

Table 1. TMAC Technical Related Responses to Agency Submitted Comments 2012

Comment No.	Topic	Commenter	Summary of Comment	TMAC Response
1	Aquatics	Fisheries and Oceans Canada	<p>DFO previously issued Fisheries Authorizations for the loss of fish habitat related to construction of Roberts Bay jetty and tailings management facilities. Proposed modifications include, not limited to: change in location of effluent discharge from Doris creek to Roberts Bay with the construction of an offshore diffuser.</p> <p>DFO may require additional design and construction details of the proposed modifications from HBML for review and comment to determine whether additional Project Certificate terms and conditions merit reconsideration.</p>	<p>DFO issued a fisheries authorization (DFO File No. NU-10-0028 to TMAC, letter signed in 2013, for the proposed modifications to the existing jetty as described by the <i>Application for Authorization for Works or Undertakings Affecting Fish Habitat - Doris North Jetty Improvements</i> (February 2010). This Application included both design and construction details for conducting the proposed modifications. TMAC will continue to work closely with DFO and will request an update to the authorization period prior to any work. TMAC will provide any requested additional design and construction details of the proposed modifications to DFO, as needed. Information with regards to the new effluent discharge location (i.e., Roberts Bay), which includes the subsea pipeline and diffuser, is further described in Section 4.4.5 of the Water Licence Amendment Application, in addition to a <i>No Net Loss Plan for Subsea Pipeline and Diffuser</i> (Rescan 2013, included in Appendix 5 of current Ammendment application). If additional information is required by DFO in relation to this Application, TMAC would be pleased to provide some.</p>
2	Wildlife - Migratory Birds	Environment Canada	<p>HBML's application to amend the existing NIRB Project Certificate and NWB Type A Water Licence includes a new general layout facility and ore storage area pads. HBML included in Section 9 of the Project Proposal description that as part of the Wildlife Mitigation and Monitoring Plan (WMMP) mitigation for wildlife will include scheduling construction activities during the least risk work timing windows. In the southern Arctic of NWT and Nunavut, migratory birds may be found incubating eggs from May 14 - July 30, and young birds can be present in nests until September 12.</p> <p>If site preparation for the new laydown and ore storage areas cannot be conducted outside the nesting season, EC recommends areas should be checked for nests before work. Crews should be trained to recognize signs that a bird might be nesting in the area. If active nest found, EC recommends area to be avoided until nesting is complete (i.e., young have left nest). EC recommends set-back distances (meters) described in letter for Pedestrian/ATV activities and for Roads/Construction/Industrial activities to minimize disturbance to nests for different bird groups in tundra habitat.</p>	<p>TMAC acknowledges and agrees with EC's technical advice to avoid and mitigate potential effects on migratory birds. These will be incorporated into relevant workplans.</p>
3	General	Government of Nunavut	<p>The GN expects HBML to provide maximum social and economic benefits to nearby communities, hiring local residents and utilizing local businesses.</p>	<p>TMAC acknowledges with the Government of Nunavut's comment regarding the importance of the project to provide positive net social and economic benefits to nearby communities. TMAC commits to hiring local residents and utilizing local businesses. Appendix 23 of the Water Licence Amendment Application provides further details with respect to Socio-economic Effects.</p>
4	Wildlife	Government of Nunavut	<p>Commitment No. "Caribou-Item 2" restricts the mine surface footprint to an area of 53 ha; Government of Nunavut Department of Environment (DOE) lacks the information to assess impacts on wildlife and wildlife habitat.</p>	<p>The proposed Water License amendment activities that may result in expanded footprint areas do not change the predicted environmental impacts as originally assessed in the Doris North Final EIS (Miramar 2005). The following potential impacts on the biophysical environment were assessed:</p> <ol style="list-style-type: none">1. Loss of wildlife habitat due to the expanded footprint;2. Disruption of movement/migration; and,3. Disturbance to wildlife. <p>Habitat loss and associated mitigation measures were assessed in the Doris North FEIS. For large-ranging wildlife (caribou, grizzly bears, wolverines), the loss is evaluated over the Regional Study Area (approximately 3700 km2), while habitat loss for those with smaller home ranges (especially during the breeding season) such as upland breeding birds, waterfowl, and raptors, was evaluated within the Local Study Area (approximately 33 km2). Those VECs evaluated within the LSA show a much greater loss of suitable habitat due to the smaller area against which the loss was evaluated.</p> <p>In terms of disruption of movement/migration, the proposed expansion areas are contiguous with/adjacent to the existing footprint and do not create any additional bottlenecking or impediments to wildlife movement. Each VEC was assessed individually for potential effects with regards to the proposed expansion. No additional effects are expected on wildlife movement or migration within the study area. For example, when migrating and crossing sea ice, caribou are known to preferentially travel along capes, isthmus, and points which limit their exposure on ice. Aerial surveys in 2010 of caribou trails on sea ice in Melville Sound corroborated this trend. Caribou are not expected to preferentially use the Roberts Bay site as a migration corridor. Aerial surveys for caribou between 1998 and 2010 during the northern (spring) migration support this assumption, with few caribou observed in the Roberts Bay area.</p> <p>Disturbance to wildlife in general was also assessed, both as part of the original FEIS and as part of the Water License Amendment. While the footprint of the Project may expand, the activities that will be carried out are not planned to change. Hence, the same level of disturbance from lights, noise, and human presence and movement is expected and mitigation actions are in effect to minimize those effects. The primary effects of the Project on wildlife are expected to remain constant and the expansions are within the extents assessed in the FEIS. Therefore, no additional impacts associated with these extensions are anticipated.</p>

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5	Air Quality	Government of Nunavut	The current proposal identifies the use of dust suppressants on roads and airstrips. The current terms and conditions do not achieve their purpose, because the use of dust suppressants is a newly proposed activity in the Project Proposal.	The use of dust suppressants provides a form of mitigation measure to reduce the environmental impact of the Project and will be done so in accordance with relevant Northern and Nunavut guidelines. TMAC will ensure that an air quality management plan will be place and updated and improved upon as required. It is also noted that dust supression at Doris North has previously been considered by the NIRB - see NIRB public registry at following link: ftp://ftp.nirb.ca/03-MONITORING/05MN047-DORIS%20NORTH%20GOLD%20MINE/02-MONITORING%20AND%20MANAGEMENT%20PLANS/AIR%20QUALITY%20PLAN/04-DUST%20SUPPRESSION/
6	Socio-economics	Government of Nunavut	Socio-economic Monitoring Commitee (SEMC) and associated program are necessary for a continued efforts for socio-economic monitoring for the Doris North project and in the Kitikmeot region in general. GN will continue to make available the relevant information to the monitoring program.	The Terms of Reference developed for the Doris North Project Socio-economic Monitoring Committee (SEMC) and Program remain in place. TMAC is committed to continued participation in the Kitikmeot Region Socio-economic Monitoring Committee initiative and in sharing information about the results of the Doris North Project Socio-economic Monitoring Program, and will continue to prepare and submit annual Doris North Project Socio-economic Monitoring Reports to NIRB.
7	Archaeology	Government of Nunavut	Pursuant to NLCA article 12.8.2©, the department of Culture, Language, Elders and Youth (CLEY) would suggest the following term and condition to be reconsidered: NIRB Project Certificate No. 003, Appendix 'A' List of Commitments: Archaeology 1. Shall explicity reference the Department of Culture, Language, Elders and Youth's <i>Nunavut Archaeological and Palaeontological Site Regulations</i> (NAPSR) and <i>Human Remains Policy</i> (HPR), and that the proponent shall follow procedures outlined in NAPSR and HPR pertaining to their commitment.	TMAC is committed to conducting archaeological procedures in accordance with the Government of Nunavut, Department of Culture and Heritage regulations and procedures.
8	Archaeology	Government of Nunavut	Department of Culture, Language, Elders and Youth (CLEY) has concerns about the locations of the proposed quarries A, B and D; certain sections of the proposed infrastructure for the potable waterline originating at Windy Lake, and; the Doris Central Portal between Doris Lake and the all-weather road. A number of archaeological resources are known to already exist within or adjacent to these proposed development infrastructures. At the same time, no archaeological reconnaissance or assessment has been performed by a professional archaeologist in certain areas of concern identified by CLEY above.	<p>Quarries A, B and D were surveyed for archaeological sites in 2008 (Green 2008) and re-examined in 2009 (Prager 2010). Seven archaeological sites were recorded: Quarry A: NaNh-49, 60, 61; Quarry B: NaNh-62, 63., 64; Quarry D: NaNh-58. These sites were fully mitigated in 2010 (Prager 2011a). Consequently, no further archaeological concerns are expected within the quarry boundaries as originally identified.</p> <p>As noted in the original Doris North amendments archaeological supporting memo (Prager 2011b), “If the revised potable water source is situated at the same location as the original Windy camp intake, there should be no archaeological concerns with the intake per se. However, if any new ground surface disturbance is required for associated facilities, further assessment will have to determine if any recorded archaeological sites are close or if field surveys are required.” This recommendation stands.</p> <p>With regard to the waterline extending from Windy Lake to Doris Camp, the plan contained in the amendment document shows that it is to run immediately beside the existing road between Windy and Doris. The road right of way was surveyed for archaeological sites in 2008 (Green 2008) and no sites were recorded. Since this waterline will be within that right of way, no archaeological concerns are anticipated.</p> <p>There are no known archaeological sites within the proposed Doris Central developments, but not all of the area has been previously examined. The recommendation made in the original archaeological supporting memo still stands: “It is recommended that a final intensive ground survey of all proposed Doris Central developments be completed prior to any ground disturbance” (Prager 2011b). If the proposed project changes are approved, TMAC commits to carrying out an intensive ground survey prior to any ground disturbance in areas that have not been previously examined.</p>
9	Navigable Waters	Transport Canada	Proponent will be required to inform the NWPP of: - any design, construction, or operational changes accordingly - proposed construction of works involving navigable water course cross along the Doris-Windy all-weather road or camp roads - changes to the TIA water management - Reduction of Water Cover in the TIA, water transfer system, discharge into Roberts Bay - Potential relocation of camp water source from Doris Lake to Windy Lake - Roberts Bay: laydown, water intake, accommodation barges, and winter fuel barges: a list of vessels involved in the project for shipment/transfer of product; current information on the location of accommodation barges, how they moored and the use of additional barges compliant with TC regulations; plans for transfer of fuel from ship to shore and use of fuel barges for storing fuel over winter.	TMAC acknowledges and will inform TC for necessary approvals in relation to the existing provisions and requirements of the <i>Navigable Waters Protection Act</i> (NWPA) and recent <i>Minor Works and Waters Order</i> , or as defined for scheduled waters should the recently proposed <i>Navigation Protection Act</i> (2012) come into force at a later date.
10	General	Kitikmeot Inuit Association	Although the KIA consultants have raised some flags, the KIA is satisfied that the NIRB reconsideration of P.C.003 is not likely to raised "significant concerns" for the KIA. HBML has consulted with the KIA on the changes. KIA is satisfied with the consultation, and the KIA is of the opinion that the flags raised by our consultant can be addressed as this process moves forward.	Comment noted.

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Comment No.	Topic	Commenter	Summary of Comment	TMAC Response
11	General	Kitikmeot Inuit Association	KIA agrees with HBML that reconsideration of these terms and conditions are needed: Section 2.1: update project description Section 4.9: remove requirement to fund and install an on-site laboratory for continuous monitoring of water quality (originally proposed by Miramar). HBML revisions to ensure discharge meets criteria makes on-site laboratory no longer necessary. Section 4.10 revise monitoring requirement to reflect discharge to Roberts Bay rather than Doris Creek Section 4.15 revise as appropriate discharge to Roberts Bay rather than Doris Creek.	Comment noted. TMAC agrees that reconsideration of these terms and conditions are needed.
12	Air Quality	Kitikmeot Inuit Association	Reconsideration of the mitigation in P.C. No. 003 may be required by the NIRB are: 1. air quality related to emissions and dust (dust supression methods) 2. committment to use TK/IQ by HBML 3. socio-economic issues Employment, Education Training and Business Opportunities 4. wildlife attractant management (the effects of the modifications on wildlife)	TMAC will ensure that air emissions will comply with all Nunavut and Canadian air quality standards, and furthermore, will meet current best practice for mines in the Arctic.
13	Socio-economics	Kitikmeot Inuit Association	Reconsideration of the mitigation in P.C. No. 003 may be required by the NIRB are: 1. air quality related to emissions and dust (dust supression methods) 2. committment to use TK/IQ by HBML 3. socio-economic issues Employment, Education Training and Business Opportunities 4. wildlife attractant management (the effects of the modifications on wildlife)	TMAC is committed to the application of TK/IQ, as appropriate, in the further development of mitigation as part of adaptive management. This will include consideration if the TK/IQ described as part of the studies previously conducted for the Doris North Project, as well as other information that may be brought forward. Ongoing feedback from TMAC employees, as well as that received through TMAC's interactions with NIRB, the KIA, and the Kitikmeot Region Socio-economic Monitoring Committee, among others, will continue to be an important means through which appropriate changes to mitigation are identified and considered. Similarly, TMAC remains committed to addressing issues related to Employment, Education and Training, and Business Opportunities through the continued engagement of stakeholders and refinement of mitigation, as appropriate, in order to maximize the local benefits of the Project and minimize any adverse effects to the Kitikmeot Region.
14	Wildlife	Kitikmeot Inuit Association	Reconsideration of the mitigation in P.C. No. 003 may be required by the NIRB are: 1. air quality related to emissions and dust (dust supression methods) 2. committment to use TK/IQ by HBML 3. socio-economic issues Employment, Education Training and Business Opportunities 4. wildlife attractant management (the effects of the modifications on wildlife)	TMAC will ensure that waste management mitigation activities will meet current best practice for mines in the Arctic to limit attractiveness of the facilities to wildlife species.
15	Aquatics Marine	Kitikmeot Inuit Association	KIA's consultants identified the following areas as having a potential to arouse concern: 1. expanded mine plan and the increased duration of mine life which - will increase the amounts of ore, tailings and waste rock that will be created and will increase environmental liability - will impact terrestrial and marine wildilfe. For example, grizzly bears may be impacted if HBML does not use sufficient mitigation - may change air quality from emissions and from the generation of fugitive dust 2. subsea outfall and diffuser in Roberts Bay due to a.- the perceived global aversion to ocean discharge of mine wastes in general b.- the discharge pipeline into Roberts Bay and its potential effects on marine birds and mammals c.- the possibility of bioaccumulation of contaminants in Roberts Bay that can travel up the food chain 3. the consideration of IQ is of importance to all Inuit, commitments to use TK/IQ by HBML	2a. The perceived global aversion to ocean discharge of mine wastes in general: The global perception of mining-related discharges to the marine environment is often related to the discharge of untreated water or those discharges with elevated sediment content. TMAC is proposing the discharge of treated water into Roberts Bay that has been developed with extensive mitigation and management measures in place. Most importantly, the proposed discharge to Roberts Bay will meet MMER and result in CCME water quality guidelines being met for the protection of marine life in Roberts Bay. These guidelines are meant to be protective of all forms of aquatic life and all aspects of aquatic cycles, including the most sensitive species over the long term. By meeting these standards in situ, the health of marine life in Roberts Bay will be maintained. All discharge will be treated for suspended sediments so there will be no visual effects, and the quality of light in Roberts Bay will remain intact and primary production will not be affected. The discharge will be released at depth and will form a buoyant plume below the pycnocline. This will ensure that nutrients will not enter the euphotic zone where they could be accessed by phytoplankton, and the discharge plume will not interact with the benthic sediment layer as it will be buoyant. Recent modelling has shown that during the open-water season, Roberts Bay has the potential to completely flush within one week to a month depending on the environmental conditions; thus, the discharge is expected to leave Roberts Bay within this timeframe to be diluted by the much greater volume of Melville Sound. The discharge pipe is expected to create habitat for macroflora and macrofauna such as fish. An Aquatics Effect Monitoring Program (AEMP) has been developed to monitor potential changes to the Roberts Bay environment. This will be adaptively managed such that potential Project-effects will be noted and management decisions made to ensure the protection of water quality and marine life. The use of design features (treated discharge, discharge at depth) and the extensive mitigation, management, and monitoring procedures increases the confidence that no Project effects will result from the discharge of treated water into Roberts Bay. 2b. TMAC will consider additional monitoring of marine birds and mammals in Roberts Bay if water quality results exceed CCME guidelines or an effect is observed in tissue sampling conducted as part of the AEMP (Existing on site monitoring records any incidental observations and incidents that may occur at Roberts Bay with marine mammals.) 2c. The possiblity of bioaccumulation of contaminants in Roberts Bay that can travel up the food chain: The Project has been designed such that the discharge will form a buoyant plume in low productivity areas (below pycnocline and above benthic habitat), with a high dilution potential (bottom waters). This will limit the biological uptake of discharge water in the water column and at depth in the sediments. The water will be treated to meet CCME water quality guidelines for the protection of marine life in Roberts Bay and Roberts Bay continuously exchanges its water with Melville Sound. An Aquatic Effects Monitoring Program (AEMP) has been in place in Roberts Bay since 2010 and has measured tissue metal burdens for shellfish in Roberts Bay. This data would be used to test if the bioaccumulation of contaminants was occurring during the course of discharging treated water into Roberts Bay. This would inform management decisions if contaminants were shown to be increasing.

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Table 1. TMAC Technical Related Responses to Agency Submitted Comments 2012 (completed)

Comment No.	Topic	Commenter	Summary of Comment	TMAC Response
16	Wildlife Air Quality	Kitikmeot Inuit Association	<p>KIA's consultants identified the following areas as having a potential to arouse concern:</p> <p>1. expanded mine plan and the increased duration of mine life which</p> <ul style="list-style-type: none">- will increase the amounts of ore, tailings and waste rock that will be created and will increase environmental liability- will impact terrestrial and marine wildilfe. For example, grizzly bears may be impacted if HBML does not use sufficient mitigation- may change air quality from emissions and from the generation of fugitive dust <p>2. subsea outfall and diffuser in Roberts Bay due to</p> <ul style="list-style-type: none">- the perceived global aversion to ocean discharge of mine wastes in general- the discharge pipeline into Roberts Bay and its potential effects on marine birds and mammals- the possibility of bioaccumulation of contaminants in Roberts Bay that can travel up the food chain <p>3. the consideration of IQ is of importance to all Inuit, commitments to use TK/IQ by HBML</p>	<p>Wildlife - The expanded mine plan is small relative to the current footprint. No new types of effects are expected for terrestrial wildlife. Habitat loss was included in the 2005 EIS and the 2011 water licence amendment. This expansion represents additional habitat loss only. As a result, additional impacts to terrestrial wildlife populations are not expected.</p> <p>Air Quality - Emissions from the expanded mine plan are expected to be minimal. TMAC will ensure it is meeting all Canadian and Nunavut air quality standards through its various air quality monitoring programs.</p>
17	Socio-economics	Kitikmeot Inuit Association	<p>KIA's consultants identified the following areas as having a potential to arouse concern:</p> <p>1. expanded mine plan and the increased duration of mine life which</p> <ul style="list-style-type: none">- will increase the amounts of ore, tailings and waste rock that will be created and will increase environmental liability- will impact terrestrial and marine wildilfe. For example, grizzly bears may be impacted if HBML does not use sufficient mitigation- may change air quality from emissions and from the generation of fugitive dust <p>2. subsea outfall and diffuser in Roberts Bay due to</p> <ul style="list-style-type: none">- the perceived global aversion to ocean discharge of mine wastes in general- the discharge pipeline into Roberts Bay and its potential effects on marine birds and mammals- the possibility of bioaccumulation of contaminants in Roberts Bay that can travel up the food chain <p>3. the consideration of IQ is of importance to all Inuit, commitments to use TK/IQ by HBML</p>	<p>TMAC acknowledges and understands that IQ is of importance to all Inuit, and is supportive of measures that encourage and support IQ in all aspects of Inuit life. TMAC remains committed to the application of TK/IQ, as appropriate, in the design of Doris North Project policies, practices and procedures in order to avoid advsere effects on the continuance of traditional lifestyles and TK/IQ with respect to Inuit that are employed by or otherwise affected by the Project. TMAC is of the opinion that the mitigation as currently defined for the Doris North Project will be supportive of IQ values, but will consider changes on an ongoing basis as part of adaptive management.</p>
18	General	Natural Resources Canada	<p>Some apparent differences in the location of the temporary explosives factory and its distance from site features (e.g., airstrip) in Appendix 24 of its HBML's November 2011 Application in comparsion to the information NRCan has on file related to the current <i>Explosives Act</i> licence. The changes are not considered significant but will require ongoing regulatory licensing and review.</p>	<p>TMAC has provided an update to Appendix 24 in the Water Licence Amendment application showing the location of project infrastructure. TMAC also acknowledges the need for ongoing regulatory licensing and review in relation to NRCan's area of interest.</p>
19	General	Natural Resources Canada	<p>Condition #3: HBML must obtain all required federal and territorial permits and other approvals. NRCan states that Condition #3 remains, any proposed changes to explosives storage and manufacturing licenced under the Explosives Act would require approval.</p>	<p>Comment noted. TMAC is in agreement.</p>
20	Engineering	Natural Resources Canada	<p>Condition #19: HBML shall install thermistor cables and temperature loggers in the jetty foundation. HBML shall monitor the effects of the jetty on shallow water permafrost through operations and report the monitoring results.</p> <p>Context of comment: NRCan noted in our Technical Review of the FEIS January 18, 2006 that there was a potential for jetty construction to impact the state of the nearshore permafrost and it would be of scientific and engineering interest to install thermistor cables and temperature loggers beneath jetty to monitor effects on shallow water permafrost regime. Expect the design of the proposed outfall pipe and diffuser to be informed by the monitoring of the jetty and the shallow water permafrost.</p>	<p>Comment noted. Thermistors are in place.</p>
21	Aboriginal Affairs and Northern Development Canada	AANDC	<p>No technical related comments.</p>	<p>No technical related comments.</p>