

Review Comment Table

Board:	MVLWB
Review Item:	DIAND-GIANT - Water Licence Post-EA Information Package â€™ MV2007L8-0031 (2 of 7)
File(s):	MV2007L8-0031 MV2019X0007
Proponent:	DIAND - GIANT
Document(s):	Post-EA Information â€™ Cover Page, Water Licence Information, Updated Project Description, and Proposed Licence Conditions (5.54 MB) Proposed Surveillance Network Program (Proponent) (580.03 KB) Response to Pre-Engagement Reviewer Comments (431.01 MB) Technical Session Presentations (20 MB) Technica Session Agenda (5 MB) Technical Session Agenda Update (5 MB)
Item For Review Distributed On:	Apr 10 at 13:33 Distribution List
Reviewer Comments Due By:	May 30, 2019
Proponent Responses Due By:	June 25, 2019
Item Description:	<p>This is Review item number 2 of 7 associated with the Giant Mine Remediation Project. On April 8, 2019, an e-mail was distributed to the Giant Mine distribution list which provided a detailed explanation of the Online Review System (ORS) plan for the Giant Mine Remediation Project. If you did not receive an e-mail or require additional information, please contact Board staff identified below.</p> <p>History The Giant Mine, located in Yellowknife, produced gold from 1948 until 1999. After the mine owner (Royal Oak Mines Ltd.) went into receivership in 1999, the mine was transferred to Department of Indian Affairs and Northern Development (DIAND). Immediately thereafter, DIAND entered into an agreement by which Miramar Giant Mine Ltd. continued to operate the mine, with the gold ore shipped offsite for</p>

processing, from 1999 until 2004. Mining ceased in July 2004 and DIAND again took control of the site. The Giant Mine became "orphaned and abandoned" when Miramar Giant Mine Ltd. was assigned into bankruptcy.

On October 18, 2007, DIAND applied for Type A Water Licence, MV2007L8-0031 to cover the remediation of Giant Mine and ongoing maintenance and monitoring of the site. On March 31, 2008, the City of Yellowknife referred the Licence application to the Mackenzie Valley Environmental Impact Review Board (MVEIRB) for Environmental Assessment on the basis that the proposed activities to take place during the term of the Water Licence will have, in the City's opinion, an adverse impact on the environment within its municipal boundaries. On June 20, 2013, MVEIRB released its Report of Environmental Assessment (EA 0809-001 or REA) for the Giant Mine Remediation Project. The Minister of DIAND provided approval of the REA, including modified measures on August 11, 2014.

Since 2014, the Giant Mine Remediation Team (GMRT) has worked towards fulfilling the requirements of the 26 Measures set forth in the REA. Since the conclusion of the EA, DIAND has been undertaking care and maintenance activities at Giant Mine under section 89 of the Mackenzie Valley Resource Management Act (MVRMA).

On April 1, 2019, the Department of Indian Affairs and Northern Development - Giant Mine (GMRT) submitted the Post Environmental Assessment (Post-EA) Information Package to the Mackenzie Valley Land and Water Board (MVLWB or the Board).

Board staff have determined that the Department of Indian Affairs and Northern Development - Giant Mine (GMRT) submitted a complete response to the Board's August 20, 2014 Post-EA Information Request. The purpose of this Application is to support the remediation of the Giant Mine site which is located within the boundaries of the City of Yellowknife.

Instructions

Reviewers are invited to submit comments and recommendations on GMRT's Post-EA Information Package using the Online Review System (ORS) by the review comment deadline specified below. If reviewers seek clarification on the submission, they are encouraged to correspond directly with the proponent prior to submitting comments and recommendations.

Reviewers may also wish to consider providing an overarching recommendation regarding whether they are in support of the submission, to provide context for comments and recommendations and to assist the Board with its decision.

Please provide comments and recommendations on the following components of the Post-EA Information Package including:

- Post-EA Information Package – Cover Page and Updated Project Description;
- Proposed Draft Licence Conditions (Proponent);
- Proposed Surveillance Network Program (Proponent); and
- Response to Pre-Engagement Reviewer Comments.

Board staff would also like to note that further supporting documentation can be found in ORS reviews:

- DIAND-GIANT - Land Use Permit Application – MV2019X0007 (1 of 7)
- DIAND-GIANT - Management Plans Group 1 (Standard) – MV2019X0007 and MV2007L8-0031 (3 of 7)
- DIAND-GIANT - Preliminary Screening Information – MV2019X0007 and MV2007L8-0031 (4 of 7)
- DIAND-GIANT - Closure and Reclamation Plan – MV2019X0007 and MV2007L8-0031 (5 of 7)
- DIAND-GIANT - Management Plans Group 2 (Water) – MV2019X0007 and MV2007L8-0031 (6 of 7)
- DIAND-GIANT - Management Plans Group 3 (Other) – MV2019X0007 and MV2007L8-0031 (7 of 7)

The documents that have been uploaded to this review are also available on our public Registry. If you have any questions or comments about the ORS or this review, please contact Board staff identified below.

Water Compensation:

Issues of water compensation must also be identified by the review comment deadline identified below.

Work Plan:

A draft work plan was distributed by e-mail on April 8, 2019. If you did not receive an e-mail or require additional information, please contact Board staff identified below. Feedback on the draft work plan is requested by April 16, 2019. The intention of this work plan is to provide a proposed timeline for this (the

	<p>Post-EA Information Package) Licence proceeding. Please note the timelines are approximate, and subject to change due to Board, proponent, and reviewer schedules.</p> <p>Draft Licence Board Staff's Draft Licence conditions will be provided for review later in the process (see draft work plan). The purpose of the draft Licence is to allow parties to comment on proposed Licence conditions and schedules. These draft materials are not intended to limit in any way the scope of parties' comments. The Board is not bound by the contents of the draft Licence and Permit and will make its decision at the close of the proceeding on the basis of all the evidence filed by all parties.</p> <p>The documents that have been uploaded to this review are also available on our public Registry.</p> <p>If you have any questions or comments on this review or other reviews, please contact Board staff below: Shannon Allerston 867-766-7465 sallerston@mvlwb.com Tyree Mullaney 867-766-7464 tyree@mvlwb.com Kimberley Murray 867-766-7458 kmurray@mvlwb.com</p>
General Reviewer Information:	<p>The following organization has received this review by fax:</p> <p>NWT Metis Nation Tim Heron NWTMN IMA Coordinator (867) 872-3586</p>
Contact Information:	<p>Kim Murray (867) 766-7458 Shannon Allerston 867-766-7465 Tyree Mullaney 867-766-7464</p>

Comment Summary

DIAND - GIANT (Proponent)				
ID	Topic	Reviewer Comment/Recommendation	Proponent Response	Board Staff Response
1	General File	Comment (doc) ORS 2 - Attachment 1 - GMRP Climate Change Review		

		Memo Recommendation		
2	General File	Comment (doc) ORS 2 - Attachment 2 - Contaminated Soils Response Recommendation		
Alternatives North: Thomas Katharine				
ID	Topic	Reviewer Comment/Recommendation	Proponent Response	Board Staff Response
1	Closure criteria P2-1	<p>Comment The primary design plan for pit covers and tailings covers appears to consist of an impermeable membrane surmounted by a depth of granular fill. Although the design intent is to prevent ponding of water on tailings covers, any ponding would presumably occur at the level of the geomembrane below the overtopping fill, and be difficult to visually observe other than in extreme cases. Similarly, subsidence events that may compromise the integrity of the geomembrane itself may also prove difficult to identify through visual inspection. Similar pits in other locations often use clay as a liner. Is clay available in sufficient quantity and if so was this considered for Giant?</p> <p>Recommendation Alternatives North (AN) recommends that the Giant Mine Remediation Project (GMRP) clarify how effective monitoring of shallow graded pit covers may identify ponding</p>	<p>June 25: Open pit closure design studies are ongoing however the GMRP is current thinking is that engineered covers will not be integrated into the pit closure design. If pit covers are required, they will be graded to reduce ponding and if any differential settlement is noted re-grading will be carried out. If a cover with a geomembrane similar to the tailings cover is used, limited (non-visible) ponding would only result in very little infiltration in terms of total volume. Any infiltration would report to the mine pool and be treated. As per the CRP section 5.3: Open Pits, if pit covers are required either a rockfill layer with a geosynthetic barrier layer (as chosen for tailings), or a rockfill cover with compacted fine-grained soil would be used. Monitoring of geomembrane from surface includes observing for excessive deformation of engineering cover and testing water</p>	

		<p>or loss of integrity of geomembranes in the absence of clear visual data. What, if any, measures may be instituted to monitor for the occurrence of such ponding or loss of geomembrane integrity?</p>	<p>quality of runoff. If excessive differential deformation is observed, the rockfill layer would be excavated to expose the geomembrane and the repair would be complete, as required.</p>	
2	WTP outflow	<p>Comment Water Treatment Plant (WTP) effluent is predicted to be denser than surface water, creating a sinking plume, and to dilute less efficiently during under ice conditions. Modelling may need to be done to assess the possibility that this may represent a seasonally heightened risk to benthics in the outflow area.</p> <p>Recommendation AN recommends modelling of under ice dispersal from the Yellowknife Bay water outfall be followed up with monitoring of benthics in the area during winter conditions once built to verify the extent to which benthic communities may be impacted. Will there be possible seasonal alterations to the use and rate of outflow of the WTP, or differing expectations about the dispersal of contaminants under these conditions?</p>	<p>June 25: The GMRP will monitor benthic invertebrates in sediment near to the outfall area in the AEMP. The location of the monitoring stations is still under review and would be included in the Yellowknife Bay AEMP, which would be for MVLWB approval prior to discharge from the new WTP and outfall. In general, some changes to benthic invertebrate communities will occur with the dredging/covering of contaminated habitat and replacement with new habitat in the area of the outfall and there might be a lag time for communities to colonize the new habitat. Modelling has been done to predict under-ice and open water behaviour of the plume (please refer to EQC Report, Appendix E, Section E.2.2-4). Modelling assumed steady state flow and indicated some changes in dispersal patterns of the plume between open-water conditions and under-ice conditions. For example, the dilution factor at the end of the turbulent mixing zone under-ice was</p>	

			<p>approximately 30 whereas during open-water conditions the dilution factor was between 39 and 44. Seasonal alterations to the WTP outflow rate have not been modelled. In general, under-ice benthos sampling poses health and safety challenges near any outfall in winter; fall benthos sampling is proposed, which still captures any possible effects from the previous winter and would allow consistency with the past sampling programs.</p>	
3	WTP outflow	<p>Comment Treated water outflow to Great Slave Lake is anticipated to result in a sinking plume as a result of being denser than lake surface water. If there is a possibility of water outflow from the WTP being warmer than winter lake temperatures, perhaps this might result in a rising plume seasonally during under ice conditions.</p> <p>Recommendation AN recommends that the GRMP clarify whether any significant temperature differential may exist between water released by the WTP during winter time and the under ice lake water in the mixing zone. Would such an occurrence possibly alter dispersal patterns in the mixing zone or cause a change in ice thickness in the outflow area?</p>	<p>June 25: Please refer to the response for Alternatives North #2, and Appendix E of the EQC Report for more details on dispersal patterns during open water and under-ice conditions. Near-field dispersion modelling was completed on the effluent discharge to Yellowknife Bay (Please refer to EQC Report, Appendix E, Section E.2.2-4). During the ice-covered season, the temperature of the effluent was assumed to be 6 degrees C and the water in the Yellowknife Bay is assumed to be 0.3 degrees C. The potential for thin-ice due to this temperature differential was discussed in SDE and input from communities on the location of the outfall was considered. The outfall location was moved to the near-shore to reduce</p>	

			health and safety risks (please refer to section 5.8 of the CRP). Ice-thinning would be monitored post construction of the outfall and signage and other communication would be used to warn workers and the public of risks of possible thin ice. (Please refer to New Effluent Treatment Plant - Outfall Location Options Analysis, Appendix 5.8B to the CRP (AECOM 2017a).	
4	Freeze program	<p>Comment The effects of future climate warming on the freeze program design have been accounted for by considering a 6.1°C increase to the mean annual air temperature over the next hundred years, based on stabilization scenarios in the International Panel on Climate Change 5th assessment report. That assessment has been demonstrated to be overly conservative in its warming predictions since its publication in 2014, as more recent climate research indicates the potential for significantly greater warming. Of particular note are findings that climate sensitivity is higher than previous estimates and also nonlinear, increasing as temperatures rise (Tobias Friedrich, Axel Timmermann, Michelle Tigchelaar, Oliver Elison Timm, and Andrey Ganopolski: Nonlinear climate sensitivity and its implications for</p>	<p>June 25: In line with recent climate change findings by Environment and Climate Change Canada, Canadian Centre for Climate Modelling and Analysis (CCCMA) and the IPCC 2014, the GMRP has recently reevaluated its climate change assumptions and made revisions to those reported in the CRP. The CRP specified a MAAT of 6.1oC based on IPCC 2007 projections. In 2014, the IPCC released its Fifth Assessment Report, and used Representative Concentration Pathway (RCP) scenarios to depict a range of possible future concentrations of atmospheric greenhouse gases, air pollutants and land use scenarios. Baseline scenarios, which do not include any mitigation effort to constrain greenhouse gas emissions result in pathways that fall between RCP 6.0 and RCP 8.5. As such, the RCP 8.5 scenario reflects a</p>	

		<p>future greenhouse warming, Science Advances 09 Nov 2016: Vol. 2, no. 11, e1501923. DOI: 10.1126/sciadv.1501923), and Environment and Climate Change Canada's findings that Northern Canada is warming at triple the global rate within the global context of a current trajectory towards more than 2°C of warming.</p> <p>Recommendation As climate change will represent the largest variable impacting the project, AN recommends that the GMRP update its climate considerations to bring them in line with current predictions and understanding of climate science, and report at a regular interval, no less than annually, on how updated findings in the field may impact the project's current assumptions. It would be of value for the freeze program in particular if the minimum number of operating days for thermosyphons to maintain the frozen shell were calculated and a threshold of observed warming established to trigger consideration of upgrading towards the use of a hybrid freezing model.</p>	<p>worst case scenario and is now used as the basis for the scenario to evaluate long term thermosyphon performance at Giant Mine. In support of the IPCC assessments, detailed temperature projections specific to Canadian regions were issued in 2016 through the Canadian Centre for Climate Modelling and Analysis (CCCMA). The Government of the Northwest Territories website regarding climate change (www.nwtclimatechange.ca), states that the rate of warming in the Northwest Territories is anticipated to be four to five times faster than the global rate. Their website links to a tool developed by SNAP (Scenarios Network for Alaska + Arctic Planning). The SNAP tool uses model outputs that form the basis for the IPCC's Fifth Assessment Report 2014 and the data is presented on a monthly basis, allowing for the differentiation between summer and winter warming trends. The developers of the SNAP tool were asked by the Government of the Northwest Territories to estimate climate change trends beyond the IPCC 5th report bounds for specific mines in and around, but excluding Giant Mine. Current MAAT climate data at Giant best matched that of the nearby NICO Mine. Using the highest</p>	
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			<p>and lowest MAAT projections out to 2130 for the NICO Mine, the change in MAAT between 2010 and 2130 is estimated to be +7.3°C with winter air temperatures increasing +9.0°C over 120 years, while the summer air temperatures only increase by +5.5°C. This is compared to a MAAT of 6.1oC specified in the CRP based on IPCC 2007 projections. In terms of specifying a minimum number of thermosyphon operating days per year, this is not a relevant factor because it is both days of operation and temperature of operation that affect the heat extraction. The current design accounts for both these factors. Annual updates to the model will not be done; however, the long term monitoring plan will allow for early detection of ground temperature trending that is outside an expected range and there will be multiple years of response time to manage any change in operating strategy, including a potential retrofit of thermosyphons (which can be done without additional drilling of more holes). Further details can be found in ORS 2 - Attachment 1 - GMRP Climate Change Review Memo.</p>	
5	Baker Creek PMF measures	Comment Where section 5.0.5 mentions climate considerations for Baker Creek, it specifies that "Based	June 25: The existing hydraulic model did not calculate the additional channel and floodplain hydraulic capacity that	

		<p>on the high end of the range of potential change indicated by the climate change assessment, detailed designs will include provision of additional freeboard in critical areas near pits (nominally up to 1 m additional) to further decrease the risk of flooding pits." If adding additional freeboard to critical areas near pits is intended to serve as a provision against the possibility of Probable Maximum Flood (PMF) being underestimated, this provides little clarity as to how much additional security one metre of additional freeboard may provide.</p> <p>Recommendation AN recommends that the GMRP clarify how much additional security against flooding additional freeboard may represent by expressing it as a specific additional percentage of calculated PMF volume as an available margin of error. Would one metre of extra freeboard allow the site to accommodate 101% of calculated PMF, or 150% ?</p>	<p>might be provided by including 1 m of freeboard. However, it did consider a scenario of 120% of calculated PMF, which resulted in a water level increase of approximately 0.35 m over the PMF alone.</p>	
6	Freeze program monitoring and maintenance plan	<p>Comment The water licence states that if a warming trend occurred with the potential to exceed the containment criterion, this would be indicated by post-closure monitoring of temperature. Warming trends will require investigation and could require mitigation. Greenland ice core data</p>	<p>June 25: Analyses have shown that there will be approximately 2-5 years of response time to implement adaptive management strategies in the event the field measured data show trends that deviate from the calibrated models, which will use actual climate data to the date of modeling as well as the best</p>	

		<p>indicate that significant regional temperature changes can occur quite rapidly during periods of climate change. This raises questions about the responsiveness available to the temperature monitoring regime.</p> <p>Recommendation How rapid is the potential response time for investigation of and enacting mitigation measures in response to a warming trend?</p>	<p>climate future predictions available at that time.</p>	
7	Closure criteria P1-1	<p>Comment The closure criteria state that Berms/Diversions are to be built to an elevation of Baker Creek PMF. Section 5.0.5 specifies that "designs will include provision of additional freeboard in critical areas near pits (nominally up to 1 m additional) to further decrease the risk of flooding pits." This mention of additional freeboard should be consistent in all parts of the licence, and should also specify not only that the designs will include additional freeboard but that this additional freeboard will indeed be built.</p> <p>Recommendation AN recommends that the GMRP specify that berms and diversions be constructed to accommodate PMF as well as providing additional freeboard as a margin for possible error in PMF calculations.</p>	<p>June 25: Specific design criteria for Berms/Diversions will be developed during detailed design, and provision of freeboard above the PMF will be considered. Values for freeboard at different locations will be specified on a location-specific basis in consideration of potential risk.</p>	

8	Wildlife and Wildlife Habitat Management and Monitoring Plan	<p>Comment Since birds and other fauna tend to range over wide areas, it will be difficult to assess impacts on avian populations in the region that may be specific to Giant Mine. Since insect and small mammal populations tend to contain themselves to smaller ranges and provide food sources for birds and other larger fauna, it may be possible to better assess potential impacts on bird populations by testing the levels of arsenic bioaccumulation in key insect and rodent species within the site.</p> <p>Recommendation AN recommends that the GMRP consider adding a monitoring effort that measures bioaccumulation levels of arsenic in insects and rodents within the site area as a measure towards greater understanding of likely effects on local bird populations.</p>	<p>June 25: The GMRP conducted a co-located soil, vegetation, and small mammal (rodent) survey in 2016 that was incorporated into the 2018 HHERA. This survey collected approximately 50 small mammal samples consisting of deer mouse (<i>Peromyscus maniculatus</i>), northern red-backed vole (<i>Myodes rutilus</i>), and shrews (<i>Sorex</i> sp.). This data set was sufficient to determine whether there were elevated levels of arsenic in these small mammals and determine the possibility of adverse effects. The measured small mammal data demonstrated that no matter what the soil concentrations were that the concentrations in the small mammals (rodents) ranged from 0.1 to 5 mg/kg ww and the lowest concentration measured was not associated with the lowest arsenic soil concentration. The fact that rodents were easy to collect on the Giant Mine site demonstrated that rodents were reproducing. The results of the assessment determined that birds such as falcons and owls that would eat these rodents were not at risk and therefore there is no likely effects on these bird populations. The 2018 HHERA determined that there were risks to birds that consumed insects. This evaluation was based on</p>	
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			<p>many conservative assumptions including that emergent insect concentrations were 1/10 the concentrations of benthic invertebrates and that terrestrial insect concentrations were the same as plant concentrations. Due to the data gap surrounding insects within the 2018 assessment a recommendation was made to collect of insect data to verify the assumptions for birds and animals that eat insects. The GMRP is evaluating adding an insect monitoring component to its monitoring programs.</p>	
9	Human health monitoring plan	<p>Comment As one of the concerns raised in the Quantitative Risk Assessment process includes consideration of the possibility that humans may forage for food or medicinal plants from the site area without understanding of the possible risk of bioaccumulated arsenic levels in those plants being high, it may serve the public good to conduct testing of plants that are more likely to be foraged near their time of potential harvest and make the results publicly available.</p> <p>Recommendation AN recommends that the GMRP undertake to test bioaccumulation of arsenic in plants associated with traditional food and medicine during the season when</p>	<p>June 25: As part of the Human Health and Ecological Risk Assessment (HHERA), a voluntary sampling program was initiated to collect samples of country foods that members of the different communities would eat. Members of the YKDFN, NSMA, and other interested stakeholders submitted samples of country foods to the GMRP study team. The community provided large wild game samples, small game samples from different types of animals such as rabbit, beaver, muskrat, bird, as well as berries or edible plants and medicinal plans. The samples came from areas where people hunt and harvest. Organ samples were also analyzed. There was a large number of fish samples from different</p>	

		<p>people would be most likely to harvest them and make the results public in order to help reduce risks of public exposure by foragers.</p>	<p>areas in Yellowknife Bay that were collected by various scientific programs, as well as lake trout by community members. Aquatic and terrestrial vegetation sampling by the GMRP was also considered in the HHERA. The samples provided were then sent to the laboratory for analysis. The sampling program was carried out over the course of a year to cover harvesting during different seasons. These results have been made public.</p>	
10	B1 pit	<p>Comment Contaminated material that does not fit in chamber 15 is intended to be stored in B1 pit, with a part of B1 pit to be frozen. B1 pit has the lowest pit rim elevation, making it the most vulnerable to overtopping by a possible PMF, and 3 stopes or voids under or adjacent to it with volume c. 8200 cubic metres that will need to be stabilized. By contrast, B2 pit has a higher pit rim and no underlying voids or stopes to represent risks of leakage underground. B1 pit has a larger volume, but only a non-specified fraction of B1 pit is to be frozen. It is somewhat unclear why B1 pit was chosen for this specific purpose.</p> <p>Recommendation AN recommends that the GMRP clarify why B1 pit was specifically chosen for additional storage of contaminated material and</p>	<p>June 25: The B1 pit has suitable volume available to store the highly contaminated waste, and freezing the arsenic stopes and chambers adjacent to the pit walls will allow most of this material to be frozen within the AR4 freeze zone without installing extra thermosyphons. The B2 pit does not have enough volume suitable to store and freeze the 52,000 m³ of highly contaminated granular fill. Although the B2 pit is adjacent to some planned freeze zones extending the freeze into the pit excavation could be problematic due to the steep terrain on the east wall of the pit. Any highly contaminated pit waste that is frozen in B1 pit will meet the same frozen containment criteria as other freeze areas. Once the areas meet the freeze criteria of -5C at 5 m from the contaminants, water will not</p>	

		freezing, and what proportion of B1 pit is intended to be frozen.	penetrate this highly contaminated pit fill in the frozen zone and cannot enter the mine workings below. Water diversion berms will be constructed between Baker Creek and the pit rims to protect the underground from flooding, in the event that the area experiences a PMF. While the B1 pit has a pit rim elevation close to the PMF, the B2 pit rim incorporates the potentially vulnerable B2 dam which will need to be raised to meet the new design standard of a PMF. Arguably the B2 pit is more vulnerable to a PMF flood than the B1 pit even though the rim elevation is lower. Although the B1 pit does have underground workings under and adjacent to it, ongoing underground closure design includes reasonably straight forward backfilling approaches can suitably stabilize the floor of B1 pit. Heavily contaminated fill will be placed in the bottom eastern side of B1 pit and will cover a portion of the pit; the percentage of which remains to be determined. It is anticipated that the planned thermosyphons to freeze these stopes will only need to be augmented slightly to freeze this material.	
11	Underground voids	Comment A drilling program was carried out in 2016 to characterize the underground voids, both under and	June 25: Substantive designs for underground closure is scheduled to be completed in the spring of 2020, and	

		<p>adjacent to the pits, and void volumes were estimated, based on the findings of this program. Additional work is planned to improve these estimates and better understand the feasibility and associated costs of stabilizing the voids under and adjacent to the open pits where required, but no specific time frame within which this work is expected to be completed is provided.</p> <p>Recommendation When will this work be conducted? Is it possible that this assessment will change the intended usage of each pit or other aspects of the current design plan? AN recommends that the GMRP specify the time frame in which additional efforts to better categorize the underground voids, stability of crown pillars, and challenges involved in backfilling those voids is expected to be completed, and whether the results may significantly alter aspects of the final design plan as it currently exists.</p>	<p>the open pit closure designs is scheduled to be completed in the summer of 2020. Pit stabilization work is scheduled to be completed by the spring of 2023, and open pit closure is planned to be complete in the fall of 2025. Currently, the underground design team is collecting data to categorize the underground voids, including getting entry to underground areas which have not been accessible for years, for example under and near the A1, B3, B4, and C1 pits. This investigation significantly improved the understanding of the requirements for stabilizing the underground areas under and adjacent to the open pits. At this time, assessment of the data suggests that the current design approach stated in the CRP will be appropriate to complete the underground substantive design and no change to the intended usage of the pits is expected.</p>	
12	Contaminated soils and sediments	<p>Comment While developed areas of the site are intended to be remediated to industrial soil quality standards, and the Townsite, Shoreline Lands and Marina area will be remediated to residential standards, evidence seems to indicate that there are likely to remain at least some areas of relatively high arsenic contamination outside of</p>	<p>June 25: The GMRP has a stated the following site-wide objective: SW-4 "Residual risks are identified, and local residents have been and continue to be informed of residual hazards (post-remediation) (CRP, Table 5.0-1). Specific to this objective, the GMRP has identified the following two criteria: "SW4-1 Public</p>	

		<p>the fenced area within bedrock, forest, or wetlands areas. As excavation and remediation efforts in these areas may result in extensive environmental damage, such work is considered infeasible, but arsenic loading in the soil will remain bioavailable and concentrate in local flora, possibly including traditional foods.</p> <p>Recommendation Is there any intention to create a detailed map of concentrations in areas outside of the fence and to mark areas of high concentration with signage or other warning measures? AN encourages the GMRP to develop a specific plan to identify and reduce risks associated with any "islands" of higher contaminant concentration in bedrock, forest, and wetland soils outside of the fenced area of the site. Are any methodologies for remediation of that soil under consideration, or is there a commitment to funding research in this area?</p>	<p>communication initiatives as outlined in the Perpetual Care Plan/Engagement Plan are undertaken", and "SW4-2 A land map with residual risks identified and available at Land Titles and project websites." A concentration map (for outside the fence area after remediation) is not planned as it assumed that is not a useful mechanism for communicating with the public. The GMRP will consult and engage on the Perpetual Care Plan about the types and format of signs and information to communicate risk. The GMRP has finished its review of potential remediation options for these areas. No further investigations or research is planned. Please refer to ORS 2- Attachment 2 - Contaminated Soils Response for more information regarding the GMRP's approach to risk-managing contaminated soils.</p>	
13	Delineation of fenced area	<p>Comment The final routing of the fence is still under evaluation and will be completed as part of the engineering work. Additional soil sampling will be completed to refine the definition of arsenic impacts in the bedrock/forest/wetland terrain areas for consideration in the fence routing. It is</p>	<p>June 25: Arsenic concentrations in bedrock/forest/wetland terrain soils are one of multiple lines of evidence used to determine the location of the fence. The rationale for the location of the physical barrier was developed based on the forensic mineralogy findings, the soil quality model, review of case</p>	

		<p>unclear what specific criteria will be used to define the fenced boundary.</p> <p>Recommendation Is a specific threshold of contamination in local soil the primary factor in determining the exact final location of the fence? How are any areas of relatively high contamination outside of the fence to be managed? AN recommends that the GMRP clarify the specific criteria to be used in determining placement of the fence and what strategies are available for management of areas of relatively high contamination which are outside the fence and not subject to remediation efforts.</p>	<p>studies, and input from the risk assessment team. Discussions on each of these lines of evidence are provided in Sections 5.4.4.3 through 5.4.4.6 in the CRP. On average, soil within the bedrock/forest/wetland terrain with arsenic concentrations greater than 3,000 mg/kg will be located inside the fenced area. Relative to contaminated soils located in bedrock/forest/wetland terrain outside the fence, which are subject to risk management the GMRP has stated the following site-wide objective: "SW-4. Residual risks are identified, and local residents have been and continue to be, informed of residual hazards (post-remediation)" (CRP, Table 5.0-1). Specific to this objective, the GMRP has identified the following two criteria: "SW4-1 Public communication initiatives as outlined in the Perpetual Care Plan / Engagement Plan are undertaken; and SW4-2 A land map with residual risks identified and available at Land Titles and project websites."</p>	
14	Contingency measures	<p>Comment While an effort is clearly being made to assess risks that may arise over the course of the project, the current plan is sparse on what sort of contingency measures are being put in place lest some of those potential risks manifest.</p>	<p>June 25: There will be sufficient time (2-5 years) to supply and install thermosyphon infrastructure should the frozen shell require it to maintain containment. There is redundancy in the plant design and pumping capacity, given the amount of underground</p>	

		<p>Recommendation AN would like more detail on any additional contingency measures that the site will be equipped with. Will additional thermosyphon parts and equipment be on site should the frozen shell require additional stabilization? Will the site or other local facilities have the material capacity to build more thermosyphons or to convert them to hybrid freezing systems? Will the mine water pumps be supported by backup systems that can take over in the case of a failure of the primary pumps, and/or to provide extra pumping capacity in the event of unanticipated rise in mine water levels? Has modelling been done on the impact that a potential rise in water level might have upon the frozen shell? Will impacted communities be helped in establishing a stockpile of chelating agents to have available for medicinal use in circumstances where the public may be exposed to elevated arsenic levels?</p>	<p>storage there is sufficient time to supply and install pumping capacity. Initial modeling has been completed on the impact to the frozen shell from a potential mine water raise. Any health related concerns related to arsenic exposure should be directed to a health care provider for treatment. The GMRP is not considering stockpiling chelating agents.</p>	
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City of Yellowknife: Kerry Penney

ID	Topic	Reviewer Comment/Recommendation	Proponent Response	Board Staff Response
1	New Requirement	<p>Comment Under the NWT Water Act, the Board must be satisfied that the project has sufficient resources to complete the undertaking being</p>	<p>June 25: The Northern Abandoned Mine Reclamation Program, announced in Budget 2019, will cover the full implementation cost for the</p>	

		<p>proposed. Funding was a matter of concern during the Environmental Assessment, with MVEIRB reviewing the evidence and finding that there was significant concern, issuing a Measure and Suggestion aimed at developing mitigations to avoid significant impacts. These matters have not yet been completed.</p> <p>Recommendation Given that FCSUP was just renewed, there is some certainty over the next few years. However, as Section 2.4 of the Preliminary Screening Document notes, the temporal scope of the project is 100 years. - For each year, please indicate the funding required (and the confidence level associated with the prediction), and the funding currently available. - Understanding that the level of certainty associated with the years covered by the water license will be higher, please provide the anticipated costs and the level of approved funding associated with the current workplan.</p>	<p>Giant Mine remediation project. Recognizing that cost estimates for planned future work are subject to change and contain commercially sensitive information, we are not releasing a precise amount associated with the Giant Mine Project at this time. Advancing this project is a priority for the Government of Canada, and the GMRP is pleased that we will have access to a secure source of funds for the implementation phase of the project.</p>	
2	Proposed Water License, Part 1	<p>Comment Scope does not include the workings in Back/Yellowknife Bay</p> <p>Recommendation Adjust to include all affected areas</p>	<p>June 25: The Giant Mine Site boundary is shown in Figures 1, 2 and 3 on the Type A Water Licence Application Form, Supplementary Information. It includes the areas required in Yellowknife Bay.</p>	

3	Proposed Water License, Definitions	<p>Comment Use of "Engineered Component" instead of "Engineered Structure" decreases legibility because it overlaps with Mine Component which is another defined word under the Mine Closure Guidelines.</p> <p>Recommendation Similar to our comments in Part one regarding the same matter, the project uses 'component' in an inconsistent way - there are many lists of components and sub components. We suggest a return to Engineered Structure.</p>	<p>June 25: The GMRP prefers to use the term 'Engineered Component' as defined in the draft Water Licence as it better reflects the types of activities that will occur throughout the remediation project.</p>	
4	Proposed Water License, Definitions	<p>Comment Question: Within the license context (SNP/EQC), does the Maximum Average Concentration apply to a specific time series? If so, please add to the definition.</p> <p>Recommendation None</p>	<p>June 25: The Maximum Average Concentration in the Water Licence is correct and is based on the last four consecutive samples, whereby samples are collected weekly as per the proposed SNP.</p>	
5	Proposed Water License, Definitions	<p>Comment The definition of Wastewater does not include runoff or other contact waters that must be collected and treated.</p> <p>Recommendation Add wastewater to the definition.</p>	<p>June 25: Further discussion regarding the intent of including run-off in the definition of wastewater is requested.</p>	
6	Proposed Water License, 10	<p>Comment The current Closure Plan lacks a significant number of important closure criteria that will guide the design, including land use constraints. Absent these essential elements of a closure plan, the proponent has indicated that they will provide these</p>	<p>June 25: The GMRP intends to provide updates to the Closure and Reclamation Plan based on updates to criteria or significant changes to scope which have gone through a review process and have been approved in the respective Design and Construction</p>	

		<p>criteria and land use constraints through design and construction plans. This lacks the holistic vision required for a full evaluation. To provide this, a 3 year review, similar to an ICRP cycle is required.</p> <p>Recommendation Every three years a comprehensive update of the CRP should be prepared that looks at the Environmental Assessment Measures and Suggestions, the predictions from that process, the Closure Goals, Objectives and Criteria from the Water License and any additional research or predictions from Phase I or II of the remediation. Reporting on the commitments and progress to date should also be included.</p>	<p>Plan. The Closure and Reclamation Plan provides an overview of the project and the GMRP does not intend to provide a comprehensive update unless there are significant changes to the scope of the remediation project.</p>	
7	Proposed Water License, 10	<p>Comment The license review and issuance may have consequences on the items in the series of plans found in item 10, requiring reconsideration and modifications to the draft plans.</p> <p>Recommendation These plans should be updated and resubmitted following issuance of the license. The Water, Waste, and Dust plans should be resubmitted within 6 months. All other plans should be updated and resubmitted within 9 months.</p>	<p>June 25: The GMRP will update and re-submit the water, waste and dust management plans to incorporate reviewer comments and commitments made during the process. An updated Appendix B: Conformity Table of Items Requiring Submission will be provided to clarify the requested timing of specific plans and approvals after the second technical session.</p>	
8	Proposed Water License, 10	<p>Comment Tracking closure performance.</p>	<p>June 25: The GMRP agrees that the project should report on project</p>	

		<p>Recommendation In addition to the tracking of the closure items already noted, an itemized report detailing the performance of the project, as demonstrated through monitoring, with respect to each Closure Objective and Criteria.</p>	<p>performance, however in order to provide relevant trend information, there may be detailed analysis required and it may not be possible to report on an annual basis. It is anticipated that this information would be provided within the performance assessment report. Some items also require multiple years of monitoring to confirm and as such the performance assessment is not expected to be provided annually, which is in line with the closure guidance.</p>	
9	Proposed Water License, 10 1e	<p>Comment The details around the updated schedule can be more certain. Recommendation The schedule should include: - a simplified one page version, useful for general distribution - a detailed version, organized by Closure Component and closure activity (or whatever term equates to the actions detailed in a single Design and Construction Plan)</p>	<p>June 25: Yes, a simplified 1 page schedule and a detailed schedule organized by construction packages can be provided annually, beginning 1 year after the issuance of the Water Licence.</p>	
10	Proposed Water License, 10 - 2a	<p>Comment A great deal of this project is related to management of a wide variety of waste streams. Tracking this effort is important for reviewers to understand the progress. Recommendation Add: - volumes of each waste stream moved to its final destination - for each destination (Landfill, chamber 15, B2 Pit, etc.), a</p>	<p>June 25: The Annual Water Licence Report will include details about waste management. The specific metrics are being developed and the GMRP will take into consideration the items that have been suggested by the reviewer.</p>	

		<p>working estimation on the volume of the final space used and the available volume remaining - updated comparisons to predictions and explanations of differences - a list of auditing actions and results to ensure effective/appropriate waste stream segregation, ensuring wildlife attractants aren't being disposed of incorrectly - updated contingencies and emerging concerns - a narrative explaining the key elements and messages associated with waste management actions</p>		
11	Proposed Water License, 10 - 2d(ii)	<p>Comment The EA encourages (and/or requires) the project to use predictive tools to help manage and minimize dust. This is mostly absent within the plan.</p> <p>Recommendation Part ii should emphasize the link between modeling or forecasting with mitigative actions as a requirement.</p>	<p>June 25: The GMRP is of the opinion that no changes are required as the Annual Water Licence Report will provide details on changes to mitigations related to dust management as per B10 - 2d (i).</p>	
12	Proposed Water License, 10 - 2d(iv)	<p>Comment There is concern that the mitigations proposed within the plan are insufficient to make meaningful impacts. Providing information to help modify the approach will be important.</p> <p>Recommendation In addition to the items listed, additional text to clarify: - number of wind thresholds events, along with the actions taken - an</p>	<p>June 25: The GMRP is of the opinion that the requirements outlined in B10.2d (i-iv) will provide the information being requested and no changes are required.</p>	

		assessment of these mitigations - an assessment of road/work site wetting - reviewing the frequency and distribution		
13	Proposed Water License, 10 - 2d(e)	<p>Comment Reporting for this plan should include results for the 'performance criteria' that will drive the design.</p> <p>Recommendation Include items that will demonstrate cover performance, monitoring for seepage quantity and criteria, comparisons between runoff quality/quantity and expectations</p>	<p>June 25: The Annual Water Licence Report will include runoff quality and quantity information as part of the SNP portion, including summary and interpretation as per B10. 2e(ii).</p>	
14	Proposed Water License, 10 - 2d(f)	<p>Comment Borrow and Explosives Plan</p> <p>Recommendation This plan was not present with the package provided, with a planned submission within 3 months. Should our recommended timeline be adopted, we suggest that this could be delayed until 6 months. - Our current understanding is that ARD is not a particular concern at Giant, but the City would like to see this issue specifically addressed for Borrow sources (geochemical testing does seem to be recognized as an issue) - The Borrow and Explosives Management Plan must detail incomplete explosive consumption (or failed shots) and provide mitigations to ensure appropriate protection of the</p>	<p>June 25: Borrow Materials and Explosives Management Plan will be ready for public review and comment in 2021, 90 days before the start of construction. Further engagement with affected parties will occur late 2019. The content of the [Borrow/Explosives] plan and schedule is located in the Proposed Type A Water License for the Giant Mine Remediation Project, part G, condition 7 (p 21). The bedrock within the Giant Mine lease was investigated in the pre-feasibility study (Phase 1) for Borrow Sources and has been identified as non-acid generating. A geochemical feasibility study (Phase 2) on preferred borrow areas is planned for additional sampling and geochemical analysis for</p>	

		<p>environment - The project must institute appropriate controls on blast sizes and timing to minimize impacts on City residents - Given the regional contamination, this plan must include requirements to demonstrate that the source material is not contaminated by historic releases - The areas within the core should be prioritized for use - taking material from the area already most affected, rather than the undisturbed areas, should be the default</p>	<p>metal leaching. The GMRP will make the preliminary geochemical results available as soon as they are finalized. The GMRP will abide by all applicable regulations related to operating a quarry within the Northwest Territories, including those related to explosive use and misfire reporting. The GMRP commits to using safe and efficient blasting techniques, as well as engineered blast pattern and blast initiation designs in order to minimize the impacts on the surrounding communities and its residents. The use of the core area as a borrow source has been rejected as an option due to the extent of ground contamination around the core industrial area, and the CRPs closure objective Q2 (Table 5.7-4), which states that "Borrow and quarry material/areas are not a source of environmental contamination and do not pose a safety risk."</p>	
15	Proposed Water License, 10 - 3(f)	<p>Comment With the EA, there are no specific follow up programs outside the Measures. Recommendation Amend this item from: "Implement measures and follow-up programs" to "Implement measures and suggestions."</p>	<p>June 25: At this time, the GMRP is of the opinion it can implement measures and follow-up programs. Where possible, suggestions are being implemented as described in Updated Project Description, Table 3.1. It is requested that the wording remain unchanged.</p>	

16	Proposed Water License, 10 - 3	<p>Comment Under other reporting.</p> <p>Recommendation Including a year-end review of the inspections, inspector notes, and any remedial action.</p>	<p>June 25: A summary of actions taken to address concerns, non-conformances, or deficiencies in any reports filed by an Inspector will be provided in the Annual Report.</p>	
17	New Condition	<p>Comment Specific Emergency Response Plan</p> <p>Recommendation Given the proximity of the site to the City and the importance of rapid and clear response to any major upset conditions, the City would like to ensure effective communication and emergency response. Does the project believe that a specific Emergency Management Plan would be a useful safeguard?</p>	<p>June 25: The GMRP, through the Main Construction Manager, Parsons, has a site-specific Emergency Response Plan in place. Parsons is also working with the City of Yellowknife to renew the Municipal Services Contract which establishes the process and response for emergency providers. Ongoing regular monthly meetings between City and GMRP staff continue. As this is a specific agreement between the two parties, it is not recommended that it be added as a condition in the Water Licence.</p>	
18	Proposed Water License, 12	<p>Comment The Engagement Plan will likely need changes as a result of the license issuance and subsequent modifications to the plans. It is important that engagement with the parties reflects the current proposals.</p> <p>Recommendation Update and submit the plan for approval 9 months after license issuance.</p>	<p>June 25: Approval of the engagement plan is requested at issuance of the Water Licence. Any updates to the plan required as a result of this process will be submitted to the Board 90 days after Water Licence issuance, unless significant changes are required. The plan will undergo annual reviews and will be resubmitted should there be changes.</p>	
19	Proposed Water License, 20	<p>Comment Given the proximity of the project to the City and use of the surrounding area, any upset condition</p>	<p>June 25: The GMRP considers the Water Licence submissions and approvals framework of the MVWLB</p>	

		<p>should result in notice being provided to the City, YKDFN and NSMA.</p> <p>Recommendation As mentioned in Part 1, row 17, Please add the City of Yellowknife, YKDFN and NSMA to the list of recipients.</p>	<p>to be fair, transparent and predictable for all parties. The GMRP will rely on these well-established publication, notification, public review and comment procedures.</p>	
20	New Condition	<p>Comment Given that the project is taking place within Yellowknife, minimizing impacts to the residents should be a priority similar to condition 21 where every reasonable precaution is taken to protect the environment. The life and well-being of the people of Yellowknife should be similarly respected</p> <p>Recommendation The Licensee shall make every effort to minimize the impacts of its activities on the citizens of Yellowknife. - reporting where the project demonstrates that they have made choices to avoid or minimize impacts should be provided as part of the annual report</p>	<p>June 25: The GMRP believes a new condition is not required and that public concern is taken into consideration through activities outlined in the Engagement Plan.</p>	
21	Proposed Water License, Part D, 2	<p>Comment The burden of review will be significant. Respecting this, a thorough change tracking approach will allow all reviewers to maximize efficiency.</p> <p>Recommendation The yearly update must have a comprehensive change log that details the modifications made from the previous year. This will also</p>	<p>June 25: The GMRP will implement a document change control process within the Closure and Reclamation Plan and throughout its submissions to facilitate the review process.</p>	

		link back to the original commitments and requirements.		
22	New Condition	<p>Comment Measure 6 of the Report of Environmental Assessment requires the completion of a Quantitative Risk Assessment. The City understands that the QRA could not be completed prior to the water license submission. However, we want to ensure that this work, the product of a long and effective engagement, is incorporated into the water license.</p> <p>Recommendation Within a year of the QRA's completion or within 12 months of the issuance of the water license, the project should be required to submit a special study that illustrates how the proponent is modifying the project or the administrative approach being used.</p>	<p>June 25: The GMRP does not support the recommendation for a special study. It is anticipated that the QRA will be completed in the Winter of 2019/2020. The GMRP will hold stakeholder meetings to present the findings of the QRA and the QRA documents will be made publicly available upon completion, prior to the issuance of a Water Licence, as required by Measure 5. The findings of the QRA will be incorporated into the contingency sections of the revised management plans, updates of which will be submitted to the MVLWB. Any influence on design by the QRA findings will be captured explicitly in associated Design and Construction Plans (i.e. section specific to QRA findings)</p>	
23	Water License Conditions, Part E, 8	<p>Comment The project has chosen to utilize the Design and Construction plans to bring forward their Closure Criteria for the individual closure Objectives. Closure criteria have been an ongoing issue for several years - to allow only 90 days for review is insufficient. We are recommending that this timeline be adjusted to 270 days to allow for meaningful review</p>	<p>June 25: The GMRP maintains that 90 days (3 months) is a reasonable time for interested party review for each of the Design and Construction Plans. Any increase to the approvals schedule would significantly impact the schedule presented in the CRP and the GMRPs ability to deliver the Project.</p>	

		<p>and sufficient time for adjustments to made, with an appropriate buffer to ensure that the operational needs of the project are not constrained.</p> <p>Recommendation Instead of 90 days prior to commencement, Design and Construction Plans should be submitted for approval 270 days prior.</p>		
24	Water License Conditions, Part E, 9	<p>Comment Reversibility was a key requirement of the Environmental Assessment. Obviously, we expect this to be a rather empty paragraph in the short to medium term, but this concern should always be carried forward in the reporting to ensure that it is always respected.</p> <p>Recommendation Within item (i) or (j), a paragraph that details any impacts to reversibility must be provided.</p>	<p>June 25: The GMRP does not consider that an additional paragraph is required and has indicated in Part E Condition 9b(ii) that an explanation of how the results of the FOS satisfy Approved EA Measure 18 and the requirements of Approved EA Measure 19 will be provided as part of the Arsenic Trioxide Frozen Shell Final Design Report.</p>	
25	Water License Conditions, Part E, 12	<p>Comment The Performance Assessment should include an assessment not just to the Closure Criteria (found in part a), but also the design or evaluation criteria. The project is doing a great deal of monitoring associated with performance evaluation that is not incorporated into the Closure Criteria.</p> <p>Recommendation Require the project to outline the design or performance criteria associated with each Engineered Component</p>	<p>June 25: MVLWB guidance indicates that the Performance Assessment Report (PAR) is used to compare closure objectives and criteria to actual post-closure site conditions. Design criteria are not equivalent to closure criteria, and do not provide a practical or useful basis for evaluating the performance of an engineered structure. For instance, a structure can be designed and built to withstand a given design flood. It is possible in a PAR to confirm that the structure was</p>	

			built in accordance with its design (which is explicitly stated in the criteria), but the design criteria (eg, the PMF) cannot be compared to anything.	
26	Water License Conditions, Part E, 14	<p>Comment The project's approach to limiting the number of reviews required seems misplaced as the approach they've adopted already imposes a heavy review burden. As there are only a few monitoring and management plans, but likely will be many Design and Construction Plans, with an equal number of Performance Assessment Reports, reviewers with limited resources will understandably focus on the overarching plans. However, given the large number of changes (dozens, perhaps hundreds if the rate exceeds 1:1 per closure activity) for the project to modify the management and monitoring plans, it will be vital for the project to develop a thorough yet comprehensible change tracking effort.</p> <p>Recommendation While many of the monitoring plans already have yearly reporting, this would result in them being updated without the opportunity for review. The only review/comment opportunity will occur as part of one of the many documents submitted for approval. If the project wanted to reduce the review burden, adopting a</p>	<p>June 25: The GMRP is required to submit reports as described within the Water Licence and the monitoring and management plans will not be updated without the opportunity for review and approval. As much as possible, the annual submissions will be bundled and the GMRP is committed to implementing a change control process to facilitate review, such that any changes are identified at the beginning of the document.</p>	

		<p>bundled approach on a yearly or multi-year scale would have been much more beneficial for reviewers. Given these facts, the monitoring and management plans must be open for review, with the changes being proposed clearly identified.</p>		
27	Water License Conditions, Part G, 4	<p>Comment Reducing the amount of arsenic moving off site was one of the principle goals of the remediation project. The Erosion and Sediment Plan must specifically address the fact that the material open to erosion has high potential arsenic contamination.</p> <p>Recommendation Part a(ii) discusses risk, but the primary focus in the plan relates to quantity of material rather than the composition of the material. This needs to be updated, with appropriate monitoring to capture the amount of potentially arsenic laden material moving into the receiving environment.</p>	<p>June 25: Under existing conditions, water in contact with developed areas is collected in sumps, temporarily stored in the Mill Pond and TCAs and conveyed to the ETP for treatment (Please see Water MMP Section 4.0). Some pit water is conveyed directly to the underground. There is an existing non-contact water management system comprising ditches and pipelines that diverts runoff around the pits on the west side of Baker Creek (please see Water MMP Section 4.1.3). A runoff monitoring program is operational and described in the Standard Operating Procedures (SOP) submitted as part of the GMRP Water Licence Application package. This program, in addition to the SNP program and other operational monitoring, has been used to develop the arsenic loading model for the site (presented in the EQC Report, Section 2.5) and will remain operational during remediation to continue to support the understanding of the overall loadings to Baker Creek from the different sub-</p>	

			<p>drainage basins within the watershed. During active remediation, the same water management system will be employed. Diversion systems will remain in place to convey runoff from undeveloped areas to Baker Creek that exist now. Runoff from areas undergoing active remediation and/or all areas within the existing contact water management system will be collected and treated. An additional level of protection is provided by sediment and erosion control. Activity-specific monitoring is one component of each design and construction plan. The GMRP is committed to reducing the amount of arsenic moving off-site during remediation. Within the Erosion and Sediment Monitoring and Management Plan, as part of Section 4.2.3 Step 3: Evaluation of Consequence/Risk Assessment of the Site Assessment Prior to Implementation of Work (Section 4.2), the consequence of erosion and sedimentation is examined based on ecological consequences. In general, this will consider whether the affected soils are a source of chemical contaminants; whether the activity is occurring near water bodies; and whether large areas will be exposed for extended periods. It will be in this step</p>	
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			of the assessment that will look at potential arsenic levels in soils and eroded material that will determine the level of activity-specific monitoring and mitigation that takes place.	
28	Water License Conditions, Part G, 5	<p>Comment The project documents are effectively silent on stockpile management.</p> <p>Recommendation The Dust Monitoring and Management Plan must include a focus on stockpile operations (size, numbers, etc.) and management (cover, wetting, etc.). With this effort, there should be particular focus on collecting and preserving organic materials for future use.</p>	<p>June 25: The GMRP agrees that additional information related to general best practices for stockpile management be included in the next version of the Dust MMP. Details are also outlined in the Erosion and Sediment Control Management and Monitoring Plan. However, as noted in Water License Conditions Part G, 5, each construction plan containing stockpile operations will include activity-specific monitoring based on the type of material being handled, ensuring compliance with the overall site-wide Dust MMP and Erosion and Sediment Control MMP.</p>	
29	Water License Conditions, Part G, 5	<p>Comment Require a section that utilizes predictive tools, and specifically addresses the relevant Measures and Suggestions in the EA</p> <p>Recommendation Develop appropriate predictive models using meteorological tools. Prepare a response framework based not just on the observed phenomenon but also the predictive tools (See Suggestion 11 in the EA). Using this approach, identify</p>	<p>June 25: The GMRP and MCM receive daily meteorological forecasts to help inform site activities in the short-term. As well, the GMRP has incorporated consideration of seasonal variability into the scheduling and staging of activities for seasonal variability as a best management practice. This consideration as to when the GMRP times/schedules activities, based on historic wind patterns, will be</p>	

		constraints to meet the requirements of Measure 20, which is not particularly well addressed at present.	incorporated into the Project schedule for activities with medium and high potential for dust generation. As well, the GMRP will include the text of Measure 20 into the revised version of the Dust MMP as a very clear reminder of our commitment. Methods and mechanisms presented above give the GMRP confidence that predictive modelling using meteorological tools should not be a requirement of this Water License. Planning around predictive modelling has already been incorporated.	
30	Water License Conditions, Part G, 5	<p>Comment Suggestion 12 in the EA discusses wind speed and direction as a constraint for demolition and construction activities.</p> <p>Recommendation Develop a framework which incorporates this constraint, noting the range of wind direction and the types of activities that need to be specifically identified.</p>	<p>June 25: The GMRP is of the opinion that the description of identification of risks, thresholds and action levels in Part G, Condition 5 d (i-iii) will provide this type of information in the Dust Management and Monitoring Plan and no changes to this section are required.</p>	
31	Water License Conditions, Part G, 6	<p>Comment The draft WL Package identified a number of issues associated with both moving tailings and backfilling.</p> <p>Recommendation As part of item c (a typo in the package), the project should identify the criteria and constraints regarding placement of tailings and backfill, with a particular focus on</p>	<p>June 25: Water Licence Conditions G, 6 addresses the Tailings Management and Monitoring Plan (TMMP). The purpose of the TMMP is not to address the detailed construction methodology for the execution of closure works. Execution methodology for the tailings transport is important and has been addressed at a conceptual level (see for</p>	

		<p>water content and/or frozen state. This should also be a matter of focus regarding movement of south pond tailings - if liquids are present within the material, there is a very likelihood of seepage during transport, 'tracking'/leaking contamination across the site.</p>	<p>example Appendix 5.6B of the Closure and Reclamation Plan, Tailings Remedial Options Report, particularly Section 4.1 of that report). Further detail on water content and liquid management will be developed as part of detailed design and construction management.</p>	
32	Water License Conditions, Part G, 7	<p>Comment Recognizing that this is not a remote site, the size and scheduling of blasting must take into account the citizens of Yellowknife. In 2018, a very large blast at the NWT construction quarry was noted by virtually everyone in town, with a large plume seen thereafter (Similar to a very large blast earlier during Con Mine Remediation). Unlike quarry and Con blasts, Giant is a very large contaminated site where unexpected events may quickly be seen with potential concern. Furthermore, City staff have witnessed YKDFN participants who have expressed concerns with the blasting and the competency of the rock at site.</p> <p>Recommendation As part of the Explosives Mgmt Plan (under d(iii)(f)), the project must indicate how they intend to conduct operations so as to avoid undue public concern. This should include discussions of timing, magnitude and appropriate notification</p>	<p>June 25: The GMRP agrees that the Borrow and Explosives Management and Monitoring Plan requirements should be updated to include blasting notification procedures.</p>	

		of anything larger in scope than would be expected within the City boundary.		
33	Water License Conditions, Part G, 9	<p>Comment Given that the project is occurring within the City, inspections should made be available to those impacted by the activities.</p> <p>Recommendation As mentioned earlier, these inspections should be made available not just to the Board and Inspector, but also to the City of Yellowknife, YKDFN and NSMA.</p>	<p>June 25: The GMRP requests that the condition remain as proposed. The GRMP considers the Water Licence submissions and approvals framework of the MVLWB to be fair, transparent and predictable for all parties. The GMRP will rely on these well-established notification and public review and comment procedures.</p>	
34	Water License Conditions, Part G, 10	<p>Comment Given that the project is occurring within the City, inspections should made be available to those impacted by the activities</p> <p>Recommendation These inspections should be made available not just to the Board and Inspector, but also to the City of Yellowknife, YKDFN and NSMA. Furthermore, should the geotechnical inspections reveal concerns to areas on or near the Yellowknife River, the Shot Lake watershed, or north end of Yellowknife Bay, the project must hold a face-to-face meeting with the City and Board within 7 days to discuss the inspection and the remedial actions.</p>	<p>June 25: The GMRP requests that the condition remain as proposed and the Geotechnical Inspection Report will be made available to all reviewers through the Board's Registry. The GMRP considers the Water Licence submissions and approvals framework of the MVLWB to be fair, transparent and predictable for all parties. The GMRP will rely on these well-established publication, notification and public review and comment procedures. The GMRP will continue to engage with the City of Yellowknife on an ongoing basis and will discuss results of the Geotechnical Inspection Reports at these meetings.</p>	
35	Water License Conditions, Part G, 11	<p>Comment Our understanding of the Dam Safety Guidelines is limited. While it is understood that the project is seeking flexibility, it is important for</p>	<p>June 25: The GMRP is in compliance with the Canadian Dam Association Safety Guidelines. The Project follows</p>	

		<p>the board to remember that this project is within the City of Yellowknife. Thus it is requested that the frequency reflect this, occurring far more often than those associated with a remote site.</p> <p>Recommendation Ensure that the frequency of inspection reflects the project's location inside the City of Yellowknife.</p>	<p>the regulated frequency of inspections embedded within the guidelines.</p>	
36	Water License Conditions, Part G, 11	<p>Comment Given that the project is occurring within the City, if water quality is determined to exceed EQC or be acutely toxic, that is critical information for the local residents.</p> <p>Recommendation As mentioned earlier, these notifications should be made not just to the Board and Inspector, but also to the City of Yellowknife, YKDFN and NSMA.</p>	<p>June 25: The GRMP considers the Water Licence submissions and approvals framework of the MVLWB to be fair, transparent and predictable for all parties. The GMRP will rely on these well-established publication, notification and public review and comment procedures.</p>	
37	Water License Conditions, Part H, 11	<p>Comment Given that the project is occurring within the City, spills and unauthorized discharge are of particular concern to residents.</p> <p>Recommendation As mentioned earlier, these notifications, and detailed follow up reports, should be made not just to the Board and Inspector, but also to the City of Yellowknife, YKDFN and NSMA.</p>	<p>June 25: In order to ensure appropriate regulatory authorities are notified, all reporting will be submitted as indicated in the Spill Response Plan to the authorities having jurisdiction.</p>	

38	Updated Project Description - Goals	<p>Comment The Goals of the Giant Mine Reclamation Project have changed from the EA/DAR. The project does not provide a comparison of the changes, context on what those changes mean for the actual proposed undertakings, or a rationale on why the changes to goals will result in a better remediation for the residents of Yellowknife.</p> <p>Recommendation The updated goals should provide sufficient background for the reader to understand - in a big picture sense - what the project originally intended to do, what was approved and how that has been altered.</p>	<p>June 25: The GMRP believes that Section 1.2 of the Closure and Reclamation Plan outlines the background and the intent but is open to adjusting the wording of this section if that is helpful. The project followed the MVLWB closure guidance and set more broad closure goals that applied to the whole site, with more specific objectives that are applicable to specific areas. For example, to better align with the closure guidance with respect to terminology of objectives and goals, DAR/Remediation Plan Objectives 1, 2 and 5 below were moved into component-specific objectives within the Closure and Reclamation Plan. The wording reflected in the DAR/Remediation Plan objectives 3 and 4 have been kept to represent higher level Project Goals. There are now four specific objectives for Baker Creek, that were intended to replace the goal that was in the EA in a form that is better aligned with current MVLWB guidance, and states clearly the objectives for Baker Creek, with BC4 and BC5 providing more precise language. Please also refer to the responses to City of Yellowknife Kerry Penney #75 and #77.</p>	
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39	Updated Project Description - Site Location	<p>Comment Unlike the goals, this section does discuss the changes. However, it does not clearly reflect the commitment for remediation of the sediment of the 'boat launch' area.</p> <p>Recommendation The text describing the scope should specifically note not just the shore portion of the boat launch, but the sediment remediation as well.</p>	<p>June 25: The GMRP has included the boat launch in the definition to encompass the sediment remediation and does not feel that this was an omission in the UPD.</p>	
40	Updated Project Description - VCs	<p>Comment This whole section is unclear and is presented in isolation. Some of the language around the VCs are motherhood statements that aren't followed through. Though this list may be the same as in the DAR and at EA, many other aspects of the proposal have changed. Refining these to add precision, allowing for logical connections between VC, design aspects of closure, monitoring, and adaptive management would provide a significant increase in clarity and especially value.</p> <p>Recommendation None</p>	<p>June 25: GMRP acknowledges the comment provided and does not believe any changes are required at this time</p>	
41	Updated Project Description - VCs	<p>Comment Baker Creek and Yellowknife Bay</p> <p>Recommendation What is it about these places that makes them valued components (to allow linkages to Closure Objectives, Closure criteria monitoring)?</p>	<p>June 25: Baker Creek and Yellowknife Bay were identified as valued components for various reason outlined in Section 7 of the DAR in relation to the value of water quality and aquatic habitat.</p>	

42	Updated Project Description - VCs	<p>Comment Permafrost extent is a valued component, but is not clear how or what the project values about it.</p> <p>Recommendation If attempting to preserve it, where are areas of permafrost identified, what permafrost monitoring is being done, and what mitigations will the project implement to avoid or mitigate impacts.</p>	<p>June 25: The extent of permafrost was identified in the DAR as a VC because of its interactions with other environment components. Engineering design teams are aware of the discontinuous permafrost zone in which the GMRP is located, and this has underpinned design decisions.</p>	
43	Updated Project Description - VCs	<p>Comment Terrestrial Vegetation - If this is a valued component, please indicate what actions the project is undertaking to identify these areas, what monitoring is being done to assess impacts and what mitigations the project will do to avoid or minimize impacts to this VC should they be encountered.</p> <p>Recommendation The UPD must make it clear what is important about these VCs, what they're doing to minimize impacts on a design level, and what management tools they will employ should the VCs be encountered during the remediation actions.</p>	<p>June 25: The DAR outlines why VCs were selected in chapter 7: Terrestrial vegetation VCs and the rationale for their selection are summarized in Table 7.5.11 of the DAR. Mitigation includes minimizing the extent of newly disturbed areas and revegetation of borrow areas and other remediated areas will use native species. Vegetation monitoring activities for major structures in areas of major remediation activities will be completed to comply with Measure 21 (See also City of Yk 61).</p>	
44	Updated Project Description - VCs	<p>Comment Intrinsic value of the environment. What does this mean and how can we monitor it?</p> <p>Recommendation If this is a valued component, how is the project assessing the impacts? Are they</p>	<p>June 25: The DAR recognized that northerners and indigenous groups value components of the environment for their intrinsic value. The DAR identified certain VCs as an intrinsic value to reflect this view. The GMRP as a remediation project has an overall</p>	

		working with citizens to assess and track opinions?	goal to reduce loading of contaminants to the environment. Many of its objectives and activities and monitoring contribute to achieving this goal.	
45	Updated Project Description - VCs	<p>Comment How is the project monitoring and assessing the impact to aboriginal interests and community well-being? The Socio-Economic aspects of the project have only just been initiated and there is considerable concern on the lack of social monitoring.</p> <p>Recommendation If this is a valued component, how is the project assessing the impacts?</p>	<p>June 25: In April of 2019, in partnership with stakeholders, GMRP developed Key Performance Indicators (KPI) that are currently being tracked by the MCM for the 2019-20 fiscal year. These KPIs will be analyzed and reviewed on a quarterly basis going forward and reported in the GMRP's Annual Report. GMRP is tracking input from stakeholders and will be updating them based on feedback in the following fiscal year. In addition, the GMRP is updating and preparing to release, in 2019, to the public, the Socio-economic Strategy. The Strategy will provide direction to the GMRP for delivering socio-economic benefits two ways: (1) directly by aligning contracting approaches with local capacity and needs; (2) and, indirectly through capacity building activities and impact mitigation. The City of Yellowknife is a standing member of GMRP's Socio-economic Advisory Body (SEAB) which was established in November of 2018 and its purpose is to provide advice and input to GMRP on socio-economic activities of the</p>	

			<p>project and raising potential barriers to implementation. With the respect to social monitoring, the GMRP has initiated a community wellness study (stress) that will assess the indirect effects of the project. The design of this study is being developed with key YKDFN management staff who have formed a committee to further advise the team on study considerations (e.g. community wellness, housing, socio-ec etc.) The research team will continue to work closely to carrying out this study throughout the 2019-20 year.</p>	
46	Updated Project Description - VCs	<p>Comment The VC are much too broad, limiting their meaning and any potential effectiveness they have at providing assurance that the values of the parties are being respected, protected where necessary, and improved overall.</p> <p>Recommendation For each of these VCs, the project should link closure goals, Objectives or Criteria to show how they are addressing items of the "utmost importance to the affected parties". This section captures the interests of the parties but improvements are required.</p>	<p>June 25: Closure goals, objectives and criteria are implicitly developed to protect valued components. The GMRP does not consider it necessary that the project description contain this and it is not the purpose of a project description for a Water Licence.</p>	
47	Updated Project Description -	<p>Comment It is inaccurate to state that the project has achieved "continued compliance". CIRNAC has refused to</p>	<p>June 25: The GMRP is in compliance with the current water licences and land use permits in place for the site</p>	

	Regulatory Compliance	obtain a new water licence, thus, there is nothing to comply with. Recommendation Correct this technicality.	and has carried out its activities using the intent of the expired historic Water Licence, despite its expiration.	
48	Updated Project Description - Regulatory Compliance	Comment The project provided a list of all activities at site completed under section 89 of the MVRMA on August 18th, 2017. Recommendation Please update the UPD, adding this as an appendix current until April 1, 2019.	June 25: The GMRP does not consider this a necessary update to the GMRP Water Licence Application package at this time.	
49	Updated Project Description - Components Requiring Remediation	Comment This isn't the list of mine components requiring remediation. Recommendation Rename to avoid confusion.	June 25: This is a list of on-site features including mine components and supporting infrastructure that require remediation or long-term management. The GMRP considers the heading appropriate.	
50	Updated Project Description - Table 2-1, Contaminated Soils	Comment The activities do not note the change around moving from the industrial standard Recommendation Add bolded section "leave undisturbed soils <3000 ppm as in place".	June 25: The GMRP notes that another bolded bullet could have been added that reads "risk manage contaminated soils in forest / wetland/ bedrock terrain that cannot be excavated", however it is maintained that this does not warrant an update to this document at this time.	
51	Updated Project Description - Table 2-1, Contaminated Soils	Comment In bullet 2, the project states that they will be excavating 'contaminated granular fill' to industrial standards. This is understood to mean that all areas not in a 'natural state' will be remediated to this standard. Alternatively, a definition of	June 25: The GMRP considers this bullet as stated in the UPD to accurately reflect the CRP. The bullet reads "excavate all contaminated granular fill to industrial soil quality standards in Developed Areas and dispose of in A1 pit." The CRP	

		<p>contamination could be added identifying and areas over 340 ppm as contaminated.</p> <p>Recommendation Update language to reflect commitments.</p>	<p>glossary provides a definition of contaminated granular fill and of Developed Areas. The definition of contaminated granular fill is "Sand and gravel; minor to some silt and clay; occasional to frequent angular cobbles and boulders. Contaminant sources may include: mineralized waste rock; tailings; ore; roaster stack emissions; and/or petroleum hydrocarbons. Contains total arsenic concentrations greater than 340 mg/kg for Site and greater than 160 mg/kg within the Townsite/Marina and/or petroleum hydrocarbon concentrations greater than Environment and Natural Resources Guidelines. A subset of this material contains total arsenic concentrations greater than 4,500 mg/kg. This material is found in the mill/roaster area and is referred to as heavily contaminated. The primary contaminant source is roaster stack emissions." The definition of Developed Areas as provided in the CRP is: " Developed Areas were developed to support mining operations (i.e., mill/roaster area, tailings retreatment plant, Townsite/Marina, roadway network, and various laydown and material storage areas). These areas were constructed primarily with mineralized</p>	
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			granular material and, as a result, soil conditions typically consist of contaminated granular fill, underlain by natural fine-grained soil, and bedrock".	
52	Updated Project Description - Site Infrastructure	<p>Comment There is nothing indicating the change in pumping arrangements, the rationale, or the redundancy associated with the new proposal.</p> <p>Recommendation Include these items.</p>	<p>June 25: The pumping plan that had been proposed in the DAR was premised on maintaining the mine water elevation circa 425L. (Please reference Section 6.8.3 of the Developer's Assessment Report). The mine development workings (e.g. drifts) are well connected and are continuous laterally across almost the entire length of the mine on the 575L, 750L and at greater depths. At other levels, such as the 425L, the lateral connection is limited. For this reason, the pumping plan of the DAR was predicated clusters of multiple wells intersecting various depths. By contrast, the pumping plan proposed in the current CRP is premised on maintaining the mine water elevation circa 750L. (Please reference Sections 4.3 and 5.8.2.2 of the Closure and Reclamation Plan, and Sections 4.2.2 and 5.2.3 of the Water Management and Monitoring Plan.) A new system consisting of submersible pumps installed in two deep wells drilled from surface to intersect mine workings in the Akaitcho area (North end of the</p>	

			<p>mine) between 750L and 950L has recently been installed. It is currently used to maintain the mine water elevation circa 750L by pumping mine water to the Northwest Tailings Area. A similar system is planned to be installed in the C-shaft area (Core Industrial Area of the mine) for active remediation / adaptive management and the post-closure phases of the project. That system will have 2 separate well intakes intersecting 2 different underground workings areas. Each pump will provide 50% of the required maximum pumping capacity. Should operational difficulties occur with one of the two wells a 3rd target in the core area has been identified and can be developed to provide added pumping redundancy, if required. Further one or both of the interim wells at Akaitcho can be retrofitted, as required, to provide even more redundancy.</p>	
53	Updated Project Description - 2.4, Design and Construction Plans	<p>Comment "These plans will be structured by closure component." Recommendation It's not clear what list of 'components' this is. At other points in the documentation it's indicated that they will be organized by closure activity (presumably those identified as the effort to meet closure objectives).</p>	<p>June 25: The GMRP has proposed a definition for Engineered Component, which intends to identify mine components, structures or facilities related to Water Use or Deposit of Waste that is designed by a Professional Engineer. The list of engineered components is still under development, once available, the list of</p>	

			engineered designs required to meet the closure objectives and criteria for the project will be provided. This will inform the number of Closure and Design Plans required for review and approval by the MVLWB.	
54	Updated Project Description - 2.4, Construction Completion Reports	<p>Comment This passage states that the Construction Completion Reports will only propose changes to the monitoring. However, the draft license (p16) notes that it "shall include, but not be limited to, monitoring and management details."</p> <p>Recommendation Again, parties are going to be overloaded and the project will have so many opportunities to make changes - as seen in the moves from the standards of the DAR to that of the new WL application - that major standards changes are inevitable. The Board should consider imposing serious constraints on when the project can request changes so that they receive appropriate focus from parties - who live in and around the area contained by the mine.</p>	<p>June 25: The regulatory strategy proposed by the GMRP seeks to prioritize the re-initiation of the Water Licence process as a means to create greater certainty for the GMRP and its stakeholders. Importantly, the approach acknowledges that the MVLWB has the authority to make final decisions on the final remediation plan including the interpretation and implementation of EA measures; therefore, the proposed approach allows the GMRP to seek input from the MVLWB, through the water licensing process, prior to finalization of the remediation plan. This GMRP proposed regulatory approach assumes that some project details will be finalized during the term of the Water Licence. Note that this is consistent with the way water licences for other major projects typically work. The Draft Water Licence lays out the reports, management plans, monitoring plans that will be necessary to carry out the project going forward. The GMRP acknowledges that there may</p>	

			<p>be some areas of inconsistency in the Draft Water Licence and supporting documentation and additionally there are likely opportunities to refine or streamline the current proposal. The GMRP would welcome a discussion during the upcoming Technical Session to review the proposed approach with Board staff and reviewers. The goal of the GMRP is for the GMRP and the Board to agree to a regulatory strategy that allows the Board adequate opportunity to review and approve details of the Project as they are developed without creating a needlessly burdensome process for reviewers or the Project.</p>	
55	Updated Project Description - 2.4, Performance Assessment Reports	<p>Comment This represents yet another change for modifications to monitoring and management (in the form of 'maintenance' actions). This section does not note any constraints on what is for consideration, nor does the Draft License contain any.</p> <p>Recommendation There is no reason that the changes to monitoring that might be envisioned as part of this reporting cannot be done as part of a larger, bundled application.</p>	<p>June 25: The GMRP will seek out ways to streamline submissions the GMRP is committed to implementing a change control process to facilitate review, such that any changes are identified at the beginning of the document. Please refer to City of Yellowknife: Kerry Penney #54.</p>	
56	Updated Project Description - 2.4,	<p>Comment This project is not seeking to reduce reviewer overload. As mentioned numerous times through the</p>	<p>June 25: Please refer to the response for City of Yellowknife: Kerry Penney # 54</p>	

	p 27 2nd last paragraph	<p>working group and draft period, this approach creates change opportunities with almost every submission, requiring reviewers to dutifully analyze and track *every* submission rather than just a few key documents.</p> <p>Recommendation It is requested of the Board to reject the approach proposed - where reviewers have to read every document carefully - in favour of where a number of larger annual or, preferably, multi-year documents are used as points where significant changes can be introduced (this includes major monitoring changes, modifications to adaptive management, introduction of criteria, or evaluations of success).</p>		
57	Updated Project Description - 2.4, p 26-27	<p>Comment The listed items under section 2.4 are not well reflected in the Engagement Plan, being represented as a short plan, rather than an onerous and repeated series of necessary reviews over the years of Phase II.</p> <p>Recommendation The Engagement Plan needs to be modified to reflect the cycle of plans requiring review. Section 2.4 of the UPD could be improved for readers if the planned list of closure activities were provided in this section, and broken down by years (Cued off figure 2-5). This would allow reviewers to more properly</p>	<p>June 25: The GMRP will take this comment into consideration for future versions of the Engagement Plan, with specific inclusion in the trigger table.</p>	

		consider the amount of reviews required.	
58	Updated Project Description - Table 3-1, p37	<p>Comment The project has chosen not to follow the Review Board's Measure 16, regarding suspension of sediments at the outfall.</p> <p>Recommendation It's not clear why the project has not returned to the Board to seek a modification of this measure. While the intent of the sediment cover is similar, it is not the one approved by the Review Board. - How will the project show that the Closure Activity under WTP1 is assessed (there is no criteria associated with resuspension of sediment to even address the intent or concern of the Review Board requirement from the Review Board)</p>	<p>June 25: Measure 16 states: 'Before construction, the Developer will model re-suspension of arsenic from sediments and resulting bioavailability in the vicinity of the outfall. If the modelling results indicate that the outfall may re-suspend arsenic from sediments, the Developer will modify the outfall design until operation does not cause re-suspension of arsenic from sediment.' The GMRP interprets this measure to mean that the proponent should a) assess if a risk exists and b) mitigate the risk by design of the outfall such as to not cause resuspension of arsenic from sediment. Based on this and Measure 14, the outfall design was modified and relocated. The current outfall design is a near-shore pipe with low flow rather than a high velocity diffuser. The GMRP did a preliminary review of potential effects of the outfall flow and decided that the final design should account for resuspension. Decisions made after SDE further informed the design of the outfall area, i.e., a sediment cover would be installed. As outlined in Section 5.8 of the CRP, the outfall will be placed over a sediment cover and at a depth and flow rate that</p>

			<p>minimizes ice scour and sediment scour and maximizes mixing and meets Measures 14. The GMRP has moved to the mitigation portion of the measure and considers the intent of the measure to be met. Further assessment the specifics (e.g., thickness of the sediment cover) will be confirmed in detailed design. Monitoring will be done in this area to confirm mitigations are effective. WTP2-5 is how this will be noted.</p>	
59	Updated Project Description - Table 3-1, p37	<p>Comment The project has not provided the comprehensive quantitative risk assessment that evaluated both the wet and dry methods for the initial freezing designs. Nor has it completed a plain language report despite 3 years passing between the 2016 freeze design basis report and this submission.</p> <p>Recommendation The LWB should direct the project to comply with Review Board Measure 18 prior to the technical session.</p>	<p>June 25: The GMRP position is that the Project is in full compliance with this measure. The wet and dry methods for the initial freeze designs were evaluated as part of the Design Basis Report developed by SRK Consulting. Findings from that report were presented to the GMRP Working Group on January 2016. The plain language report was finalized in June 2019 and will be made publicly available.</p>	
60	Updated Project Description - Table 3-1, p37	<p>Comment The project response to measure 20 does not address wind direction or employ predictive tools. Similarly, the qualifiers attached to the potential employment of mitigations or work reductions result in a lack of clarity.</p>	<p>June 25: The GMRP considers the Air Quality Management Plan to meet Measure 20. Please refer to Section 4.2.1 and Section 5.1 specifically.</p>	

		<p>Recommendation As mentioned elsewhere, the project should comply with Measure 20 to address the significant risks found by the Review Board in their assessment of the project.</p>		
61	New Condition	<p>Comment Measure 21 relates to vegetation and soil sampling occurring near demolition activities. This is not currently part of the GMRP. The project's comments on air quality monitoring are not relevant to the Measure.</p> <p>Recommendation Rather than employing such an approach, the project should be required to submit a vegetation monitoring plan, similar to that found at the Diamond Mines, modified for this instance.</p>	<p>June 25: The GMRP does not agree that a new condition to meet Measure 21 including inclusion of a vegetation monitoring plan is necessary. The GMRP is already committed to meeting the measures and has a Dust Management and Monitoring Plan but it is agreed that this plan is not explicit about vegetation. The GMRP proposes to update the Dust Management and Monitoring Plan with a vegetation monitoring component pre and post demolition of major structures in major areas of remediation.</p>	
62	Updated Project Description - Table 3-1, p38	<p>Comment Measure 23 requires the Tailings Monitoring and Management Plan to address the B1 Pit Cover. The TMMP does not include consideration of the B1 (or any other) pit covers. In reviewing Appendix 5.0A, Objective p2, Criteria 4 & 5 will feature criteria, but there's nothing that indicates/links to where the monitoring, management or research will be found.</p> <p>Recommendation With the next update, the TMMP should be improved</p>	<p>June 25: The design of the B1 pit cover has yet to be finalized. It will need to incorporate both the freeze program and arsenic waste disposal activities. Depth of the cover will be one of the criteria that will be evaluated during the design. Studies conducted for the development of the tailings cover are directly applicable to any cover that may be needed for B1 pit or portions of B1. Similar concepts in terms of cover thickness, materials,</p>	

		to address the MVEIRB measure and provide all necessary information for pit covers.	and vegetation control are expected to apply. The TMMP will be updated once a design has been formalized for the B1 pit cover.	
63	Updated Project Description - Table 3-1, p39	<p>Comment Suggestion 4 advocated for the government to develop a policy framework and guidance for the perpetual care and management of remediated contaminated sites.</p> <p>Recommendation The project response regarding the Giant Perpetual Care Plan is not the same thing. As FCSUP was just renewed, please update this section to include an appropriate response as to why this was not pursued.</p>	<p>June 25: The GMRP stands by the response to Suggestion 4 in the UPD. The development of additional guidance beyond the Perpetual Care Plan for Giant is outside of the purview of the GMRP.</p>	
64	Table 4-2q	<p>Comment Components of the Giant Mine Remediation Project</p> <p>Recommendation Again, just what are the Mine Components for the closure plan? If it's the ones listed here, the closure plan needs amending.</p>	<p>June 25: Further discussion at the technical session is requested to understand the City of Yellowknife's concerns with respect to the identification of mine components. Table 4-2 is intended to provide a high level overview of potential impacts from remediation activities and long-term monitoring and maintenance. It was not intended to be a comprehensive list of mine components.</p>	
65	UPD 4.1, Bullet 5	<p>Comment The City is pleased to see that blasting residues will be a specific monitoring focus.</p> <p>Recommendation Please provide the</p>	<p>June 25: Please refer to the Draft Water Licence submitted as part of the GMRP Water Licence Application Part E, condition 8, Schedule 2 for details</p>	

		<p>general expectation that will be expected in each of the Design and Construction Reports. - Rather than using such an approach which may have many different monitoring structures, standards and requirements, why has the project chosen not to set forth a standard set of commitments that will apply to all blasting?</p>	<p>to be expected in each Design and Construction Plan. The GMRP is proposing an overarching Blasting and Explosives Management and Monitoring Plan that any activity-specific plans would be required to follow, similar to other Management and Monitoring Plans.</p>	
66	UPD, Table 4-3, p64	<p>Comment The mitigation "drilling methods will be selected to minimize dust" seems clear, but it not reflected in the Dust Management Plan. In that document, wet and dry drilling are discussed (4.3.4, 6.3.5). Recommendation Please indicate what drilling methods are being selected against and what the evaluation scheme is.</p>	<p>June 25: The likely drilling methods will include rotary (diamond drill core) and/or percussion (downhole hammer), but the exact method will be determined on a project-specific basis. Rotary methods use a constant flow of low-pressure water to bring cuttings to surface. Percussion drilling methods use air to bring cuttings to surface and inject water to control dust. Drill evaluation will include the hole deviation tolerance and control of dust.</p>	
67	UPD, Table 4-3, p65	<p>Comment Temperature, Ice and Outfall management Recommendation It's not clear where the home of this monitoring and management will be. Secondly, further information on how the demarcation will be undertaken - does this mean signs from shore or something that is more analogous to NTPC's efforts at Jackfish Lake?</p>	<p>June 25: The specifics related to the monitoring of the outfall will be outlined through the detailed design of the WTP and outfall. These monitoring components, such as temperature, as well as operational management components will be incorporated into the appropriate plans such as the Water Management and Monitoring Plan and operating procedures for the WTP, once known. Demarcation of the</p>	

			outfall will be determined through the design and construction plan(s), incorporating best practice and community input.	
68	UPD, Section 4.2 p 70	<p>Comment "The [Borrow/Explosives] plan has not yet been developed and will be submitted prior to commencement of remediation (refer to Proposed Water License for proposed plan content)."</p> <p>Recommendation This content is not provided.</p>	<p>June 25: Borrow Materials and Explosives Management Plan will be ready for public review and comment in 2021, 90 days before the start of construction.</p>	
69	UPD, p70	<p>Comment The project notes that they will adhere to the City of Yellowknife Noise Bylaw on page 70. However, this is not present in the table on 75.</p> <p>Recommendation Please confirm that the residents of Yellowknife should expect 8 hours of quiet each day.</p>	<p>June 25: The GMRP will adhere to the City of Yellowknife noise bylaw. However, many work packages will run 24 hours/day especially during the summer field season, as has been the case during all of the Site Stabilization Program work completed to date. The GMRP has never had a noise complaint.</p>	
70	UPD, Appendix B	<p>Comment The Commitments Table is to be provided with the Post EA package.</p> <p>Recommendation It's not provided as part of this document, nor is it readily available amongst the CRP appendices. This should be added to the Updated Project Description approved following the issuance of the license.</p>	<p>June 25: The GMRP submitted the Commitments table as part of the Updated Project Description in the Water Licence Application Package.</p>	

71	Response to pre-engagement comments, AN# 5	<p>Comment Section 1.5 of the CRP does not provide additional clarity on land management or creation of a research reclamation plan (as suggested) linked to the criteria.</p> <p>Recommendation The creation of a perpetual care plan, along with the aspects associated with communication with future generations is not part of the draft permit or license.</p>	<p>June 25: The GMRP confirms that the Perpetual Care Plan (PCP) is not proposed to be part of the Water Licence; rather, this is a requirement of the Giant Mine Environmental Agreement. It is worth noting that a closure principle is minimizing long-term active care requirements, which have guided the development of the CRP, in addition to Site Wide Closure Objective SW4. The development of the PCP will take place with affected parties beginning in June of 2019.</p>	
72	New Condition	<p>Comment Responding to EA requirements and commitments, this requirement should form a requirement of the closure plan.</p> <p>Recommendation Under Part D of the Water License, achieved through Closure Objective SW4, a closure criteria requiring the completion of a Perpetual Care Plan. To achieve this, this project will complete a research reclamation plan within 2 years, that focuses on aspects of perpetual care and communicating with future generations. Monitoring will be proposed within that plan, with management actions linked. This plan will eventually form another management plan, with similar reporting and review requirements.</p>	<p>June 25: The GMRP does not support a Water Licence condition to bind the Project to the EA Measures or the commitments made in the EA process. The GMRP legally agreed to these measures in 2014. A concordance table of the measures and commitments is provided in the appendix to the Updated Project Description. Further the project does not propose a reclamation research plan on perpetual care needs. The development of the draft Perpetual Care Plan will occur with affected parties beginning in June 2019. The Perpetual Care Plan is a requirement of the Environmental Agreement not the Water Licence and as such it is not appropriate to add further conditions within the Water Licence. The GRMP notes that it</p>	

			submits an annual report to GMOB and includes an update on the Project's progress including how it is addressing Measures and Suggestions as applicable.	
73	Response to pre-engagement comments, AN# 6	<p>Comment It's not clear what reduction in review obligation has been made between the draft and the submission. Indeed, identifying the performance assessment report as another mechanism for changes to the monitoring and management approach has resulted in another step where Parties need to complete full reviews.</p> <p>Recommendation The Board needs to be aware of the severe obligation the project's approach is placing on the parties. Absent the introduction of procedural limits on where and when significant changes could be made, Parties will be overwhelmed. The City strongly encourage the board to require the project to submit annual or multi-year packages to reduce the burden.</p>	<p>June 25: The GMRP will provide an overview of the process it has proposed during the technical session. A document control process will be used to help indicate to reviewers where there are significant changes, however the GMRP needs to ensure all relevant information is provided to the Board and Inspector.</p>	
74	Response to pre-engagement comments, AN# 7	<p>Comment Climate Change projections have historically under-predicted the magnitude of change. This project is fundamentally based on temperature and the rate of warming will strongly impact the need for management (increasing unfunded project costs) and the viability of the project. We are</p>	<p>June 25: The GMRP is committed to working with GNWT-ENR Climate Change and Air Quality unit to ensure updated climate change parameters are incorporated into our thermal model used to predict performance of the freeze system. The GMRP has also committed to developing a Freeze</p>	

		<p>aware of the freeze failures are Fukushima and McArthur River (world's largest uranium mine) and want to ensure that the predictions for the freeze project in our City aren't a footnote to those failures.</p> <p>Recommendation This is another case where GNWT expertise would have been welcome. According to the reviewer comments at no point has the GNWT assessed the nature of the climate change predictions. We ask the Board to use its jurisdiction to compel evidence from GNWT's experts to: - review the predictive nature of past IPCC climate change predictions and discuss the relative accuracy - to review the changes that have occurred between IPCC iterations - to provide a review of the relationship between the IPCC predictions and the Northern setting. - to consider the predictions used as part of the project and recommend best practices - to recommend a research plan designed at developing an update cycle aimed at providing critical information to allow the project to make proactive adaptive management choices to ensure that the frozen shell maintains its value.</p>	<p>Management and Monitoring Plan that will include expert advice from the GNWT-ENR Climate Change and Air Quality unit during the development of this plan.</p>	
75	Response to pre-engagement	<p>Comment The project has deleted one of the goals assessed at EA.</p> <p>Recommendation Instead of noting</p>	<p>June 25: The GMRP has made a specific objective to address this - reduce contaminant loading site-wide</p>	

	comments, AN# 19	that the project has developed EQCs, why not acknowledge the driver used in EA and address it directly? Will the refined EQC's result in less than 2000kg/yr. of arsenic being released from the site (including Baker Creek)	(SW2). Further, the project has proposed additional activities since the EA to reduce arsenic concentrations including an RRP to study additional treatment (i.e. wetlands). As noted in the response to AN#19 in pre-engagement, setting an arsenic loading criterion of <2000 mg/kg has been superseded by use of EQC and runoff criteria and water quality objectives. The GMRP suggest that the EQC, water quality objectives and runoff criteria gives reviewers and the proponent more control over site activities, has real-time submission of results to the MVLWB on a monthly basis, it is what organisms are exposed to, and it's easier to measure reliably.	
76	Response to pre-engagement comments, AN# 23	Comment The project does not provide an answer as to what conditions B2 will receive waste material. Recommendation Please provide an answer.	June 25: Contaminated granular fill will be disposed in the B2 Pit if additional contaminated granular fill is encountered during the remediation of the Developed Areas and if there is no remaining disposal capacity in the TCAs, the A1 Pit, or the B1 Pit.	
77	Response to pre-engagement comments, AN# 31	Comment Rather than changing the Goal of the project that was assessed and approved at EA, then stating that the project "believes" it will be met, the Goal should be maintained. The reclamation plan for Baker Creek is effectively the same as in the DAR,	June 25: The GMRP followed the Board's closure guidance and set more broad closure goals that applied to the whole site, with more specific objectives that are applicable to specific areas. There are four specific objectives for Baker Creek that are	

		<p>there is no reason to change the approved goals.</p> <p>Recommendation The Board should require this goal to be incorporated into the Objectives for Baker Creek.</p>	<p>explicitly outlined in the Closure and Reclamation Plan. These replace the goal that was in the Environmental Assessment (EA) in a form that is better aligned with current MVLWB guidance, and states clearly the objectives for Baker Creek, with BC4 and BC5 providing more precise language. The EA process did not necessarily approve closure goals as written nor did it specify that they could not be refined. Refinements were made based on the following: 1.) closure guidance provided by the water board/GNWT in 2013 that gives more direction on closure goal development. 2.) Fisheries Act amendments and changing emphasis on the word 'productive' given it is hard to measure. 3.) Engagement during SDE indicated that not all parties had the same goal for Baker Creek. Some parties wanted fish excluded and others wanted a sport fishery retained. Taking all of this into account, the GMRP identified specific objectives for Baker Creek restoration and accommodation of the probable maximum flood. The GMRP plans to use the Fisheries Act Authorization and compensation monitoring to outline the specifics for the future Baker Creek fishery.</p>	
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78	Response to pre-engagement comments, AN# 37	<p>Comment Winter 2019 is complete and the project did not provide an update.</p> <p>Recommendation Prior to the technical sessions, please provide an update on the process and the progress to date.</p>	<p>June 25: The GMRP has not met with DFO since it was last reported. The GMRP will continue to keep DFO apprised of the Project's general approach or strategy to the Fisheries Authorization application(s).</p>	
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Giant Mine Oversight Board: GMOB Giant Mine Oversight Board

ID	Topic	Reviewer Comment/Recommendation	Proponent Response	Board Staff Response
41	General File	<p>Comment (doc) GMOB Cover Letter</p> <p>Recommendation</p>		
42	General File	<p>Comment (doc) GMOB response to GMRP Pre-engagement Comments</p> <p>Recommendation</p>		
1	WL - Definitions: New Water Treatment Plant (WTP) and Outfall Systems	<p>Comment GMOB supports separate definitions for the Existing Water Treatment Plant (ETP) and the New Water Treatment Plant (WTP), but we are unclear as to why the term for the WTP includes "and Outfall Systems". The full term (i.e., "WTP and Outfall Systems") is not used in the proposed water licence and the inclusion of the outfall systems is already in the definition.</p> <p>Recommendation GMOB recommends deleting "and Outfall Systems" from the term "WTP and Outfall Systems".</p>	<p>June 25: The GMRP supports this recommendation.</p>	

2	WL - Definitions: Surveillance Network Program	<p>Comment Water Licences typically define the "Surveillance Network Program" as the "the monitoring requirements detailed in Annex A of this Licence." The GMRP has proposed to change this definition to explicitly apply to environmental sampling and it is unclear whether this addition now limits the scope of the SNP. GMOB notes that SNP sampling can have broad regulatory intentions, and does not see the value in apparently narrowing the scope of the sampling over the current definition.</p> <p>Recommendation GMOB recommends that this definition should not be narrowed in order to maintain flexibility in the design of SNP sampling programs.</p>	<p>June 25: The GMRP did not intend to limit the scope of SNP monitoring requirements and supports use of the standard definition.</p>	
3	WL - Definitions: Sump	<p>Comment GMRP has proposed to define a sump as a "low point where water collects". This is a very general definition and could potentially apply to a number of scenarios, including both natural and constructed locations. GMRP should confirm the intention of this term by including additional description such as "constructed low point", "excavated low point", or similar.</p> <p>Recommendation GMOB recommends this definition be updated</p>	<p>June 25: The GMRP supports the definition of sump to be "a human-made pit, trench, hollow, or natural depression used for the purpose of depositing Water and/or Waste" as proposed by the MVLWB in its draft standard Water Licence conditions.</p>	

		to more specifically identify the type of low point that is being referred to.		
4	WL - Definitions: Tailings Containment Areas	<p>Comment The definition does not include a listing of the specific tailings areas. Other recent water licences identify the tailings containment areas by name, or identify a plan or document that specifies them explicitly.</p> <p>Recommendation GMOB recommends this definition should be updated to explicitly identify the tailings containment areas.</p>	<p>June 25: The GMRP agrees it would be appropriate to update the definition of TCA to reflect the locations on site which have been designated as TCAs (Northwest, North, Central , and South Tailings Ponds).</p>	
5	WL - Clause B.8	<p>Comment This clause specifies that a "dry well" is not an inoperable well within the meaning of the licence. GMOB is uncertain why this clause is required. GMOB notes that it is important that a groundwater well is providing the intended monitoring information. If a well is routinely dry and not providing samples, then the efficacy of the well should be reviewed, and the well re-installed if necessary.</p> <p>Recommendation GMOB recommends that the GMRP provide additional support for including this clause in the licence.</p>	<p>June 25: The intention of the clause was to match other recent Licences issued by the MVLWB , and to provide clarity to reviewers who did not differentiate between dry wells and inoperable wells. More specifically, a well should not be removed from the program (or considered inoperable) if it has only been dry for a limited period of time. 'Dry wells' are commonly associated with shallow wells that respond to seasonal variations in water supply; e.g., from infiltration of surface water from rainfall and snowmelt. These wells may be dry in years with low winter snowfall or spring rainfall amounts, but may recharge sufficiently in wet years for a sample to be collected. If a</p>	

			well has been persistently dry over a number of years, the efficacy of the well will be reviewed.	
6	WL - Clause D.2	<p>Comment The GMRP has proposed a clause requiring that an updated CRP, reflecting changes in any Management and Monitoring Plans or Design and Construction Plans, be submitted each year. The intent of this clause is to ensure that the CRP is current, while also ensuring that multiple approval processes are not required. GMOB agrees with the intent of this clause, but suggests that additional clarity should be provided regarding the need to ensure that any changes incorporated into the CRP must be with Board approval.</p> <p>Recommendation GMOB recommends the wording be adjusted to: "The Licensee shall submit an updated version of the Giant Mine Remediation Project Closure and Reclamation Plan each year to reflect project updates and changes identified in any Management and Monitoring Plan(s) or Design and Construction Plan(s) approved by the Board".</p>	<p>June 25: Further discussion is requested to clarify if the recommendation is requesting a second approval process. The GMRP intends to provide updates to the Closure and Reclamation Plan based on updates to criteria or significant changes to scope which have gone through a review process and have been approved in the respective Design and Construction Plan. The Closure and Reclamation Plan provides an overview of the project and the project does not intend to provide a comprehensive update.</p>	
7	WL - Clause D.3 - Post-Closure Monitoring and Maintenance Plan	<p>Comment The GMRP proposes to submit a Post-Closure Monitoring and Maintenance Plan to the Board for approval a minimum of one year prior</p>	<p>June 25: The GMRP agrees that the guidelines will be referenced in the plan. The GMRP does not recommend setting a firm date, as any potential</p>	

		<p>to completing Remediation. GMOB notes that the Board "Guidelines for the Closure and Reclamation of Advanced Mineral Exploration and Mine Sites in the Northwest Territories" provides recommendations for Post-Closure Monitoring for different mine components, and should be referenced. In addition, the proposed timing for submission of this report is "one year prior to completing Remediation". This is subjective, and the Board should consider setting a definite date for submission of this Plan; active remediation is scheduled to be completed by October 31, 2031, so a potential due date would be October 31, 2030. If the submission date is set in a schedule then it could be changed relatively easily by the Board, if required.</p> <p>Recommendation GMOB recommends that this Plan should reference the Board "Guidelines for the Closure and Reclamation of Advanced Mineral Exploration and Mine Sites in the Northwest Territories". GMOB recommends that a definite date should be set for submission of this Plan and could be included in a licence schedule.</p>	<p>delays or efficiencies may cause that date to fluctuate. As indicated in Part B, Condition 17, the GMRP will provide an updated schedule to the Board and the Inspector upon request.</p>	
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8	WL - Part D - Perpetual Care Plan	<p>Comment GMOB notes that the Perpetual Care Plan is referenced some of the closure criteria and monitoring/maintenance items for the site wide closure objectives.</p> <p>Recommendation At this time, the contents of the Perpetual Care Plan are still under discussion; GMOB recommends that the GMRP ensures that the plan content will be able to fulfill the proposed closure criteria and/or monitoring/maintenance requirements of the CRP going forward.</p>	<p>June 25: The development of the Perpetual Care Plan (PCP) will take place with affected parties beginning in June of 2019. The GMRP has identified closure criteria in SW3, SW4 and SI 3 and elements of these can be achieved through the development of the Perpetual Care Plan. Any updates to closure criteria will also be taken into consideration as the project progresses.</p>	
9	WL - Clause D.4 - Final Closure and Reclamation Report	<p>Comment The GMRP proposes to submit a Final Closure and Reclamation Report to the Board for approval prior to entering the Closure Monitoring and Maintenance Phase. GMOB notes that the Board "Guidelines for the Closure and Reclamation of Advanced Mineral Exploration and Mine Sites in the Northwest Territories" provides recommendations for a Reclamation Completion Report, and should be referenced. In addition, the proposed timing for submission of this report is "prior to entering the Closure Monitoring and Maintenance Phase." This timing is vague and should be tied to a discrete action or timeline. The active remediation phase is currently</p>	<p>June 25: The GMRP agrees that the guidelines will be referenced in the plan. The GMRP does not recommend setting a firm date, as any potential delays or efficiencies may cause that date to fluctuate. As indicated in Part B, Condition 17, the GMRP will provide an updated schedule to the Board and the Inspector upon request.</p>	

		<p>scheduled to end October 31, 2031 so a possible date could be March 31, 2032 (or as recommended by the GMRP). If this date were included as a schedule, then it could be amended relatively easily by the Board.</p> <p>Recommendation GMOB recommends that this Plan should reference the Board "Guidelines for the Closure and Reclamation of Advanced Mineral Exploration and Mine Sites in the Northwest Territories". GMOB recommends that a definite date should be set for submission of this Plan and could be included in a licence schedule.</p>		
10	WL - Part D - minewater elevation	<p>Comment The CRP proposes a research program for raising the minewater level from the current 750 level. GMOB understands that the findings from this study will be presented to the Board, and that a minewater raise would not occur without approval by the Board. However, GMOB feels that the potential implications of a minewater raise to the overall water quality on the site is of sufficient importance that a clause requiring Board approval of any raise should be included within the Water Licence.</p> <p>Recommendation GMOB recommends that the water licence</p>	<p>June 25: The GMRP does not feel this condition is required. The submitted Water Management and Monitoring Plan describes that the mine pool water level will be maintained at approximately 750 Level with seasonal fluctuations. If in consideration of the RRP results, the GMRP determines a raise above 750 L is appropriate, an updated Water Management and Monitoring Plan would be submitted to the MVLWB for approval.</p>	

		include a condition requiring submission and approval of this study before the water level in the mine is permitted to be raised above the 750L.		
11	WL - Clause E.9 - Frozen Shell Final Design and Construction Plan	<p>Comment The GMRP is proposing that an Arsenic Trioxide Frozen Shell Final Design and Construction Plan be submitted a minimum of 90 days prior to commencement of the Arsenic Trioxide Frozen Shell. GMOB notes that this is a significant undertaking in regards to the overall closure of the site, and expects that the design will be highly technical. GMOB is concerned that 90 days will not provide sufficient time to review the submission and provide evidence to the Board. Additional time should be provided. The frozen shell is also a unique undertaking in the north, and GMOB expects that there will be challenges. GMOB notes that for other projects with unique challenges, such as the Diavik frozen core dams and the Fortune co-disposal facility, the Board has required that peer review panels are established that provide independent third party technical review and recommendations to the proponent. Such a panel could be considered for this undertaking.</p> <p>Recommendation GMOB recommends that the timeline for</p>	<p>June 25: The GMRP maintains that 90 days (3 months) is a reasonable time for interested party review for each of the Design and Construction Plans, including the Arsenic Trioxide Frozen Shell Design. The GMOB is reminded that the extremely robust and resilient arsenic trioxide frozen shell option was fully reviewed and endorsed by the Independent Peer Review Panel (IPRP) through an extensive in-situ and ex-situ options analysis process. The role of the IPRP is to perform independent technical quality assessments and endorsements of the most appropriate technical solutions that accompany the closure and reclamation plan for the GMRP. The IPRP has recently reviewed and endorsed the frozen shell detailed design of the AR1 and AR2 zones. Additional independent peer review is not required.</p>	

		<p>reviewing the Arsenic Trioxide Frozen Shell Final Design and Construction Plan should be a minimum of six months. GMOB recommends the Board consider whether a peer review panel should be established for this component of the project.</p>		
12	WL - Clause G.3	<p>Comment In section 1.5 of the draft Water Management and Monitoring Plan, the GMRP requests the approval of Phase 1 of the plan upon issuance and commits to updating Phase 2 of the plan for submission 90 days prior to Phase 2.</p> <p>Recommendation GMOB supports a phased approval process for the Water Management and Monitoring Plan but recommends that specific language describing this process be included in the water licence.</p>	<p>June 25: A Phased approval process is requested in order to reflect the change from current operations (Phase I) to remediation (Phase II). This will be discussed during the technical sessions and an updated Appendix B: Conformity Table of Items Requiring Submission will be provided to clarify the requested timing of specific plans and approvals after the second technical session is complete.</p>	
13	WL - Clause G.14	<p>Comment Part c of clause G.14 in the proposed water licence references an "approved Standard Operating Procedure", but there doesn't seem to be any other reference to this procedure elsewhere in the licence.</p> <p>Recommendation GMOB recommends inclusion of a condition specifying the requirements of a Standard Operating Procedure related to effluent discharge.</p>	<p>June 25: The GMRP supports the addition of a condition to provide a Standard Operating Procedure related to effluent discharge.</p>	

14	WL - Clause G.17	<p>Comment This clause identifies that a minimum of 6 months prior to discharge from the new WTP, the GMRP will submit a report demonstrating that the WTP will satisfy the EQC in Part G, condition 16 and Approved EA Measures 14 and 15. GMOB notes that this report is not intended for Board approval. GMOB further notes that the effluent quality being discharged into Back Bay was a significant source of discussion during the EA for this project and warranted the development of two EA measures. GMOB's opinion is that reports concerning the ability of the project to meet EA measures are significant to require Board approval.</p> <p>Recommendation GMOB recommends that the report demonstrating that the WTP will meet EQC should be for Board approval.</p>	<p>June 25: The GMRP does not feel that Board approval is necessary for this report, as there will be no discharge from the WTP until the EQC is met.</p>	
15	WL - Part G - runoff water quality criteria	<p>Comment Section 3.4.2 of the draft Water Management and Monitoring Plan (WMMP) proposes to allow runoff from engineered structures (e.g., TCAs, remediated pits or the landfill) to enter the receiving environment directly if it meets "surface runoff quality criteria". The GMRP has proposed to use the MDMER discharge criteria for surface runoff quality criteria.</p>	<p>June 25: The GMRP would support a revision to the proposed requirements for the Water Management Plan (Schedule 3, Condition 1) to include runoff. The GMRP has discharges that should meet runoff criteria, i.e. engineered structures and has included placeholder SNP stations to reflect runoff from engineered structures.</p>	

		<p>Recommendation Although we support the concept of having surface runoff quality criteria, in our comments on the WMMP GMOB has requested further rationale for the GMRP's current proposal to use MDMER limits. Regardless of the values chosen, it may be necessary to either define these criteria directly in the water licence or include a clause requiring runoff meet criteria set in the WMMP. Discharges that must meet the criteria should also be specified.</p>		
16	WL - Part I - general	<p>Comment GMOB has submitted several comments on the GMRP's proposed AEMPs for Baker Creek and Yellowknife Bay.</p> <p>Recommendation GMOB will provide specific recommendations on this part of the water licence after discussion of the proposed AEMPs during the technical sessions.</p>	<p>June 25: The GMRP acknowledges the recommendation from the Giant Mine Oversight Board.</p>	
17	WL - Clause I.3	<p>Comment This clause identifies that the AEMP Annual Report will be submitted for Board approval. This differs from the summary table provided in Annex B which states that the AEMP Annual Report is not for Board Approval. GMOB notes that the AEMP results form an important component of the overall monitoring for the project, and will be used to</p>	<p>June 25: The GMRP agrees that the AEMP Annual Report will be submitted for Board approval.</p>	

		<p>confirm that a number of EA measures related to acceptable environmental change are being met. As such, the AEMP Annual Report should be for Board approval. Requiring Board approval for AEMP Annual Reports is also consistent with other MVLWB water licences as for the Gahcho Kue Project.</p> <p>Recommendation GMOB recommends that the AEMP Annual Report should be for Board Approval.</p>		
18	WL - Clause I.5	<p>Comment This clause requires submission of an Aquatic Effects Baseline Report for Yellowknife Bay along with the AEMP Design Plan. The Concordance Table in Annex B identifies that the Baseline Report is not for Board approval. GMOB notes that the Baseline Report is a requirement of an EA measure, and will form a fundamental component of the overall AEMP monitoring for the project. As such, it is an important document, and should be for approval. If it is submitted as part of the overall AEMP design, then it could be subject to Board approval as part of the overall AEMP design package.</p> <p>Recommendation GMOB recommends that the Baseline report should be for Board approval, either as</p>	<p>June 25: The GMRP will submit the design of the Yellowknife Bay Aquatic Baseline as a Special Study to the AEMP Design Plan. Then results are reported as appendices to the AEMP Annual Report. It is thought this will take a few years of data collection such that there will be interim updates in annual reports and a final report submitted as part of the AEMP Annual Report once complete.</p>	

		a standalone document or as part of the AEMP Design Package.		
19	WL - Clause I.6	<p>Comment This clause requires submission of a Plume Delineation Study as part of the first AEMP Annual Report. The Concordance Table in Annex B identifies that this study is not intended for Board approval. As noted in previous comments, issues dealing with effluent quality and zones of impact are of significant concern to the local community, and formed an important component of the EA. As such, this study should be subject to the full review afforded to submissions requiring Board approval. GMOB previously recommended that the AEMP Annual Reports should be submitted for Board Approval, and the Plume Delineation Study could be reviewed and approved as part of the first Annual Report submission package.</p> <p>Recommendation GMOB recommends that the Plume Delineation Study should be for Board Approval, either as a standalone document or as part of the first AEMP Annual Report submission.</p>	<p>June 25: The GMRP feels that the Plume Delineation Study should not require Board approval.</p>	

20	WL - Clause I.9	<p>Comment The recently approved GNWT/MVLWB Guidelines for Aquatic Effects Monitoring Programs describe a slightly different approach to responding to Action Level exceedances. The requirement is now that Low, Moderate and High Action Levels be described in the Design Plan along with a description of actions that are proposed to be taken at each exceedance level. However, the submission of an AEMP Response Plan is now only required if a Moderate or High Action Level is exceeded. If Low is exceeded, the GMRP need only carry out the actions approved in their AEMP Design Plan.</p> <p>Recommendation GMOB recommends that the proposed language in Clause I.9 should be modified to meet the requirements in the recently approved AEMP Guidelines.</p>	<p>June 25: The GMRP supports the update in wording to reflect the new Guidelines.</p>	
21	WL - General - Use of Action Levels in Management Plans	<p>Comment GMOB notes that the GMRP has updated some of the requirements for its proposed management/monitoring plans including adding a reference to "a threshold or action level to define the point at which monitoring indicates a response is necessary" (e.g., Schedule 3, Condition 1, section d). GMOB believes this is an improvement but we</p>	<p>June 25: The GMRP will update the language used in the Management and Monitoring Plans in the next submission.</p>	

		<p>are still not clear why the GMRP isn't using the defined term of "Action Level", as is done in other MVLWB Type A water licences.</p> <p>Recommendation GMOB recommends that requirements for the following plans refer to the defined term of Action Levels as used for other recent MVLWB Type A water licences: Water Management and Monitoring Plan, Erosion and Sediment Management and Monitoring Plan, Dust Management and Monitoring Plan, Tailings Management and Monitoring Plan, Borrow and Explosives Management and Monitoring Plan, Arsenic Trioxide Frozen Shell Management and Monitoring Plan. As in other water licences, the specifics of the requirements should be listed in the Schedules associated with each plan.</p>		
22	<p>WL - Schedule 1, Condition 1 - Annual Water Licence Report</p>	<p>Comment In the section describing what needs to be reported for each management plan, GMRP have included a condition to describe "any corrective actions taken during the year in response to monitoring results" or "a summary and interpretation of monitoring results, including any response or corrective action taken". However, modern Type A water licences issued by the Board have a</p>	<p>June 25: The GMRP does not oppose the use of Action Levels, should the Board wish to use the terminology in the Water Licence.</p>	

		<p>requirement to provide a "summary of Action Level exceedances" and a "description of actions taken in response to Action Level exceedances" in the Annual Water Licence Report. It is not clear why the GMRP is proposing not to use Action Levels as they are used in other licences.</p> <p>Recommendation It is important to note that the requirement of Action Levels in management plans was introduced by the MVLWB as a way of simplifying the interpretation of annual monitoring data that is provided in the Annual WL Reports. Typically, quantitative Action Levels are proposed in draft management plans and subject to review and then approval by the Board. The exceedance of pre-defined Action Levels is not a compliance issue; instead it is only meant as an early warning that facilities or activities are not performing as intended and that further inquiry is needed. Conversely, no exceedances of Action Levels (as reported in the Annual WL Report) gives some assurance that further investigations may not be necessary. The wording proposed by the GMRP for the Annual Water Licence Report suggests that reviewers may need to spend a lot more time every year trying</p>		
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		to interpret results and the proponent's interpretation of those results for each management plan in order to determine whether further investigation is necessary or not. For this reason, GMOB suggests that the GMRP utilize the standard Action Level terminology and requirements of modern Type A water licences issued by the MVLWB for the Annual Water Licence Report.		
23	WL - General - Quantitative Risk Assessment	<p>Comment Given that the Quantitative Risk Assessment (QRA) is not completed, it may be necessary during the term of the water licence to update one or more management plans as well as the AEMP Design Plan to address the assessment outcomes.</p> <p>Recommendation GMOB recommends assessing the need to update plans, including the AEMP Design Plan, based on the outcomes of the QRA when it is completed.</p>	<p>June 25: Upon completion of the QRA, the Project will evaluate what improvements are required to any Project documentation. Any management and monitoring plans that require updates will be submitted to the Board for consideration.</p>	
24	SNP - Proposed Surveillance Network Program - SNP Stations 43-1 and 43-1a	<p>Comment The monitoring list for these stations does not include flowrate or volume.</p> <p>Recommendation GMOB recommends that discharge rates and volumes should be included as monitored parameters for these stations.</p>	<p>June 25: Discharge volumes for SNP 43-1 are collected as part of existing operations (and are outlined in section 3.5 of the SOP) and are included in monthly and annual water monitoring, including the annual MDMER/EEM report. Similar practice will continue with the WTP and SNP 43-1a.</p>	

25	SNP - Proposed Surveillance Network Program - - SNP 43-1a	<p>Comment The monitoring information for this station does not include toxicity testing.</p> <p>Recommendation GMOB recommends the planned toxicity testing program for this station should be included in the monitoring information.</p>	<p>June 25: Table 1-1 in the Proposed SNP and Table 3-1 in the SOP will be updated to match the text in Section 3.1.2.2 in the SOP which outlines the toxicity testing required under the MDMER.</p>	
26	SNP - Proposed Surveillance Network Program - - MW 19-1 to 19-6	<p>Comment Water levels are to be collected monthly for the first year, but water level is not identified as a parameter for subsequent monitoring years. Water levels should be collected at the same time as the water chemistry samples (i.e. twice per year).</p> <p>Recommendation GMOB recommends that water level information should be collected at the same time that water chemistry samples are taken.</p>	<p>June 25: Text will be clarified in the Proposed SNP, as well as reflected in the SOP. During the first year after installation, water levels will be collected monthly (during thawed conditions). It is intended that water levels will also be collected during chemistry sampling, and changes to the text will be made to more clearly describe the monitoring program.</p>	
27	SNP - Proposed Surveillance Network Program - - A1 and B3 Pits	<p>Comment SNP stations are located to collect samples of run-off from all pits except the A1 and B3 pits.</p> <p>Recommendation GMOB recommends the GMPR provide a rationale for not collecting run-off samples from the A1 and B3 pits.</p>	<p>June 25: It is intended that future runoff locations for A1 and B3 pits will be established, if runoff is conveyed off these areas.</p>	
28	SNP - Proposed Surveillance Network Program - Influent to WTP	<p>Comment It isn't clear which station will be used to monitor influent for the new WTP.</p> <p>Recommendation GMOB requests clarification on which station will be</p>	<p>June 25: Influent for the new WTP will be pumped from the C-Shaft area of the underground. Specific location(s) to sample for the quality and quantity of influent for the WTP</p>	

		used to sample the quality and quantity of influent to the WTP.	will be developed through the detailed design of the WTP.	
29	SNP - Proposed Surveillance Network Program - Monitoring at different locations on Baker Creek	<p>Comment The proposed SNP monitoring includes only a few monitoring points on Baker Creek, positioned in relation to the ETP discharge.</p> <p>Recommendation As also noted in our comments on the AEMPs, monitoring on Baker Creek should capture all potential releases/loadings of waste to the creek, not just waste from the ETP.</p>	<p>June 25: Table 3-2 in the SOP for Effluent and Water Sampling outlines the operating monitoring program (OMP) station locations. These include 12 runoff locations (see Figure 3-1 of the SOP). Further potential monitoring locations are anticipated to be determined through detailed design and the development of construction plans which will include activity-specific monitoring.</p>	
30	PEC - General	<p>Comment GMOB has reviewed the GMRP's responses to the pre-engagement comments provided by GMRP. In general, the GMRP responses did not fully address the issues raised by GMRP, and additional discussion is required to resolve GMRP's concerns. GMRP has attached a table that provides an assessment of the adequacy of the GMRP response on a comment by comment basis. GMRP has also summarized the remaining concerns by topic in the following comments.</p> <p>Recommendation GMRP recommends review of the attached table for a detailed evaluation of the GMRP's responses to pre-engagement comments.</p>	<p>June 25: The GMRP appreciates the submission of the table to assist in future discussions</p>	

31	PEC - General - Permanence and the Options Selection Process	<p>Comment GMOB raised questions regarding the selection of closure options that would not be considered permanent, and would require on-going maintenance, e.g. fencing. GMOB recommended that a defensible rationale should be provided wherever non-permanent closure options are selected. In a subsequent comment, GMOB extended this recommendation to include the whole options selection process. The GMRP responded that on-going care and maintenance of the site over the 100 year project life is an integral part of the project, several non-permanent components are standard mine closure practices, and that further clarity on the rationale and selection of options has been provided through a series of figures for each mine component of the CRP. The CRP does not explicitly describe the rationale for selecting any remediation measures that are not permanent. GMOB acknowledges there are situations where designing for permanence may not be technically feasible or desirable for other reasons. However, we maintain that a defensible rationale should be presented whenever non-permanent remedial solutions are selected. The additional information presented in the</p>	<p>June 25: The GMRP disagrees that every non-permanent component of the overall closure plan requires a justification. Designing for permanence is not part of the stated goals for the CRP (Section 1.2 of the CRP), nor is it directly listed as one of the six closure principles. GMRP is not suggesting that permanence is undesirable, and in some instances, this has been factored into the decision making where appropriate, in line with Principle 4, minimizing long term active care requirements. The CRP is not considered "walk-away" in the next 100 years. The site will require ongoing management presence for the next 100 years, for monitoring, maintenance, and operation. There is no avoiding the need for on-going operation and maintenance at the site in the current concept of the plan, nor in any viable closure plan approach that has been identified over the history of the Project. With regards to the fence, additions were made to the CRP in Section 5.4.6.2 to clarify the multiple accounts analysis done to result in the decision to have a fence in the Core Industrial Area.</p>	
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		<p>updated CRP does help reviewers better understand the GMRP's rationale for design decisions, however there is still a need for further discussions on this topic.</p> <p>Recommendation GMOB recommends that additional discussion on this topic should occur at the technical session.</p>		
32	PEC - General - Off-site Contamination	<p>Comment GMOB noted that there are impacts associated with the Giant Mine that extend beyond the project boundaries, and will impact water and land use in the region. GMOB acknowledged that these offsite impacts are not within the scope of the Giant Mine Remediation Project, but suggested that the CRP include a description of the processes the Federal and Territorial Governments are taking to assess and mitigate off-site contamination. The GMRP responded that the off-site contamination was outside the scope of the remediation, and that they continue to work with federal and territorial agencies to share information. GMOB is aware that off-site contamination is not directly within the spatial scope of the current project. However, there are clear linkages between on-site and off-site impacts and a need for consistency of approaches. In addition, the co-</p>	<p>June 25: The GMRP acknowledges that risks associated with the legacy of the Giant Mine extend beyond the scope of the GMRP. While risk management activities outside the Project Boundary are not part of the scope of the Project it is sensible strive to align the approach to risk management between the Project Boundary and surrounding lands. Please refer to ORS 2 - Attachment 2 - Contaminated Soils Response for more discussion</p>	

		<p>proponents of the GMRP are also responsible for managing off-site impacts caused by the historic operation of the Giant Mine. That was the basis of our request for clarification on the processes being used by the Federal and Territorial governments. The request was not acted on.</p> <p>Recommendation GMOB recommends that additional discussion on the topic of off-site contamination should occur at the technical session.</p>		
33	PEC - Contaminated Soils	<p>Comment GMOB provided questions and comments related to the changes to the project related to the level and type of soil remediation that is to take place on the site. The proposed plan has moved from remediating the surface of the site to industrial standards to a hybrid approach whereby disturbed areas will be remediated to industrial standards, undisturbed areas above a certain level (significantly greater than industrial standards) will be fenced and undisturbed areas below this level will be left alone. GMOB's questions were intended to develop a better understanding of the scope and rationale for the proposed actions which are very different from those proposed in the DAR, as well as the incremental increase in risk that would result from these changes. In response</p>	<p>June 25: The GMRP acknowledges that the scope for the proposed closure actions for contaminated soils are different from those proposed in the DAR; this was noted in the Preliminary Screening Table 3-1 (Volume 1) and the CRP. These changes in scope are a result of two primary factors: (i) key historical information gathered during the SDE program; and (ii) the results of university based mineralogy research. Both of these facilitated the identification of regional residual soil quality impacts from: (i) historical Roaster operations; and (ii) historical TCA management in the vicinity of Dam 3. These soil quality findings provided new insight into historical Giant Mine operations, and resulted in the expansion of investigation</p>	

		<p>to GMOB's comments, the GMRP did provide additional information in the CRP in an attempt to better explain the rationale for the changes. However, the responses lacked the required detail to fully address GMOB's concerns.</p> <p>Recommendation GMOB recommends that additional discussion regarding the changes to the method for addressing contaminated areas should occur at the technical session.</p>	<p>activities and the requirement to develop remedial alternatives for soil quality issues not envisioned when the DAR was prepared. The human health and ecological risk assessment was also completed to support the options evaluation. The CRP describes the interpretation of the current soil quality within the bedrock/forest/wetland terrain and the closure strategy proposed to address these issues. Specifically, the interpretation of soil quality conditions within the bedrock/forest/wetland terrain, both within and outside the Core Industrial Area, is presented in Sections 5.4.4.2 through 5.4.4.5. Section 5.4.4.6 further describes the Project's interpretation of the recorded conditions, with a summary of the primary factors affecting contaminant distribution, as benchmarked by the case study record. The preferred closure activity associated with the Core Industrial Area is described in Section 5.4.6.2. Further technical details with respect to the regional soil quality data and the process for the selection of the preferred remedial strategy for the Core Industrial Area are presented in Appendix 5.4-A. The GMRP has provided further detail with respect to the approach to address the changes in</p>	
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			the characterization of contaminated soils between the DAR and the CRP, differences between assessed risk between 2006 and 2018, and other comments related to this topic in responses to other reviewers comments and in ORS 2- Attachment 2 - Contaminated Soils Response.	
34	PEC - Sediments	<p>Comment GMOB requested information to help clarify and better understand the rationale for decisions relating to remediation of shoreline sediments. Topics included providing a rationale to support the selected risk assessment scenarios as there seemed to be some differences in the exposure assumptions for sediments compared to soils, concerns related to re-contamination of sediments at the mouth of Baker Creek, responsibility for remediation of sediments further out in Back Bay and the need to screen proposed shoreline remediation as this activity did not form part of the EA. The GMRP responses only partially addressed GMOB's concerns, and additional discussion is required to more completely resolve the issues raised by GMOB.</p> <p>Recommendation GMOB recommends that additional discussion regarding the shoreline remediation should occur at the technical session.</p>	<p>June 25: The GMRP has provided responses to GMOB's Reviewer Comments on these topics throughout the various ORS packages. The GMRP will be prepared to have discussions on shoreline remediation at the technical session should questions remain after review of the GMRP responses. In general, shoreline remediation was an outcome of the Surface Design Engagement process to address affected party concerns on use of the Townsite area post-remediation for recreational activities (i.e. safe for humans to wade in this area). As noted in the Updated Project Description, wave and ice processes affecting the shoreline require consideration and are currently under review; engineering designs will be discussed with affected parties during engagement and final designs brought forward for MVLWB review and approval. Please note the shoreline remediation was noted as a modification from the DAR in the</p>	

			Preliminary Screening document (Table 3-1, Item 7).	
35	PEC - Covers	<p>Comment GMOB made several comments and asked for additional clarification to better understand the technical and environmental rationale for several of the GMRP's decisions related to the types of cover selected for the tailings areas, using contaminated soils instead of tailings to backfill the pits and the decision to relocate the South Pond into the North and Central Ponds. It appears to GLOB that these decisions were made on the basis of community concerns. While GLOB respects that community concerns are a very important consideration, it is also important to ensure that these decisions are well supported technically. The GMRP's response did not provide the additional support that GLOB was hoping to obtain, and further discussion is required to resolve GLOB's concern.</p> <p>Recommendation GLOB recommends that additional discussion should occur at the technical session regarding the technical and environmental basis for the chosen reclamation options relating to the tailings covers and relocation plans.</p>	<p>June 25: The GMRP took the feedback from pre-engagement on the CRP and added additional supporting rationale for some options. GLOB is correct, the primary driver for some decisions was community preference/concern. However, all designs advanced by the GMRP have been carefully vetted for technical feasibility, and all decisions are well supported technically. The technical support for the engineering works is provided in Section 5 of the CRP, and the related appendices. For example, Appendix 5.6A Conceptual Tailings Cover Design summarized the rationale for the cover design on the TCAs, and 5.6B Tailings Remedial Options Report provides additional detail on the rationale behind design choices for the tailings relocation. GLOB has not provided specifics on what they believe is not technically feasible. Note that further engineering details will be available as detailed design proceeds and affected parties will have opportunities to review design documents and the final Design and Construction plans will be provided to the MVLWB for review and approval.</p>	

36	PEC - Borrow and Pits	<p>Comment GMOB is concerned that there does not seem to be a consistent, technical basis for backfilling the pits. The primary rationale appears to be that filling the pits will reduce the potential for pit flooding; however it is GMOB's understanding that the realignment proposed for Baker Creek will largely address this concern. A second rationale is to improve safety and reduce the potential physical hazards associated with steep pit walls; however GMOB's fencing is being considered to reduce exposures to other on-site hazards. There will be a significant volume of borrow material required to fill the pits, and impacts associated with obtaining this material. In addition it appears that stabilization of the underground will be required before the pits can be filled. The GMRP provided some additional rationale for the decision to fill the pits, but GMOB remains concerned that there is not a strong technical basis for opting to backfill the pits. Particularly given the amount of new material that will need to be quarried and the additional impacts associated with this activity.</p> <p>Recommendation GMOB recommends that additional discussion should occur at the technical session</p>	<p>June 25: GMOB is correct that a combination of other options (Baker Creek re-alignment, fences, berms) is expected to significantly reduce risks associated with pits. Pit filling (or partial pit filling) is under consideration on a pit-by-pit basis. The risks and conditions at each pit are different. Pit fill may be required to address risks to humans and wildlife, and/or provide additional flood protection. Where used, pit fill can provide a robust component of the closure plan that also complies with community preferences, aesthetics, and long-term stability. It was also a Suggestion of the MVEIRB's Reasons for Decision. GMRP is sensitive to the fact that increases in pit fill result in increased need for borrow, and for this reason, optimization of the design is underway. Balancing the minimization of borrow requirements with the needs to improve safety and provide the needed flood protection is an important component of the ongoing design.</p>	
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		regarding the technical basis for backfilling the pits with new borrow material.	
37	PEC - Freeze Program	<p>Comment GMOB requested additional information to ensure that the freeze program is an appropriate action to take given that freezing the arsenic is intended to be an interim measure. GMOB is seeking to understand what the freeze program is intended to achieve in order to understand what failure modes and risks need to be protected against. GMOB's current understanding is that the freeze program is intended to reduce the risk of physical release of arsenic dust, and to reduce the potential for arsenic dissolution. However, other activities being completed by the GMRP such as the Site Stabilization Program, the re-alignment of Baker Creek and the plan for long term treatment will also address these concerns, but at potentially a lower cost. GMOB maintains that the objectives and rationale for the freeze program need to be fully articulated in the closure plan in order to ensure that appropriate strategies for managing this aspect of the remediation.</p> <p>Recommendation GMOB recommends that additional discussion regarding the objectives of the freeze</p>	<p>June 25: The GMRP does not agree with GMOB's implication that the objectives and rationale for the freeze are lacking in the Water License submission. Two key closure objectives for the freeze are outlined in the CRP: waste containment for now and the future, and reversibility. Further, the freeze, as with many other closure activities follow the principles of chemical and physical stability, meets the site wide objective of reduction in loading of contaminants to the environment as well as the main GMRP goal of minimizing public and worker health and safety risks. GMOB is correct that additional measures of protection are given to the arsenic chambers including re-alignment of Baker Creek to reduce flood risk to the underground and water treatment. Neither of these activities is a replacement for the freeze which offers containment of the chambers themselves. It is noted that these additional measures of protection were also outcomes of the Environmental Assessment (EA) process and were not meant to replace the freeze, they were meant to supplement the freeze to</p>

		<p>program should occur at the technical sessions.</p>	<p>reduce additional risks of release of the arsenic trioxide dust. Note that an extensive review process of alternative means for addressing risks from the arsenic trioxide chambers was conducted over many years that included options such as long-term water treatment only. This was rejected as being too high risk. The freeze is an approved component of the project through the EA process and resultant measures. As part of the Environmental Assessment, the initial freeze assessment and analysis was summarized and updated in the Developers Assessment Report (2010). To manage the arsenic dust stored underground it was recommended to freeze those stopes and chambers to contain the dust and prevent the release of arsenic into the underground environment. A freeze optimization study was conducted around chamber 10 that demonstrated large scale freezing can be done and will guide design, operation and monitoring. In the Mackenzie Valley Review Board - Report of Environmental Assessment and Reasons for Decision (2013), "The Board considers that the Developer's design for creating the frozen shell or blocks of underground stored arsenic trioxide appears to be sound, from an</p>	
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			<p>engineering perspective, for the Review Board's prescribed 100-year Project lifespan". Significant design work including climate change studies and thermally modelling has progressed to achieve a robust and resilient remediation for the arsenic trioxide dust stored underground that addresses environmental impacts and public concern with Review Board approval. The GMRP does not think the rationale for the freeze requires further discussion in the technical sessions given it has already been through extensive public review in the EA phase and the CRP outlines objectives for the freeze and that no other party raised issues with the freeze objectives.</p>	
38	PEC - Minewater Management - High Test Line	<p>Comment It appears that the GMRP will be decommissioning the High Test Line, which is currently used to convey minewater with very high arsenic concentrations, as part of the the closure process. GMOB notes that there can be advantages to segregating highly contaminated waters from less contaminated waters in a water treatment context, and is seeking to understand whether there may be any reasons to maintain the High Test System.</p> <p>Recommendation GMOB</p>	<p>June 25: Currently the existing piping leads high test water down the C shaft, down the B Ramp and from 575 level to 750 level near Supercrest Pump Station. On the 750 level a horizontal pipe collects all three vertical pipes and transfers the high test water to the Akaitcho high lift sump, where it flows toward the Akaitcho submersible pumps and is conveyed to the NWTP for storage, treatment and discharge. (Please reference Section 4.2.2.2 of the WMMP.) It is estimated that 90% of the high test water reports to the</p>	

		<p>recommends that additional discussion regarding whether there are any potential advantages to maintaining the High Test Line should occur during the technical session.</p>	<p>Akaitcho submersible pumps with limited mixing with the mine pool water. This offers the advantage of substantially preventing the dilution of the high test line waters into the mine pool and of limiting the arsenic loading to the mine pool. Maintenance of the high test line is the only reason access to certain areas of the mine is maintained. This requires that power be maintained underground and that personnel be potentially exposed to high arsenic concentrations and to physical injury risks in order to: maintain primary and secondary egress anywhere access is required; maintain sump pumps at various locations and levels; and maintain piping at various locations and levels. Once the system is decommissioned, access to the North portion of the underground will no longer be required. The level of effort required to decommission the system is low and the process is straightforward: the vertical pipes can be cut free of the horizontal pipe; and power to various sump pumps would be disconnected. Upon decommissioning, high test water from C shaft area will then flow into the mine pool at or near C Shaft; high test water from B Ramp will flow to mine pool at or near B ramp; and 575 level water will flow to the mine</p>	
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			<p>pool in vicinity of the Akaitcho shaft and Akaitcho submersible pumps. If the system is decommissioned before the new WTP is commissioned, a significant fraction of the high test water would mix with the mine pool (C-shaft and B-ramp). Once the new WTP is operational, a smaller fraction of the high test water would mix with the mine pool (575 level water flowing to Akaitcho shaft.) A short-term advantage to maintaining the system in place is that it helps limit the dilution of the high arsenic concentrations into the mine pool. This will no longer be the case once the mine water intakes are installed near C-shaft to feed the new WTP. That being said, the mine remains a hydraulic "sink" that captures the high test water regardless of its discharge location underground. Upon decommissioning of the high test system, once the mine water intakes are installed near C-shaft, most of the high test water will be drawn into the WTP system after some mixing. A portion of it will still flow toward the North end of the mine via gravity before being drawn back toward the C-shaft area after entering the mine pool. This mixing of the high test waters into the mine pool in the vicinity of the mine water intake is anticipated to</p>	
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			<p>provide the advantage of averaging out the contaminant concentration in the water being delivered to the water treatment plant. An underlying assumption of the EQC models is that the high test line would be decommissioned and that this water would report to the mine pool until the arsenic stopes are frozen. The decommissioning of the high test system will result in water with high concentrations of arsenic originating from the areas of the arsenic stopes reporting to the mine pool. The freeze of the arsenic stopes will stop the flow of high test water. During active remediation and the adaptive management phase, as well as post-closure, the freeze program will monitor the temperature of the rock and fill surrounding the arsenic chambers and the water treatment program will monitor the arsenic concentrations at intake. This will enable the verification of the assumptions made during design. The GMRP will work towards assisting the Board in gathering evidence to support specific project details that can be finalized during the term of the Water License. The GMRP acknowledges the request and is open to further discussion during the technical session.</p>	
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39	PEC - Arsenic Impacted Waste Disposal in Frozen Zone	<p>Comment GMOB is concerned about the reversibility of the current strategy to dispose of arsenic impacted wastes into the frozen zone, such as Chamber 15. The GMRP identified that reversibility will be factored into the design of this disposal strategy; GMOB will pursue this concern when reviewing future detailed design information.</p> <p>Recommendation GMOB recommends that additional discussion regarding the reversibility of waste disposal in the frozen zone should occur during the technical sessions.</p>	<p>June 25: The GMRP would like to better understand GMOB's concerns regarding how reversibility is considered during design development.</p>	
40	PEC - Baker Creek - Habitat	<p>Comment There appear to be different opinions regarding the final state of Baker Creek - one opinion is that no efforts should be taken to encourage use of Baker Creek by fish or other aquatic species, which may be incompatible with environmental protection such as the Federal Fisheries Act. The GMRP has indicated they will work with the affected parties prior to finalizing the design for Baker Creek. This is a positive step, however GMOB notes that concerns regarding the post-closure habitat of Baker Creek have been on-going for more than a decade and it appears that limited progress has been made towards resolution of these concerns.</p>	<p>June 25: The GMRP recognizes that some stakeholders are of the opinion that fish access to Baker Creek should be prevented. However, DFO has clearly indicated that such a design would not be permitted. Therefore, the GMRP is proposing to replace existing habitat with similar habitat, not limit fish access to Baker Creek but also not create different or more attractive fish habitat. Final site conditions for Baker Creek are described in Section 5.5.6 of the Closure and Reclamation Plan. The GMRP will discuss this approach with stakeholders during the upcoming engagement sessions planned for Fall 2019 and with DFO when they are next available. The GMRP updated fish</p>	

		<p>Recommendation GMOB recommends that additional discussion regarding the post-closure habitat of Baker Creek should occur at the technical session.</p>	<p>habitat mapping in Baker Creek in 2018 and 2019 to support engagement and design. While the GMRP is open to a discussion regarding post-closure habitat of Baker Creek in the technical sessions, the GMRP has heard clearly that the YKDFN would like to be active participants in planning the future of Baker Creek and so the GMRP stresses the importance of having the engagement sessions with community members in later 2019. The GMRP acknowledges that resolution of future habitat of Baker Creek has been outstanding for some time. In part, this is because the GMRP conducted a comprehensive options analysis to determine if Baker Creek needed to be routed off-site. This was completed in 2017. Furthermore, the Fisheries Act and regulations regarding offsetting, particularly as they relate d to contaminated sites, has been in flux. The very recent Royal Assent of the Fisheries Act revisions may now allow the GMRP to proceed with more clarity.</p>	
MVLWB: Kim Murray				
ID	Topic	Reviewer Comment/Recommendation	Proponent Response	Board Staff Response

1	UPD Summary of EA Measures and Suggestions and how they are addressed in the Post-EA Information Package, Measure 16	<p>Comment Measure 16 states that before construction the Developer will "model re-suspension of arsenic from sediments and resulting bioavailability in the vicinity of the outfall. If the modelling results indicate that the outfall may resuspend arsenic from sediments, the Developer will modify the outfall design until operation does not cause resuspension of arsenic from sediments". GMRP has stated that it is taking a more protective approach and mitigating the potential of sediment resuspension through design of a sediment cover, rather than modelling.</p> <p>Recommendation It is requested that GMRP provide further justification as to how Measure 16 will be met by using a sediment cover instead of modelling re-suspension of arsenic from sediments, as required through the measure.</p>	<p>June 25: Please refer to City of Yellowknife: Kerry Penney #58 for a full discussion.</p>	
2	UPD Summary of EA Measures and Suggestions and how they are addressed in the Post-EA Information Package, Measure 22	<p>Comment Measure 22 states that the Developer will "conduct a study to determine appropriate depth of the tailings cap and B1 pit cover. to verify that the depth proposed will ensure the tailings cap and B1 pit cover are not compromised by vegetation growth". GMRP has provided details about meeting the measure with respect to the tailings cover (found in CRP Section 5.6, Appendix 5.6A, Appendix</p>	<p>June 25: Measure 22 was specific to a vegetated cover. The change in approach to a non-vegetated cover addresses this Measure. Furthermore, studies conducted for the development of the tailings cover are directly applicable to any cover that may be needed for B1 pit or portions of B1. Similar concepts in terms of cover thickness, materials, and vegetation control are expected to apply. The</p>	

		<p>5.6D). It is unclear how Measure 22 will be met with regards to the B1 pit cover; it is noted that a closure activity in Section 5.3 (Open Pits) of the CRP is "Install engineered cover over pit when needed to protect underground water quantity or quality". This suggests that it is not yet known if a cover will be used for B1 Pit.</p> <p>Recommendation It is requested that GMRP provide further justification as to how Measure 22 will be met with respect to conducting a study to determine the appropriate depth of the B1 pit cover.</p>	<p>design of the B1 pit cover has yet to be finalized. It will need to incorporate both the freeze program and arsenic waste disposal activities. Depth of the cover will be one of the criteria that will be evaluated during the design. Studies conducted for the development of the tailings cover are directly applicable to any cover that may be needed for B1 pit or portions of B1. Similar concepts in terms of cover thickness, materials, and vegetation control are expected to apply.</p>	
3	<p>UPD Summary of EA Measures and Suggestions and how they are addressed in the Post-EA Information Package, Measure 24</p>	<p>Comment Measure 24 states that the Developer will "physically prevent all-terrain vehicle access to the tailings cap and B1 pit cover to prevent the surface from being eroded or otherwise compromised." It is noted that, in table 3-1 of the UPD GMRP has provided details about meeting the measure with respect to the tailings cover (found in CRP section 5.6), however no reference to how this measure will be met with respect to B1 Pit is provided. It is noted that details in Section 5.3 (Open Pits) do suggest that this measure will be met (e.g. Objective P2, and the description of thermosyphon piping required to isolate the arsenic trioxide waste placed there (page 5-77)</p>	<p>June 25: It is assumed, based on the reviewer's comment that the recommendation is in relation to Measure 24. B1 Pit will contain thermosyphons for both underground stopes and chambers as well as arsenic trioxide impacted waste from the roaster complex. Protection of the thermosyphons is required with fencing, which would also prevent all-terrain vehicle access. In addition all pits will be covered with a coarse clean rock cover to dissuade public access, including on foot and on ATVs. This will meet the requirements of Measure 24 of the Environmental Assessment.</p>	

		<p>which would likely prevent all-terrain vehicle access).</p> <p>Recommendation It is requested that GMRP clarify how Measure 22 will be met with respect to B1 Pit.</p>		
MVLWB: Shannon Allerston				
ID	Topic	Reviewer Comment/Recommendation	Proponent Response	Board Staff Response
1	Water Use	<p>Comment In the application it is stated that water will come from Yellowknife Bay.</p> <p>Recommendation Please provide additional information including but not limited to the location of the intake, when the intake will be installed, and design details.</p>	<p>June 25: A freshwater intake may be required during active remediation only. The intake is proposed to be located near the existing disturbed corridor (i.e. near the existing un-used pumphouse identified as Pumphouse No. 2 - please refer to Figure 5.9-2 of the CRP). The freshwater intake has not yet been sited nor designed. This is underway. The intake design will follow the DFO Freshwater Intake End of Pipe Fish Screen Guideline (1995) The intake will likely be installed in 2025, upon approval from DFO. The Giant Mine Remediation Project (GMRP) will notify the MVLWB and the Inspector 10 days prior to construction and submit a Construction Completion Report within 90 days of completion.</p>	
2	Project Description	<p>Comment Board Staff note a comment from the YKDFN representative at the September 2018 engagement meetings relating to the re-naming of the</p>	<p>June 25: The GMRP will consider any recommendation put forward by the YKDFN. The GMRP would like to point out that the Akaitcho Headframe</p>	

		<p>Akaitcho Shaft.</p> <p>Recommendation If this is the desire of the YKDFN community, can the Giant Mine Project Team honor the request and re-name the Akaitcho Shaft.</p>	<p>will be demolished with the rest of the mine infrastructure, currently scheduled to begin in 2022. The Akaitcho shaft will also be decommissioned over the course of the Project. As such, it may not warrant renaming.</p>	
3	Water Licence term	<p>Comment In CRP Part 1 it states that "the Site is applying for a 20-year licence term" (4.7 Lessons Learned).</p> <p>Recommendation Please confirm that the licence term that GMRP is applying for is 20 years.</p>	<p>June 25: Yes, the GMRP confirms it is applying for a term of 20 years.</p>	
4	Proposed GMRP Type A Water Licence: Part E condition 8 Design and Construction Plan	<p>Comment A definition included in Part A is "Design and Construction Plan". This definition identifies that the Plan will be for each Engineered Component or other structure. Part E condition 8 requires the Licensee to submit to the Board, for approval a Design and Construction Plan in accordance with a Schedule 2, Condition 1. "Other structures" are not included in the Design and Construction Plan condition. Note: Engineered Component is specified for many parts of Schedule 2, Condition 1.</p> <p>Recommendation Please discuss if the GMRP Team believes that "other structures" will not require Design and Construction Plans, and if this could have implications on plans that depend</p>	<p>June 25: The GMRP anticipates that Design and Construction plans will be required for Engineered Components. The definition in Part A, Section 2 is incorrect and should read "a plan for Construction and Remediation which includes Construction specifications and monitoring details for each Engineered Component". The definition of Engineered Component is considered sufficient to address all of the undertakings on site that will require Board approval. Part E, Condition 13, should also read "The Licensee shall ensure that all Engineered Components are constructed in accordance with the Design and Construction Reports".</p>	

		on Design and Construction Plans to implement specific environmental mitigations (e.g. as per the SEMMP: the selected erosion and sediment controls to be used for specific activities will be detailed and submitted to the Board for approval in each Design and Construction Plan).		
5	Quantitative Risk Assessment	<p>Comment The Post EA Information Package letter issued to GMRP from the MVLWB (2014) required contingency scenarios to be included in all management plans. GMRP indicates in the Dust Management and Monitoring Plan that: ".the GRMP is completing a Quantitative Risk Assessment (QRA; ongoing at the time of submission). The QRA is working to identify all potential risks that will remain at the site after remediation is complete. It will also identify the level of risk associated with each (low, medium, or high). Contingency scenarios will be developed or the risks identified in the QRA once complete. Risks will be updated in each management plan, as it relevant, moving forward." (5.4 Contingencies)</p> <p>Recommendation It appears that information in the QRA may be relevant for contingency scenarios for management plans. Please discuss when the QRA will be completed, and</p>	<p>June 25: The GMRP does not consider a condition specific to the QRA process to be appropriate for the Water Licence. It is anticipated that the QRA will be completed in the Winter of 2019/2020, prior to issuance of the Water Licence as required by Measure 5. The GMRP will hold stakeholder meetings to review the findings of the QRA and the QRA documents. The GMRP will ensure the documents are made publicly available prior to the issuance of a water license. The findings of the QRA will be incorporated into the contingency sections of the revised management plans and elsewhere in Project documentation, as appropriate. Updates to management plans will be submitted to the MVLWB for consideration.</p>	

		if the GMRP Team believes including a water licence/land use permit condition related to the Quantitative Risk Assessment would be appropriate.		
6	Traffic Management Plan	<p>Comment Commitment 15 from EA0809-001 indicates that "A Traffic Management Plan" will be developed (UPD Appendix B). GMRP has indicated that a Traffic Management Plan will be developed, and is relevant to the Wildlife Habitat Management and Monitoring Plan and the Dust Management and Monitoring Plan.</p> <p>Recommendation Please discuss if the GMRP Team believes that including a water licence/land use permit condition related to the Traffic Management Plan would be appropriate (e.g. to provide further details for dust mitigation).</p>	<p>June 25: Yes, the GMRP team can provide the Traffic Management Plan to the Board, however the Traffic Management Plan should not be considered for approval as it is intended to inform the dust and wildlife habitat management plans.</p>	
7	Management Plan Approvals (Timing)	<p>Comment Conditions for plans are not consistent: Spill Contingency Plan is "within 90 days following issuance of this Licence."; Tailings, Dust, Erosion and Sediment, Water, Engagement, Waste are: "the Licensee shall comply with the ., once approved"; Borrow and Arsenic Trioxide are "90 days prior to commencement of Remediation/Construction". It is noted that there is a request to approve some plans in phases (project phases).</p> <p>Recommendation Can the GMRP</p>	<p>June 25: The GMRP team can confirm that we are requesting approval of the Tailings, Dust, Erosion and Sediment, Spill, Water, Engagement and Waste Management Plans at issuance of the Water Licence. These management plans are required to carry out Phase 1 activities. Other plans have different timelines because they are tied to specific activities that will be approved through Design and Construction Plans. An updated Appendix B: Conformity Table of Items Requiring</p>	

		Team confirm that they are requesting approval of the Tailings, Dust, Erosion and Sediment, Water, Engagement, and Waste Management Plans at issuance (Phase 1)?	Submission will be provided to clarify the requested timing of specific plans and approvals after the second technical session is complete.	
8	Managment Plan Revisions	<p>Comment For example, the DMMP states that "A clean-copy of this Plan will be submitted within 90 days of Licence issuance to reflect any updates or changes resulting from commitments and direction provided during the Licence process."</p> <p>Recommendation Would the GMRP Team oppose a condition in the WL such as: "A minimum of 90 days prior to the commencement of remediation activities, the Licensee shall submit to the Board, for approval, a revised Plan. The Licenses shall not commence remediation activities prior to Board approval."</p>	<p>June 25: The GMRP agrees that the management plans submitted with the application may require revisions as a result of commitments or directions provided during the Water Licence process. Approval is requested for the Tailings, Dust, Erosion and Sediment, Spill, Water, Engagement and Waste Management Plans at issuance of the Water Licence, pending any revisions identified in the process. It is requested that the submission timing for other management plans are tied to the specific activity to which it applies. An updated Appendix B: Conformity Table of Items Requiring Submission will be provided to clarify the requested timing of specific plans and approvals after the second technical session is complete.</p>	
9	EQC: Total Petroleum Hydrocarbons Part G item 16	<p>Comment In the EQC Report for 5.2.4.7 Total Petroleum Hydrocarbons it states that "It is proposed that a narrative statement also be included in the Water Licence to indicate that "Discharge from the new WTP shall be managed to prevent the appearance of</p>	<p>June 25: Yes, the GMRP believes this statement may be appropriate in the Water Licence. The wording will need to distinguish between potential sheens caused by other users of that area including boats</p>	

		any visible film on the surface of Yellowknife Bay." Recommendation The Proposed Type A Water Licence submitted by GMRP and associated Proposed SNP does not appear to include this statement. Please comment if GMRP believes this statement would be appropriate in the Water Licence.		
North Slave Metis Alliance: Jess Hurtubise				
ID	Topic	Reviewer Comment/Recommendation	Proponent Response	Board Staff Response
7	General File	Comment (doc) NSMA comments refer to the analysis done by Slater Environmental (2019) - "Review of Post-EA Information Package Giant Mine Remediation Project"; Recommendation		
1	Post EA Information Package - Updated Project Description - Re-vegetation	Comment Table 4-4 states that "where soils are removed down to bedrock, fill materials will not be replaced to minimize issues with erosion and sedimentation as well as pooling of runoff water." This approach to reclamation and re-vegetation will result in landscape changes and loss of wildlife habitat. It will also affect the long-term aesthetic condition of the post-closure site (Slater Environmental, 2019). Recommendation One main priority for NSMA is to ensure options are	June 25: Active stabilization using vegetation is planned for possible locations like steep slopes near the Townsite to prevent erosion of new material into Yellowknife Bay, or remediation of fine grained borrow sources. Species have not been chosen but native species will be chosen and input from affected parties considered. Active stabilization is planned at borrow locations where there are remaining exposed fine-grained sediments to prevent erosion of	

		<p>available for future use of the Giant Mine site, post-Remediation. NSMA supports the Project's goal to protect the public and prevent any further impacts from arsenic; however, NSMA does not want to leave the site "grey and ugly". More active reclamation and re-vegetation efforts may be warranted in areas that present little post-reclamation risks, for example pits that are backfilled with clean material, or areas where contaminated soil will be removed for safe storage in other locations. NSMA recommends the proponent consider areas of possible re-vegetation to prevent further landscape changes and loss of habitat.</p>	<p>material, with vegetation being the preferred method.</p>	
2	<p>Post EA Information Package - Updated Project Description Section 2.5 - The Role of Procurement</p>	<p>Comment Section 2.5 of the UPD describes how the GMRP envisions using procurement mechanisms to "ensure socio-economic benefits are realized by the affected Indigenous and local communities." Section 4.4 describes potential impacts, mitigation and monitoring for socio-economics, culture and heritage, again with a focus on employment and procurement. The construction, operation and abandonment of the Giant Mine project has caused significant, adverse socio-economic effects for affected Indigenous groups and others in the</p>	<p>June 25: The GMRP acknowledges that the socio-economic legacy impacts of this site are beyond the scope of this Water Licence proceeding, however the GMRP is committed to leaving a positive legacy on the site as well as in surrounding communities through the implementation of remediation activities. In November of 2018, GMRP established a Socio-economic Advisory Body (SEAB) consisting of federal, territorial and municipal partners and its purpose is to provide advice and input to GMRP on socio-economic activities of the project and</p>	

		<p>local community. The successful remediation of the Giant Mine needs to address not only the physical remediation, but also remediation of the socio-economic legacies of the project. The procurement approaches described in the UPD are one part of this remediation, primarily focused on economic benefits (Slater Environmental, 2019).</p> <p>Recommendation NSMA believes addressing the socio-economic legacies will require a more comprehensive plan that also considers the social legacies and includes an effective monitoring program for key social and economic indicators. NSMA recommends further developing this component of the Remediation Project.</p>	<p>raising potential barriers to implementation. In February of 2019, Giant Mine Oversight Board in a letter to GMRP made a recommendation to extend SEAB's membership to include all signatories to the Environmental Agreement; this included the addition of YKDFN, NSMA and Alternatives North. In March of 2019, SEAB agreed to extend its membership and formal invitations were sent out to the above-mentioned organizations in April of 2019. All three organizations confirmed their participation.</p>	
3	<p>Post EA Information Package - Updated Project Description Table 2-1 Proposed Closure Activities - Pit coverings</p>	<p>Comment It is unclear in both the Post-EA Information Package and the UPD whether the backfilled pits will be covered. For e.g., Table 2-1 in the UPD states that "a layer of clean borrow materials will be placed over contaminated materials; engineered covers may be installed over filled pits when needed to protect underground water quality." (Slater Environmental, 2019)</p> <p>Recommendation NSMA believes it would be beneficial to have a better understanding of the process and</p>	<p>June 25: Open pit design effort is ongoing and the GMRP is assessing which type of cover or cap will be used on a pit-by-pit basis. A cap is synonymous for engineered cover, or implies less engineering than the engineered cover. An engineered cover is a system that may include layers of granular materials such as soil, clay, rockfill, topsoil or geosynthetics designed to achieve objectives that may include: control dust, flow of air and/or water, maintain physical stability or to support the growth of</p>	

		<p>criteria that will be used to make decisions about whether backfilled pits require covers, and recommends providing more information on what those covers will be intended to achieve, if applicable.</p>	<p>vegetation. A cap can be defined as a layer used to protect the material under it from erosion, to limit exposure of the public and wildlife to the material, to dissuade public access (e.g. by ATV's), and to limit vegetation penetration. An engineered cover can be defined as a layer or system that may include layers of granular materials, such as soil, clay, rockfill, topsoil, or else geosynthetics designed to achieve objectives including control of dust, maintain physical stability, reduce flux of water, air, or oxygen through the material being covered. All contaminated material placed in pits will be covered with a cap consisting of clean granular fill. Some of the considerations when determining whether to incorporate a cover into the design are the nature of the pit fill, dust control, the flood risks, the monitoring and maintenance requirements, the risk of settlement and the durability. If predicted water quality from the pit to the minepool is significantly different from the input assumptions used in the EQC modeling, then revisions to the modelling may be considered. Depending on predicted influence on mine pool water quality and evaluation of the impacts to the WTP design, further examination on type of cover</p>	
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			would be completed. Considerations may include an engineered cover to reduce water flow through the pit as needed.	
4	Post-EA Information Package - Updated Project Plan - Section 5.2 Scope of Water Licence	<p>Comment Section 5.2 of the UPD describes the GMRP's interpretation of the scope of the water licence process for the proposed project. Table 5-1 lists several components that the GMRP asserts should not be part of the formal water licence process. However, NSMA believes these components, especially off-site contamination (e.g., in the event of a spill into offsite areas), are important and relevant to the Water Licence Process (Slater Environmental, 2019).</p> <p>Recommendation NSMA understand that the Related Concerns are legally not part of the regulatory process of a Water Licence, and thus that the Board cannot enforce changing these to be within the scope of the Water Licence. But, NSMA does request the Board continue to consider these Related Concerns throughout the Water Licence process.</p>	<p>June 25: The GMRP would like to clarify that off-site contamination relates only to legacy impacts from historical mining activities, and any future project-related impacts that occurred off-site would be within the scope of the Water Licence.</p>	
5	Role of the GNWT	<p>Comment There exists some lingering uncertainty as to the role of the GNWT in the Remediation Project and post-Remediation care (Slater Environmental, 2019).</p>	<p>June 25: Please refer to the response to ORS 2 - Attachment 2 - Contaminated Soils Response for current approach with respect to 1) the management of long-term risks and 2)</p>	

		<p>Recommendation To ensure continued and longterm management of the Giant Mine site, NSMA believes a clear plan is needed describing the GNWT's role(s), notably in regards to: 1) The management of long-term risks associated with the site and the contamination from the site will require definitive action by land management agencies; for example, possible permanent legal constraints on land dispositions and activities; 2) effective communication with future generations about the risks from arsenic trioxide storage has been identified as an important issue for the GMRP; 3) the GNWT's role for input on social legacies and need for economic benefits. It would be useful to understand the perspectives of GNWT land management agencies, heritage and culture, and social agencies have on these topics.</p>	<p>effective communication with future generations. 3) GNWT agrees that the GMRP is an opportunity for significant social and economic benefits to Indigenous, northern and local people. GNWT- Environment and Natural Resources, Industry Tourism and Investment and Tourism, Education, Culture and Employment are members of both the Socio-Economic Advisory Body and the Working Group and will contribute to the implementation of a successful Socio-Economic Strategy. The Department of Education, Culture and Employment also have been involved with the completion and subsequent documentation of the 2018 Archeological Impact Assessment. Discussions have also occurred with the Department to support the inclusion of Mine Legacy History into the grade ten northern studies program; this work is currently underway.</p>	
6	<p>Longterm Monitoring - Updated Project Description - Shoreline Lands cleanup</p>	<p>Comment Other priorities for NSMA for the Water Licence is clear longterm planning and robust mitigation processes for the Remediation Project. This involves continued and extensive monitoring. The UPD proposes covering of nearshore sediments in the Shoreline Lands - along the Yellowknife Bay shoreline from the Townsite to (and including) the</p>	<p>June 25: Monitoring and management details will be described in specific Design and Construction Plans that, once approved, will be used to update the Closure and Reclamation Plan. CS1 Post-Closure Phase notes that the Operational Monitoring Plan will include cover monitoring for settlement and erosion by a Qualified Professional. While the power to</p>	

		<p>Foreshore Tailings. The cover on sediments and tailings is intended to be a long-term solution that will limit direct human contact with arsenic-containing waste. Lakeshores are dynamic areas and even robust designs will likely deteriorate over time. Any covers for lakeshore sediments will require long-term monitoring and maintenance programs, for as long as the materials present risks from arsenic contamination. The CRP proposes that monitoring will include visual monitoring for settlement, erosion, vegetation growth or deposition of sediment (Table 5.12-6) (Slater Environmental, 2019).</p> <p>Recommendation Another priority for NSMA for the Water Licence is clear longterm plans for the Remediation Project. Due to the Shoreline Lands being a highly dynamic area, outside areas subject to substantive administrative controls, and needing to be remediated to residential standards, NSMA recommends that the CRP include further details on how the proposed monitoring will specifically address the ongoing status of the covers and the extent of maintenance that will be required. It should also describe what types of administrative measures may be required to ensure</p>	<p>designate future land interests does not rest with the GMRP, the GMRP will provide any necessary guidance and expertise about the final state, which outlines any residual risks and/or constraints of the land, as required.</p>	
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		that nobody disturbs these areas in the long-term, and who will be responsible for making sure the administrative controls, monitoring and maintenance happen.		
Slater Environmental Consulting: Bill Slater				
ID	Topic	Reviewer Comment/Recommendation	Proponent Response	Board Staff Response
14	General File	Comment (doc) Cover letter for comments provided by Bill Slater as the Technical Advisor to the Giant Mine Working Group. Recommendation		
15	General File	Comment (doc) Slater Environmental Report, prepared for the Giant Mine Working Group. Recommendation		
16	General File	Comment (doc) Bill Slater resume. Recommendation		
1	1. Updated Project Description	Comment Figure 1-3 of the UPD is described as "a high-level depiction of how [the Valued Components] may interact with the GMRP environment." The figure comes from the HHERA Report (Appendix 2e of the CRP) and provides a conceptual model of contaminant-related effects pathways for the GMRP. The figure does not address the full scope of potential effects, including effects that are not	June 25: The GMRP agrees that the scope of potential effects extends beyond those that are directly associated with contaminants. Chapter 4.0 of the UPD characterizes all of these effects, not only those related to contaminants.	

		contaminant-related. Recommendation The UPD should be clear that the scope of potential effects extends beyond those that are directly associated with contaminants.		
2	2. Updated Project Description	Comment Section 2.2 of the UPD states that "the Site will continue to be managed by CIRNAC in post-closure as minewater treatment will be ongoing and the freeze system, as well as other Site features, will continue to be monitored in the long-term." In recent discussions about options for long-term, post-closure funding of the GMRP some parties have indicated that mechanisms and responsibilities for post-closure site management warrant further discussion. Recommendation The co-proponents should address whether final decisions have been made about long-term management of the site, and if so, the rationale for the selection of a long-term management approach.	June 25: The GMRP documentation presents the most current concept for long-term management. The CRP is more accurate as it states, "This land located in the central areas of the Site (freeze areas, water treatment plant [WTP], non-hazardous landfill; see Figure 3.4-1) will remain under a reserve for use exclusively by CIRNAC".	
3	3. Updated Project Description	Comment The Post-EA Information Package including the UPD leaves a lot of uncertainty about whether backfilled pits will be covered - e.g., Table 2-1 in the UPD states that "a layer of clean borrow materials will be placed over contaminated materials; engineered covers may be installed	June 25: Open pit design effort is ongoing and the GMRP is assessing which type of cover or cap will be used on a pit-by-pit basis. A cap is synonymous for engineered cover, or implies less engineering than the engineered cover. An engineered cover is a system that may include layers of	

		<p>over filled pits when needed to protect underground water quality." Recommendation The co-proponents should provide additional information about the process and criteria that will be used to make decisions about whether backfilled pits require covers, and if so what those covers will be intended to achieve</p>	<p>granular materials such as soil, clay, rockfill, topsoil or geosynthetics designed to achieve objectives that may include: control dust, flow of air and/or water, maintain physical stability or to support the growth of vegetation. A cap can be defined as a layer used to protect the material under it from erosion, to limit exposure of the public and wildlife to the material, to dissuade public access (e.g. by ATV's), and to limit vegetation penetration. An engineered cover can be defined as a layer or system that may include layers of granular materials, such as soil, clay, rockfill, topsoil, or else geosynthetics designed to achieve objectives including control of dust, maintain physical stability, reduce flux of water, air, or oxygen through the material being covered. All contaminated material placed in pits will be covered with a cap consisting of clean granular fill. Some of the considerations when determining whether to incorporate a cover into the design are the nature of the pit fill, dust control, the flood risks, the monitoring and maintenance requirements, the risk of settlement and the durability. If predicted water quality from the pit to the minepool is significantly different from the input assumptions used in the</p>	
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			<p>EQC modeling, then revisions to the modelling may be considered. Depending on predicted influence on mine pool water quality and evaluation of the impacts to the WTP design, further examination on type of cover would be completed. Considerations may include an engineered cover to reduce water flow through the pit as needed.</p>	
4	4. Updated Project Description	<p>Comment Section 2.5 of the UPD describes how the GMRP envisions using procurement mechanisms to "ensure socio-economic benefits are realized by the affected Indigenous and local communities." Section 4.4 describes potential impacts, mitigation and monitoring for socio-economics, culture and heritage, again with a focus on employment and procurement. The construction, operation and abandonment of the Giant Mine project has caused significant, adverse socio-economic effects for affected Indigenous groups and others in the local community.</p> <p>Recommendation The successful remediation of the Giant Mine needs to address not only the physical remediation, but also remediation of the socio-economic legacies of the project. The procurement approaches described in the UPD are one part of</p>	<p>June 25: Please refer to the response to North Slave Metis Alliance: Jess Hurtubise #2 above.</p>	

		<p>this remediation, primarily focused on economic benefits. However, addressing the socio-economic legacies will require a more comprehensive plan that also considers the social legacies and includes an effective monitoring program for key social and economic indicators.</p>		
5	5. Updated Project Description	<p>Comment Table 3-1 of the UPD states that "constraints to end land use are presented in the CRP." The CRP does not appear to provide any details about land use constraints that would be required.</p> <p>Recommendation Additional detail should be provided about proposed constraints to end land use and how these will be accomplished. See comments on the Preliminary Screening Documents in Group 4 and Section 3.1 of the Slater Environmental Report for more details on this issue.</p>	<p>June 25: Please refer to ORS 2 - Attachment 2 - Contaminated Soils Response</p>	
6	6. Updated Project Description	<p>Comment The UPD proposes covering of nearshore sediments in the Shoreline Lands - along the Yellowknife Bay shoreline from the Townsite to (and including) the Foreshore Tailings. The cover on sediments and tailings is intended to be a long-term solution that will limit direct human contact with arsenic-</p>	<p>June 25: Monitoring and management details will be described in specific Design and Construction Plans that, once approved, will be used to update the Closure and Reclamation Plan. CS1 Post-Closure Phase notes that the Operational Monitoring Plan will include cover monitoring for settlement and erosion by a Qualified</p>	

		<p>containing waste. Lakeshores are dynamic areas and even robust designs will likely deteriorate over time. Any covers for lakeshore sediments will require long-term monitoring and maintenance programs, for as long as the materials present risks from arsenic contamination. The CRP proposes that monitoring will include visual monitoring for settlement, erosion, vegetation growth or deposition of sediment (Table 5.12-6).</p> <p>Recommendation It is likely that more robust monitoring methods will be required to fully understand the condition of the cover. Also, finding mechanisms to make sure that monitoring and maintenance happens in the long-term will be challenging because the Shoreline Lands will be outside of areas that are subject to substantive administrative controls. “the area is to be remediated to residential standards so that people using the area should not be subject to unacceptable health risks. It would be useful for the CRP to describe how the proposed monitoring will specifically address the ongoing status of the covers and the extent of maintenance that will be required. It should also describe what types of administrative measures may be required to ensure</p>	<p>Professional. While the power to designate future land interests does not rest with the GMRP, the GMRP will provide any necessary guidance and expertise about the final state, which outlines any residual risks and/or constraints of the land, as required.</p>	
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		that nobody disturbs these areas in the long-term, and who will be responsible for making sure the administrative controls, monitoring and maintenance happen.		
7	7. Updated Project Description	<p>Comment The UPD proposes a minimalist approach to reclamation and re-vegetation of areas that are disturbed as part of the closure project. For example, Table 4-4 states that "where soils are removed down to bedrock, fill materials will not be replaced to minimize issues with erosion and sedimentation as well as pooling of runoff water." In general, the GMRP does not propose to carry out active re-vegetation except in areas where it is required to prevent erosion (e.g., Table 4-5 states that re-vegetation efforts, if any, will be minimal and that the GMRP will not actively develop wildlife habitat as part of site remediation). This approach to reclamation and re-vegetation will result in landscape changes and loss of wildlife habitat. It will also affect the long-term aesthetic condition of the post-closure site. In part, the proposed reclamation and re-vegetation approach arises from input received during the SDE process, specifically that: "First Nations feedback included a desire to avoid promoting vegetation</p>	<p>June 25: Active stabilization using vegetation is planned for possible locations like steep slopes near the Townsite to prevent erosion of new material into Yellowknife Bay, or remediation of fine grained borrow sources. Species have not been chosen but native species will be chosen and input from affected parties considered. Active stabilization is planned at borrow locations where there are remaining exposed fine-grained sediments to prevent erosion of material, with vegetation being the preferred method.</p>	

		<p>growth, such that the site would have the appearance of an abandoned site, helping to communicate risks to future generations" (CRP Appendix 5.6A, p.4). The desire for a "grey and ugly" appearance at the site is an important outcome from the SDE process.</p> <p>Recommendation It is not clear whether the proposed landscape reclamation approach should be applied to all areas of the site or just to areas that present specific risks that people are concerned about, for example the TCAs. More active reclamation and re-vegetation efforts may be warranted in areas that present little post-reclamation risks, for example pits that are backfilled with clean material, or areas where contaminated soil will be removed for safe storage in other locations.</p>		
8	8. Updated Project Description	<p>Comment Section 5.2 of the UPD describes the GMRP's interpretation of the scope of the water licence process for the proposed project. Table 5-1 lists several components that the GMRP asserts should not be part of the formal water licence process.</p> <p>Recommendation It appears that many of these matters are directly relevant to water and land use activities and need to be key</p>	<p>June 25: The GMRP has proposed the scope of the Water Licence based on the MVLWB's jurisdiction as defined by the MVRMA.</p>	

		considerations in the licensing processes.		
9	9. Response to Pre-engagement Reviewer Comments	<p>Comment The "Response to Pre-engagement Reviewer Comments" indicates that the GMRP received written input from several GNWT agencies during preparation of the Post-EA Information Package, including Water Resources Division; Wildlife Division; Conservation, Assessment and Monitoring Division; and, Environmental Protection and Waste Management Division. Depending on the extent to which the GMRP addressed the input provided by these agencies, further input would likely be beneficial during the licensing processes. Many of the previous GNWT comments refer to the need for additional information or clarification of the information provided. This indicates that the agencies needed additional information in order to understand whether they would have concerns and the scope of their concerns. See Slater Environmental Report, Section 4.0.</p> <p>Recommendation Now that the GMRP has provided responses, and in some cases revised the documentation to address input, it would be beneficial to understand whether the GNWT agencies consider their previous</p>	<p>June 25: As noted in the reviewer comment, the GMRP has provided responses to the GNWT comments. In a letter dated August 1, 2018 from A/Assistant Deputy Minister, Robert Jenkins with the Department of Environment and Natural Resources (ENR), the role of GNWT's participation in the regulatory process for the GMRP was described. GMOB and other parties during the annual meeting of the parties to the Environmental Agreement requested that GNWT reconsider the options for their involvement. A response will be provided directly to GMOB and the other Parties by the GNWT on this request, prior to the second technical session.</p>	

		<p>comments to have been adequately addressed, and whether they have any outstanding concerns or comments, or any specific licensing recommendations.</p>		
10	9. Response to Pre-engagement Reviewer Comments	<p>Comment There are some important issues within the GNWT jurisdiction that are unique to the GMRP and do not appear to have been addressed by the pre-engagement input received from GNWT. See Slater Environmental Report, Section 4.0.</p> <p>Recommendation There are some specific issues and concerns for the GMRP that may warrant consideration and input by GNWT agencies that are not typically involved in licensing processes. For example: - The management of long-term risks associated with the site and the contamination from the site will require definitive action by land management agencies; for example, possible permanent legal constraints on land dispositions and activities. It would be useful to have input from land management agencies about what permanent actions and options are available. - The need for effective communication with future generations about the risks from arsenic trioxide storage has been identified as an important issue for the GMRP. The</p>	<p>June 25: Please refer to ORS 2 - Attachment 2 - Contaminated Soils Response. The GNWT agrees that the GMRP is an opportunity for significant social and economic benefits to Indigenous, northern and local people. GNWT- Environment and Natural Resources, Industry Tourism and Investment and Tourism, Education, Culture and Employment are members of both the Socio-Economic Advisory Body and the Working Group and will contribute to the implementation of the Socio-Economic Strategy.</p>	

		<p>establishment of a memorial/monument/museum has been identified as one component of the long-term messaging. It would be useful to understand the perspectives GNWT heritage and culture agencies about long-term messaging, and how they may contribute to this aspect. - Addressing the social legacies of the Giant Mine Project is an important component of the GMRP, as is providing economic benefits for local people and communities. Input from GNWT social agencies would be beneficial for understanding whether the proposed project adequately addresses the social legacies and need for economic benefits. These same agencies could likely provide beneficial input about how to effectively monitor social and economic outcomes of the GMRP.</p>		
11	10. Draft Water Licence Conditions	<p>Comment The Proposed Type A Water Licence appears to envision a single Performance Assessment Report for each engineered component. This may be effective for some components where completion of the physical work can demonstrate achievement of the associated closure criteria and objectives (e.g., building demolition). In other cases, demonstration of satisfactory performance will not be a</p>	<p>June 25: The GMRP agrees that Performance Assessment Reports will be submitted to the board at the end of the initial monitoring period following the construction completion report to compare conditions for the component to the objectives and criteria. Depending on the observed performance, multiple performance assessment reports may be needed over time.</p>	

		<p>one-time event, but will require evidence over an extended period of time. For example, tailings covers could be subject to differential settlement, erosion or other instability. These conditions may develop over time. See Slater Environmental Report, Section 5.0.</p> <p>Recommendation The GMRP does propose monitoring to address these types of changes, but there may also be a need to provide additional performance reports to confirm continued achievement of closure criteria and objectives.</p>		
12	11. Draft Water Licence Conditions	<p>Comment The proposed requirement to annually submit an updated CRP with revisions to "reflect project updates and changes identified in any Management and Monitoring Plan(s) or Design and Construction Plan(s)" (Proposed Type A Water Licence, Part D, Clause 2) may create an additional layer of review if the changes are already addressed through review of the specific plans (e.g., DCPs).</p> <p>Recommendation There is likely benefit in maintaining a relevant and up-to-date CRP for this project through the annual updates, but it may be useful to define appropriate mechanisms and scopes to avoid</p>	<p>June 25: The GMRP agrees that multiple reviews of the same project components and plans would be cumbersome. The GMRP intends to provide updates to the Closure and Reclamation Plan based on updates to criteria or significant changes to scope which have gone through a review process and have been approved in the respective Design and Construction Plan. The Closure and Reclamation Plan provides an overview of the project and the GMRP does not intend to provide a comprehensive update unless there are significant changes to the scope of the remediation project.</p>	

		multiple reviews of the same project components and plans.		
13	12. Proposed Surveillance Network Program	<p>Comment The proposed Surveillance Network Program (SNP) monitoring includes only limited monitoring in Baker Creek - an upstream reference location (SNP 43-11), an exposure point at the junction of Reaches 5 and 6 (Baker Creek Exposure Point), and the mouth of Baker Creek just before entering Yellowknife Bay (SNP 43-11). While the outfall from the Existing Effluent Treatment Plans (SNP 43-1) is the main source of mine-related loading to Baker Creek, it is likely not the only one. Sediments in the stream, and runoff and seepage from site facilities/areas, can also contribute. As the remediation project progresses it will be beneficial to understand the loading from various on-site sources and areas.</p> <p>Recommendation Monitoring stations should be established with monitoring requirements the same as those for SNP 43-11 at discrete locations along Baker Creek, aimed at being able to distinguish loading from individual mine facilities and areas. Similar approaches should be applied for Trapper Creek and any other streams that may be subject to mine-related contaminant loading.</p>	<p>June 25: In addition to the SNP locations outlined in the Proposed SNP submitted as part of the Water Licence application package, the Standard Operating Procedures (SOP) for Effluent and Water Sampling that was also submitted includes Table 3-2 which outlines operational monitoring program (OMP) stations. These OMP stations include Trapper Creek, Pocket Lake, and 12 surface runoff locations. These locations are shown in Figure 3-1 of the SOP. Additional monitoring locations may also be identified through surface water management design and construction plans for near-water work.</p>	

Yellowknives Dene First Nation: Machel Thomas

ID	Topic	Reviewer Comment/Recommendation	Proponent Response	Board Staff Response
1	General File	Comment (doc) YKDFN cover letter in response to Giant Mine Remediation Project water license application MV2007L8-0031 Recommendation		