areas of the document (i.e., Section 3.6.2.4).	DDMI should correct the references to the AEMP Criteria throughout the document
Appendix X-25, Section 4.1.1, P.37	The mixing zones proposed by DDMI remain too large. ARC 1 should be the mixing zone boundary at which chronic effects to aquatic life are not expected.	It appears that DDMI's approach to the protection of aquatic life would not result in meeting their closure objective of no adverse impacts to aquatic life. Mixing zones need to be as small as possible and the end of the mixing zone (ARC1) should not result in chronic effects to aquatic life. Mixing zones need to be reduced and the action levels defined in the SWALF need adjustment as discussed in previous comments and recommendations.
Appendix X-25, Section 4.3.1.1	Table 15- the species specific HQ was presumably derived from the LC50 for Daphnia and trout from Table 13, a benchmark by which 50% of test organisms die. Clarification should be provided how an HQ that is less than 1 based on an LC50 for different contaminants is in fact protective of those organisms.	DDMI's response to comment 91 on the WLA was accepted, the reliance on literature models needs to be validated with site-specific toxicity testing to confirm the lack of acute lethality. Acute toxicity testing is being conducted as part of the AEMP monitoring.  Confirm model prediction of no acute lethality with toxicity test results collected as part of monitoring programs.

Appendix X-25, Section 4.3.1.1	Given that stakeholders have described considerable issues with dust and having to brush dust from the mine off of their clothing when they were situated at a distance from the mine, it is questionable whether these locations represent unimpacted areas from mine activity. EMAB suggests that the data relied upon as reference locations be compared with data collected pre-mining activity to confirm that they are indeed unimpacted by mining activity.	EMAB recommends that the data relied upon as reference locations be compared with data collected pre-mining activity to confirm that they are indeed unimpacted by mining activity.
Appendix X-25, Section 4.4	It is not supported to provide an interpretation of magnitude of risk based on a predicted HQ above 1. HQs cannot be linearly scaled to risk because the intercept, slope and shape of the dose-response relationship is not reflected in the point estimate HQ. Reliable comparisons can only be made through detailed understanding of the underlying concentration-response relationships, safety (application) factors, and uncertainties, none of which are conveyed by an HQ.	EMAB recommends that DDMI remove reference to low risk from an HQ of 5 in Table 19.
Appendix X-25, Section 4.4	It is acknowledged by DDMI that uncertainty remains with the BLM and Windward models in that predicted concentrations e.g., of copper are lower than concentration in natural conditions of Lac de Gras which seems unrealistic. This seems to underestimate the input and end concentrations in Lac de Gras which potentially underestimates risk.	DDMI should verify modelling results and once monitoring commences confirm with measured data whether the predictions are accurate.

<p>Appendix X-25 FCRP V1.0 Human Health and Ecological Risk Assessment Section 6.3.1 Table 30 and 31</p>	<p>The reviewer agrees with providing an interpretation of risk based on contribution from the mine to background conditions, however, an unacceptable risk should not be identified only if the difference in the risk from the mine is greater than the acceptable risk threshold.</p> <p>As per Alberta Health guidance (referenced in DDMI's response) "The primary outcome of a quantitative HHRA is to estimate the risk of potential adverse health effects on an individual, community or population that could arise from changes in environmental quality due to the proposed project alone and combined with the cumulative impact from other existing and planned projects, as well as inclusion of ambient or baseline conditions in the region. By comparing the predicted risks with the relevant protection goals, the overall effect of a project on human health, and the significance of the effect, can be assessed".</p> <p>Alberta's guidance is to assess the risk from the project alone, and to assess the risk from the project in addition to reference and other local contributions. BC's guidance indicates that any parameter that has a measurable increase from baseline conditions (measurable increase is defined as a predicted increase equal or greater than the lowest laboratory RDL) due to project activities is to be kept as a COPC and retained for assessment.</p> <p>As such DDMI should consider re-evaluating the potential risks to be any of those that are predicted to be greater than the acceptable risk thresholds where mining activity has resulted in a potential increase in exposure.</p>	<p>DDMI should revise the approach taken in the HHRA to identify and discuss all risks above background.</p>
<p>Appendix X-25 FCRP V1.0 Human Health and Ecological Risk Assessment Table 30 and 31</p>	<p>DDMI should discuss all parameters where the HQ or ILCR are above the acceptable risk threshold and mining activity has contributed to exposure.</p>	<p>Additional discussion should be added for all parameters where potential unacceptable risks are identified and the mine contributed to exposure.</p>
<p>Appendix X-25 FCRP V1.0 Human Health and Ecological Risk Assessment Appendix I Section 2.3</p>	<p>How is DDMI addressing the uncertainty as the arsenic concentrations predicted are below the range for which the in vitro/in vivo validation are available and below the range used to develop the regression equation.</p>	<p>DDMI should provide a discussion of the uncertainties associated with relying on a model for which the predicted concentrations of arsenic are outside the validation range.</p>
<p>Appendix L Water Quality Screening Criteria Section 2.2 Human Health</p>	<p>Diavik intends to replace the Aquatic Effects Monitoring program Response Framework with the SWALF after mine closure. The predicted concentrations were below the drinking water guidelines, however, until such time that the model is validated and is accurately predicting concentrations at the end of the mixing zone, the comparison to drinking water guidelines should be completed as part of the closure monitoring.</p>	<p>DDMI should add Drinking Water Guidelines to the SWALF</p>