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September 1, 2015

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Re: 2BB-MAE--- Madrid Bulk Sample Type B Water Licence Application - Responses to Comments Received

Dear Ms. Beaulieu;

With respect to the Type B Water Licence Application submitted to the NWB December 18, 2014, and in response to the comments received by interested parties on or before the extended comment period closing date of May 8, 2015, TMAC Resources Inc. is pleased to provide the following responses. Comments were received from AANDC, EC, and KIA. These comments are tabulated below, with responses and/or clarifications for each item.

Should you have any questions regarding the responses, or require any further information, please contact me at john.roberts@tmacresources.com.

Yours sincerely,

M. John Roberts
Vice President, Environmental Affairs
Hope Bay Project
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ITEM	TOPIC	PARTY COMMENT	PARTY REQUEST	TMAC RESPONSE
AANDC May 8, 2015				
***Issue #1* Acid Base Accounting of sample set from Madrid North bulk sample waste rock**				
A1	Waste Rock	The report notes that waste rock from the Madrid North bulk sample will contain early gabbro (category 7a) rock formations that have the potential to be acid generating due to low amounts of both sulphide and neutralization potential.	The applicant should conduct additional geochemical analysis on the rock formations at the Madrid North bulk sample area and provide review findings in upcoming annual report submissions. It is noted that only six samples of the early gabbro (category 7a) rock formation were subjected to acid base accounting analysis.	Geochemical analysis on Madrid North waste rock will be conducted in accordance with the WROMP and results reported in Annual Reporting. As noted, there were only six samples of the early gabbro unit. However, the number of samples is considered sufficient given that this unit only occurred in minor quantities in the deposit area. Additionally, although there are only small amounts of early gabbro, the number of samples is consistent with the recommendations in the MEND Prediction Manual for Drainage Chemistry from Sulphidic Geological Materials (Price 2009) which indicate that "At least 5 to 10 representative samples should be tested for each key lithology/alteration type."
Issue # 2 Submission of a Comprehensive Waste Rock Management Plan six months after issuance of a Type B water licence				
A2	Waste Rock	This report presents a conceptual waste rock management plan. The report states that a comprehensive waste rock management plan will be developed and submitted six months after the issuance of a Type B water licence.	The submission of a Comprehensive Waste Rock Management Plan six months after issuance of a type B water licence is reasonable. This plan should be distributed to interested parties for review. Additional information that may be acquired by the applicant during this time period can lead to a good quality submission. If issued, the licence should make the submission of this plan within six months of licence issuance a term and condition. The licence should also stipulate that there be no continued stockpiling of waste rock in 2016 if the plan is not approved following three months of receipt by the NWB.	The Hope Bay WROMP will be updated to include a module specific to the Madrid Advanced Exploration Program. However, TMAC believes that a good quality submission is possible based on the information that is already available for the site. Additionally, TMAC believes that the conceptual waste rock management plan presented in the application is sufficient for conditional approval of the plan, and pending submission and approval of the comprehensive WROMP six months subsequent to licence issuance, a separate licence condition governing stockpiling of waste rock is unnecessary.

Issue # 3 Segregation of potentially acid generating for non-potentially acid rock generating waste rock.				
A3	Waste Rock	The report claims, "the geochemical characterization programs for the Madrid Advanced Exploration Project indicated that there are no practical methods for segregating potentially acid generating (PAG) waste rock from non-PAG waste rock." The segregation of non-PAG and PAG waste rock is commonly practiced at other mine sites (e.g., Meadowbank Gold Project and the Doris North Gold Project) for environmental protection and reclamation purposes.	The applicant should explain why it believes that the segregation of non-PAG from PAG waste rock is not possible for the Madrid Exploration Project prior to licence issuance. The department is concerned about the potential for acid rock drainage originating from waste rock stockpiles.	The results from the geochemical characterization program indicate that only a very small portion of the samples from this site were classified as PAG or uncertain. In the event localized ARD is produced from these materials, it is anticipated that the high carbonate content in the overall waste rock stockpile would provide sufficient buffering capacity, and that the overall drainage from the stockpile would remain neutral to alkaline. For this reason, SRK does not believe that segregation is necessary at this site. The statement that there are no practical means of segregating the PAG waste rock was made in the memo because segregation was a component of the WROMP for Doris North. Segregation of the PAG waste rock is not practical at this site because, unlike the rock at Doris North, there are no clear lithological, mineralogical or spatial patterns in the data that can be used to identify this material during mining. ABA testing is not considered to be practical given the analytical equipment and the time required to complete the procedure.

Issue # 4 Parameters of concern from water collected within Pollution Control Ponds and seeps downstream of waste rock piles				
A4	Waste Rock	The report states, "Water collected in the Pollution Control Ponds and any seeps flowing directly from waste rock would be monitored in accordance with the water licence and to monitor metal leaching from the stockpile. The objective of monitoring is to assess the magnitude of arsenic and nickel concentrations to inform waste management practices and adjust closure planning, if results determine this is appropriate."	The applicant should explain the importance of assessing the magnitude of arsenic and nickel concentrations from collected water and if there are any other parameters of concern (metals and metalloids).The implications of having high concentrations of specific parameters should be made known through either a memorandum or a monthly monitoring report sent to the NWB.	From Application Appendix 8B, pg. 8: "Arsenic and nickel were the only elements that exhibited noteworthy trends in concentrations and leaching rates." There are two main reasons why ongoing monitoring of water quality is important. • First, water collected in the PCP will be transported to the Tailings Impoundment Area which is subject to stringent discharge water quality requirements. The potential effects of this water on TIA water quality have been assessed in the water and load balance. However, the predictions for the PCP should be verified to ensure that concentrations do not exceed thresholds that could prevent discharges from the TIA from occurring. • Second, water quality monitoring will provide an indication of whether seepage water quality from this area will be acceptable for discharge at closure. The current closure plan assumes that controls on metal leaching may be required, and assume that an impervious liner would be placed on the waste rock stockpile at closure. However, if monitoring indicates that concentrations are acceptable for discharge, then this cover may not be required.

				Refer to E3 response below for further elaboration on Kinetic Test Results. Results from the monitoring will be included in the annual monitoring report.
Issue # 5 Sampling frequency of waste rock				
A5	Waste Rock	The report states that monitoring of waste rock would include a geological inspection and collection of confirmatory samples from the blasted rock, either from within the mine, or immediately following placement in the waste rock pile. Sampling frequency would be approximately one sample per 5,000 tonnes of rock. A minimum of one in five samples would be submitted for full acid base accounting tests. The other four samples would be submitted for total sulphur and TIC (total inorganic carbonates) only.	The applicant should explain the basis for its planned frequency of sampling waste rock. Reference to applicable standards / guidelines should be provided.	Consistent with the recommendations on sampling frequency provided by Price (2009), the proposed sampling frequency considered the degree of variability in the analytical results (from the pre-mining characterization work), the objectives of the monitoring program, and the required accuracy of the results. • As shown in Figures 4 and 5 of SRK's December 2014 Memo – *Overview of Madrid North and South Bulk Sample ML/ARD Characterization Programs and Conceptual Waste Rock Management Plans* (provided in Appendix 8 of the Application), the pre-mine ABA results indicate that the vast majority of the samples are non-PAG, indicating that there is limited variability in the ARD potential. • The objective of monitoring is to verify that the majority of the waste rock is non-PAG. 1 sample per 5000 tonnes of waste rock will result in a total of 102 samples for the combined Madrid North and South development (totalling 510,000 tonnes of waste rock), which is more than sufficient to verify the overall ARD potential and proportions of PAG and NPAG waste rock in each of these stockpiles. • Despite the low risk for ARD from this site, the conceptual waste rock management plan

				includes conservative and robust management and closure plans, such as collection of seepage and runoff during operations, and impervious covers at closure to limit infiltration. These are considered to be more than adequate to address any uncertainties associated with ML/ARD from these materials.
Issue # 6 Reclamation cost estimate				
A6	Reclamation Cost Estimate	The applicant recommends that the total closure and reclamation cost for the Madrid Advanced Exploration Project be set at $7,131,000in 2014 CAD. Of this amount, $4,425,000 are for direct costs and $2,706,000 for indirect costs. The closure cost estimates were developed using an MS Excel spreadsheet base cost estimating process that is consistent with the principles of RECLAIM 6.1. This spreadsheet model was accepted by the NWB during the 2014 renewal of the Doris North Gold Project's type A water licence. The department notes that the RECLAIM model has been revised (version 7) and that the submitted cost estimate does not include care and maintenance provisions. It is the department's experience that there is inevitably a period of care and maintenance required after an operator abandons a site due to financial difficulty. That time is required for legal processes, non-operator reclamation planning, service procurement, etc. Costs expended on interim care and maintenance in that period reduce the amount of security available for reclamation purposes.	The applicant should familiarize itself with the most recent version of RECLAIM (version 7) and make any necessary revisions to its reclamation cost estimate. Additionally, the applicant should ensure that its cost estimate includes care and maintenance provisions. The applicant should provide this information within three months of licence issuance. The water licence can include a term and condition that would allow for the review of the reclamation cost estimate and posting of reclamation security following its issuance. If the NWB is in agreement, such a review should occur three months followings the licence issuance.	SRK has reviewed the Closure Cost Estimate and can confirm that it is consistent with RECLAIM version 7.0, with exception of the inclusion of a Care and Maintenance cost. TMAC agrees to submit an updated Reclamation cost estimate which includes the Care and Maintenance cost within three months of the licence issuance.

Issue # 7 Proposed term of licence				
A7	Term	The applicant is requesting a 10 year licence term. Within this time period there will be construction, operations, closure, and post-closure phases at both the Madrid North and Madrid South deposits.	The department supports the applicants request for a 10 year licence term.	Acknowledged.
Issue # 8 Conceptual Closure and Reclamation Plan				
A8	Closure and Reclamation	Included in the application is a Conceptual Closure and Reclamation Plan that was prepared by SRK Consulting on the applicant's behalf. This plan is considered to belong to the first of three phases in closure plan development as described in AANDC's 2007 Mine Site Reclamation Guidelines for the Northwest Territories: • Preliminary Closure and Reclamation Plan; • Interim Closure and Reclamation Plan; and • Final Closure and Reclamation Plan	The licence should require the applicant to provide an Interim Closure and Reclamation Plan to the NWB for approval within two to three years of licence issuance. This plan should be revised whenever there is a change to the project design or no later than every five years. A Final Closure and Reclamation Plan should be submitted to the NWB for approval at least one year prior to the project's closure. Every closure and reclamation plan submission, regardless of its phase, should be accompanied by a revised reclamation cost estimate.	TMAC agrees with this schedule.
EC April 23, 2015				
Incineration of Toilet Wastes				
E1	Supplemen-tal Report Section 4.2.11	"*If "Pacto"- type portable toilet facilities are used, these wastes will be returned to Doris North Project for incineration.*"	EC discourages incineration of toilet wastes, and it is not likely that the Doris North site incinerator is operating nor designed to deal with sewage. EC would like to reiterate the request that the Tailings Impoundment Area (TIA) be used for the storage of sewage effluent, as per correspondence from EC to the NWB dated September 10, 2008, which states: "*Hope Bay Mining Ltd. (HBML) has stated that once the permanent camp and mine are operational, the sewage effluent will be deposited into the tailings impoundment area (TIA). HBML has also stated that sewage*	It is anticipated that use of "Pacto" type toilets will be limited, if at all. The Application has retained reference to their use in the event they are required for emergency temporary sanitary facilities. The planned and preferred management of domestic liquid wastes for the Madrid program is through the use of self-contained "wash cars", which are essentially small portable trailers equipped with the appropriate holding tanks for fresh and waste water to support toilet, sink and emergency shower facilities. Effluent is removed from these facilities by truck and transferred to

			sludge will be incinerated in an appropriate incinerator in order to meet the Canada Wide Standards for Dioxins and Furans. In general EC does not recommend incineration of any type of biosolids, however is agreeable to HBML's current incineration commitments. Given that HBML will be utilizing the TIA for sewage effluent, EC requests that the proponent advise on feasibility of depositing the sewage sludge into the TIA (or another appropriate containment area) once the mine is operational."	the biomembrane sewage treatment plant at Doris North and will be discharged to the TIA. Proper functioning of the Doris biomembrane treatment plant requires removal of solids; these solids are removed by pressing sludge into dry cakes, which are burned in the site incinerator as part of the site-wide program to manage wildlife attractants. The sludge cake forms only a fraction of the domestic waste volume in the incinerator waste stream, and strict control of this waste stream and incinerator batching and burn processes in a dual chambered forced air incinerator has proven to be effective in producing emissions that meet the applicable CWS, as demonstrated in the last stack test performed in 2012. Proper waste segregation practices continue to be implemented at Hope Bay, to reduce or eliminate from the incinerator waste stream those materials that contribute to the formation of emissions contaminants. TMAC will consider examining sludge disposal into the TIA, taking into account appropriate human health and safety considerations for management of biohazardous materials, and also the appropriate management of potential wildlife attractants at the mine site. The next revisions to the Domestic Wastewater Treatment Management Plan and Incinerator Management Plan may propose options or alternatives for disposition of sewage sludge, for regulatory review and approval.

Length of Licence Term				
E2	Term	The Proponent has requested a Licence term of 10 years for a Type "B" Water Licence. This is unusual, and EC anticipates that there will be a "Hope Bay Phase 2" decision made before the proposed licence end date. A 10 year water licence seems more appropriate for a Type "A" licence, (i.e. of an operational mine site).	EC suggests a licence length of 8 years, which will allow the Proponent to align this project with the water licence for the Doris North Project. While an 8 year length is longer than that of a typical Type "B" water licence, EC supports the plans and effluent criteria already in place that would be used for this project.	The term of 10 years is proposed to accommodate all phases of the Madrid Program, including Construction, Operations, Closure and Post-Closure activities for the sequential development of the Madrid North, then Madrid South bulk samples. A term of 10 years is in line with other Type B bulk sample licences granted (ie: 2BB-MEL1424, issued in 2014) and TMAC considers a 10 year term an appropriate timeframe to carry out the activities proposed under the Application.
Kinetic Test Results				
E3	Section 2.1.3 of Appendix 08B	The Proponent states that the pH levels for the barrel tests were alkaline, with field and lab values typically between 8 and 8.5. Antimony, arsenic, cobalt and nickel release rates were higher for the sample containing sedimentary units (5+1) and to a lesser degree for deformation zone (13a). The Proponent concludes that the kinetic test results suggest that arsenic and nickel leaching under neutral pH conditions is expected from materials containing the trace mineral gersdorffite. The Proponent further concludes that as there is no practical means of identifying gersdorffite during mining, and that waste rock cannot be segregated and managed according to arsenic and nickel leaching characteristics.	It is not clear to EC why the wt. % concentration of gersdorffite cannot be used to identify the rock units that may potentially leach arsenic and nickel as these metals are related to gersdorffite just as wt. % of sulphide is used to identify rock units which may have acid potential. In addition, the preliminary economic classification in table 2 shows that high concentration of arsenic and nickel are in the "O" classification ((HC 26, HC-28 and HC-24) – Mafic Volcanics and Mafic metavolcanics), and rocks with >100% total sulphur (table 2, HC-20 and HC-21). Also, the samples HC-20 and HC-21) not in the "O" classification does show that the TIC/AP ratios are within the uncertain potentially acid generating (PAG) range. EC asks that the Proponent clarify why these indicators could not be used to attempt to separate rock units.	The gersdorffite content of the kinetic test samples was determined using mineral liberation analysis (MLA). MLA and/or QEMSCAN (a very similar method) are the only commercially available methods that can reliably detect and quantify such low concentrations of a specific mineral phase (in this case down to concentrations of <0.01%). However, these methods require highly specialized and expensive analytical equipment that cannot realistically be included in an on site laboratory. In the current waste rock and ore management plans for Doris North, material with a sulphide content is estimated visually, but the cutoff used to define mineralized rock for segregation purposes is at a threshold of 0.5%, which can be detected visually in hand samples. TMAC would like to clarify that the numbers in column 3 of Table 2 show the %rank of the total sulphur content relative to the Madrid North sample set as an indication of how representative these samples are of the Madrid

				North deposit area. Some of the values exceed a rank of 100% because they are from other deposits in the Madrid North area. Additionally, due to a report typo, sulphur was omitted from the title of column 5. Column 5 provides the total sulphur content (%) of these samples. As noted, samples with higher sulphur content tend to have higher total arsenic and nickel concentrations and lower TIC/AP ratios. However, solid phase arsenic and nickel concentrations were only weakly correlated with arsenic or nickel leaching (see Figures 3-13 and 3-16 from SRK 2015 – appended below), suggesting that even if the rock was segregated according to arsenic and/or nickel content, there would be no guarantee that arsenic concentrations in the seepage from a segregated stockpile would be at an appropriate level for discharge. Additionally, without additional on-site analytical equipment, quantification of the arsenic and nickel content is not possible at this site. To address both the practical concerns associated with segregation and the uncertain level of benefits, TMAC has taken a conservative approach in developing water management and closure plans for the waste rock at Madrid that address the potential for elevated arsenic and nickel concentrations in the contact water from un-segregated waste rock, and believes that these plans are the most appropriate means of addressing the potential water quality issues.

E4	Section 2.1.3 of Appendix 08B	The Proponent also states that sulphate release rates were low (maximum 1 mg/kg/week) for the Mafic metavolcanic and late porphyry granitoid samples, indicating low rates of sulphide oxidation.	If this is the case, the Proponent is asked to clarify why high sulphate leachate in some samples does not indicate higher rates of sulphide oxidation.	This comment appears to pertain to the Madrid South results. As stated in the memo, "Stable sulphate leaching rates for the sample of mixed early gabbro [HC-62] were higher (23 mg/kg/week), however this likely reflects the leaching of primary sulphate minerals in the sample rather than sulphide oxidation." This is supported by ABA results presented in SRK (2012) which indicate that all of the sulphur present in this sample occurred as sulphate, and mineralogical results that confirmed that gypsum was present.
KIA April 23, 2015				
Issue # 1 Waste Rock Slope Design Criteria				
K1	Construction and Operation Phase	The report notes 2H:1V waste rock side slopes for Madrid North waste rock piles but 2.5H:1V for Madrid South waste rock. No explanation or rationale is provided for the different side slopes for similar waste rock materials.	TMAC provide rationale for different slopes for the waste rock piles.	Unmineralized waste rock remaining on surface at closure will be regraded to slope of 2.5H:1V as indicated for Madrid South. The mineralized rock remaining on surface at Madrid North will be covered with an HDPE liner and will require a final slope of 3H:1V. During the operational stage, it is important to minimize the footprint of the Madrid waste rock pile so as to reduce the volume of contact water which needs to be managed. Therefore the operational waste rock pile slope is set at 2H:1V.

Issue # 2 Hydrological design criteria's selection of precipitation over watershed				
K2	Construction and Operation Phase	SRK has selected 25% of annual snowfall over watershed area plus 1:100 year 24 hour rainfall. No rationale is provided for this selected value of 25%. Also is it not evident that this value allows for site snow fall accumulation due to drifting within the watershed basin.	TMAC provide rationale for hydrological design criteria's selection of precipitation over watershed.	The Pollution Control Ponds are designed to retain 25% snow-water equivalent, between October and May (i.e. the winter season), 100% of the precipitation, between May and October (i.e. the summer season), and 100% of a 1:100 year 24 hour storm event. The sum of these precipitation events were applied over the watershed areas which drains towards the Pollution Control Pond. This is the same design criteria which has been consistently used throughout the Doris North Project.
Issue # 3 Hydrological design criteria for the Pollution Control Ponds				
K3	Construction and Operation Phase	No freeboard seems to have been allowed for in the design. Generally some freeboard amount is allowed for in the design of ponds. No rationale is provided for the lack of freeboard being appropriate for the design of the pond. There may be some identifiable risks that could be mitigated through the use of freeboard.	TMAC provide rationale for the PCP hydrological design criteria.	The full supply level of the ponds is set to the elevation where the liner terminates. Since this is an event pond with design criteria as outlined in the response above, which is intended to be maintained normally empty (i.e. as soon as there is water in it, it is supposed to be pumped out), the likelihood of reaching the full supply level is virtually impossible. There is however an additional 0.9 m of fill over the liner, providing an effective freeboard against overtopping which will ensure that in the highly unlikely event that the full supply level is exceeded, the pond integrity is not at risk.
Issue # 4 Connection detail between the HDPE liner on the PCP berm and upstream 0.9m deep cut-off trench				
K4	Construction and Operation Phase	No site specific geotechnical detail has been collected at the locations of the upstream cut-off trench where the liner is to be tied into. Any adverse ground conditions, including frost affected bedrock, immediately below ~~liner~~ proposed liner connection, could lead to seepage under the liner and under the berm. In addition, no detail is provided regarding connection of liner	TMAC provide more details on the connection of liner to the underlying subgrade for PCP berm.	Construction of the Pollution Control Ponds will be during the winter season. The key trench will be excavated to permafrost (in the case of overburden soils) and to competent bedrock (in the case where bedrock is encountered) the typical Detail 1 on MNP-10 (Madrid North) and MSP-08 (Madrid South) is an illustration of upstream liner installation under ideal

		to the underlying subgrade.		conditions. Construction Activities will be in accordance to SRK's technical specifications for earthworks and geotechnical engineering as referenced in the design brief technical memorandums. These specifications have been utilized for various approved works on the Hope Bay Project. These technical specifications provide construction contingencies should unfavorable ground condition be encountered.
Issue # 5 PCP Berms and associated lined pond area				
K5	Construction and Operation Phase	No geotechnical information has been collected under proposed berms or lined pond areas as design input. Organic materials, ground ice and highly fractured bedrock could be problematic for the performance of retention berms and liners. No engineering assessments and operational controls are identified to ensure proper performance of the containment berm and liners. No contingency measures are proposed for the event of pond seepage.	TMAC provide geological information for proposed PCP berms and information on operational controls to prevent seepage.	SRK has prepared geotechnical design parameters and technical specifications for the Hope Bay Project which are based on all available overburden and bedrock geotechnical data collected belt wide. This data was used to design and build all existing surface infrastructure for the Doris North Project, as well as develop feasible designs for the Madrid PCP. Prior to constructing the Madrid PCP berms a geotechnical investigation will be carried out and the design verified.
Issue # 6 Pond operations – 90% empty state				
K6	Construction and Operation Phase	Please provide context of 90% empty state to indicate whether it pertains to volume or to time duration when pond is retained. Any remnant pond would collect at low point on upstream face, near the cut-off trench. Warm pond water would potentially melt any underlying permafrost leading to liner and berm performance issues.	TMAC clarifies the context of 90% state in terms of capacity or time.	The Pollution Control Ponds are designed to be operated as normally empty. That means that at any given time when there is water in the ponds, the discharge or water removal process, including water quality sampling as needed, will be initiated.

Issue # 7 Waste rock side slopes are to be flattened during closure to 3V:1H.				
K7	Closure Phase	Leaving the flattening operation until closure phase leaves work and potential costs that are put off till [sic] later closure phase. It is suggested that waste rock side slopes of 3V:1H be installed during operations phase so that this liability cost is not left until the closure phase. This minor operational change would hence reduce potential closure liabilities for the KIA.	TMAC install waste rock side slopes of 3V:1H during operations.	While it may be prudent to ensure the pile is constructed to that configuration from the outset to avoid later re-grading it should be noted that waste rock placement by nature cannot be dumped to slopes other than angle of repose. Therefore the operational practice is to dump at angles of repose with setback benches followed by re-grading to achieve the overall design grade. This grading can either be done as dumping progresses or when all dumping has taken place. TMAC will endeavour to do as much of the grading as is practical during the operational phase.
Issue # 8 Waste rock cover design – HDPE liner plus 0.3 m of crushed rock				
K8	Closure Phase	HDPE liners are subjected to punctures and tears, depending upon the grain size and angularity of both the subgrade and the cover layers. This usually requires the use of finer grained material (nominally -15mm) or heavy weight geotextile to protect the liner. These details are not mentioned in the current documents. Also the cover's design objectives for both the short and long term are not specified. This objective need to be specified and incorporated into the final design and closure cost estimate.	TMAC provide further detail on the rock cover design.	The closure plan is conceptual. The waste rock needs to be covered with an infiltration reducing cover, and since there are no suitable natural materials, a geosynthetic product has been proposed. The current closure cost allows for regrading the waste rock pile from 2H:1V slopes to 3H:1V, laying down a 60 mil HDPE textured liner and covering that with 0.3 m of gravel to act as a UV protection layer. Given the conceptual nature of the design, a target infiltration reduction rate has not been specified, and therefore the requirement for additional bedding layers to protect the liner against damage has not been assessed. Such refinement will be done as part of future closure plan updates.

Issue # 9 Portals plugs – rock fill portal plugs are described				
K9	Closure Phase	The design objective for the portal plugs are not specified. These objectives could be to act as a physical barrier to retain mine head water in expected parts of the Madrid South stopes and to provide crown pillar support. Also, the final portal plug designs should be stamped by a Professional Engineer in NU.	TMAC provide further details on portal plugs	The portal plug will be constructed using mine waste rock and will prevent mine access in accordance with the necessary acts and regulations. The plug does not have to retain any head of water since they are well above the Windy, Patch, and Wolverine Lake elevations where any groundwater inflows may equilibrate.
Issue # 10 Closure Costs				
K10	Closure Phase	It is noted that SRK (2014a) provides a cost estimate for the conceptual closure plan. This cost estimate totals $7.1 million (M) comprised of $4.4M direct costs and $2.7M indirect costs, based on the assumptions, quantities and rates provided therein. The indirect costs allowed for $0.72M contingency, along with costs for mob/demob, G&A costs and site monitoring. KIA's engineering consultants did not review this cost estimate in any detail but as the closure plan details and logistics evolve over time, the closure costs are expected to increase. In addition, the closure of the Madrid North and South facilities is likely dependent on the assumption that appropriate equipment and logistical supply (eg. camp) are in the area for closure work of the other Doris North Project facilities. Should that equipment and support not be available from nearby sites, then the closure cost would be higher than stated.	TMAC provide further updates on closure costs.	Refer to response to AANDC Issue #6 and #8 above re: reclamation cost estimate review frequency and submission schedule of Interim Closure and Reclamation Plan and subsequent revisions through to Final Closure and Reclamation Plan submission.

Issue # 11 General Lack of Information on Baseline Results within Madrid Advanced Exploration Area				
K11	Baseline	Appendix 5, Environmental Baseline Part 6, Sections 3.2.1.1 to 3.2.3.2, p.3-7 to 3-10: The sections of Appendix 5 that summarize the wildlife baseline information collected for the Hope Bay belt project do no contextualize the findings spatially, meaning impacts cannot be determined for the Type B Water Licence Application boundary. As this is baseline information is meant to support a water licence application for the application zone shown in Figure 1.1-2 of Appendix 5 (part 1), critical wildlife use and habitat information should be summarized for within that boundary, particularly where critical wildlife habitat features could be destroyed through project development. For example, sections 2.2.2.2 and 2.2.2.3 include vague information on dens, in statements such as: :Carnivore den surveys located three wolf dens in the Hope Bay Belt area," yet no information is provide [sic] as to whether these dens overlap with the application boundary for the Madrid advanced exploration project. Similar issues occur with regard to other wildlife VECs as well; information on the types and numbers of surveys conducted is provided, but no spatially specific information is included about use of the area within the proposed Type B Water Licence application boundary.	TMAC updates this information such that it explicitly summarizes the key habitat use and observations for each wildlife VEC within the proposed application boundary.	See response appended below

Issue # 12 More information on camp use and vehicular requirements				
K12	Supplemental Information Report (SIR)	In section 4.1.4, Page 4-4, the proponent states that "*The Madrid Advanced Exploration Program will utilize available capacity at the existing permanent camp facilities at the Doris North project and/or the planned camp at Windy Lake permitted under Type "B" water Licence 2BE-HOP122 [sic]. Combined, these camps have the capacity to house 360 workers*." The proportion of people housed at the Doris North and/or Windy camps will affect wildlife differently. The location of workers for this project will affect the amount of traffic added to the Doris North-Windy all weather road over the proposed 10-year period.	TMAC to provide information on the approximate numbers of people to be housed in each camp, information about when Windy camp is expected to open, and the numbers of vehicles expected to travel along the Doris North to Windy road.	Doris Camp is presently permitted to house 180 workers; Windy Camp is not presently constructed but is permitted to house 180 workers. These camps are authorized separately from the Madrid Advanced Exploration Program Application. It is expected that the Madrid workforce will be housed at the Doris Camp and commute to the Madrid project site(s) daily. It is planned that workers will be transported daily via crew bus, reducing the number of vehicles and traffic on the road. The mitigative measures currently in place for the Doris North project, with respect to reducing effects on wildlife from vehicle traffic will be implemented, including speed limits, wildlife notification systems, and wildlife having the right of way. The scheduling of Windy Camp construction or opening has not been determined.
Issue # 13 The type of flocculant to be used in the suppression of sediment				
K13	SIR	In Section 4.2.10.2, p.4-11: The document states that the bulk samples will require the use of a flocculant for the suppression of sediment, which will be stored at the Madrid North Laydown Area. Information on the flocculant to be used needs to be provided, as some flocculants and coagulants may be harmful to aquatic life and wildlife. i.e., will mineral, natural, anionic, or synthetic (i.e. long chain polymer or sulfonated) flocculants be used?	TMAC provide information on the flocculant to be used in the suppression of sediment.	Flocculant is not required nor planned for routine use for the suppression of suspended sediment in the Pollution Control Ponds. Should suspended sediment prove to be an issue, TMAC would like to reserve the option to consider flocculant use with appropriate approval.

Issue # 14 Effluent Disposal on tundra and exposure of wildlife to heavy metals				
K14	SIR	In Section 7.2, Table 7.2-1, p. 7-2, indicates that large volumes of surface contact water (40,000 and 94,000 cubic metres per year from Madrid South and North, respectively) will be partly discharged to the tundra in the area of the pollution control pond (when discharge criteria are met). The quarry effluent discharge quality limits are presented in Table 7.2-1 and pollution control pond effluent discharge limits are presented in Table 7.4-1. On-going deposition of water with these levels of arsenic, iron, zinc, copper, ammonia, TSS, etc. (Tables 7.4-1 and 7.2-1) may affect the toxic loads found in vegetation in the area. Wildlife feeding in these discharge areas could be exposed to concentrations of heavy metals that create physiological problems and the implementation of a highly effective waste and wildlife attractant management program will be required to ensure that wildlife do not access or feed in these areas. However, the mitigation dealing with this issue, in Section 10.5.2, p.10-2, states that: "*a waste and wildlife attractant management protocol will be implemented such that wildlife do not have access to camp wastes, contaminated areas and attractants*".	TMAC include some information about what will be or will likely be, included in this plan, and whether the tundra discharge locations are included in this mitigation commitment. Also include information on how the mitigation to keep wildlife out of areas will be evaluated for effectiveness, if the use of adaptive management is cited. TMAC provide information on the numbers of samples, taken from vegetation and soil that will be available from areas that will be used for partial discharge of quarry effluents. It is important that these baseline levels be available for later comparison against metals measured in soils and vegetation after successive effluent discharges over the 10-year period.	The tundra discharge locations will receive effluent compliant with the discharge criteria specified in the licence issued by the NWB. Water that is not compliant for discharge to the tundra, will be directed to the TIA, which is the facility designated for receipt of such discharges. Wildlife interaction with site infrastructure is monitored under the Wildlife Mitigation and Monitoring Plan. A robust waste management plan is in place which has been effective in minimizing wildlife interaction with site infrastructure. Baseline information submitted with this application is considered of an appropriate level of detail to facilitate screening level review of a bulk sample (Type B) licence application.

Issue # 15 Habitat Loss and Changes in Movement and Behaviour only Part Mitigable				
K15	SIR	In Section 10.3, Table 10.3-1, p.10-8, it shows that changes in movement and behaviour of wildlife due to sensory disturbance from blasting, human presence, vehicle and aircraft traffic is rated as M, although most of these disturbances cannot be fully or even largely mitigated, particularly during construction.	TMAC adds another category for negative but partly mitigable may provide a more realistic picture for information presented in this table. Or, a more explicit discussion of the residual effects of sensory disturbances to wildlife VECs over the 10-year application period should address this issue.	Category of M (Negative and Mitigable) is established by NIRB in Table 2 of the PSIR contained in Appendix 10. The other options to categorize impact from interactions are: P (Positive), N (Negative and Non-mitigable), U (Unknown) or blank if no impact is expected. There is no category to describe the magnitude of mitigation, but it can be expected that through the implementation of measures in management plans such as the Noise Abatement Plan, that some mitigation will aid in lessening impact, therefore, the classification selected is M (Negative and Mitigable). Disturbance due to blasting at quarry sites, human presence, and vehicle and aircraft traffic may occur during Construction and Operation phases of the Project. Mitigation measures, in addition to those to be implemented in the Noise Abatement Plan, specific to wildlife, will be outlined in an update to the Wildlife Mitigation and Monitoring Plan and implemented to minimize the effects of disturbance to wildlife during all phases of the project. After implementation of mitigation measures, some disturbances during construction activities are anticipated to be present, primarily due to blasting at the quarry sites and construction and use of the roads. However, these disturbances are anticipated to be intermittent and short-term in duration and localized in geographical extent. Thus, only a very small proportion of wildlife habitat may be affected by these disturbances for short periods of time. The majority of wildlife habitat affected by noise is expected to fully

				recover once Project activities cease. The effects of sensory disturbance are currently being studied as part of the Doris North Wildlife Mitigation and Monitoring Plan by determining if VEC species close to infrastructure are less abundant than when far from infrastructure. Effects of sensory disturbance are anticipated to be of greater concern for VEC species with small home ranges i.e. upland and waterbirds, than those with larger home ranges i.e. raptors and mammals. If a similar study design is used for the Madrid Water License boundary area then this data could contribute to the current dataset available for Doris North.
Issue # 16 No Information on Residual Impact to Wildlife				
K16	SIR	In Section 10.5.2, p. 10-21, there is no statement about whether there is expected to be a residual or significant effect of this project on wildlife after mitigation. Other disciplines have included such a section. For instance, the authors of the aquatic organisms, fish and fish habitat section (Section 10.5.3, p. 10-23) state that: “the Project is not expected to cause any significant adverse effects on Arctic Char, Lake Trout, Lake Whitefish, and Ninespine Stickleback in the Project area”.	TMAC provide comment on the potential for a residual effect on wildlife after the application of mitigation as well as on the significance of that effect.	The construction of the Madrid proposed infrastructure is anticipated to result in minimal habitat loss for wildlife and is not anticipated to affect any critical or important habitat features for wildlife. Thus, the effect of habitat loss due to the proposed Project is anticipated to be negligible for mammals and raptors. In addition, disturbance to wildlife in surrounding habitat due to noise is anticipated to be relatively minimal (intermittent and short-term in duration) and expected to fully recover upon cessation of Project activities. Wildlife specific mitigation measures will be proposed for blasting activities and other noise generating activities in an update to the Wildlife Monitoring and Management Plan in addition to those that will be implemented in the Noise Abatement Plan.

				A small section of road is to be built for the Madrid Project, and mitigation measures are to be proposed in the Wildlife Monitoring and Management Plan, such as the construction of road crossing areas, if required, thus minimizing the potential for the creation of a barrier to movement of wildlife. Mortality of wildlife, which primarily occurs as a result of collisions with vehicles on Project roads, is also anticipated to be minimized through the implementation of mitigation measures specific to wildlife ie: speed limits, wildlife notification system. Through the adherence to current management practices, standard operating procedures, and regulatory guidelines, and mitigation measures developed for the Project, no residual effects to wildlife or wildlife habitat are anticipated as a result of the development of the Project.
Issue # 17 Cumulative Effects Section Lacking Information				
K17	SIR	In Section 10.7, the cumulative effects section is very short and high level, and does not state whether the advanced exploration project is expected to contribute to cumulative effects.	TMAC provide more information or comment on expected cumulative effects.	See response appended below.
Issue # 18 Possible impact of blasting activities on water bodies				
K18	SIR	P. 6-3: Blasting activities are proposed for construction of project infrastructure and roads. Blasting is not included in the aquatic organisms, fish and fish habitat effects assessment (p. 10-21 to 10-23). Site infrastructure may be built as close as 31 m to water bodies in the study area.	Please indicate if blasting activities may result in potential impacts to fish health, and identify any mitigation measures that will be considered for avoiding or reducing adverse effects.	Potential for detrimental effects of blasting on fish (and vulnerable life stages) is recognized in Appendix 8C, in the Quarry Management Plan, Section 4.1.4. This section indicates that the Guidelines for the use of explosives in or near Canadian fisheries waters (Wright and Hopky, 1998) will be followed for blasting activities with appropriate setbacks monitoring.

Issue # 19 Update of Aquatic Effect Monitoring Program to include Madrid				
K19	SIR	P. 9-3: The Doris North Aquatic Effect Monitoring Program will be revised to include the geographic scope of the Madrid area. A detailed plan will be provided 60 days prior to construction.	Review the updated Aquatic Effects Monitoring Program once available.	A revised AEMP, including a module specific to the Madrid Advanced Exploration Program, will be distributed for comment. The revised AEMP will be available 60 days prior to construction.
Issue # 20 Construction mitigation actions				
K20	SIR	P. 10-17: Proposed mitigation for construction activities in or near water is very general, for example "currently accepted industry construction practices will be employed during construction and operations", and "the release of poor quality water and/or sediment during construction and operations will be avoided through the use of erosion control measures and available spill and emergency response equipment".	Please indicate more specific construction monitoring best management practices that will be adhered to such as maximum acceptable TSS levels, isolation of in-water works, or replanting disturbed vegetation. If appropriate, a similar document from Doris North may be referred to.	Similar construction and monitoring practices as those described in Part D of the Doris North Water Licence 2AM-DOH1323 will be adhered to, including thresholds for maximum TSS levels as found at Part D, Item 18. Construction activities in or near water will implement best management practices as described in Fisheries and Oceans Canada (DFO) Nunavut Operational Statements as relevant to the work being conducted, such as observing fisheries timing windows, to avoid serious harm to fish.
Issue # 21 Introduction of nutrients or contaminants to water bodies				
K21	SIR	P. 10-21 to 10-22: Potential project-related effects include the introduction of nutrients or contaminants into streams and water bodies, which may produce negative effects on aquatic organisms. Discharge criteria values will be used to determine if site contact water in pollution control ponds can be safely discharged to the tundra (at minimum 31m away from local waterways), or alternatively trucked to the Doris North Project TIA 9P. 6-4). Discharge quality limits provided in Table 7.4-1 (p.7-6 to 7-7) are based on the Doris North Water Licence 2AM-DOH1323. However, it is not clear how the discharge criteria were developed, or how they will adequately protect aquatic resources in the Madrid Project area.	It would be beneficial if the discussion of potential water quality effects was expanded on to include the following points: What are the discharge criteria values based on, and do they take into account the CCME aquatic guidelines for the protection of aquatic life. Are discharge criteria defined for the Doris North Project also applicable for the proposed Madrid Project? Please discuss.	Through consistent best management practices, TMAC makes every effort to reduce release of nutrients or contaminants in the effluents involved with their operations, and water that is potentially elevated with substances that may have a negative effect on aquatic organisms is captured and managed within designated structures to prevent uncontrolled release to the environment Water quality discharge criteria is set by the NWB. In general, for site facilities, the discharge criteria mirrors that established by CCME guidelines for protection of aquatic life, or references MMER discharge limits for mine effluents. Tundra discharges are performed in accordance with criteria established in the licence and discharge locations established

				"where direct flow into a water body is not possible and no additional impacts are created"; therefore using criteria established for the protection of aquatic environments is a conservative approach to protecting the receiving terrestrial environment (ie: tundra). Similar licences, such as 2BM-ULU1520, issued recently in 2015, have the same discharge criteria as the Doris Licence 2AM-DOH1323.
Issue # 22 Culvert Crossing				
K22	Appendix 5	App. 5, Part 7, P.4-1: Unimpeded 1m diameter closed bottom CSP culverts are proposed for Crossing #1 and Crossing #2 based on the assessment that the watercourse does not support fish that are part of a recreational, commercial or Aboriginal fishery, or fish which support such a fishery. However, Crossing # 2 is located between two fish-bearing lakes and contains forage fish species such as ninespine stickleback.	Please provide further evidence that this connecting watercourse does not act as an occasional corridor for migrating fish, and that the ninespine stickleback which reside in the creek are unable to support CRA fish species in adjacent water bodies. If a lack of supporting evidence exists, it is recommended that the culvert is designed to facilitate fish passage, and/or that a request for DFO review may be considered.	Crossing #2 was assessed in Aug 24, 2010 and June 18, 2011. No fish were captured at the crossing location (UTM 434766 m E, 7547121 m N) as this area of land was dry on both sampling occasions. The connection between Wolverine Lake and Patch Lake on the northern Wolverine Lake outflow is discontinuous with no standing or flowing water observed at the crossing location. Moving downstream from Wolverine Lake, the nearest surface water was approximately 20 meters from the shoreline with no surface connection. Beyond this 20 meters, and moving downstream toward the crossing location, the surface water consisted of isolated and largely unconnected patches of ponded water, rather than channelized stream. Within the crossing co-ordinates the land was dry and the stream only began to run from a subsurface water source approximately 160 m downstream of the crossing location, toward Patch Lake. Fish (Ninespine Stickleback) were observed and captured (1 individual) near Patch Lake, approximately 230 meters downstream of the crossing location.

				Based on the available field information, ERM's conclusion is that no Ninespine Stickleback reside within the footprint of the crossing location and that there is no surface water connection between Wolverine and Patch Lakes that would act as a corridor for CRA fisheries species or the fish species (e.g. Ninespine Stickleback) that support them. In addition, there is no fish habitat present at the Crossing #2 co-ordinates and, therefore, the footprint of the water crossing will not affect either CRA fisheries or the fish species that support them. The Ninespine Stickleback captured and observed in this stream were present only near the Patch Lake inflow, approximately 230 meters in downstream direction from Crossing #2. Thus, the population of Ninespine Stickleback that may support CRA fisheries in Patch Lake will be unaffected by the crossing. By following DFO's Measures to Avoid Causing Harm to Fish and Fish Habitat, TMAC will ensure that effects to stream sections downstream of the crossing location will not be affected by erosion or sedimentation during the construction and decommissioning of the culvert crossing.

Issue # 23 Sampling information for Crossing #1				
K23	Appendix 5	App. 5, Part 7, P. 4-3: Crossing #1 was determined to not support fish during 2010 fisheries assessments. The detailed sampling information was not located.	Please indicate the details (e.g. sampling effort and timing) of the sampling surveys conducted to determine the non-fish bearing status at Crossing #1. Fish habitat information and photo documentation of the area would also be useful.	Fish community sampling was conducted at Crossing #1 on August 24, 2010 and fish habitat was assessed on September 5-10, 2010 and again June 29, 2011. Fish Community sampling consisted of electrofishing the length of wetted stream (893 s) and minnow trapping the upstream ponds (4 traps set overnight). No fish were captured and this information is summarized on page 4-3 of Appendix 5. In addition, the 2010 baseline report (Rescan 2011) indicates that Crossing #1 (labelled stream N22) has marginal to no fisheries value when considering spawning, rearing and overwintering capacity (Table 3.1-4a in 2010 report). All ponds were less than 1.2 m depth and likely to freeze overwinter. The stream was found to be quite acidic (pH 4.89) and may potentially inhibit fish use. A Sensitive Habitat Index Mapping (SHIM) survey was completed between September 5-10, 2010, which indicated the stream is more characteristic of a wetland with ephemeral connection to Patch Lake (downstream) and the upstream ponds (Figure 3.1-19c in 2010). A photograph of the area is provided below (Plate 1).

Issue # 24 Location of Wolverine Lake Outflows				
K24	Appendix 5	App. 5, Part 7, P. 4-2: It is noted that Wolverine Lake has two outflows that connect this lake to Patch Lake; one flows to the north (Crossing #2) and one to the east. The eastern outflow was not located on the map (Figure 3.3-1, P.3-14), and it appears that is may be in or near the proposed south portal footprint.	Please indicate the location of the eastern outflow on a figure, and assess if and how it will be impacted by the project.	The eastern outflow of Wolverine Lake that connects this lake to Patch Lake is now presented in revised Figure 1.1-2 appended below. (For consistency, this stream has also been added to Figures 2.5-2, 2.5-3, 2.5-4, and 2.5-7, 3.,3-1).The eastern outflow of Wolverine Lake is not within the footprint of the Madrid South development and therefore will not be impacted.
Issue # 25 Freshwater requirements				
K25		TMAC has estimated 295 m3/day of freshwater will be required throughout the life of the project. This estimate relies on estimated inflows from groundwater and other sources. Predictions and models are inherently subject to some degree of uncertainty. TMAC has not provided any site specific data on groundwater quality and quantity and the implications of this uncertainty have not been addressed by TMAC in their supporting documentation. Given the uncertainty of water inputs and the resulting water balance, the predicted freshwater requirement may also be subject to some uncertainty. We are therefore concerned TMACs predicted freshwater requirements are ~98% of the Nunavut Water Board threshold of 300 m3/day for a Type A licence. TMAC may be required to alter their application from a Type B to Type A water licence should the actual required freshwater volume exceed 300 m3/day and the existing uncertainty of their estimates, and absence of an estimate of variance in water requirements means there is some potential that their water needs will exceed the Type A threshold.	That TMAC provide further information as per enclosed Information Request.	See response to KitIA-7 below re: Threshold Water Use

Issue # 26 Insufficient data				
K26		TMAC has not provided sufficient data to adequately assess several key project areas. Examples include: • No site specific data or analysis of groundwater flow, groundwater chemistry or permafrost. Instead, TMAC assumes that conditions are similar to those at the Doris site. • Water chemistry has not been modelled in the pollution control ponds (PCPs) and so one cannot determine how much effluent may be discharged to the tundra of how much may have to be placed in the Tailings Area. • Details of management plans pertaining to the Madrid project have not been completed at this time, • The method and exact locations at which PCP effluent will be applied to the tundra have not been provided and so one cannot assess the risk to surface water, • A detailed water balance is not included. TMAC has only provided a “summary” in their supporting documentation.	That TMAC provide further information as per enclosed Information Request.	See responses to KitIA-5 and KitIA-6 below.

Issue # 27 The pollution control ponds (PCPs) and application of effluent to the tundra				
K27		TMAC has not provided an estimate of water quality within the separate PCPs. This makes it impossible to determine if held water will be compliant with effluent discharge criteria for tundra application or require transport to the Doris North TIA. Further to this, no effluent quality discharge criteria has been provided for salinity in the form of TDS or chloride. Groundwater inflows, particularly at Madrid South, will be a significant contribution to the water balance and salinity is assumed to be similar to that of seawater. Application of saline water to the tundra may degrade the permafrost and subsequent flow to surface water may impair aquatic life in the near shore. TMAC has not provided a monitoring plan to track water quality down gradient from where PCP effluent will be applied to the tundra to confirm no impact to aquatic life. Finally, there is no explanation of how the effluent will be applied to the tundra. Description of the application method is important to ensure that preferential flow paths or scouring of the tundra will not occur.	That TMAC provide further information as per enclosed Information Request.	See responses to KitIA-14, KitIA-15 and KitIA-16 below.
Issue # 28 Nunavut Impact Review Board Screening				
K28		TMAC has undertaken an internal environmental impact screening assessment but has asked the NIRB for exemption from a formal screening assessment. Our review has identified substantial uncertainty with the project and the potential to elevate the application to a Type A licence.	We advise the Kitikmeot Inuit Association to withhold approval of the water licence until the NIRB provides a decision regarding the need for formal screening.	See response to KitIA-7 below re: Threshold Water Use

KIA Consultant Information Request April 23, 2015				
Use of Doris North Mill to Process Bulk Samples				
KitIA-1	Section 4.0, Page 4-2	Approximately 800 tonnes of ore/day will be generated from each of Madrid South and Madrid North which will be milled and processed at Doris North. The TIA is not yet completed and the Supplemental Report states that "There are plans to construct a dam at the south end of Tail Lake (South Dam) to increase the capacity of the impoundment area to meet the needs for the Doris North Project. Once fully constructed, the TIA will have the capacity to process the ore from the currently permitted Doris North Project mine and process the bulk sample ore from the Madrid Advanced Exploration Program."	Please discuss how the increased milling needs will affect the required water for the Doris North Mill operating under the Hope Bay Phase 1 Water License. Please confirm that the TIA will be expanded to meet the needs of the currently permitted Doris North Project mine and process the bulk sample ore from the Madrid Advanced Exploration Program.	There are no increased milling needs associated with processing Madrid ore at Doris. Processing of Doris and Madrid ores will occur consecutively and not concurrently ie: the bulk sample ore will be processed discretely. Water to operate the Doris North mill is approved under the Type A Water Licence 2AM-DOH1323; milling the Madrid ore will not require more water than what is currently permitted under that licence. Expansion of the Doris North TIA is not required to accommodate processing the Madrid test sample. A clarification of the revised Madrid bulk sample ore processing campaign and the volume of tailings generated in relation to the capacity of the Doris North TIA, as currently permitted, to accommodate them has been provided in responses to party comments submitted to the NIRB on Aug 21, 2015. Please refer to page 9 of that submission under the topic “Tailings Volume - Placement of Madrid Tailings” for a detailed description.

Pollution Control Pond Capacity				
KitIA-2	Section 4.2.7, 4.3.7. Appendix 4-A, Appendix 8A Section 4.1.1 and 4.1.2 and 5.2	The pollution control pond (PCP) at Madrid North is designed to capture flow from the overall drainage area plus 25% of the annual snow coverage and 100-year 24 hour storm event. This is collectively a 15,100 m3 capacity. We are concerned that the pond has not been built to accommodate 100% of the annual snow coverage in conjunction with other water inputs. This may result in insufficient capacity should a large storm event occur during freshet. This is despite some removal of water for use in the brine mixing facility, the 50 m3 holding tank, etc. A similar design is used for the primary and secondary PCPs at Madrid South. We understand that water is transported from the PCP to the TIA when >10% capacity is reached. However, it is unclear from Appendix A Table 1 if all sources of contact water and other inputs are accounted for in the contact water volumes reporting to the PCP.	TMAC should provide rationale why the pond is build [sic] to handle 25% of the annual snow coverage rather than 100%. This rationale should be accompanied with a discussion of the Doris North TIA treatment capacity.	The Pollution Control Ponds are designed to retain 25% snow-water equivalent, between October and May (i.e. the winter season), 100% of the precipitation, between May and October (i.e. the summer season), and 100% of a 1:100 year 24 hour storm event. The sum of these precipitation events were applied over the watershed areas which drains towards the Pollution Control Pond. This is the same design criteria which has been consistently used throughout the Doris North Project. Water from the TIA will be discharged in accordance with the Water licence requirements. No water treatment is planned.
Holding capacity design for 25% annual snow coverage				
KitIA-3	Section 4.2.10.3	TMAC indicates that a double-walled fuel storage tank at each location will be placed into a lined containment facility and designed to accommodate 110% of the tank volumes plus 10% of the fuel transport truck a 1 in 100 year 24 hour storm event and 25% of the annual snow coverage. TMAC has designed the holding capacity for 25% of the annual snow coverage rather than 100% similar to the PCPs.	See KitIA-2. TMAC should provide rationale why the pond is build [sic] to handle 25% of the annual snow coverage rather than 100%.	The Pollution Control Ponds (and the Fuel Storage Areas) are designed to retain 25% snow-water equivalent, between October and May (i.e. the winter season), 100% of the precipitation, between May and October (i.e. the summer season), and 100% of a 1:100 year 24 hour storm event. The sum of these precipitation events were applied over the watershed areas which drains towards these facilities. This is the same design criteria which have been consistently used throughout the Doris North Project.

Documentation of Diamond Drilling Chemicals				
KitIA-4	Section 4.4.1	In 2011, drilling at the Boston site released large quantities of brine to the environment that were only detected by an AANDC inspector. Chemicals used during drilling activities include calcium chloride (salt) used to prevent freezing of the water in the hole, Visco which is used as a lubricant in the hole, linseed soap for cleaning of drill string components, and heavy grease to prevent seizure of drill rods to each other. TMAC reports that small quantities of each will be stored with each drill.	Please provide details on monitoring and management of drilling chemicals during operations in all seasons. These details should include a spill response plan applicable to exploration drilling activities. These may be included in an update to the Doris North Type A License Spill Contingency Plan as indicated in Table 8.1-1.	MSDS are maintained on site for handling and storage of all chemicals used for drilling, and all products are kept in secondary containment at each drill site as well as at the drill shops and laydown areas. Details of management of drill cuttings/brine is included in the NWB Water Licence Application form section 15 and the SIR at Section 4.4.3. Most brine solution utilized in the drilling process is dewatered and recycled or retained and managed with the drill cuttings. Saline drill cuttings are removed from the drill locations and deposited in a contained location where any surface runoff is captured and managed. A mutli-phase drill inspection protocol from drill set-up to site closure is implemented to ensure all drilling products are managed appropriately and sites are inspected routinely. Close tracking of daily drill water use ensures excess brine solution is not being generated. Updates are planned to the site-wide Spill Contingency Plan that include management of spills associated with surface exploration activities.

Groundwater Chemistry Assumptions and Lack of groundwater data				
KitIA-5	Section 6.3.2, Section 7.3, Section 10.4.3, Appendix 7-A	There is no site-specific Madrid baseline for groundwater quality or quantity. Groundwater on site is stated to be saline with TDS similar to seawater. This has not been confirmed with site specific groundwater samples and is important at the South Madrid Site where a talik is thought to be present (Sec. 10.4.3). The absence of a site-specific baseline prevents accurate estimates of mine water effluent quality and quantity. TMAC states (Sec. 10.4.3.) "The rate of inflow into mine workings is dependent on the location and extent to which bulk sample mining within these zones occurs. Potential effects to the quality of groundwater are introduced by mining within these unfrozen zones." The absence of a baseline does not provide a means to test for changes in the future. The statement that *"Groundwater quality for this area is assumed based on data from Doris and Boston areas. Both areas have saline groundwater at relatively shallow depths in the respective taliks. There is no reason to believe these areas are any different than the Madrid South Bulk Sample.* (App 7-A, Sec 2.3)" does not provide adequate evidence water quality in the Doris and Boston areas are applicable to Madrid South.	Please collect groundwater samples to confirm groundwater chemistry in the Madrid area. Alternatively, please provide evidence showing that groundwater data from the Doris and Boston areas are applicable to the salinity and mineralogy of the Madrid site.	Prior groundwater characterization in the Madrid area includes the following: • In 2008, a single groundwater sample was collected from the Madrid North area (Suluk), during geotechnical drilling on Patch Lake, within the talik. TDS was 11,200 mg/L. This concentration is lower than those at Doris and Boston areas, but not indicative of freshwater (which was used for drilling). The sampling was not repeatable and results were considered only an indication of the potential for saline water. The existing (Suluk) data is considered sufficient to indicate the talik water is likely to be saline, and the extensive data sets from Doris and Boston are considered conservative indications of what could be encountered at Patch14. Groundwater samples will be collected during the Madrid Advanced Exploration Project to confirm groundwater chemistry.

Unsubstantiated Groundwater Inflow Assumptions and Lack of thermal data				
KitIA-6	Section 6.3.2, Section 7.3, Section 10.4.3, Appendix 7b Section 2.1	TMAC has provided estimates of groundwater inflow between 16 to 1073 m3 / day but has chosen to use 500 m3 / day as input into the water balance (Appendix 7-A Table 2). Water management will require an accurate water balance and the ability to manage worst case scenarios. Use of an intermediate value as input into the water license may underestimate the quantity of groundwater requiring management on site (if 500 m3/day is too low) or, alternatively, underestimate the amount of freshwater make up needed (if 500 m3/day is too high), thus challenging the 300 m3/day threshold for a Type B Water Licence . This concern is further highlighted by the lack of site specific permafrost information for Patch 14 and the Wolverine deposits and the likelihood of taliks adjacent to Wolverine Lake (p. 5-2 " It is anticipated that the Madrid South underground activities will intercept groundwater when operating in areas of taliks." This deficiency will make it impossible to assess if project related changes to groundwater flow regimes occur or have been mitigated (10.4.3).	Please provide a discussion of the variance in estimated groundwater inflows to the site and implications to the water balance and subsequent requirement for freshwater. This is critical given how close TMAC's estimate of freshwater use is to the NWB Type A threshold of 300 m3/day. Please commit to confirming groundwater quality and quantity at the Madrid South site prior to any further development. AND Please collect thermal data for the Madrid site prior to development activities. This will be used to inform the presence of taliks in the area and assist in modeling groundwater flow regimes.	Groundwater inflow is considered a waste, not a specific component of water use (Section 6.1 and Section 7). Groundwater inflow can be used to supplement drilling water requirements (although it is not required) and could reduce freshwater needs. Freshwater requirements will not increase if groundwater inflows are lower than expected. Available hydraulic testing data indicates that hydraulic conductivity in the area of the bulk sample is generally low. Inflows will be controlled by discrete features within a generally very low hydraulic conductivity bulk rock mass. In such a setting, a groundwater management plan represents the most appropriate course of action, with discrete features managed on an as-needed basis, if they are encountered. This planning provides flexibility to respond to local conditions that cannot be fully characterized prior to mining. Groundwater quality will be confirmed by samples collected during the Madrid Advanced Exploration Project. Groundwater quantity will also be confirmed at this time. The Madrid South bulk sample stoping area is assumed to be fully within the talik of Patch Lake. The permafrost/talik boundary has been assumed based on extensive thermal data available from the Hope Bay belt.

Type A Threshold Water Use				
KitIA-7	Section 6.1	Water use is estimated to peak at 295 m3/day, which is within 2% of the threshold for a Type A water license as per the NWB. TMAC has estimated daily peak water use very close to the threshold; yearly freshwater use is also provided. The NWB does not use yearly water use as the threshold and so we are concerned TMAC will view the estimated peak freshwater use as a mean value rather than an absolute value. We are further concerned that 295 m3/day will be sufficient to meet TMACs needs. Further to this point, we are concerned with the accuracy of the freshwater use estimate given the absence of groundwater data.	Please provide an estimate of how frequently freshwater use will reach the peak value and how often it will exceed it. We do not see an occasional exceedance as need for a Type A license, but TMAC should discuss implications of exceeding their peak value and the accuracy of their estimate in the absence of groundwater data. Continued exceedances of the 300 m3/day may necessitate a Type A License for Madrid North and South including formal NWB hearings. AND Please confirm the demand for make up water by providing a) the total water use including a discussion of uncertainty b) the amount to be made up of contact water or reused water and c) the amount to be made up by freshwater takings.	Section 6.1.1 of the SIR clearly states the daily peak industrial water use maximum will be 290m^3/day. An additional 5m^3/day is proposed for domestic use to support the sanitary facilities for the daily work force at Madrid. It is planned that water use will be below these thresholds and within the appropriate water usage allowable for a Type B water licence. Based on historical usage and associated reporting at Hope Bay under existing licences 2AM-DOH1323, 2BB-BOS1217 and 2BE-HOP1222, TMAC has demonstrated a comprehensive understanding of water use volumes for any given process, including underground and surface exploration, dust suppression, other minor industrial uses such as fire suppression systems or wash water, and domestic use. In response to new interpretations of “water use”, TMAC and its contractors have responded in innovative ways to reduce water use through recirculation of cooling water through closed systems, by recycling compliant effluents to reduce freshwater usage, and have demonstrated on-going compliance with existing water volume limits established under other site licences.

				Water use volumes for the Madrid Advanced Exploration Program will be within the quantities authorized by the Type B bulk sample licence. Water use control procedures will include daily measurements of water use and early warning notifications to notify users of approaches to the threshold. Water use practises will be curtailed as necessary to ensure water use thresholds are not exceeded.
Fate of Drill Brines				
KitIA-8	Section 6.4.3 [sic]	TMAC states "Excess brine generated during the drilling process will be removed from the drill site and deposited onto waste rock piles, into Pollution Control Ponds, or discharged to the TIA." This does not outline the conditions under which each fate would be used.	Please provide details on the decision rules to be used to determine the three alternatives for disposal of drill brines.	See response to KitIA-4 above re: Documentation of Diamond Drilling Chemicals. As described above, exploration water use (and salt use) is closely tracked to prevent generation of excess brine that cannot be recycled through the drilling process. Most brine is retained in the drill cuttings and the selection for disposition of saline cuttings will be made based on proximity of drilling activity to any of the various components of the water management system, with consideration given to seasonal accessibility of either the waste rock piles, the PCPs, or the TIA. There will also be consideration to consolidate smaller quantities as deemed necessary to reduce haulage traffic to the TIA.
Fate of Non-compliant Quarry Water				
KitIA-9	Section 7.2	TMAC states that non-compliant quarry water would be sent to the Doris North TIA for treatment or reused through the PCP. We are concerned addition of non-compliant water contaminated by an unknown source (pending investigation as outlined in Section 7.2) may overwhelm the dilution capacity of the PCP requiring shipment of a greater quantity of water to the Doris North TIA for treatment. Similarly,	Please provide details on the fate of drill brines under differing conditions. Specifically we request details that would precede TMACs three stated potential fates for drill brines - the waste rock piles, PCPs and the TIA and how decisions would be influenced by laboratory response times. AND Please provide a discussion of how much	Fate of drill brines is discussed in the comment above. Quarry water quality is directly related to the geochemistry of the quarry rock. Geochemistry of the quarries is well understood and is predominately non-acid generating. In addition, TMAC continually strives to reduce release of nutrients or contaminants in the effluents

		what is the response time for laboratory analysis needed to make a decision as to treat the quarry water at the TIA or add it to the PCP.	truck traffic would be required to transport effluent from the PCPs to the TIA.	involved with their operations, including best management practices for explosives handling and use in the quarries. Spills are managed in accordance with the Spill Contingency Plan and not expected to contribute to contamination of quarry water. Consolidation of any non-compliant water (in PCPs) allows an option for re-use in industrial processes where appropriate, and centralization of effluents for more efficient haulage reduces road traffic. The ultimate disposition of any non-compliant discharge is the TIA. Table 4 in Appendix B provides the peak daily truck traffic per day as calculated against varying hydrologic conditions.
Fate of excess inflowing groundwater				
KitIA-10	Section 7.3	TMAC states excess ground water will be transported to the PCP where it will presumably be spread to the tundra as per Section 7.2. Application of saline contact water to the tundra may increase the potential for permafrost degradation, alter vegetation communities and create channelized flows to adjacent surface waters.	Please provide decision rules and criteria for disposal of PCP water to the tundra or the TIA that will ensure protection of the tundra.	The NWB sets out sampling requirements and specific water quality criteria for facility discharges. A requirement of any tundra discharge is that it meets the criteria set out in the Licence, appropriate advance notification is provided to the Inspector prior to discharges, and erosion does not occur at tundra discharge points. Monitoring of discharge points for erosion is part of routine water management. Though chloride is not included in any facility discharge criteria in other site licences, Table 7.4-1 of the SIR proposed chloride concentrations for consideration by the NWB, based on limits contained in the 2AM-DOH1323 licence for Doris Creek water quality, and referencing the BC Ambient Water Quality Guidelines for protection of aquatic life.

Updated Plans				
KitIA-11	Section 8.1, Table 8.1-1	We note that several management plans currently in implemented [sic] under the Doris North Type A license will be updated to accommodate activities associated with Madrid North and South. Specific examples of updates include 1) an Updated Wildlife Monitoring and Management Plan to accommodate increased truck traffic between the two project footprints, 2) Updates to the Water Management Plan to accommodate treatment of non-compliant water from the Madrid PCPs and quarries, 3) Updated Spill Contingency Plan as per KIA-4, etc.	We request an additional review period prior to "60 days prior to the commencement of construction" or after the next annual plan update to assess the adequacy of TMACs changes to the varied plans to accommodate activities at Madrid North and South.	Updated management plans will be submitted in accordance with the Terms and Conditions of the Licence once issued.
Outdated Reclaim Model				
KitIA-12	Section 9.2	Costs for closure and reclamation have been estimated using a NWB approved Microsoft Excel spreadsheet consistent with the principles of the RECLAIM 6.1 model. We note that this is not the most recent version of RECLAIM and may provide a more or less conservative estimate than what is currently accepted.	Please provide a discussion of how assumptions have changed between RECLAIM 6.1 and 7.0. Costs should be adjusted to reflect any more conservative assumptions present in version 7.0 that were not incorporated into the Microsoft Excel spreadsheet.	SRK has reviewed the Closure Cost Estimate and can confirm that it is consistent with RECLAIM version 7.0.
Inconsistencies in water balances				
KitIA-13	Section 6.1.2, Section 6.1.3, Section 6.3.2, Table 7.1-1, Appendix 7b Section 2.2	Groundwater is not expected to contribute to the Madrid North water budget (6.1.1) as the excavation is in permafrost (6.3.2). TMAC then states that contact water will be reused for makeup water. Alternatively Madrid South underground activities may intercept groundwater (6.3.2) but is not mentioned in the water balance (6.1.2). TMAC states that the remaining water requirements will be made up by the same sources as from Madrid North. The "Water Balance Summary" in Appendix 7b section 2.2 does not provide sufficient detail to assess if the water requirements will be sufficiently addressed without violating the 300 m3 / day threshold for a	TMAC should explicitly state how inflowing groundwater will contribute to the water balance in Madrid South beyond outlining differences in wastewater generation (Table 7.1-1).	Groundwater inflow is considered a waste, not a specific component of water use (Section 6.1 and Section 7). Groundwater inflow can be used to supplement drilling water requirements (although it is not required) and could reduce freshwater needs. Freshwater requirements will not increase if groundwater inflows are lower than expected.

		Type A license.		
Application of Contact Water to Tundra				
KitIA-14	Section 7.4, Table 7.4-1, Appendix 7-A Table 1, Appendix 8-A	Table 7.4-1 outlines effluent quality limits for discharge to the tundra based on MMER and the Doris Mining and Milling Licence 2AM-DOH1323 for discharges to the tundra. We note that these limits do not include salinity which may be of concern due to unsubstantiated groundwater inflow predictions. Further to this, MMER effluent quality criteria are designed to be protective of aquatic life when discharged through an engineered structure to surface water where dilution will occur. TMAC has not provided sufficient detail to provide assurance aquatic life will not be impacted through PCP discharges from the Madrid project. Application of effluent to tundra may create preferential flow paths resulting in degradation of the tundra and a reduction in terrestrial based mitigation prior to contact water reaching the productive nearshore area of surface waters 31 m away.	Please provide: 1) Effluent discharge quality limits for salinity as part of Table 7.4-1. Specifically limits for TDS and chloride as they are shown to be elevated in Appendix 7-A Table 1. 2) More information regarding how and where effluent will be applied to the tundra. For example, will it be through an engineered diffuser structure to prevent creation of preferential flow paths? 3) Establish nearshore monitoring stations to ensure application of compliant PCP effluent to the tundra is protective of aquatic life. These monitoring stations should take into account the application method and natural flow regimes of the area. Specific stations should be established to capture the influence of the Primary Madrid North PCP and the Primary and Secondary PCPs at Madrid South. 4) Outline the monitoring program to track any changes to permafrost resulting from application of contact water to the tundra. Insufficient detail is provided for monitoring in Appendix 8-A Sections 6 and 7.	See response above at KitIA-10. Table 7.4-1 in the SIR proposed for consideration by the NWB, tundra discharge criteria for chloride. Similar to requirements under other site licences, it is expected that tundra discharge locations for Madrid will be established "*where direct flow into a water body is not possible and no additional impacts are created*" and land-based discharges "*performed in a manner that prevents erosion at the point of discharge and downstream*". Visual monitoring of discharge points is conducted during all discharge activities to ensure prevention of pooling water, creation of any preferential flow paths, and to detect any areas of permafrost subsidence. Diffusers may be employed if observations indicate discharge is creating tundra impacts. Updates to the Water Management Plan will ensure mitigative measures for tundra discharges from facilities are described. Given the above, TMAC is not proposing to monitor any adjacent water bodies; however it is expected that the NWB will outline an adequate SNP when administering the new Type B water licence.

Pollution Control Pond Water Quality Predictions				
KitIA-15	Appendix 7-B	TMAC has not provided water quality predictions for the PCPs. This information is necessary to assess the volume that will be compliant for discharge to the tundra and non-compliant that will be shipped to the TIA for treatment.	Please provide monthly modeled water quality for each of the three PCPs over the duration of project life.	Modelling of water quality in the PCPs over the duration of the project life will not be performed. Water quality in the ponds will be monitored in accordance with the requirements of the water licence, and compliant water will be discharged to tundra in the manner specified above in KitIA-14. Non-compliant water will be disposed in the TIA.
Pollution Control Pond Sampling Frequency				
KitIA-16	Section 8.1, Table 8.1-2	We note that TMAC has proposed monthly water quality sampling for the pollution control ponds during discharge. This may be too infrequent to detect changes in PCP water quality or to discontinue tundra application prior to excessive non-compliant discharge to the receiving environment.	Please increase the sampling frequency of PCP water quality during discharge to once weekly. Results of PCP water quality should be compared with nearshore water quality monitoring results as recommended in KIA-14. TMAC should also provide PCP water quality trigger values that would cease discharge to the tundra as well as a trigger to cease based on channelization or development of preferential flow paths in the tundra to surface water.	Water quality sampling in the PCPs is intended to determine compliance with licence criteria. In general, water quality compliance is verified prior to discharge and the pond is discharged in a single event. Real time parameter monitoring will be considered for those constituents of concern that can be measured directly, to ensure discharge is compliant with the licence criteria. Monthly monitoring of water quality in the PCPs is intended to evaluate the effectiveness of programs to reduce explosives residuals or generation of excess brine.

Exemption from NIRB Screening				
KitIA-17	Section 10, Memo Directed to NIRB	TMAC has indicated in their memo to the NIRB and in Section 10 of the Supporting Document that the project is not predicted to have to have any long term adverse impacts to the environment. For this reason and "pursuant to NLCA Schedule 12-1(5)...Section 13.7.3" are exempt from public hearings.	HESL's review on behalf of the KitIA has identified significant uncertainty in the predictions associated with the Madrid Project. We advise that the KitIA withhold their approval of the Type B Water License until the NIRB has issued their decision regarding screening. This uncertainty may also be sufficient to elevate TMACs application from a Type B to a Type A water license as per the NWBs license threshold criteria.	As described above in KitIA-7, water use volumes for the Madrid Advanced Exploration Program will be within the quantities authorized by the Type B bulk sample licence. In response to new interpretations of "water use", TMAC and its contractors have responded in innovative ways to reduce water use through recirculation of cooling water through closed systems, by recycling compliant effluents to reduce freshwater usage, and have demonstrated on-going compliance with existing water volume limits established under other site licences. The NWB has granted similar 10 year, bulk sample water licences to other projects with water usage expectations in line with the amount proposed for the Madrid Advanced Exploration Program. TMAC will meet the threshold criteria for water volume usage, as proposed in the Application.

ISSUE E3: Kinetic Test Results - Arsenic

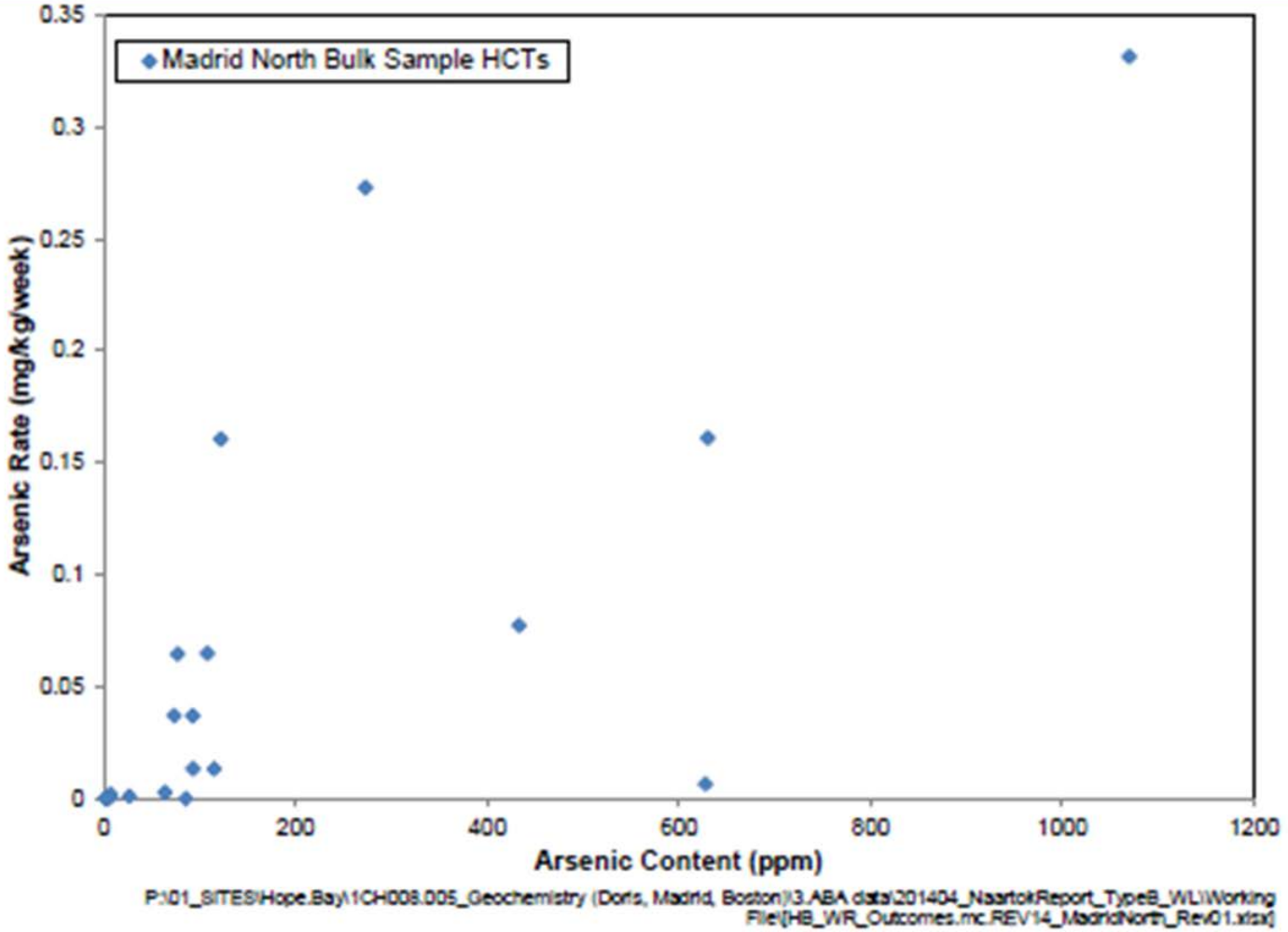


Figure 3-13: Comparison of Stable Arsenic Release Rates and Arsenic Content

ISSUE E3: Kinetic Test Results - Nickel

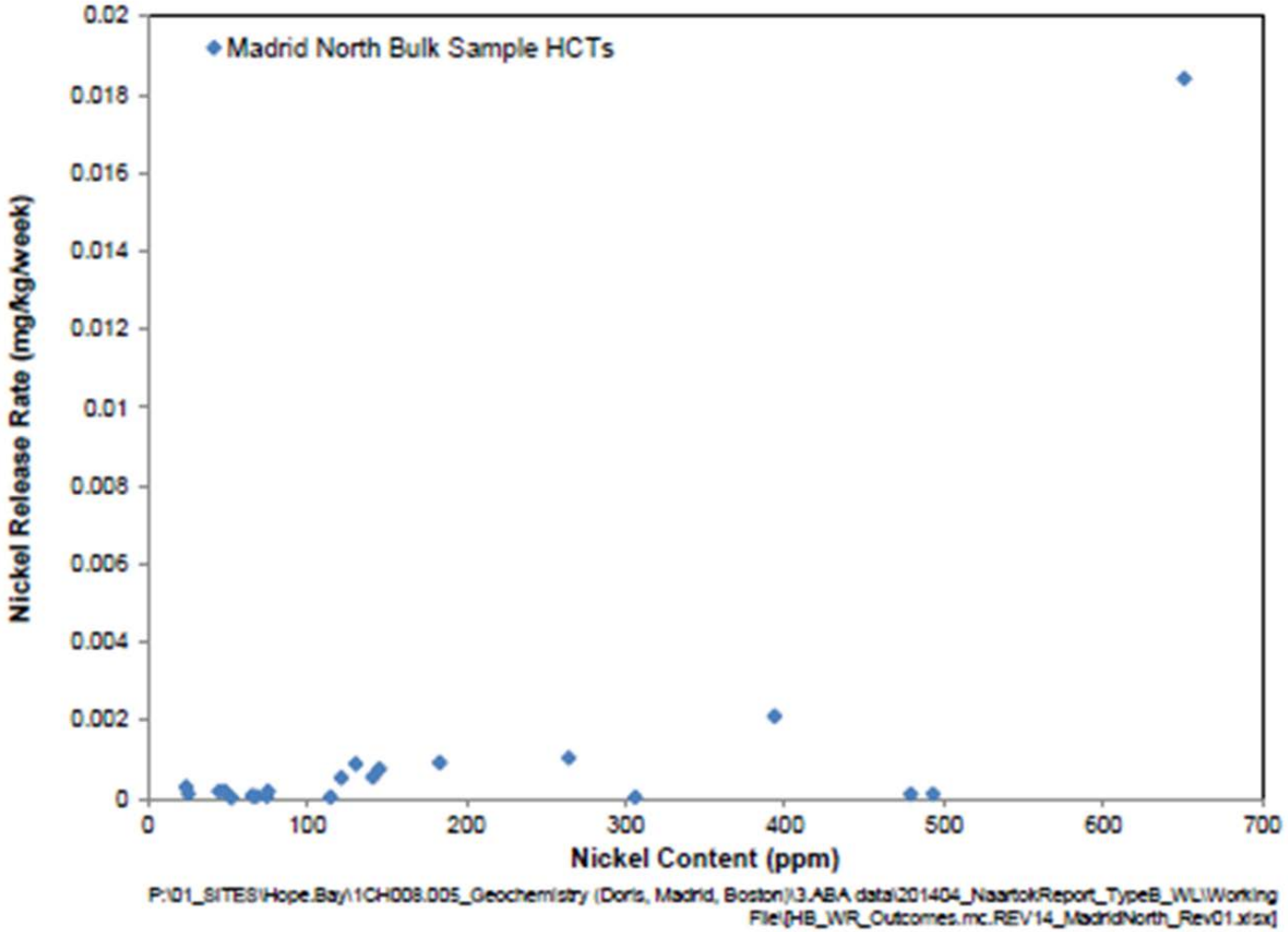


Figure 3-16: Comparison of Stable Nickel Release Rates and Nickel Content

Issue K11 General Lack of Information on Baseline Results within Madrid Advanced Exploration Area

Response:

Six terrestrial fauna or bird VECs were identified during the Doris North Project EIS consultation process (caribou, wolverine, grizzly bear, upland breeding birds, waterfowl and raptors). Baseline and monitoring studies for these wildlife species were conducted between 2009 and 2014 within a wildlife study area (Figure 1) encompassing the geographical area of the Madrid Advanced Exploration Program, and therefore they are considered appropriate in identifying the effects for this application for the Madrid Advance Exploration Program.

Baseline and monitoring studies for wildlife species were conducted between 2009 and 2014 within a wildlife study area encompassing the Hope Bay Belt Region. Species listed on Schedule 1 of the SARA (2002) which have been observed within the study area include; Dolphin Union caribou, peregrine falcon and short-eared owl. However, all three of these species are considered Special Concern and as such do not have federally identified critical habitat as this is only identified for Threatened and Endangered species. However, using the definition of critical habitat to mean “an identified breeding site, nursery area or feeding ground” (http://www.dfo-mpo.gc.ca/species-especes/act-loi/habitat-info-eng.htm) then the key habitat use that has been observed within Type B Water Licence Application boundary for each VEC includes:

1. Caribou (Beverly herd) – foraging habitat;
2. Grizzly bear – foraging habitat;
3. Wolverine – denning habitat;
4. Upland birds – nesting and foraging habitat;
5. Waterbirds – nesting and foraging habitat;
6. Raptors – nesting and foraging habitat including peregrine falcons (nesting and foraging) and short-eared owls (foraging).

Mammal observations have primarily come from the remote camera program while bird observations are from point counts and prism plots for upland birds and aerial surveys for raptors and waterbirds as well as incidental observations for all species (Figure 1).

Large mammals such as caribou and grizzly bear forage in vast ranges on the tundra. Caribou typically feed in areas with a high abundance of cottongrass, flower buds, green sedge leaves, and lichen. This vegetation is primarily found in Heath Tundra, Lichen Veneer, Tussock/Hummock, Low Shrub areas, and Wetland Sedge Meadow vegetation classifications (Figure 2). Grizzly bear, in addition to their carnivorous diet, forage on a variety of foods from various habitats including crowberry, blueberry, sedge, riparian shrub which are typically found in Tall Shrub, Low Shrub, Heath Tundra, Heath/Bedrock, Heath/Boulder Areas. Foraging habitats for caribou and grizzly bear are not specific to the proposed Madrid Advanced Exploration Type B Water Licence Application boundary and the larger regional Hope Bay Belt area and are generally found in abundance on the tundra. For this reason, the effect of the proposed Madrid Project to caribou and grizzly bear foraging habitat is minimal.

Wolverines also have large ranges on the tundra. Denning habitat is limiting for wolverine, thus denning is considered as important habitat for this species. Wolverines typically den in areas with rocky outcrops or in boulder fields, rock overhangs, or large cracks in rocks. These features are associated with Bedrock and Boulder Associations, and Heath/Bedrock, Heath/Boulder

vegetation associations. Denning habitat is not unique within the Madrid Advanced Exploration Type B Water Licence Application boundary and surrounding area. In addition, while wolverines do occur within the area, they are low in abundance. Only one wolverine den has been observed during wildlife studies conducted between 2009 and 2014 for the Doris North Project within the Hope Bay Belt region, located near Roberts Lake (Figure 1) north of Doris Camp. Similarly, wolf dens were scarce on the tundra within the Hope Bay Belt region. The closest wolf den was located approximately 3 km from the proposed northern infrastructure for the Advanced Exploration Project (but outside the Type B Water Licence Application boundary) and west of Windy Lake (Figure 1). Thus, the effect of the proposed Madrid Advanced Exploration Project on denning habitat is anticipated to be negligible.

Eskers, which are known to be important wildlife features, used for travel and denning by mammals were also identified in the wildlife study area but none were observed in the Madrid Advanced Exploration Type B Water Licence Application boundary (Figure 2). These features are scarce within the wildlife study area, and occur at a distance greater than 4 km from Project infrastructure (Figure 2).

Bird observations have primarily been recorded through aerial surveys for raptors and waterbirds, and PRISM Plot and Point Count surveys for upland breeding birds, through the monitoring programs for the Doris North Project. Raptor nests have been observed along cliffs within the Madrid Advanced Exploration Type B Water Licence Application (Figure 1) during cliff nesting surveys conducted for raptors during monitoring programs for the Doris North Project. There are approximately 5 raptor territories within 1 km of proposed Madrid infrastructure (Figure 1). None of the raptor nests identified within the Type B Water Licence Application boundary directly overlap with the proposed infrastructure, thus no raptor nests will be lost due to habitat removal. Upland bird nests and waterbird broods have also been observed during monitoring activities for the Doris North Project. Upland bird nests and waterbird broods have also been observed during monitoring activities for the Doris North Project. Upland bird nests and potential waterbird nests at the edge of Patch Lake can be assumed to be affected.

Important nesting and foraging habitats for upland breeding birds in the area include a variety of habitats, given the range of species that have been observed nesting during monitoring studies for the Doris North Project. For example, dry upland heath areas, such as the Heath Tundra and Heath/Bedrock ecosystems are typical for horned lark and American golden plover (Figure 2). Most shorebirds nest and forage with wet lowland habitats (e.g., Shallow Water, Wetland (Sedge Meadow); Figure 2). Areas containing shrubs, which can be found in drier and wetter landscape positions, are important nesting and foraging habitat for a variety of species, including both common and hoary redpolls and American tree sparrow. Finally, species like the common Lapland longspur nest and forage in relatively all habitats known to occur within the Madrid Advanced Exploration Type B Water Licence Application area, except barren areas and areas of open water (Figure 2).

Waterbirds primarily nest within and surrounding wetland habitats, which include lakes, ponds, rivers, and wetlands (e.g., bogs and fens). Examples of these habitats include Deep Water, Shallow Water, and Wetland (Sedge Meadow; Figure 2).

Raptors in the arctic exhibit two different nesting strategies. The majority of species, including peregrine falcon, golden eagle, rough-legged hawk, and gyrfalcon, nest on steep cliffs and forage in nearby areas in search of food. Cliffs are represented by the Bedrock Association ecosystem type (Figure 2). Ground-nesting raptors, include the short-eared owl which generally select tundra with pockets of willow for nesting habitat and forage within open habitats

surrounding the nest site where small mammal prey are abundant. Suitable foraging habitat for short-eared owl may be represented by the Low Shrub, Heath Tundra, and Tussock/Hummock ecosystems (Figure 2).

Habitat features for all bird species are not limited to within the Madrid Advanced Exploration Type B Water Licence boundary and are widespread on the tundra. Thus, the effect of habitat removal on upland breeding birds, waterbirds, and raptors for the construction of the Madrid Project are anticipated to be minimal.

Figure 1. Wildlife Study Area

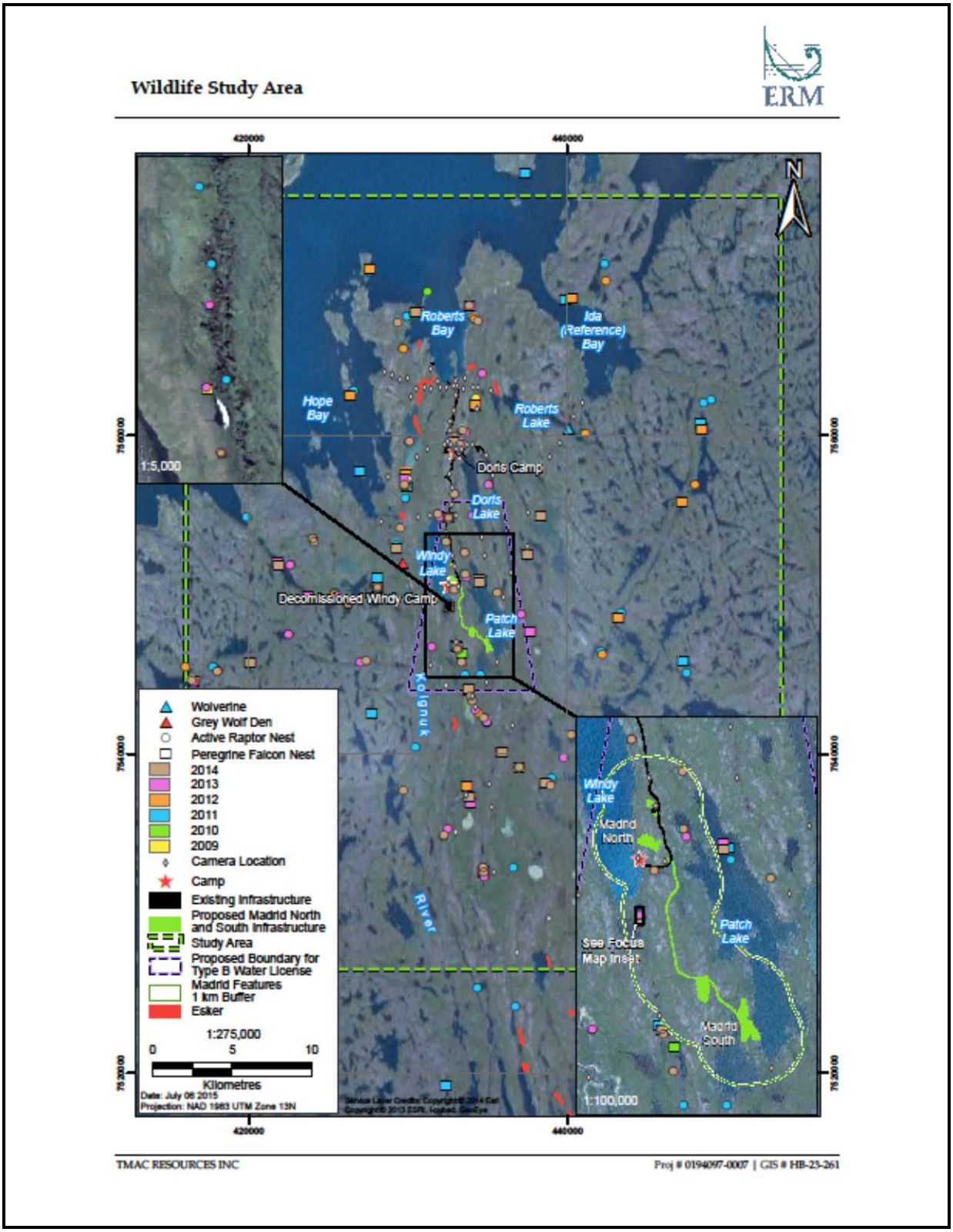
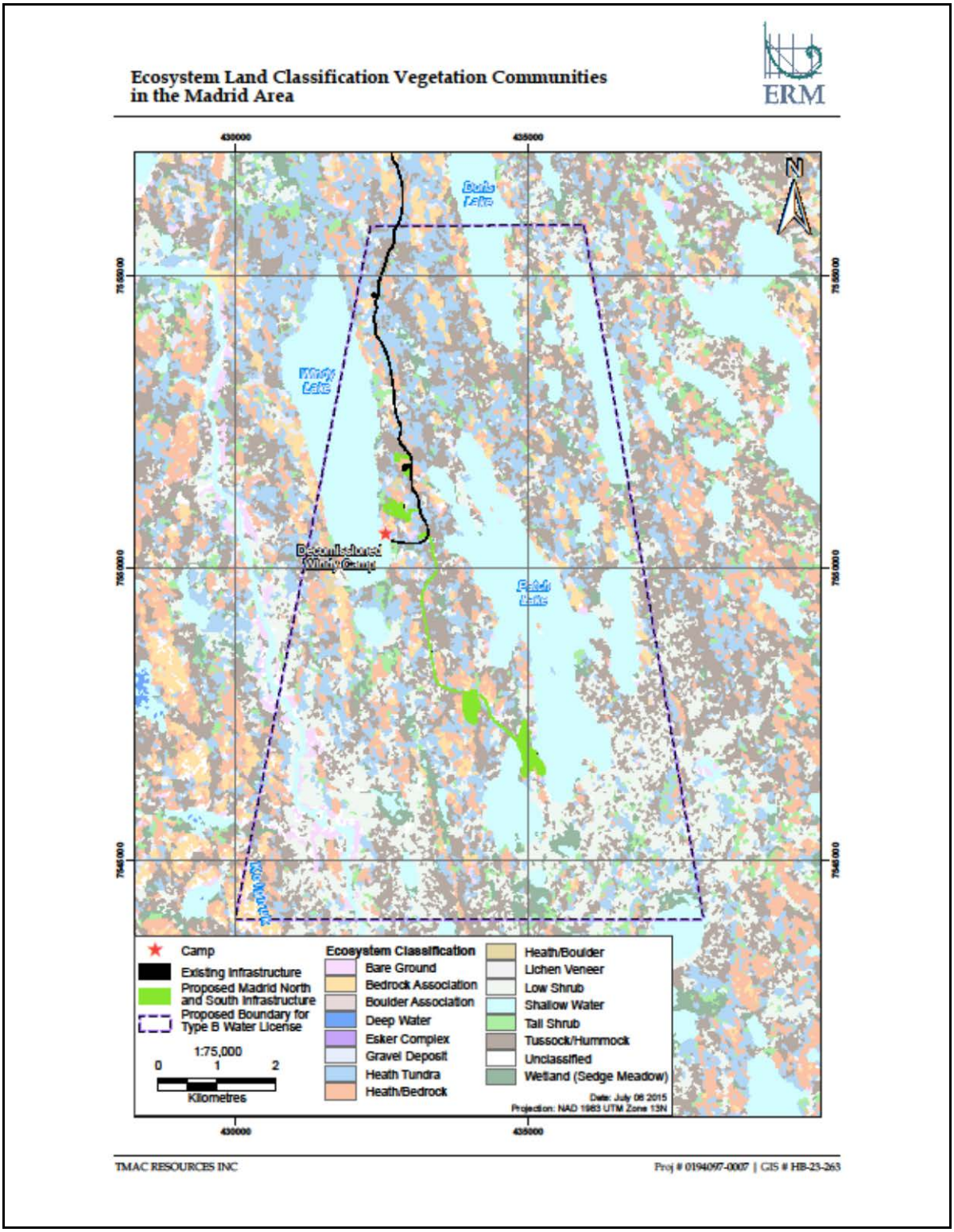


Figure 2. Ecosystem Land Classification Vegetation Communities in the Madrid Area



Issue K17: Cumulative Effects Section Lacking Information

Response:

Cumulative environmental effects are residual effects from a proposed Project (those that are present after mitigation measures have been enacted) that combine with the environmental effects of existing Projects and/or activities to act cumulatively, additively, or synergistically.

The proximity of the Madrid area to the Doris North Project provides the opportunity to take advantage of existing infrastructure that will reduce costs, minimize the footprint and minimize the time required to complete the Madrid Advanced Exploration Program. The permitted infrastructure and facilities at Doris North Project have sufficient capacity to support the proposed Project. Infrastructure associated with the Doris North Project includes port facilities, an airstrip, a camp, waste treatment facilities, milling and processing facilities, tailings impoundment facilities, and existing access roads.

The cumulative effects assessment conducted in the Doris North Project Final EIS (Miramar 2005) included the proposed footprint of the Type B application. Please see Chapter 5 of the Doris North Project Final EIS and supporting document D6 for details of the cumulative effects assessment that was conducted.

The addition of the Madrid Advanced Exploration Program is expected to:

- Add up to an estimated maximum of 48 personnel per bulk sample execution. The Madrid Advanced Exploration Program will utilize available capacity at the existing permanent camp facilities at the Doris North Project and/or the planned camp at Windy Lake permitted under Type “B” Water Licence 2BE-HOP122. Combined, these camps have the capacity to house 360 workers. Activities associated with the Madrid Advanced Exploration Program will be scheduled such that additional camp space will not be required during the construction, operations, or closure stages. Planning for the Madrid Advanced Exploration Program anticipated a peak work force of up to 70 workers if maximum overlap occurred in development of the North and South components of the program and as few as 5 during post-closure. This “peak” number was included in the application to demonstrate that sufficient camp space was already permitted at Hope Bay to house the workers required for Madrid, though it is not anticipated that such a peak will be reached as each bulk sample development will occur sequentially. Use of the existing infrastructure is a mitigation by design and eliminates the need for additional camp facilities.

- Add to the footprint affected (approximately 25 ha of the total 209 ha). Existing infrastructure is in place for water use, solid and hazardous waste management, laydown/storage, processing and tailings management for the Doris North Project; this infrastructure will be used to support the proposed Madrid Advanced Exploration Program. No changes to existing Doris North Project infrastructure are required as a result of the advanced exploration program; however, some of the existing management plans will need to be updated to encompass the addition of the Madrid area. The resultant footprint of the Madrid Exploration Activities is limited to the area in the vicinity of the underground access portals and surface facilities to complete the bulk sampling program efficiently and safely. This represents a mitigation by design to minimize the area affected by the area.

- Expand underground bulk sampling for a short timeframe (1.5 years each). Bulk sample ore will be transported from Madrid North and Madrid South to the Doris North Project mill for

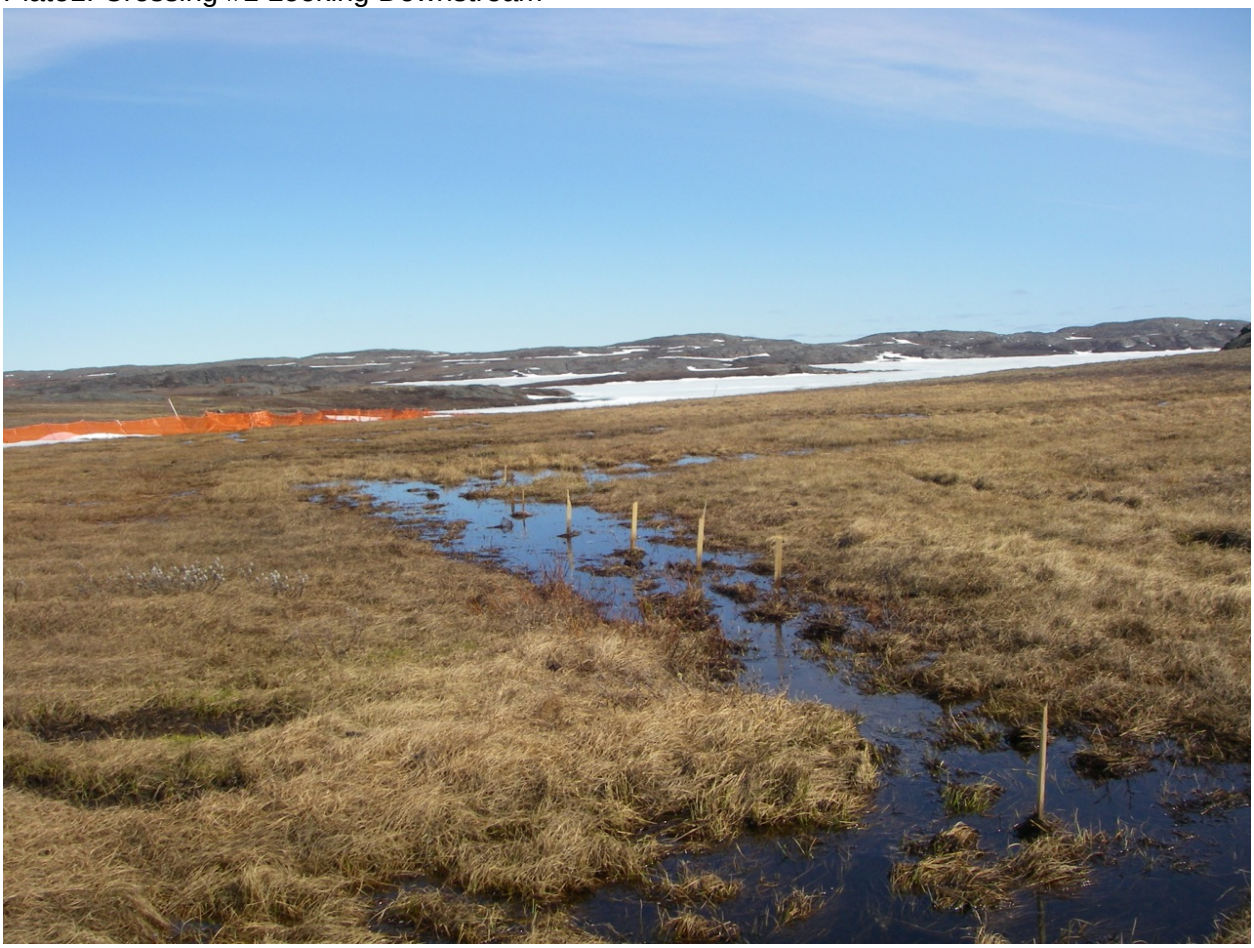
test processing. The Doris North Project mill is an approved but yet to be constructed facility under the Type “A” Water Licence 2AM-DOH1323. It uses a conventional milling process consisting of crushing, grinding, gravity and flotation concentration, cyanide leach of the concentrate, gold recovery, and on-site refining. Once constructed, the mill will have the permitted capacity to process ore from the bulk samples at an average rate of 800 tonnes per day. As described above in response to comment KitIA 1, test ore from Madrid will be processed in volumes within the capacity of the currently permitted Doris North TIA (previously Tail Lake) to accommodate the tailings generated. Tail Lake has been added to Schedule 2 of the Metal Mining Effluent Regulations and is fully permitted for use as a tailings impoundment area. Discharge from the TIA must meet the water quality criteria for the Doris North Project Type “A” Water Licence 2AM DOH1323. Use of existing facilities is a mitigation by design and eliminates the need for additional processing facilities on site.

Due to the mitigation measures that will be applied to the proposed Project, which includes using the existing permitted infrastructure and personnel at the Doris North Project, no residual impacts are expected due to the proposed Project.

As there are no anticipated residual effects, there are no cumulative effects between the Madrid Exploration Program and the Doris North Project.

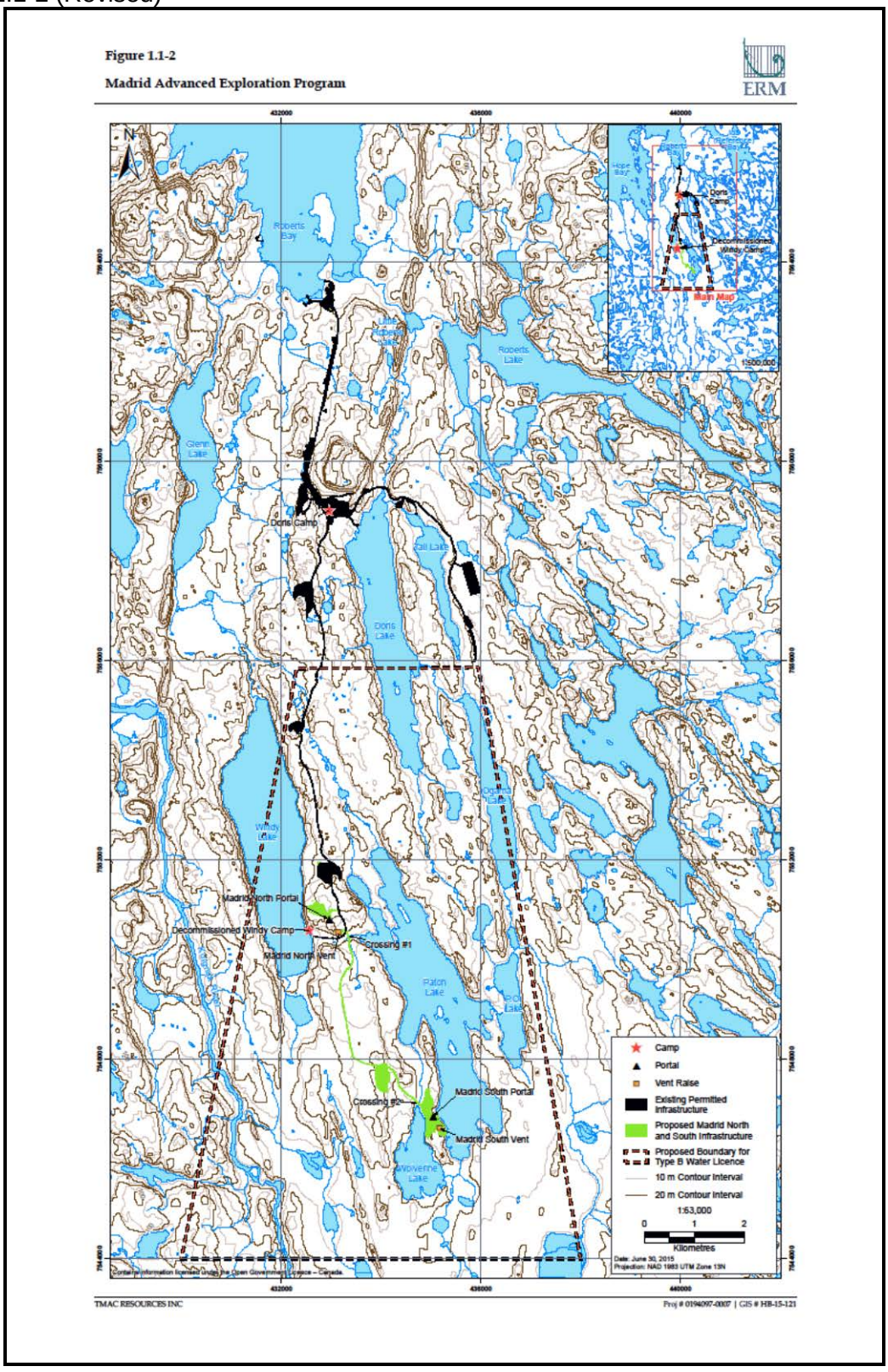
Issue # K23: Sampling information for Crossing #1

Plate1: Crossing #1 Looking Downstream



Issue # K24 Location of Wolverine Lake Outflows

Figure 1.1-2 (Revised)



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